

04-26-2024 LETTING ITEM 174

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

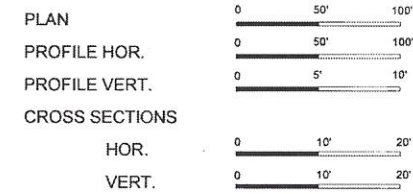
PLANS FOR PROPOSED  
SURFACE TRANSPORTATION PROGRAM - BRIDGE

SECTION 20-00130-00-BR LAWRENCE COUNTY

PROJECT XCNX(049)

JOB NO. C-97-121-22

FAS 806



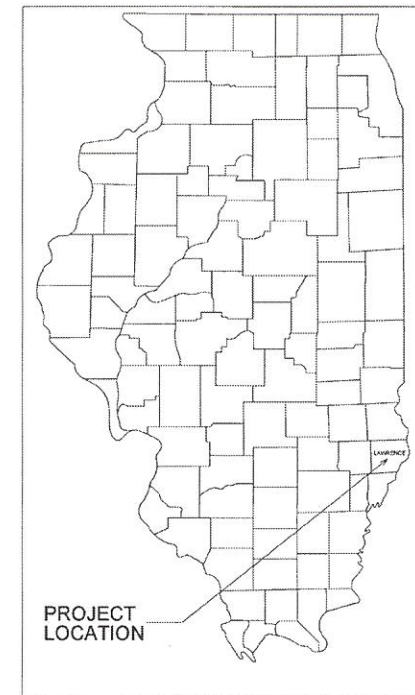
NOTE: SCALES VALID FOR 22" X 34" SHEETS

Joint Utility Locating Information for Excavators

JULIE 1-800-892-0123



ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 806	20-00130-00-BR	LAWRENCE	24	1
CONTRACT 95931		ILLINOIS	PROJECT XCNX(049)	



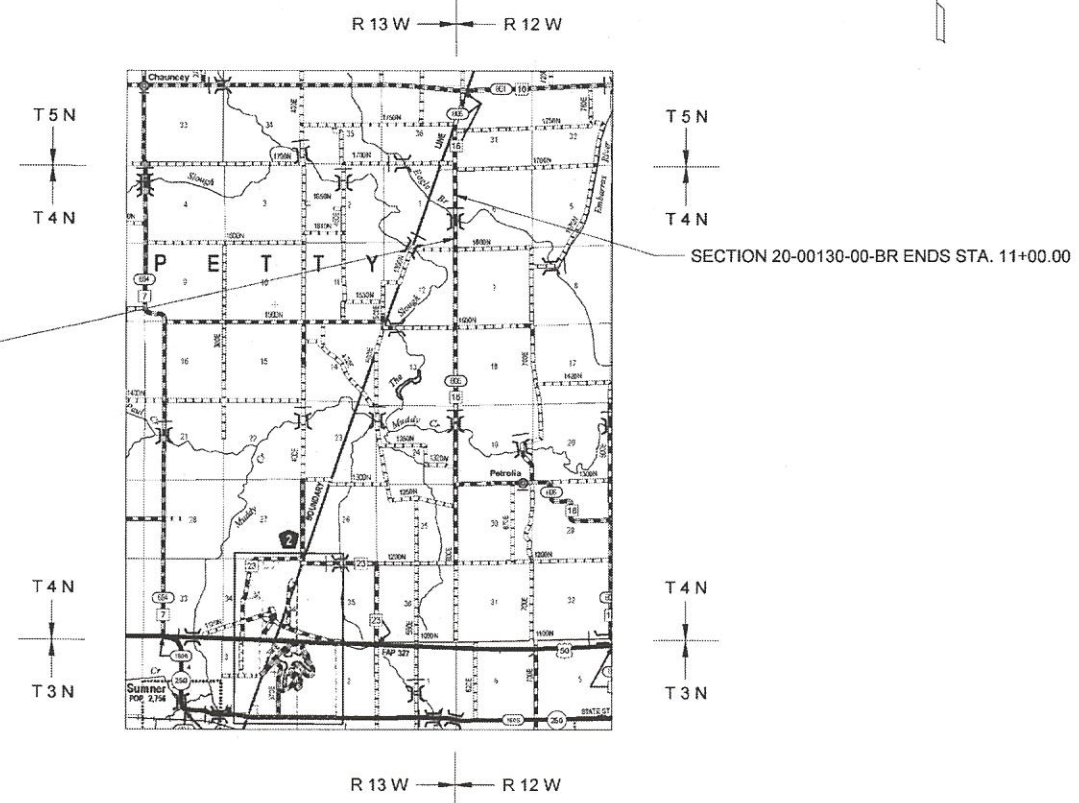
SHEET	ITEM
1	COVER SHEET
2	SUMMARY OF QUANTITIES AND DETAILS
3	GENERAL NOTES AND TYPICAL SECTIONS
4	SCHEDULE OF QUANTITIES
5	PLAN AND PROFILE
6	BRIDGE SHOULDER AND GUARDRAIL PLAN
7	GENERAL PLAN AND ELEVATION
8-9	21' X 48" PPC DECK BEAM (SPAN 1 OR 3)
10-11	21' X 48" PPC DECK BEAM (SPAN 2)
12	STEEL RAILING, TYPE SM
13	STEEL RAILING, TYPE SM DETAILS
14	ABUTMENT DETAILS
15	PIER DETAILS
16	PILE DETAILS
17	BORING LOGS
18-24	CROSS SECTIONS OF ROADWAY

STANDARD DRAWINGS

STANDARD 000001-05
STANDARD 280001-07
STANDARD 515001-04
STANDARD 701901-09
STANDARD 725001-01
STANDARD BLR 21-9
STANDARD BLR 23-4
STANDARD BLR 26-3
STANDARD BLR 27-1

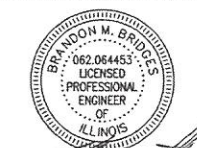
SECTION 20-00130-00-BR BEGINS STA. 1+00.00

THREE-SPAN PRECAST PRESTRESSED CONCRETE DECK BEAM BRIDGE  
 103'-35" BK - BK ABUTMENTS  
 STEEL H PILE / SPILLTHROUGH ABUTMENTS  
 STEEL H PILE / SOLID WALL PIERS  
 28' WIDE DECK  
 EXISTING STRUCTURE NO. 051-3009  
 PROPOSED STRUCTURE NO. 051-3313



NET LENGTH SECTION 20-00130-00-BR = 1000.00 Ft. = 0.189 Mi.

CONTRACT 95931  
 FUNCTIONAL CLASSIFICATION - MAJOR COLLECTOR  
 ADT = 175  
 DESIGN SPEED = 40 MPH



*Brandon M. Bridges*  
 2/22/2023  
 LICENSE EXPIRES 11/30/2023

**CHARLESTON ENGINEERING, INC.**  
 CONSULTING ENGINEERS  
 105 NORTH KITCHELL  
 P.O. BOX 397  
 OLNEY, ILLINOIS 62450  
 (618) 392-0736  
 ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION REGISTRATION #184 003513

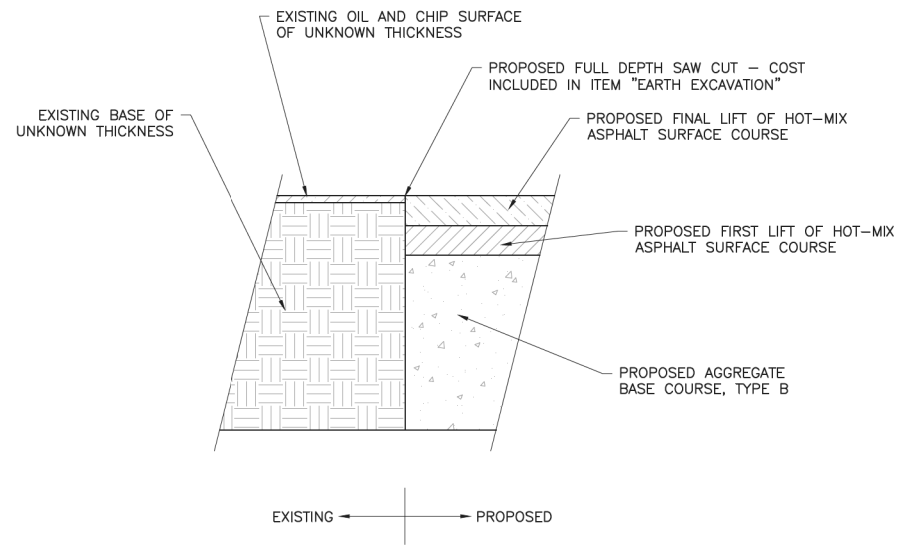
APPROVED *February 27, 2023*  
*Aaron M. [Signature]*  
 COUNTY ENGINEER

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

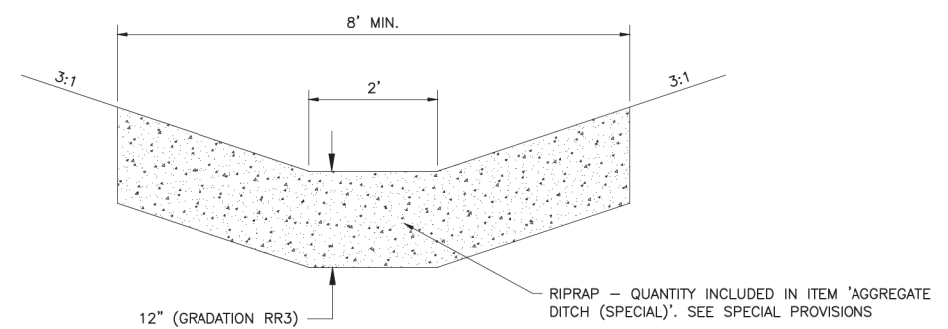
PASSED *02/24/24*  
*[Signature]*  
 DISTRICT SEVEN ENGINEER OF  
 LOCAL ROADS AND STREETS

Releasing For  
 Bid Based on  
 Limited Review

*01/24/24*  
*[Signature]*  
 REGION FOUR ENGINEER



**ROADWAY TRANSITION DETAILS**  
 STA. 1+00  
 STA. 11+00



**AGGREGATE DITCH (SPECIAL) DETAIL**  
 RT. STA. 3+15 TO 4+30  
 LT. STA. 3+50 TO 4+85  
 RT. STA. 5+15 TO 6+50  
 LT. STA. 5+70 TO 6+85

SUMMARY OF QUANTITIES			
CODE NO.	ITEM	UNIT	QUANTITY
* LR631020	TRAFFIC BARRIER TERMINAL, TYPE 1	EACH	4
X2501000	SEEDING, CLASS 2 (SPECIAL)	ACRE	0.95
X2830495	AGGREGATE DITCH (SPECIAL)	TON	300
20100500	TREE REMOVAL, ACRES	ACRE	0.25
20200100	EARTH EXCAVATION	CU YD	2115
20300100	CHANNEL EXCAVATION	CU YD	1700
20400800	FURNISHED EXCAVATION	CU YD	1410
28100807	STONE DUMPED RIPRAP, CLASS A4	TON	1140
35101400	AGGREGATE BASE COURSE, TYPE B	TON	1380
40600275	BITUMINOUS MATERIALS (PRIME COAT)	POUND	4485
40600290	BITUMINOUS MATERIALS (TACK COAT)	POUND	750
40604052	HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "C", N70	TON	400
50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1
50300225	CONCRETE STRUCTURES	CU YD	184.2
50300280	CONCRETE ENCASEMENT	CU YD	5.5
50400405	PRECAST PRESTRESSED CONCRETE DECK BEAMS (21" DEPTH)	SQ FT	2828
50800205	REINFORCEMENT BARS, EPOXY COATED	POUND	15220
* 50901050	STEEL RAILING, TYPE SM	FOOT	207
51201800	FURNISHING STEEL PILES HP14X73	FOOT	2134
51202305	DRIVING PILES	FOOT	2134
51203800	TEST PILE STEEL HP14X73	EACH	2
51500100	NAME PLATES	EACH	1
59300100	CONTROLLED LOW-STRENGTH MATERIAL	CU YD	65
* 63100075	TRAFFIC BARRIER TERMINAL, TYPE 5A	EACH	4
* 63000001	STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS	FOOT	125
67100100	MOBILIZATION	L. SUM	1
* 72501000	TERMINAL MARKER - DIRECT APPLIED	EACH	4

\*SPECIALTY ITEMS

**GENERAL NOTES**

THE CONTRACTOR SHALL CONTACT JULIE (1-800-892-0123) BEFORE COMMENCING WORK. UNDERGROUND UTILITIES SHOWN ON THE PLAN SHEETS WERE OBTAINED FROM LOCAL UTILITY COMPANIES AND OTHER AVAILABLE SOURCES. LOCATIONS, SIZE, MATERIAL, DESCRIPTION, OR TYPE OF EXISTING UTILITIES INDICATED ON THE PLANS ARE NOT REPRESENTED AS BEING ACCURATE, SUFFICIENT, OR COMPLETE AND SHALL BE CONSIDERED APPROXIMATE. ABOVE GROUND UTILITY LOCATIONS ARE SHOWN AS FOUND DURING THE INITIAL SURVEY FIELD WORK AND MAY NOT REFLECT CURRENT CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES AND COORDINATION WITH UTILITY COMPANIES.

THE ESTIMATED QUANTITY SHOWN IN THE SUMMARY OF QUANTITIES FOR HOT-MIX ASPHALT SURFACE COURSE, IL-9.5, MIX "C", N70 INCLUDES 140 TONS FOR THE FIRST LIFT AND 260 TONS FOR THE FINAL LIFT (FOR INFORMATION ONLY). THE HOT-MIX ASPHALT SHALL END AT THE BACK OF EACH ABUTMENT-NO H.M.A. OVERLAY ON THE BRIDGE STRUCTURE.

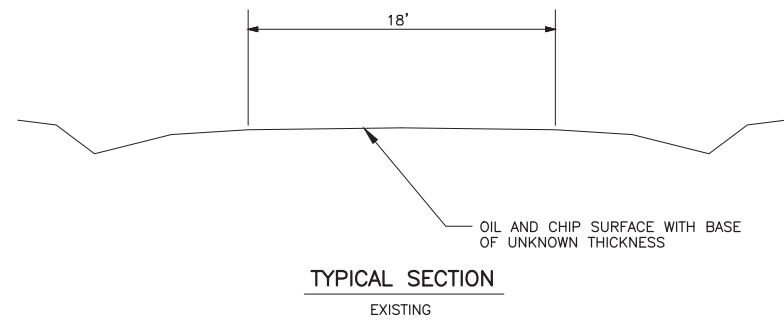
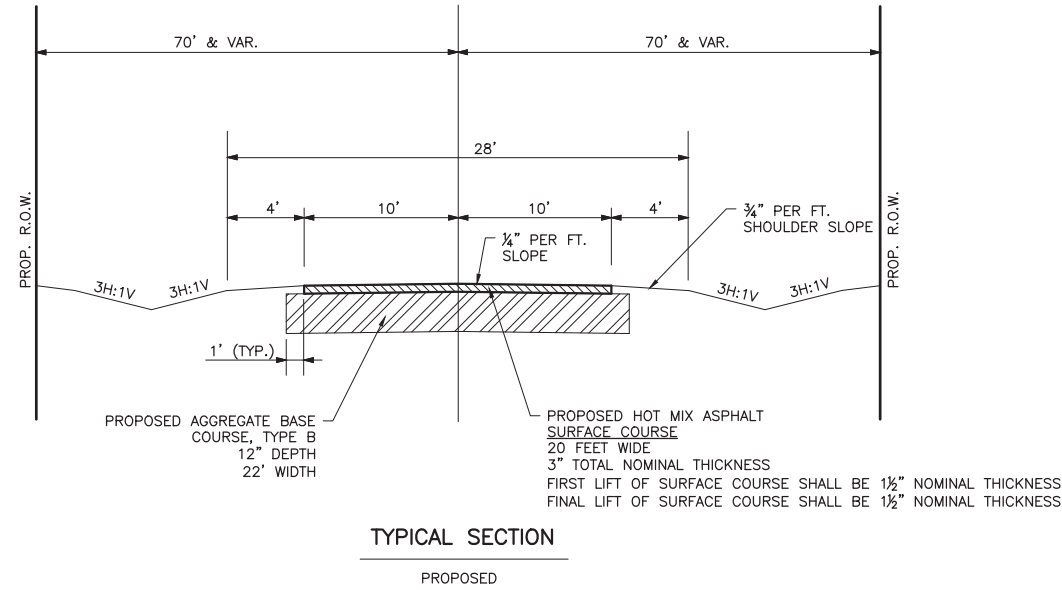
THE FOLLOWING RATES HAVE BEEN USED TO CALCULATE PLAN QUANTITIES:

AGGREGATE DITCH (SPECIAL)	1.75 TONS/CU YD
STONE DUMPED RIPRAP, CLASS A4	1.75 TONS/CU YD
AGGREGATE BASE COURSE, TY-B	2.0 TONS/CU YD
BITUMINOUS MATERIALS (PRIME COAT)	0.25 LB/SQ FT
BITUMINOUS MATERIALS (TACK COAT)-OVER NEW HMA LIFTS	0.025 LB/SQ FT
BITUMINOUS MATERIALS (TACK COAT)-OVER EX. HMA LIFTS	0.05 LB/SQ FT
AND EXISTING OIL & CHIP SURFACES	
HOT-MIX ASPHALT SURFACE COURSE	112 LBS/(SQ YD * INCH THICKNESS)

**SCHEDULE OF KNOWN UTILITIES**

DESIGN STAGE JULIE NO. X1541209

UTILITY COMPANY	TYPE	CONTACT NAME	PHONE NUMBER	E-MAIL ADDRESS	MAILING ADDRESS
AMEREN ILLINOIS	ELECTRIC	NATE HILL	618-301-5327	nhill2@ameren.com	#6 EXECUTIVE DRIVE, COLLINSVILLE, IL 62234
FRONTIER COMMUNICATIONS	COMMUNICATIONS	BRIAN VANGUNDY	618-395-6189	brian.vangundy@ftr.com	225 E. CHESTNUT ST, OLNEY, IL 62450



**PAVEMENT DESIGN DATA**

ADT = 175 CLASS IV  
 MAJOR COLLECTOR  
 DESIGN SPEED = 30 MPH  
 PV = 154  
 SU = 16  
 MU = 5  
 PAVEMENT TYPE: HOT-MIX ASPHALT, 3" TOTAL NOMINAL THICKNESS  
 BASE TYPE: AGGREGATE BASE COURSE, TYPE B - 12" THICK

HOT-MIX ASPHALT MIXTURE REQUIREMENTS	
LOCATION:	FAS 806 (CH 18)
MIXTURE APPLICATION:	HOT-MIX ASPHALT SURFACE COURSE
PERFORMANCE GRADE:	PG 64-22
DESIGN AIR VOIDS:	4% @ N=70 GYRATIONS
MIXTURE COMPOSITION:	IL - 9.5
FRICTION AGGREGATE:	MIXTURE "C"
MIXTURE UNIT WEIGHT:	112 LBS / SQ YD / INCH THICKNESS
QUALITY MANAGEMENT PROGRAM:	QC/QA

**PROPOSED PAVEMENT STRUCTURE MATERIALS:**  
 STA. 1+00 TO 11+00  
 1 1/2" H.M.A. SURFACE COURSE - FINAL LIFT  
 1 1/2" H.M.A. SURFACE COURSE - FIRST LIFT  
 3" TOTAL H.M.A. OVERLAY

**COMMITMENTS**

1. U.S. ARMY CORPS OF ENGINEERS SECTION 404 NATIONWIDE PERMIT.
2. TREES THREE (3) INCHES OR GREATER IN DIAMETER AT BREST HEIGHT SHALL NOT BE CLEARED BETWEEN APRIL 1 AND SEPTEMBER 30 OF ANY GIVEN YEAR.

EARTHWORK SCHEDULE										
CODE NUMBER		20200100	20300100	N/A	N/A	N/A	N/A	N/A	N/A	
LOCATION	STATION	EARTH EXCAVATION (CU YD)	CHANNEL EXCAVATION (CU YD)	PERCENT USED (%)	ESTIMATED UNSUITABLE MATERIAL (CU YD)	ESTIMATED SUITABLE MATERIAL (CU YD)	SHRINKAGE FACTOR (%)	ESTIMATED SUITABLE MATERIAL ADJUSTED FOR SHRINKAGE (CU YD)	EMBANKMENT (CU YD)	EARTHWORK BALANCE WASTE (+) OR SHORTAGE (-) (CU YD)
LT. & RT.	STA. 1+00 TO 4+48.35	960		100	0	960	25	720	1505	-785
LT. & RT.	STA. 4+48.35 TO 5+51.65 (PROPOSED BRIDGE)		1700	50	850	850	25	638		638
LT. & RT.	STA. 5+51.65 TO 11+00	510		100	0	510	25	383	1910	-1527
SUBTOTAL =		1470	1700		850	2320		1741	3415	
VOLUMES NOT SHOWN ON CROSS SECTION SHEETS										
LT. & RT.	CONCRETE STRUCTURES & AGG. ABUTMENT BACKFILL VOID	245		100	0	245	25	184		184
LT. & RT.	ADDITIONAL 1 FOOT EACH SIDE OF EDGE OF PAV'T FOR AGG B.C.	60		100	0	60	25	45		45
LT. & RT.	AGGREGATE DITCH (SPECIAL)	165		100	0	165	25	124		124
LT. & RT.	DITCH/SLOPEWALL TRANSITION DUE TO BRIDGE SKEW	175		100	0	175	25	131	220	-89
TOTAL =		2115	1700		850	2965	100	2225	3635	-1410

- NOTES: 1. COST OF EXCAVATION FOR CONCRETE STRUCTURES INCLUDED IN ITEM "EARTH EXCAVATION."  
2. SUITABLE MATERIAL EXCAVATED FROM THE CHANNEL SHALL BE USED TO CONSTRUCT THE SHOULDER WIDENING.  
3. UNSUITABLE MATERIAL SHALL BE DISPOSED OFF THE JOBSITE BY THE CONTRACTOR.  
4. FURNISHED EXCAVATION = 1410 C.Y.

ROADWAY SCHEDULE		
CODE NUMBER		35101400
LOCATION	STATION	AGGREGATE BASE COURSE, TYPE B (TON)
LT. & RT.	STA. 1+00 TO 11+00	1380
TOTAL =		1380

NOTE: QUANTITY OF "AGGREGATE BASE COURSE, TYPE B" INCLUDES 103 FOOT OMISSION THROUGH BRIDGE.

GUARDRAIL SCHEDULE					
CODE NUMBER		LR631020	63100075	63000001	72501000
LOCATION	STATION	TRAFFIC BARRIER TERMINAL, TYPE 1 (EACH)	TRAFFIC BARRIER TERMINAL, TYPE 5A (EACH)	STEEL PLATE BEAM GUARDRAIL, TYPE A, 6 FOOT POSTS (FOOT)	TERMINAL MARKER - DIRECT APPLIED (EACH)
RT.	STA. 3+62 TO 3+89	1			
LT.	STA. 3+91 TO 4+18	1			
RT.	STA. 5+82 TO 6+09	1			
LT.	STA. 6+11 TO 6+38	1			
RT.	STA. 4+27 TO 4+40		1		
LT.	STA. 4+43 TO 4+56		1		
RT.	STA. 5+44 TO 5+57		1		
LT.	STA. 5+60 TO 5+73		1		
RT.	STA. 3+91 TO 4+27			37.5	
LT.	STA. 4+18 TO 4+43			25	
RT.	STA. 5+57 TO 5+82			25	
LT.	STA. 5+73 TO 6+11			37.5	
RT.	STA. 3+62				1
LT.	STA. 3+91				1
RT.	STA. 6+09				1
LT.	STA. 6+38				1
TOTAL =		4	4	125	4

NOTE: SEE SHEET 6 FOR GUARDRAIL PLAN

AGGREGATE DITCH SCHEDULE		
CODE NUMBER		X2830495
LOCATION	STATION	AGGREGATE DITCH (SPECIAL) (TON)
RT.	STA. 3+15 TO 4+30	70
LT.	STA. 3+50 TO 4+85	80
RT.	STA. 5+15 TO 6+50	80
LT.	STA. 5+70 TO 6+85	70
TOTAL =		300

TREE REMOVAL		
ITEM NUMBER		20100500
LOCATION	STATION	TREE REMOVAL (ACRES)
RT.	STA. 1+50 TO 5+30	0.22
LT.	STA. 5+55 TO 5+90	0.03
TOTAL =		0.25

SEEDING SCHEDULE						
CODE NUMBER		X2501000	FOR INFORMATION ONLY			
LOCATION	STATION	SEEDING, CLASS 2 (SPECIAL) (ACRE)	NITROGEN FERTILIZER NUTRIENT (100 LBS/ACRE) (POUND)	PHOSPHOROUS FERTILIZER NUTRIENT (100 LBS/ACRE) (POUND)	SUITABLE POTASSIUM FERTILIZER NUTRIENT (100 LBS/ACRE) (POUND)	MULCH METHOD 2 (2 TONS/ACRE) (TONS)
LT. & RT.	STA. 1+00 TO 11+00	0.95	95	95	95	1.90
TOTAL =		0.95	95	95	95	1.90

NOTE: FERTILIZER AND MULCH QUANTITIES SHOWN ARE FOR INFORMATION ONLY, SEE SPECIAL PROVISIONS

CONTROLLED LOW-STRENGTH MATERIAL	
ITEM NUMBER	59300100
LOCATION	C.L.S.M. (CY)
SOUTH ABUTMENT	25.0
NORTH ABUTMENT	25.0
EXISTING PILING VOIDS	15.0
TOTAL =	65.0

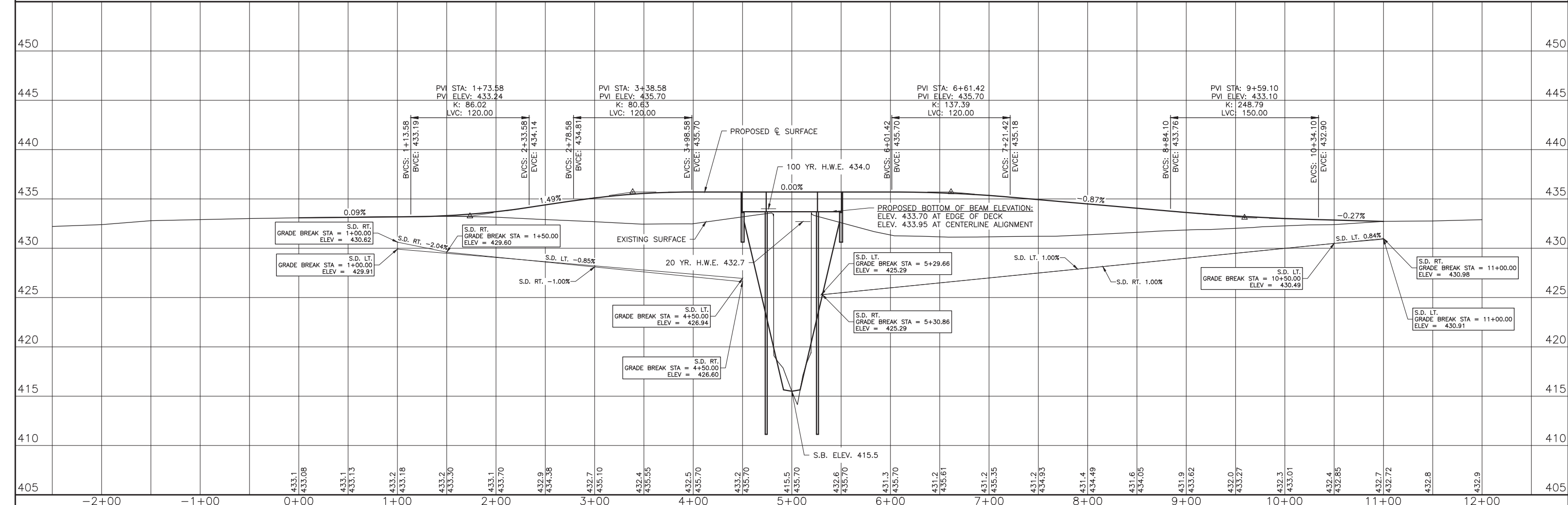
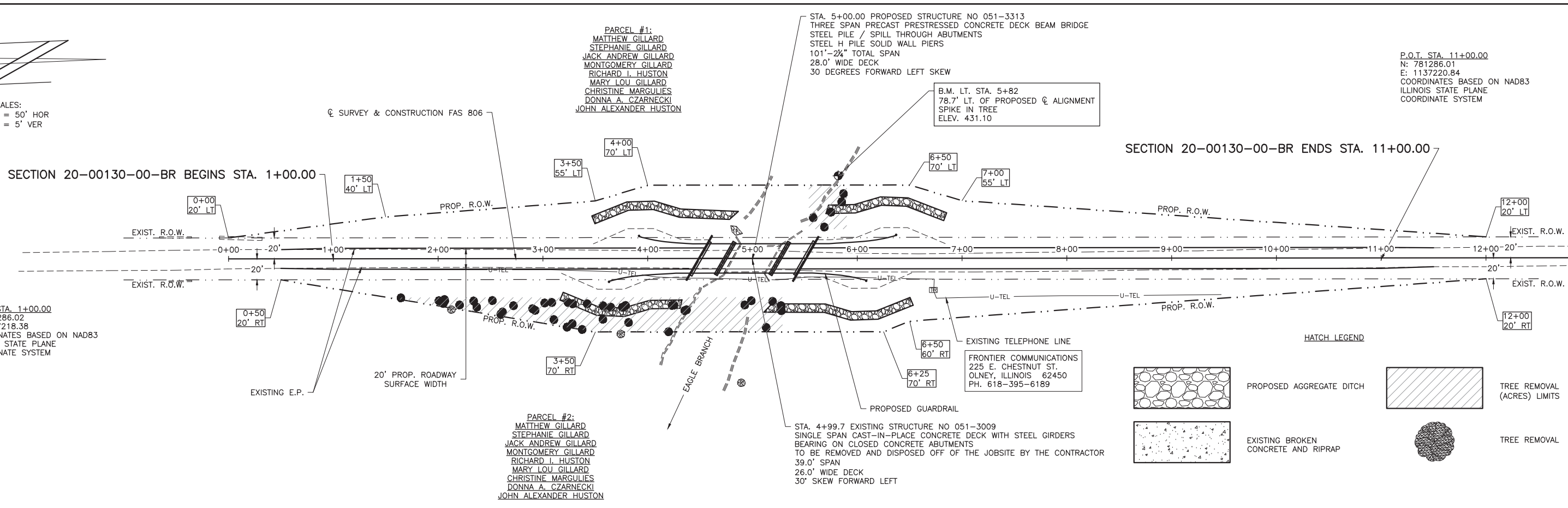
SCALES:  
 1" = 50' HOR  
 1" = 5' VER

SECTION 20-00130-00-BR BEGINS STA. 1+00.00

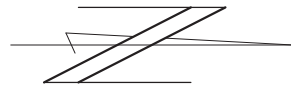
SECTION 20-00130-00-BR ENDS STA. 11+00.00

P.O.T. STA. 1+00.00  
 N: 780286.02  
 E: 1137218.38  
 COORDINATES BASED ON NAD83  
 ILLINOIS STATE PLANE  
 COORDINATE SYSTEM

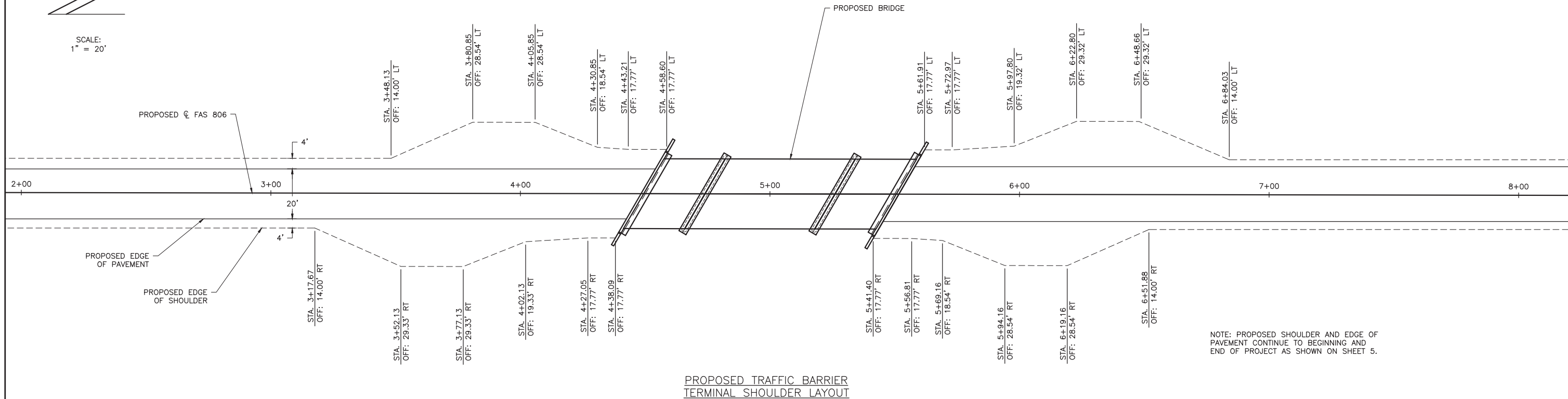
P.O.T. STA. 11+00.00  
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 COORDINATES BASED ON NAD83  
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 COORDINATE SYSTEM



