

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 229	16-06121-00-BR	WAYNE	22	1
FED. ROAD DIST. NO.		ILLINOIS	CONTRACT NO. 95826	

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1.	COVER SHEET
2.	SUMMARY OF QUANTITIES AND GENERAL NOTES
3.	TYPICAL CROSS SECTIONS
4.	PLAN AND PROFILE
5-8.	STATION CROSS SECTIONS
9-20.	BRIDGE PLANS
21-22.	BORINGS

HIGHWAY STANDARDS:

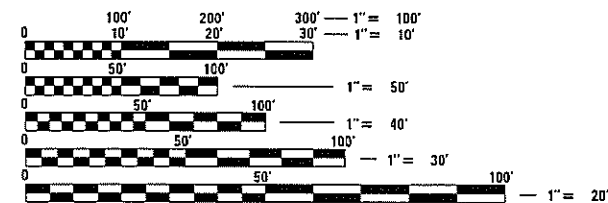
000001-06	STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS
280001-07	TEMPORARY EROSION CONTROL SYSTEMS
515001-03	NAME PLATE FOR BRIDGES
630001-12	STEEL PLATE BEAM GUARDRAIL
701901-07	TRAFFIC CONTROL DEVICES
725001-01	OBJECT AND TERMINAL MARKERS
BLR 21-9	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS
BLR 27-1	TRAFFIC BARRIER TERMINAL TYPE 5A

**PLANS FOR PROPOSED
SURFACE TRANSPORTATION PROGRAM
OFF SYSTEM BRIDGE**

**PROJECT NO. XD6X(932)
SECTION 16-06121-00-BR
ELM RIVER ROAD DISTRICT
WAYNE COUNTY
T.R. 229
PROPOSED STRUCTURE NO. 096-3468
C-97-031-18**

UTILITIES

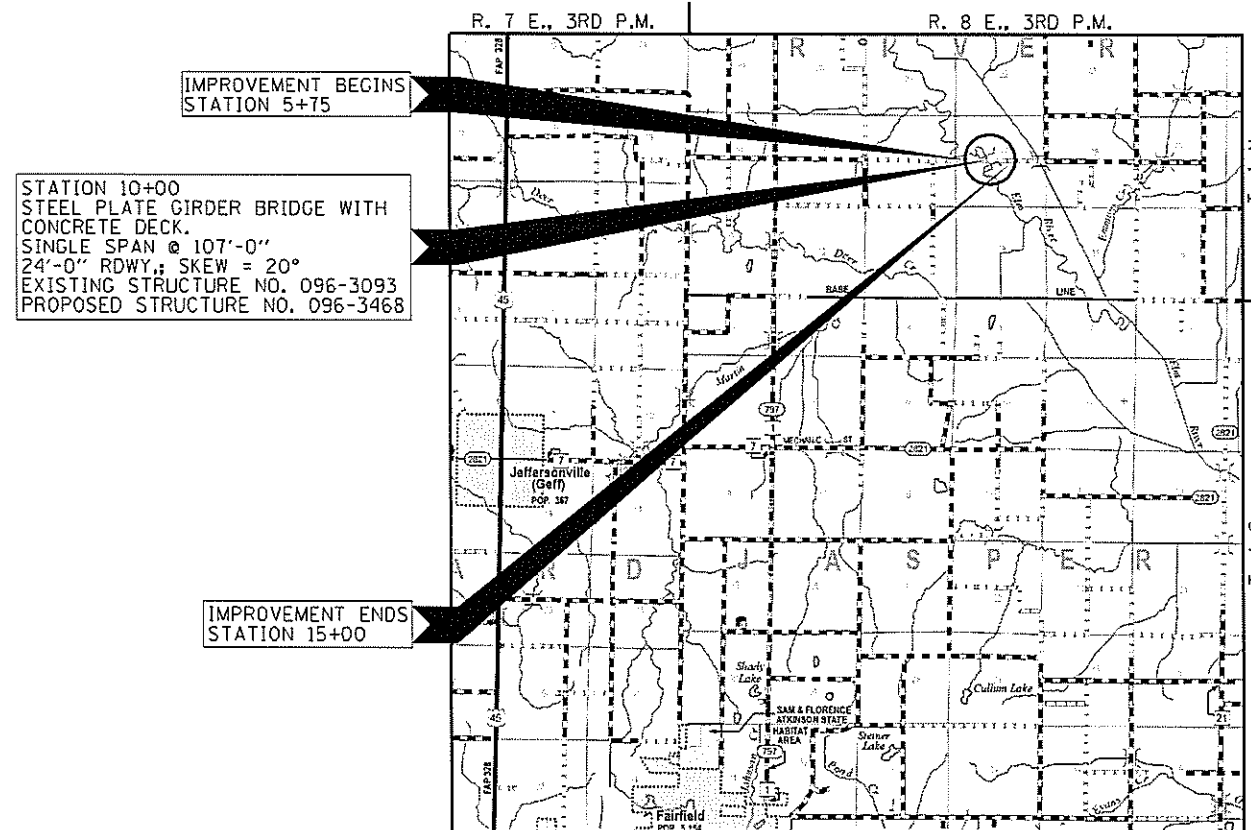
COUNTRYMARK
1200 REFINERY ROAD
MT VERNON, IN 47620
812-838-8545



FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES. REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES. IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

FUNCTIONAL CLASSIFICATION: LOCAL ROAD
DESIGN SPEED: 30 MPH
DESIGN TRAFFIC: 100 ADT (2016)

CONTRACT NO. 95826 PRINTED BY THE AUTHORITY OF THE STATE OF ILLINOIS



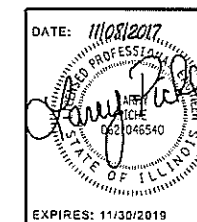
LOCATION MAP

APPROXIMATE SCALE: 0 1 MILE
NET LENGTH OF SECTION = 925.0 FEET = 0.175 MILES



Know what's below.
Call before you dig.

ILLINOIS DEPARTMENT OF TRANSPORTATION	
APPROVED	<i>Nov 8 2017</i> <i>W. S. Sander</i> COUNTY ENGINEER
PASSED	<i>Nov 15 2017</i> <i>L. A. Shull</i> DISTRICT SEVEN ENGINEER OF LOCAL ROADS & STREETS
Releasing for Bid Based on Limited Review	<i>Nov 15 2017</i> <i>Jeffrey M. South</i> REGION FOUR ENGINEER
STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	



LMAC
ENGINEERING
A division of Hampton, Lenzini and Renwick, Inc.
323 W. 3RD ST., P.O. BOX 160
MT. CARMEL, ILLINOIS 62863
184-000959 ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP

DATE: 11/08/2017
PROJECT NUMBER: 16.0472
DATE: 11/08/17

SUMMARY OF QUANTITIES			
	ITEM	UNIT	TOTAL QUANTITY
20100500	TREE REMOVAL, ACRES	ACRE	1.2
20200100	EARTH EXCAVATION	CU YD	433
20300100	CHANNEL EXCAVATION	CU YD	151
20400800	FURNISHED EXCAVATION	CU YD	3,833
28000305	TEMPORARY DITCH CHECKS	FOOT	60
28100807	STONE DUMPED RIPRAP, CLASS A4	TON	700
40200800	AGGREGATE SURFACE COURSE, TYPE B	TON	803
42001300	PROTECTIVE COAT	SQ YD	354
50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1
50200100	STRUCTURE EXCAVATION	CU YD	50
50300225	CONCRETE STRUCTURES	CU YD	32.6
50300255	CONCRETE SUPERSTRUCTURE	CU YD	112.0
50300260	BRIDGE DECK GROOVING	SQ YD	271
50500105	FURNISHING AND ERECTING STRUCTURAL STEEL	L SUM	1
50500505	STUD SHEAR CONNECTORS	EACH	825
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	27,090
* 50900205	STEEL RAILING, TYPE S1	FOOT	225
51201610	FURNISHING STEEL PILES HP 12X63	FOOT	680
51202305	DRIVING PILES	FOOT	680
51203610	TEST PILE STEEL HP 12X63	EACH	2
51204650	PILE SHOES	EACH	10
51500100	NAME PLATES	EACH	1
542D0229	PIPE CULVERTS, CLASS D, TYPE 1 24"	FOOT	42
542D0241	PIPE CULVERTS, CLASS D, TYPE 1 36"	FOOT	60
59100100	GEOCOMPOSITE WALL DRAIN	SQ YD	74
* ^ 63000001	STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS	FOOT	12.5
* 63100075	TRAFFIC BARRIER TERMINAL, TYPE 5A	EACH	2
* 63100167	TRAFFIC BARRIER TERMINAL, TYPE 1 (SPECIAL) TANGENT	EACH	1
67100100	MOBILIZATION	LSUM	1
* 72501000	TERMINAL MARKER - DIRECT APPLIED	EACH	3
^ X2501000	SEEDING, CLASS 2 (SPECIAL)	ACRE	1.2
^ X5860110	GRANULAR BACKFILL FOR STRUCTURES	CU YD	176
^ Z0046304	PIPE UNDERDRAINS FOR STRUCTURES 4"	FOOT	136
^ Z0068900	STONE LINED DITCH	TON	121

^ SEE SPECIAL PROVISIONS
* SPECIALTY ITEMS

TEMPORARY DITCH CHECKS	
LOCATION	TEMPORARY DITCH CHECKS
	28000305
	FOOT
RT. STA 7+75	15
RT. STA 9+00	15
RT. STA 11+00	10
LT. STA 8+00	10
LT. STA 12+00	10
TOTAL	60

AGGREGATE SURFACE COURSE, TYPE B	
LOCATION	40200800
	TON
T.R. 229	
STA 5+75 TO STA 9+44.72	337
STA 10+55.28 TO STA 15+00	304
FIELD ENTRANCE	
STA 8+35 RT	53
STA 10+97 LT	58
STA 11+66 RT	51
TOTAL	803

STONE LINED DITCH	
LOCATION	Z0068900
	TON
T.R. 229	
STA 8+65 RT. TO STA 9+75 RT.	68.2
STA 10+30 LT TO STA 10+75 LT	27.9
STA 10+60 RT TO STA 11+00 RT	24.8
TOTAL	120.9

GENERAL NOTES

- THIS SECTION SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE PLANS, SPECIAL PROVISIONS AND "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", ADOPTED APRIL 1, 2016, "THESE PLANS AND THE SPECIAL PROVISIONS INCLUDED IN THE CONTRACT DOCUMENTS.
- ALL CLEARING AND GRUBBING, FENCE REMOVAL, REMOVAL OF EXISTING DRAINAGE STRUCTURES, AND REMOVAL OF THE EXISTING ROADWAY SURFACE SHALL BE INCLUDED IN THE COST OF EARTH EXCAVATION.
- UTILITIES SHOWN WERE LOCATED PER QUALITY LEVEL "C", A.S.C.E. STANDARD CI/38-02, STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA FROM SURFACE MARKINGS ONLY. UTILITIES SHALL BE FIELD LOCATED HORIZONTALLY AND VERTICALLY PRIOR TO BEGINNING ANY WORK. THE CONTRACTOR IS RESPONSIBLE FOR THE FIELD LOCATION OF THESE UTILITIES.
- IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO VERIFY ALL EXISTING FIELD DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION AND ORDERING MATERIALS.
- THE FOLLOWING RATES OF APPLICATION HAVE BEEN USED IN CALCULATING PLAN QUANTITIES.
AGGREGATE SURFACE COURSE 2.05 TONS/CU.YD.
STONE RIPRAP 1.75 TONS/CU.YD.
- EARTHWORK COMPACTION SHALL BE TO THE SATISFACTION OF THE ENGINEER.
- THE AREA TO BE SEEDED SHALL CONSIST OF ALL EARTH SURFACES DISTURBED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER.
ESTIMATED QUANTITY: SEEDING CLASS 2 (SPECIAL) = 1.2 ACRES
- COMMITMENTS: TREES 3 INCHES OR GREATER IN DIAMETER AT BREAST HEIGHT WILL NOT BE CLEARED FROM APRIL 1 THROUGH SEPTEMBER 30.
- TERMINAL MARKERS SHALL BE PLACED AT THE CURLED END SECTION AT THE S.E. & N.W. CORNERS AND PLACED AT THE TBT TY 1 SPL AT THE S.W. CORNER.
- END SECTION AS PER STD. 630001 SHALL BE ERECTED AT THE END OF STEEL PLATE BEAM GUARDRAIL AT N.E. CORNER. COST INCLUDED WITH GUARDRAIL.

EARTHWORK SUMMARY								
LOCATION	EARTH EXCAVATION	CHANNEL EXCAVATION	ESTIMATED SUITABLE MATERIAL	SHRINKAGE FACTOR	% USED	SUITABLE MATERIAL ADJUSTED FOR SHRINKAGE(25%)	EMBANKMENT REQUIRED	EARTHWORK BALANCE WASTE (+) OR SHORTAGE (-)
	20200100 CU. YD.	20300100 CU. YD.	CU. YD.			CU. YD.	CU. YD.	CU. YD.
T.R. 229								
STA 5+75 TO STA 9+44.72	299.8	0.0	0.0	25.00%	100.00%	225.0	1846.6	-1622.0
STA 9+44.72 TO STA 10+55.28	0.0	150.9	75.5	25.00%	100.00%	57.0	0.0	57.0
STA 10+55.28 TO STA 15+00	132.7	0.0	0.0	25.00%	100.00%	100.0	2008.1	-1908.0
FIELD ENTRANCE								
STA 8+35 RT	0.0	0.0	0.0	25.00%	100.00%	0.0	127.3	-127.0
STA 10+97 LT	0.0	0.0	0.0	25.00%	100.00%	0.0	126.2	-126.0
STA 11+66 RT	0.0	0.0	0.0	25.00%	100.00%	0.0	106.6	-107.0
TOTAL	432.5	150.9				382	4214.8	-3833

FURNISHED EXCAVATION 3833 CU.YD.

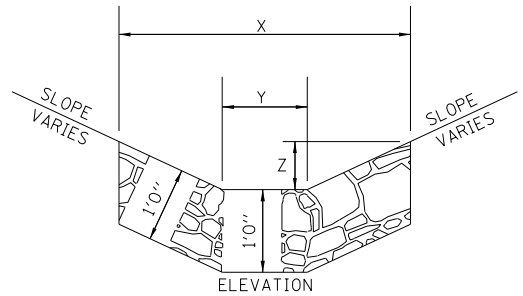
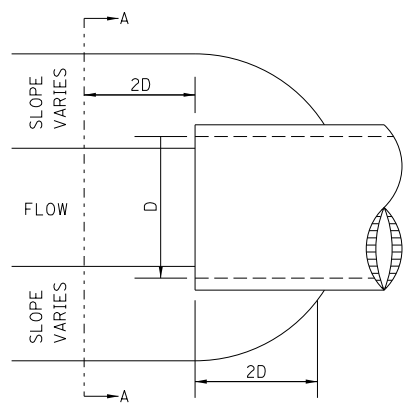
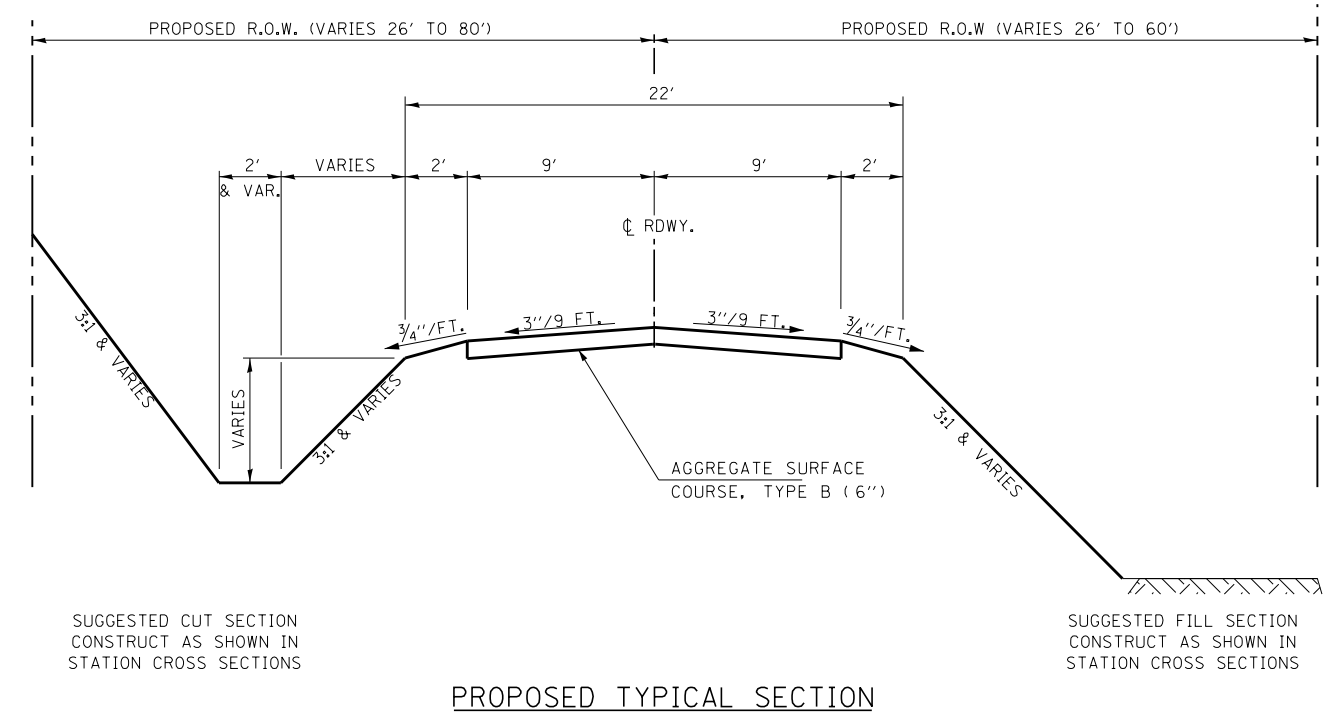
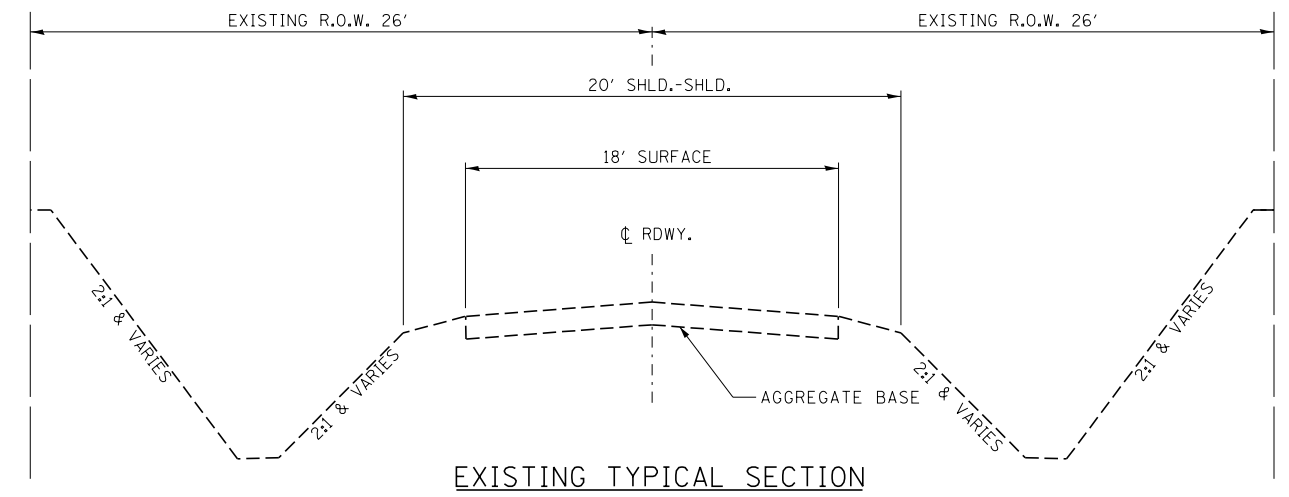
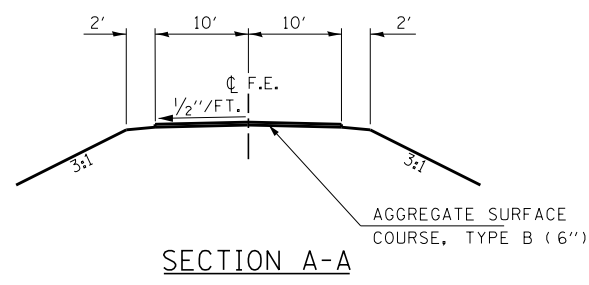
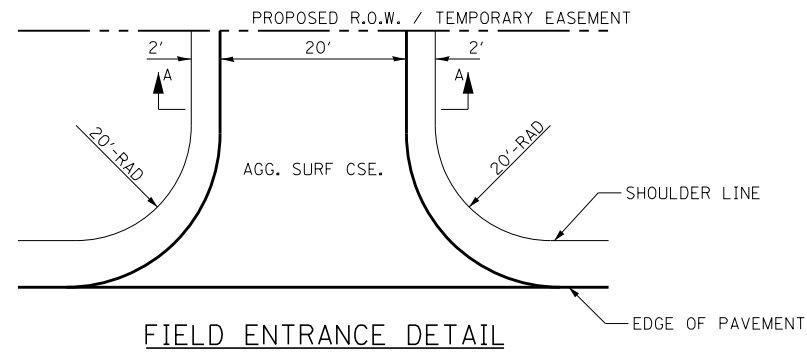


333 N. 570 ST. P.O. BOX 160 Mt. CARROLL, IL 62853	HLR JOB NO = 16-0472	DESIGNED - A.M.M.	REVISED -
		DRAWN - A.M.M.	REVISED -
	PLOT SCALE = 1/8" = 1' SCALE	CHECKED - L.P.	REVISED -
	PLOT DATE = 11/9/2017	DATE - 11/08/17	REVISED -

**STATE OF ILLINOIS
WAYNE COUNTY HIGHWAY DEPARTMENT**

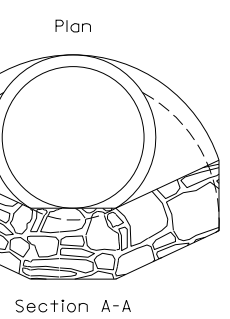
SUMMARY OF QUANTITIES AND GENERAL NOTES			
SCALE:	SHEET NO. 1 OF 1 SHEETS	STA.	TO STA.

