11-18-11 LETTING ITEM 112

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	1
FEDERAL AID PROJECT		ILLINOIS	PROJECT	

CONTRACT NO. 97460

INDEX OF SHEETS

STANDARDS

STANDARD 000001–06	STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS
STANDARD 280001–05	TEMPORARY EROSION CONTROL SYSTEMS
STANDARD 515001–03	NAME PLATE FOR BRIDGES
STANDARD 631026–05	TRAFFIC BARRIER TERMINAL, TYPE 5
STANDARD 635006–03	REFLECTOR AND TERMINAL MARKER PLACEMENT
STANDARD 701901–01	TRAFFIC CONTROL DEVICES
STANDARD B.L.R. 21–8	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS

UTILITIES:

PHONE: AT&T
210 N. LOCUST
CENTRALIA, IL 62801
ATTN: ART NALL
(618)533–3416

POWER: TRI–COUNTY ELECTRIC
1631 E. MAIN ST.
SALEM, IL 62881
(618)548–3508

WATER: RACCOON WATER COMPANY
2640 STATE RTE. 161
CENTRALIA, IL 62801
(618)532–9201

Call Before You Dig
JULIE
ILLINOIS ONE-CALL SYSTEM

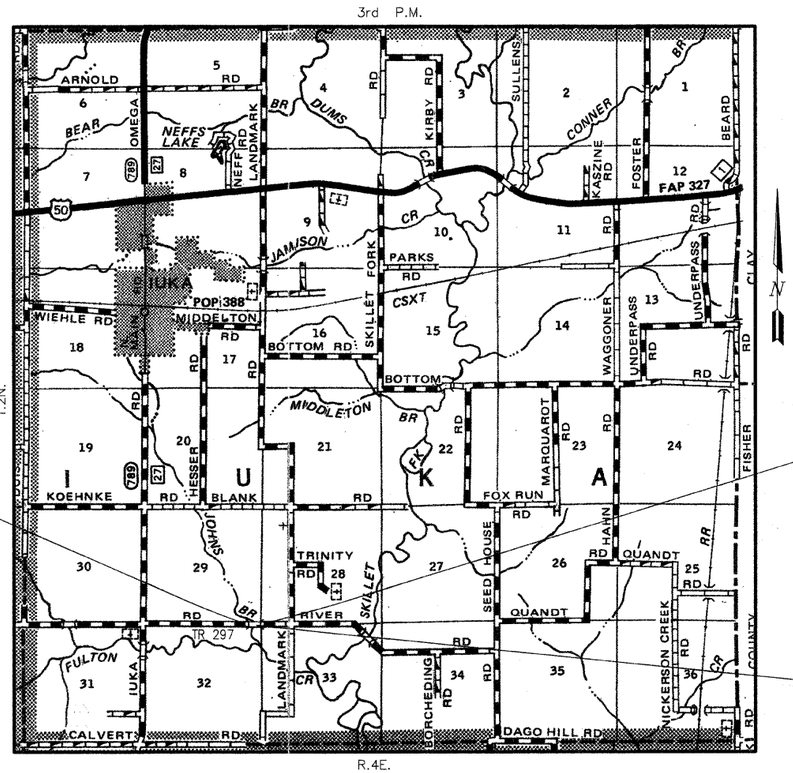
48 HOURS PRIOR TO EXCAVATION CALL J.U.L.I.E.:
811 OR 1–800–892–0123

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR PROPOSED
HIGHWAY BRIDGE PROGRAM

SCALES:
PROFILE HORIZ. 0' 20' 40'
PROFILE VERT. 0' 2' 4'
CROSS SECTIONS HORIZ. 0' 10' 20'
CROSS SECTIONS VERT. 0' 5' 10'

SECTION 07-06117-00-BR
PROJECT NO. BROS-0121(056)
IUKA ROAD DISTRICT
MARION COUNTY
JOB NO. C-98-344-10
T.R. 297 (RIVER ROAD) OVER JOHNS BRANCH

LOCATION OF PROJECT INDICATED THUS – —



BEGIN SECTION 07–06117–00–BR
STA. 47+80.00

END SECTION 07–06117–00–BR
STA. 51+10

STA. 49+96 – CONSTRUCT SINGLE SPAN PRECAST PRESTRESSED CONCRETE DECK BEAM BRIDGE (42.50' BK. TO BK. ABUTMENTS) WITH PILE BENT SPILL THRU ABUTMENTS ON STEEL HP PILES, 0° SKEW, 24' ROADWAY
EXISTING STRUCTURE NO. 061–3135
PROPOSED STRUCTURE NO. 061–3306

LOCATION MAP

APPROXIMATE SCALE – 1" = 0.60 MILE
LENGTH OF IMPROVEMENTS – 330.00 FEET = 0.0625 MILE

APPROVED 8-16-11, 20___.
Ralph W. Strand
IUKA ROAD DISTRICT COMMISSIONER

MARION COUNTY
HIGHWAY DEPARTMENT
APPROVED Aug 16, 2011.
Jerry L. Cunningham
MARION COUNTY ENGINEER

PASSED September 19, 2011.
DISTRICT EIGHT ENGINEER OF LOCAL ROADS & STREETS

Releasing For Bid Based on Limited Review September 19, 2011.
DEPUTY DIRECTOR OF HIGHWAYS, REGION FIVE ENGINEER

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PRINTED BY AUTHORITY OF THE STATE OF ILLINOIS

WILLIAM D. LUEKING
62-38870
LICENSED PROFESSIONAL ENGINEER OF ILLINOIS

William D. Lueking
WILLIAM D. LUEKING
ILLINOIS LICENSED PROFESSIONAL ENGINEER NO. 62-38870
EXPIRES NOV. 30, 2011
09-13-2011

RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

CLASS ROAD: LOCAL ROAD (NON–URBAN)
A.D.T. = 125
3R

PREPARED FOR:
AECOM

DATE: AUGUST 15, 2011
RHUTASEL JOB NO. 51010

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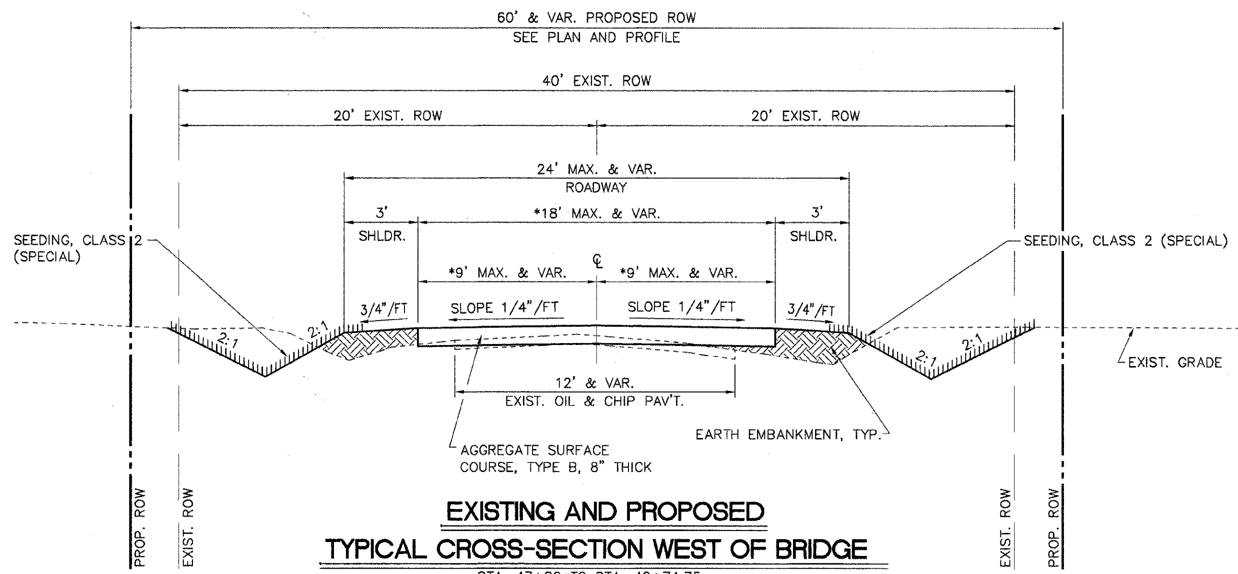
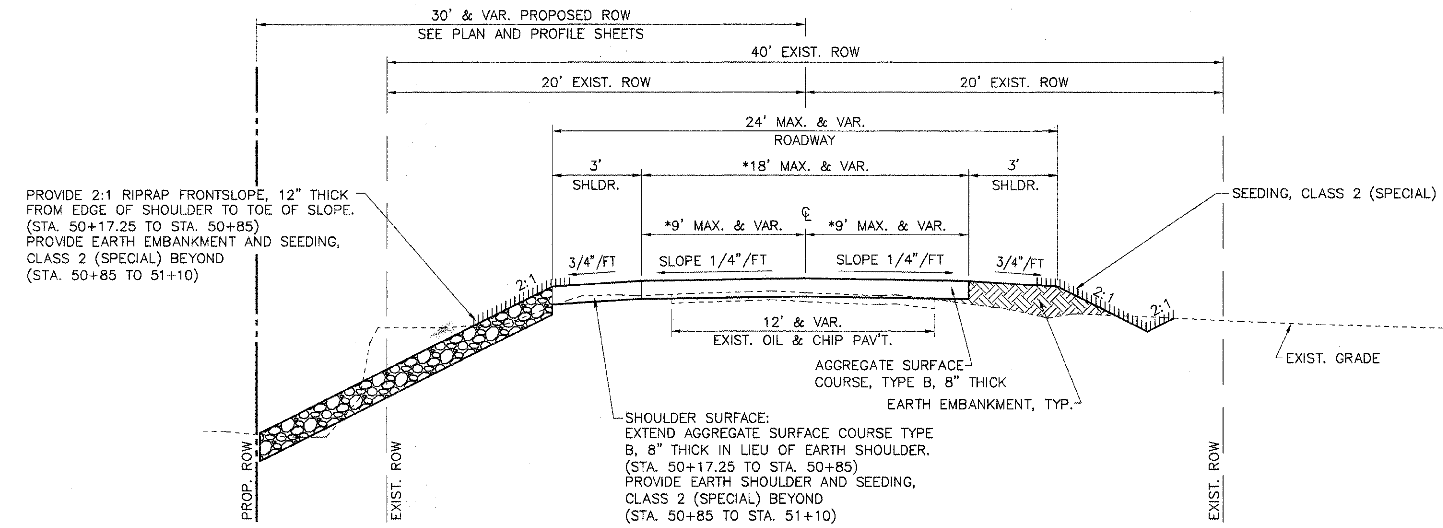


EXISTING AND PROPOSED TYPICAL CROSS-SECTION WEST OF BRIDGE

STA. 47+80 TO STA. 49+74.75

* TRANSITION FROM EXISTING 12' PAVEMENT TO PROPOSED 18' PAVEMENT STA. 47+80 TO STA. 48+70. PROVIDE 18' PROPOSED PAVEMENT STA. 48+70 TO STA. 49+74.75.