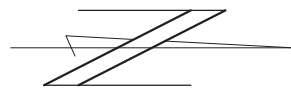
<b>CHARLESTON ENGINEERING, INC.</b> CONSULTING ENGINEERS - LAND SURVEYORS 105 NORTH KITCHELL AVENUE OLNEY, ILLINOIS 62450 P.O. BOX 387 (618) 392-0736 ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION REGISTRATION #184.003513		DESIGNED - BMB DRAWN - BMB CHECKED - BMB DATE - 2-2022	REVISED - REVISED - REVISED - REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION	PLAN AND PROFILE	ROUTE FAS 806 CONTRACT 95931	SECTION 20-00130-00-BR	COUNTY LAWRENCE	TOTAL SHEETS 24	SHEET NO. 5
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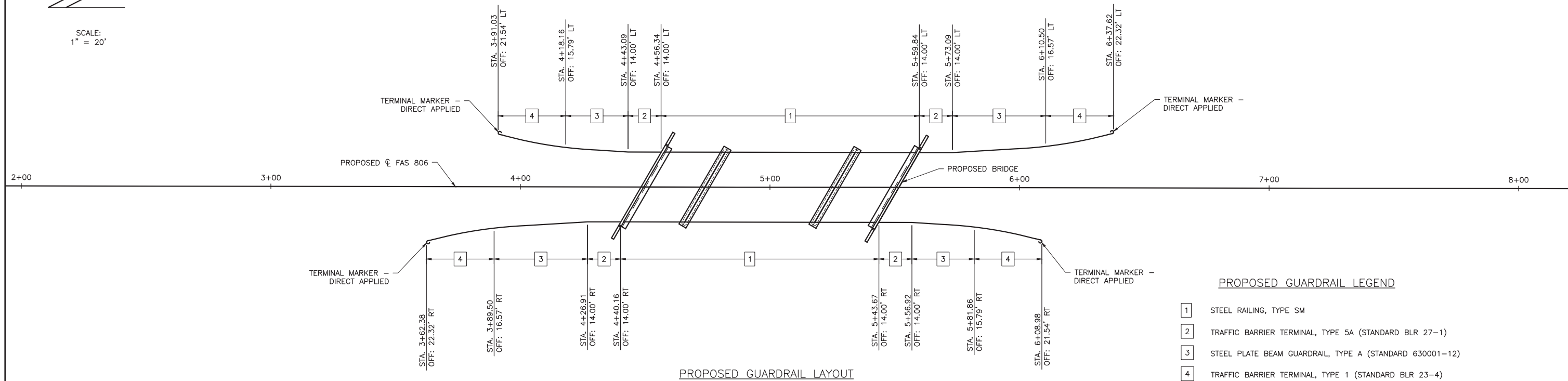
SCALE:  
1" = 20'



PROPOSED TRAFFIC BARRIER  
TERMINAL SHOULDER LAYOUT



SCALE:  
1" = 20'



PROPOSED GUARDRAIL LAYOUT

PROPOSED GUARDRAIL LEGEND

- 1 STEEL RAILING, TYPE SM
- 2 TRAFFIC BARRIER TERMINAL, TYPE 5A (STANDARD BLR 27-1)
- 3 STEEL PLATE BEAM GUARDRAIL, TYPE A (STANDARD 630001-12)
- 4 TRAFFIC BARRIER TERMINAL, TYPE 1 (STANDARD BLR 23-4)

**CHARLESTON ENGINEERING, INC.**  
CONSULTING ENGINEERS - LAND SURVEYORS  
105 NORTH KITCHELL AVENUE OLNEY, ILLINOIS 62450  
P.O. BOX 387 (618) 392-0736  
ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION REGISTRATION #184.003513

DESIGNED - BMB  
DRAWN - BMB  
CHECKED - BMB  
DATE - 2-2022

REVISED -  
REVISED -  
REVISED -  
REVISED -

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

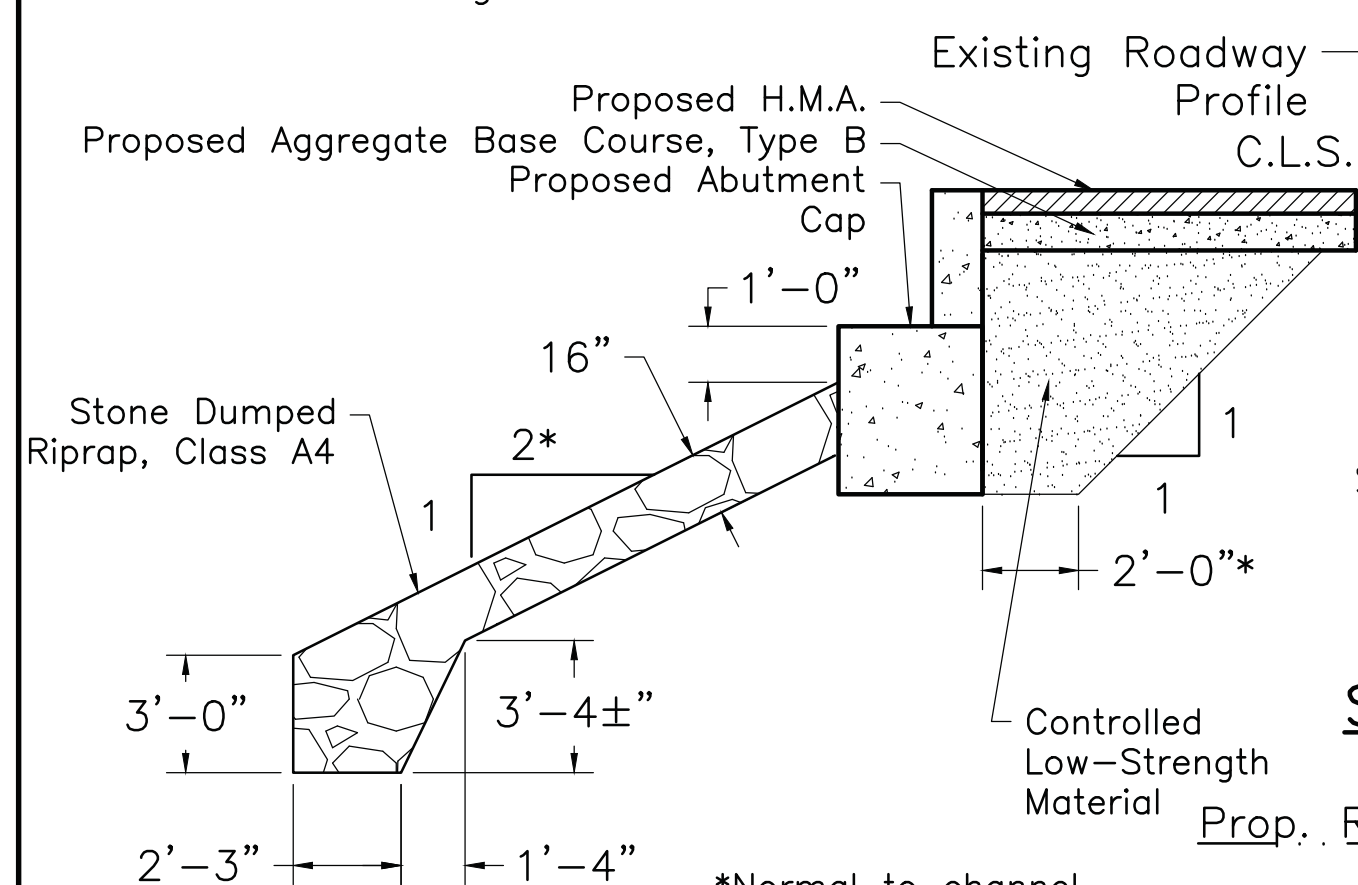
BRIDGE SHOULDER AND GUARDRAIL PLAN

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 806	20-00130-00-BR	LAWRENCE	24	6
CONTRACT 95931		ILLINOIS	PROJECT XCNX(049)	

B.M.—Lt. Sta. 5+82, 78.7' Lt. of Proposed  $\bar{C}$  Alignment, Mag Spike in Tree, Elev. 431.10.

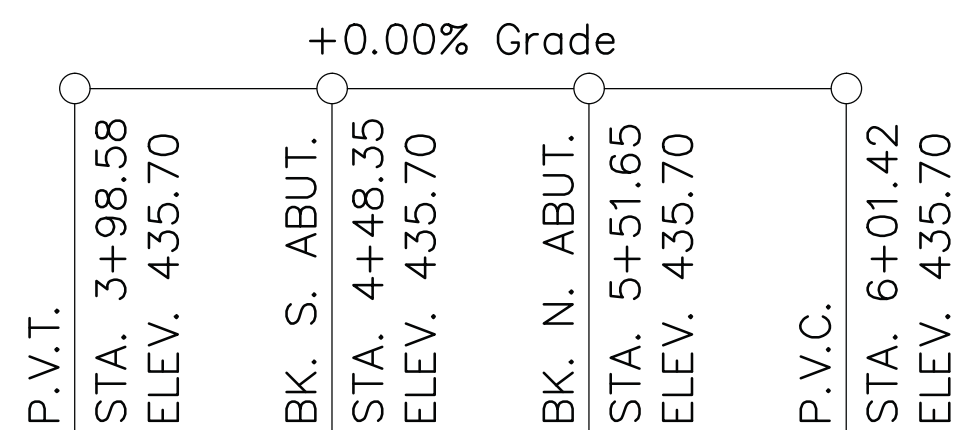
Existing Structure — Existing structure No. 051-3009 consists of a single span cast-in-place reinforced concrete deck bridge with steel girders bearing on closed concrete abutments supported by timber piling. The bk. to bk. length of abutments is 39.6' and out-to-out deck width is 26'. The existing structure shall be completely removed and disposed off the jobsite. Road closure shall be used during construction.

No Salvage — See Special Provisions; "Removal of Existing Structures."



**SECTION A-A**

Note: See Special Provisions for Stone Dumped Riprap, Class A4



**PROFILE GRADE**  
(along  $\bar{C}$  roadway)

**DESIGN STRESSES**

FIELD UNITS

$f'_c = 3,500$  psi  
 $F_y = 60,000$  psi (reinforcement)

**PRECAST PRESTRESSED UNITS**

$f'_c = 6,000$  psi  
 $f'_{ci} = 5,000$  psi

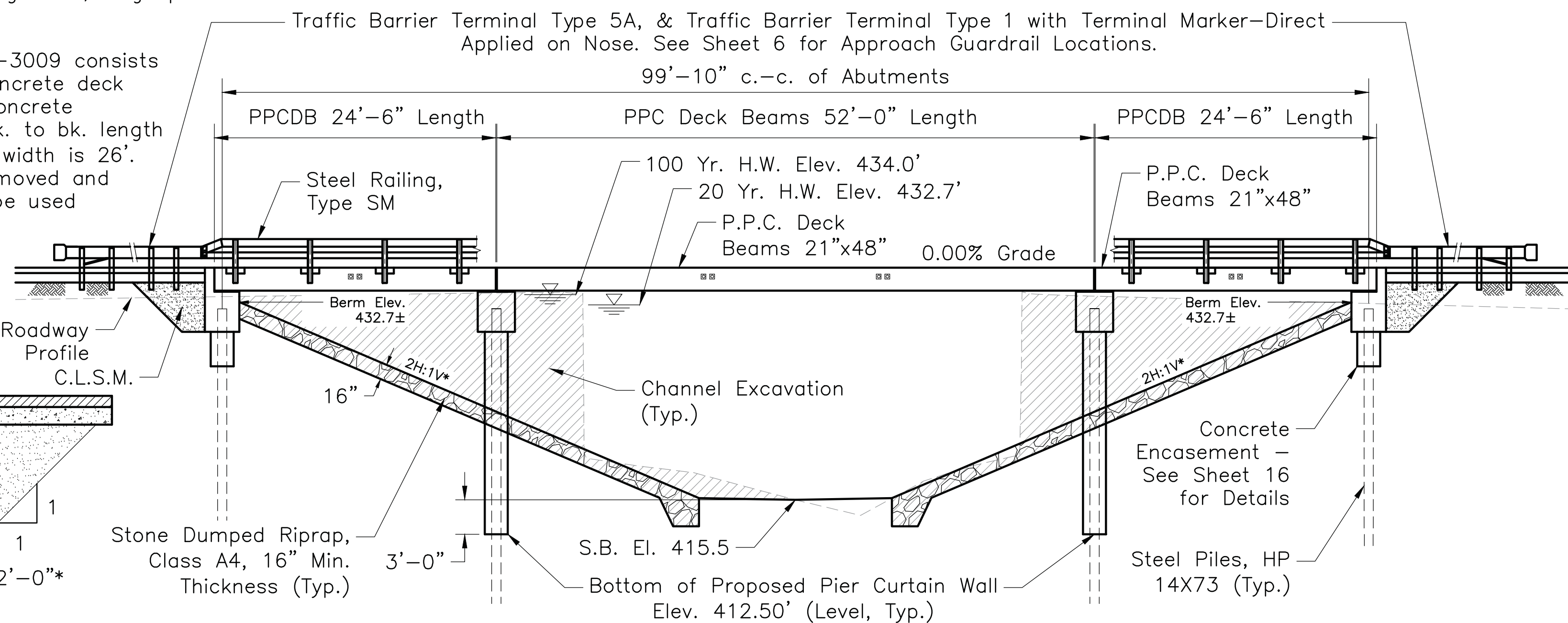
$F'_s = 270,000$  psi ( $\frac{1}{2}$ " low relax. strands)  
 $F_{si} = 201,960$  psi ( $\frac{1}{2}$ " low relax. strands)

**DESIGN SPECIFICATIONS**

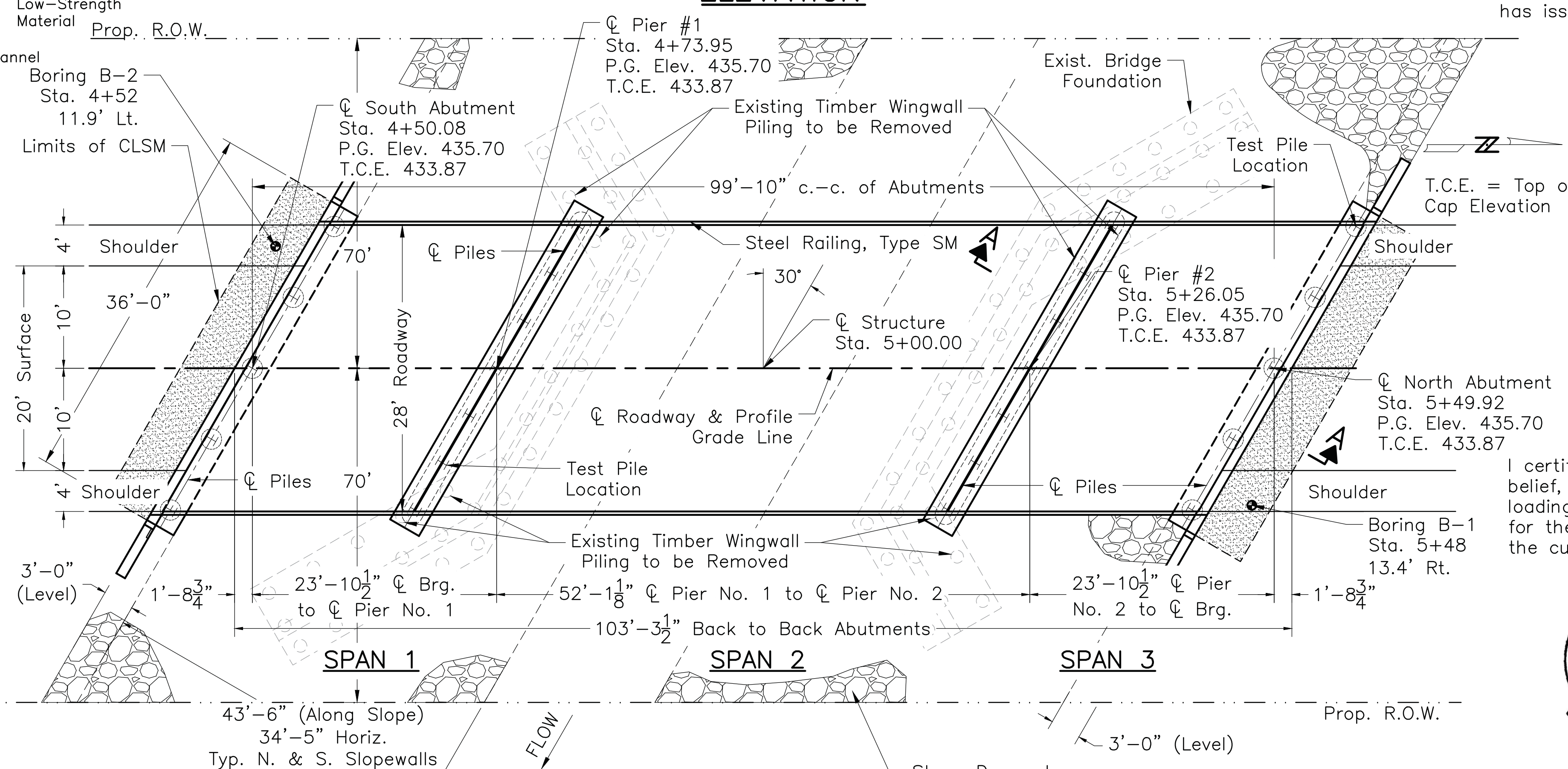
AASHTO LRFD Bridge Design Specifications — 9th edition

**SEISMIC DATA**

Seismic Performance Zone (SPZ) = 3  
Design Spectral Acceleration at 1.0 sec. ( $S_{D1}$ ) = 0.340g  
Design Spectral Acceleration at 0.2 sec. ( $S_{D5}$ ) = 0.755g  
Soil Site Class = E



**ELEVATION**



**PLAN**

Skew Angle = 30°  
Forward Left

**LOADING HL-93**

50#/sq. ft. included in dead load for future wearing surface.

**LETTERING FOR NAME PLATE**

Locate Name Plate at SE Corner of Bridge (See Std. 515001)

EAGLE BRANCH  
BUILT 202\_ BY  
LAWRENCE COUNTY  
SEC. 20-00130-00-BR  
FAS 806 STATION 5+00.00  
STR. NO. 051-3313 LOADING HL-93

**WATERWAY INFORMATION**

Drainage Area=3.4 Sq.Mi.		Low Grade Elev = 432.72 @ Sta. 11+00.00								
Flood	Freq. Yr.	Q. C.F.S.	Opening Sq. Ft.		Nat. H.W.E.		Head — Ft.		Headwater El.	
			Exist.	Prop.	Exist.	Prop.	Exist.	Prop.	Exist.	Prop.
Design	20	555	430.4	835.3	432.7'	0.0'	0.0'	432.7'	432.7'	
Base	100	795	430.4	947.7	434.0'	0.0'	0.0'	434.0'	434.0'	

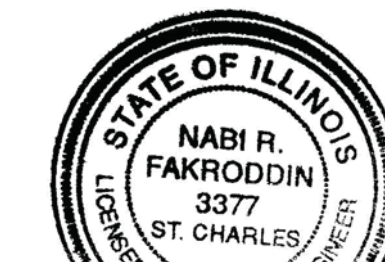
**GENERAL NOTES**

- Do not scale sheets 7-17.
- See Special Provisions for removing existing wingwall timber piles and backfilling pile voids with Controlled Low-Strength Material (15 C.Y. estimated). Voids shall be filled before any steel H-piles are driven. The Contractor shall take special care while driving piling to ascertain and avoid driving proposed steel piling into existing timber piling that remain in place. 12" minimum from outside of existing pile to outer edge of proposed H-pile shall be maintained.
- The Contractor shall drive the test piles to 110% of the nominal required bearing specified in production locations at the North Abutment and Pier No. 1 or as approved by the Engineer before ordering the remainder of piles.
- It shall be the responsibility of the Contractor to divert flow during construction to keep construction areas free of water. The method of water diversion shall be subject to the approval of the Engineer and shall be included in the cost of Concrete Structures.
- See Sheet 17 for boring logs.
- Excavation required to construct the Abutments and Piers shall be included in the cost of Earth Excavation. No additional compensation will be allowed for Structure Excavation.
- Layout of the slope protection system may be varied to suit ground conditions in the field as directed by the Engineer.
- Toe stone riprap treatment as shown in Section A-A shall extend entire channel length from proposed R.O.W. west to proposed R.O.W. east.
- 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.

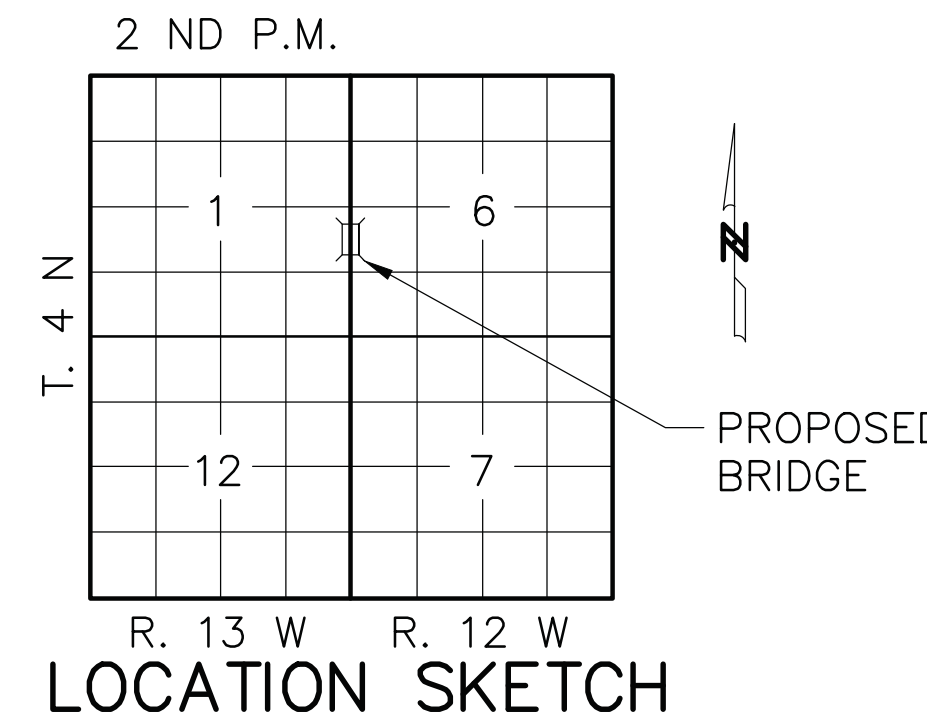
**TOTAL BILL OF MATERIAL**

Item	Unit	Total
Channel Excavation	Cu. Yd.	1700
Stone Dumped Riprap, Class A4	Ton	1140
Removal of Existing Structures	Each	1
Concrete Structures	Cu. Yd.	184.2
Concrete Encasement	Cu. Yd.	5.5
Precast Prestressed Concrete Deck Beams (21" Depth)	Sq. Ft.	2828
Reinforcement Bars, Epoxy Coated	Pound	15220
Steel Railing, Type SM	Foot	207
Furnishing Steel Piles HP 14 X 73	Foot	2134
Driving Piles	Foot	2134
Test Pile Steel HP 14 X 73	Each	2
Name Plates	Each	1
Controlled Low-Strength Material	Cu. Yd.	65
Terminal Marker — Direct Applied	Each	4

I certify that to the best of my knowledge, information and belief, this bridge design is structurally adequate for the design loading shown on the plans. The design is an economical one for the style of structure and complies with requirements of the current AASHTO Standard Specifications for Highway Bridges.



9/17/22  
Lic Exp 11-30-22



**LOCATION SKETCH**

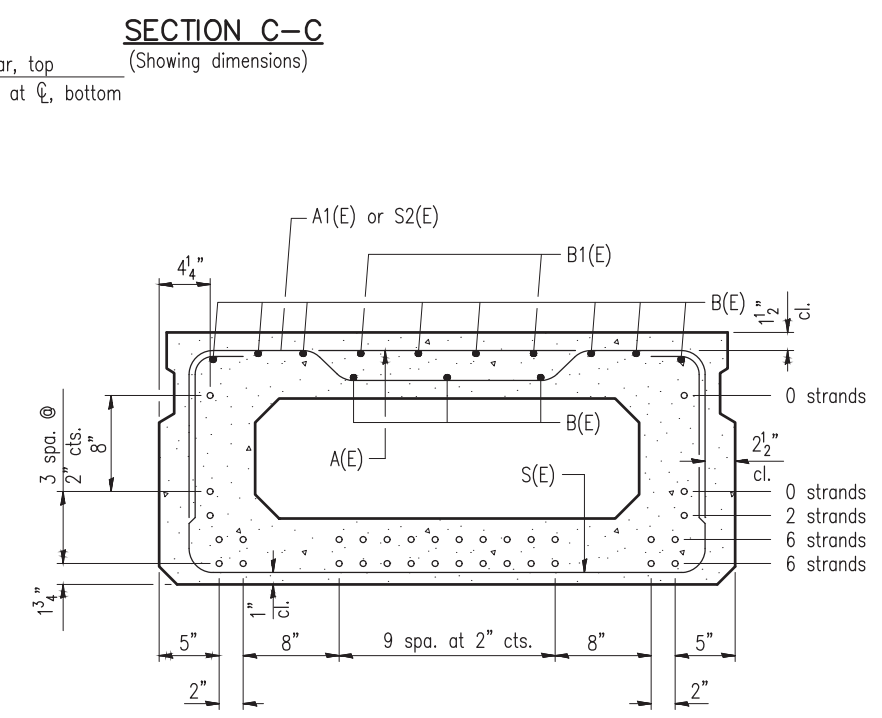
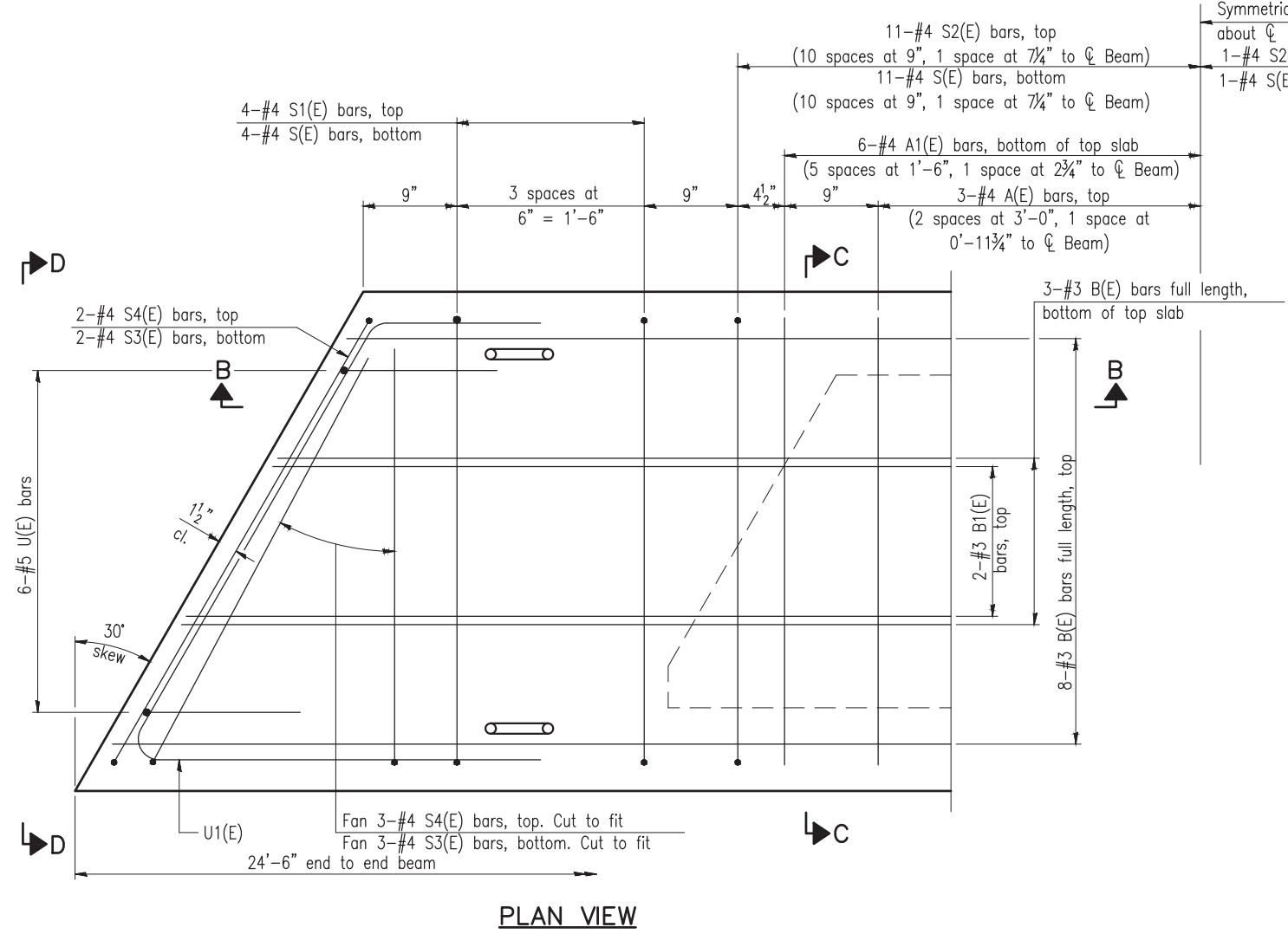
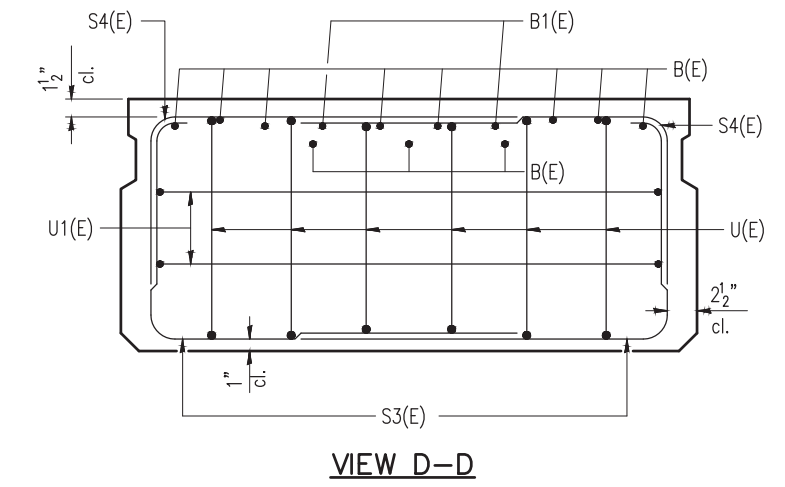
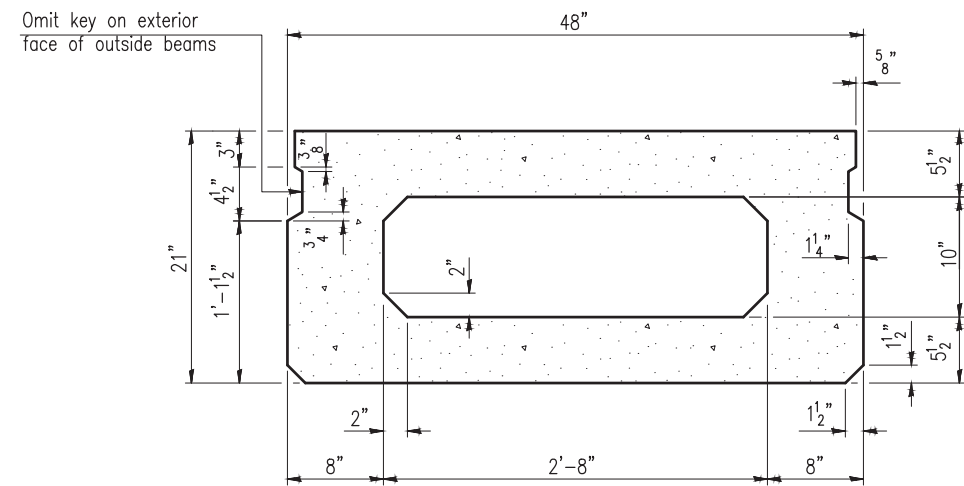
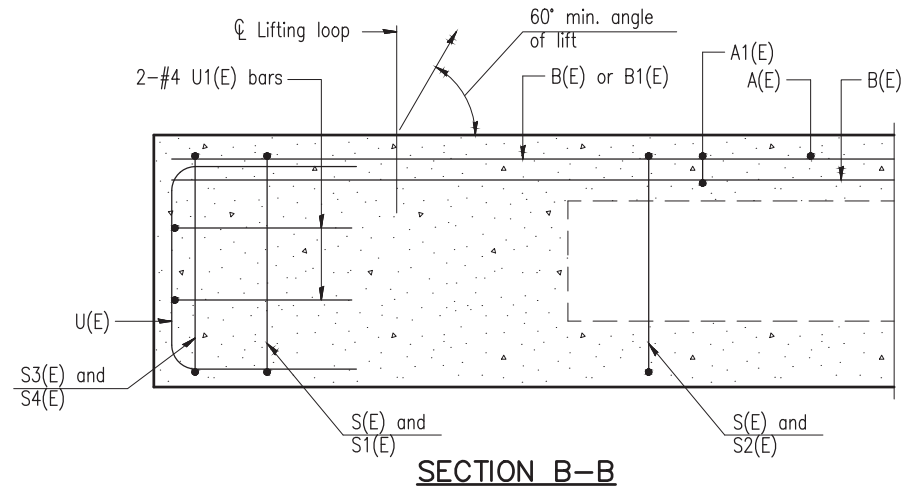
**CHARLESTON ENGINEERING, INC.**  
CONSULTING ENGINEERS - LAND SURVEYORS  
105 NORTH KITCHELL AVENUE OLNEY, ILLINOIS 62450  
P.O. BOX 397 (618) 392-0736  
ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION REGISTRATION #184.003513

DESIGNED — NRF/BMB  
DRAWN — BMB  
CHECKED — NRF  
DATE — 2-2022

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION  
STRUCTURE NUMBER 051-3313

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 806	20-00130-00-BR	LAWRENCE	24	7
CONTRACT 95931		ILLINOIS	PROJECT XCXN(049)	



**SECTION C-C**  
 (Showing reinforcement and permissible strand locations)  
 Notes: 14 total strands per beam  
 Place the number of strands specified in each row symmetrically about the centerline of beam in the permissible strand locations shown.