T.R.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	2
ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		
ILLINOIS FED. AID PROJECT X06X1932				



NOTE:

BOTTOM OF DITCH	SLOPE			
	1 1/2:1	2:1	3:1	
2 FT	X= 5 FT	6 FT	8 FT	
	Y= 2 FT	2 FT	2 FT	
	Z= 1 FT	1 FT	1 FT	
	0.40	0.48	0.62	TON/LIN. FT



STONE LINED DITCH DETAILS

NOTE: FOR PLACEMENT, QUALITY GRADATION AND OTHER MISCELLANEOUS REQUIREMENTS FOR STONE LINED DITCH - SEE SPECIAL PROVISIONS.

TRANSITIONS FROM THE PROPOSED ROADWAY TO THE EXISTING ROADWAY ARE TO BE CONSTRUCTED FROM STA. 5+75 TO 6+25 AND STA. 14+50 TO 15+00. SEE SHEET 9 FOR TRANSITION AT BRIDGE.

DATE	
BY	
PLAN	
SURVEYED	
PLOTTED	
GRADES CHECKED	
NOTES CHECKED	
STRUCTURE	
NO. AT THIS OFFICE	

DATE	
BY	
PROFILE	
SURVEYED	
PLOTTED	
GRADES CHECKED	
NOTES CHECKED	
STRUCTURE	
NO. AT THIS OFFICE	

PROP. CURVE PRCL 3
 PI STA. = 4+83.31
 $\Delta = 1^\circ 29' 09''$ (RT)
 $D = 1^\circ 28' 09''$
 $R = 3,900.00'$
 $T = 50.57'$
 $L = 101.14'$
 $E = 0.33'$
 NO S.E.
 P.C. STA. = 4+32.74
 P.T. STA. = 5+33.88

HEWING TRUST
 NW 1/4, SEC 27, R. 8 E., T. 1 N., 3RD P.M.

PROP. CURVE PRCL 6
 PI STA. = 7+73.62
 $\Delta = 4^\circ 27' 00''$ (LT)
 $D = 1^\circ 41' 07''$
 $R = 3,400.00'$
 $T = 132.10'$
 $L = 264.07'$
 $E = 2.57'$
 NO S.E.
 P.C. STA. = 6+41.52
 P.T. STA. = 9+05.59

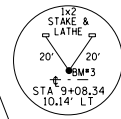
STA. 7+13 AR
 PIPE CULVERTS, CL. D, TY. 1, 24"
 LENGTH = 42 FOOT
 USFL = 390.35
 DSFL = 390.15
 EXISTING PIPE TO BE REMOVED

STATION 10+00
 STEEL WIDE FLANGE BEAM BRIDGE,
 SINGLE SPAN @ 107'
 24' RDWY; SKEW 20°
 PROPOSED STRUCTURE NO. 096-3468

TRAF BAR TERM T5A
 12.5 FT SPBGR ON 18' RAD
 AND END SECTION (630001)

LT. STA. 10+97 F.E.
 NO PIPE

IMPROVEMENT ENDS
 STATION 15+00



PROP. CURVE PRCL 9
 PI STA. = 13+53.26
 $\Delta = 2^\circ 28' 05''$ (RT)
 $D = 1^\circ 38' 13''$
 $R = 3,500.00'$
 $T = 75.40'$
 $L = 150.77'$
 $E = 0.81'$
 NO S.E.
 P.C. STA. = 12+77.86
 P.T. STA. = 14+28.63

EXISTING STRUCTURE NO. 096-3093
 STATION 10+00 - THREE SPAN STEEL BEAM DECK
 BRIDGE WITH A CONCRETE DECK ON TIMBER PILE
 BENT PIERS AND CLOSED TIMBER ABUTMENTS.
 80.0' FC. -FC. ABUTS; 20.0' 0.-0. DECK

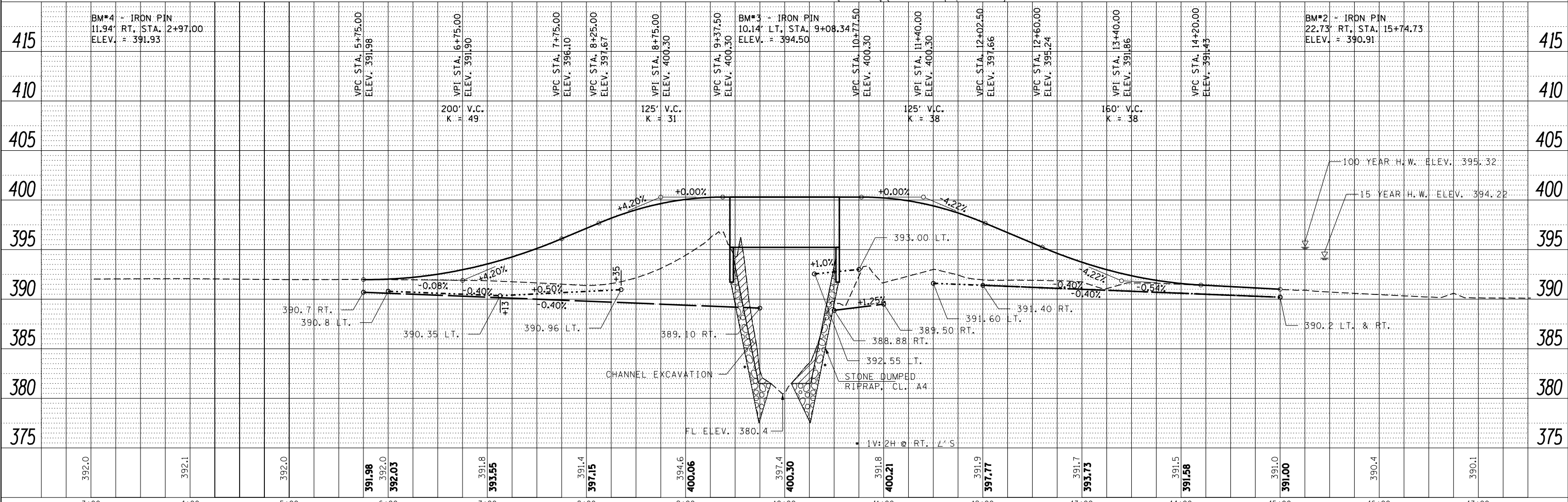
CHANNEL EXCAVATION: THIS MATERIAL
 SHALL BE EXCAVATED WITHIN THE LIMITS
 OF THE PROPOSED BRIDGE, THEN TAPERED
 TO THE EXISTING CHANNEL AT THE R.O.W. LINE.

RT. ST. 8+35 F.E.
 PIPE CULVERTS, CL. D, TY. 1, 36"
 LENGTH = 60 FOOT
 UP = 389.78
 DOWN = 389.54
 EXISTING PIPE TO BE REMOVED

HEWING TRUST
 SW 1/4, SEC 27, R. 8 E., T. 1 N., 3RD P.M.

NOTE: FILL AT ABUTMENTS TO BE
 GRANULAR BACKFILL

HEWING TRUST
 SW 1/4, SEC 27, R. 8 E., T. 1 N., 3RD P.M.



3+00	392.0	4+00	392.1	5+00	392.0	6+00	391.98 392.03	7+00	391.8 393.55	8+00	391.4 397.15	9+00	394.6 400.06	10+00	397.4 400.30	11+00	391.8 400.21	12+00	391.9 397.77	13+00	391.7 393.73	14+00	391.5 391.58	15+00	391.0 391.00	16+00	390.4	17+00	390.1
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LAMAC ENGINEERING
 323 W. 3RD ST.
 P.O. BOX 160
 MT. CARMEL, IL 62863
 A Division of Hampton, Lenzini and Ranwick, Inc.
 ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP. 184000959

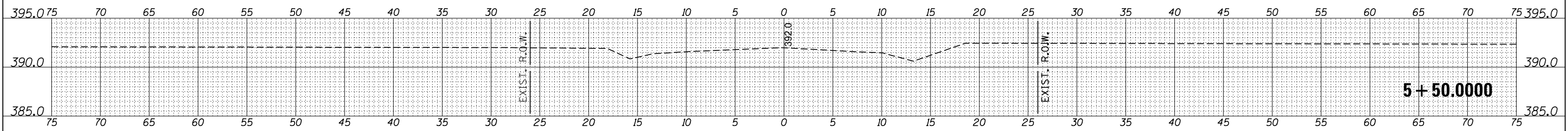
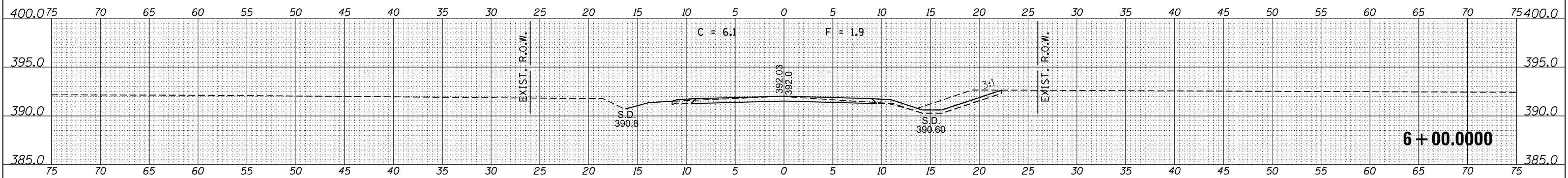
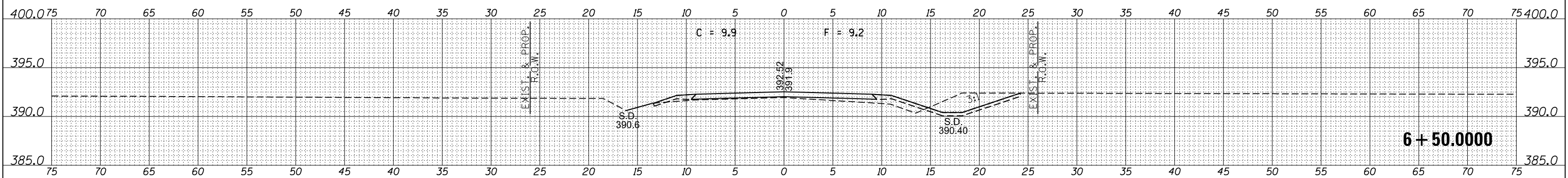
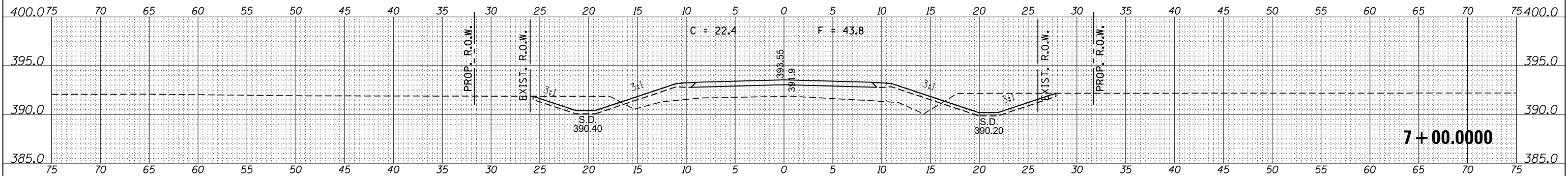
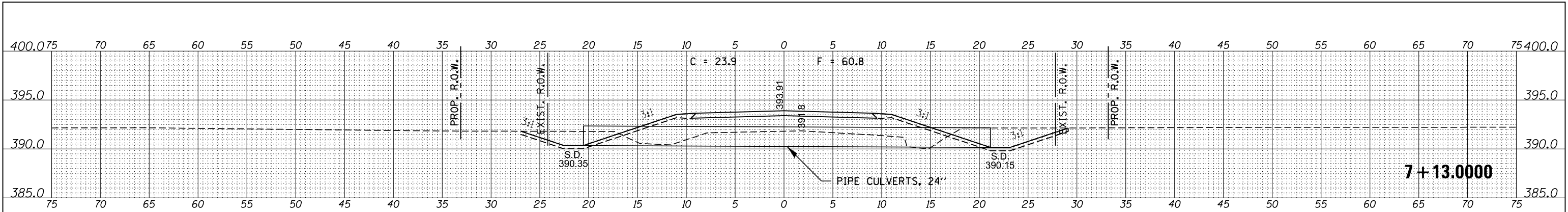
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PLOT SCALE = *SCALE*	DRAWN - A.M.M.	REVISED -
PLOT DATE = 11/9/2017	CHECKED - L.P.	REVISED -
	DATE - 11/08/17	REVISED -

STATE OF ILLINOIS
 WAYNE COUNTY HIGHWAY DEPARTMENT

SCALE: 1" = 50'	SHEET NO. 1 OF 1 SHEETS	STA. 3+00.00 TO STA. 17+00.00
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TR	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	4
ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		
ILLINOIS FED. AID PROJECT XD6X(932)				

DATE	
BY	
FINAL SURVEY	
SURVEYED	
PLOTTED	
TEMPLATE	
NOTE BOOK	
AREAS	
CHECKED	
NO.	



DATE	
BY	
ORIGINAL SURVEY	
SURVEYED	
PLOTTED	
TEMPLATE	
NOTE BOOK	
AREAS	
CHECKED	
NO.	

LAMAC
ENGINEERING
A Division of Hampton, Lenzini and Renwick, Inc.
ILLINOIS PROFESSIONAL DESIGN FIRM LS/PE/SE CORP 18400099

HLR JOB NO = 16.0472
PLOT SCALE = *SCALE*
PLOT DATE = 11/9/2017

DESIGNED - A.M.M.
DRAWN - A.M.M.
CHECKED - L.P.
DATE - 11/08/17

REVISED -
REVISED -
REVISED -
REVISED -

**STATE OF ILLINOIS
WAYNE COUNTY HIGHWAY DEPARTMENT**

STATION CROSS SECTIONS
SCALE: SHEET NO. 1 OF 4 SHEETS STA. 5+50.0 TO STA. 7+13.0

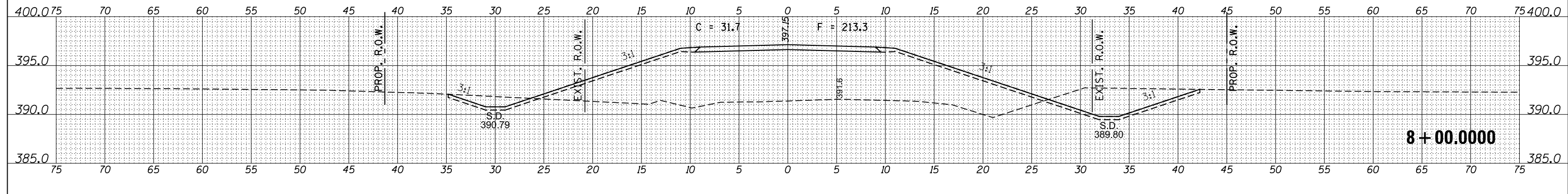
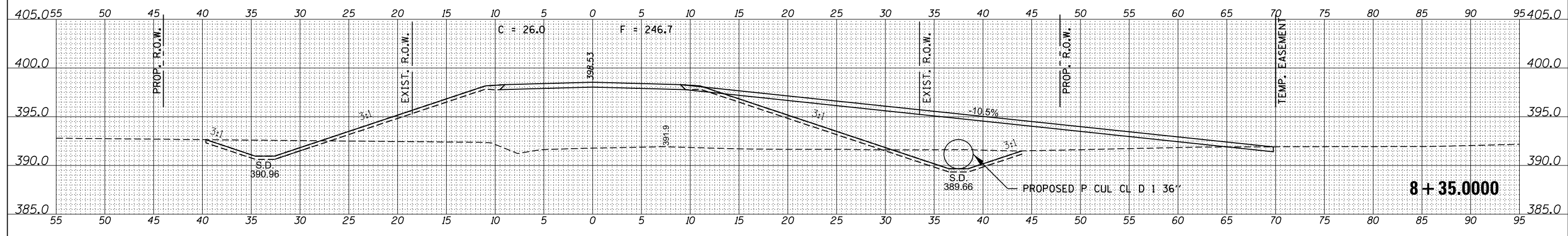
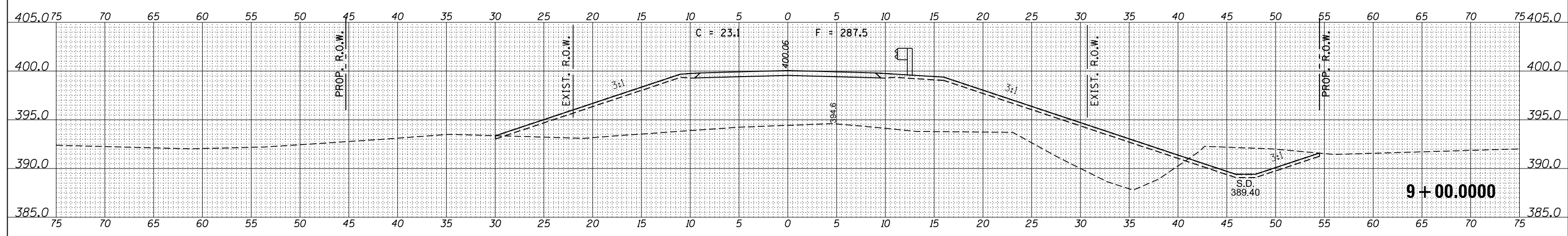
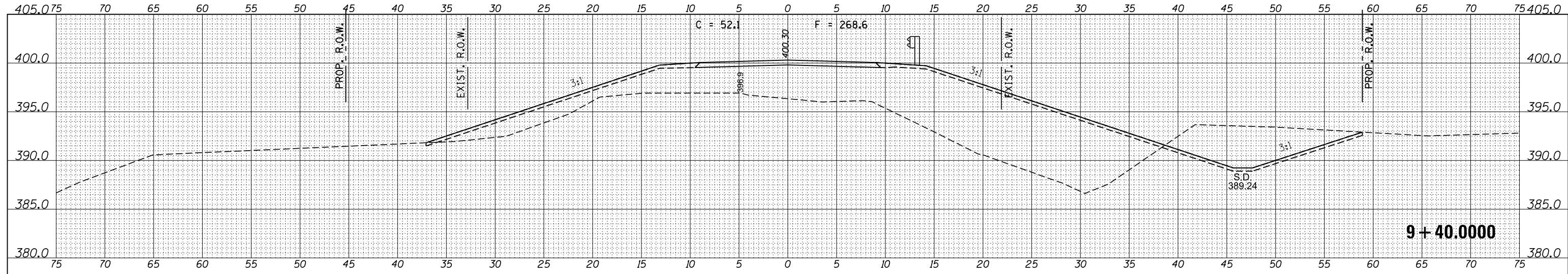
TR	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	5
ELM RIVER ROAD DISTRICT			CONTRACT NO. 95826	
ILLINOIS FED. AID PROJECT XD6X(932)				