EXISTING AND PROPOSED TYPICAL CROSS-SECTION EAST OF BRIDGE

STA. 50+17.25 TO STA. 51+10

* TRANSITION FROM PROPOSED 18' PAVEMENT TO EXISTING 12' PAVEMENT, STA. 50+17.25 TO STA. 51+10.

EXTRA BARS FOR TEST SAMPLES

BAR	NO.	SIZE	LENGTH	SHAPE
h	1	#4	5'-0"	
u	1	#6	11'-1"	
p	1	#7	24'-9"	

THESE BARS SHALL BE IDENTICAL TO AND DELIVERED WITH THE BARS OF THE SAME MARK LISTED ON THE BRIDGE SHEETS. ONE BAR OF EACH OF THESE MARKS WILL BE SELECTED BY THE ENGINEER TO BE USED AS A TEST SAMPLE. THIS CHART ASSUMES THAT ALL BARS OF THE SAME SIZE ON THE JOB WILL HAVE THE SAME HEAT NUMBERS. IF BARS OF THE SAME SIZE ON THE JOB HAVE DIFFERENT HEAT NUMBERS, THEN THE CONTRACTOR SHALL SUPPLY ADDITIONAL BARS FROM OTHER HEAT NUMBERS FOR SAMPLING BY THE ENGINEER AT NO ADDITIONAL COST.

THE COST TO FURNISH THESE EXTRA BARS SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE PER POUND FOR REINFORCEMENT BARS AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

GENERAL NOTES

1. THIS SECTION SHALL BE CONSTRUCTED ACCORDING TO THE PLANS, THE SPECIAL PROVISIONS AND THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" ADOPTED JANUARY 1, 2007.
2. THE SHRINKAGE FACTOR FOR EMBANKMENT IS 25%.
3. BITUMINOUS SURFACE TREATMENT (A-2) WILL BE COMPLETED BY THE OWNER.
4. IF ASH TREES ARE REMOVED ON THE PROJECT, THE CONTRACTOR SHALL BECOME FAMILIAR WITH AND COMPLY WITH MEASURES SPECIFIED BY THE ILLINOIS DEPARTMENT OF AGRICULTURE (IDOA) TO PREVENT THE SPREAD OF THE EMERALD ASH BORER. THE IDOA INFORMATION FOR ASH TREE REMOVAL CAN BE FOUND ON THE IDOA WEBSITE AT WWW.AGR.STATE.IL.US/EAB.
5. COMMITMENTS: NONE AS OF AUGUST 15, 2011.

SUMMARY OF QUANTITIES

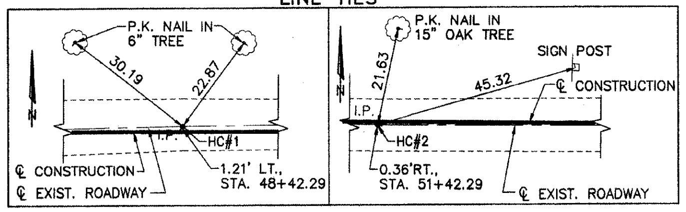
	CODE NO.	ITEM	QUANTITY	UNIT
	20100110	TREE REMOVAL (6 TO 15 UNITS DIAMETER)	26	UNIT
	20100210	TREE REMOVAL (OVER 15 UNITS DIAMETER)	52	UNIT
	20200100	EARTH EXCAVATION	164	CU. YD.
	20300100	CHANNEL EXCAVATION	155	CU. YD.
	20400800	FURNISHED EXCAVATION	180	CU. YD.
	28000305	TEMPORARY DITCH CHECKS	40	FOOT
	28100807	STONE DUMPED RIPRAP, CLASS A4	172	TON
	40200800	AGGREGATE SURFACE COURSE, TYPE B	228	TON
	50100100	REMOVAL OF EXISTING STRUCTURES	1	EACH
	50300225	CONCRETE STRUCTURES	16.6	CU. YD.
	50300280	CONCRETE ENCASEMENT	2.1	CU. YD.
	50400305	PRECAST PRESTRESSED CONCRETE DECK BEAMS (17" DEPTH)	984	SQ. FT.
	50800105	REINFORCEMENT BARS	2240	POUND
*	50900205	STEEL RAILING, TYPE S1	82	FOOT
	51201400	FURNISHING STEEL PILES HP 10x42	455	FOOT
	51202305	DRIVING PILES	455	FOOT
	51203400	TEST PILE STEEL HP 10x42	1	EACH
	51500100	NAME PLATES	1	EACH
	67100100	MOBILIZATION	1	L. SUM
*	78201000	TERMINAL MARKER - DIRECT APPLIED	4	EACH
	X2501000	SEEDING, CLASS 2 (SPECIAL)	0.14	ACRE

* SPECIALTY ITEM

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	3
FEDERAL AID PROJECT		ILLINOIS	PROJECT	

CONTRACT NO. 97460

LINE TIES



HORIZONTAL CONTROL COORDINATES

POINT	LOCATION	N. COOR.	E. COOR.
HC#1(IRON PIN)	1.21' LT., STA. 48+42.29	5002.52	4802.62
HC#2(IRON PIN)	0.36' RT., STA. 51+42.29	5011.12	5102.49

BENCH MARK COORDINATES

POINT	LOCATION	ELEV.
BM#1(R.R. SPIKE IN POWER POLE)	23.01' RT., STA. 49+46.26	453.53
BM#2(R.R. SPIKE IN 14" OAK TREE)	21.69' LT., STA. 50+48.27	454.53

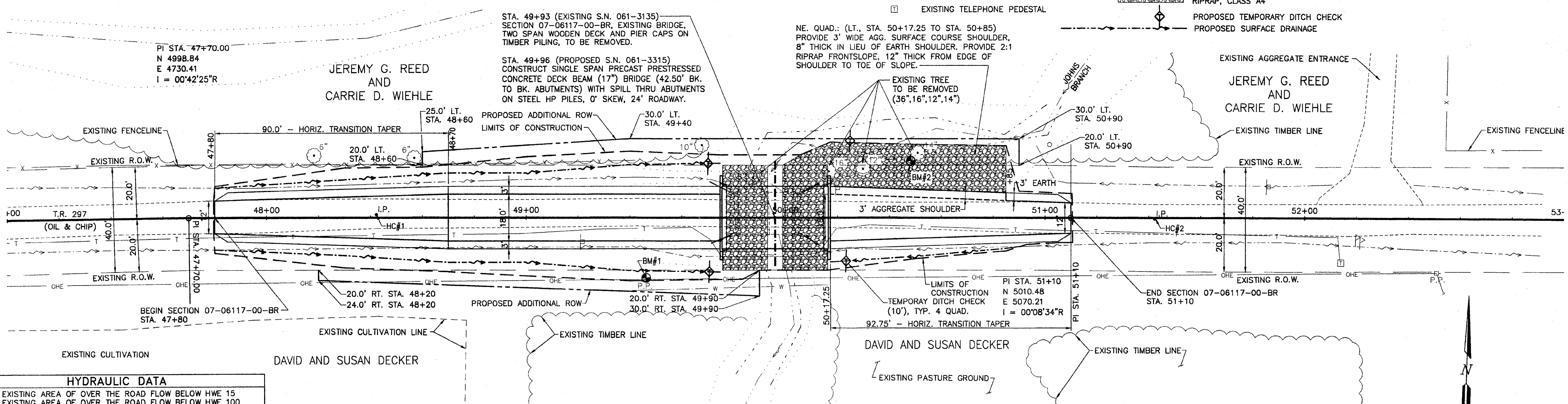
LEGEND

EXISTING TREE	EXISTING SURFACE DRAINAGE
EXISTING TREE LINE	EXISTING STREAM
EXISTING SIGN	EXISTING FENCE
EXISTING IRON PIN	EXISTING POWER POLE
EXISTING BENCH MARK	EXISTING OVERHEAD ELECTRIC LINE
EXISTING WATER LINE	EXISTING GUY WIRE
EXISTING TELEPHONE LINE	PROPOSED STONE DUMPED RIPRAP, CLASS A4
EXISTING TELEPHONE PEDESTAL	PROPOSED TEMPORARY DITCH CHECK
	PROPOSED SURFACE DRAINAGE

STA. 49+93 (EXISTING S.N. 061-3135) SECTION 07-06117-00-BR, EXISTING BRIDGE, TWO SPAN WOODEN DECK AND PIER CAPS ON TIMBER PILING, TO BE REMOVED.