**MINIMUM BAR LAP**  
 #3 bar = 1'-6"

**BAR LIST ONE BEAM ONLY**  
 (For information only)

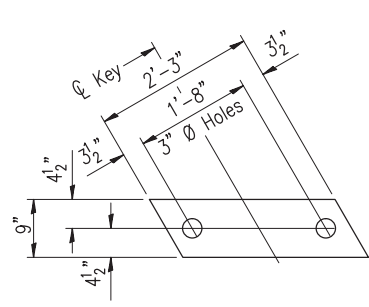
Bar	No.	Size	Length	Shape
A(E)	6	#4	3'-7"	—
A1(E)	12	#4	3'-10"	~
B(E)	11	#3	24'-2"	—
B1(E)	4	#3	10'-0"	—
S(E)	31	#4	7'-5"	⌋
S1(E)	8	#4	5'-11"	⌋
S2(E)	23	#4	6'-2"	⌋
S3(E)	10	#4	6'-1"	⌋
S4(E)	10	#4	5'-4"	⌋
U(E)	12	#5	4'-0"	⌋
U1(E)	4	#4	8'-7"	⌋

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

**SPAN 1 OR 3**

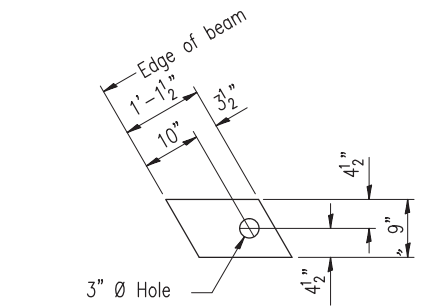
Note:  
 See sheet 9 of 24 for additional details and Bill of Material.





**FABRIC BEARING PAD**

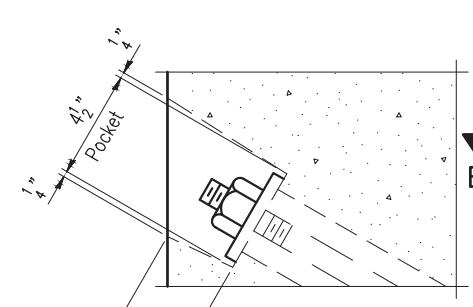
(Interior)  
 12 Required for Span 1  
 12 Required for Span 3



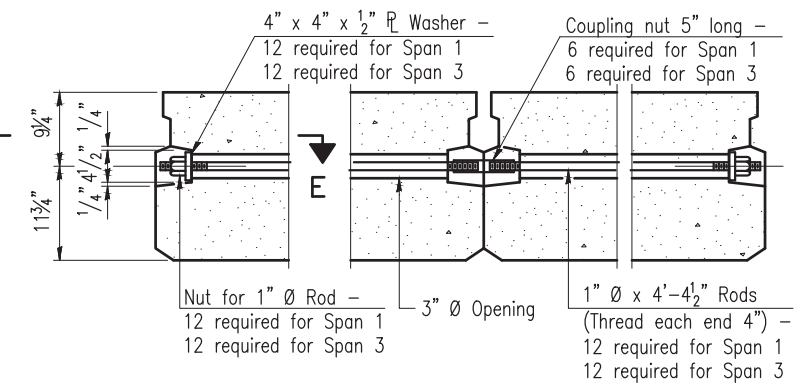
**FABRIC BEARING PAD**

(Exterior)  
 4 Required for Span 1  
 4 Required for Span 3

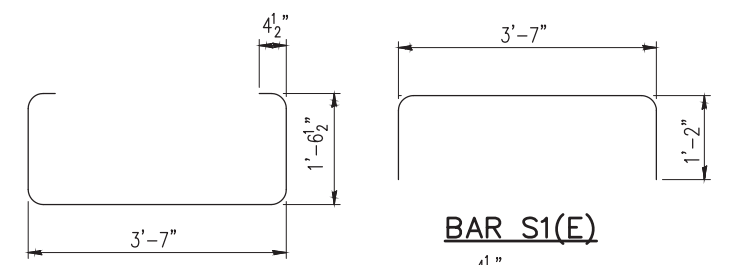
Notes:  
 All bearing pads shall be 1" thick.



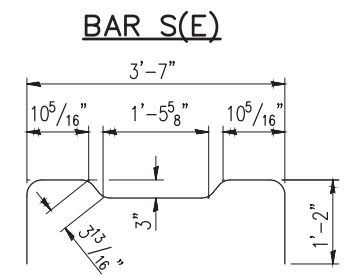
**SECTION E-E**



**TYPICAL TRANSVERSE TIE ASSEMBLY**

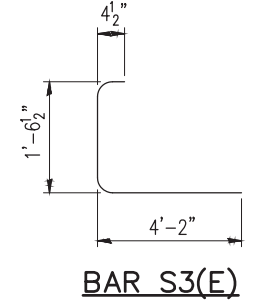


**BAR S1(E)**

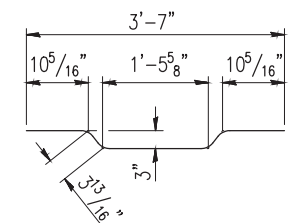


**BAR S(E)**

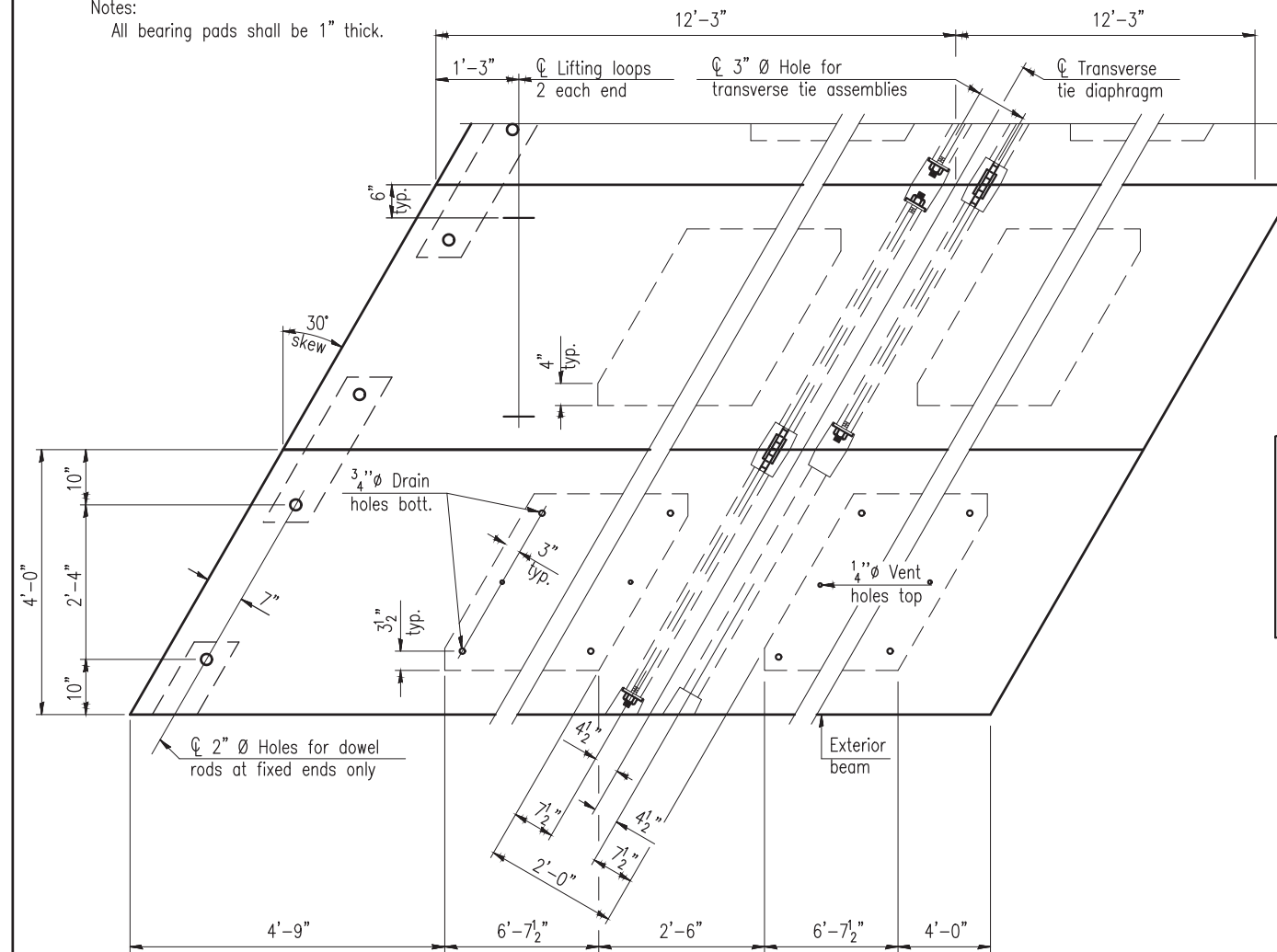
**BAR S2(E)**



**BAR S3(E)**



**BAR A1(E)**

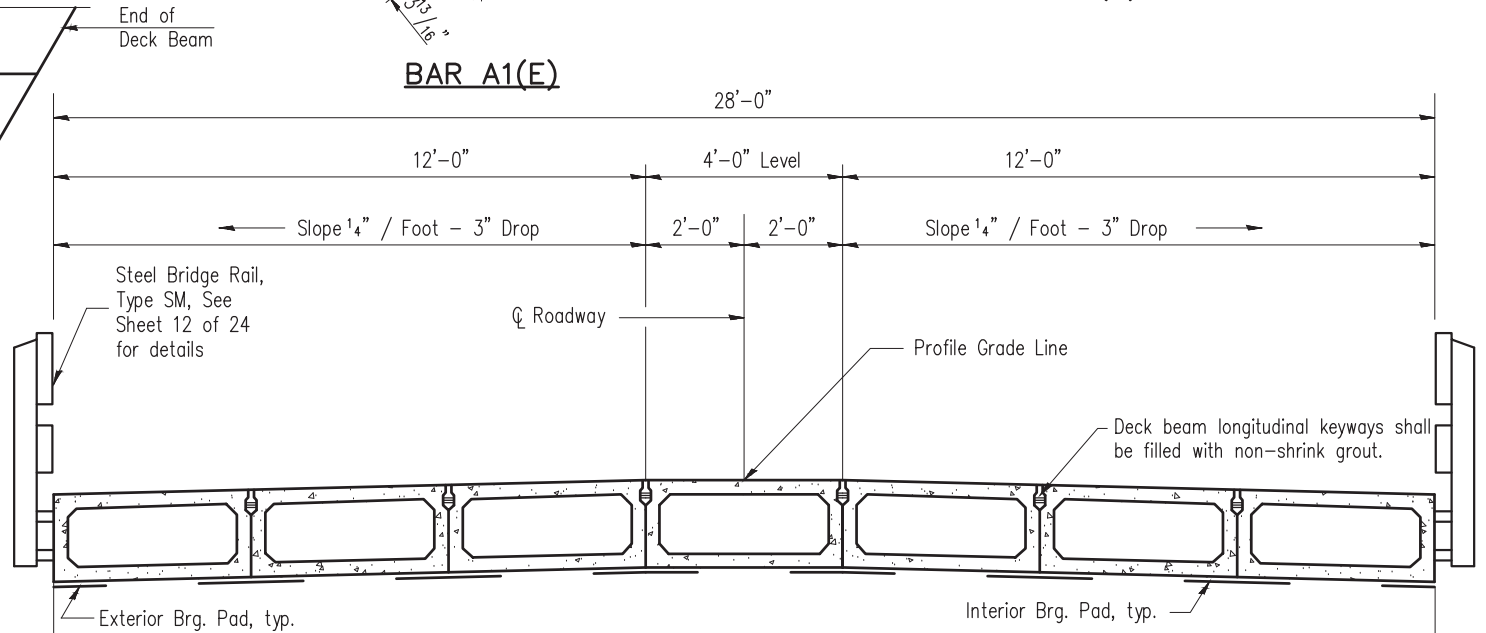


**PLAN VIEW**

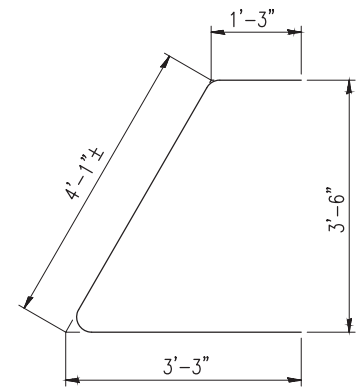
**NOTES**

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be 1/2" and the nominal cross-sectional area shall be 0.153 sq. in. The 1" rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets on exterior faces of bridge shall be filled with grout after transverse tie assembly is in place. Reinforcement bars shall conform to ASTM A 706, Grade 60. See Standard Specifications. Two 1/8" fabric adjusting shims of the dimensions of the exterior bearing pad shall be provided for each bearing pad location. A minimum 2 1/2" lifting pin shall be used to engage the lifting loops during handling. Corrosion Inhibitor, per Article 1020.05(b)(10) and 1021.07 of the Standard Specifications, shall be used in the concrete for precast prestressed concrete deck beams. Compressive strength of prestressed concrete, f'c, shall be 6000 psi. Compressive strength of prestressed concrete at release, f'ci, shall be 5000 psi.

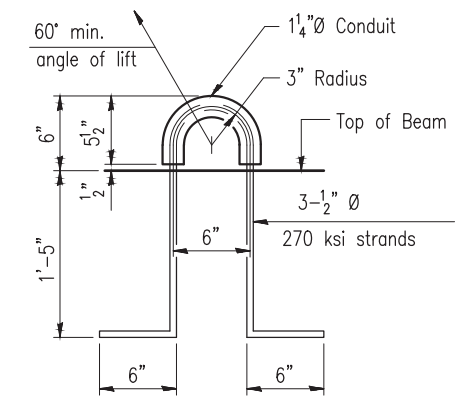
Note:  
 Connect beams in pairs with the transverse tie configuration shown.



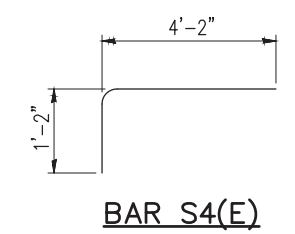
**CROSS SECTION**



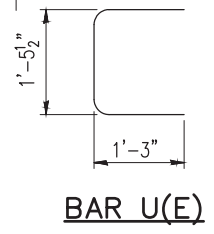
**BAR U1(E)**



**LIFTING LOOP DETAIL**



**BAR S4(E)**



**BAR U(E)**

**BILL OF MATERIAL**

Precast Prestressed Conc. Deck Bms. (21" depth)-Spans 1 and 3	Sq. Ft.	1372
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**SPAN 1 OR 3**

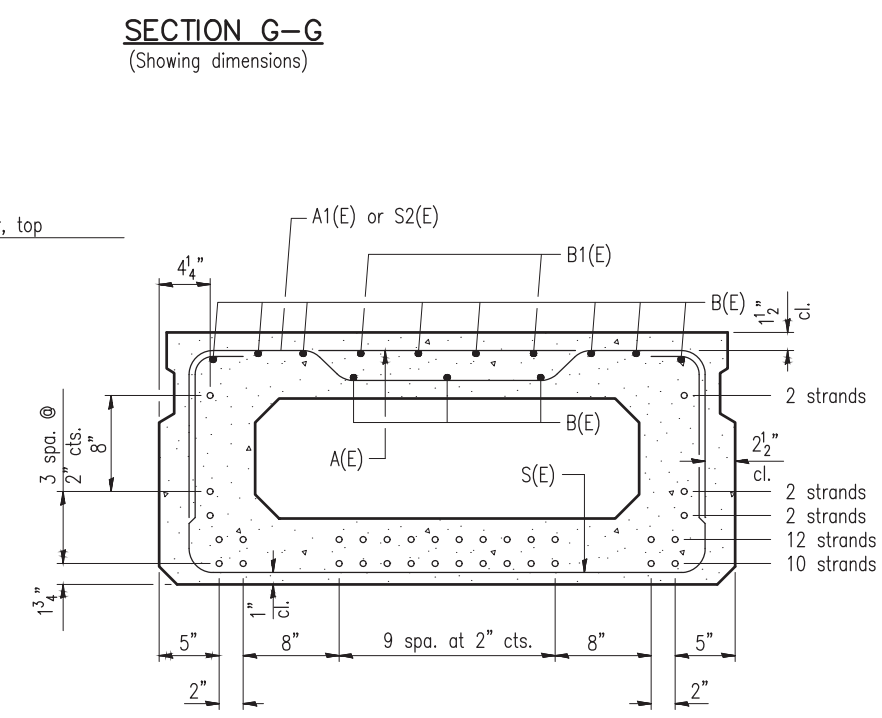
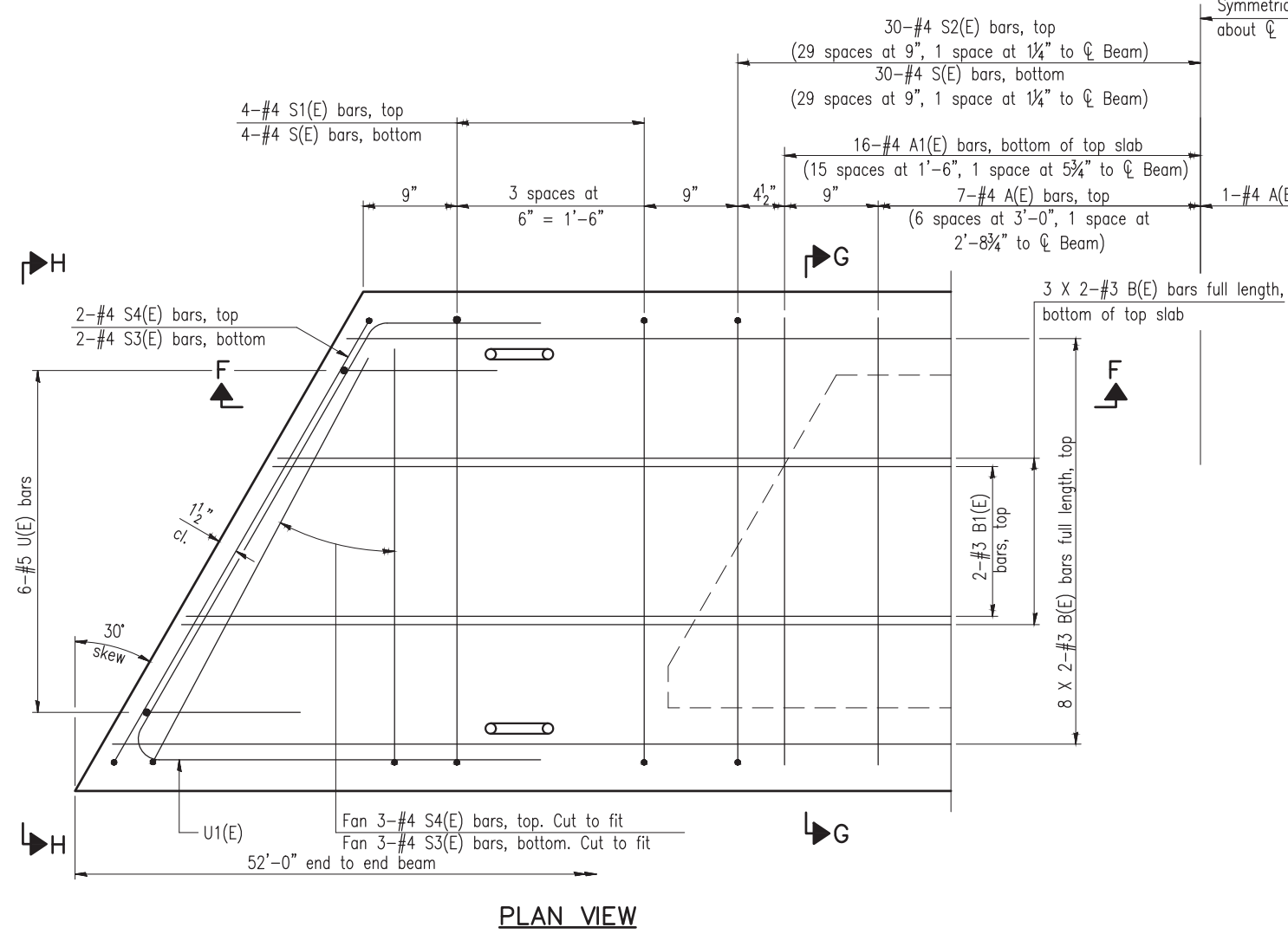
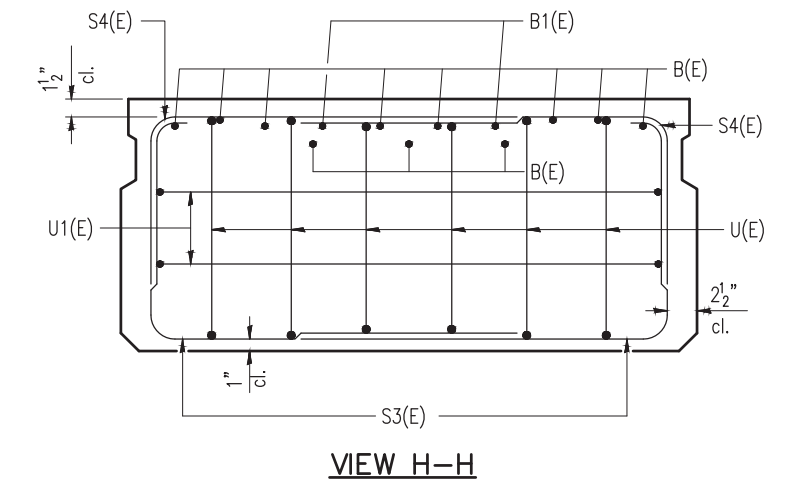
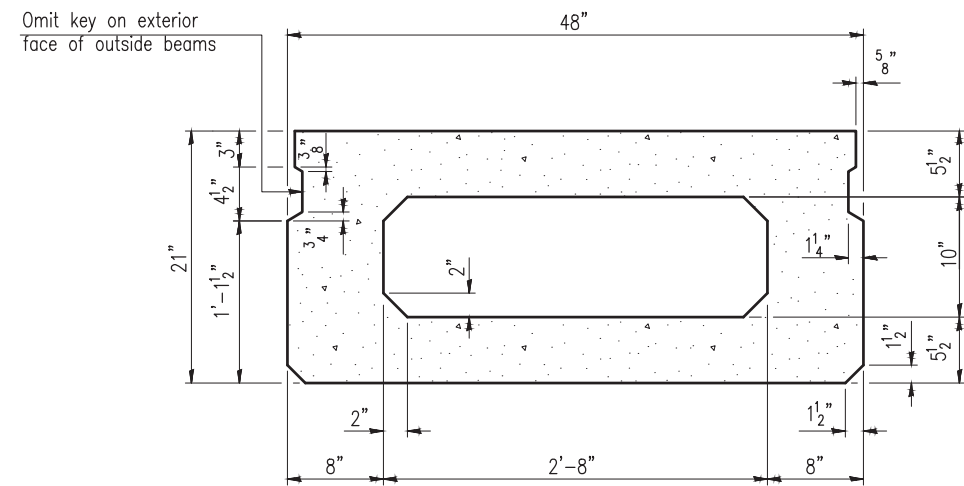
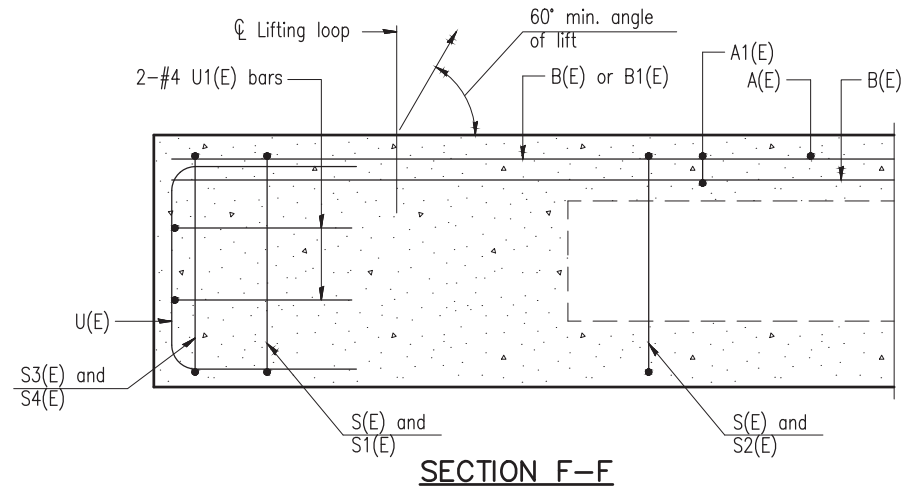
**CHARLESTON ENGINEERING, INC.**  
 CONSULTING ENGINEERS - LAND SURVEYORS  
 105 NORTH KITCHELL AVENUE OLNEY, ILLINOIS 62450  
 P.O. BOX 387 (618) 392-0736  
 ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION REGISTRATION #184.003513

DESIGNED - NRF/BMB	REVISED -
DRAWN - BMB	REVISED -
CHECKED - NRF	REVISED -
DATE - 2-2022	REVISED -

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

21" X 48" PPC DECK BEAM (SPAN 1 OR 3)  
 STRUCTURE NUMBER 051-3313

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 806	20-00130-00-BR	LAWRENCE	24	9
CONTRACT 95931		ILLINOIS	PROJECT XCXN(049)	



**SECTION G-G**  
 (Showing reinforcement and permissible strand locations)  
 Notes: 28 total strands per beam  
 Place the number of strands specified in each row symmetrically about the centerline of beam in the permissible strand locations shown.

**MINIMUM BAR LAP**  
 #3 bar = 1'-6"

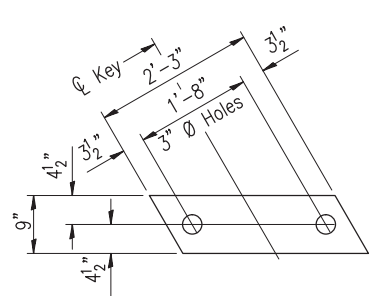
**BAR LIST ONE BEAM ONLY**  
 (For information only)

Bar	No.	Size	Length	Shape
A(E)	15	#4	3'-7"	—
A1(E)	32	#4	3'-10"	~
B(E)	22	#3	26'-8"	—
B1(E)	4	#3	10'-0"	—
S(E)	68	#4	7'-5"	⌋
S1(E)	8	#4	5'-11"	⌋
S2(E)	60	#4	6'-2"	⌋
S3(E)	10	#4	6'-1"	⌋
S4(E)	10	#4	5'-4"	⌋
U(E)	12	#5	4'-0"	⌋
U1(E)	4	#4	8'-7"	⌋

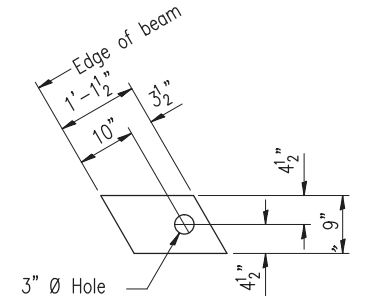
Note:  
 See sheet 11 of 24 for additional details and Bill of Material.

**SPAN 2**

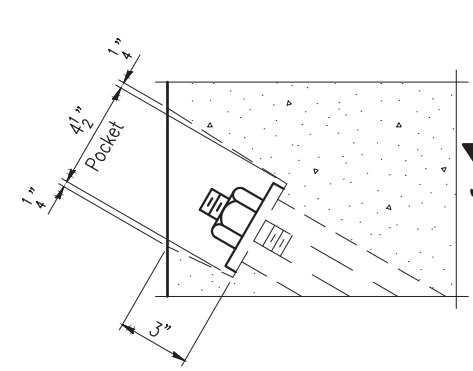
Note:  
 Spacing of S(E) and S2(E) bars may be adjusted up to 4" in the immediate area of the transverse tie diaphragms to miss the block outs for the transverse ties.



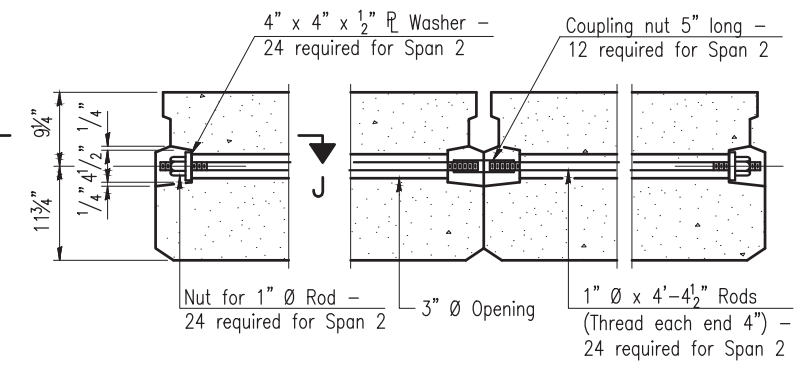
**FABRIC BEARING PAD**  
(Interior)  
12 Required



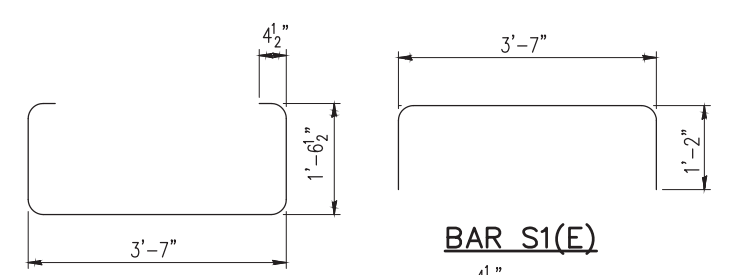
**FABRIC BEARING PAD**  
(Exterior)  
4 Required



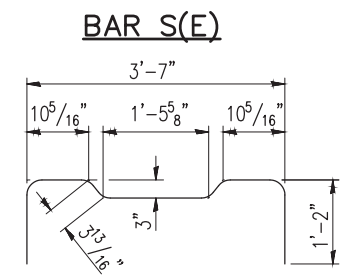
**SECTION J-J**



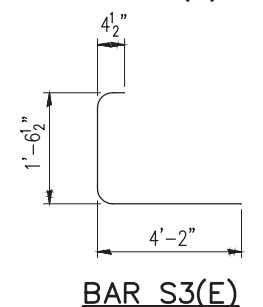
**TYPICAL TRANSVERSE TIE ASSEMBLY**



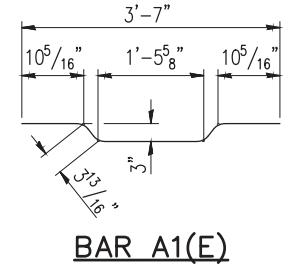
**BAR S1(E)**



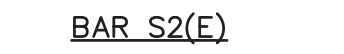
**BAR S(E)**



**BAR S3(E)**

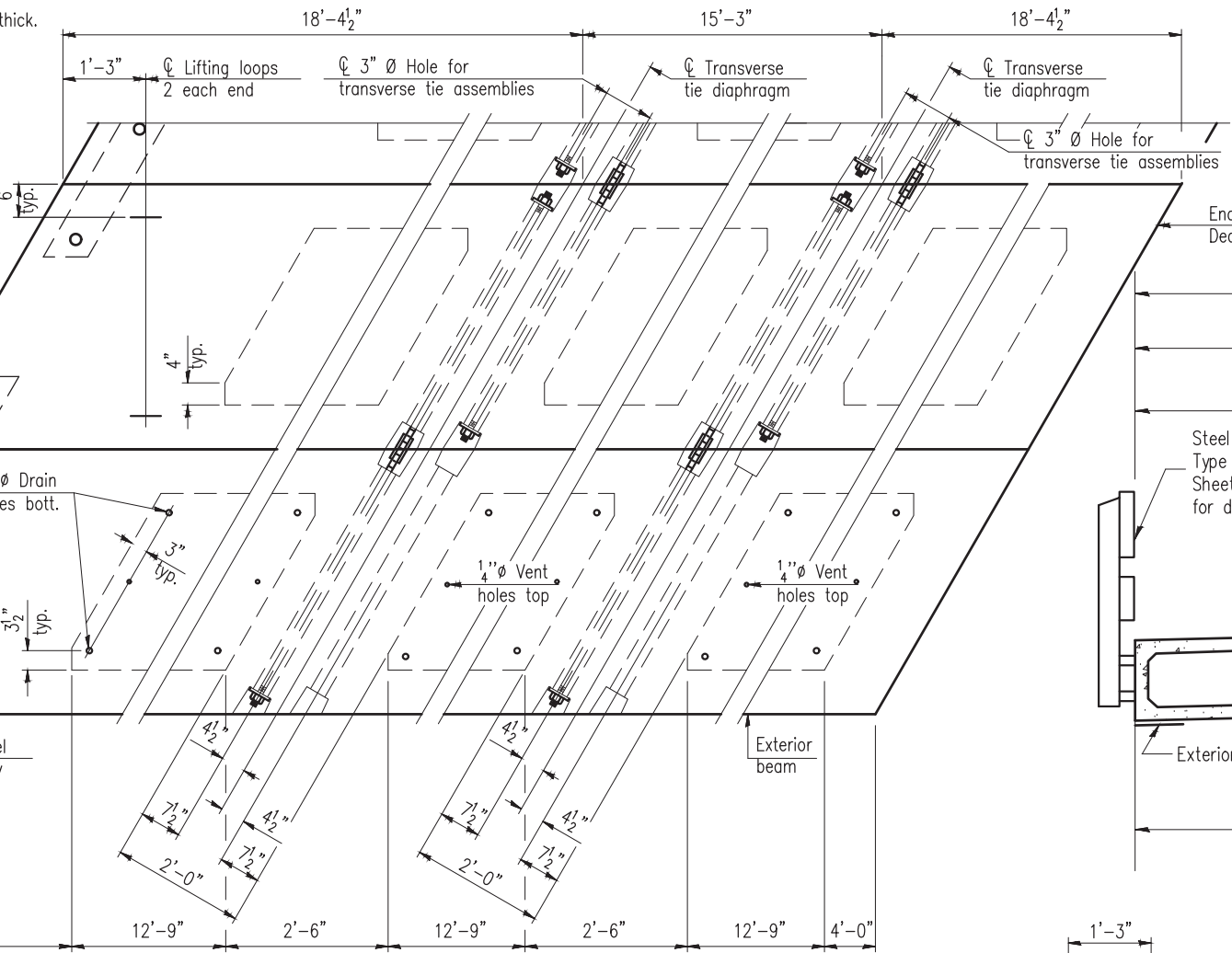


**BAR A1(E)**

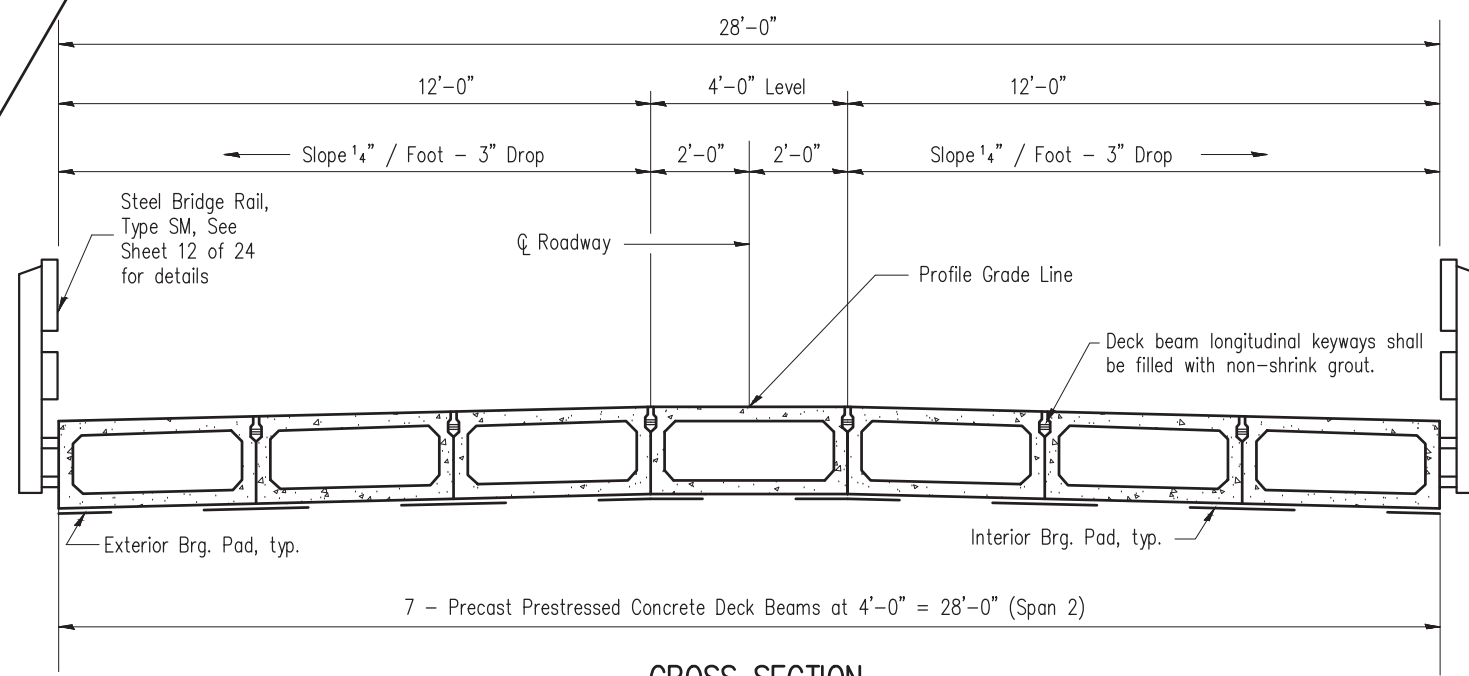


**BAR S2(E)**

Notes:  
All bearing pads shall be 1" thick.