BY	DATE

FINAL SURVEY	SURVEYED
NOTE BOOK	PLOTTED
	TEMPLATE
	AREAS
	CHECKED

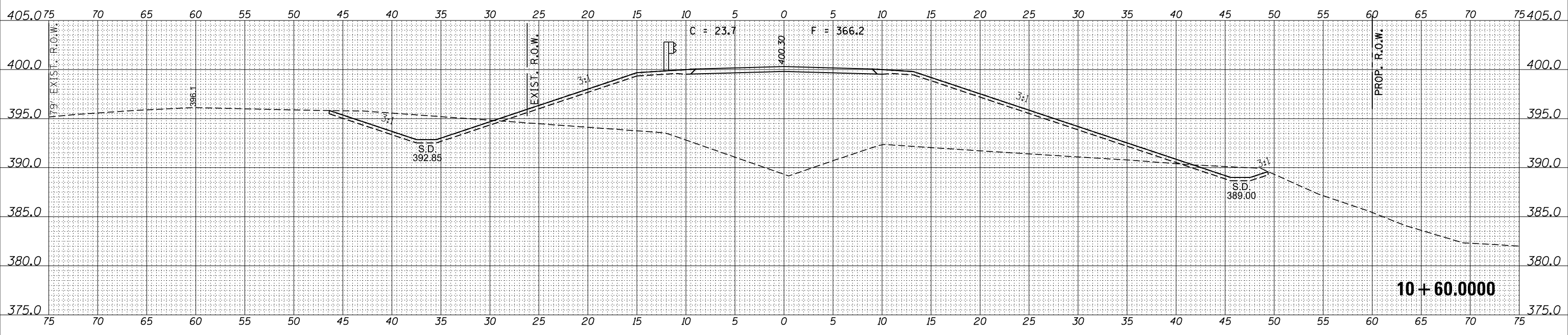
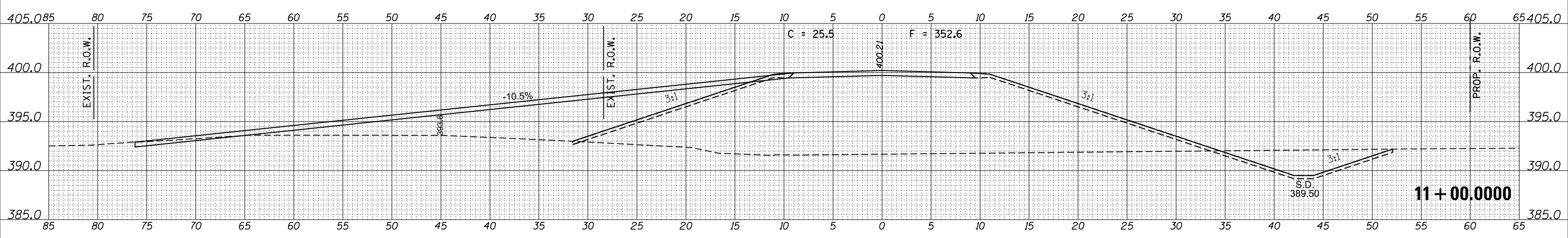
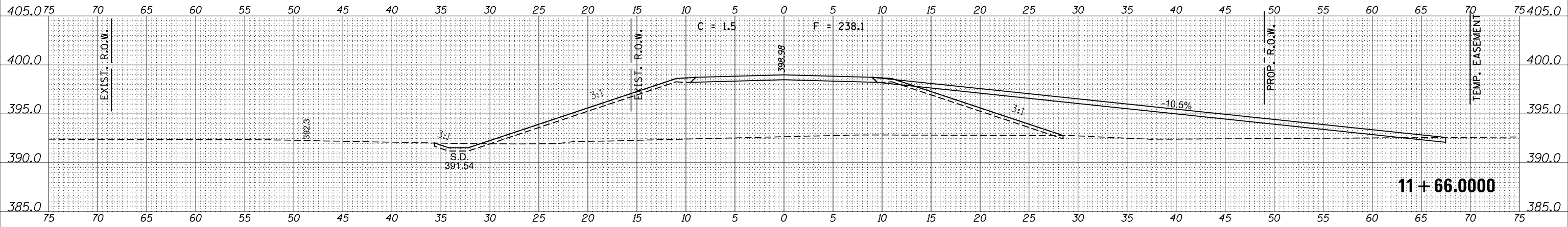
BY	DATE

ORIGINAL SURVEY	SURVEYED
NOTE BOOK	PLOTTED
	TEMPLATE
	AREAS
	CHECKED



DATE	
BY	
FINAL SURVEY	SURVEYED
NOTE BOOK	PLOTTED
NO.	TEMPLATE
	AREAS CHECKED

DATE	
BY	
ORIGINAL SURVEY	SURVEYED
NOTE BOOK	PLOTTED
NO.	TEMPLATE
	AREAS CHECKED



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A Division of Hampton, Lenzini and Renwick, Inc.
ILLINOIS PROFESSIONAL DESIGN FIRM LS/PE/SE CORP 18400099

HLR JOB NO = 16.0472
DESIGNED - A.M.M.
DRAWN - A.M.M.
CHECKED - L.P.
DATE - 11/08/17
PLOT SCALE = *SCALE*
PLOT DATE = 11/9/2017

DESIGNED - A.M.M.
DRAWN - A.M.M.
CHECKED - L.P.
DATE - 11/08/17
REVISED -
REVISED -
REVISED -
REVISED -

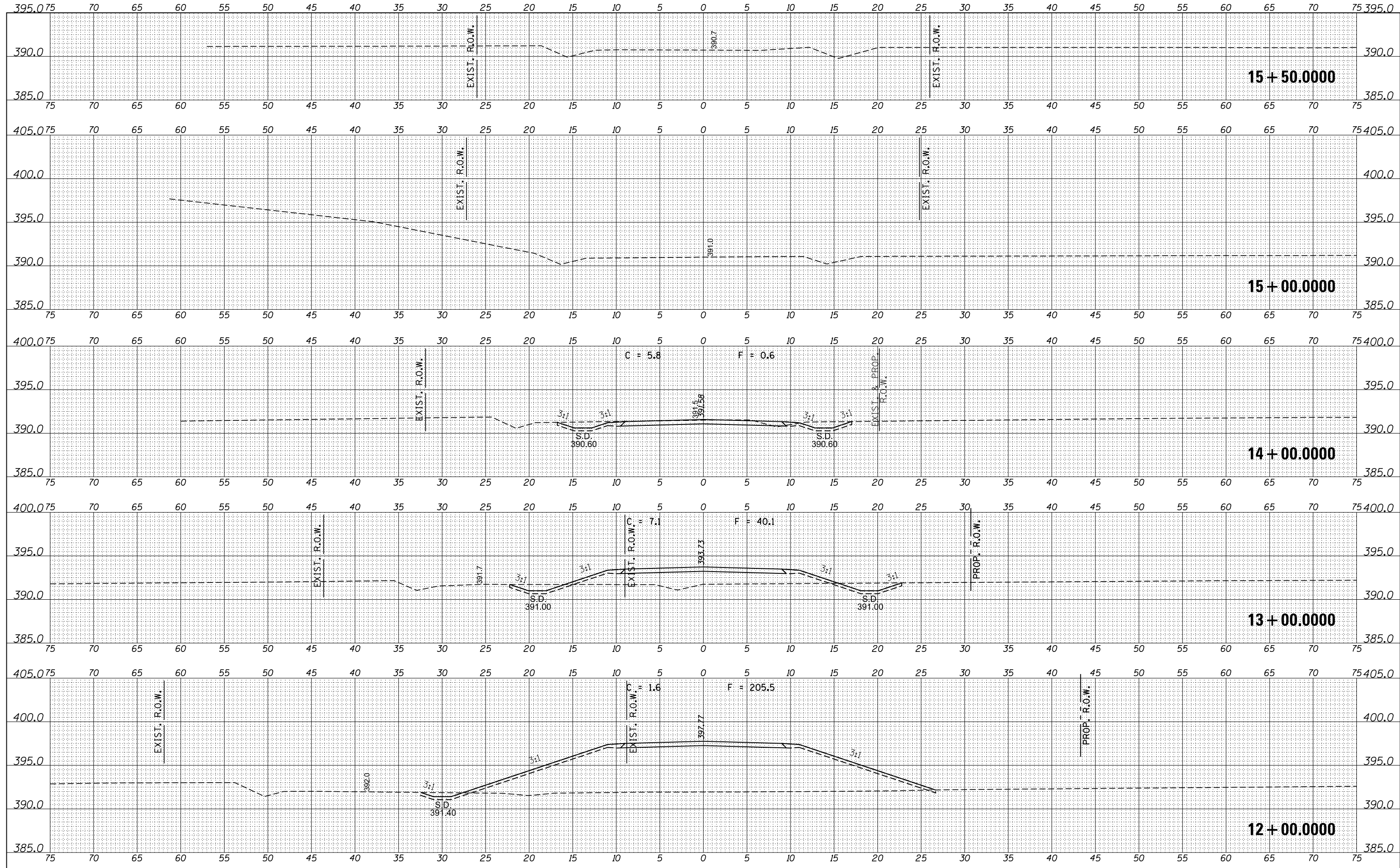
STATE OF ILLINOIS
WAYNE COUNTY HIGHWAY DEPARTMENT

STATION CROSS SECTIONS
SCALE: SHEET NO. 3 OF 4 SHEETS STA. 10+60.0 TO STA. 11+66.0

TR	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	7
ELM RIVER ROAD DISTRICT			CONTRACT NO. 95826	
ILLINOIS FED. AID PROJECT X06X(932)				

DATE	
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FINAL SURVEY	
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PLOTTED	
TEMPLATE	
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DATE	
BY	
ORIGINAL SURVEY	
SURVEYED	
PLOTTED	
TEMPLATE	
NOTE BOOK	
AREAS CHECKED	
NO.	



LAMAC
ENGINEERING
A Division of Hampton, Lenzini and Renwick, Inc.
ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORP 184000969

HLR JOB NO = 16.0472
DESIGNED - A.M.M.
DRAWN - A.M.M.
CHECKED - L.P.
DATE - 11/08/17

REVISIONS:
REVISOR: -
DATE: -
REVISOR: -
DATE: -
REVISOR: -
DATE: -

STATE OF ILLINOIS
WAYNE COUNTY HIGHWAY DEPARTMENT

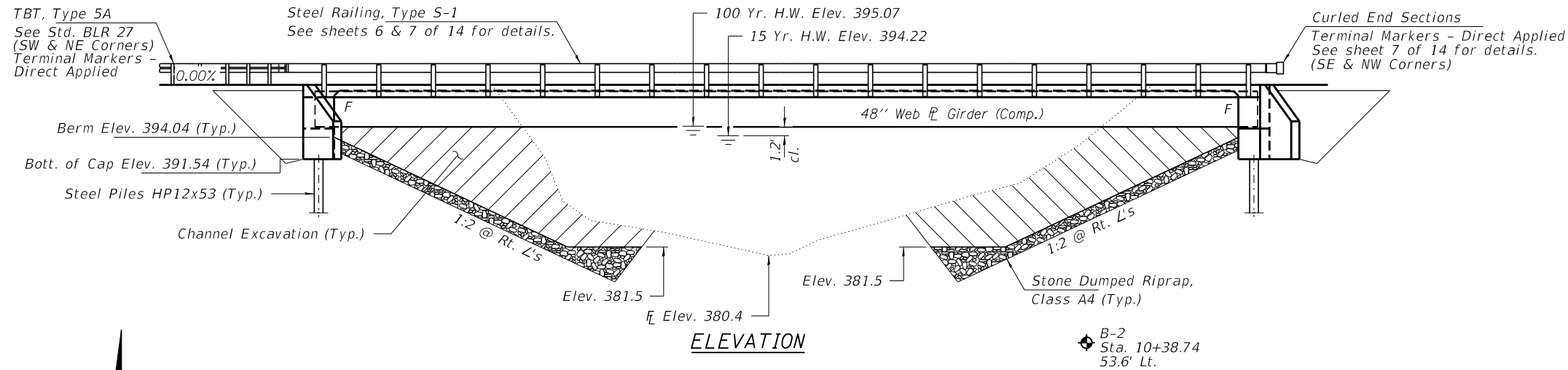
STATION CROSS SECTIONS
SCALE: SHEET NO. 4 OF 4 SHEETS STA. 12+00.0 TO STA. 15+50.0

TR	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	8
ELM RIVER ROAD DISTRICT			CONTRACT NO. 95826	
ILLINOIS FED. AID PROJECT X06X(932)				

BENCHMARK: Stake and Lathe, Sta. 9+08.34, 10.14' Lt., Elev. 394.50

EXISTING STRUCTURE NO. 096-3093: Three span continuous rolled steel multibeam bridge with precast concrete deck on timber pile bent piers and closed timber abutments. 80.0' bk.-bk. abuts.; 20.0' o.-o. deck. Original construction, 1909; Reconstruction 1975

Structure will be closed to traffic during construction.

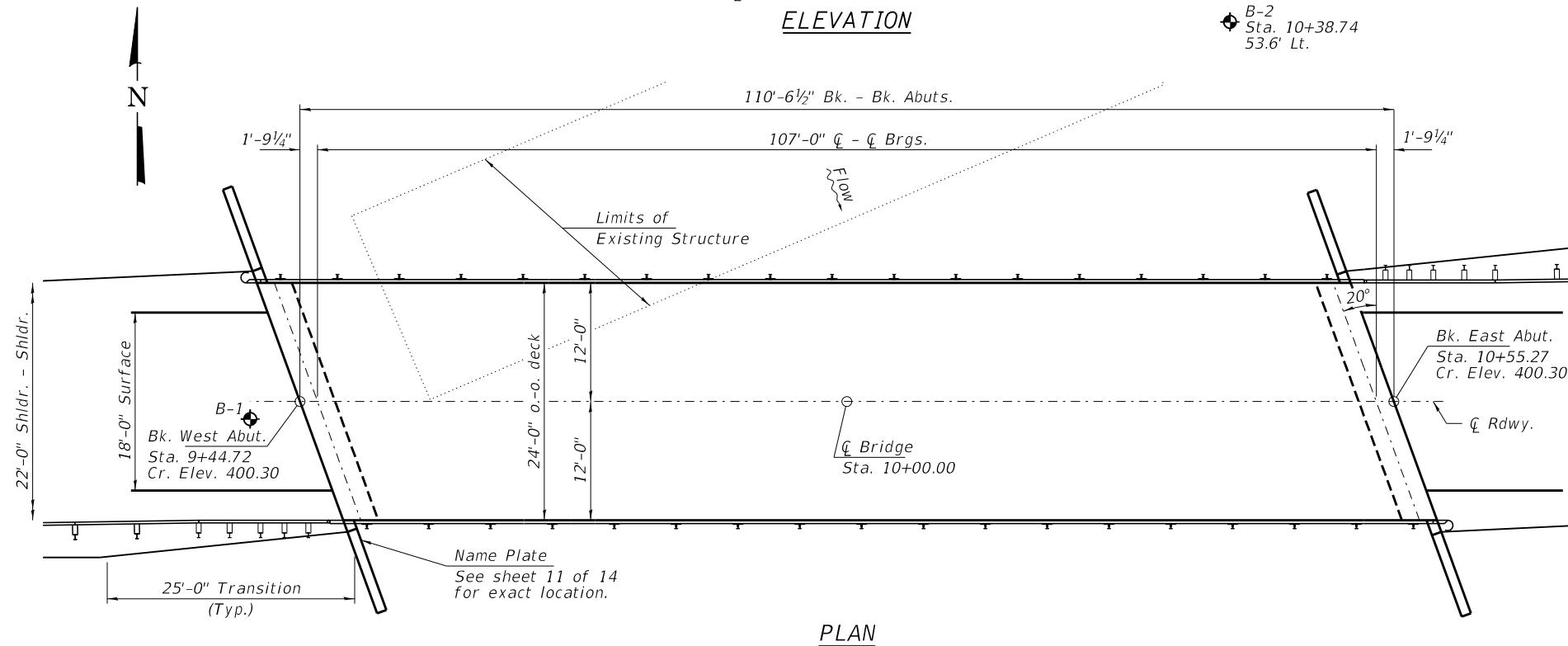


INDEX OF STRUCTURE SHEETS

1. General Plan & Elevation
2. General Data
- 3-4. Top of Slab Elevations
5. Superstructure
6. Superstructure & Diaphragm Details
7. Steel Railing, Type S-1
8. Structural Steel
- 9-10. Structural Steel Details
11. Abutments
12. HP Pile Details
- 13-14. Borings



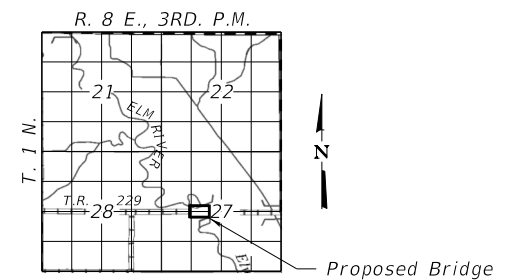
PROFILE GRADE
(Along \bar{C} Roadway)



PLAN

ELM RIVER
BUILT 201_ BY
WAYNE COUNTY
SEC. 16-06121-00-BR
ELM RIVER ROAD DISTRICT
STR. NO. 096-3468
LOADING HL-93

NAME PLATE
See Std. 515001



LOCATION SKETCH

SEISMIC DATA

Seismic Performance Zone (SPZ) = 2
Design Spectral Acceleration at 1.0 sec. (SD1) = 0.271g
Design Spectral Acceleration at 0.2 sec. (SDS) = 0.651g
Soil Site Class = D

DESIGN SPECIFICATIONS

2014 AASHTO LRFD Bridge Design Specifications, 7th Edition with all interims.

LOADING HL-93

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

DESIGN STRESSES

FIELD UNITS

f'_c = 4,000 psi (Superstructure)
 f'_c = 3,500 psi (Substructure)
 f_y = 60,000 psi (Reinf.)
 f_y = 50,000 psi (Structural Steel, AASHTO M270 Gr. 50W)

DESIGN SCOUR ELEVATION TABLE

Event/Limit State	Design Scour Elev. (ft.)		Item 113
	W. Abut.	E. Abut.	
Q100	391.54	391.54	8
Q500	391.54	391.54	
Design	391.54	391.54	
Check	391.54	391.54	

WATERWAY INFORMATION

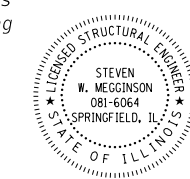
Existing Low Grade Elev. 390.1 @ Sta. 18+00
Drainage Area = 127.7 Sq. Mi. Proposed Low Grade Elev. 390.1 @ Sta. 18+00

Flood	Freq. Yr.	Q C.F.S.	Opening Ft ²		Natural Head - Ft.		Headwater El.		
			Exist.	Prop.	H.W.E. Exist.	H.W.E. Prop.	Exist.	Prop.	
Design	10	7780	690	940	393.98	0.05	0.02	394.03	394.00
Base	15	8760	710	960	394.22	0.05	0.02	394.27	394.24
Scour Check	100	13490	750	1050	395.07	0.05	0.02	395.12	395.09
Max. Calc.	200	15180	750	1060	395.32	0.06	0.06	395.38	395.38
	500	17570	750	1060	395.64	0.07	0.07	395.71	395.71

Low Water Approach to Remain

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 LRFD Specifications."