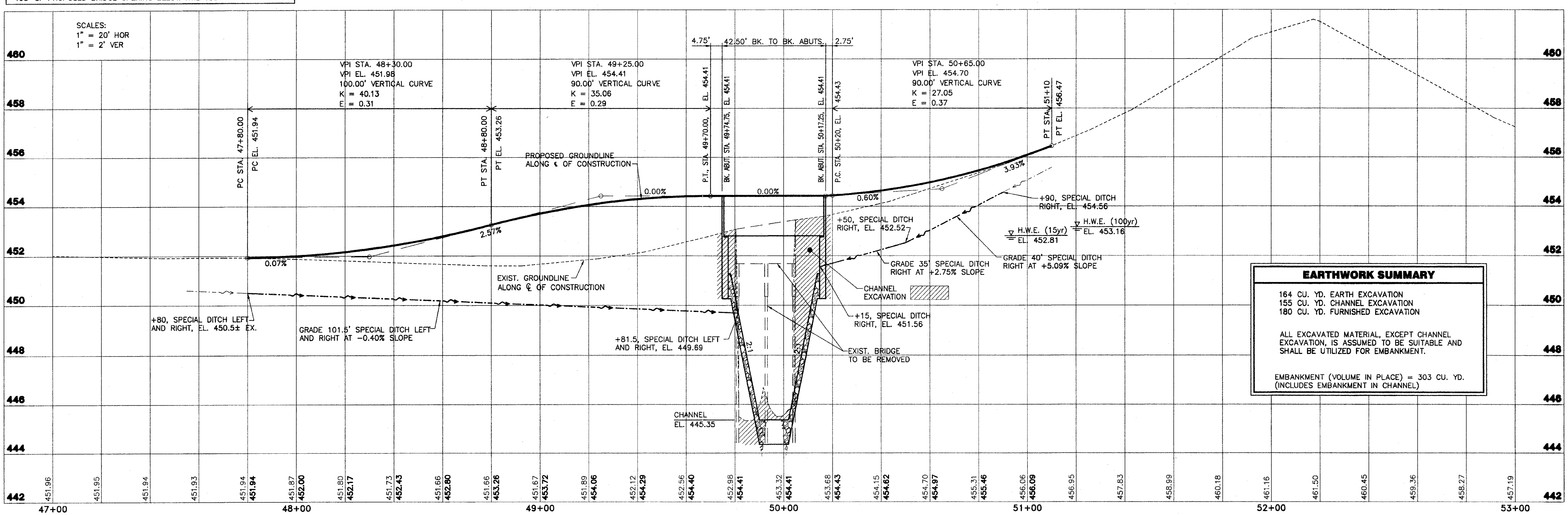
STA. 49+96 (PROPOSED S.N. 061-3315) CONSTRUCT SINGLE SPAN PRECAST PRESTRESSED CONCRETE DECK BEAM (17") BRIDGE (42.50' BK. TO BK. ABUTMENTS) WITH SPILL THRU ABUTMENTS ON STEEL HP PILES, 0° SKEW, 24' ROADWAY.

NE. QUAD.: (LT., STA. 50+17.25 TO STA. 50+85) PROVIDE 3' WIDE AGG. SURFACE COURSE SHOULDER, 8" THICK IN LIEU OF EARTH SHOULDER. PROVIDE 2:1 RIPRAP FRONTSLOPE, 12" THICK FROM EDGE OF SHOULDER TO TOE OF SLOPE.



HYDRAULIC DATA

323 SF EXISTING AREA OF OVER THE ROAD FLOW BELOW HWE 15
453 SF EXISTING AREA OF OVER THE ROAD FLOW BELOW HWE 100
192 SF PROPOSED AREA OF OVER THE ROAD FLOW BELOW HWE 15
318 SF PROPOSED AREA OF OVER THE ROAD FLOW BELOW HWE 100
120 SF EXISTING BRIDGE OPENING BELOW HWE 15
120 SF EXISTING BRIDGE OPENING BELOW HWE 100
198 SF PROPOSED BRIDGE OPENING BELOW HWE 15
198 SF PROPOSED BRIDGE OPENING BELOW HWE 100



EARTHWORK SUMMARY

164 CU. YD. EARTH EXCAVATION
155 CU. YD. CHANNEL EXCAVATION
180 CU. YD. FURNISHED EXCAVATION

ALL EXCAVATED MATERIAL, EXCEPT CHANNEL EXCAVATION, IS ASSUMED TO BE SUITABLE AND SHALL BE UTILIZED FOR EMBANKMENT.

EMBANKMENT (VOLUME IN PLACE) = 303 CU. YD. (INCLUDES EMBANKMENT IN CHANNEL)

RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

PREPARED FOR: AECOM 200705482

T.R. 297, SECTION 07-06117-00-BR
IUKA ROAD DISTRICT
MARION COUNTY, ILLINOIS

PLAN AND PROFILE
STA. 47+00 TO STA. 53+00

SURVEY JAS	CHECKED	DATE 08/15/11
DESIGN JMW	APPROVED	REVISED
DRAWN JMW		JOB NO. 51010

B.M. - B.M.#1 R.R. spike in Power Pole, 23.0' RT., STA. 49+46.3, EL. 453.53

B.M.#2 R.R. spike in 14" Oak Tree, 21.7' LT., STA. 50+48.3, EL. 454.53

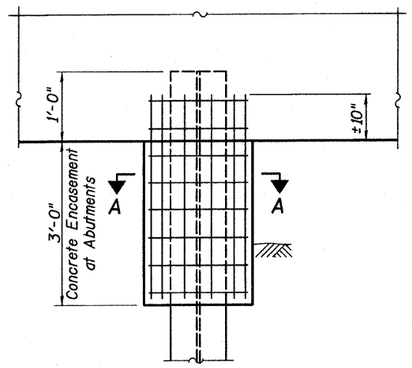
Existing Structure - The existing structure is a two span with timber deck and timber stringers. Substructure is comprised of timber abutment caps, piling, back wall and retaining walls. S.N. 061-3135

Salvage - None

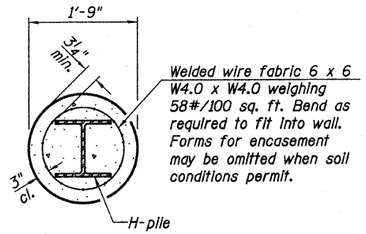
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	4
FEDERAL AID PROJECT		ILLINOIS	PROJECT	

CONTRACT NO.

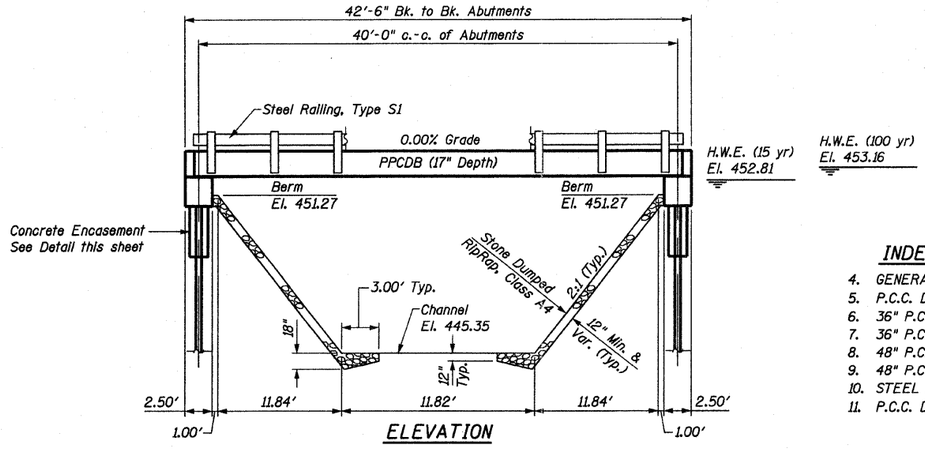


ELEVATION

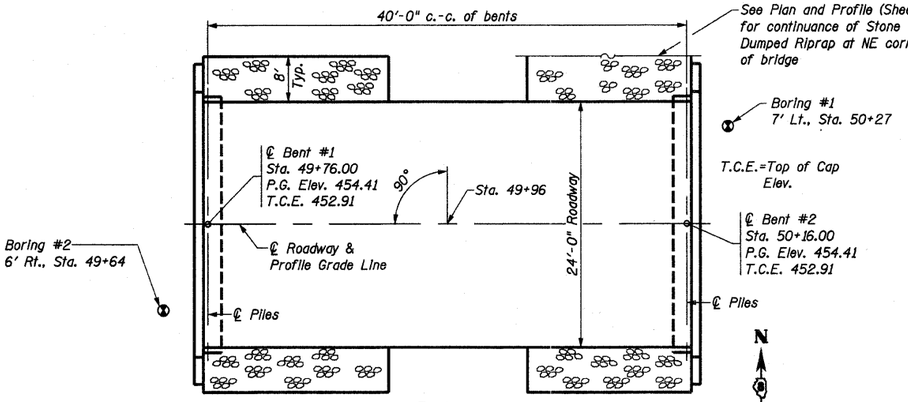


SECTION A-A

PILE ENCASEMENT
(0.086 C.Y./Ft.)



ELEVATION



PLAN

INDEX OF SHEETS

BILL OF MATERIAL - BRIDGE ONLY

Item	Unit	Super	Sub. Piers	Sub. Abuts.	Total
Removal of Existing Structures	Each				1
Concrete Structures	Cu. Yd.			16.6	16.6
Precast Prestressed Concrete Deck Beams (17" Depth)	Sq. Ft.	984			984
Steel Railing, Type S1	Foot	82			82
Reinforcement Bars	Pound			2240	2240
Furnishing Steel Pile HP 10x42	Foot			455	455
Driving Piles	Foot			455	455
Test Pile Steel HP 10x42	Each			1	1
Name Plates	Each			1	1
Concrete Encasement	Cu. Yd.			2.1	2.1

GENERAL NOTES

Reinforcement bars shall conform to the requirements of ASTM A 706 Grade 60 (IL Modified). See Supplemental Specifications.

Layout of slope protection system may be varied in the field to suit ground conditions as directed by the Engineer.

See Section 502 of the Standard Specifications for Structural Excavation.

Channel excavation shall be excavated as shown within the limits of the proposed bridge, then tapered to the existing channel at the ROW line. If the Engineer deems the material satisfactory, it may be used to construct the roadway embankment.

See Special Provisions for Soil Borings.

Do not scale these drawings.

The Steel H-piles shall be according to AASHTO M270 Grade 50.

The contractor shall drive 1 test pile, as specified, in a permanent location as directed by the Engineer before ordering the remaining piles.

The abutment bearing seat surfaces for the precast prestressed concrete deck beams shall be adjusted by shimming to assure firm and even bearing. As required, 1/8" fabric adjusting shims of the dimensions of the Exterior Bearing Pad shall be provided for each bearing. The top surface of the beams shall be finished according to the IDOT Manual for Fabrication of Precast Prestressed Concrete Products.

A corrosion inhibitor shall be used in the concrete for the precast prestressed concrete deck beams, according to Article 1020.05(b)(12) and 1020.06 of the Standard Specifications.

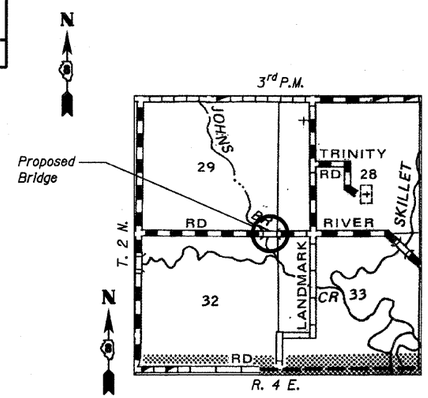
DESIGN SPECIFICATIONS
2007 AASHTO LRFD Bridge Design Specifications with 2008 and 2009 Interims

LOADING HL-93
Allow 50# / Sq. Ft. for Future Wearing Surface.