**PLAN VIEW**



**CROSS SECTION**

**NOTES**

Prestressing steel shall be uncoated high strength, low relaxation 7-wire strand, Grade 270. The nominal diameter shall be 1/2" and the nominal cross-sectional area shall be 0.153 sq. in. The 1" rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets on exterior faces of bridge shall be filled with grout after transverse tie assembly is in place.

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

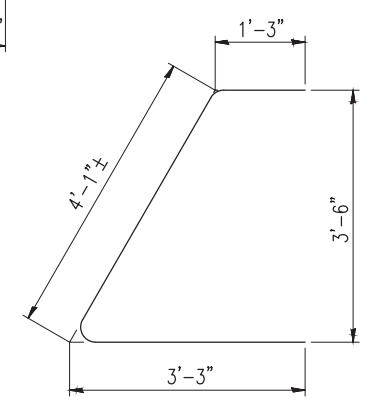
A minimum 2 1/2" lifting pin shall be used to engage the lifting loops during handling.

Corrosion Inhibitor, per Article 1020.05(b)(10) and 1021.07 of the Standard Specifications, shall be used in the concrete for precast prestressed concrete deck beams.

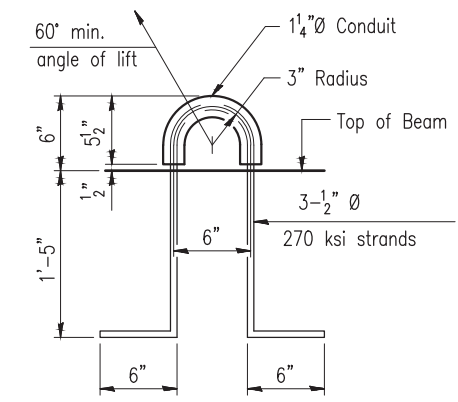
Compressive strength of prestressed concrete, f'c, shall be 6000 psi.

Compressive strength of prestressed concrete at release, f'ci, shall be 5000 psi.

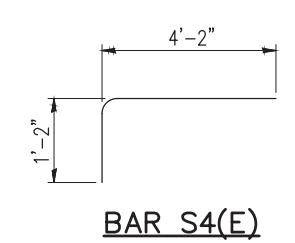
Note:  
Connect beams in pairs with the transverse tie configuration shown.



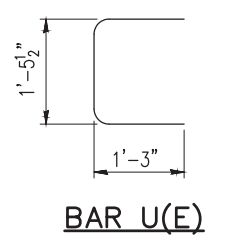
**BAR U1(E)**



**LIFTING LOOP DETAIL**



**BAR S4(E)**



**BAR U(E)**

**BILL OF MATERIAL**

Precast Prestressed Conc. Deck Bms. (21" depth)-Span 2	Sq. Ft.	1456
--	---------	------

**SPAN 2**

Notes:  
 A sufficient number of shims of various thicknesses, sized to fit behind the top spacer assembly, 5" x 11½", and bottom spacer assembly, 6" x 7", shall be provided to adjust posts for proper alignment. If the summation of shims is greater than ¼" (top) or ½" (bottom), longer bolts are required. Cost included with Steel Railing, Type SM.  
 All steel rail elements including shims shall be galvanized according to Article 509.05 of the Standard Specifications.  
 All HSS tubing serving as railing shall be CVN tested according to Article 1006.34(b) of the Standard Specifications.  
 Rail splice inserts may be built out of 2 - 3/8" bent plates in lieu of the 4 plate rail splice inserts shown, provided the outside dimensions are matched.  
 All round head bolts shall be ASTM A307 with locknuts according to ASTM A563 grade A.

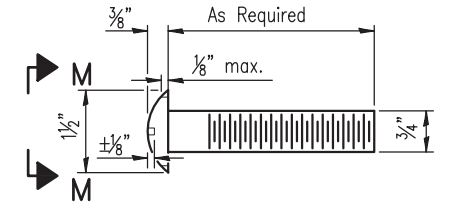
**RAILING CRITERIA**

MASH 2016 Test Level	2
Railing Weight (plf)	90
Min f'c (psi)	5,000
Max Post Spacing	6'-3"
HMA thickness range (in)	1¼ - 3½

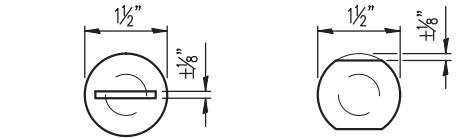
**SPLICE DIMENSIONS**

Location	T	A	B	C	D	E
All locs. not over exp. jts.	0	¼"	4"	4"	1'-8"	-
Over Strip Seal Jt.	≤4"	2½"	4½"	4¾"	1'-10"	3¼"
Over Finger or Modular Jt.	≤9½"	5½"	7¾"	7¼"	2'-9¼"	5¼"
Over Finger or Modular Jt.	≤15"	8¼"	10½"	10"	3'-8¼"	8¾"

T = ; total movement along centerline of roadway at expansion joint.

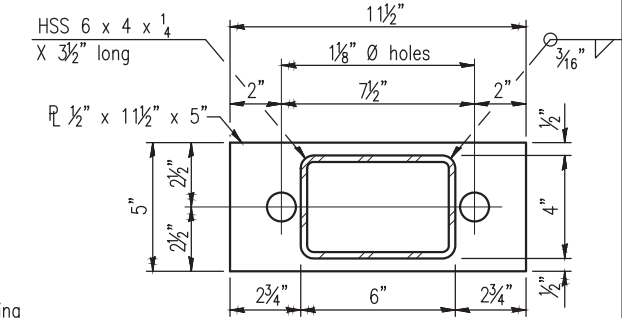


**ROUND HEAD BOLT DETAIL**

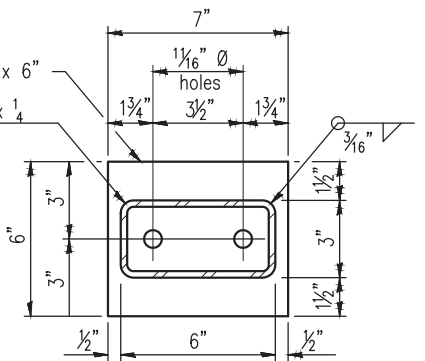


With Slot (shown) or Approved Recess / Without Slot or Recess

**VIEW M-M**



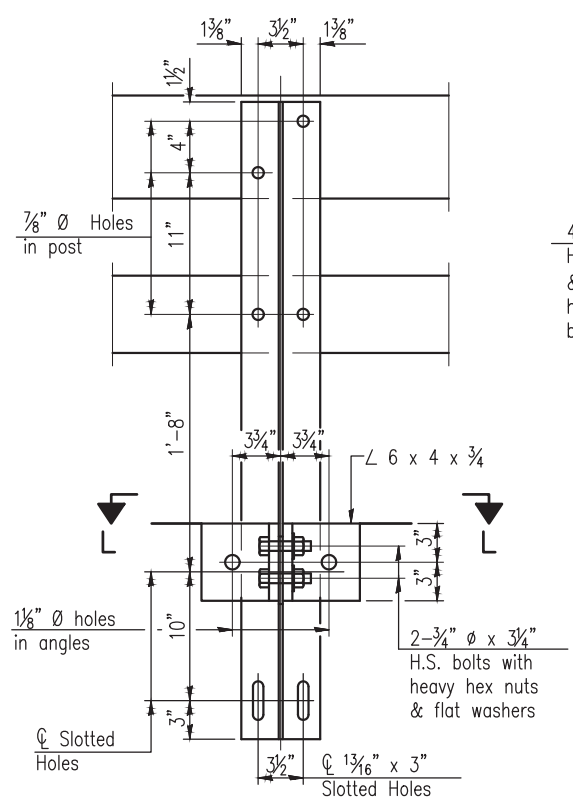
**TOP SPACER ASSEMBLY**



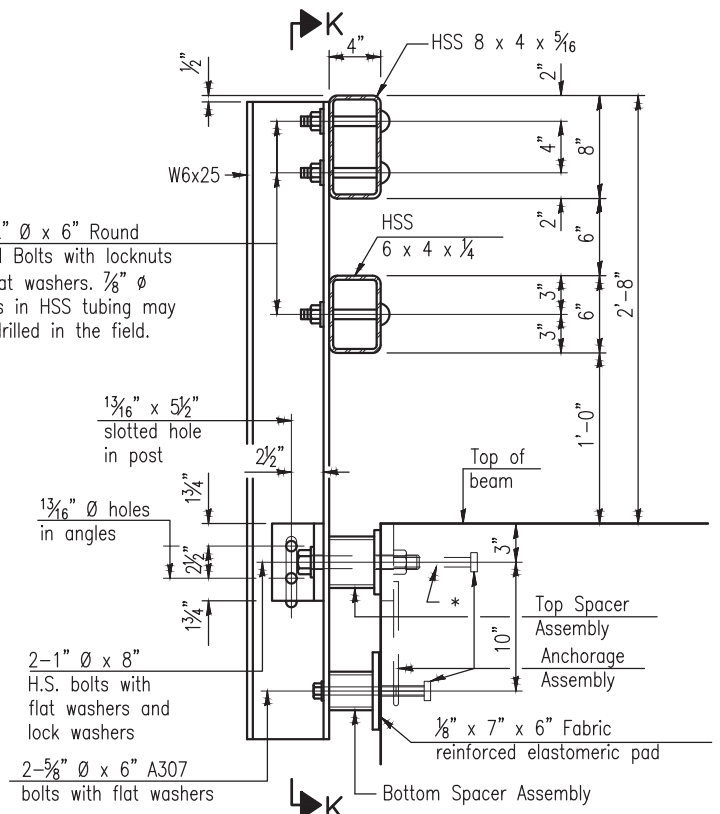
**BOTTOM SPACER ASSEMBLY**

**BILL OF MATERIAL**

Item	Unit	Quantity
Steel Railing, Type SM	Foot	207

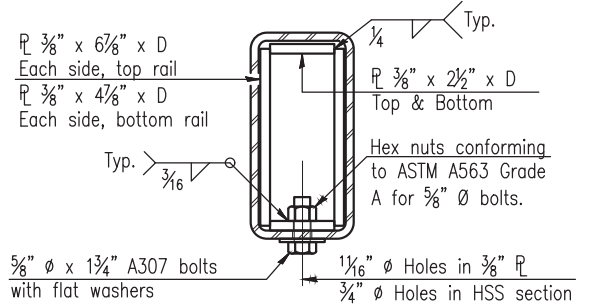


**SECTION K-K**

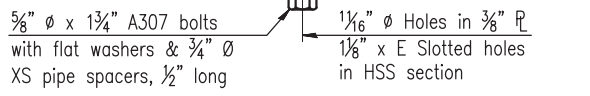


**SECTION AT RAIL POST**

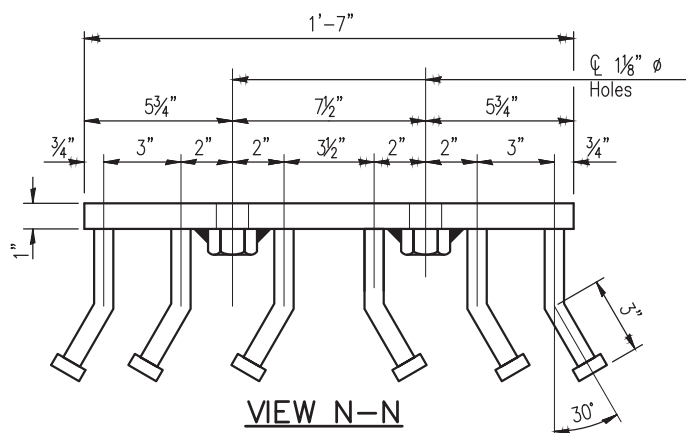
\* The outermost longitudinal reinforcement bar shall be placed directly above the studs of the rail post anchorage assembly. The anchorage studs may be bent down ½" to accommodate the top reinforcement bar placement.



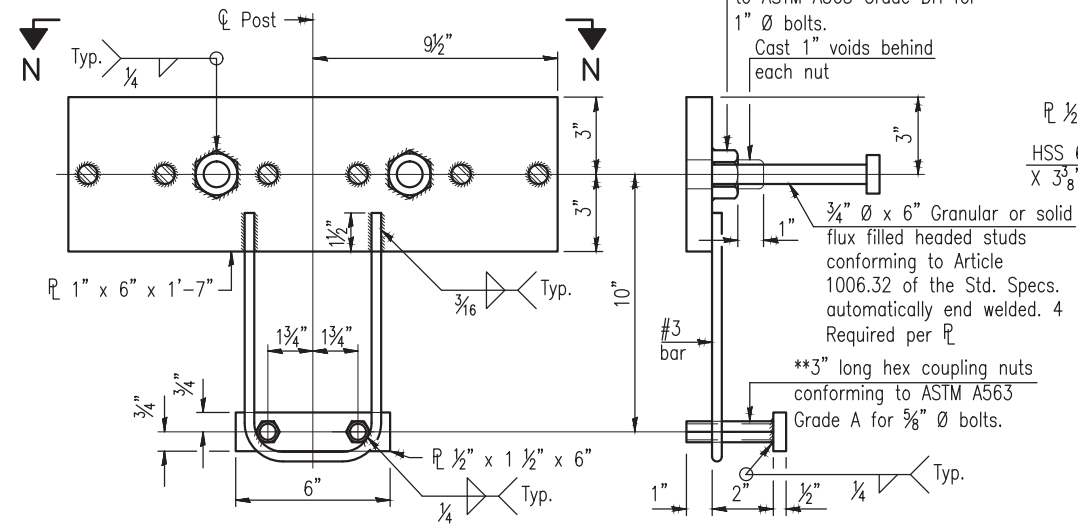
**SECTION AT RAIL SPLICE**



**RAIL SPLICE CONNECTION AT EXPANSION JT.**

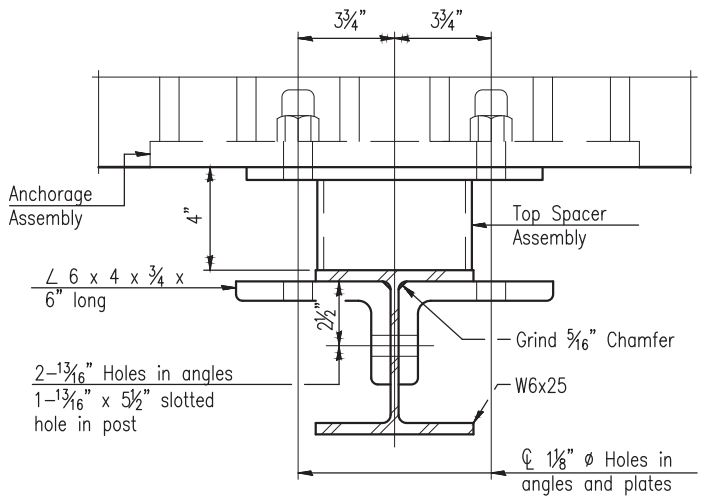


**VIEW N-N**

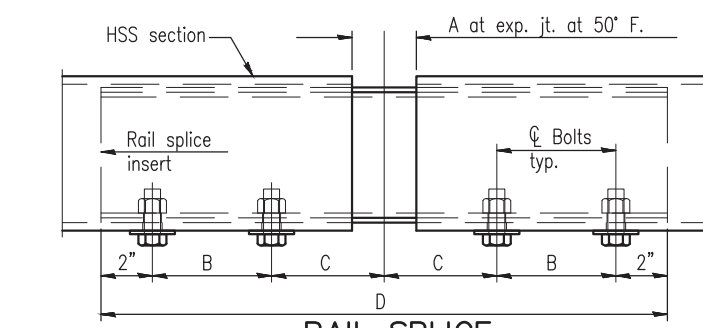


**ANCHORAGE ASSEMBLY**

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



**SECTION L-L**



**RAIL SPLICE ELEVATION**

**CHARLESTON ENGINEERING, INC.**  
 CONSULTING ENGINEERS - LAND SURVEYORS  
 105 NORTH KITCHELL AVENUE OLNEY, ILLINOIS 62450  
 P.O. BOX 387 (618) 392-0736  
 ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION REGISTRATION #184.003513

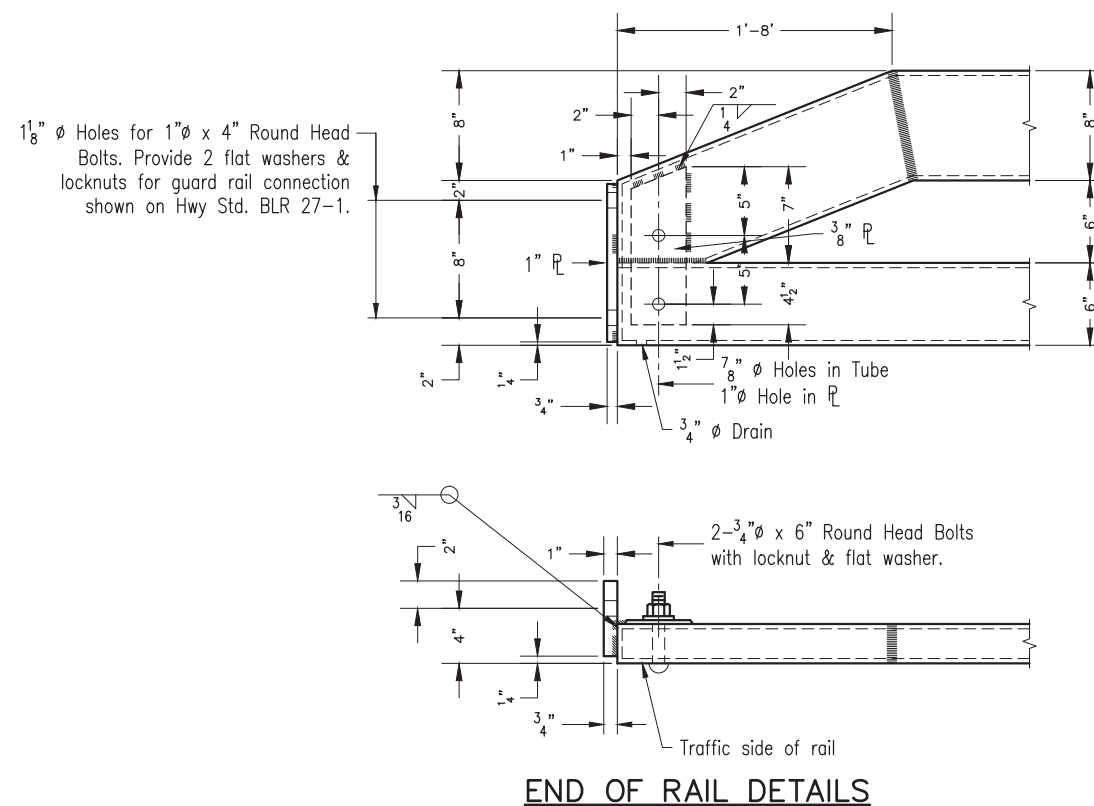
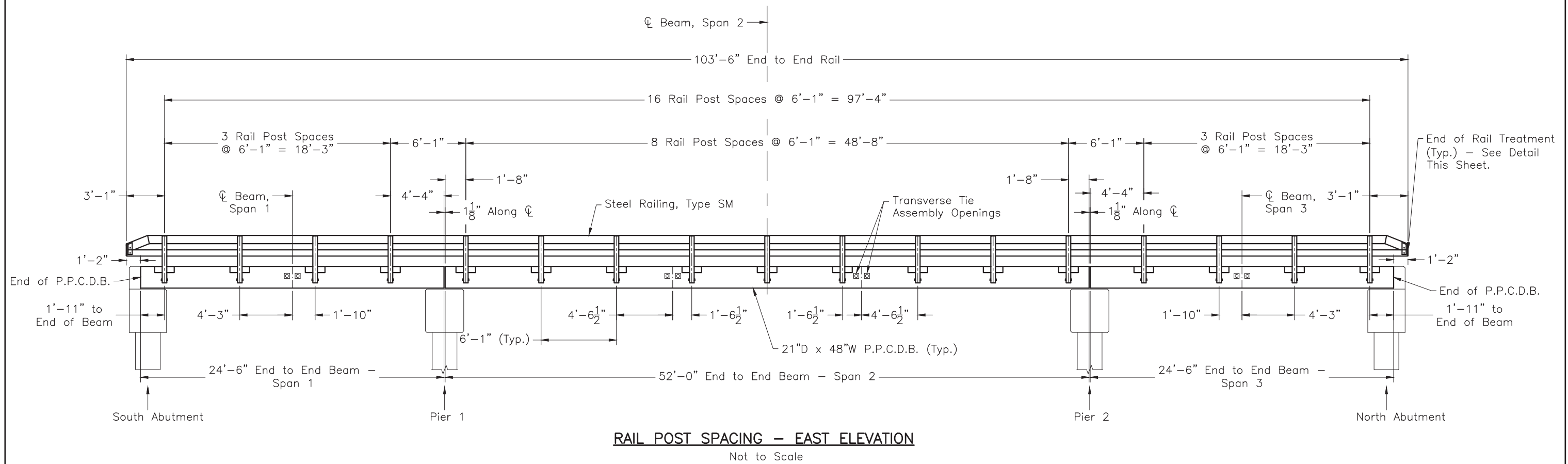
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 DRAWN - BMB  
 CHECKED - NRF  
 DATE - 2-2022

REVISED -  
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 REVISED -

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

STEEL RAILING, TYPE SM  
 STRUCTURE NUMBER 051-3313

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 806	20-00130-00-BR	LAWRENCE	24	12
CONTRACT 95931		ILLINOIS	PROJECT XCXN(049)	



**CHARLESTON ENGINEERING, INC.**  
CONSULTING ENGINEERS - LAND SURVEYORS  
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(618) 392-0736  
ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION REGISTRATION #184.003513

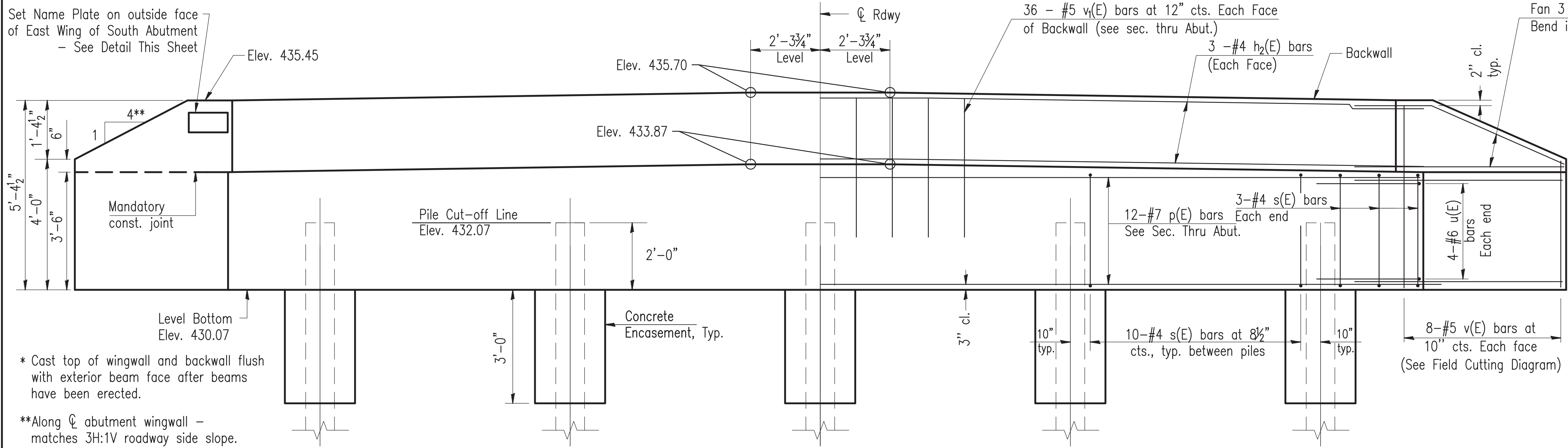
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DRAWN - BMB	REVISED -
CHECKED - NRF	REVISED -
DATE - 2-2022	REVISED -

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

STEEL RAILING, TYPE SM DETAILS  
STRUCTURE NUMBER 051-3313

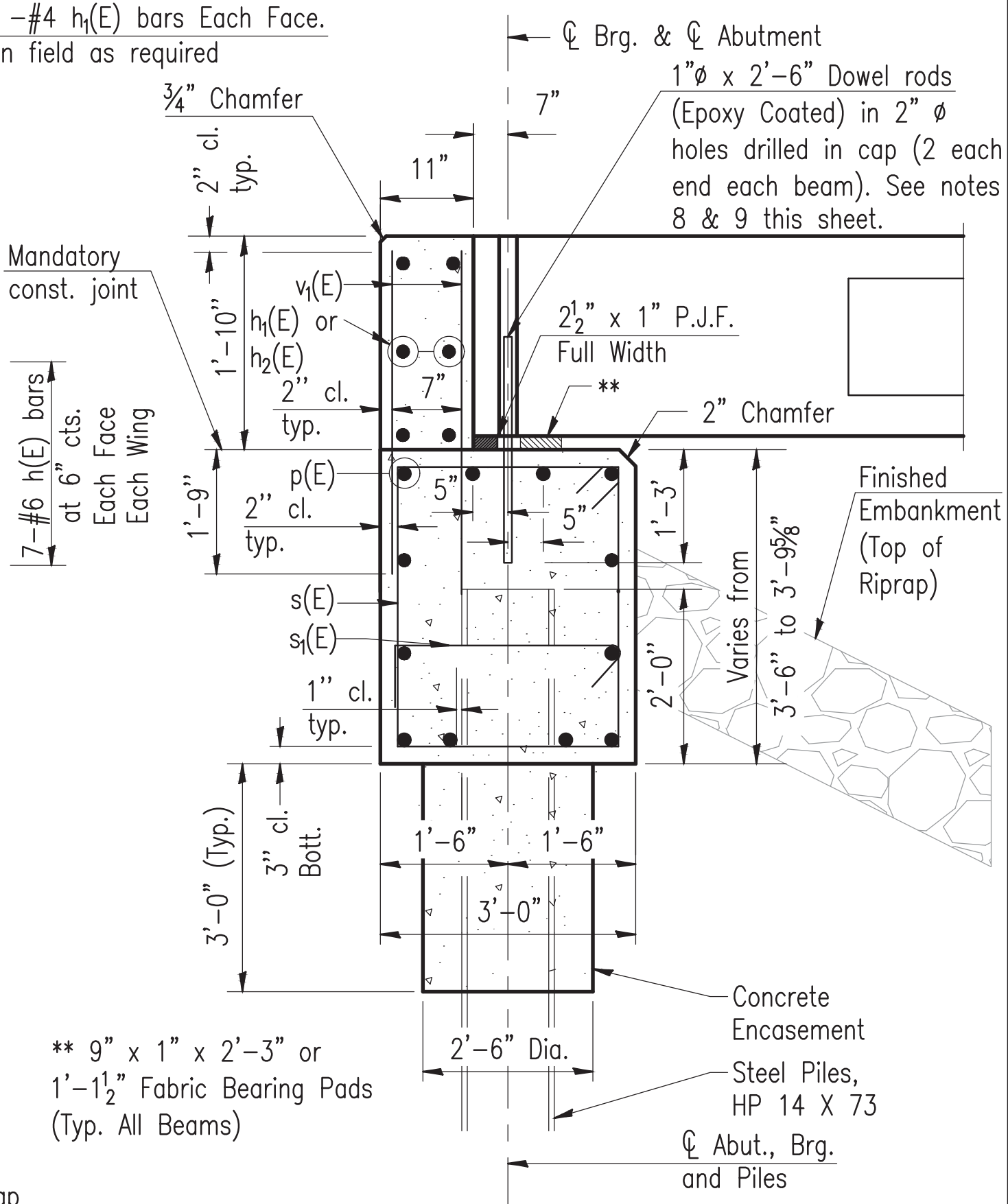
ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 806	20-00130-00-BR	LAWRENCE	24	13
CONTRACT 95931		ILLINOIS	PROJECT XCXN(049)	

Set Name Plate on outside face of East Wing of South Abutment - See Detail This Sheet

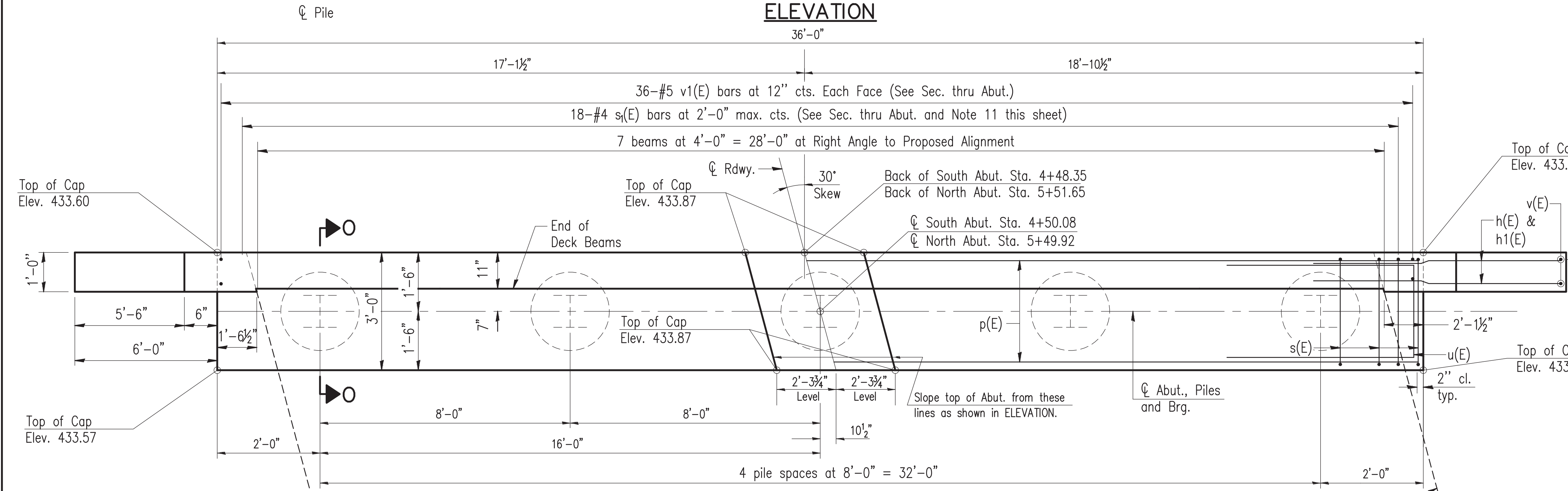


\* Cast top of wingwall and backwall flush with exterior beam face after beams have been erected.