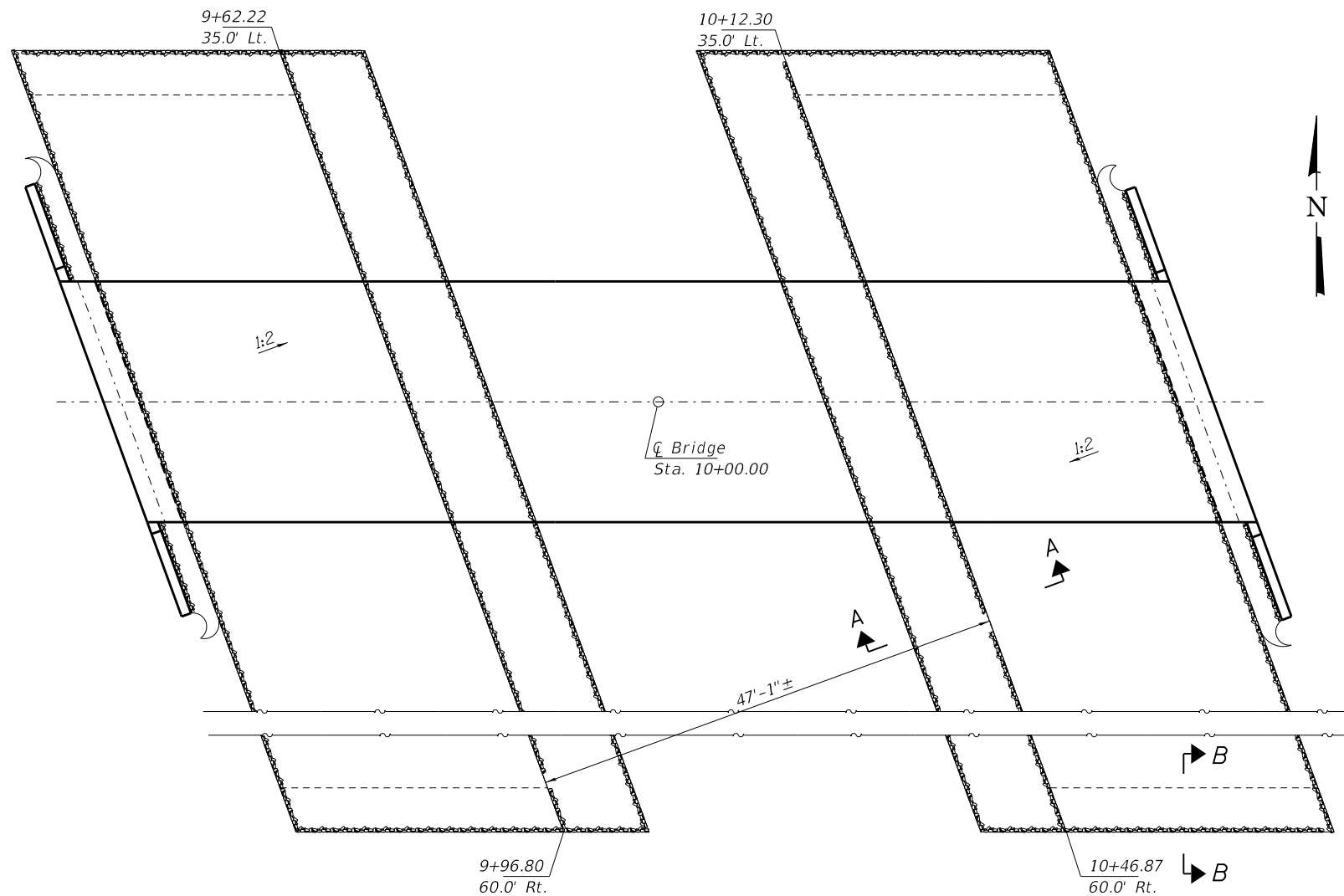
Steven W. Megginson 11/08/2017
ILLINOIS STRUCTURAL ENGINEER NO. 081-6064



Expires 11-30-2018

GENERAL PLAN & ELEVATION
T.R. 229 OVER ELM RIVER
SECTION 16-06121-00-BR
WAYNE COUNTY
STATION 10+00.00
STRUCTURE NO. 096-3468

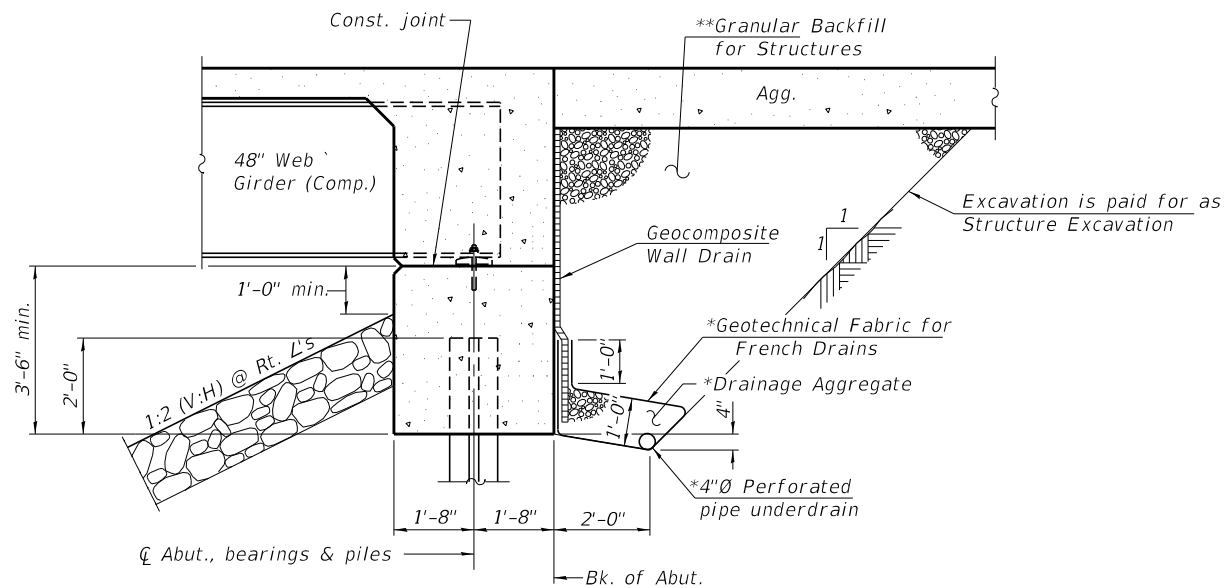
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3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703 217.546.3400 www.hfrengineering.com	PLOT SCALE =	CHECKED -	REVISED -			229	16-06121-00-BR	WAYNE	22	9	
184.000000 ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORPORATION	PLOT DATE = 11/9/2017	DRAWN - D.A.B.	REVISED -			ELM RIVER ROAD DISTRICT	CONTRACT NO. 95826	ILLINOIS FED. AID PROJECT X06(X)321			
		CHECKED -	REVISED -			SHEET NO. 1 OF 14 SHEETS					



RIPRAP PLAN

GENERAL NOTES

Fasteners shall be ASTM A325 Type 1, mechanically galvanized bolts in painted areas and ASTM A325 Type 3 in unpainted areas. Bolts 3/4"Ø, holes 1 1/16"Ø, unless otherwise noted.
 Calculated weight of Structural Steel = 97,780 lbs.
 All structural steel shall be AASHTO M 270 Grade 50W.
 No field welding is permitted except as specified in the contract documents.
 Reinforcement bars designated (E) shall be epoxy coated.
 The existing structural steel coating contains lead. The Contractor shall take appropriate precautions to deal with the presence of lead on this project.
 Layout of the slope protection system may be varied to suit ground conditions in the field as directed by the Engineer.
 The embankment configuration shown shall be the minimum that must be placed and compacted prior to construction of the abutments.
 Structural steel shall only be painted for a distance equal to the depth of embedment into the concrete cap plus 3 inches. Painted areas shall be primed in the shop with a Department approved zinc rich primer. Field painting will not be required.
 Excavation behind existing abutment walls shall be performed to balance front and back soil pressure before removing the existing superstructure.
 All proposed construction activities shall be in accordance with Nationwide Permit number 14 of the Department of the Army authorized under Section 404 of the Clean Water Act. The IEPA has issued Section 401 Water Quality Certification for this activity. See Special Provisions for conditions.
 Protective Coat shall be applied to the top surface and exposed sides of the concrete deck and wingwalls.
 Structure excavation shall be measured for payment from the front face of the abutment to the back of excavation for the granular backfill along the full length of the cap and wings from the top of existing ground to the bottom of cap elevation.

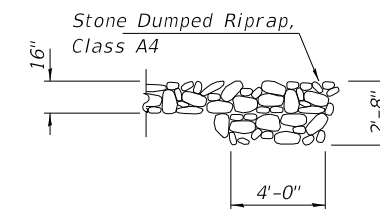


SECTION THRU INTEGRAL ABUTMENT
(Horiz. dim. @ Rt. L's)

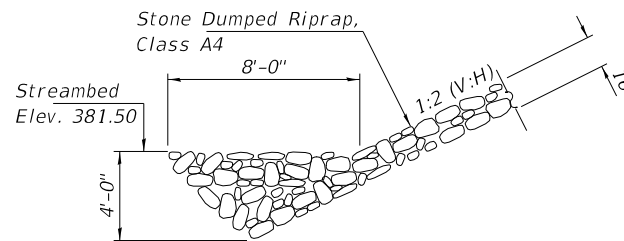
Note:
 All drainage system components shall extend to 2'-0" from the end of each wingwall except an outlet pipe shall extend until intersecting with the side slopes. The pipes shall drain into concrete headwalls. (See Article 601.05 of the Standard Specifications and Highway Standard 601101).

*Included in the cost of Pipe Underdrains for Structures. (See Special Provisions)

**Contractor shall compact item Granular Backfill for Structures as per Article 206.04 of the Standard Specifications.



SECTION B-B



SECTION A-A

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Channel Excavation	Cu. Yd.			151
Stone Dumped Riprap, Class A4	Ton			700
Removal of Existing Structures	Each			1
Structure Excavation	Cu. Yd.		50	50
Concrete Structures	Cu. Yd.		32.6	32.6
Concrete Superstructure	Cu. Yd.	112.0		112.0
Bridge Deck Grooving	Sq. Yd.	271		271
Protective Coat	Sq. Yd.	330	24	354
Furnishing and Erecting Structural Steel	L. Sum	1		1
Stud Shear Connectors	Each	825		825
Reinforcement Bars, Epoxy Coated	Pound	19,510	7,580	27,090
Steel Railing, Type S-1	Foot	225		225
Furnishing Steel Piles HP12x63	Foot		680	680
Driving Piles	Foot		680	680
Test Pile Steel HP12x63	Each		2	2
Pile Shoes	Each		10	10
Name Plates	Each		1	1
Geocomposite Wall Drain	Sq. Yd.			74
Terminal Marker - Direct Applied	Each	2		2
Granular Backfill for Structures	Cu Yd.			176
Pipe Underdrains for Structures 4"	Foot			136

FILE NAME = 160472-sht-bridge.dgn	USER NAME =	DESIGNED - J.T.H.	REVISED -
3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703 217.546.3400 www.hireengineering.com		CHECKED -	REVISED -
184.000099 ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORPORATION	PLOT SCALE =	DRAWN - D.A.B.	REVISED -
	PLOT DATE = 11/9/2017	CHECKED -	REVISED -

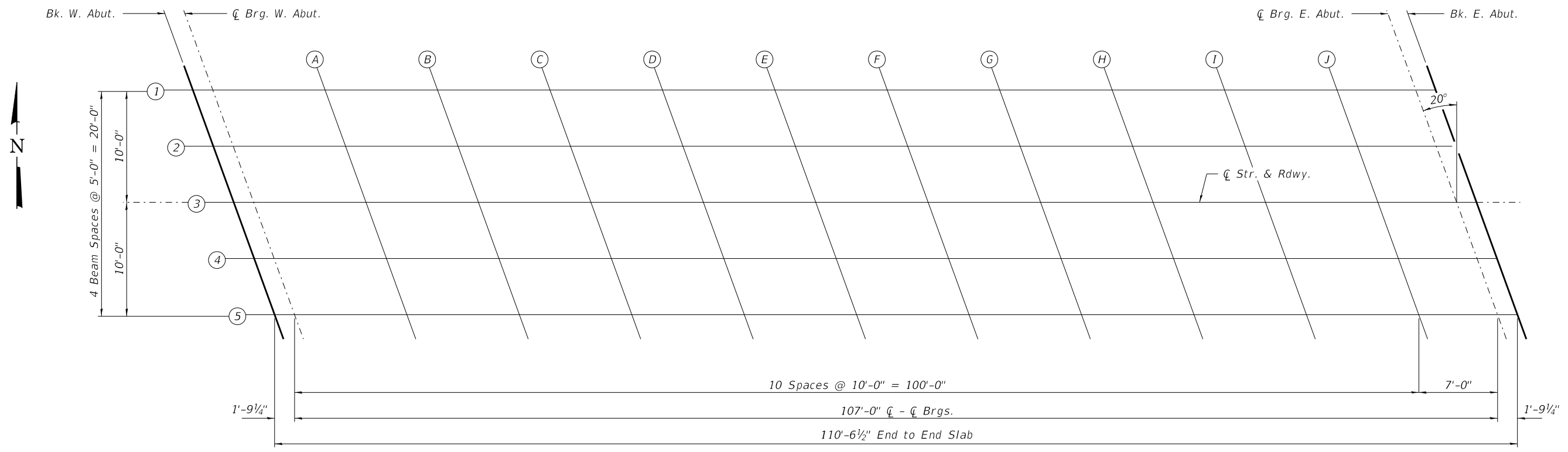
STATE OF ILLINOIS
 WAYNE COUNTY HIGHWAY DEPARTMENT

GENERAL DATA
 STRUCTURE NO. 096-3468

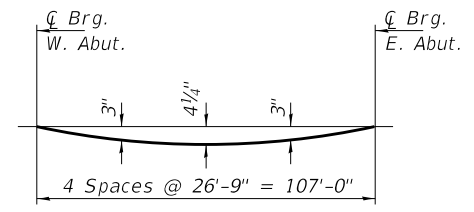
SHEET NO. 2 OF 14 SHEETS

T.R.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	10
ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		

ILLINOIS FED. AID PROJECT X06X(932)



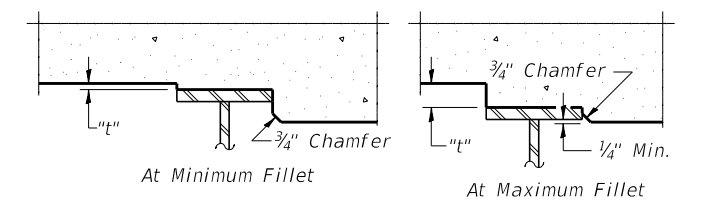
PLAN



DEAD LOAD DEFLECTION DIAGRAM

(Includes weight of concrete deck and steel railing only.)

Note:
The above deflections are not to be used in the field if the engineer is working from the grade elevations adjusted for dead load deflections as shown on sheet 4 of 14.



To determine "t": After all structural steel has been erected, elevations of the top flanges of the beams shall be taken at intervals shown above. These elevations subtracted from the "Theoretical Grade Elevations Adjusted for Dead Load Deflection" shown on sheet 4 of 14, minus slab thickness, equals the fillet heights "t" above top flange of beams.

FILLET HEIGHTS

FILE NAME = 160472-sht-bridge.dgn	USER NAME =	DESIGNED - J.T.H.	REVISED -	STATE OF ILLINOIS WAYNE COUNTY HIGHWAY DEPARTMENT	TOP OF SLAB ELEVATIONS STRUCTURE NO. 096-3468	T.R.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703 217.546.3400 www.hfengr.com		CHECKED -	REVISED -			229	16-06121-00-BR	WAYNE	22	11
184.000009 ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORPORATION	PLOT SCALE =	DRAWN - D.A.B.	REVISED -			ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		
	PLOT DATE = 11/9/2017	CHECKED -	REVISED -			SHEET NO. 3 OF 14 SHEETS		ILLINOIS FED. AID PROJECT X06X(932)		

BEAM 1

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	9+41.08	-10.00	400.09	400.09
☉ Brg. W. Abut.	9+42.85	-10.00	400.09	400.09
A	9+52.85	-10.00	400.09	400.20
B	9+62.85	-10.00	400.09	400.29
C	9+72.85	-10.00	400.09	400.37
D	9+82.85	-10.00	400.09	400.42
E	9+92.85	-10.00	400.09	400.45
F	10+02.85	-10.00	400.09	400.44
G	10+12.85	-10.00	400.09	400.41
H	10+22.85	-10.00	400.09	400.35
I	10+32.85	-10.00	400.09	400.26
J	10+42.85	-10.00	400.09	400.17
☉ Brg. E. Abut.	10+49.85	-10.00	400.09	400.09
Bk. E. Abut.	10+51.63	-10.00	400.09	400.09

BEAM 2

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	9+42.90	-5.00	400.20	400.20
☉ Brg. W. Abut.	9+44.67	-5.00	400.20	400.20
A	9+54.67	-5.00	400.20	400.30
B	9+64.67	-5.00	400.20	400.40
C	9+74.67	-5.00	400.20	400.47
D	9+84.67	-5.00	400.20	400.52
E	9+94.67	-5.00	400.20	400.55
F	10+04.67	-5.00	400.20	400.54
G	10+14.67	-5.00	400.20	400.51
H	10+24.67	-5.00	400.20	400.45
I	10+34.67	-5.00	400.20	400.37
J	10+44.67	-5.00	400.20	400.27
☉ Brg. E. Abut.	10+51.67	-5.00	400.20	400.20
Bk. E. Abut.	10+53.45	-5.00	400.20	400.20

☉ STRUCTURE, RDWY., & BEAM 3

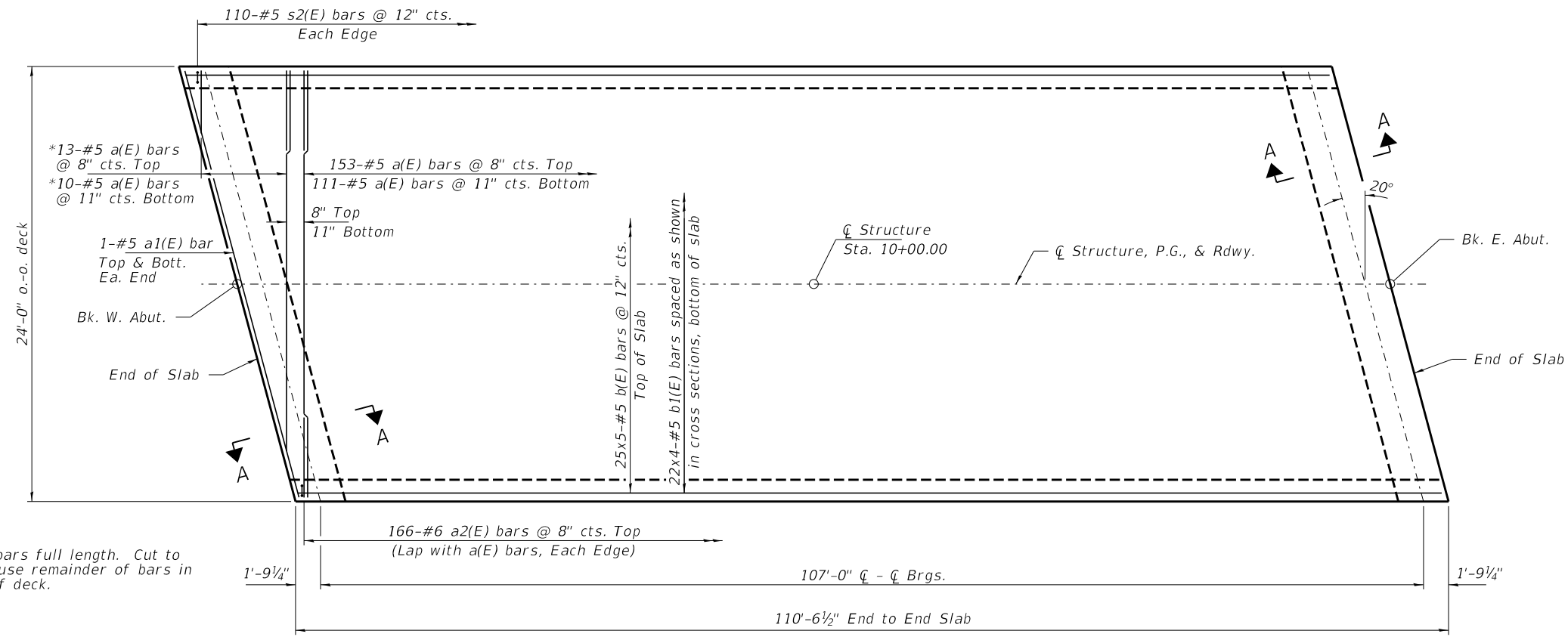
Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	9+44.72	0.00	400.30	400.30
☉ Brg. W. Abut.	9+46.49	0.00	400.30	400.30
A	9+56.49	0.00	400.30	400.40
B	9+66.49	0.00	400.30	400.50
C	9+76.49	0.00	400.30	400.58
D	9+86.49	0.00	400.30	400.63
E	9+96.49	0.00	400.30	400.65
F	10+06.49	0.00	400.30	400.65
G	10+16.49	0.00	400.30	400.62
H	10+26.49	0.00	400.30	400.56
I	10+36.49	0.00	400.30	400.47
J	10+46.49	0.00	400.30	400.37
☉ Brg. E. Abut.	10+53.49	0.00	400.30	400.30
Bk. E. Abut.	10+55.27	0.00	400.30	400.30

