

F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
T.R. 62	13-02149-00-BR	VERMILION	21	1

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION  
**PROPOSED  
 HIGHWAY PLANS**

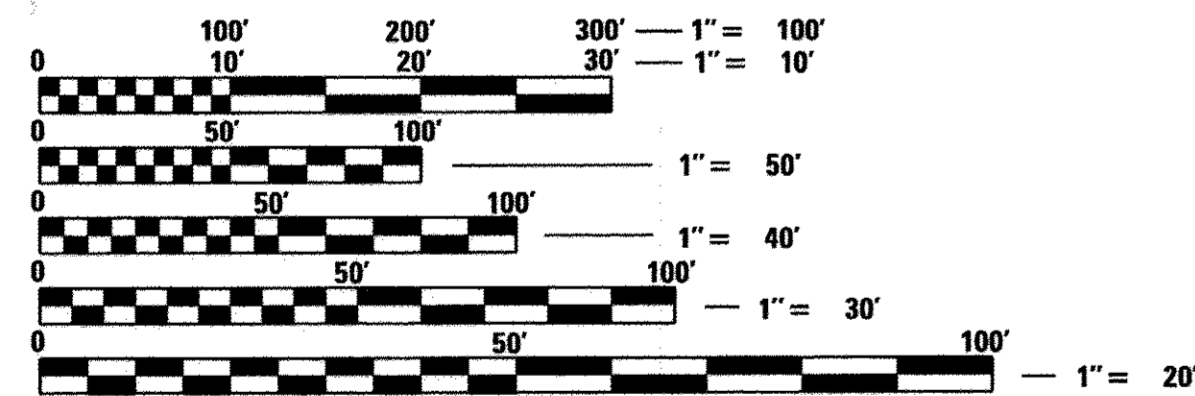
**INDEX OF SHEETS**

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T.R. 62  
 SECTION 13-02149-00-BR  
 PROJECT BROS-0183(322)  
 VERMILION COUNTY  
 PROPOSED STRUCTURE NO. 092-3530  
 C-95-301-16  
 FUNDING: FEDERAL