\*\*Along  $\phi$  abutment wingwall - matches 3H:1V roadway side slope.



\*\* 9" x 1" x 2'-3" or 1'-1 1/2" Fabric Bearing Pads (Typ. All Beams)



Top of Cap Elev. 433.60

Top of Cap Elev. 433.87

Top of Cap Elev. 433.57

Top of Cap Elev. 433.87

Top of Cap Elev. 433.60

Top of Cap Elev. 433.57

Top of Cap Elev. 433.60

**SECTION 0-0**  
(At Right Angles)

**BILL OF MATERIAL FOR ONE ABUTMENT**

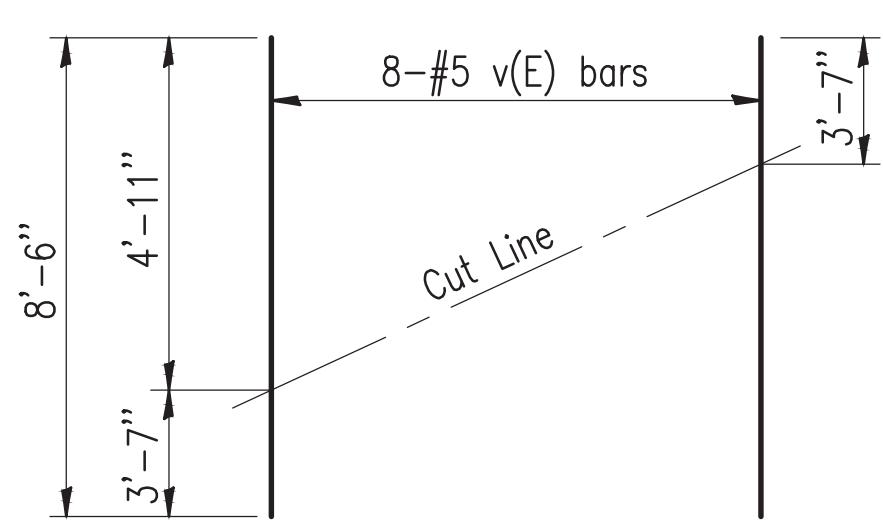
Bar	No.	Size	Length	Shape
h(E)	28	#6	9'-4"	—
h <sub>1</sub> (E)	12	#4	8'-3"	—
h <sub>2</sub> (E)	6	#4	35'-8"	—
p(E)	12	#7	35'-8"	—
s(E)	46	#4	12'-1"	□
s <sub>1</sub> (E)	18	#4	3'-10"	┘
u(E)	8	#6	11'-7"	—
v(E)	16	#5	8'-6"	—
v <sub>1</sub> (E)	72	#5	3'-5"	—
Concrete Structures			Cu. Yd.	19.3
Concrete Encasement			Cu. Yd.	2.75
Reinforcement Bars, Epoxy Coated			Pound	2440
Furnishing Steel Piles HP 14 X 73		Foot	N Abut.	388
			S Abut.	485
Driving Piles		Foot	N Abut.	388
			S Abut.	485
Test Pile Steel HP 14 X 73		Each	N Abut.	1
			S Abut.	0

**PILE DATA SOUTH ABUTMENT**

Type: Steel HP 14 X 73  
 Nominal Required Bearing: 578 kips  
 Factored Resistance Available: 317 kips  
 Est. Length: 97 Feet/Pile  
 No. Production Piles: 5  
 No. Test Piles: 0

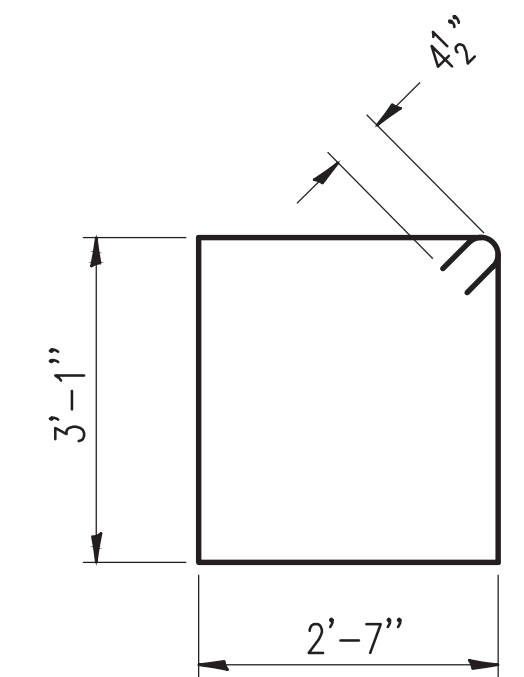
**PILE DATA NORTH ABUTMENT**

Type: Steel HP HP 14 X 73  
 Nominal Required Bearing: 578 kips  
 Factored Resistance Available: 317 kips  
 Est. Length: 97 Feet/Pile  
 No. Production Piles: 4  
 No. Test Piles: 1

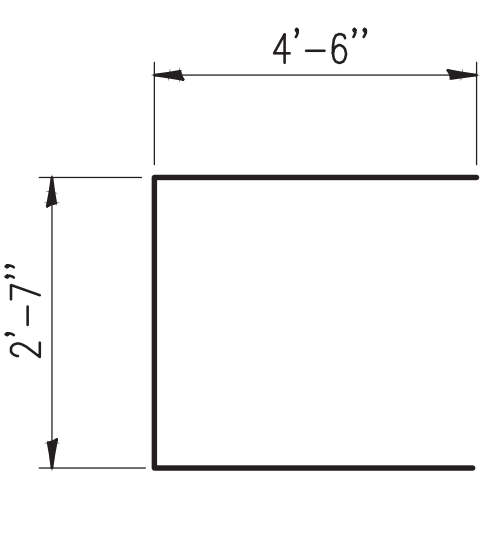


**FIELD CUTTING DIAGRAM**

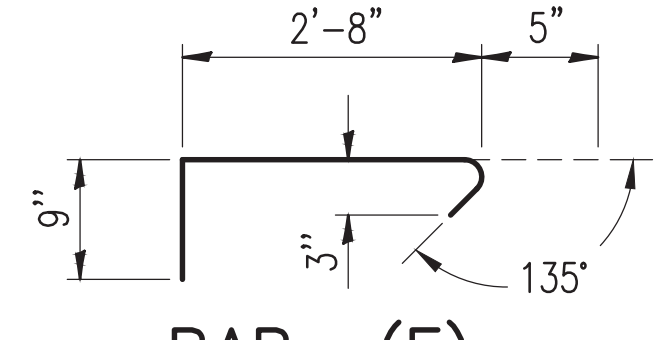
Order v(E) bars full length. Cut as shown and use remainder of bars in opposite face.



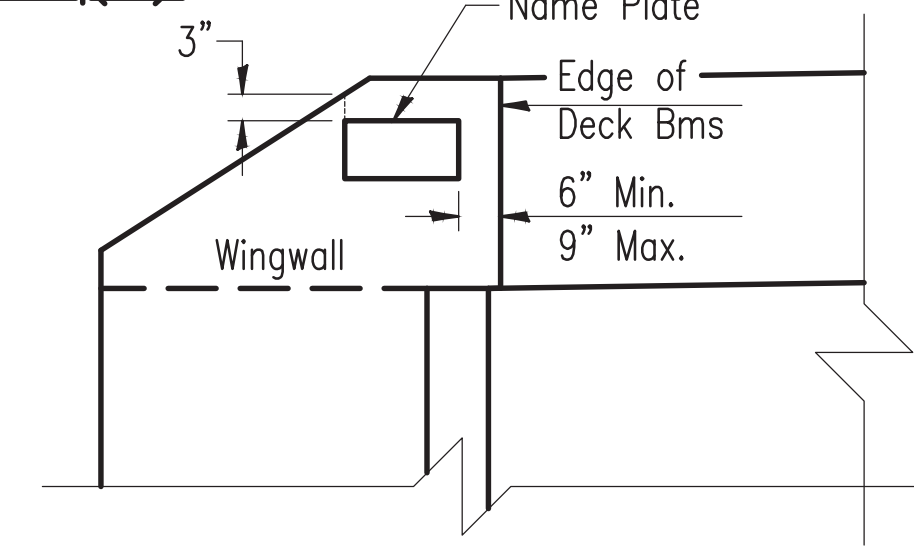
**BAR s<sub>1</sub>(E)**



**BAR u(E)**



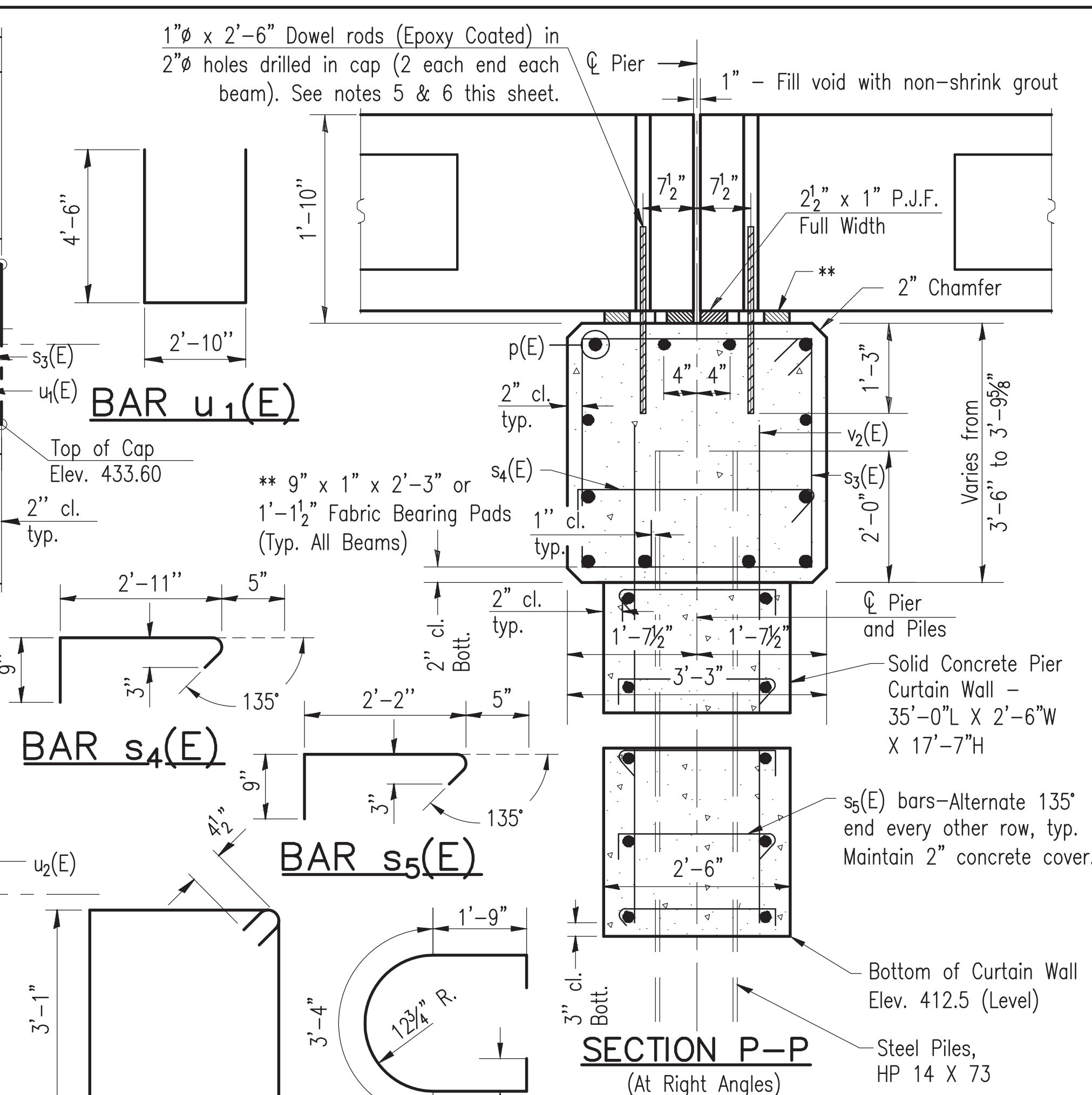
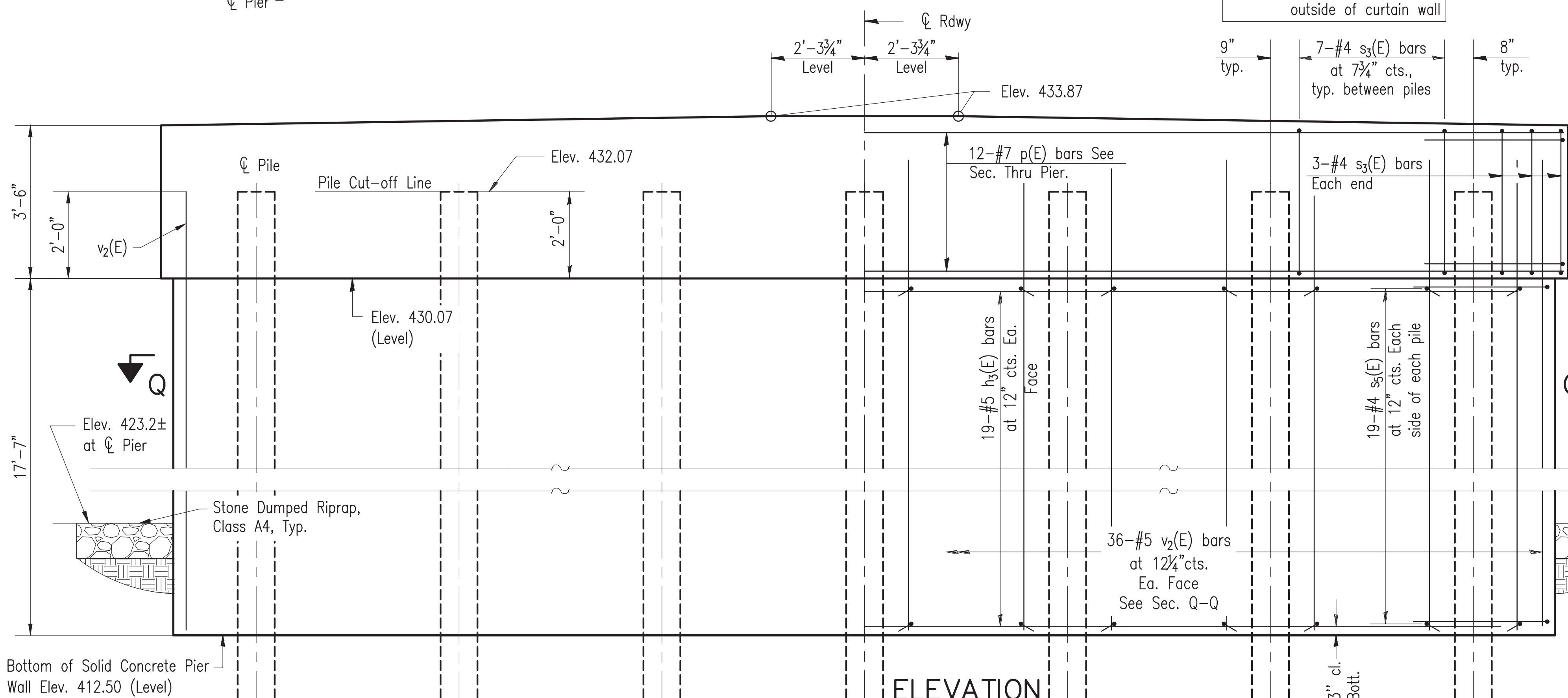
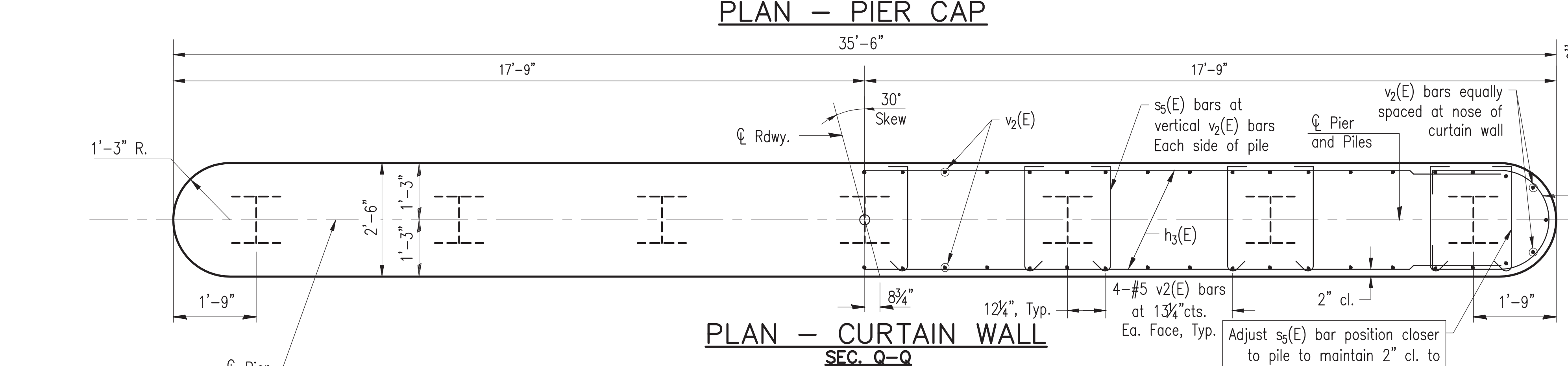
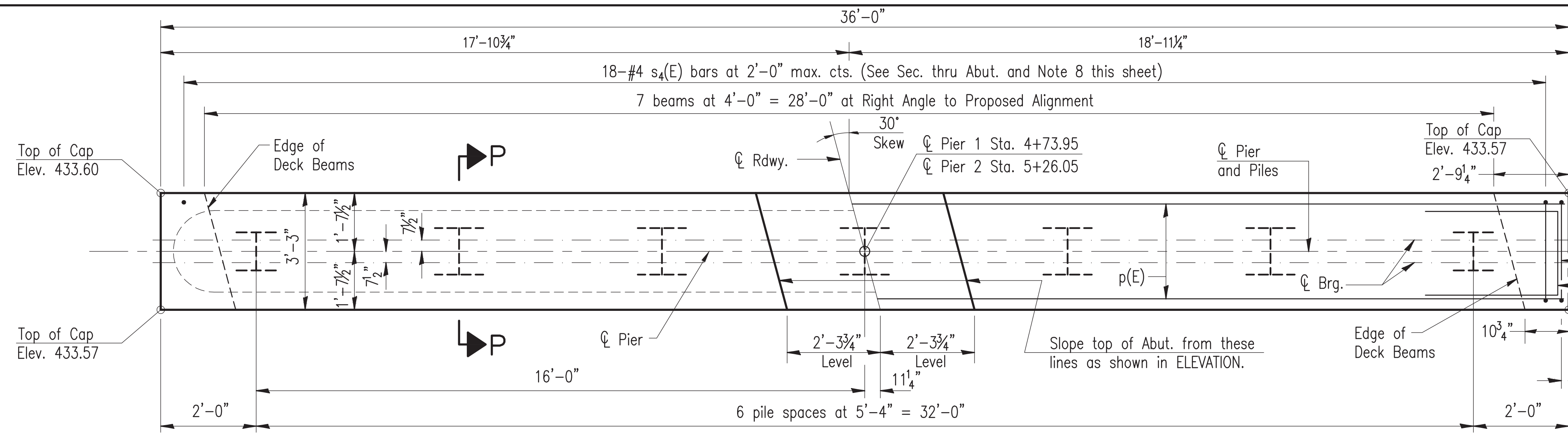
**BAR s<sub>1</sub>(E)**



**NAME PLATE PLACEMENT**

**GENERAL NOTES:**

- Cast backwalls and top of wingwalls after beams have been erected. Top of wingwall and backwall shall be cast flush with exterior beam face.
- The backwalls and the portion of the wingwalls above the mandatory construction joint shall be cast against the in-place beam.
- Extend "h(E)" bars into the abutment cap.
- For details of piles and Concrete Encasement, see sheet 16 of 24.
- Drawings not to scale.
- All clearances between rebar and form surface shall be 2" unless otherwise noted.
- Reinforcement bars shall conform to the requirements of ASTM A 706 Grade 60 (Illinois Modified).
- Space reinforcement in cap to miss PPCDB dowel rods.
- Dowel rods shall be grouted after beams are in place and allowed to cure (min. 24 hrs.) prior to start of grouting deck beam longitudinal keyways.
- All exposed edges shall have a standard 3/4" chamfer unless otherwise noted or as directed by the Engineer.
- s<sub>1</sub>(E) bars: Alternate the position of the 90° and 135° hooked ends between adjacent s<sub>1</sub>(E) bars.
- Reinforcement bars designated (E) shall be epoxy coated.
- All dimensions of bent bars are out-to-out.



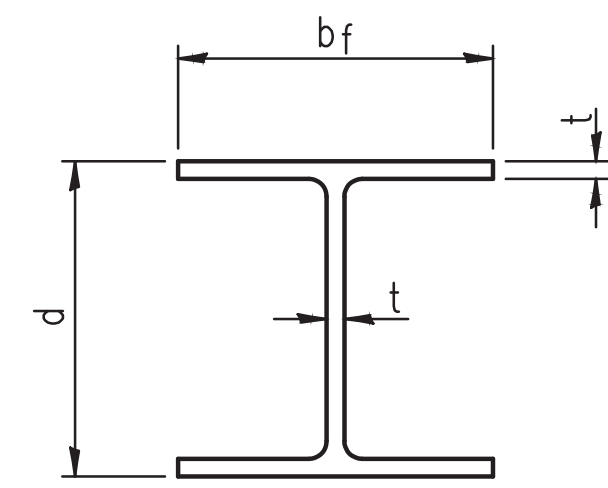
**BILL OF MATERIAL-1 PIER**

Bar	No.	Size	Length	Shape
h <sub>3</sub> (E)	38	#5	33'-0"	—
p(E)	12	#7	35'-8"	—
s <sub>3</sub> (E)	48	#4	12'-9"	□
s <sub>4</sub> (E)	18	#4	4'-1"	┌
s <sub>5</sub> (E)	266	#4	3'-4"	┌
u <sub>1</sub> (E)	8	#6	11'-10"	—
u <sub>2</sub> (E)	38	#5	8'-6"	C
v <sub>2</sub> (E)	72	#5	19'-4"	—
Concrete Structures			Cu. Yd.	72.8
Reinforcement Bars, Epoxy Coated			Pound	5170
Furnishing Steel Piles HP 14 X 73	Foot	Pier #1		582
		Pier #2		679
Driving Piles	Foot	Pier #1		582
		Pier #2		679
Test Pile Steel HP 14 X 73	Each	Pier #1		1
		Pier #2		0

- GENERAL NOTES:**
- Extend "v<sub>2</sub>(E)" bars into pier cap.
  - For details of piles see sheet 16 of 24.
  - Drawings not to scale.
  - All clearances between rebar and form surface shall be 2" unless otherwise noted.
  - Space reinforcement in cap to miss PPCDB dowel rods.
  - Dowel rods shall be grouted after beams are in place and allowed to cure (min. 24 hrs.) prior to start of grouting deck beam longitudinal keyways.
  - All exposed edges shall have a standard 3/4" chamfer unless otherwise noted or as directed by the Engineer.
  - s<sub>4</sub>(E) bars: Alternate the position of the 90° and 135° hooked ends between adjacent s<sub>4</sub>(E) bars.
  - Reinforcement bars designated (E) shall be epoxy coated.
  - All dimensions of bent bars are out-to-out.

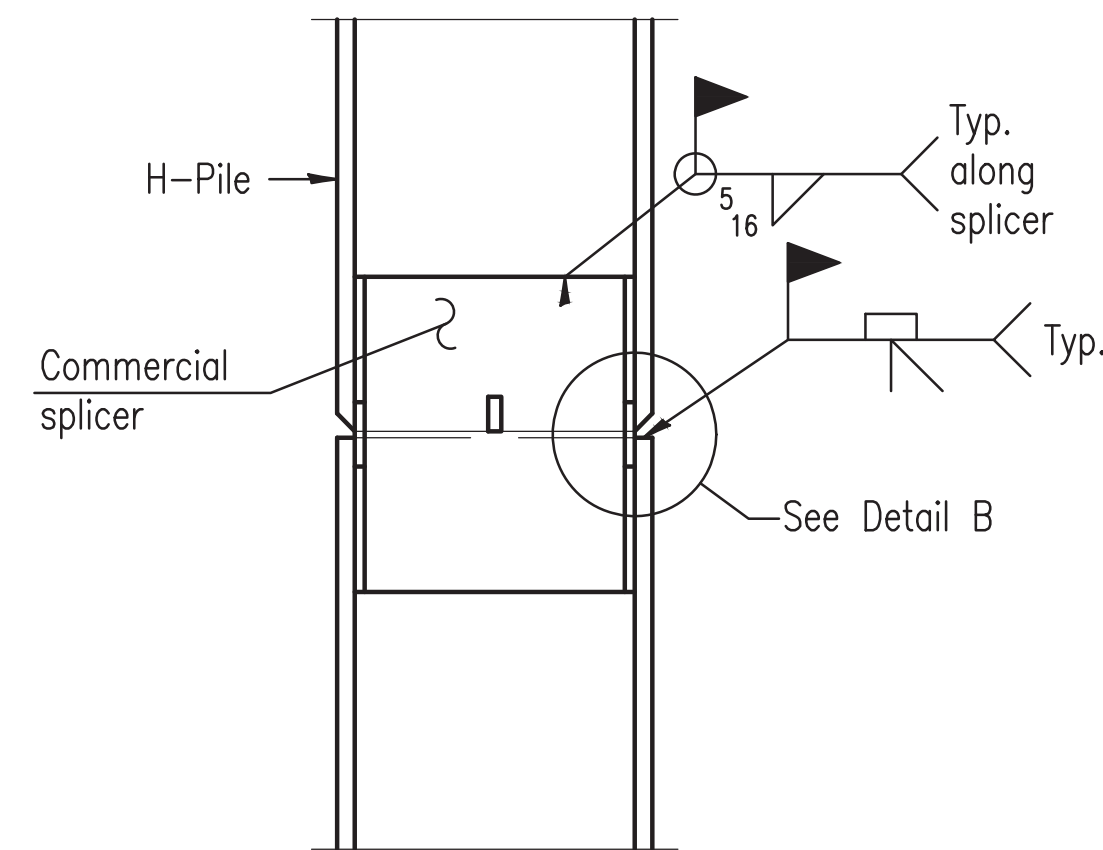
**PILE DATA**

Pier	Type	Nominal Required Bearing	Factored Resistance Available	Est. Length	No. Production Piles	No. Test Piles
Pier 1:	HP 14 X 73	578 kips	317 kips	97 Feet	6	1
Pier 2:	HP 14 X 73	578 kips	317 kips	97 Feet	7	0

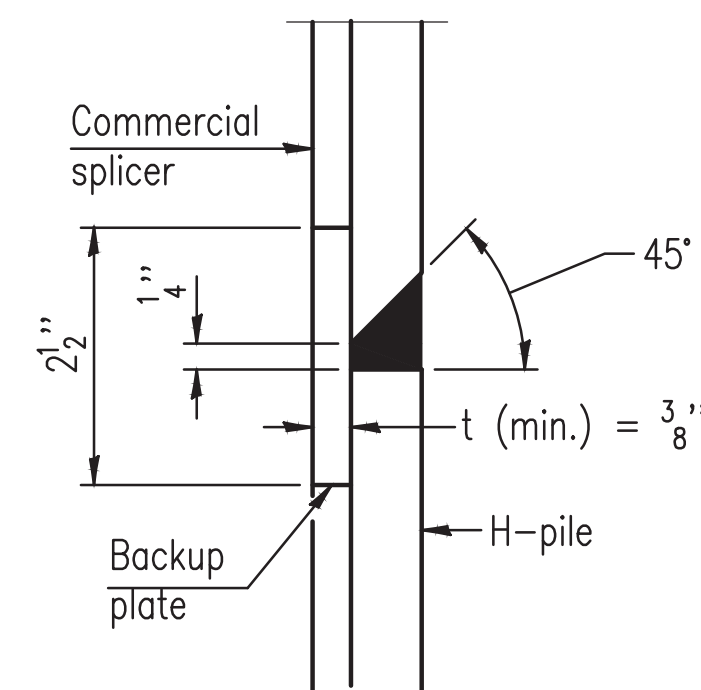


**STEEL PILE TABLE**

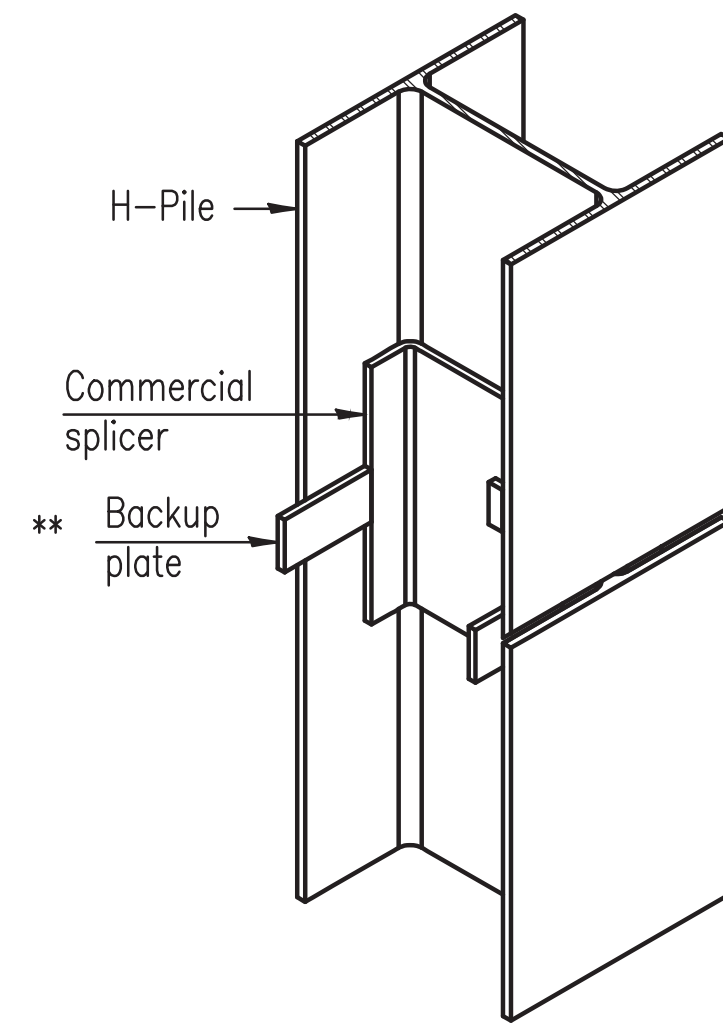
Designation	Depth d	Flange width bf	Web and Flange thickness t	Encasement diameter A
HP 14x73	13 <sup>5</sup> / <sub>8</sub> "	14 <sup>5</sup> / <sub>8</sub> "	1/2"	30"