SEISMIC DATA
Seismic Performance Zone (SPZ) = 2
Design Spectral Acceleration at 1.0 sec. (S_{D1}) = 26
Design Spectral Acceleration at 0.2 sec. (S_{DS}) = 58
Soil Site Class = D

STATION 49+96
JOHNS BRANCH
SEC. 07-06117-00-BR BUILT 201_
PROJECT NO. BROS-0121(056)
MARION COUNTY
LOADING HL93
STR. NO. 061-3315

LETTERING FOR NAME PLATE
Locate Name Plate at Southeast Corner of Bridge (See Std. 515001-03)



LOCATION SKETCH

PILE DATA (2-ABUTS.)

Pile Type and Size:	Steel Piles, HP10x42
Nominal Required Bearing:	213 kips
Allowable Resistance Available:	71 kips
Estimated Pile Length:	65 Feet
Number of Production Piles:	7
Number of Test Piles:	1 (located in Bent #2)

WATERWAY INFORMATION

Drainage Area = 3.69 Sq. Mi. Low Grade Elev. 451.94 @ Sta. 47+80

Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft. Exist.	Opening Sq. Ft. Prop.	Nat. H.W.E. Ft.	Head - Ft. Exist.	Head - Ft. Prop.	Headwater Elev. - Ft. Exist.	Headwater Elev. - Ft. Prop.
Design	15	996	120	198	452.81	N/A	0.36	N/A	453.17
Base	100	1600	120	198	453.16	N/A	0.55	N/A	453.71
Overtopping									
Max. Calc.	500								

Date of License Expiration : 11-30-2012

Date: 09-13-2011

Signature: William D Luehring

I certify that to the best of 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.

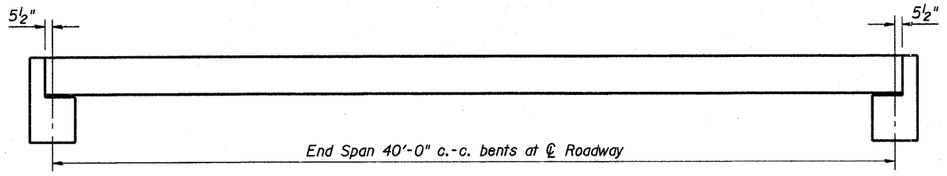
RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

PREPARED FOR: AECOM 200705482

Date: 08/15/2011
Design: WDL
Drawn: JSD
Job No.: 51010

GENERAL PLAN & ELEVATION
TR 297
JOHNS BRANCH
SECTION 07-06117-00-BR
MARION COUNTY
STATION 49+96

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	5
FEDERAL AID PROJECT		ILLINOIS	PROJECT	
			CONTRACT NO.	



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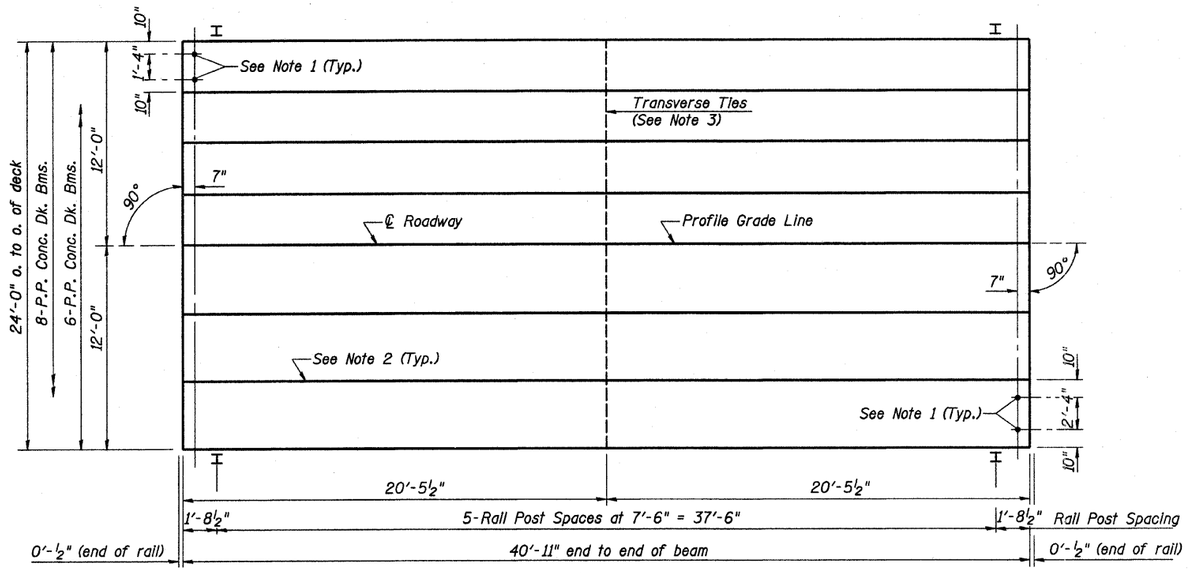
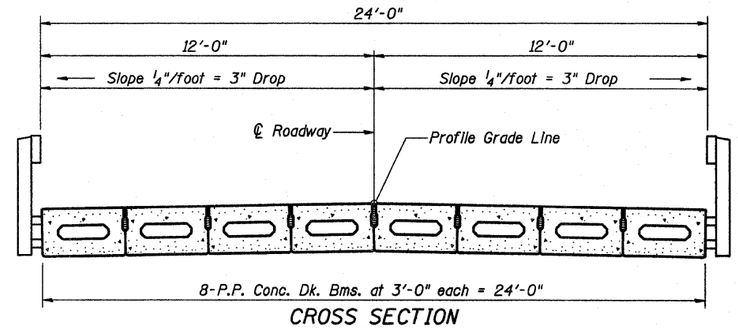
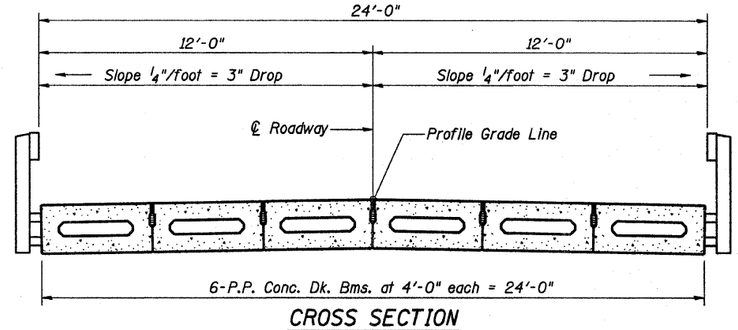


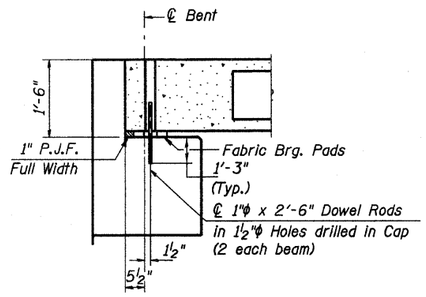
PLAN



CROSS SECTION



CROSS SECTION



SECTION AT ABUTS.
(Along ℄ Beams)

QUANTITIES FOR ONE SPAN

P.P. Conc. Dk. Bm. 17" Dp.	984 Sq. Ft.
Steel Railing	82 Ft.

NOTES

1. After beams have been erected, holes shall be drilled into substructure and anchor dowels placed. Dowel holes shall be filled with non-shrink grout to top of beam and allowed to cure min. 24 hrs. prior to grouting the shear keys.
2. Longitudinal keys shall be grouted.
3. The 1" ϕ rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets that receive transverse tie bar outside shall be filled with grout after transverse tie assembly is in place.

P.P.C. DECK BEAM SUPERSTRUCTURE

24' ROADWAY
17" BEAMS
34' SPAN - 0° SKEW

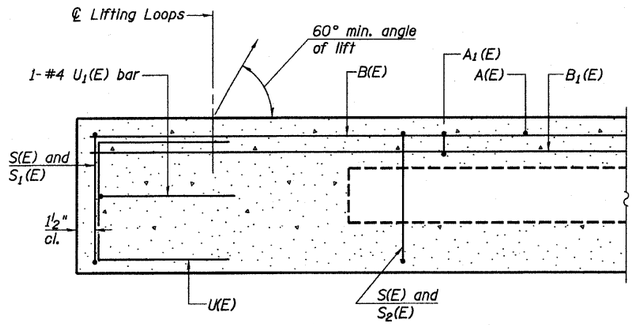
RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

PREPARED FOR: AECOM 200705482

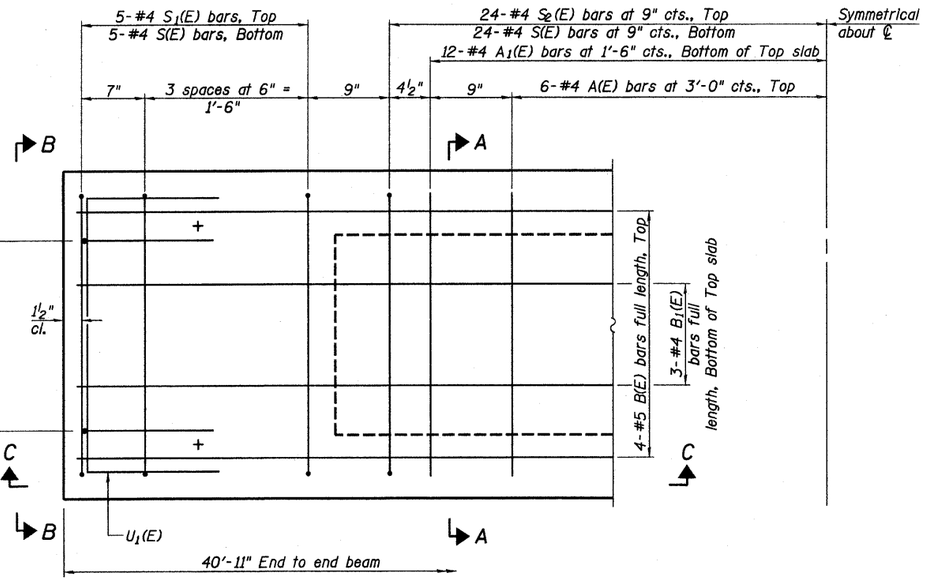
Date: 08/15/2011
Design: WDL
Drawn: JSD
Job No.: 51010

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	6
FEDERAL AID PROJECT		ILLINOIS	PROJECT	

CONTRACT NO.