BEAM 4

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	9+46.54	5.00	400.20	400.20
☉ Brg. W. Abut.	9+48.31	5.00	400.20	400.20
A	9+58.31	5.00	400.20	400.30
B	9+68.31	5.00	400.20	400.40
C	9+78.31	5.00	400.20	400.47
D	9+88.31	5.00	400.20	400.52
E	9+98.31	5.00	400.20	400.55
F	10+08.31	5.00	400.20	400.54
G	10+18.31	5.00	400.20	400.51
H	10+28.31	5.00	400.20	400.45
I	10+38.31	5.00	400.20	400.37
J	10+48.31	5.00	400.20	400.27
☉ Brg. E. Abut.	10+55.31	5.00	400.20	400.20
Bk. E. Abut.	10+57.09	5.00	400.20	400.20

BEAM 5

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	9+48.36	10.00	400.09	400.09
☉ Brg. W. Abut.	9+50.13	10.00	400.09	400.09
A	9+60.13	10.00	400.09	400.20
B	9+70.13	10.00	400.09	400.29
C	9+80.13	10.00	400.09	400.37
D	9+90.13	10.00	400.09	400.42
E	10+00.13	10.00	400.09	400.45
F	10+10.13	10.00	400.09	400.44
G	10+20.13	10.00	400.09	400.41
H	10+30.13	10.00	400.09	400.35
I	10+40.13	10.00	400.09	400.26
J	10+50.13	10.00	400.09	400.17
☉ Brg. E. Abut.	10+57.13	10.00	400.09	400.09
Bk. E. Abut.	10+58.91	10.00	400.09	400.09

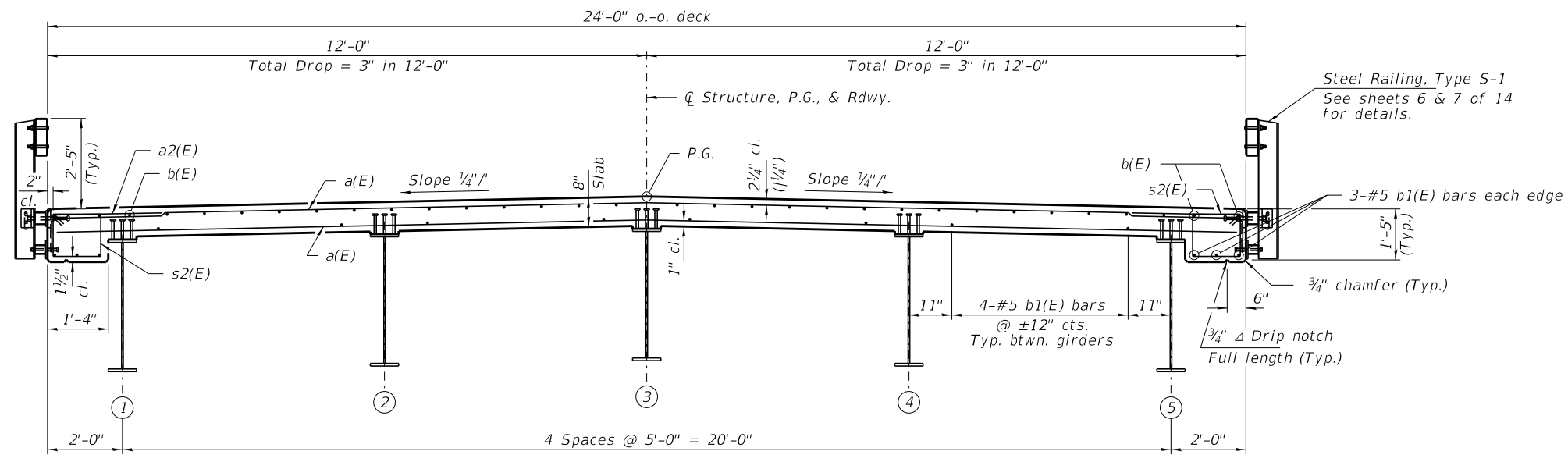


* Order a(E) bars full length. Cut to fit skew & use remainder of bars in other end of deck.

MIN. BAR LAP
#5 bars = 3'-6"

PLAN

Notes:
See sheet 6 of 14 for superstructure and diaphragm details.
See sheet 6 of 14 for SECTION A-A.
Bars indicated thus 25x5-#5 etc. indicates 25 lines of bars with 5 lengths per line.



CROSS SECTION
(Looking East)

**SUPERSTRUCTURE
BILL OF MATERIAL**

BAR NO.	SIZE	LENGTH	SHAPE
a(E)	287 #5	23'-8"	—
a1(E)	4 #5	25'-2"	—
a2(E)	332 #6	6'-6"	—
b(E)	125 #5	24'-10"	—
b1(E)	88 #5	30'-3"	—
m(E)	8 #6	25'-2"	—
m1(E)	40 #5	4'-4"	—
m2(E)	32 #6	4'-7"	—
m3(E)	16 #6	1'-7"	—
s(E)	52 #5	12'-4"	□
s1(E)	52 #5	8'-11"	□
s2(E)	220 #5	5'-1"	□
Protective Coat	Sq. Yd.	330	
Concrete Superstructure	Cu. Yd.	112.0	
Bridge Deck Grooving	Sq. Yd.	271	
Reinforcement Bars, Epoxy Coated	Pound	19,510	

FILE NAME = 160472-sht-bridge.dgn	USER NAME =	DESIGNED - J.T.H.	REVISED -
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184-000089 ILLINOIS PROFESSIONAL DESIGN FIRM L3 / PE / SE CORPORATION	PLOT SCALE =	DRAWN - D.A.B.	REVISED -
	PLOT DATE = 11/9/2017	CHECKED -	REVISED -

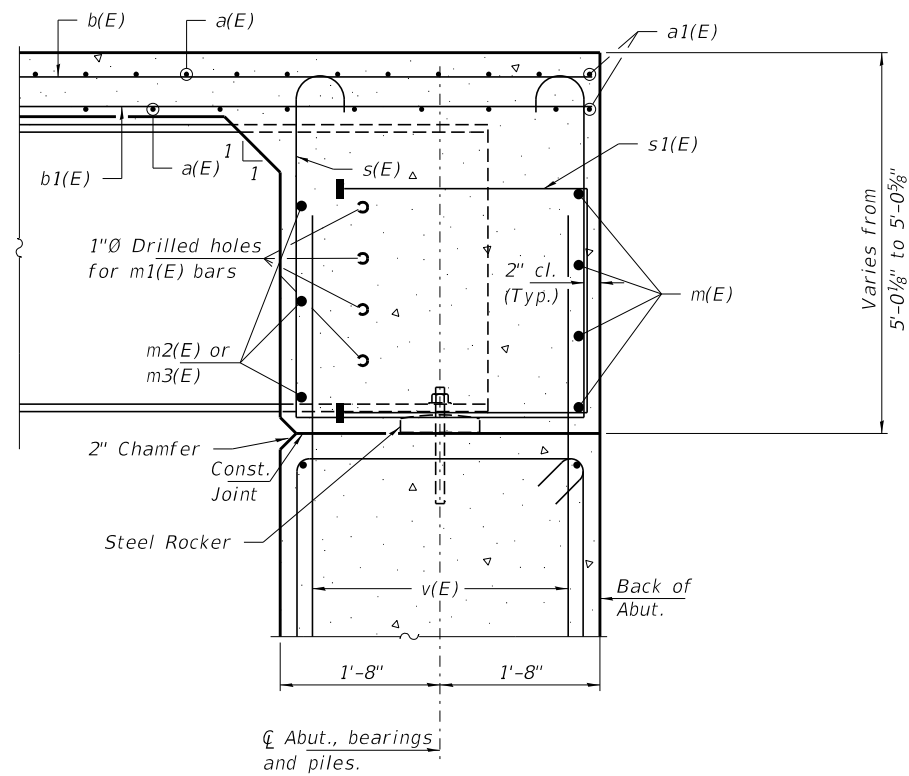
**STATE OF ILLINOIS
WAYNE COUNTY HIGHWAY DEPARTMENT**

**SUPERSTRUCTURE
STRUCTURE NO. 096-3468**

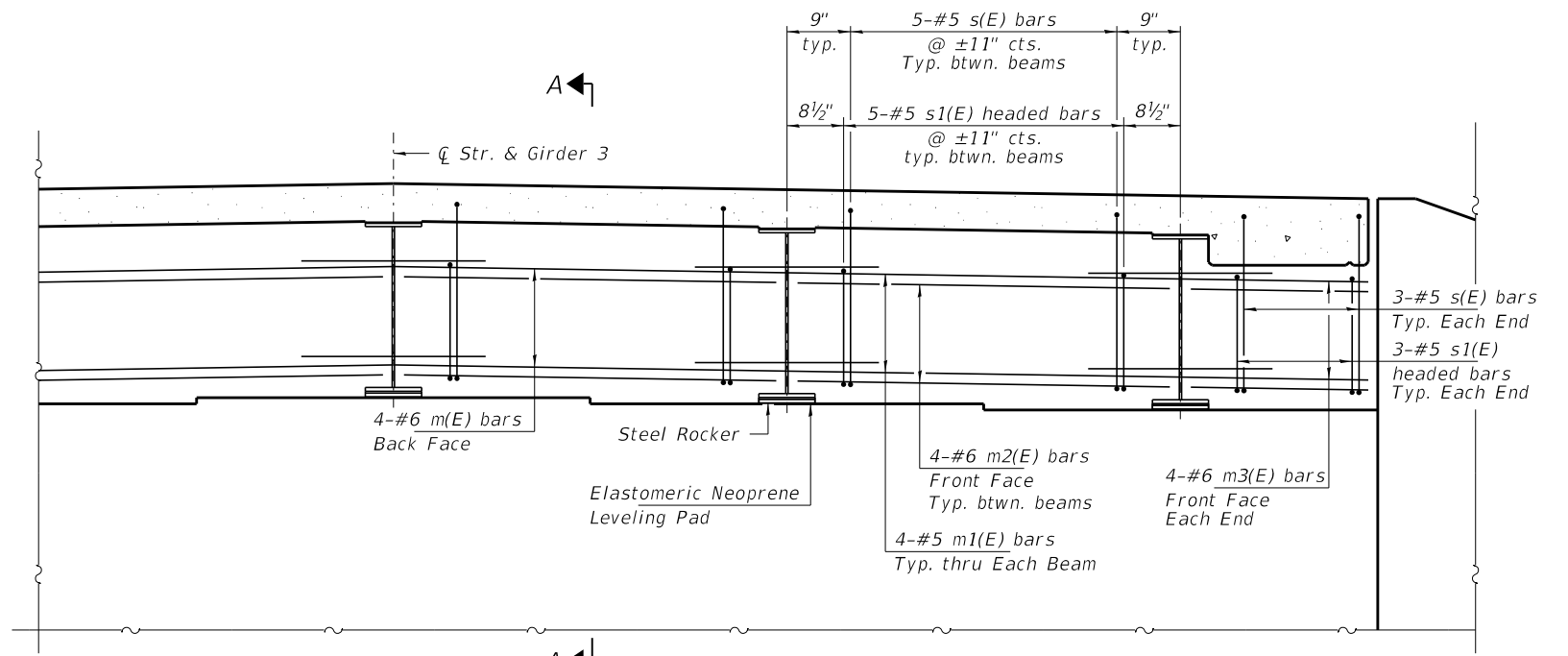
SHEET NO. 5 OF 14 SHEETS

T.R.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	13
ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		

ILLINOIS FED. AID PROJECT X06X(932)

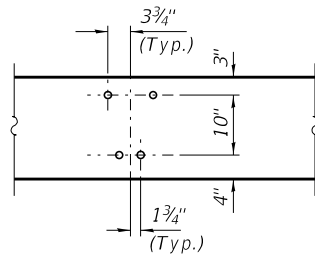


SECTION A-A
Dimensions at right angles to abutment.

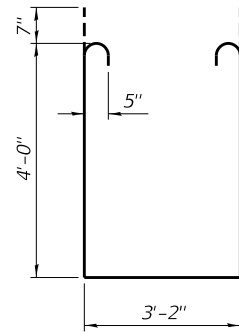


DIAPHRAGM AT ABUTMENT
Dimensions at right angles to beams

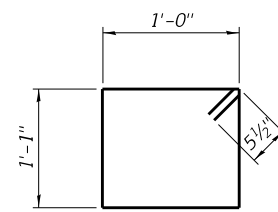
Notes:
Reinforcement bars in diaphragm are billed with Superstructure on sheet 5 of 14.
Concrete in diaphragm is included with Concrete Superstructure on sheet 5 of 14.
The s(E) bars shall be placed parallel to the beams. Spacing for these bars shall be at right angles to the beams.
For bearing details see sheet 10 of 14.
Beams shall be braced for stability during erection and remain braced until deck is poured and cured.
Headed bars shall conform to ASTM A970 Class HA. Cost included with Reinforcement Bars, Epoxy Coated.



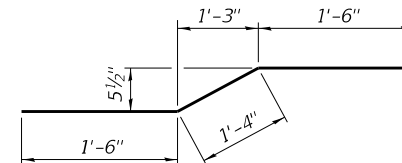
DETAIL A



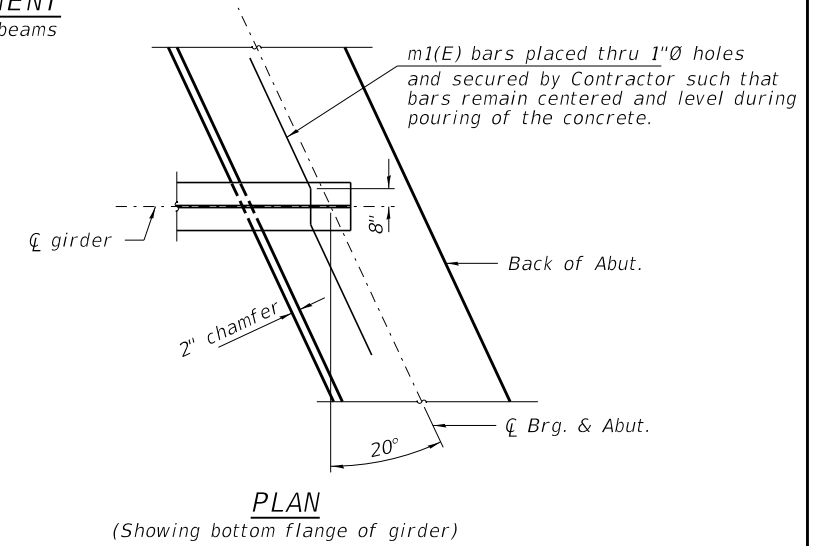
BAR s(E)



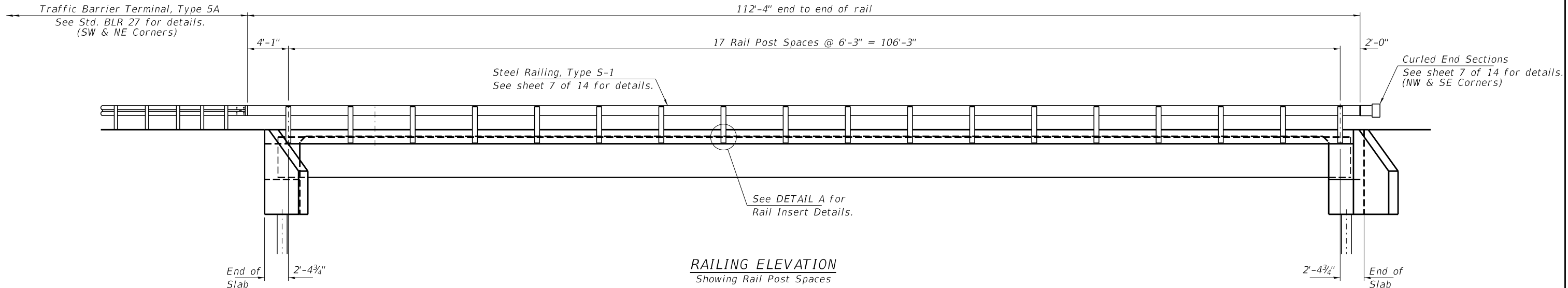
BAR s2(E)



BAR m1(E)



PLAN
(Showing bottom flange of girder)



RAILING ELEVATION
Showing Rail Post Spaces

See sheet 7 of 14 for Railing Details.