**ELEVATION**

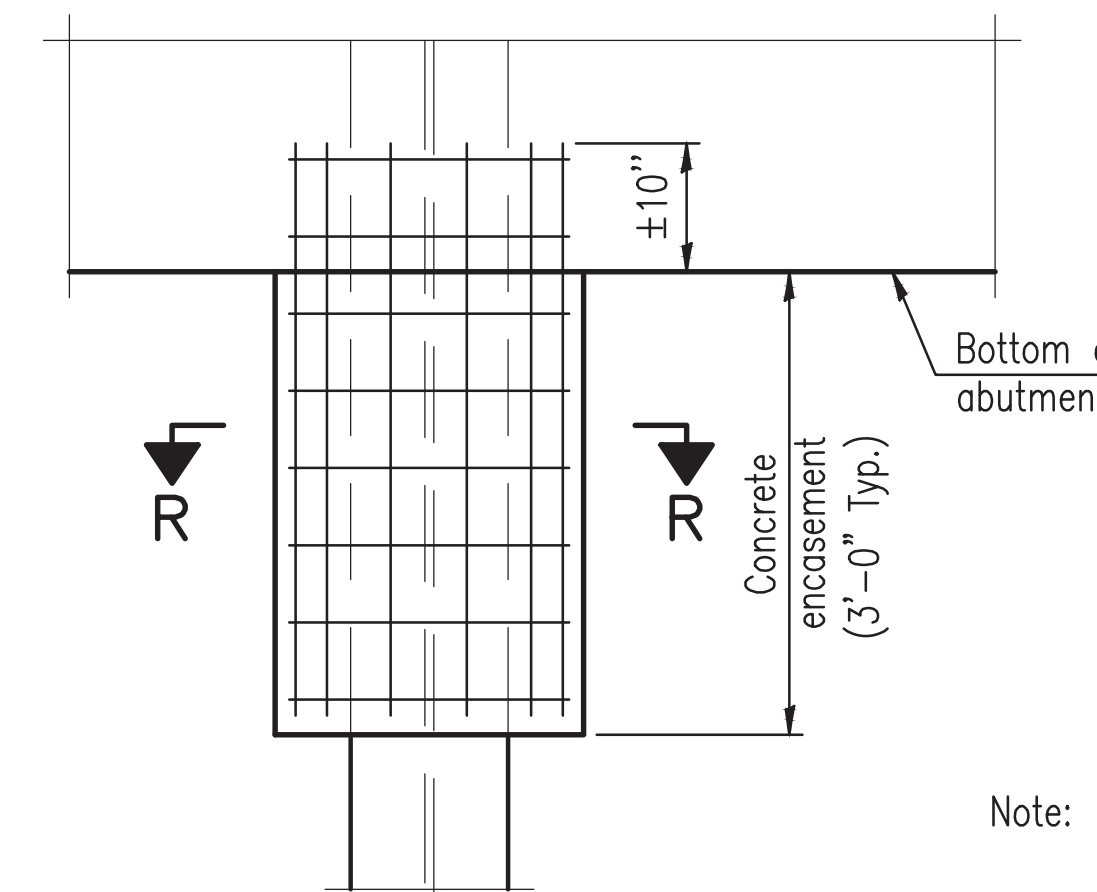


**DETAIL "B"**



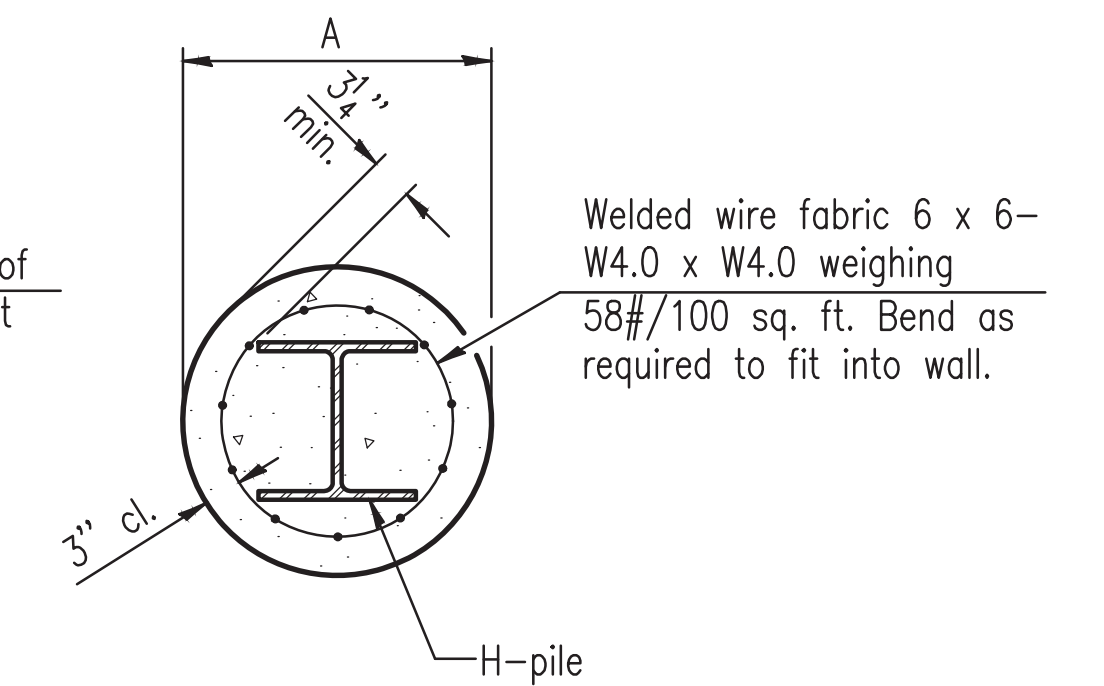
**ISOMETRIC VIEW**

**WELDED COMMERCIAL SPLICE**



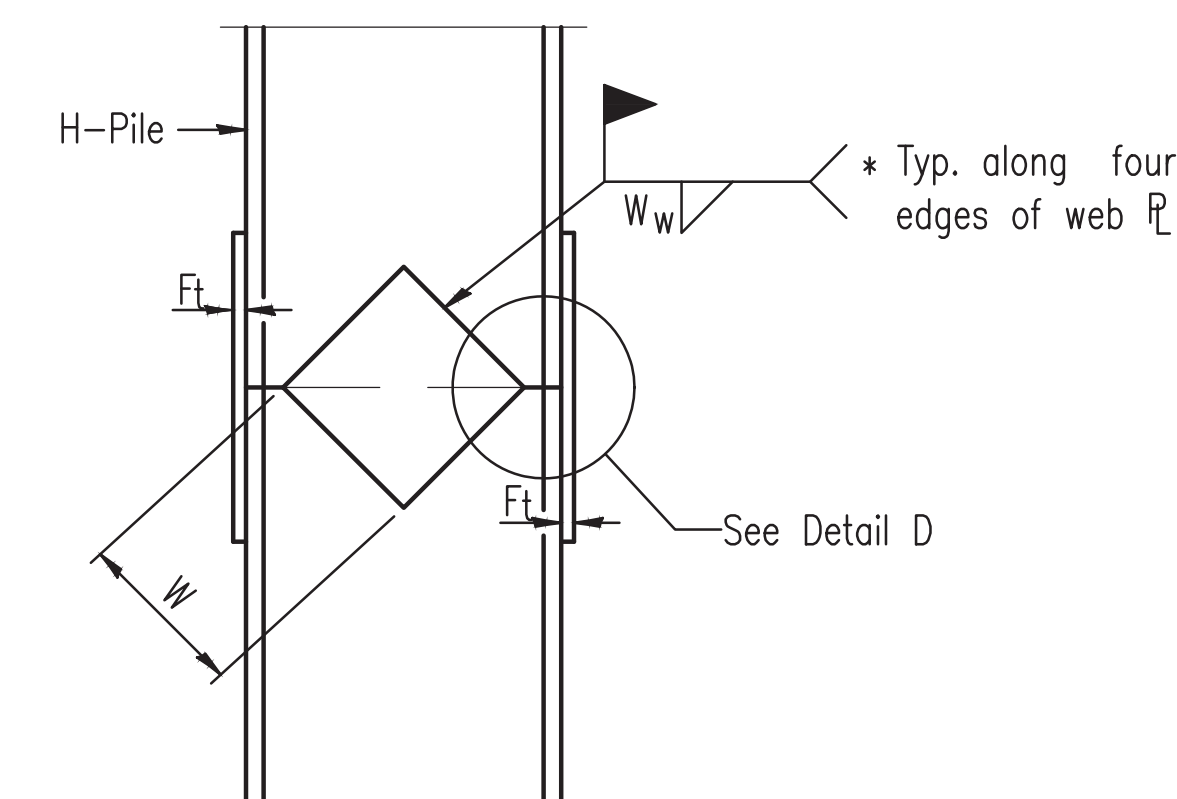
**ELEVATION DRIVEN PILES**

**PILE ENCASEMENT**

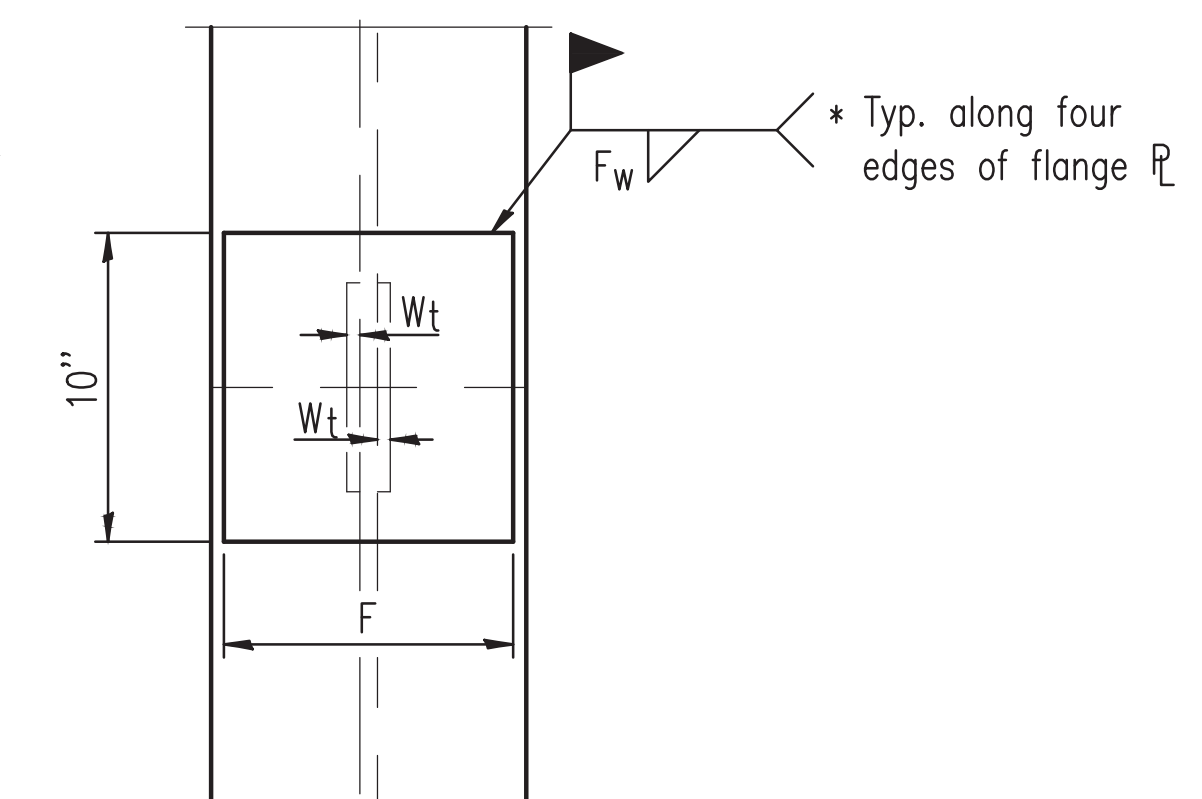


Note: Forms for encasement may be omitted when soil conditions permit. If soil conditions are not favorable to use the soil as forms, the Contractor shall provide forms; the cost for the forms and all labor to install forms shall be included in item "Concrete Encasement."

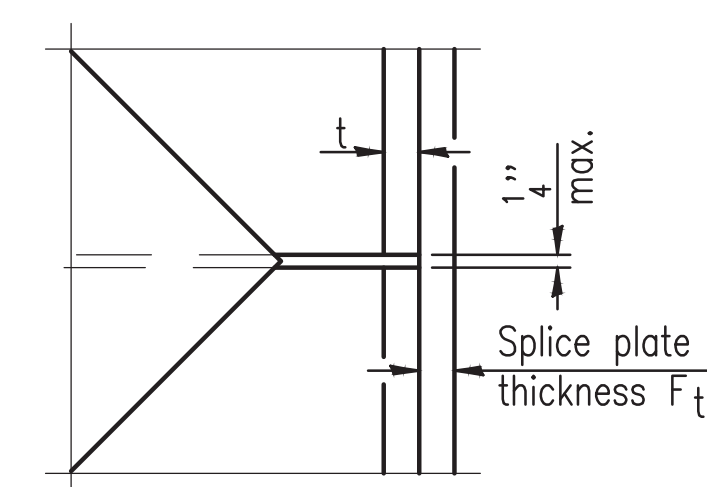
**SECTION R-R**



**ELEVATION**



**END VIEW**

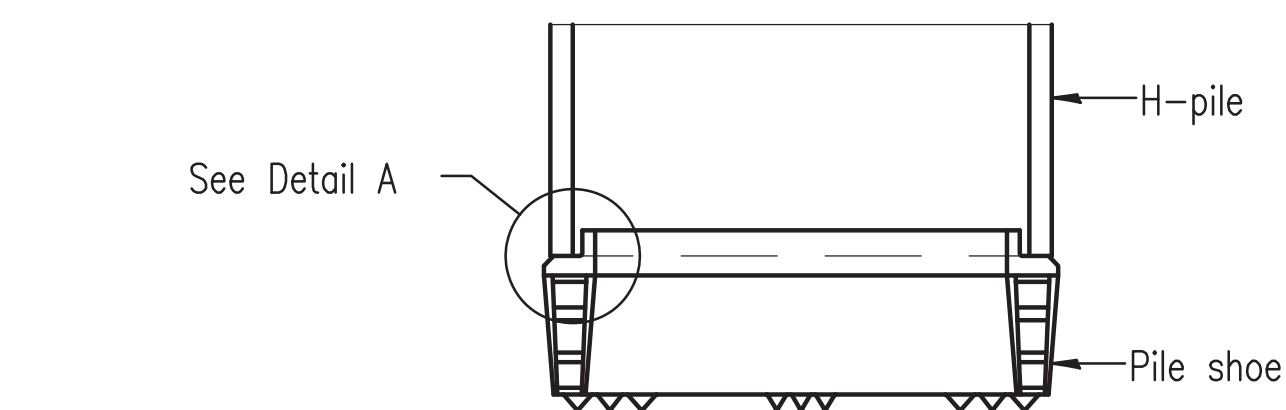


**DETAIL D**

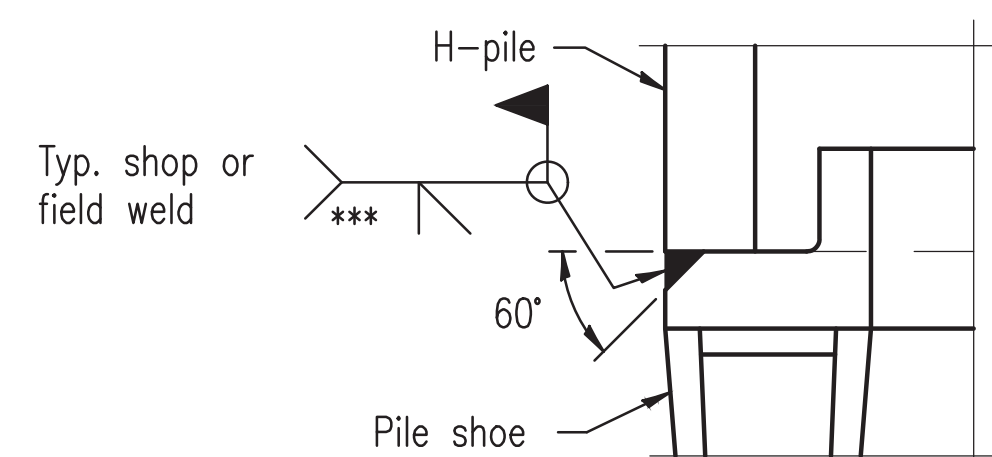
Designation	F	F <sub>t</sub>	F <sub>w</sub>	W	W <sub>t</sub>	W <sub>w</sub>
HP 14x73	12 <sup>1</sup> / <sub>2</sub> "	5/8"	9/16"	7 <sup>3</sup> / <sub>4</sub> "	5/8"	1/2"

**WELDED PLATE FIELD SPLICE**

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

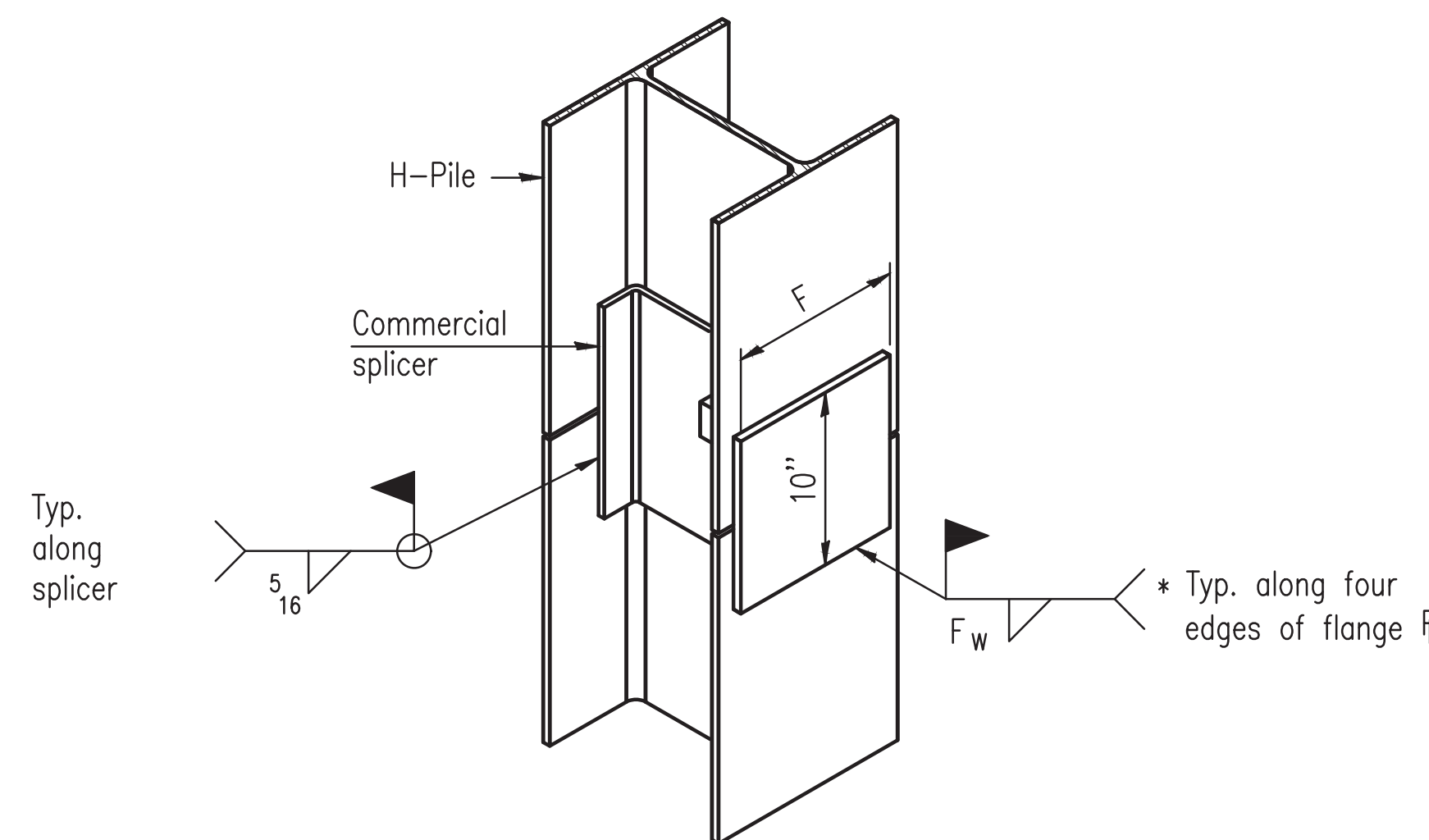


**ELEVATION**



**DETAIL A**

**H-PILE SHOE ATTACHMENT**



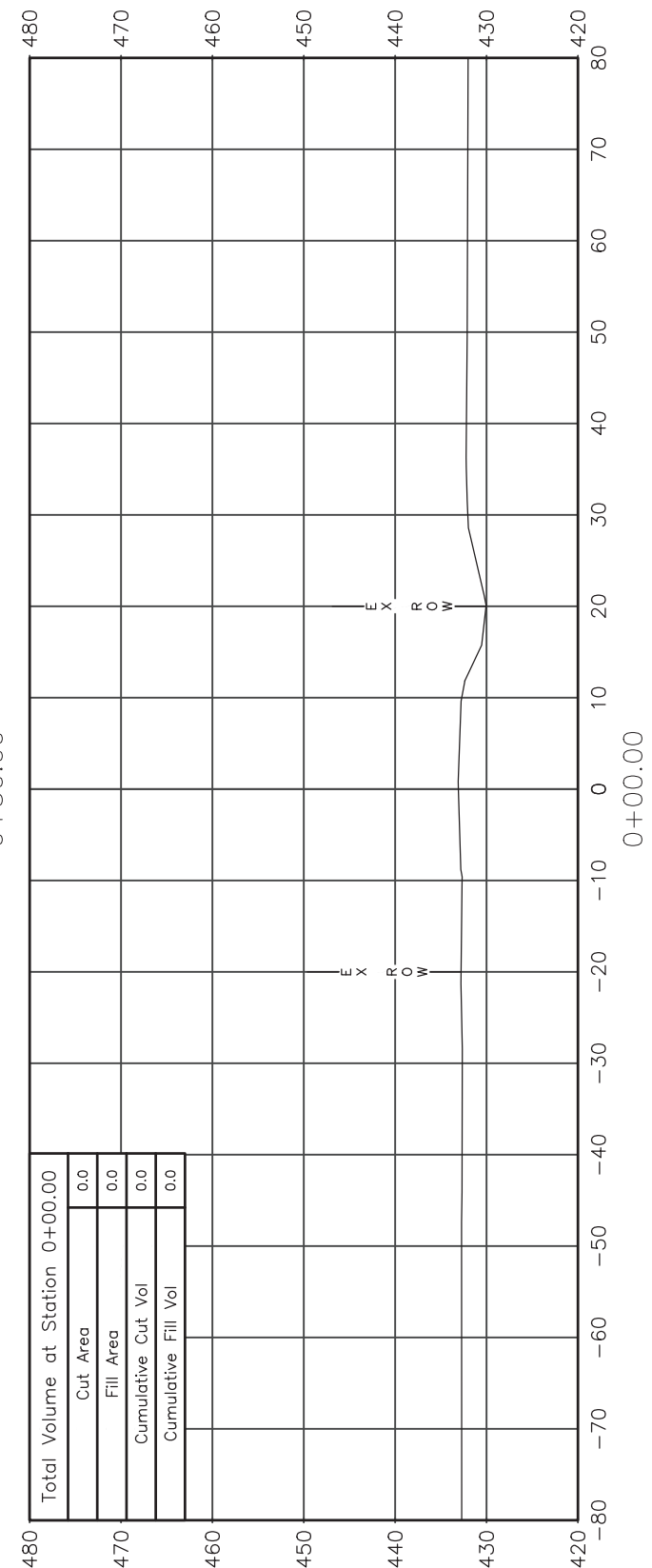
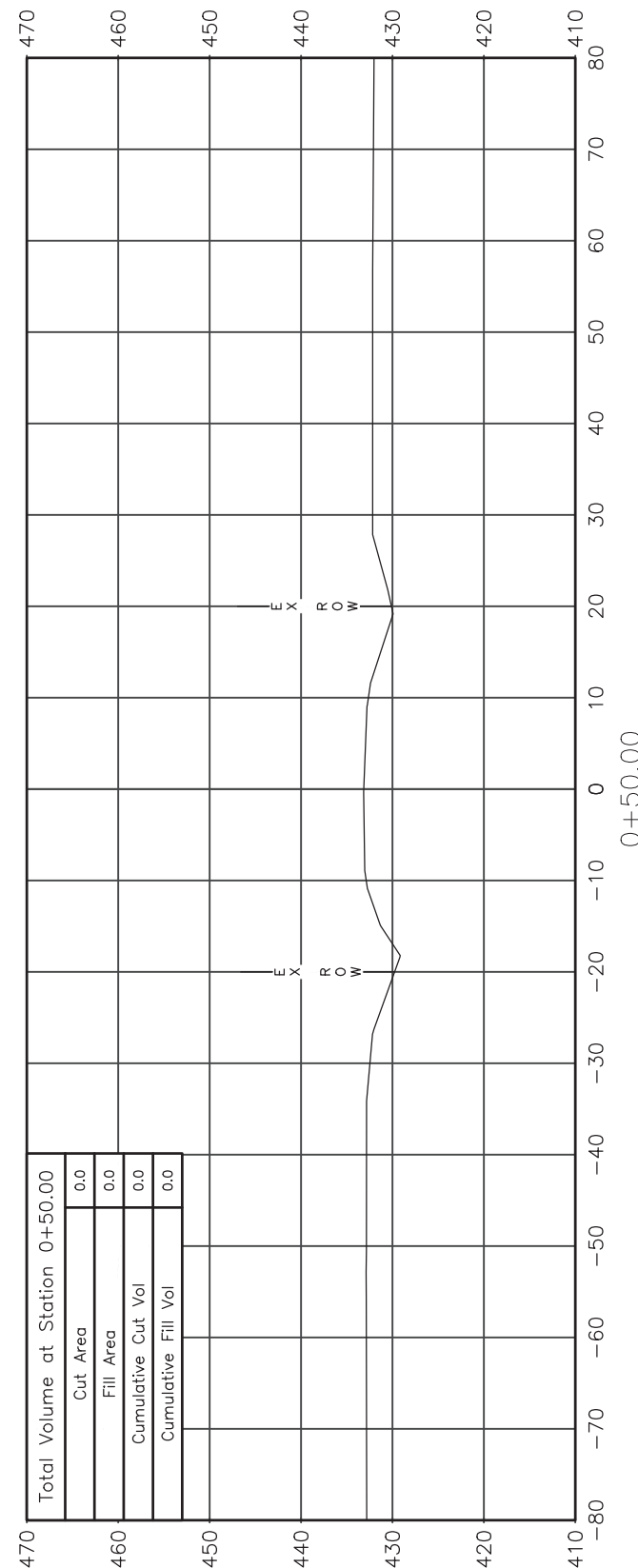
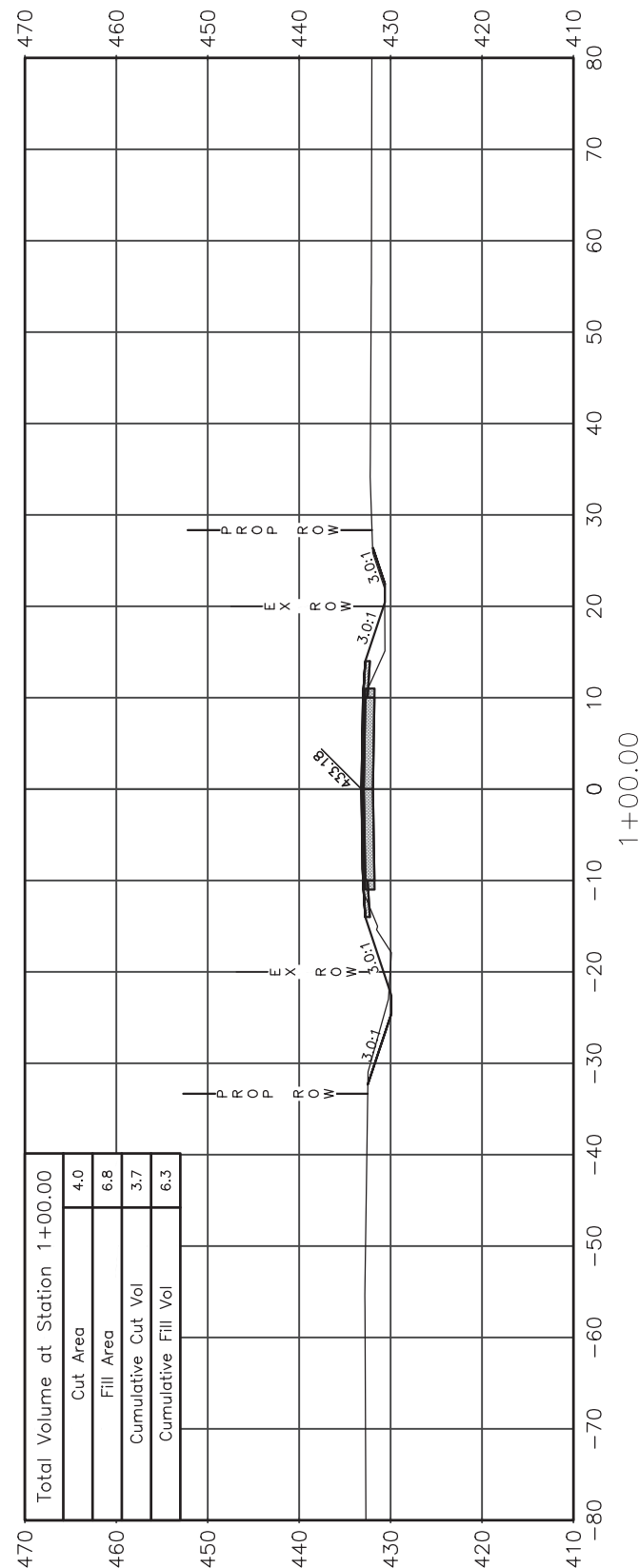
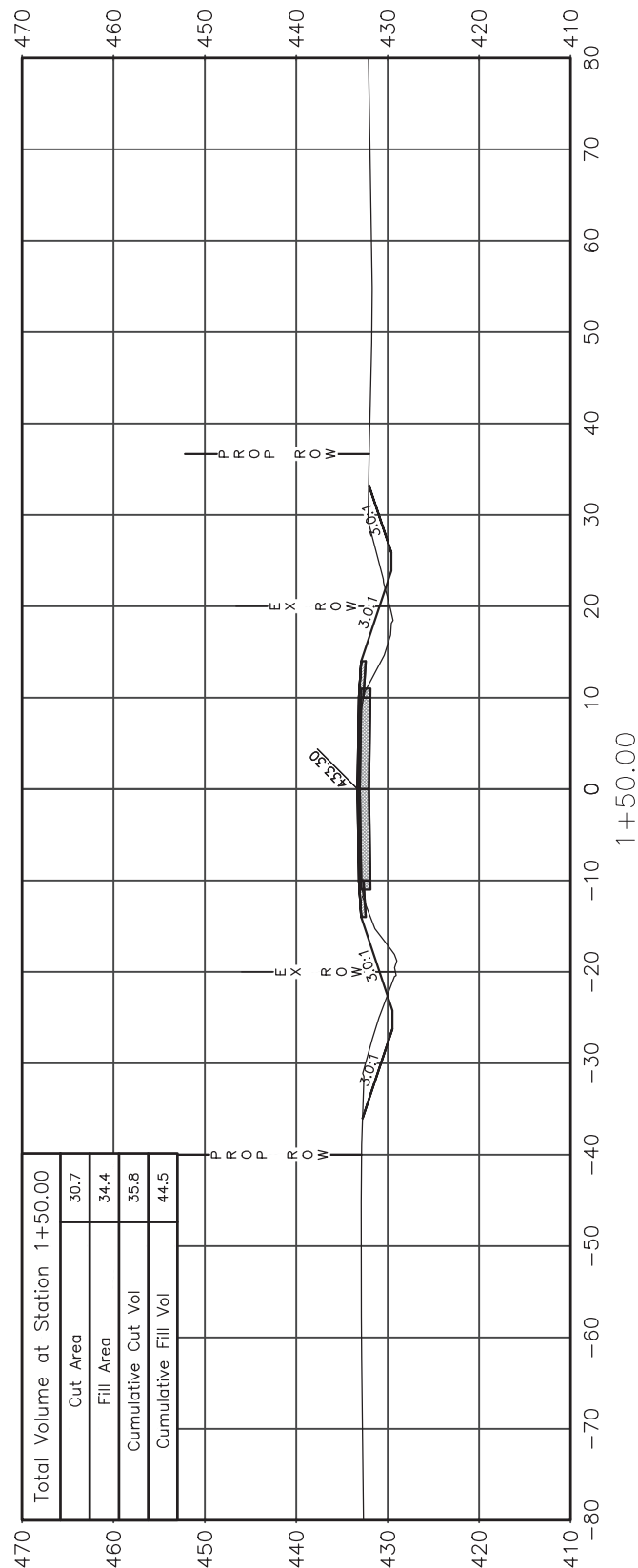
**ISOMETRIC VIEW**