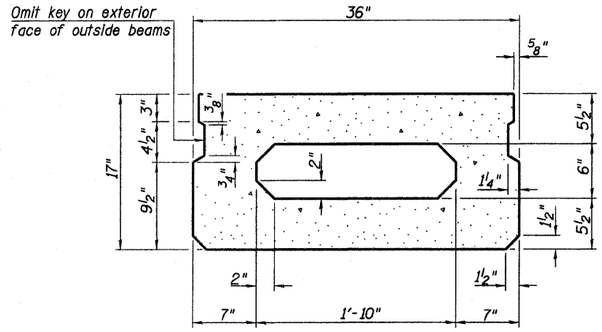


SECTION C-C

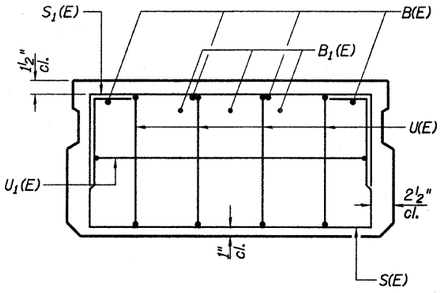


PLAN VIEW

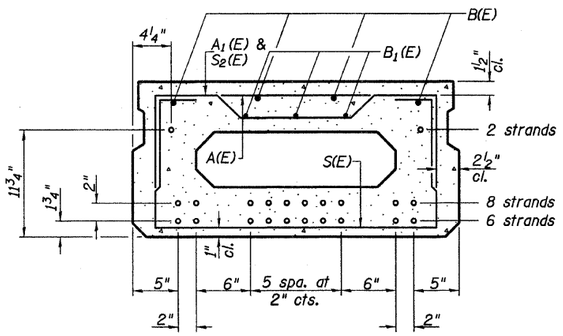
Note: Spacing of S(E) and $S_2(E)$ bars may be adjusted up to 4" in the immediate area of the transverse tie diaphragms to miss the block outs for the transverse ties.



SECTION A-A
(Showing dimensions)



VIEW B-B



SECTION A-A
(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.

Strands: 16 - ½"ϕ strands.

BAR LIST
ONE BEAM ONLY
(For information only)

Bar	No.	Size	Length	Shape
A(E)	12	#4	2'-7"	—
$A_1(E)$	24	#4	2'-11"	~
B(E)	4	#5	40'-7"	—
$B_1(E)$	3	#4	40'-7"	—
S(E)	58	#4	5'-9"	□
$S_1(E)$	10	#4	4'-3"	⊓
$S_2(E)$	48	#4	4'-6"	⊓
U(E)	8	#5	3'-8"	⊏
$U_1(E)$	2	#4	5'-0"	⊓

Note: See sheet 7 of 12 for additional details.
See sheet 4 of 12 for Bill of Material.

RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

PREPARED FOR: AECOM 200705482

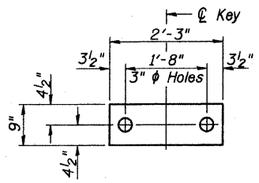
Date: 08/15/2011
Design: WDL
Drawn: JSD
Job No.: 51010

P.P.C. DECK BEAM DETAILS AND SECTIONS

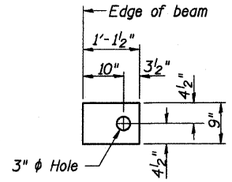
24' ROADWAY
17" x 36" BEAMS
0° SKEW

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	7
FEDERAL AID PROJECT		ILLINOIS	PROJECT	

CONTRACT NO.



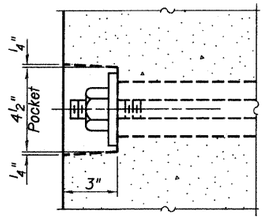
FABRIC BEARING PAD
(Interior)



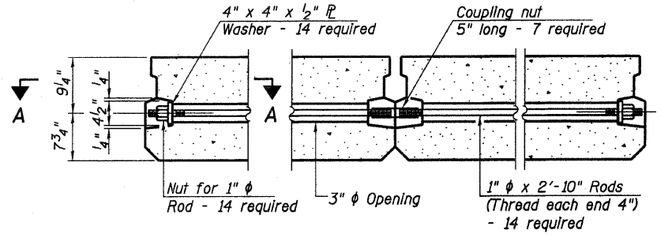
FABRIC BEARING PAD
(Exterior)

FIXED

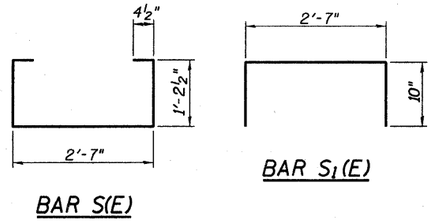
Notes:
All bearing pads shall be 1" thick.
Omit holes when using expansion bearings.
Expansion bearing pad shall be bonded to the substructure.



SECTION A-A

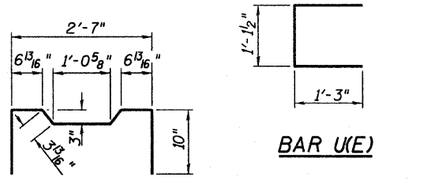


TYPICAL TRANSVERSE TIE ASSEMBLY
(Quantities for one span)



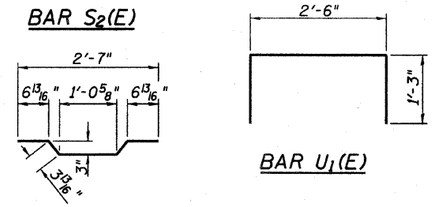
BAR S(E)

BAR S1(E)



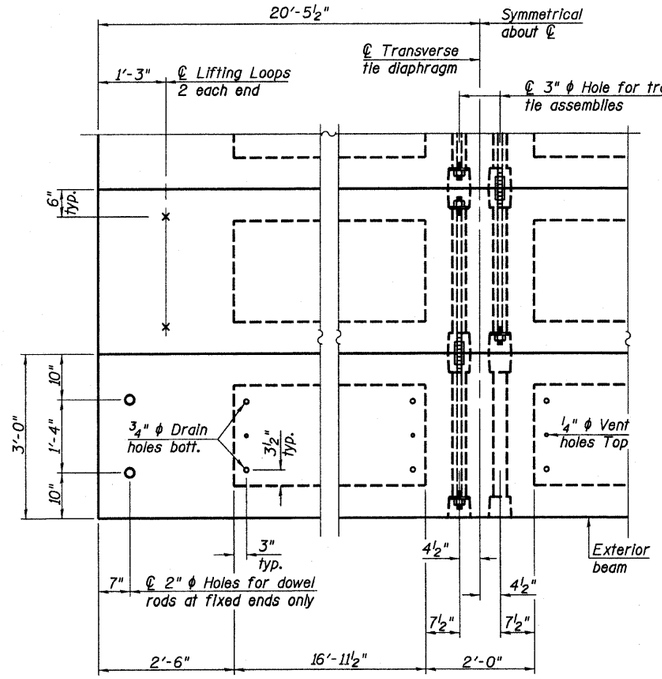
BAR S2(E)

BAR U(E)



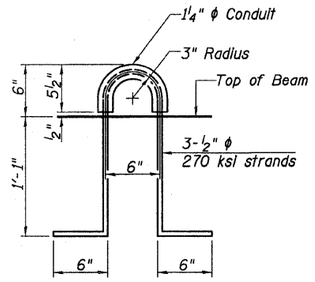
BAR A1(E)

BAR U1(E)



PLAN VIEW

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



LIFTING LOOP DETAIL

NOTES

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be ½" and the nominal cross-sectional area shall be 0.153 sq. in.

The 1" ϕ 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 Supplemental Specifications).

A minimum 2½" ϕ lifting pin shall be used to engage the lifting loops during handling.

Two ⅛" fabric adjusting shims of the dimensions of the exterior bearing pad shall be provided for each bearing pad location.

Corrosion Inhibitor, per Article 1020.05(b)(12) and 1021.06 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.

Rail post anchor devices shall be cast into outside beam as elsewhere specified.

Keyway surfaces shall be cleaned to remove form oil or other bond breaking material prior to shipment of the beams. Cleaning shall be done by sandblasting the keyway areas between the top of the beam and the bottom edge of the key.

DESIGN STRESSES

f'_s = 270,000 p.s.i. (½" ϕ Strand)
f_{si} = 201,960 p.s.i. (½" ϕ Strand)
F_i = 30,900 lbs per strand
f_y = 60,000 p.s.i. Reinf. bars
f'_c = 6,000 p.s.i.
f'_{ci} = 5,000 p.s.i.

Note: See sheet 4 of 12 for Bill of Material.

RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

PREPARED FOR: AECOM 200705482

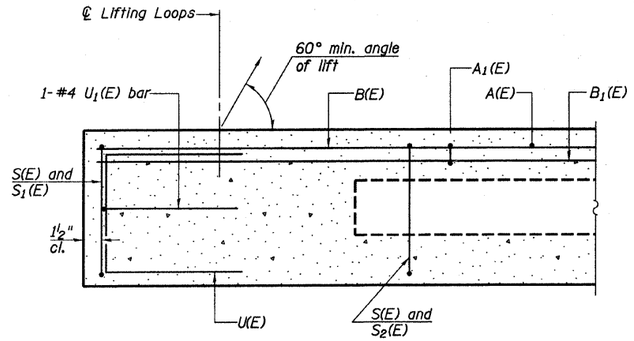
Date: 08/15/2011
Design: WDL
Drawn: JSD
Job No.: 51010

P.P.C. DECK BEAM DETAILS AND NOTES

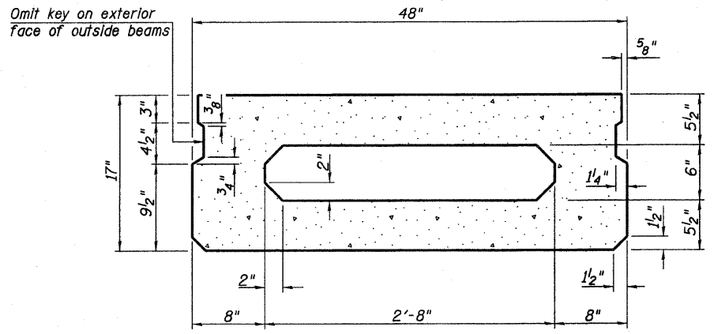
24' ROADWAY
17" x 36" BEAMS
0° SKEW

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	8
FEDERAL AID PROJECT		ILLINOIS	PROJECT	

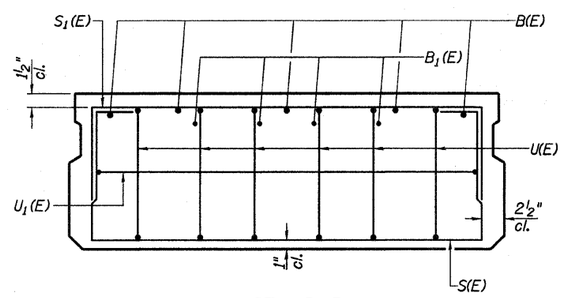
CONTRACT NO.