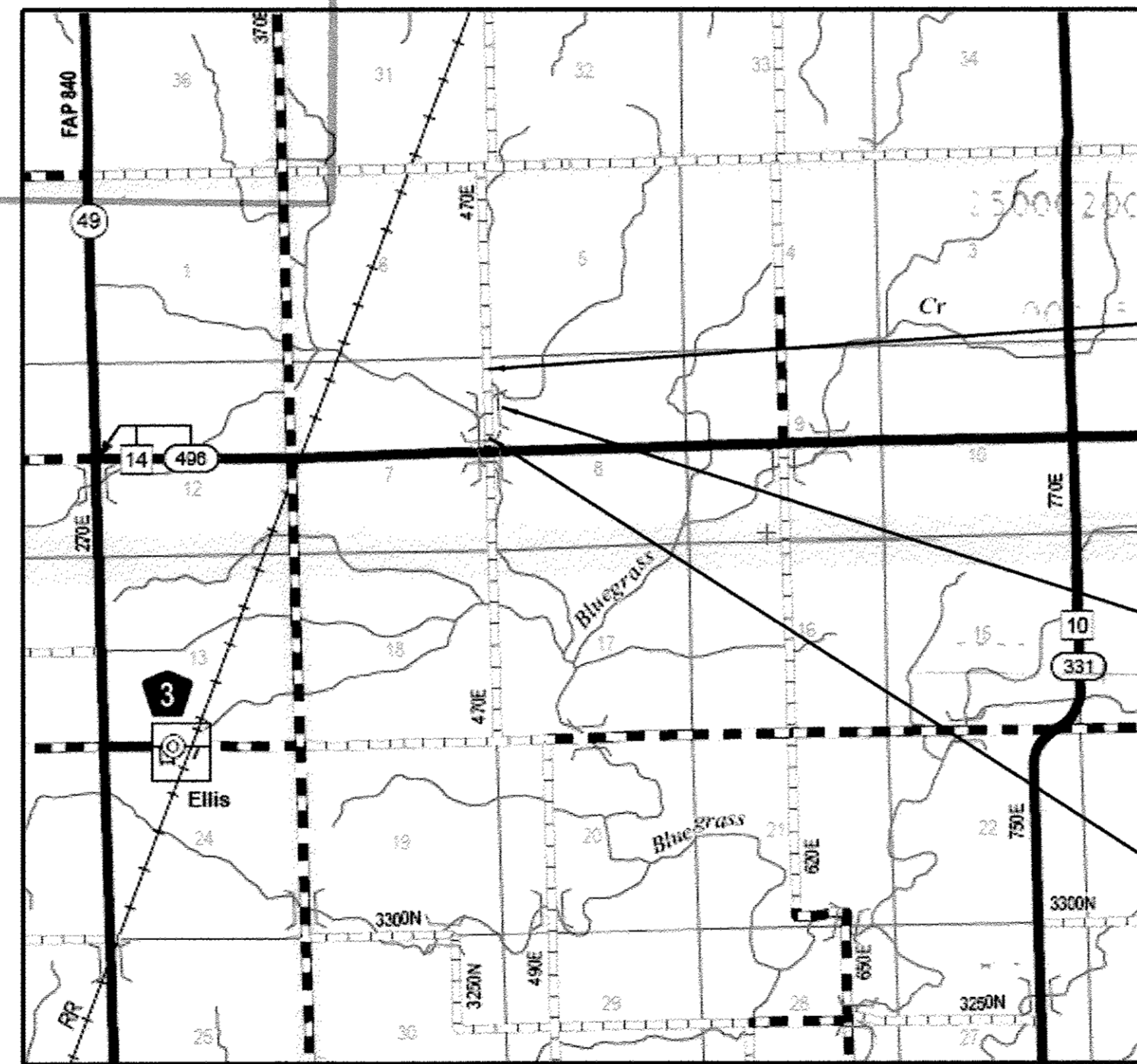
**HIGHWAY STANDARDS:**

000001-06	STANDARD SYMBOLS, ABBREVIATIONS AND PATTERNS
001001-02	AREAS OF REINFORCEMENT BARS
001006	DECIMAL OF AN INCH AND OF A FOOT
280001-07	TEMPORARY EROSION CONTROL SYSTEMS
515001-03	NAME PLATE FOR BRIDGES
666001-01	RIGHT OF WAY MARKERS
701901-06	TRAFFIC CONTROL DEVICES
B.L.R. 21-9	TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES FOR CONSTRUCTION ON RURAL LOCAL HIGHWAYS



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: 50 ADT (2016)