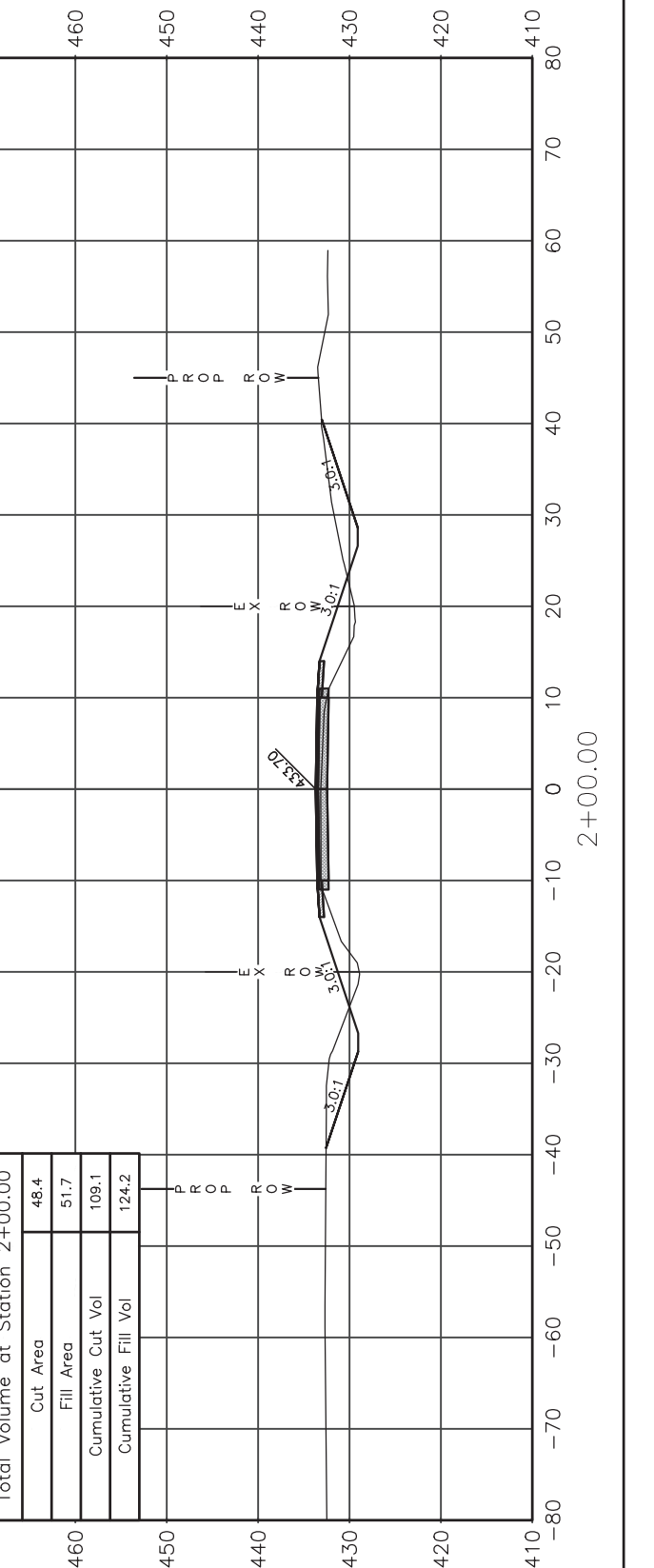
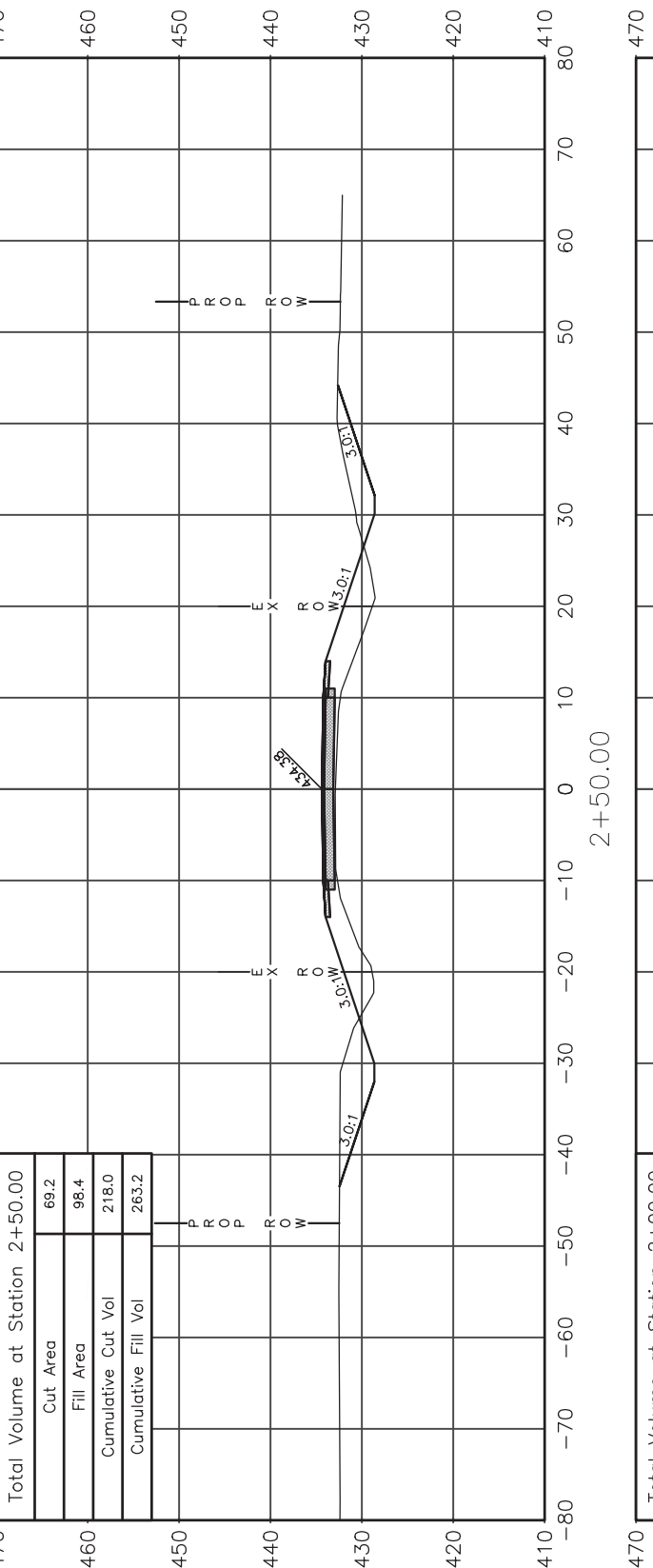
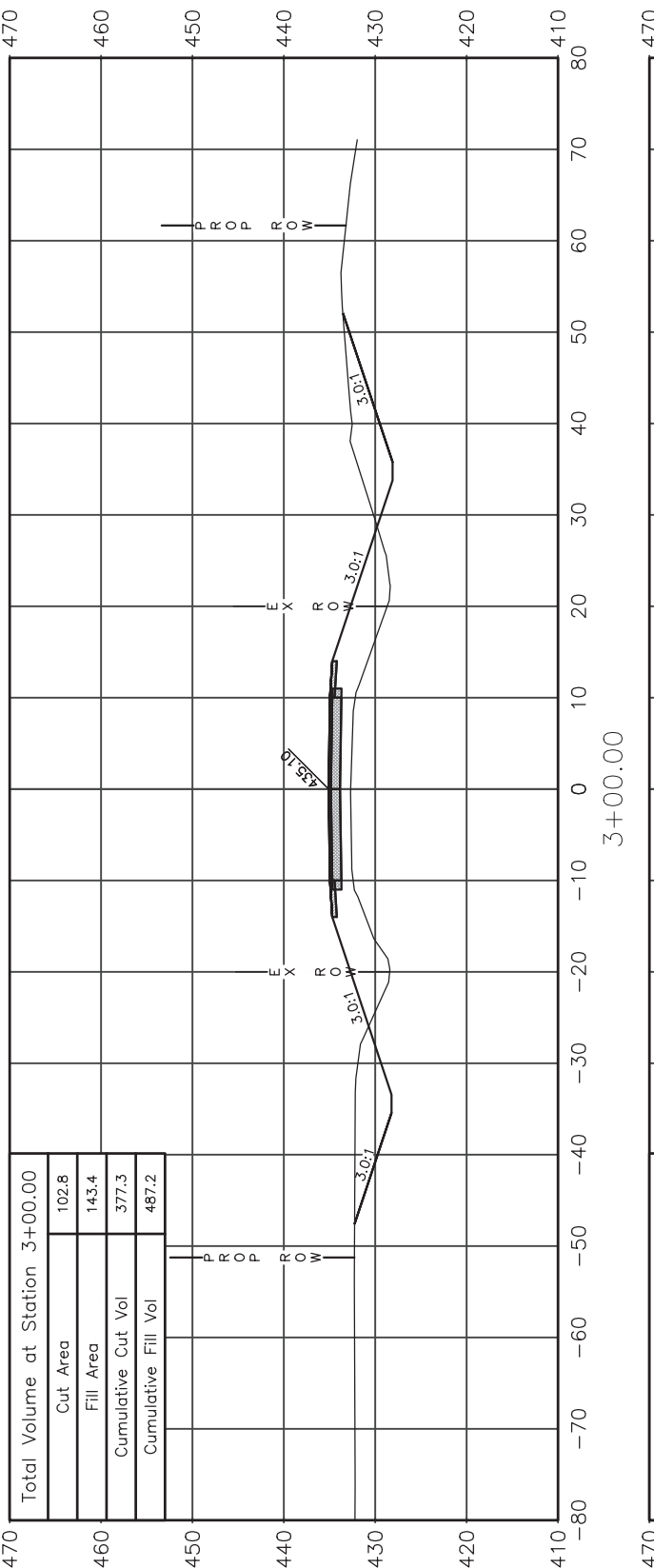
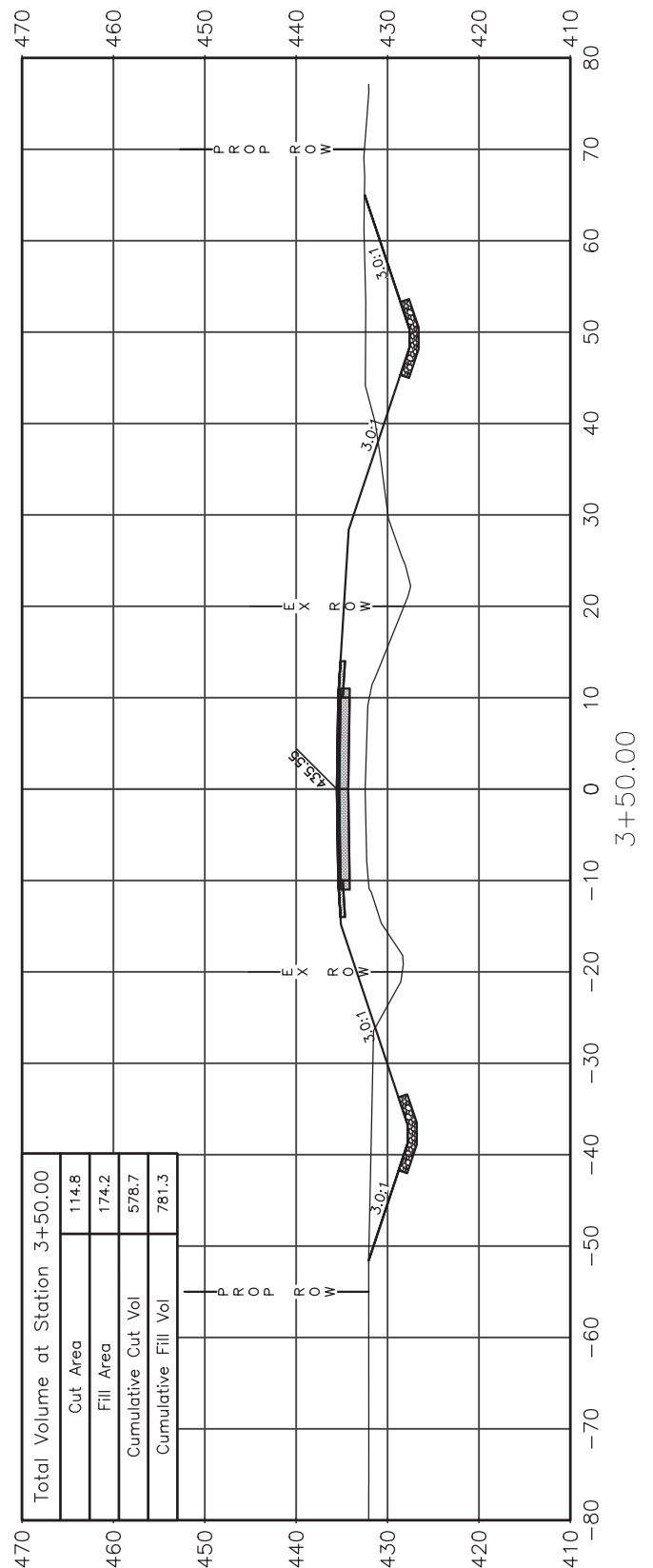
**WELDED COMMERCIAL SPLICE ALTERNATE**

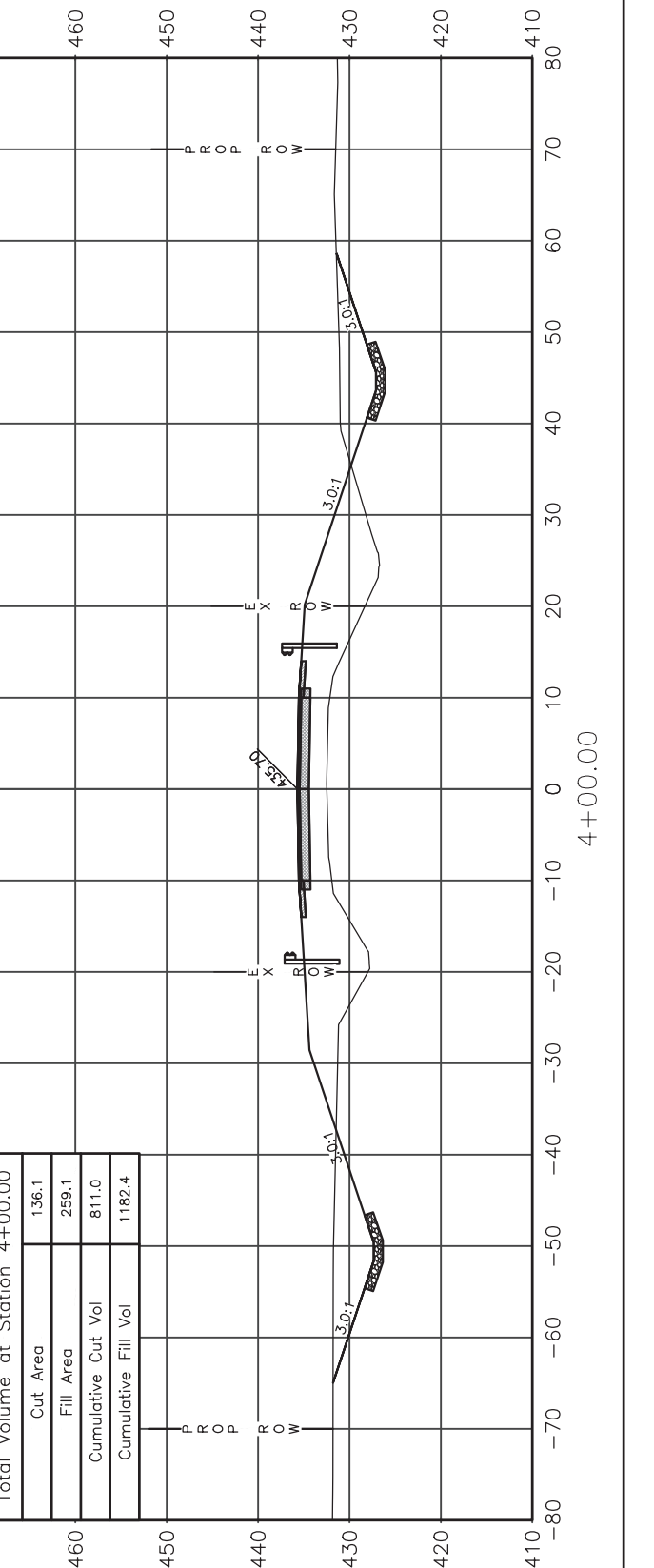
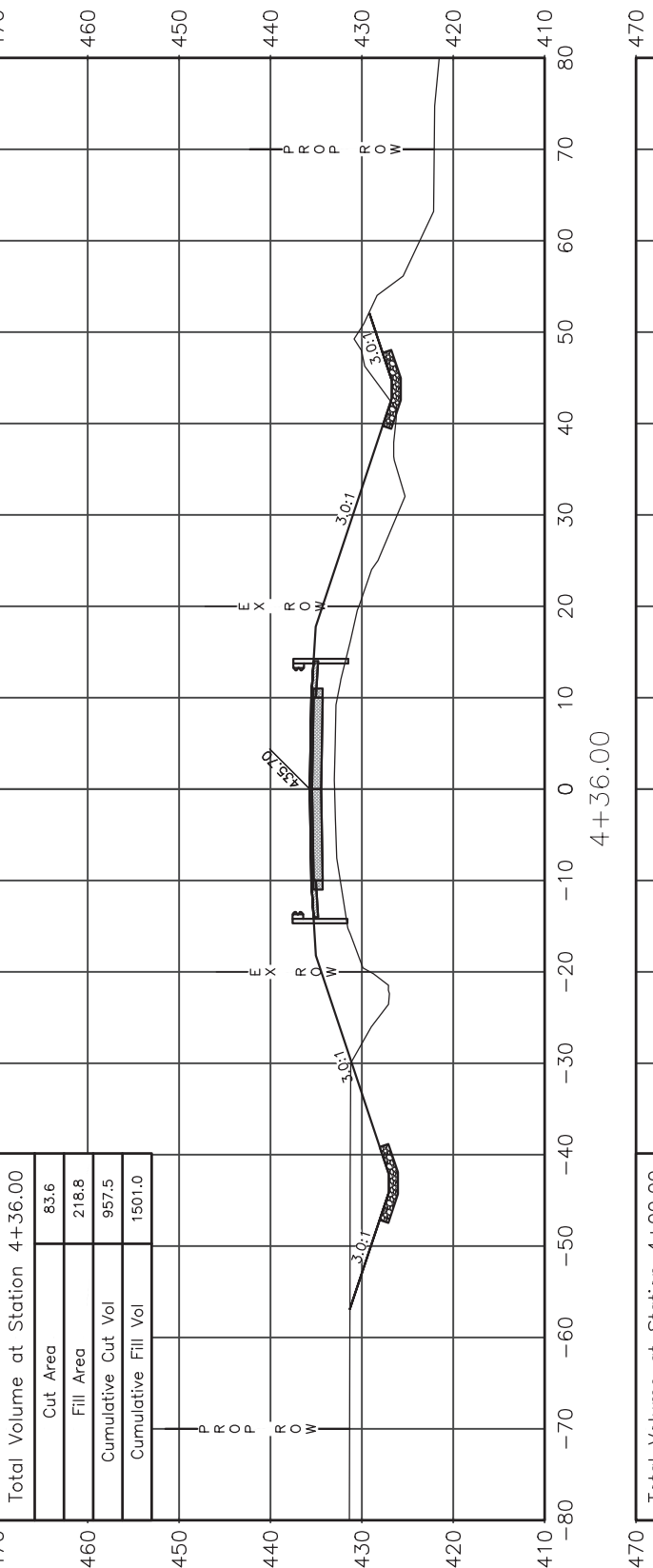
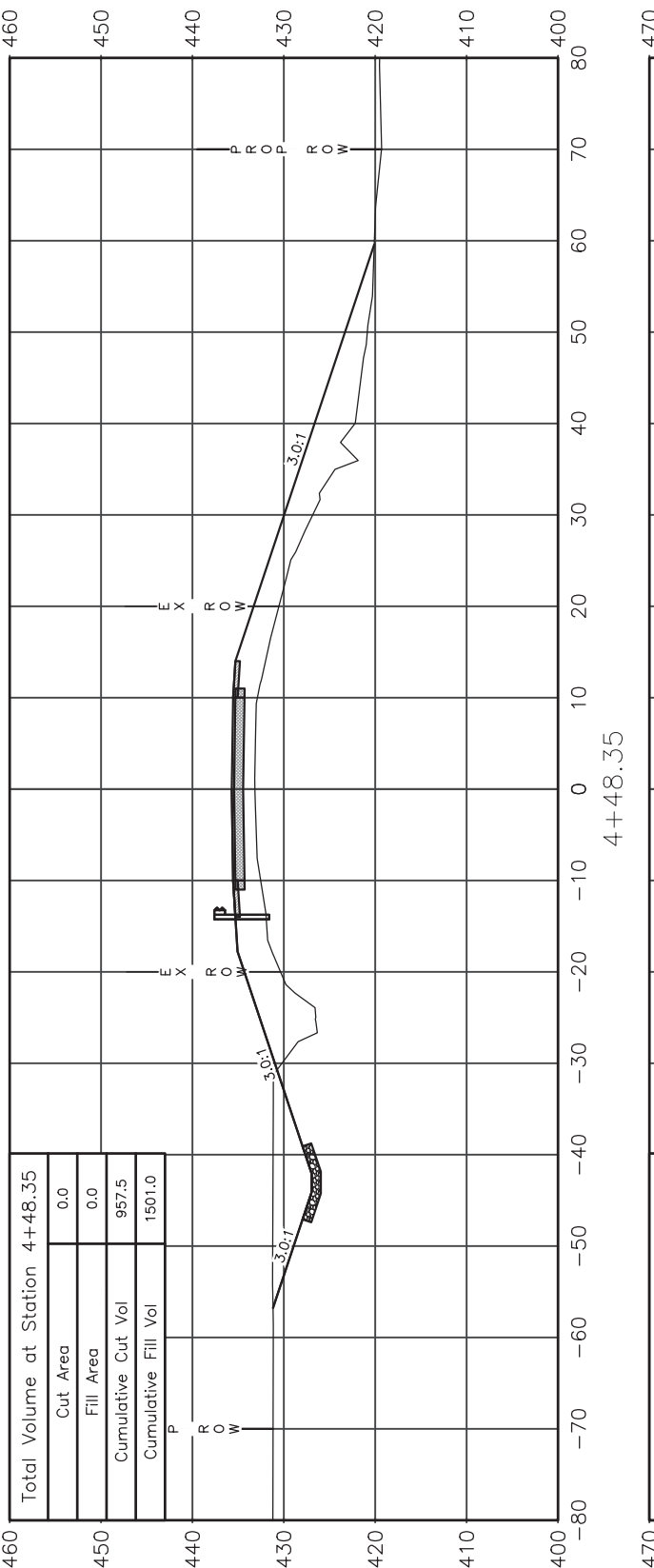
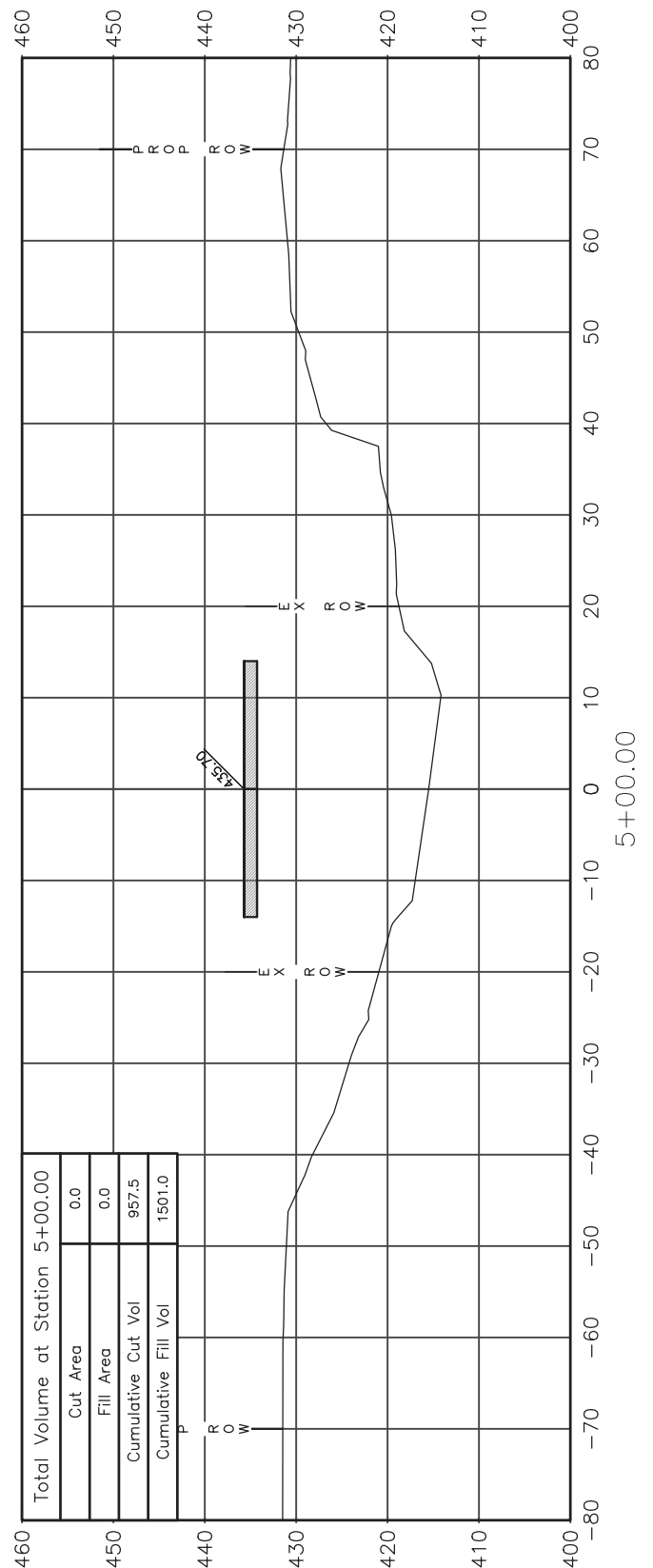
- \* Interrupt welds 1/4" from end of web and/or each flange.
- \*\* Remove portions of backup plates that extend outside the flanges.
- \*\*\*Weld size per pile shoe manufacturer (5/16" min.).

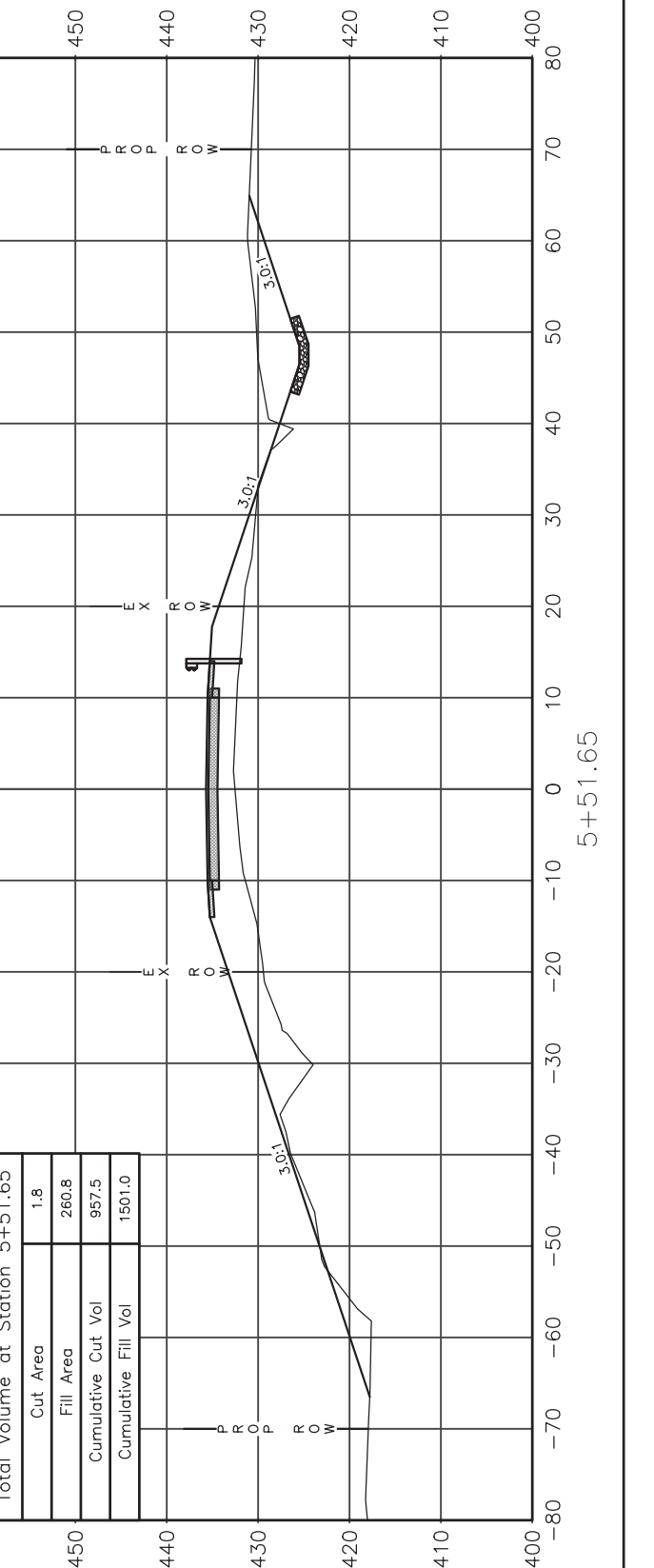
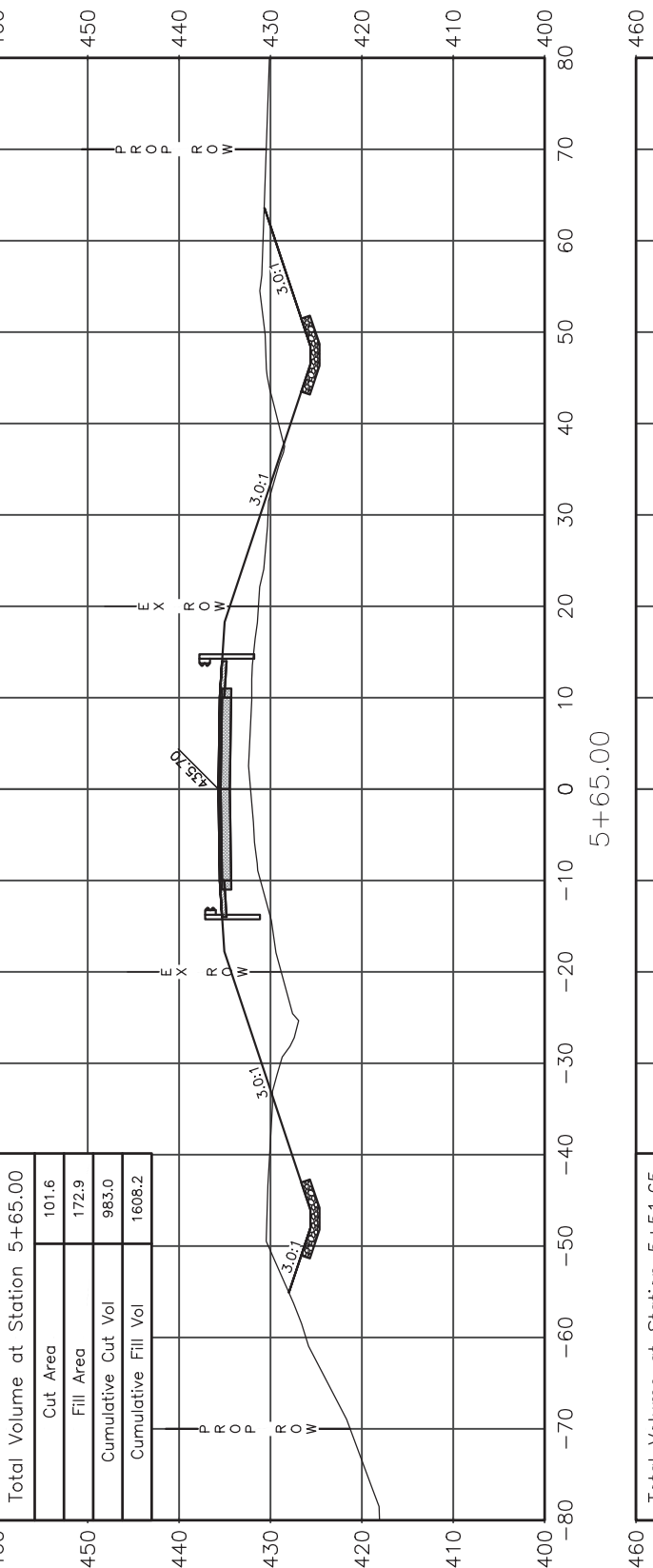
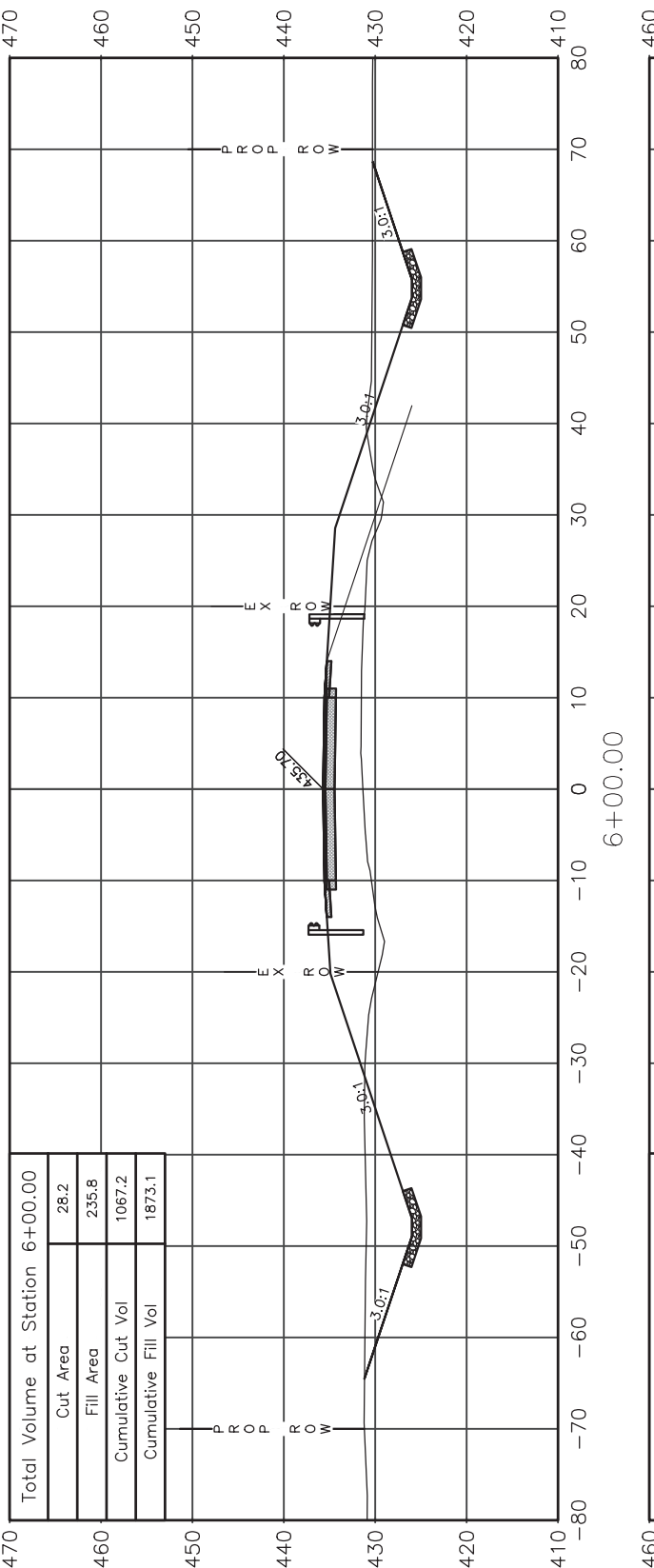
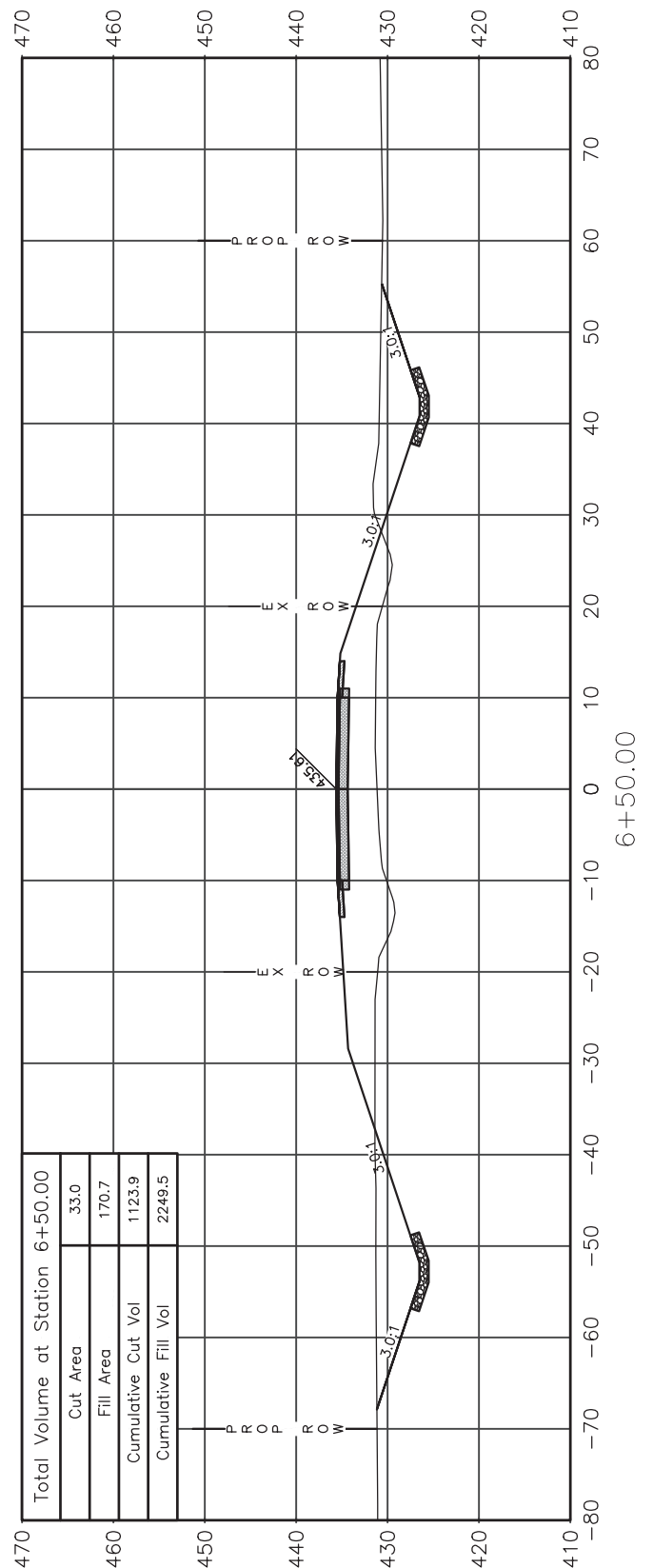