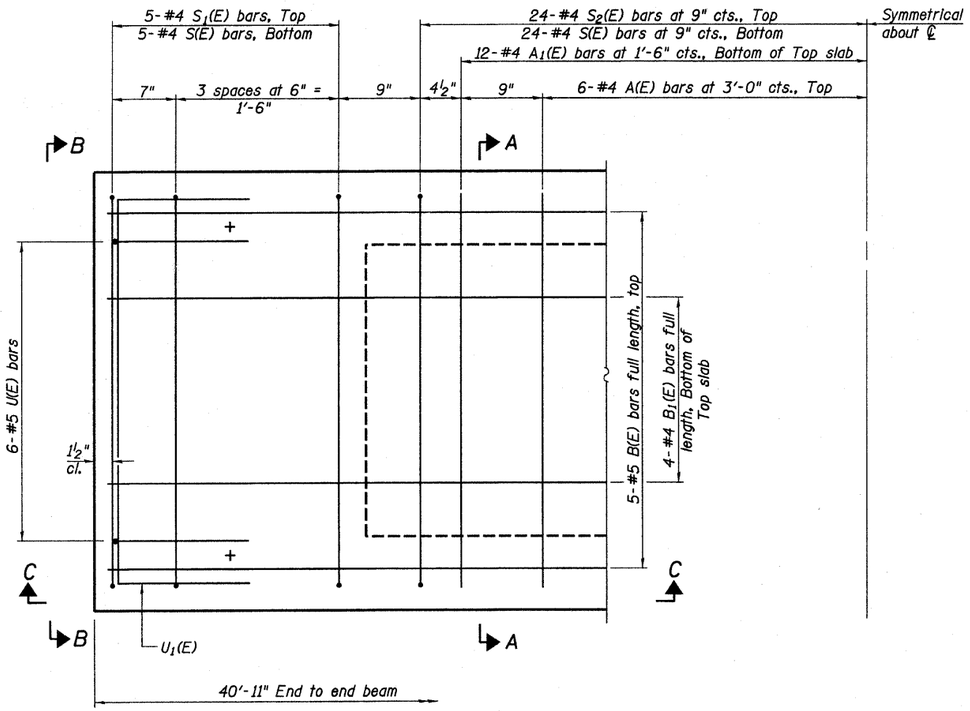
SECTION C-C



SECTION A-A
(Showing dimensions)

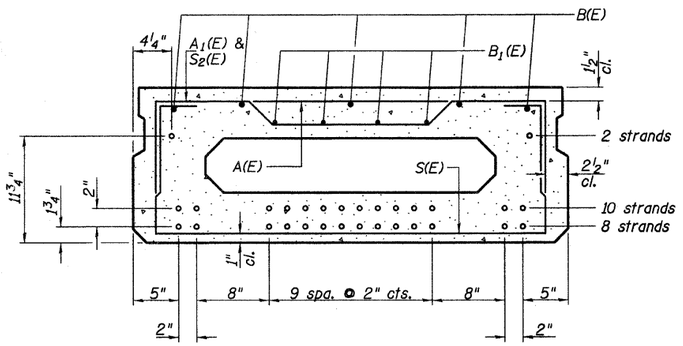


VIEW B-B



PLAN VIEW

Note: Spacing of S(E) and S_2(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 A-A
(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.

Strands: 20 - ½"ϕ strands.

BAR LIST
ONE BEAM ONLY
(For information only)

Bar	No.	Size	Length	Shape
A(E)	12	#4	3'-7"	—
A_1(E)	24	#4	3'-10"	~
B(E)	5	#5	40'-7"	—
B_1(E)	4	#4	40'-7"	—
S(E)	58	#4	6'-9"	⊏⊐
S_1(E)	10	#4	5'-3"	⊐
S_2(E)	48	#4	5'-6"	⊐
U(E)	12	#5	3'-8"	⊏⊐
U_1(E)	2	#4	6'-0"	⊐

Note: See sheet 9 of 12 for additional details.
See sheet 4 of 12 for Bill of Material.

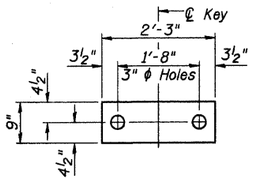
RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

PREPARED FOR: AECOM 200705482

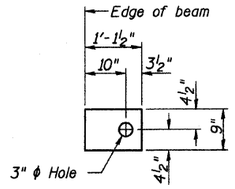
Date: 08/15/2011
Design: WDL
Drawn: JSD
Job No.: 51010

P.P.C. DECK BEAM
DETAILS AND SECTIONS
24' ROADWAY
17" x 48" BEAMS
0° SKEW

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	9
FEDERAL AID PROJECT		ILLINOIS	PROJECT	
			CONTRACT NO.	

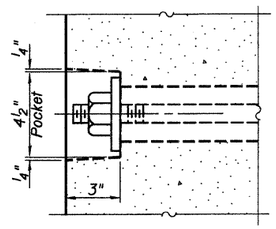


FABRIC BEARING PAD
(Interior)



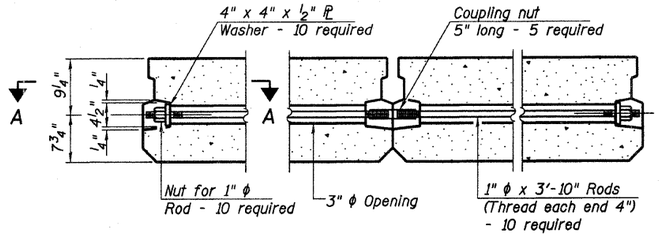
FABRIC BEARING PAD
(Exterior)

FIXED

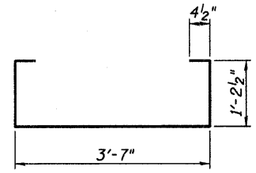


SECTION A-A

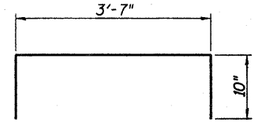
Notes:
All bearing pads shall be 1" thick.
Omit holes when using expansion bearings.
Expansion bearing pad shall be bonded to the substructure.



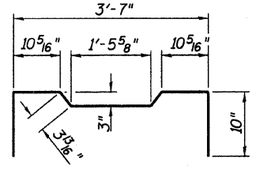
TYPICAL TRANSVERSE TIE ASSEMBLY
(Quantities for one span)



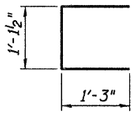
BAR S(E)



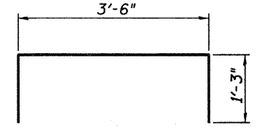
BAR S_1(E)



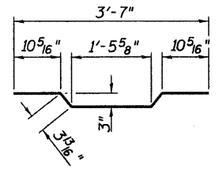
BAR S_2(E)



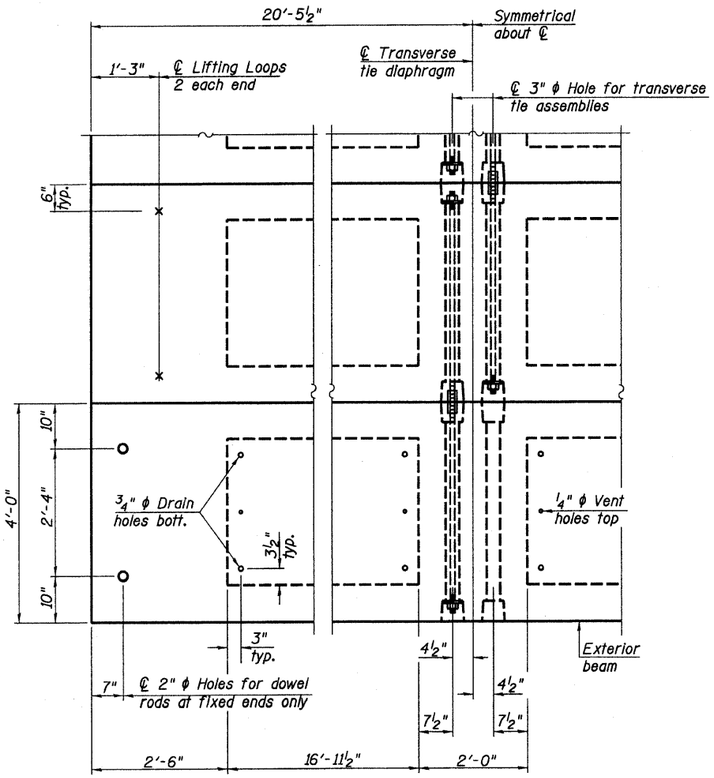
BAR U(E)



BAR U_1(E)

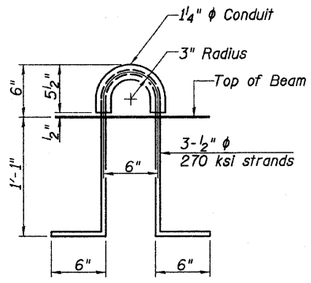


BAR A_1(E)



PLAN VIEW

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



LIFTING LOOP DETAIL

NOTES

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be ½" and the nominal cross-sectional area shall be 0.153 sq. in.

The 1" ϕ 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 Supplemental Specifications).

A minimum 2½" ϕ lifting pin shall be used to engage the lifting loops during handling.

Two ⅛" fabric adjusting shims of the dimensions of the exterior bearing pad shall be provided for each bearing pad location.

Corrosion Inhibitor, per Article 1020.05(b)(12) and 1021.06 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.

Rail post anchor devices shall be cast into outside beam as elsewhere specified.