LOCATION MAP

NET LENGTH OF SECTION = 500 FEET = 0.10 MILES

**FEHR GRAHAM**

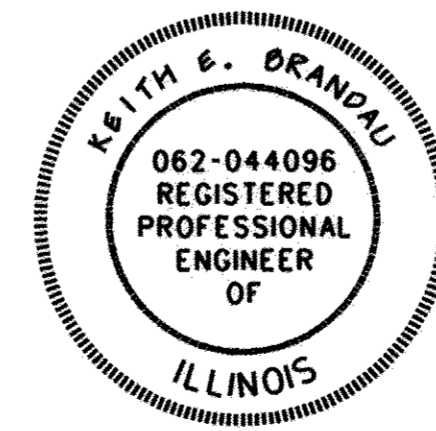
VERMILION COUNTY ENGINEERING & ENVIRONMENTAL  
 ILLINOIS IOWA WISCONSIN

ILLINOIS PROFESSIONAL DESIGN FIRM NUMBER: 184003525

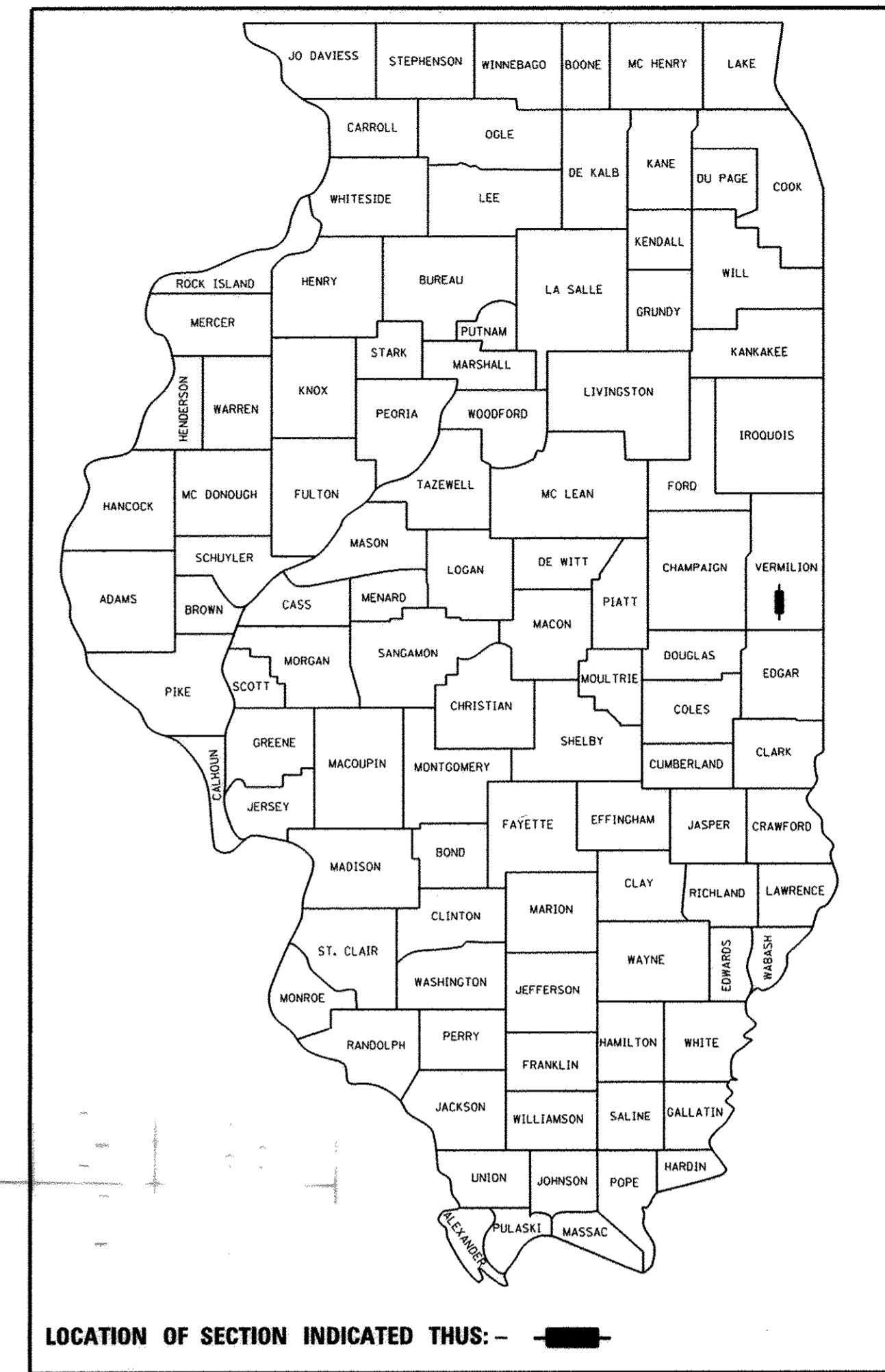
PROJECT ENDS  
 STA. 102 + 50

STATION 100 + 00  
 SINGLE SPAN PPC DECK  
 BEAM BRIDGE.  
 TO BE REPLACED.