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ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORPORATION	PLOT SCALE =	DRAWN - D.A.B.	REVISED -
	PLOT DATE = 11/9/2017	CHECKED -	REVISED -

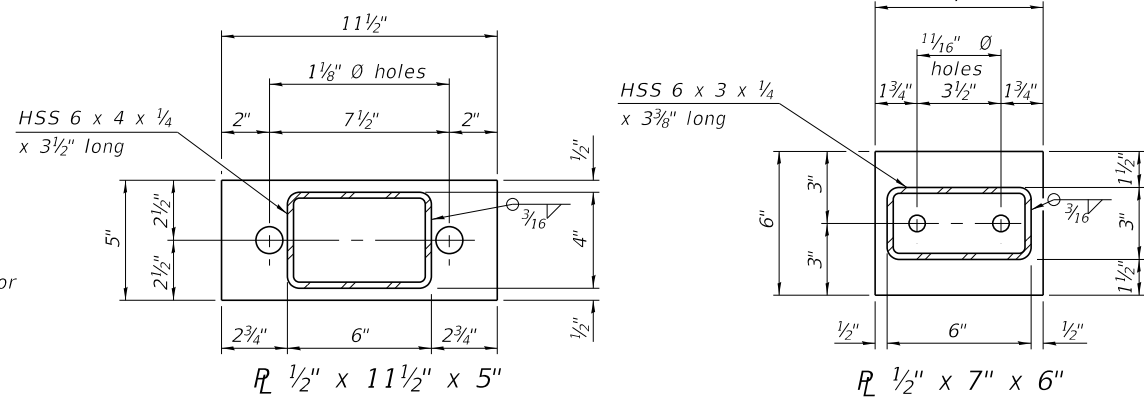
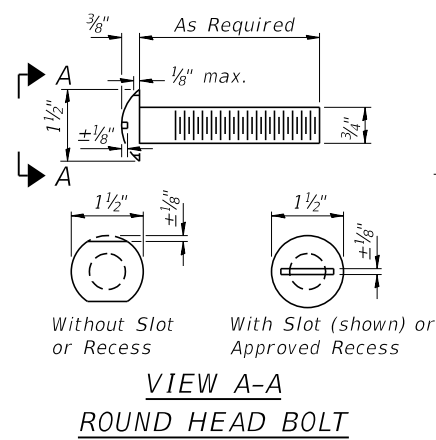
STATE OF ILLINOIS
WAYNE COUNTY HIGHWAY DEPARTMENT

SUPERSTRUCTURE AND DIAPHRAGM DETAILS
STRUCTURE NO. 096-3468

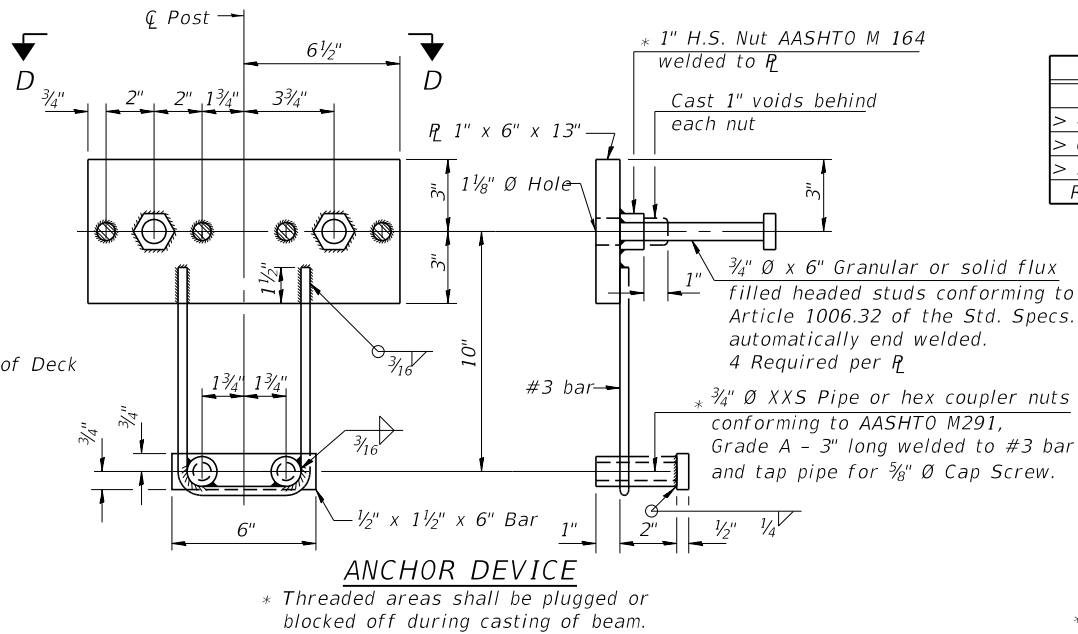
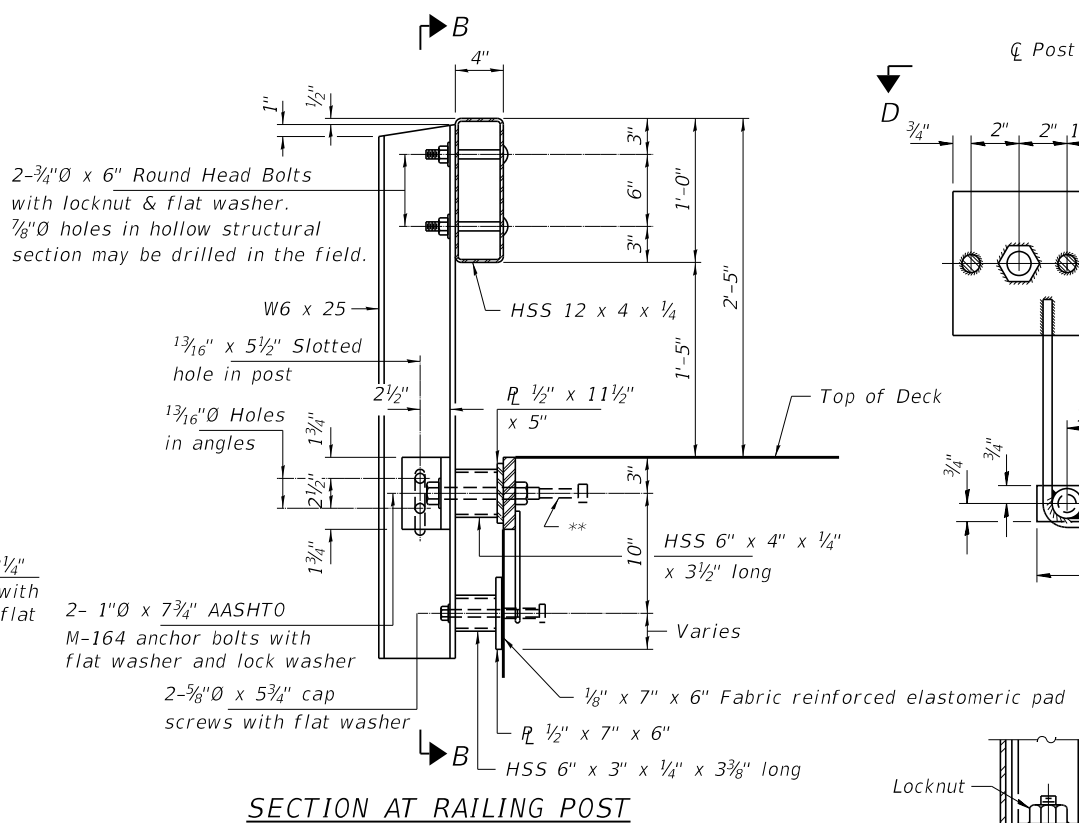
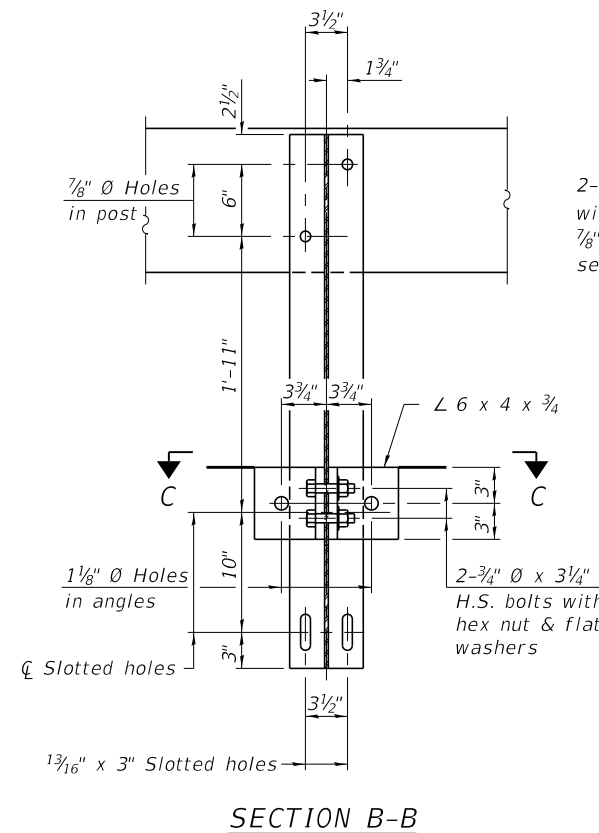
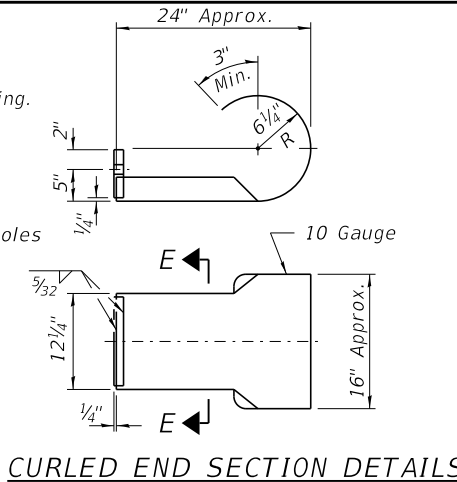
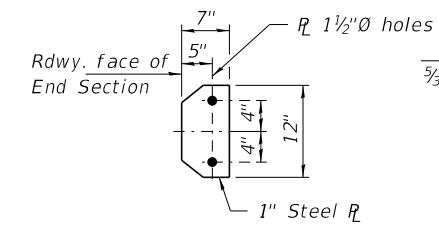
SHEET NO. 6 OF 14 SHEETS

T.R.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	14
ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		

ILLINOIS FED. AID PROJECT X06X(932)



Note: Cost of curled end sections shall be included with the Steel Railing. (2 Required)

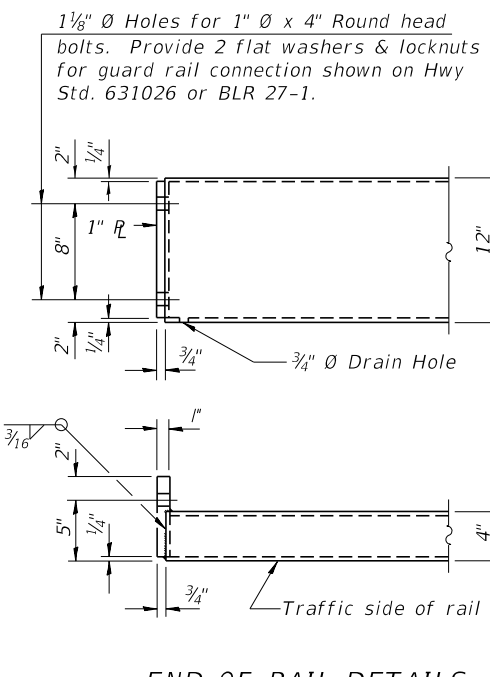
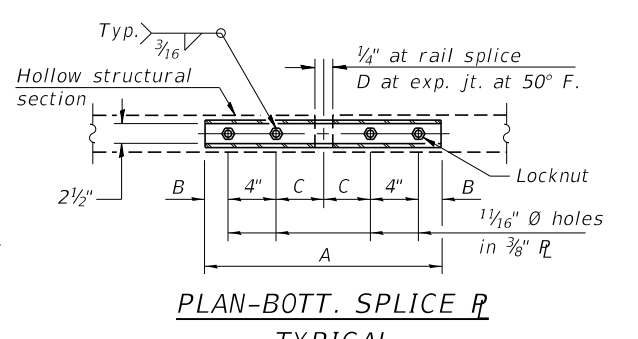
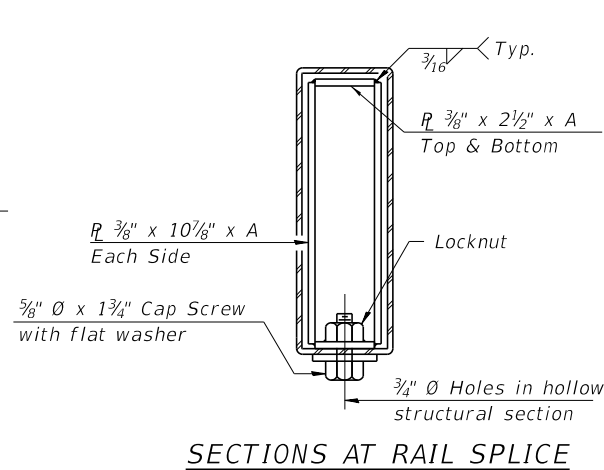
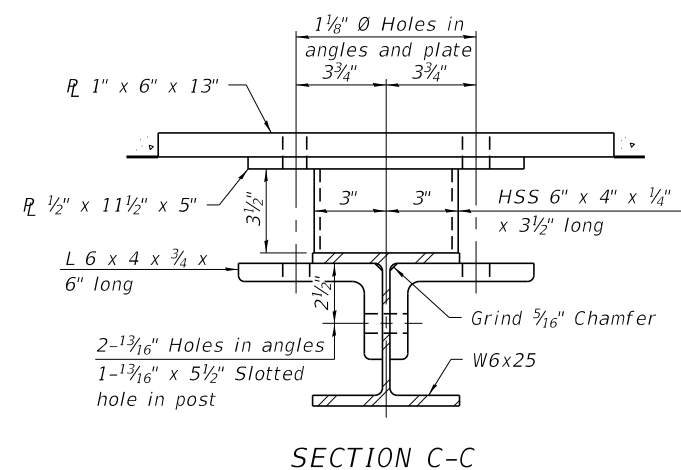


SPLICE DIMENSIONS

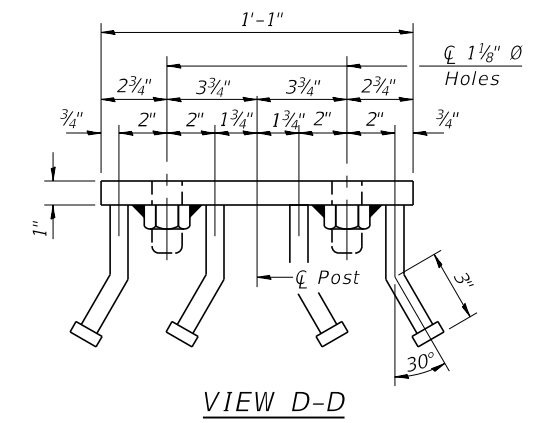
T	D	A	B	C	E
≤ 4"	2 1/2"	1'-8"	2"	4"	2 1/2"
> 4" ≤ 6 1/2"	3 3/4"	2'-0"	2 1/2"	5 1/2"	3 1/2"
> 6 1/2" ≤ 9"	5"	2'-4"	3 1/2"	6 1/2"	9"
> 9" ≤ 13"	7"	2'-10"	4 1/2"	8 1/2"	11"
Rail Splice	1/4"	1'-8"	2"	4"	—

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.



BILL OF MATERIAL

Item	Unit	Quantity
Steel Railing, Type S-1	Foot	225
Terminal Marker, Direct Applied	Each	3

FILE NAME = 160472-sht-bridge.dgn
 3085 STEVENSON DRIVE, SUITE 201
 SPRINGFIELD, ILLINOIS 62703
 217.546.3400 www.hfrengineering.com
 HFR ILLINOIS PROFESSIONAL DESIGN FIRM
 LS / PE / SE CORPORATION

USER NAME =
 DESIGNED - J.T.H.
 CHECKED -
 PLOT SCALE =
 DRAWN - D.A.B.
 PLOT DATE = 11/9/2017

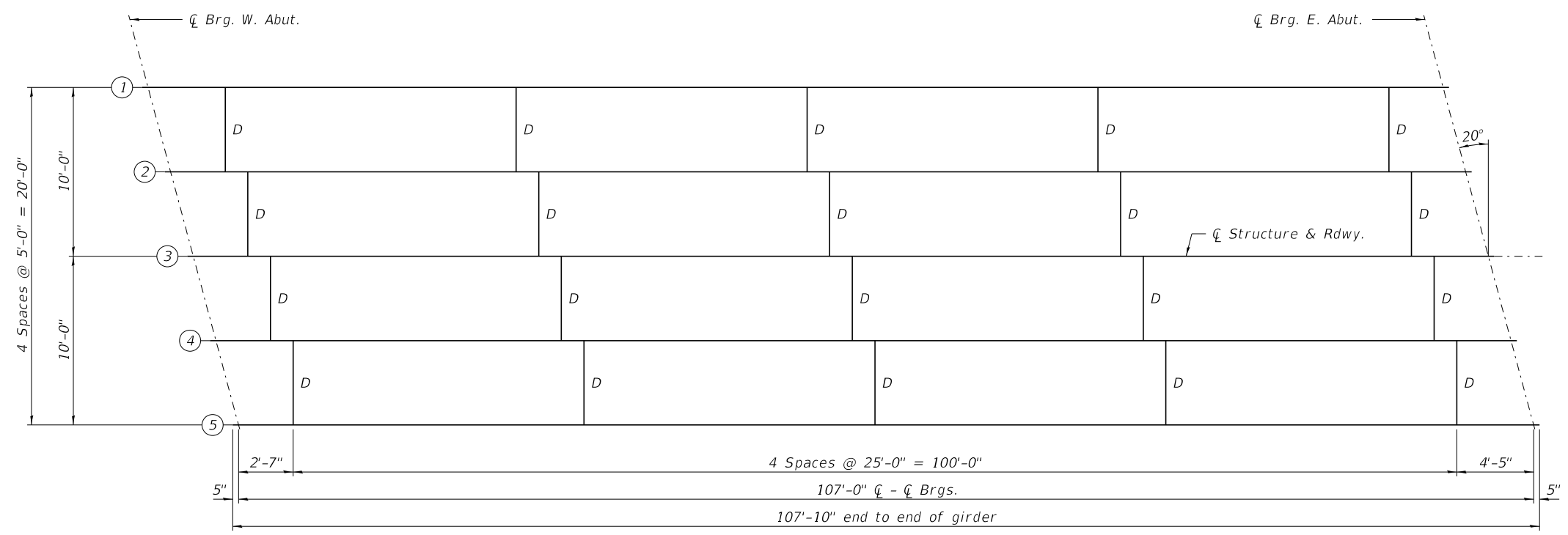
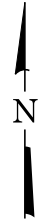
DESIGNED - J.T.H.
 CHECKED -
 DESIGNED - J.T.H.
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 DESIGNED - J.T.H.
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STATE OF ILLINOIS
WAYNE COUNTY HIGHWAY DEPARTMENT

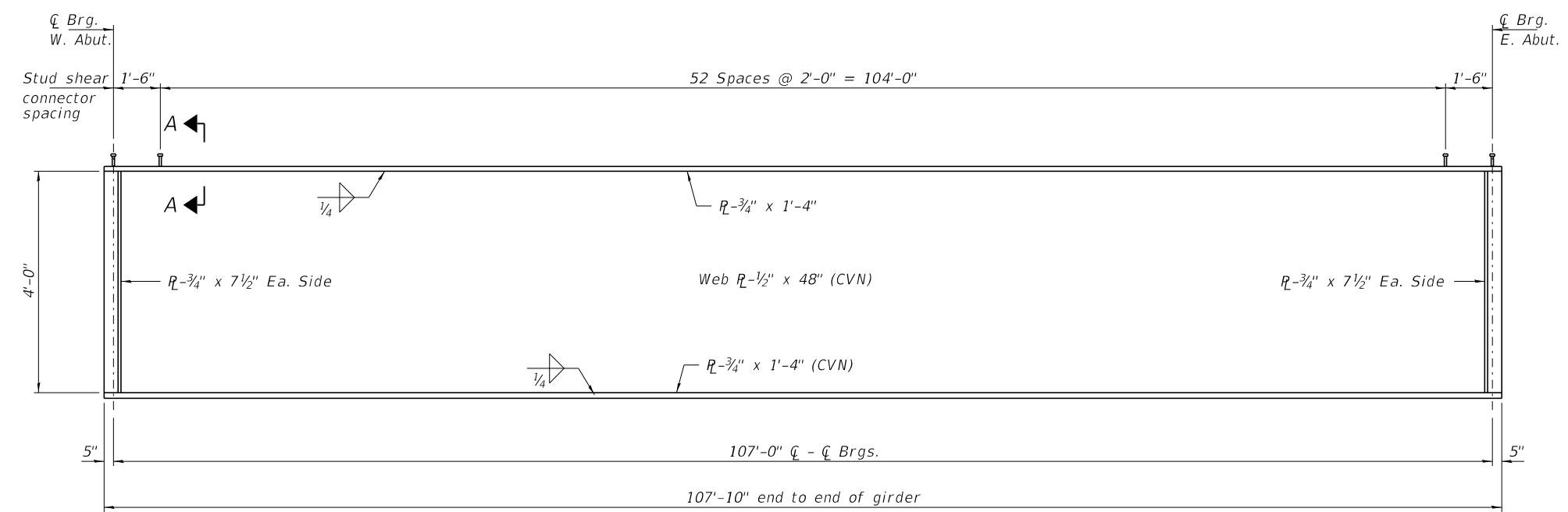
STEEL RAILING, TYPE S-1
STRUCTURE NO. 096-3468

T.R.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	15
ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		