Keyway surfaces shall be cleaned to remove form oil or other bond breaking material prior to shipment of the beams. Cleaning shall be done by sandblasting the keyway areas between the top of the beam and the bottom edge of the key.

DESIGN STRESSES

f'_s = 270,000 p.s.i. (½" ϕ Strand)
f_{si} = 201,960 p.s.i. (½" ϕ Strand)
F_1 = 30,900 lbs per strand
f_y = 60,000 p.s.i. Reinf. bars
f'_c = 6,000 p.s.i.
f'_{ci} = 5,000 p.s.i.

Note: See sheet 4 of 12 for Bill of Material.

P.P.C. DECK BEAM DETAILS AND NOTES

24' ROADWAY
17" x 48" BEAMS
0° SKEW

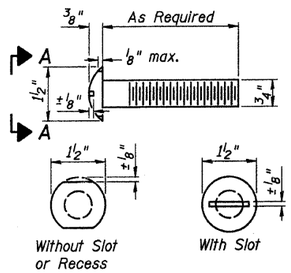
RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

PREPARED FOR: AECOM 200705482

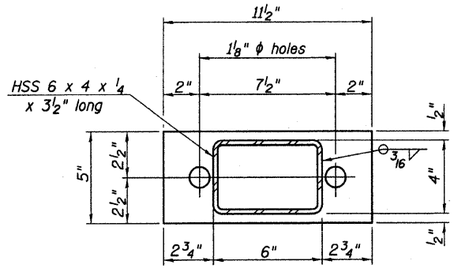
Date: 08/15/2011
Design: WDL
Drawn: JSD
Job No.: 51010

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	10
FEDERAL AID PROJECT		ILLINOIS	PROJECT	

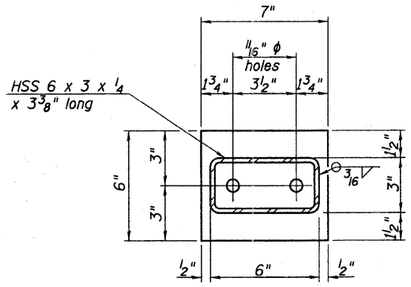
CONTRACT NO.



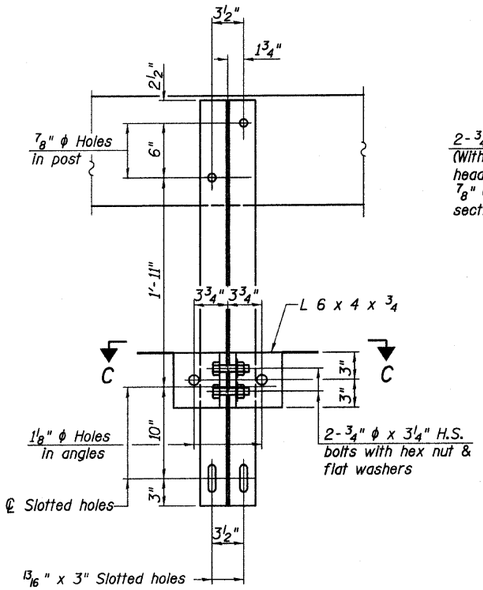
VIEW A-A ROUND HEAD BOLT



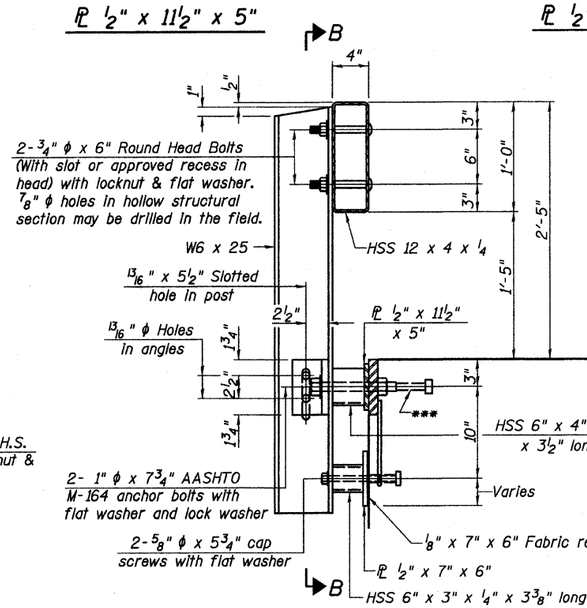
PL 1/2" x 11 1/2" x 5"



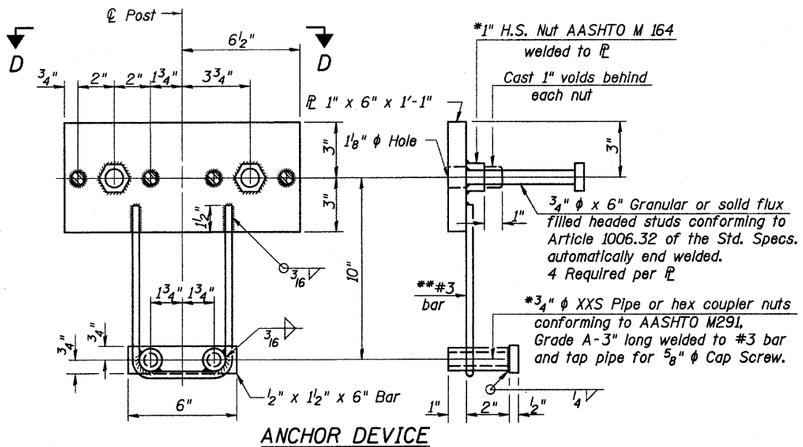
PL 1/2" x 7" x 6"



SECTION B-B



SECTION AT RAILING POST



ANCHOR DEVICE

*Threaded areas shall be plugged or blocked off during casting of beam.

Notes:

All field drilled holes shall be coated with an approved zinc rich paint before erection.

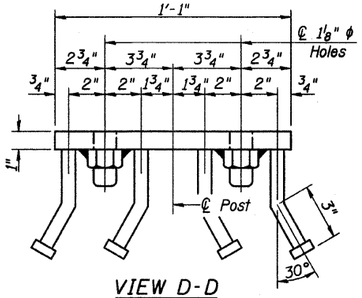
For multi-span bridges, sufficient 1/4" x 6" x 1'-2" galvanized steel shims shall be provided to align rail between adjacent spans. Cost included with Steel Railing, Type S-1.

All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.

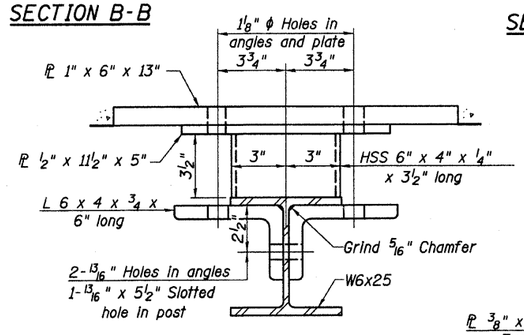
***The studs of the anchor devices shall be placed below the top reinforcement bars and the outermost longitudinal reinforcement bar shall be placed directly above the studs of the rail post anchor device.

The maximum allowable rail post spacing shall be 10'-9". The rail post spacing shown elsewhere in the plans is based on the allowable spacing for another type of rail. When this type of rail is used, the number of posts may be decreased and the past spacing increased to provide equal post spaces of 10'-9" or less.

See Special Provisions for curled end section.

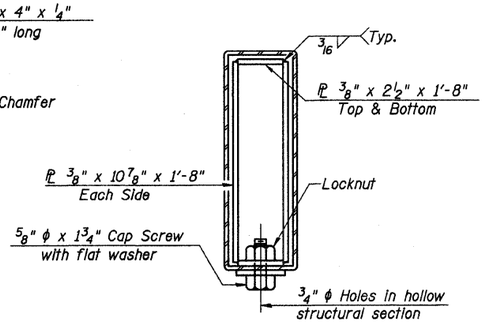


VIEW D-D

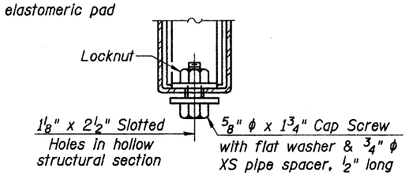


SECTION C-C

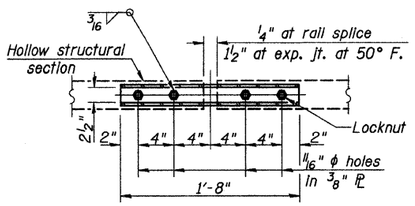
**Whenever the lower insert assemblies interfere with strand locations, the #3 bars shall be cut and adjusted in order to allow raising or lowering of the lower inserts. Maximum adjustment not to exceed 2".



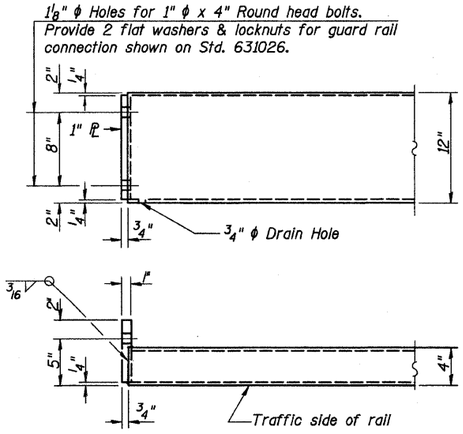
SECTIONS AT RAIL SPLICE



RAIL SPLICE CONNECTION AT EXPANSION JT.



PLAN-BOTTOM SPLICE PL TYPICAL



END OF RAIL DETAILS

See sheet 5 of 12 for Steel Railing Quantities.