PROJECT BEGINS  
 STA. 97 + 50



KEITH E. BRANDAU  
 ILLINOIS LICENSED  
 PROFESSIONAL ENGINEER NO. 062-044096  
 LICENSE EXPIRES 11-30-17



LOCATION OF SECTION INDICATED THUS: [shaded area]

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS

APPROVED *March 27, 2017*  
*Mam Rumble*  
 TOWNSHIP ROAD COMMISSIONER

APPROVED *March 27, 2017*  
*Douglas R. Staker*  
 VERMILION COUNTY ENGINEER

PASSED *APRIL 3, 2017*  
 DISTRICT FIVE ENGINEER OF  
 LOCAL ROADS & STREETS

RELEASED FOR  
 BID BASED ON  
 LIMITED REVIEW

REGION 3 ENGINEER

PRINTED BY THE AUTHORITY  
 OF THE STATE OF ILLINOIS

**FEHR GRAHAM**  
 J.U.L.I.E.  
 JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION  
 1-800-892-0123  
 CONTRACT NO. 91537

**GENERAL NOTES**

ALL ELEVATIONS SHOWN ARE REFERRED TO THE U.S.G.S. DATUM.

ANY REFERENCE STANDARDS THROUGHOUT THE PLANS SHALL BE INTERPRETED TO BE THE LATEST STANDARDS OF THE DEPARTMENT AS SHOWN ON THE SCHEDULE OF STANDARD DRAWINGS ON THE COVER SHEET.

ENGLISH UNITS OF MEASUREMENT SHALL GOVERN OVER AND SUPERSEDE ANY METRIC UNITS SHOWN IN THIS CONTRACT. WHERE INCLUDED, METRIC UNITS ARE FOR INFORMATION ONLY.

UTILITIES - THESE DRAWINGS ILLUSTRATE THE APPROXIMATE LOCATION OF ALL KNOWN UNDERGROUND UTILITIES. THE CONTRACTOR MAY EXPECT TO FIND SUCH UTILITIES WITHIN APPROXIMATELY FIVE FEET OF THE POSITION INDICATED ON THE DRAWINGS. BUT IN EVERY CASE THE CONTRACTOR SHALL LOCATE AND UNCOVER SUCH UTILITIES, WITH THE ASSISTANCE OF THE RESPECTIVE UTILITY COMPANIES, BEFORE ANY EXCAVATION IS STARTED.

CALL J.U.L.I.E. 1-800-892-0123 FOR UNDERGROUND UTILITY LOCATION MARKING PRIOR TO START OF CONSTRUCTION.

UTILITY COMPANIES MAY BE ADJUSTING THEIR FACILITIES AT THE TIME OF CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THOSE ORGANIZATIONS WHILE THEY PERFORM THEIR WORK.

DURING CONSTRUCTION THE CONTRACTOR MAY ENCOUNTER VARIOUS TYPES OF UNDERGROUND UTILITIES THAT MAY NOT BE SHOWN ON THE PLANS. THE CONTRACTOR SHALL COOPERATE WITH THE ENGINEER AND THE OWNER OF THE UTILITY WHILE THE UTILITY COMPANY ADJUSTS THEIR FACILITIES IF NECESSARY. IF IT IS DETERMINED THAT THE UTILITY HAS BEEN ABANDONED, THE CONTRACTOR WILL BE DIRECTED TO REMOVE THE UTILITY LINES THAT CONFLICT WITH HIS WORK AND CAP OR PLUG THE LINES AS DIRECTED BY THE ENGINEER. THIS WORK WILL NOT BE PAID FOR SEPARATELY AND WILL BE CONSIDERED AS INCLUDED IN THE CONTRACT.