SHEET NO. 7 OF 14 SHEETS
 ILLINOIS FED. AID PROJECT X06(X)9321



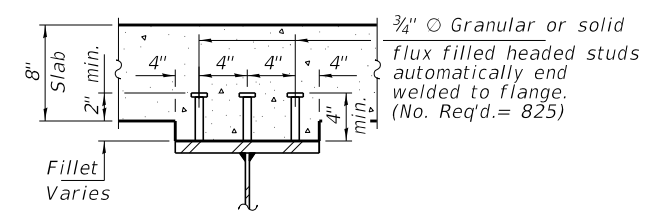
FRAMING PLAN



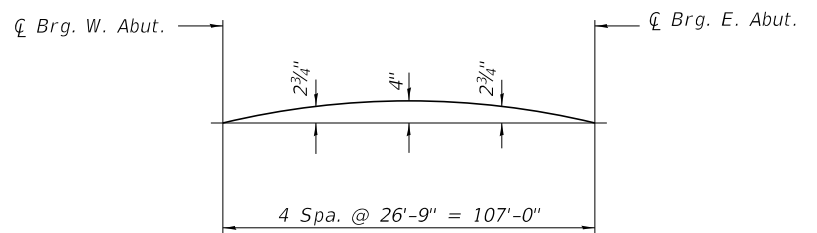
GIRDER ELEVATION

Location	Cl Brg. W. Abut.	Cl Brg. E. Abut.
BEAM 1	399.30	399.30
BEAM 2	399.40	399.40
BEAM 3	399.51	399.51
BEAM 4	399.40	399.40
BEAM 5	399.30	399.30

TOP OF WEB ELEVATIONS
(For fabrication only)
(Does not include Dead Load Deflections)

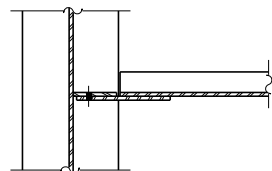


SECTION A-A

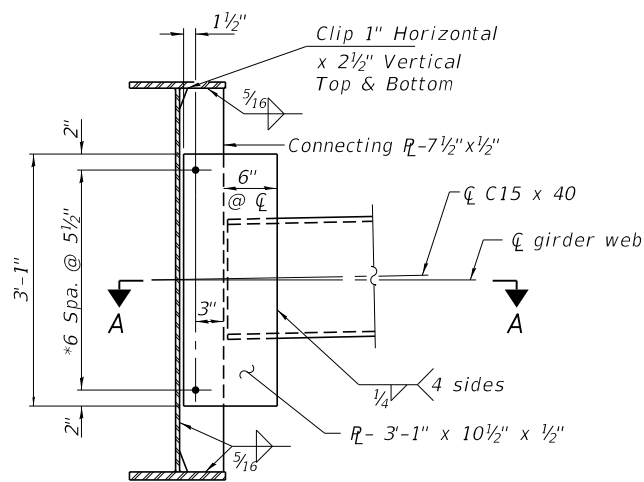


CAMBER DIAGRAM

Notes:
 "CVN" denotes Charpy-V-Notch Impact Energy Requirements, Zone 2.
 All girders and splices, including bearing stiffeners, shall be AASHTO M270 Grade 50W.
 For additional structural steel details see sheets 9 & 10 of 14.
 All cross frames and diaphragms shall be installed as steel is erected and secured with erection pins and bolts except as otherwise noted. Individual cross frames or diaphragms at supports may be temporarily disconnected to install bearing anchor rods.

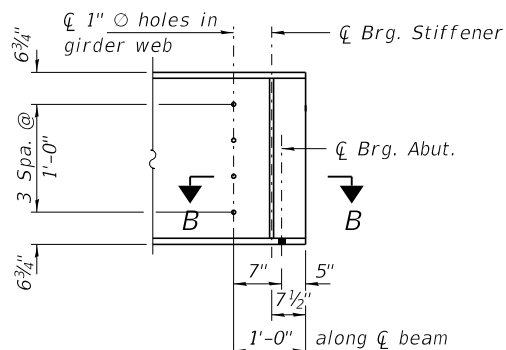


SECTION A-A

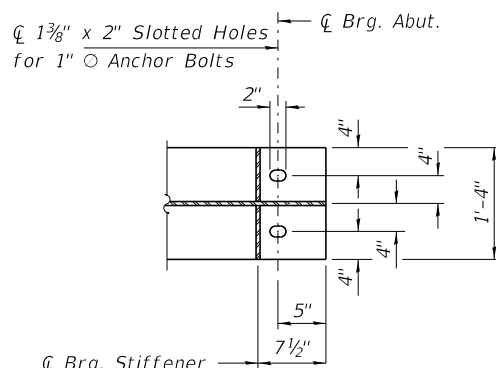


INTERIOR DIAPHRAGM D
(20 required)

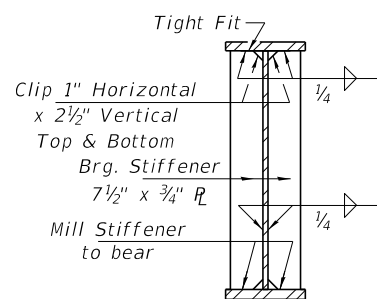
Notes:
Two hardened washers required for each set of oversized holes.
*Alternate channels C15X50 are permitted to facilitate material acquisition. Calculated weight of structural steel is based on C15x40 section. The alternate, if utilized, shall be provided at no additional cost to the Department.



TYP. END OF GIRDER ELEVATION



SECTION B-B



SECTION AT ABUTMENT BEARING STIFFNER R'S

INTERIOR GIRDER MOMENT TABLE		
		0.5 Sp. 1
I_s	(in ⁴)	18,868
$I_c(n)$	(in ⁴)	43,305
$I_c(3n)$	(in ⁴)	32,029
$I_c(cr)$	(in ⁴)	21,091
S_s	(in ³)	762
$S_c(n)$	(in ³)	1,036
$S_c(3n)$	(in ³)	943
$S_c(cr)$	(in ³)	735
DC1	(k/ft)	0.77
MDC1	(k-ft)	1,135
DC2	(k/ft)	0.03
MDC2	(k-ft)	43
DW	(k/ft)	0.25
MDW	(k-ft)	358
LLDF		0.4511
$M_{\ell} + IM$	(k)	1,401
M_u (Strength I)	(k)	4,461
$\phi_f M_n$	(k)	5,357
f_s DC1	(ksi)	17.9
f_s DC2	(ksi)	0.5
f_s DW	(ksi)	4.6
f_s ($\ell + IM$)	(ksi)	16.2
f_s (Service II)	(ksi)	44.1
0.95Rh Fyf	(ksi)	47.5
f_s (Total)(Strength I)	(ksi)	-
$\phi_f F_n$	(ksi)	-
Vf	(k)	25.8

INTERIOR GIRDER REACTION TABLE	
	Abutment
LLDF	(k) 0.6397
OCF	(k) -
R_{DC1}	(k) 42.5
R_{DC2}	(k) 1.7
R_{DW}	(k) 13.4
R_{ℓ}	(k) 63.9
R_{IM}	(k) 13.9
R_{Total}	(k) 135.5

I_s, S_s : Non-composite moment of inertia and section modulus of the steel section used for computing f_s (Total-Strength I, and Service II) due to non-composite dead loads (in.⁴ and in.³).

$I_c(n), S_c(n)$: Composite moment of inertia and section modulus of the steel and deck based upon the modular ratio, "n", used for computing f_s (Total-Strength I, and Service II) in uncracked sections due to short-term composite live loads (in.⁴ and in.³).

$I_c(3n), S_c(3n)$: Composite moment of inertia and section modulus of the steel and deck based upon 3 times the modular ratio, "3n", used for computing f_s (Total-Strength I, and Service II) in uncracked sections, due to long-term composite (superimposed) dead loads (in.⁴ and in.³).

$I_c(cr), S_c(cr)$: Composite moment of inertia and section modulus of the steel and longitudinal deck reinforcement, used for computing f_s (Total-Strength I and Service II) in cracked sections, due to both short-term composite live loads and long-term composite (superimposed) dead loads (in.⁴ and in.³).

DC1: Un-factored non-composite dead load (kips/ft.).
MDC1: Un-factored moment due to non-composite dead load (kip-ft.).
DC2: Un-factored long-term composite (superimposed excluding future wearing surface) dead load (kips/ft.).
MDC2: Un-factored moment due to long-term composite (superimposed excluding future wearing surface) dead load (kip-ft.).
DW: Un-factored long-term composite (superimposed future wearing surface only) dead load (kips/ft.).
MDW: Un-factored moment due to long-term composite (superimposed future wearing surface only) dead load (kip-ft.).
 $M_{\ell} + IM$: Un-factored live load moment plus dynamic load allowance (impact) (kip-ft.).
 M_u (Strength I): Factored design moment (kip-ft.).
1.25 (MDC1 + MDC2) + 1.5 MDW + 1.75 $M_{\ell} + IM$
 $\phi_f M_n$: Compact composite positive moment capacity computed according to Article 6.10.7.1 or non-slender negative moment capacity according to Article A6.1.1 or A6.1.2 (kip-ft.).
 f_s DC1: Un-factored stress at edge of flange for controlling steel flange due to vertical non-composite dead loads as calculated below (ksi).
MDC1/ S_c
 f_s DC2: Un-factored stress at edge of flange for controlling steel flange due to vertical composite dead loads as calculated below (ksi).
MDC2/ $S_c(3n)$ or MDC2/ $S_c(cr)$ as applicable.
 f_s DW: Un-factored stress at edge of flange for controlling steel flange due to vertical composite future wearing surface loads as calculated below (ksi).
MDW/ $S_c(3n)$ or MDW/ $S_c(cr)$ as applicable.
 f_s ($\ell + IM$): Un-factored stress at edge of flange for controlling steel flange due to vertical composite live load plus impact loads as calculated below (ksi).
 $M_{\ell} + IM / S_c(n)$ or $M_{\ell} + IM / S_c(cr)$ as applicable.
 f_s (Service II): Sum of stresses as computed below (ksi).
 $f_s DC1 + f_s DC2 + f_s DW + 1.3 f_s(\ell + IM)$
0.95RhFyf: Composite stress capacity for Service II loading according to Article 6.10.4.2 (ksi).
 f_s (Total)(Strength I): Sum of stresses as computed below on non-compact section (ksi).
1.25 ($f_s DC1 + f_s DC2$) + 1.5 $f_s DW + 1.75 f_s(\ell + IM)$
 $\phi_f F_n$: Non-Compact composite positive or negative stress capacity for Strength I loading according to Article 6.10.7 or 6.10.8 (ksi).
Vf: Maximum factored shear range in span computed according to Article 6.10.10.

Note:
 M_{ℓ} and R_{ℓ} include the effects of centrifugal force and superelevation.

Notes:
For additional structural steel details see sheets 8 & 10 of 13.
All diaphragms and connecting plates or angles, including stiffeners, shall be AASHTO M270, Grade 50W.

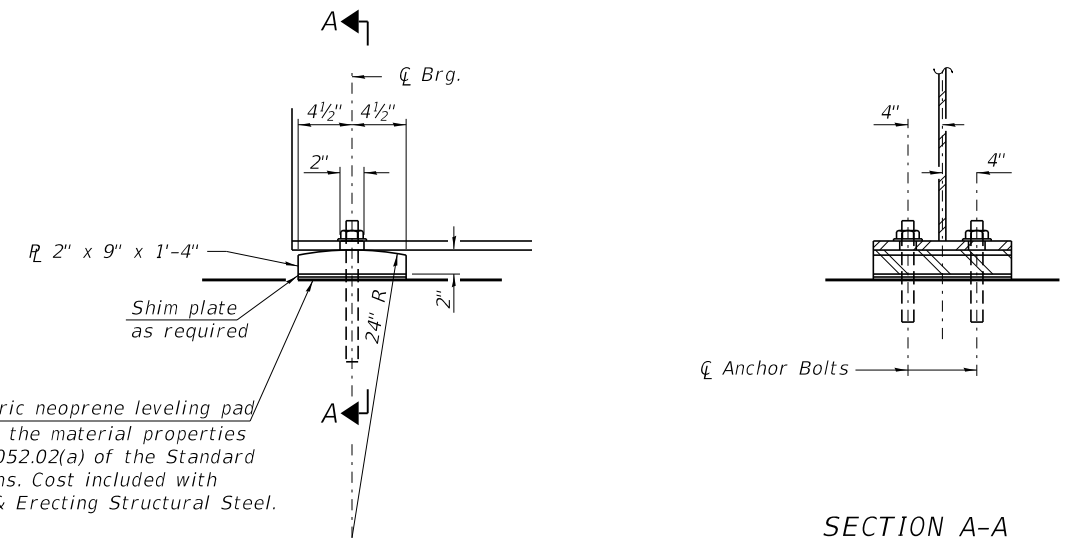
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3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703 217.546.3400 www.hireengineering.com		CHECKED -	REVISED -
	PLOT SCALE =	DRAWN - D.A.B.	REVISED -
	PLOT DATE = 11/10/2017	CHECKED -	REVISED -

STATE OF ILLINOIS
WAYNE COUNTY HIGHWAY DEPARTMENT

STRUCTURAL STEEL DETAILS
STRUCTURE NO. 096-3468

T.R.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	17
ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		
ILLINOIS FED. AID PROJECT X06X(932)				

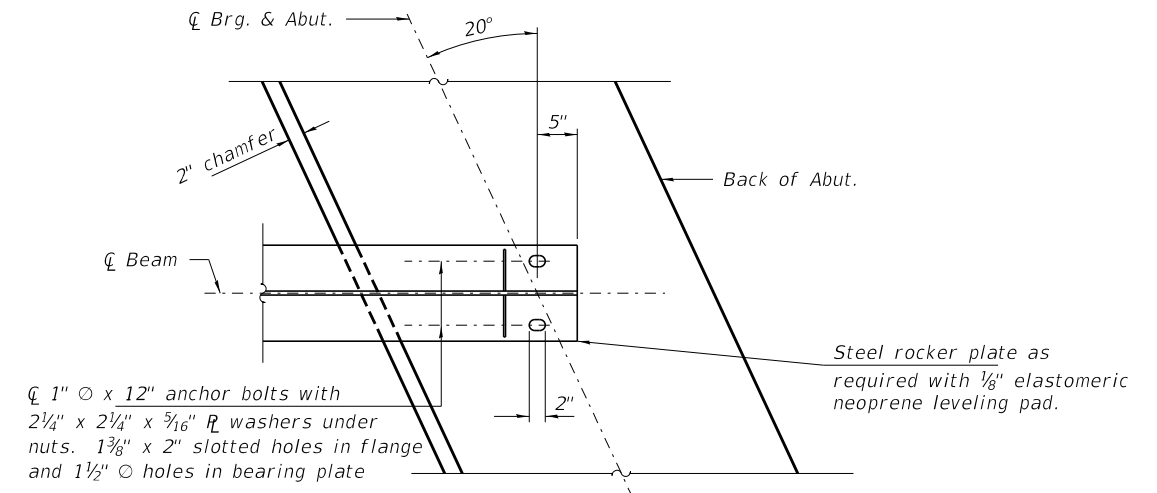
SHEET NO. 9 OF 14 SHEETS



1/8" elastomeric neoprene leveling pad according to the material properties of Article 1052.02(a) of the Standard Specifications. Cost included with Furnishing & Erecting Structural Steel.

ELEVATION

FIXED BEARING AT ABUTMENT
(10 required)



1" ϕ x 12" anchor bolts with 2 1/4" x 2 1/4" x 5/16" R washers under nuts. 1 3/8" x 2" slotted holes in flange and 1 1/2" ϕ holes in bearing plate

Steel rocker plate as required with 1/8" elastomeric neoprene leveling pad.

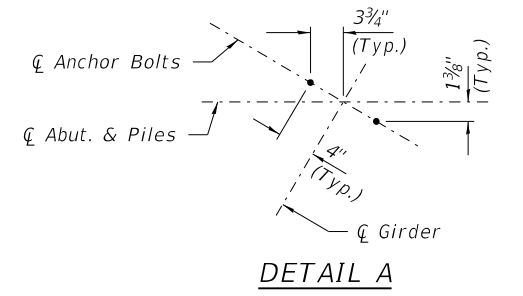
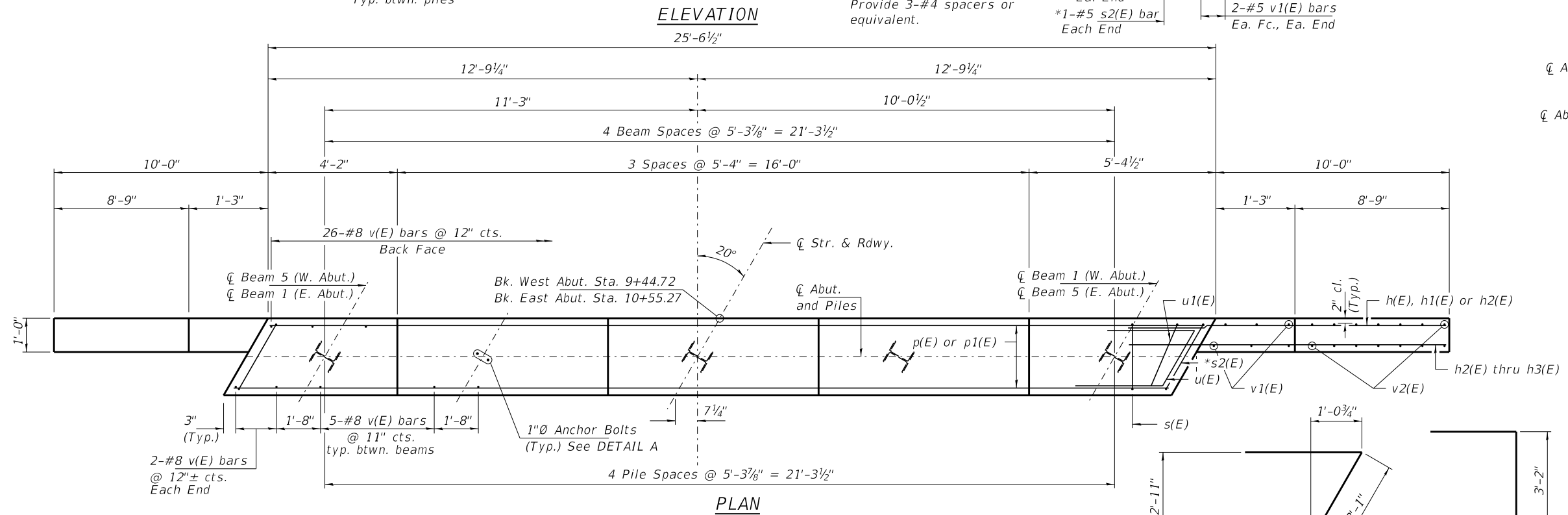
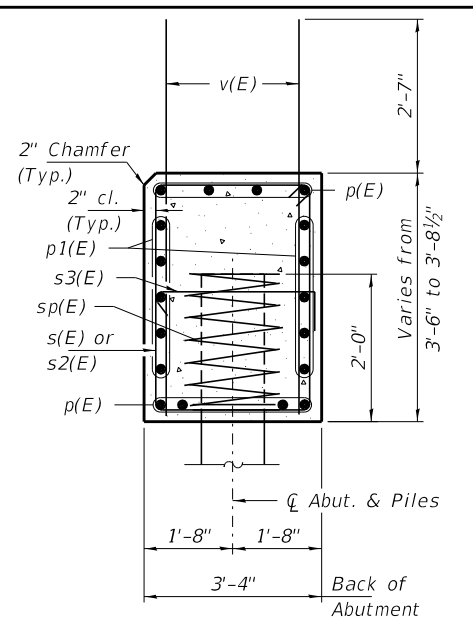
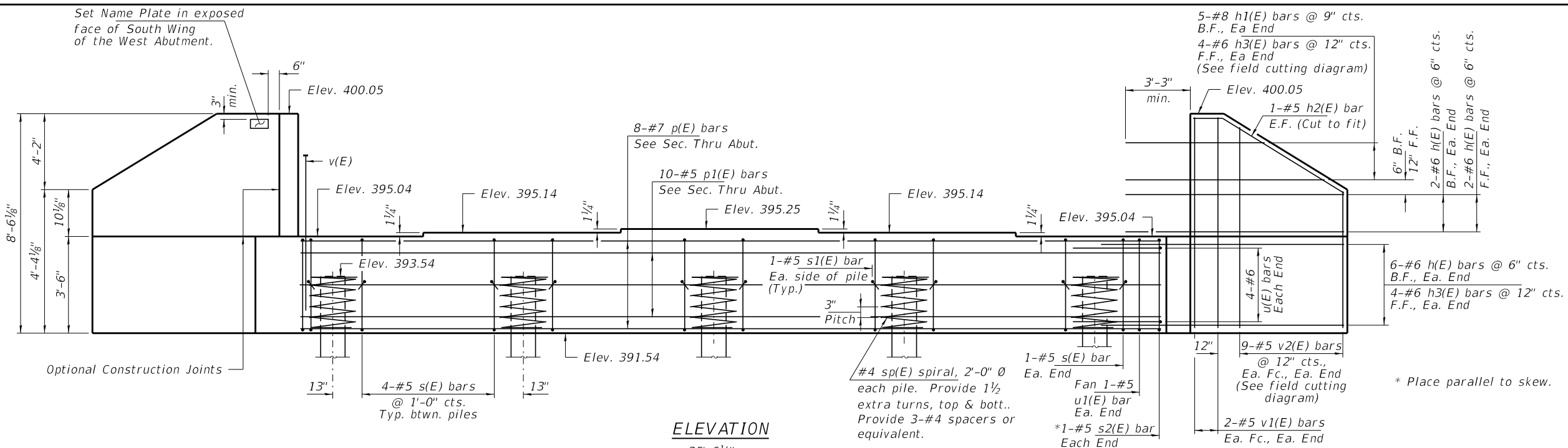
PLAN

(Showing bottom flange of steel beam at abutments)

Notes:
 Two 1/8" adjusting shims shall be provided for each bearing in addition to all other plates or shims and placed as shown on bearing details.
 Anchor bolts shall be ASTM F1554 Grade 105 all-thread (or an Engineer-approved alternate material) of the diameter(s) specified. The corresponding specified grade of AASHTO M314 anchor bolts may be used in lieu of ASTM F1554.
 Anchor bolts at fixed bearings may be either cast in place or installed in holes drilled after the supported member is in place.
 All steel plates of the bearing assembly shall be M270 Grade 50W.
 Anchor bolts shall be according to Art. 521.06 of the Standard Specifications.