(10'-9" Maximum Post Spacing)

RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

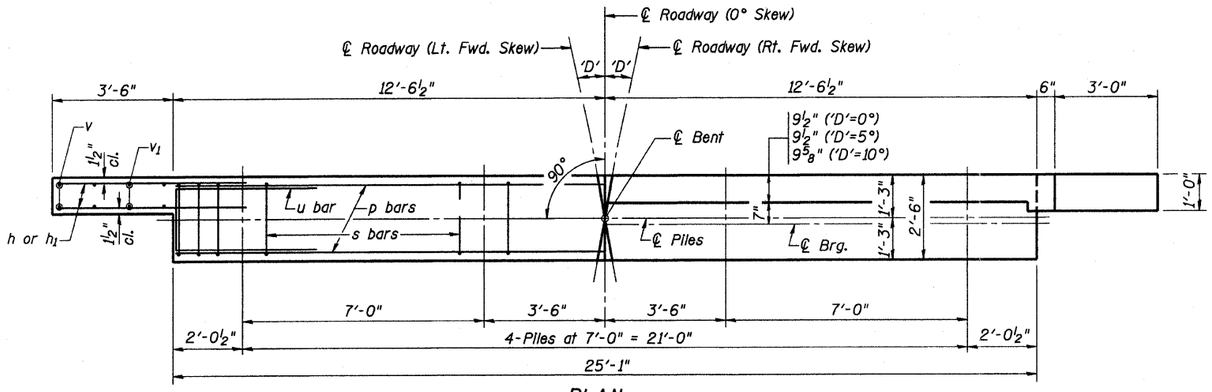
PREPARED FOR: AECOM 200705482

Date: 08/15/2011
Design: WDL
Drawn: JSD
Job No.: 5.1010

STEEL RAILING TYPE S-1

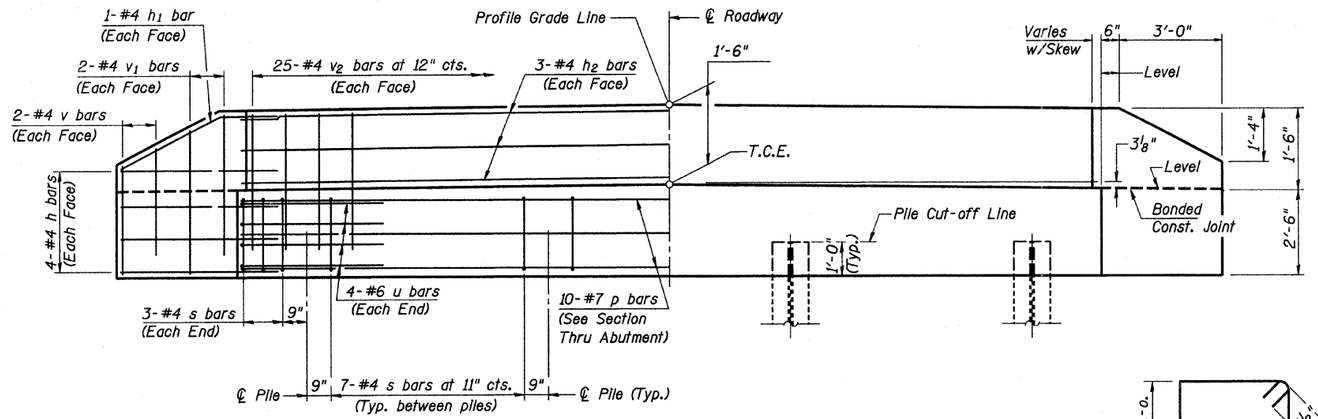
SECTION 07-06117-00-BR
MARION COUNTY
STATION 49+96

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	11
FEDERAL AID PROJECT		ILLINOIS	PROJECT	
			CONTRACT NO.	

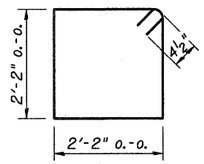


PLAN

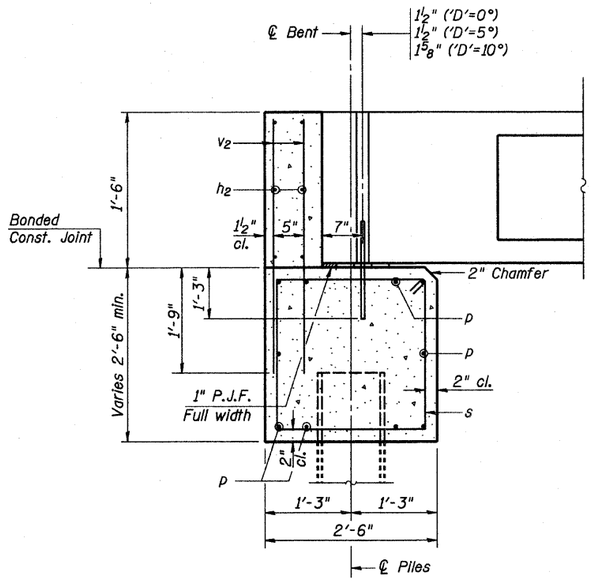
('D'=Designated Skew Angle)



ELEVATION

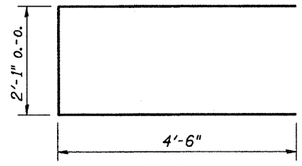


BAR s

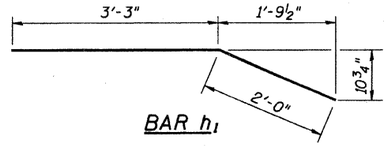


SECTION THRU ABUTMENT

(At Right Angles)



BAR u



BAR h1

BILL OF MATERIAL FOR ONE ABUTMENT

Bar	No.	Size	Length	Shape
h	16	#4	5'-0"	
h1	4	#4	5'-3"	
h2	6	#4	24'-9"	
p	10	#7	24'-9"	
s	27	#4	9'-5"	
u	8	#6	11'-1"	
v	8	#4	2'-6"	
v1	8	#4	3'-5"	
v2	50	#4	3'-1"	
Concrete Structures			8.3 Cu. Yds.	
Reinforcement Bars			1120 Lb.	

NOTES

1. The Backwall and the portion of the Wingwalls above the bonded construction joint shall be cast against the in-place beam.
2. Reinforcement bars shall conform to the requirements of A.A.S.H.T.O. M-31 or M-322, Grade 60.
3. Space reinforcement in cap to miss anchor bolts.

DESIGN STRESSES

f'c = 3,500 psi
fy = 60,000 psi

RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

PREPARED FOR: AECOM 200705482

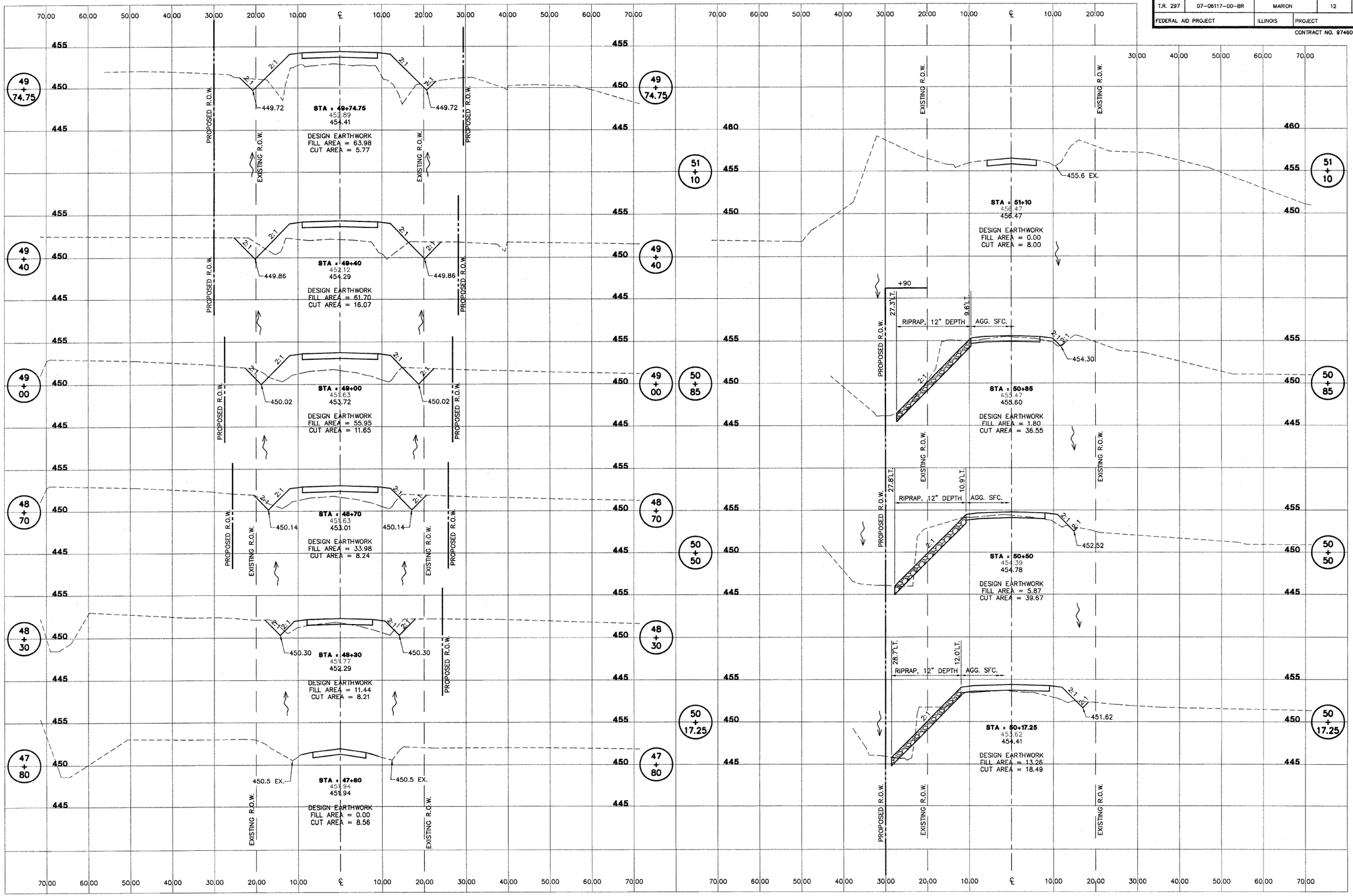
Date: 08/15/2011
Design: WDL
Drawn: JSD
Job No.: 51010

P.P.C. DECK BEAMS
PILE BENT ABUTMENT

SECTION 07-06117-00-BR
MARION COUNTY
STATION 49+96

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 297	07-06117-00-BR	MARION	12	12
FEDERAL AID PROJECT		ILLINOIS	PROJECT	

CONTRACT NO. 97460



RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS

PREPARED FOR: AECOM 200705482

T.R. 297, SECTION 07-06117-00-BR
IUKA ROAD DISTRICT
MARION COUNTY, ILLINOIS

CROSS SECTIONS
STA. 47+80 TO STA. 51+10

SURVEY	JAS	CHECKED	DATE	08/15/11
DESIGN	JMW	APPROVED	REVISED	
DRAWN	JMW		JOB NO.	51010