GRADING SHALL BE DONE BY HAND AROUND LIGHT POLES, UTILITY POLES, SIGN POSTS, SHRUBS, TREES AND OTHER NATURAL OR MAN-MADE OBJECTS WHERE SHALLOW FILLS OR CUTS ARE ADJACENT TO THESE ITEMS. IT IS THE INTENT THAT ITEMS THAT DO NOT NEED TO BE DISTURBED BY THE CONSTRUCTION SHALL BE PRESERVED. THE DECISION AS TO ITEMS TO REMAIN IN PLACE SHALL BE AS DIRECTED BY THE ENGINEER. THIS WORK WILL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED INCLUDED IN THE CONTRACT UNIT PRICE PER CUBIC YARD OF EARTH EXCAVATION AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.

SEEDING SHALL BE DONE AT LOCATIONS SHOWN ON THE PLANS WHERE THE EXISTING EARTH HAS BEEN DISTURBED, AND AT LOCATIONS DIRECTED BY THE ENGINEER. ANY EXISTING AREAS OUTSIDE THE LIMITS OF CONSTRUCTION DAMAGED BY THE CONTRACTOR SHALL BE SEEDED AT HIS OWN EXPENSE AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

THE CONTRACTOR SHALL NOT BEGIN ANY CONSTRUCTION OPERATIONS UNTIL ALL SURVEY MONUMENTS HAVE BEEN SUFFICIENTLY WITNESSED OR REFERENCED BY THE ENGINEER. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PRESERVE AND NOT DISTURB THE EXISTING IRON PIPE MONUMENTS OR RIGHT-OF-WAY MARKERS. ANY IRON PIPE MONUMENTS OR RIGHT-OF-WAY MARKERS SO DISTURBED BY THE CONTRACTOR SHALL BE RESET BY A REGISTERED ILLINOIS LAND SURVEYOR. THE COST FOR RESETTING THESE MONUMENTS SHALL BE PAID FOR BY THE CONTRACTOR.

THE EXISTING TRAFFIC SIGNS AND DELINEATORS WHICH INTERFERE WITH THE CONSTRUCTION OPERATIONS SHALL BE REMOVED AND RESET AS DIRECTED BY THE ENGINEER. THE COST FOR DOING THIS WORK WILL BE CONSIDERED INCLUDED IN THE CONTRACT AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.

**APPLICATION RATES AS FOLLOWS:**

2.05 T/CY FOR AGGREGATE SURFACE COURSE TYPE B  
1.75 T/CY FOR STONE RIPRAP CLASS A4

**FEHR GRAHAM**  
ENGINEERING & ENVIRONMENTAL  
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS  
IOWA  
WISCONSIN