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 ILLINOIS DEPARTMENT OF PROFESSIONAL REGULATION REGISTRATION #184.003513

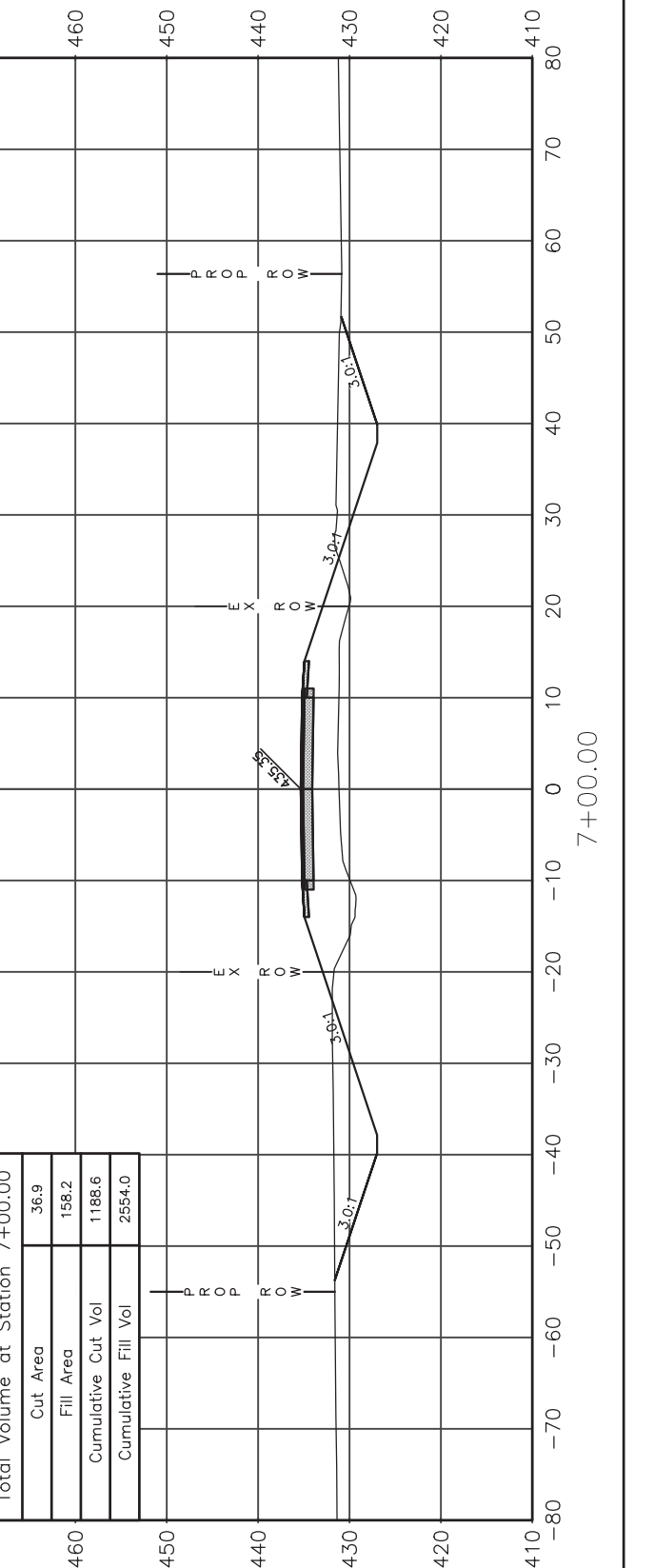
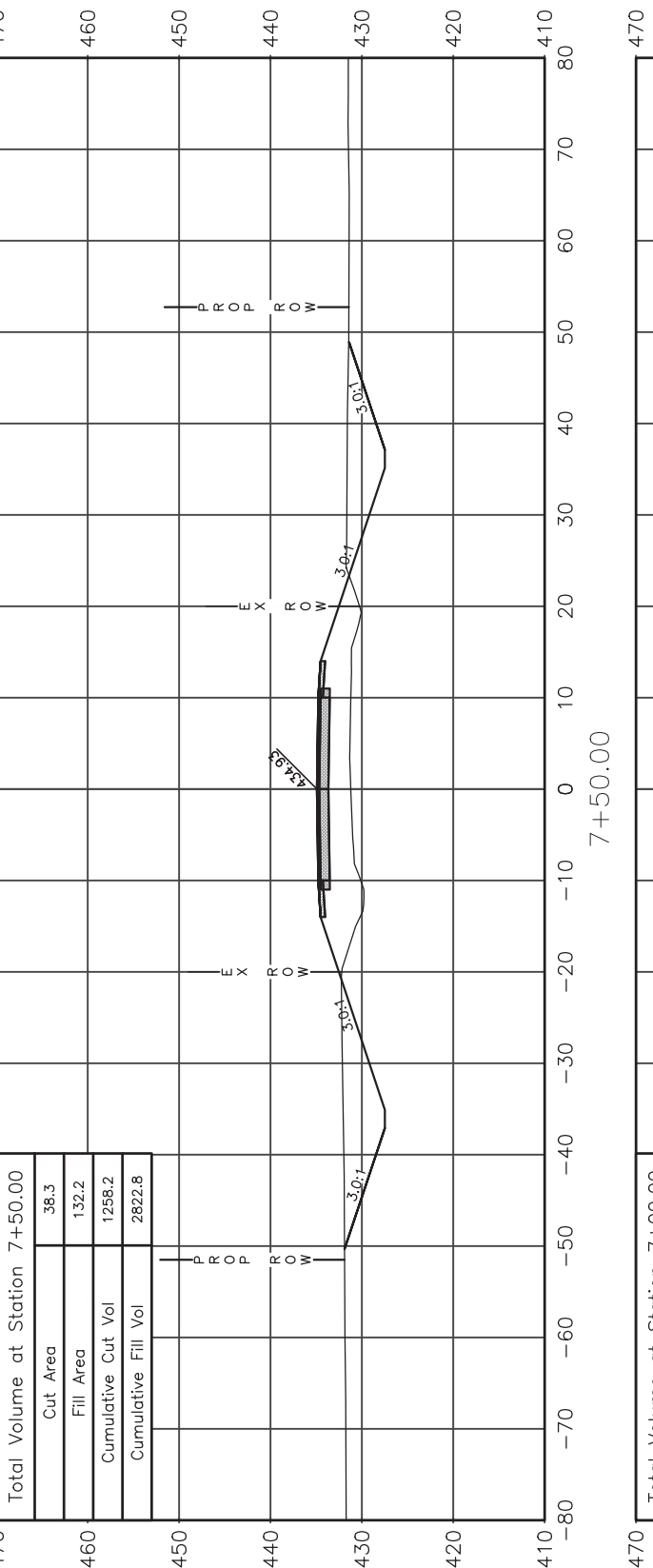
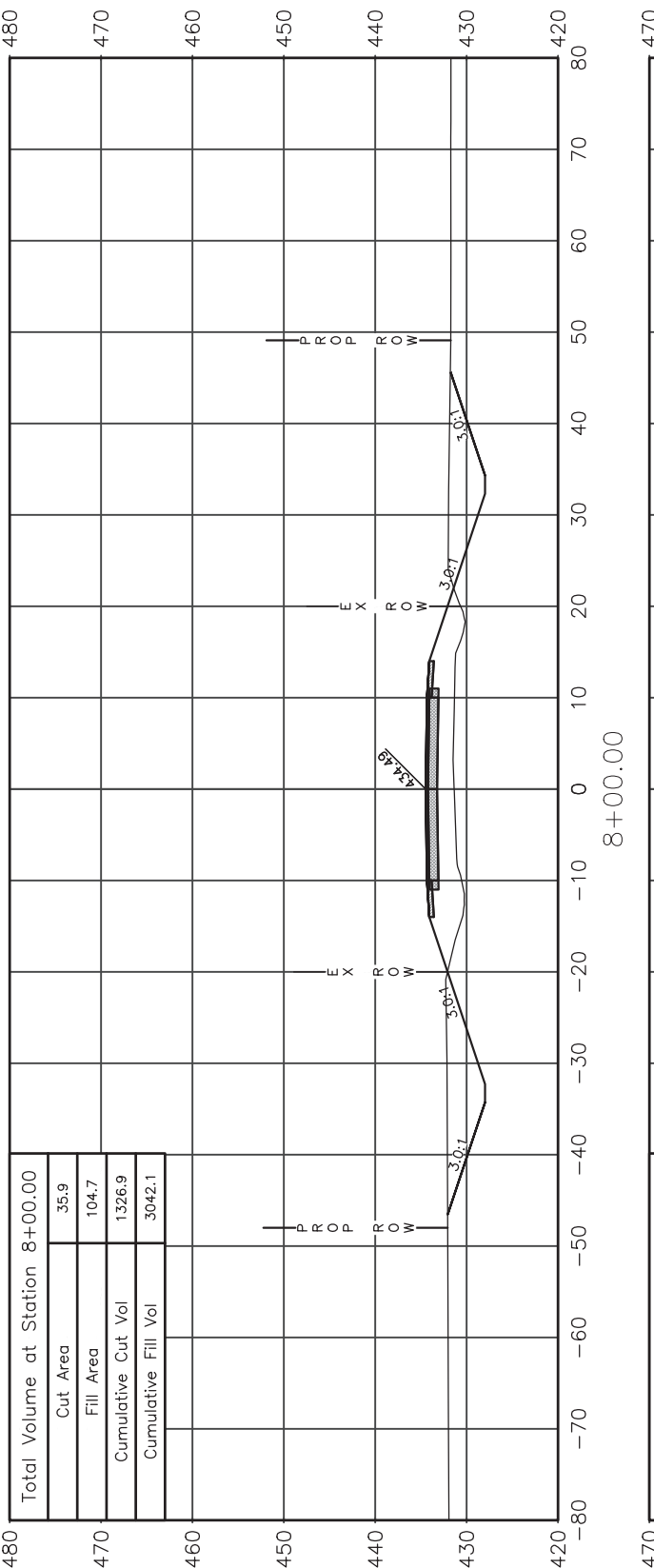
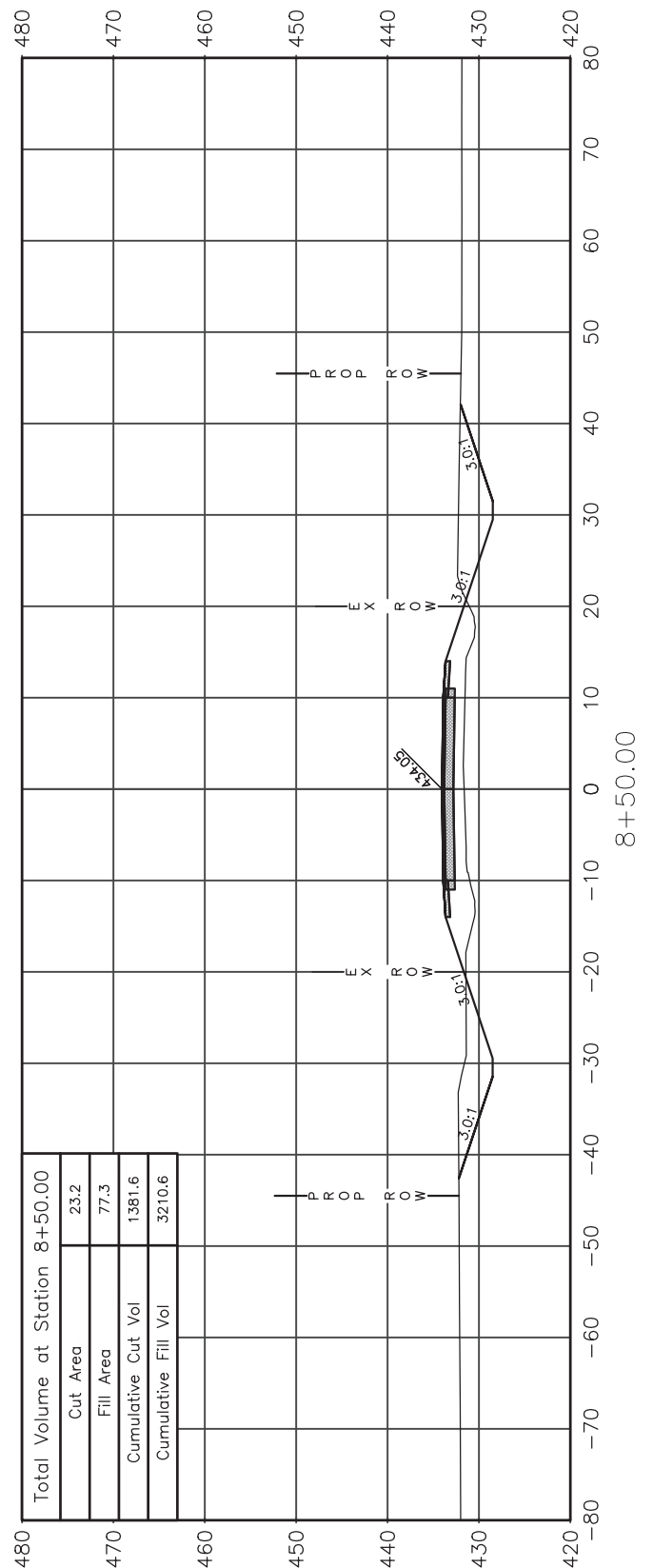
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 DATE - 2-2022

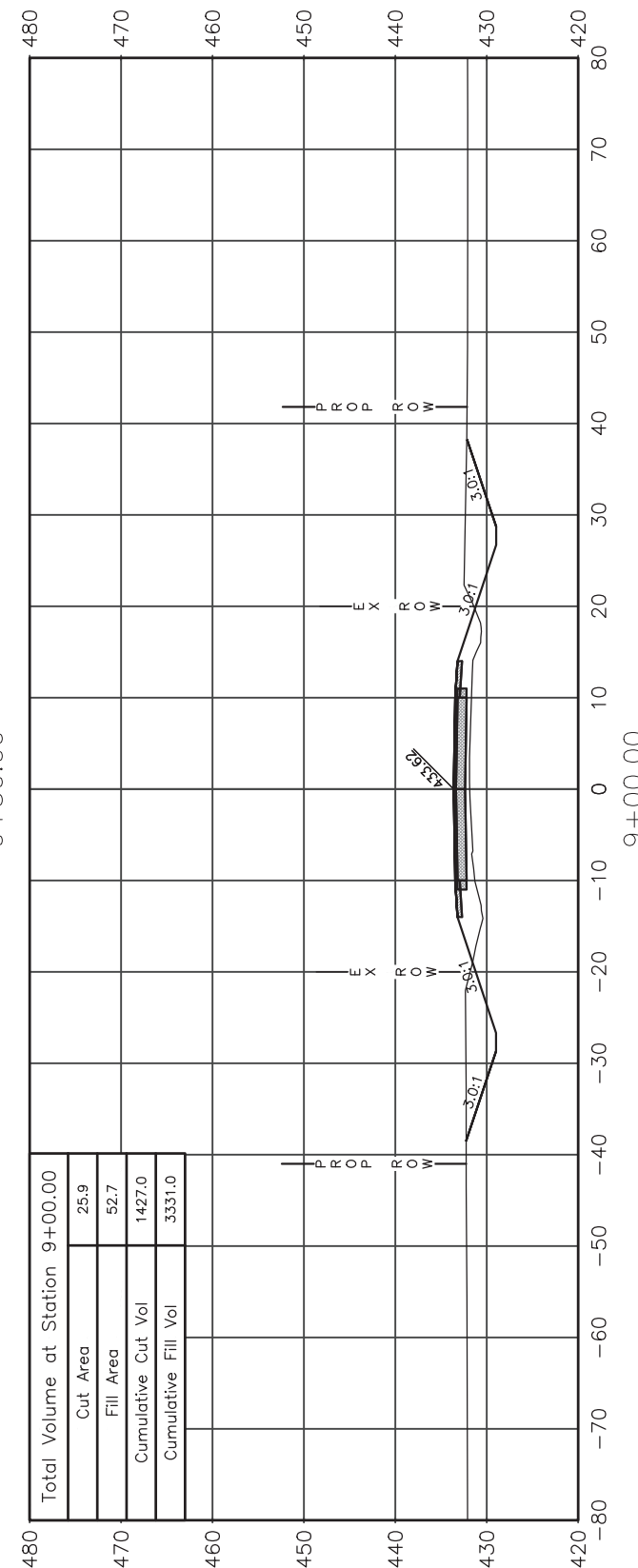
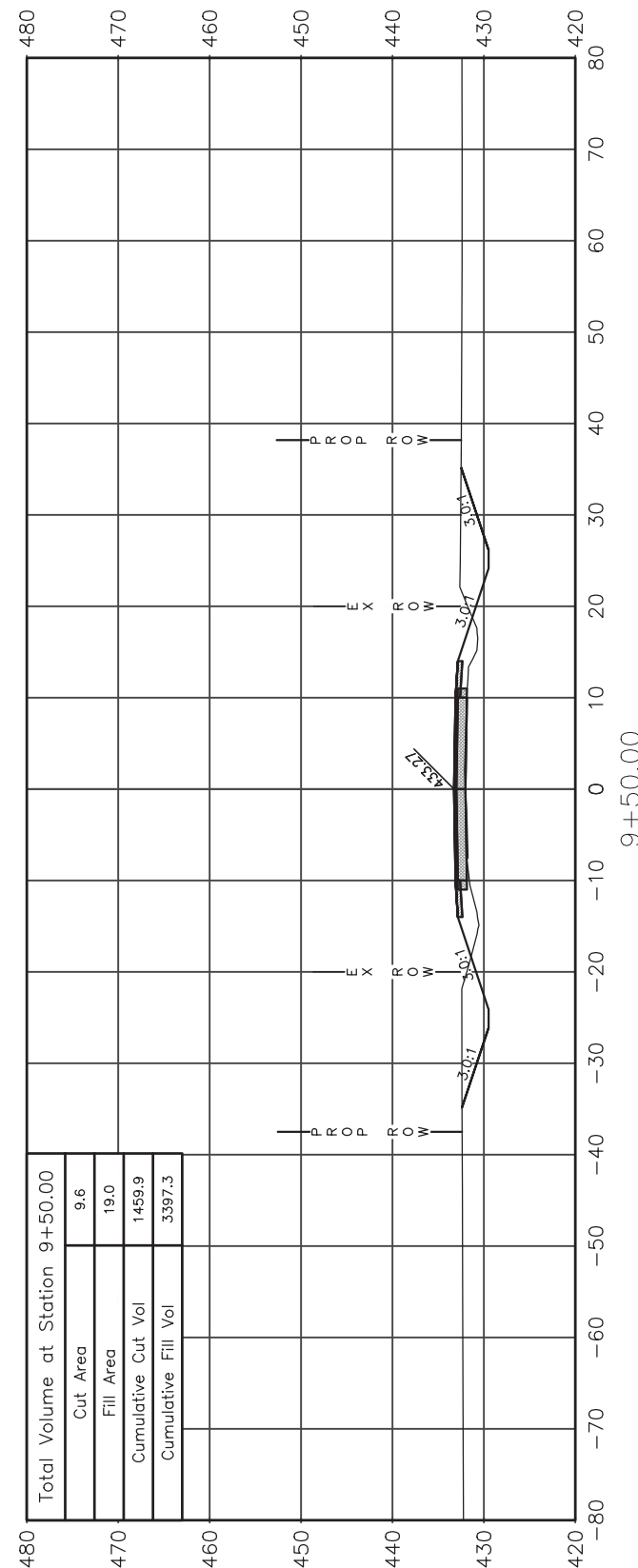
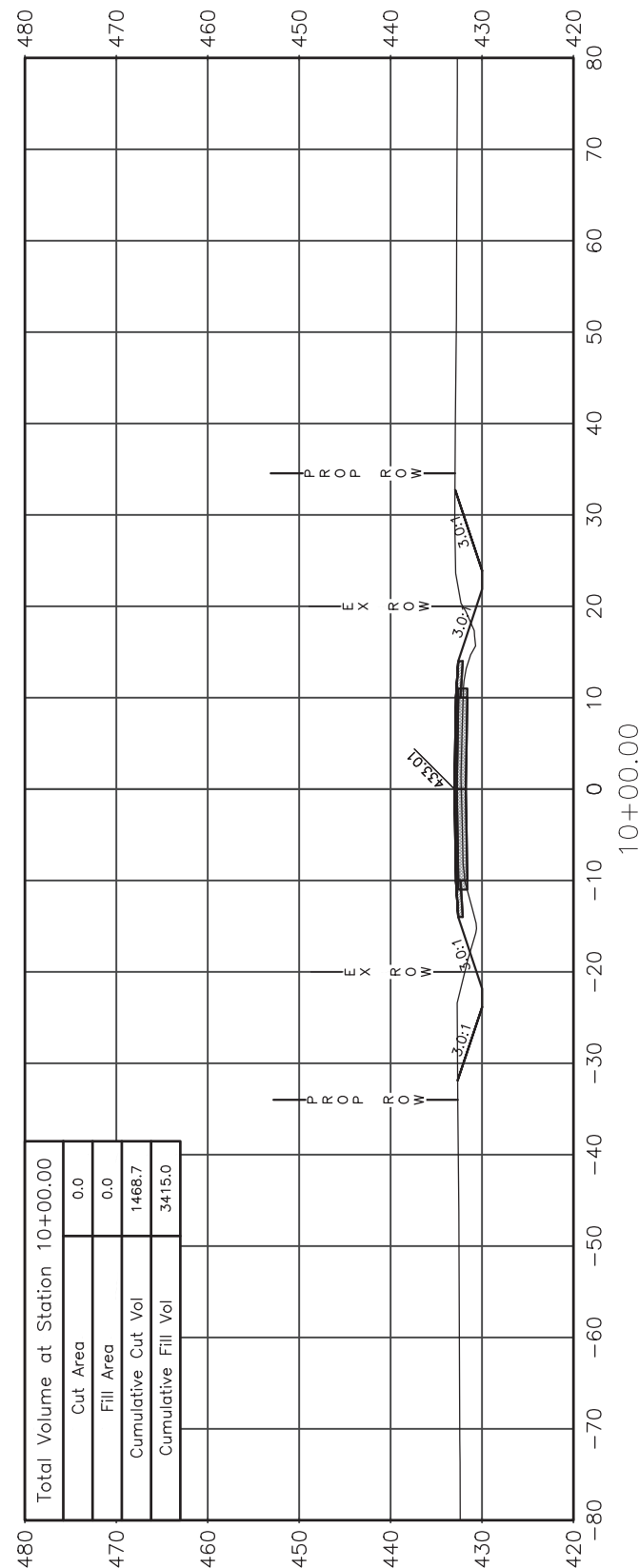
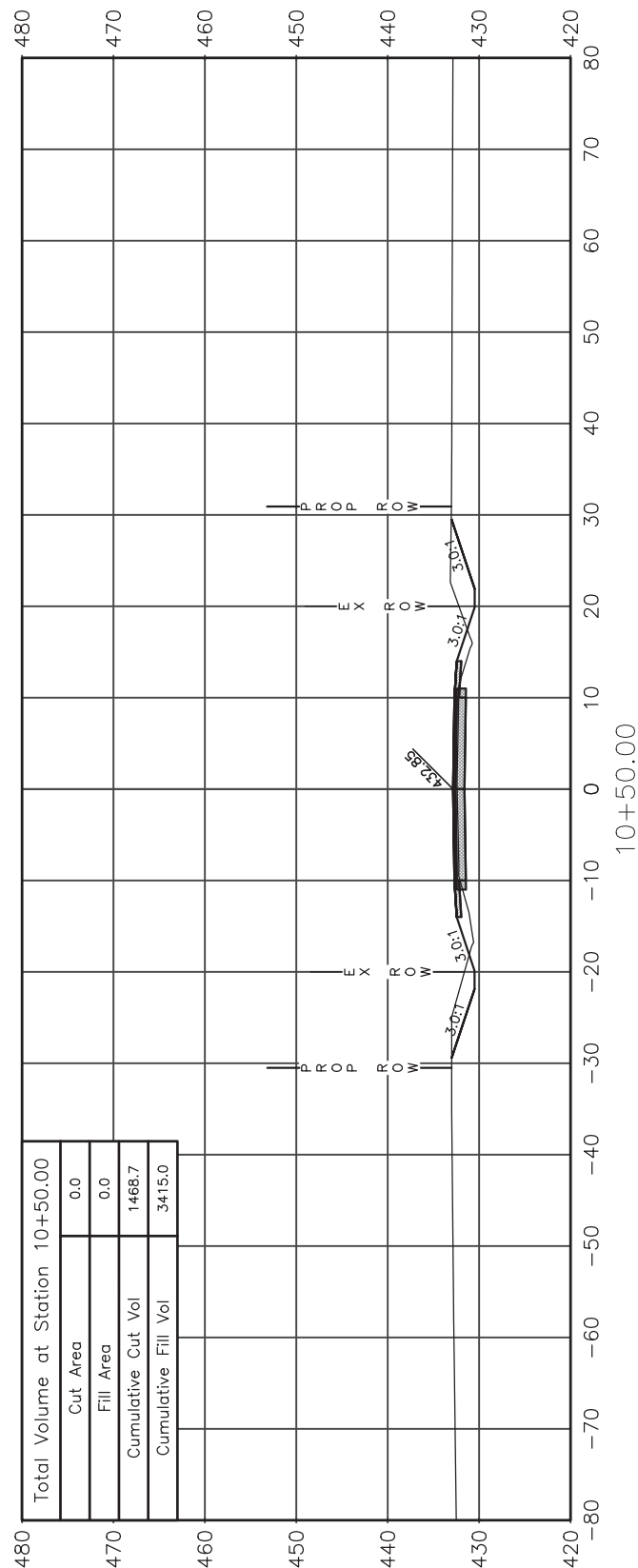
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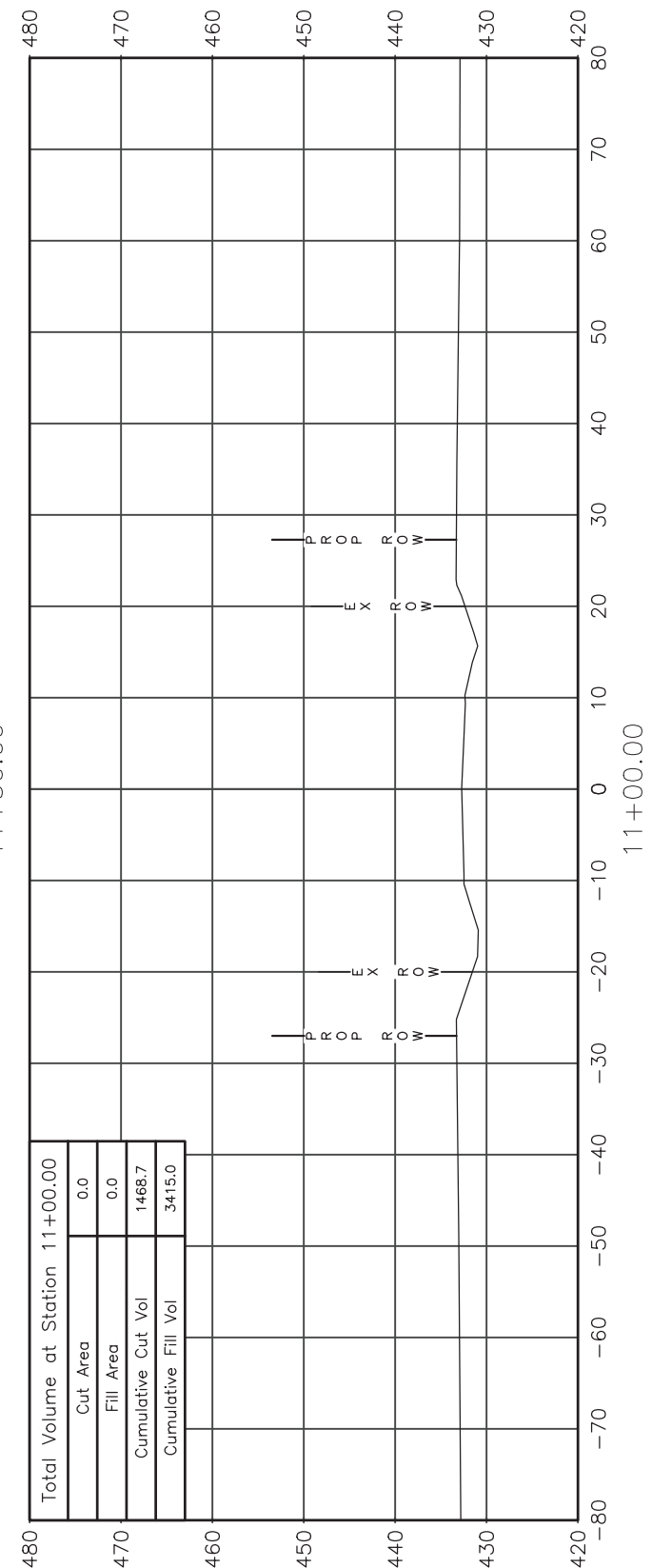
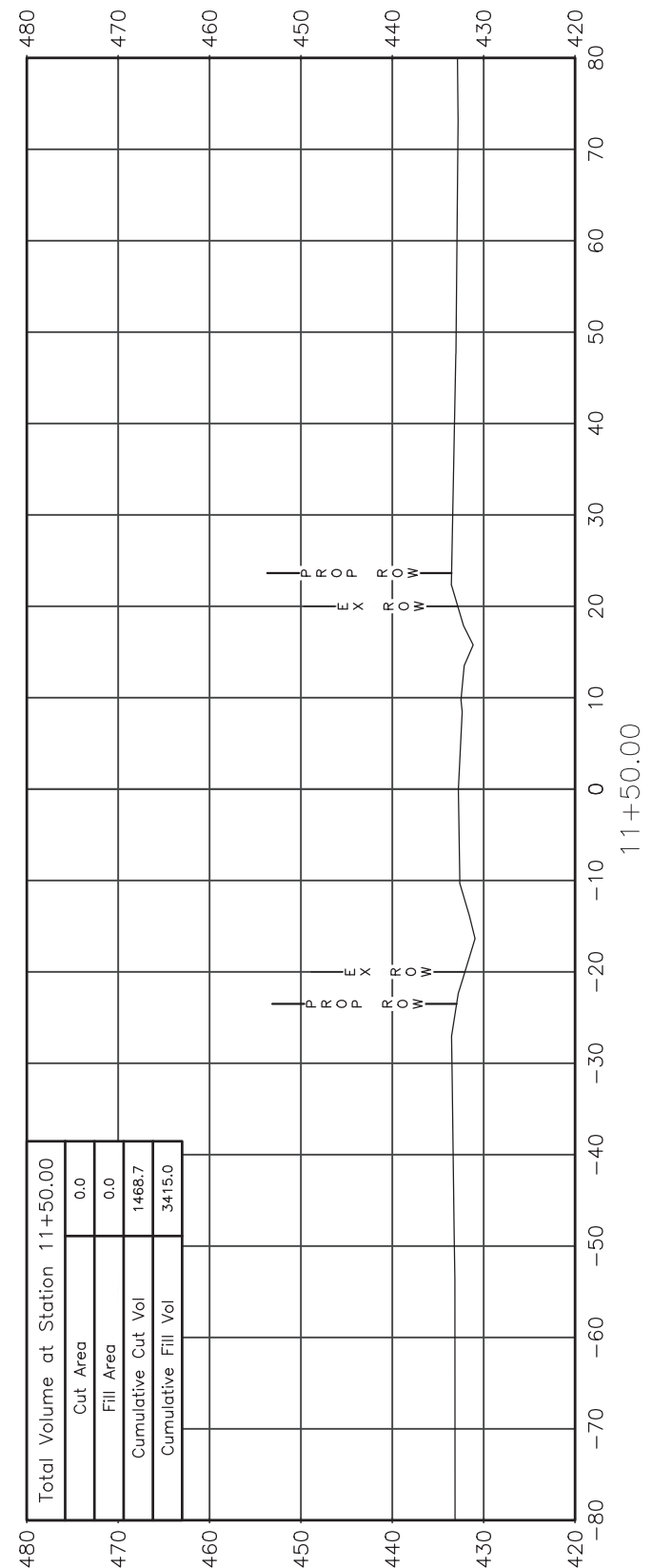
STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION

CROSS SECTIONS OF ROADWAY

ROUTE	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
FAS 806	20-00130-00-BR	LAWRENCE	24	21
CONTRACT 95931		ILLINOIS	PROJECT XCNX(049)	







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STATE OF ILLINOIS  
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CROSS SECTIONS OF ROADWAY

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