BILL OF MATERIAL

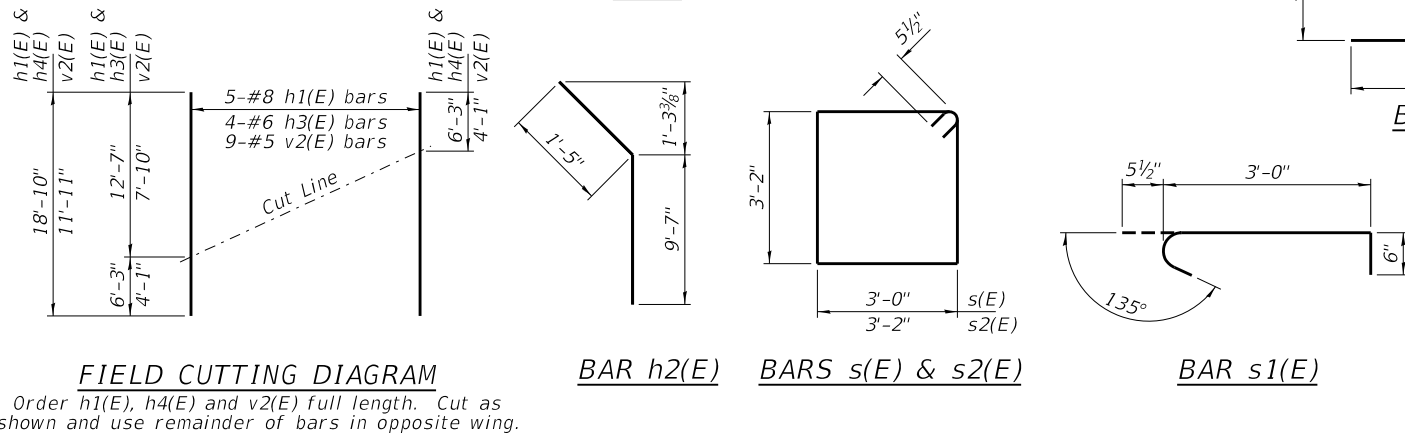
Item	Unit	Quantity
Anchor bolts, 1"	Each	20



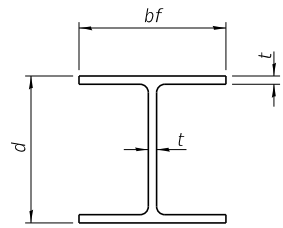
BILL OF MATERIAL - 2 ABUTS.

Bar	No.	Size	Length	Shape
h(E)	48	#6	13'-1"	
h1(E)	20	#8	18'-10"	
h2(E)	8	#5	11'-0"	
h3(E)	16	#6	18'-10"	
p(E)	16	#7	25'-2"	
p1(E)	20	#5	25'-2"	
s(E)	36	#5	13'-3"	
s1(E)	20	#5	4'-0"	
s2(E)	4	#5	13'-7"	
sp(E)	10	#4	2'-0"	WWW
u(E)	16	#6	10'-9"	
u1(E)	4	#5	9'-2"	
v(E)	100	#8	6'-2"	
v1(E)	16	#5	8'-2"	
v2(E)	36	#5	11'-11"	
Protective Coat		Sq. Yd.	24	
Concrete Structures		Cu. Yd.	32.6	
Reinforcement Bars, Epoxy Coated		Pound	7,580	
Furnishing Steel Piles, HP12x63		Foot	680	
Driving Piles		Foot	680	
Test Pile Steel HP12x63		Each	2	
Pile Shoes		Each	10	
Name Plates		Each	1	

PILE DATA
 Type: Steel HP12x63 w/ Pile Shoes
 Nominal Required Bearing: 497 Kips/pile
 Factored Resistance Available: 273 Kips/pile
 Est. Length: 85'
 No. Production Piles: 8
 No. Test Piles: 2

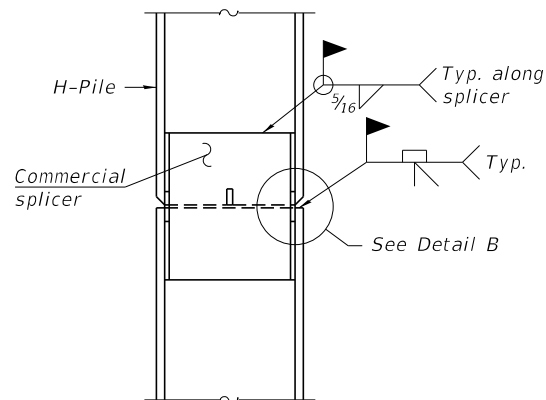


Notes:
 Pour steps monolithically with cap.
 Space reinforcement in cap to miss anchor bolts.
 For pile details see sheet 12 of 14.
 Headed bars shall conform to ASTM A970 Class HA. Cost included with Reinforcement Bars, Epoxy Coated.

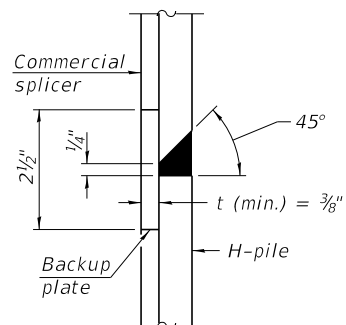


STEEL PILE TABLE

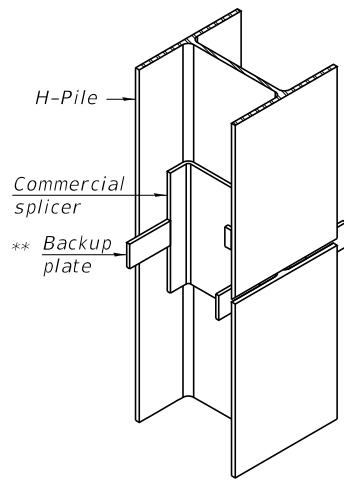
Designation	Depth d	Flange width bf	Web and Flange thickness t	Encasement diameter A
HP 14x117	14 1/4"	14 7/8"	1 3/16"	30"
x102	14"	14 3/4"	1 1/16"	30"
x89	13 7/8"	14 3/4"	5/8"	30"
x73	13 3/8"	14 3/8"	1/2"	30"
HP 12x84	12 1/4"	12 1/4"	1 1/16"	24"
x74	12 1/8"	12 1/4"	5/8"	24"
x63	12"	12 1/8"	1/2"	24"
x53	11 3/4"	12"	7/16"	24"
HP 10x57	10"	10 1/4"	9/16"	24"
x42	9 3/4"	10 1/8"	7/16"	24"
HP 8x36	8"	8 1/8"	7/16"	18"



ELEVATION

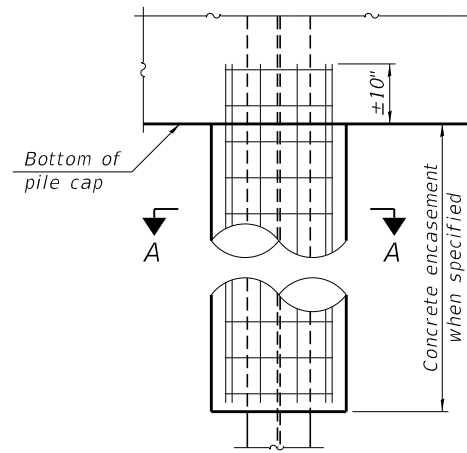


DETAIL "B"

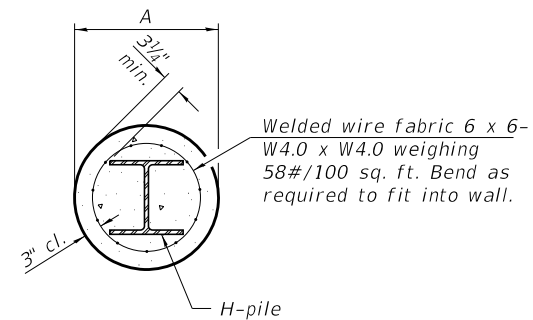


ISOMETRIC VIEW

WELDED COMMERCIAL SPLICE

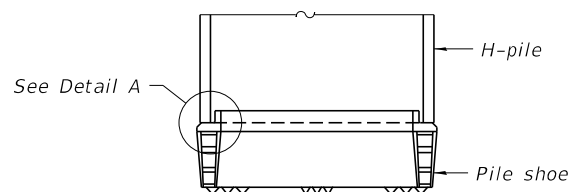


ELEVATION

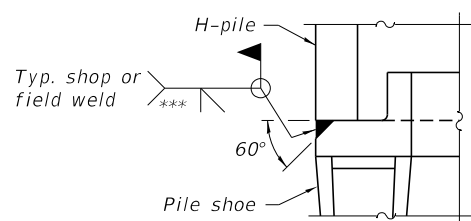


SECTION A-A

INDIVIDUAL PILE CONCRETE ENCASUREMENT
 (Forms for encasement may be omitted when soil conditions permit).



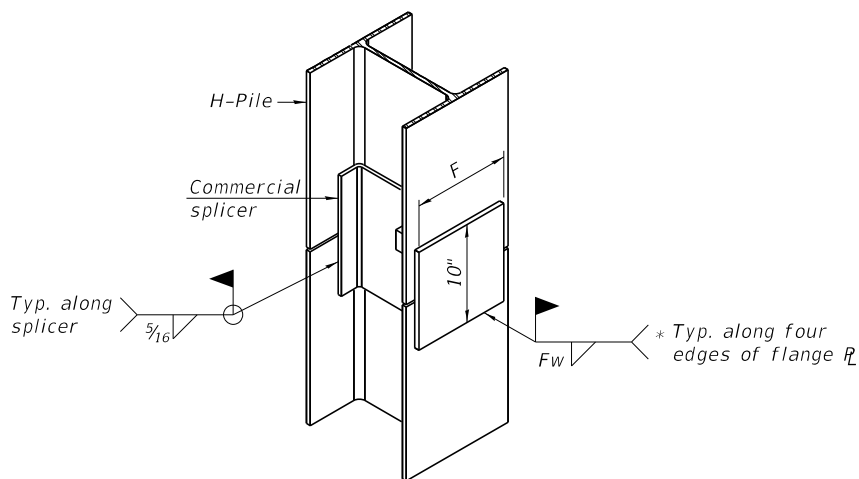
ELEVATION



DETAIL A

SHOE ATTACHMENT

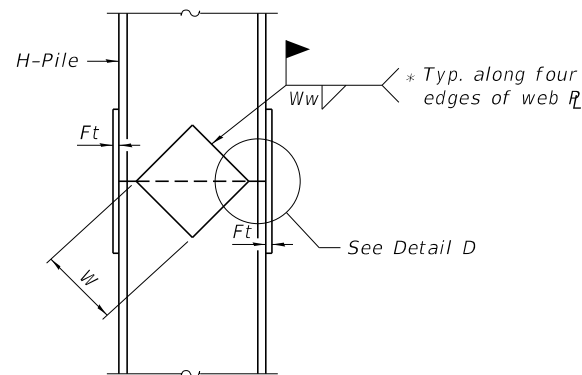
Note:
 The steel H-piles shall be according to AASHTO M270 Grade 50.



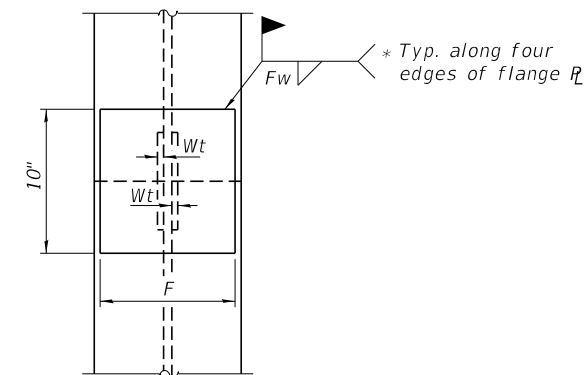
ISOMETRIC VIEW

WELDED COMMERCIAL SPLICE ALTERNATE

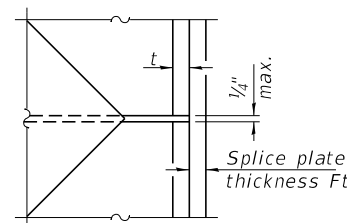
- * Interrupt welds 1/4" from end of web and/or each flange.
- ** Remove portions of backup plates that extend outside the flanges.
- *** Weld size per pile shoe manufacturer (5/16" min.).



ELEVATION



END VIEW



DETAIL D

WELDED PLATE FIELD SPLICE

Designation	F	Ft	Fw	W	Wt	Ww
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"

F-HP 8-11-2017

FILE NAME = 160472-sht-bridge.dgn	USER NAME =	DESIGNED - J.T.H.	REVISED -
3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703 217.546.3400 www.hlrengineering.com		CHECKED -	REVISED -
184.000009 ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORPORATION	PLOT SCALE =	DRAWN - D.A.B.	REVISED -
	PLOT DATE = 11/9/2017	CHECKED -	REVISED -

**STATE OF ILLINOIS
 WAYNE COUNTY HIGHWAY DEPARTMENT**

**HP PILE DETAILS
 STRUCTURE NO. 096-3468**

SHEET NO. 12 OF 14 SHEETS

T.R.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
229	16-06121-00-BR	WAYNE	22	20
ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		
ILLINOIS FED. AID PROJECT X06(X932)				

HOLCOMB FOUNDATION ENGINEERING INC. 393 Wood Road 618-529-5262 Carbondale, Il. 62901 618-457-8991 fax Page 1 of 3																																																																																																					
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Elevation	N	Qu	tsf	W	Elevation	N	Qu	tsf	W																																																														
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BORING B-1

Note: Assumed Elev. 100.0 = 397.6 USGS

FILE NAME = 160472-sht-bridge.dgn	USER NAME =	DESIGNED - J.T.H.	REVISED -	STATE OF ILLINOIS WAYNE COUNTY HIGHWAY DEPARTMENT	BORINGS STRUCTURE NO. 096-3468	T.R.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	
3085 STEVENSON DRIVE, SUITE 201 SPRINGFIELD, ILLINOIS 62703 217.546.3400 www.hfengr.com		CHECKED -	REVISED -			229	16-06121-00-BR	WAYNE	22	21	
ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORPORATION	PLOT SCALE =	DRAWN - D.A.B.	REVISED -			ELM RIVER ROAD DISTRICT	CONTRACT NO. 95826				
	PLOT DATE = 11/9/2017	CHECKED -	REVISED -			SHEET NO. 13 OF 14 SHEETS		ILLINOIS FED. AID PROJECT X06(X)321			

HOLCOMB FOUNDATION ENGINEERING INC. 393 Wood Road 618-529-5262 Carbondale, Il. 62901 618-457-8991 fax Page 1 of 3											
Bridge Foundation Boring Log											
Project: H-17011 Bridge Co Rd 1650N over Elm River Date: 1/24/2017											
Section: 16-06121-00-BR Station _____ Bored by: B. Schwartz											
Structure: 096-3093 _____ Checked By: T. Holcomb											
County: Wayne _____											
Boring No: 2		Surface Water Elev. _____		Elevation		N		Qu tsf		w %	
Station: _____		Ground Water Elev. 90.3		Elevation		N		Qu tsf		w %	
Offset: _____		Upon Completion 87.3		Elevation		N		Qu tsf		w %	
Ground Surface 396.9 99.3 0 silty clay (continued)											
2" Crushed Stone											
Brown Mottled Gray Silty CLAY (A-6)											
4		---		26		-		25		8 1.3B 20	
6		0.6B		24		-		12		0.2B 23	
2		0.4B		31		-		30		9 --- 22	
388.4		90.8		368.4		70.8		-		-	
Gray Mottled Brown Silty CLAY (A-6)											
0		0.6B		31		-		-		-	
0		0.2B		29		-		-		-	
383.4		85.8		358.4		60.8		-		-	
Gray Silty CLAY (A-6)											
0		0.8B		26		-		-		-	
0		0.8B		30		-		-		-	
5		0.6B		25		-		-		-	
6		0.3B		22		-		-		-	
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Structure: 096-3093 _____ Checked By: T. Holcomb											
County: Wayne _____											
Boring No: 2		Surface Water Elev. _____		Elevation		N		Qu tsf		w %	
Station: _____		Ground Water Elev. 90.3		Elevation		N		Qu tsf		w %	
Offset: _____		Upon Completion 87.3		Elevation		N		Qu tsf		w %	
sand (continued)											
45		27		---		22		328.4		30.8	
Gray Silty CLAY (A-6)											
348.4		50.8		-		-		-		-	
18		2.3B		12		-		-		-	
318.4		20.8		-		-		-		-	
Gray Mottled Brown Sandy CLAY (A-6) with gravel											
34		1.0S		18		-		-		-	
86		0.9S		16		-		-		-	
333.4		35.8		-		-		-		-	
Brown Mottled Gray Sandy CLAY (A-6) with pebbles											
69		2.7B		19		-		-		-	
Brown SAND (A-2-4)											
308.4		10.8		-		-		-		-	
Gray SHALE											
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Station: _____		Ground Water Elev. 90.3		Elevation		N		Qu tsf		w %	
Offset: _____		Upon Completion 87.3		Elevation		N		Qu tsf		w %	
gray shale (continued)											
90		100		---		12		-		-	
302.9		5.3		-		-		-		-	
End of Boring @ -94.0'											
95		---		10		-		-		-	
100		---		10		-		-		-	
105		---		10		-		-		-	
110		---		10		-		-		-	
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BORING B-2

Note: Assumed Elev. 100.0 = 397.6 USGS

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ILLINOIS PROFESSIONAL DESIGN FIRM LS / PE / SE CORPORATION	PLOT SCALE =	DRAWN - D.A.B.	REVISED -			ELM RIVER ROAD DISTRICT		CONTRACT NO. 95826		
	PLOT DATE = 11/9/2017	CHECKED -	REVISED -			SHEET NO. 14 OF 14 SHEETS		ILLINOIS FED. AID PROJECT X06X(932)		