OWNER/DEVELOPER:  
VERMILION COUNTY  
HIGHWAY DEPARTMENT  
2732 BATESTOWN ROAD  
OAKWOOD, IL 61858

PROJECT AND LOCATION:  
BRIDGE REPLACEMENT  
S.N. 092-3530  
SECTION NO: 13-02149-00-BR  
BUTLER TOWNSHIP

DRAWN BY: GM  
APPROVED BY: RTM  
DATE: 3/24/2017  
SCALE: NTS

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:  
GENERAL NOTES

JOB NUMBER:  
15-148

SHEET NUMBER:  
02 of 21



### SUMMARY OF QUANTITIES

CODE #	ITEM NAME	UNIT	QUANTITY
20200100	EARTH EXCAVATION	CU YD	281
20400800	FURNISHED EXCAVATION	CU YD	161
25000200	SEEDING, CLASS 2	ACRE	0.75
25000400	NITROGEN FERTILIZER NUTRIENT	POUND	54
25000500	PHOSPHORUS FERTILIZER NUTRIENT	POUND	54
25000600	POTASSIUM FERTILIZER NUTRIENT	POUND	54
25100115	MULCH METHOD 2	ACRE	0.75
28000250	TEMPORARY EROSION CONTROL SEEDING	POUND	60
28000305	TEMPORARY DITCH CHECKS	FOOT	72
28000400	PERIMETER EROSION BARRIER	FOOT	973
28100707	STONE DUMPED RIPRAP, CLASS A4	TON	318
40200800	AGGREGATE SURFACE COURSE, TYPE B	TON	651
50100100	REMOVAL OF EXISTING STRUCTURES	EACH	1
50200100	STRUCTURE EXCAVATION	CU YD	162
50300225	CONCRETE STRUCTURES	CU YD	40.6
50400505	PRECAST PRESTRESSED CONCRETE DECK BEAMS (27" DEPTH)	SQ FT	1799
50800105	REINFORCEMENT BARS	POUND	5050
△ 50900205	STEEL RAILING, TYPE S-1	FOOT	134
51201400	FURNISHING STEEL PILES, HP10X42	FOOT	600
51202305	DRIVING STEEL PILES	FOOT	600
51203400	TEST PILE STEEL HP10X42	EACH	2
51204650	PILE SHOES	EACH	14
51500100	NAME PLATES	EACH	1
59300100	CONTROLLED LOW-STRENGTH MATERIAL	CU YD	68
67100100	MOBILIZATION	L SUM	1
* X7011830	TRAFFIC CONTROL AND PROTECTION, STANDARD BLR 21	EACH	1
* XX004566	CONCRETE CUT-OFF WALL	CU YD	10.2
* Z0013798	CONSTRUCTION LAYOUT	L SUM	1
*SEE SPECIAL PROVISIONS			

△ SPECIALTY ITEMS

### SCHEDULE OF QUANTITIES

EARTHWORK SCHEDULE	APPROACH	TOTAL
	CU YD	CU YD
<b>EARTH EXCAVATION</b>	281.0	281.0
TOTAL CUT	281.0	281.0
<b>EMBANKMENT</b>	353.0	353.0
TOTAL FILL	353.0	353.0
BORROW = [FILL - (Excavation/1.25)] *1.25	161.0	161.0
BORROW = FURNISHED EXCAVATION		161.0
1.25 REPRESENTS 25% SHRINKAGE FACTOR		

40200800 AGGREGATE SURFACE COURSE, TYPE B			
LOCATION TO LOCATION		TON	
97+50	99+66	325.1	
100+34	102+50	325.8	
TOTAL		651	

28000300 TEMPORARY DITCH CHECKS		
STATION	FOOT	
98+00	LT	6.0
98+00	RT	6.0
99+00	LT	6.0
99+00	RT	6.0
99+35	LT	6.0
99+60	RT	6.0
100+40	LT	6.0
100+65	RT	6.0
101+00	LT	6.0
101+00	RT	6.0
102+00	LT	6.0
102+00	RT	6.0
TOTAL		72.0

25000200 SEEDING CLASS 2 AND 25100115 MULCH METHOD 2				28000250 TEMPORARY EROSION CONTROL SEEDING	
LOCATION TO LOCATION			ACRE	POUND	
97+50	99+96	RT	0.1	10.0	
101+01	101+19	RT	0.1	10.0	
101+45	102+50	RT	0.2	20.0	
97+50	99+55	LT	0.1	10.0	
99+91	102+50	LT	0.1	10.0	
TOTAL			0.75	60.0	

NOTE: TEMPORARY EROSION CONTROL SEEDING IS APPLIED AT A RATE OF 100 LB / ACRE.

NOTE: NITROGEN, PHOSPHOROUS & POTASSIUM FERTILIZER NUTRIENTS ARE APPLIED AT A RATE OF 90 LB / ACRE.

28000400 PERIMETER EROSION BARRIER				
LOCATION TO LOCATION				FOOT
97+50	25.5' RT.	99+87	25.5' RT.	251.3
97+50	25.5' LT.	99+49	37.4' LT.	218.1
100+51	48.5' RT.	102+50	49.2' RT.	209.8
100+04	37.7' LT.	102+50	26' LT.	293.3
TOTAL				973.0

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VERMILION COUNTY  
HIGHWAY DEPARTMENT  
2732 BATESTOWN ROAD  
OAKWOOD, IL 61858

PROJECT AND LOCATION:  
BRIDGE REPLACEMENT  
S.N. 092-3530  
SECTION NO: 13-02149-00-BR  
BUTLER TOWNSHIP

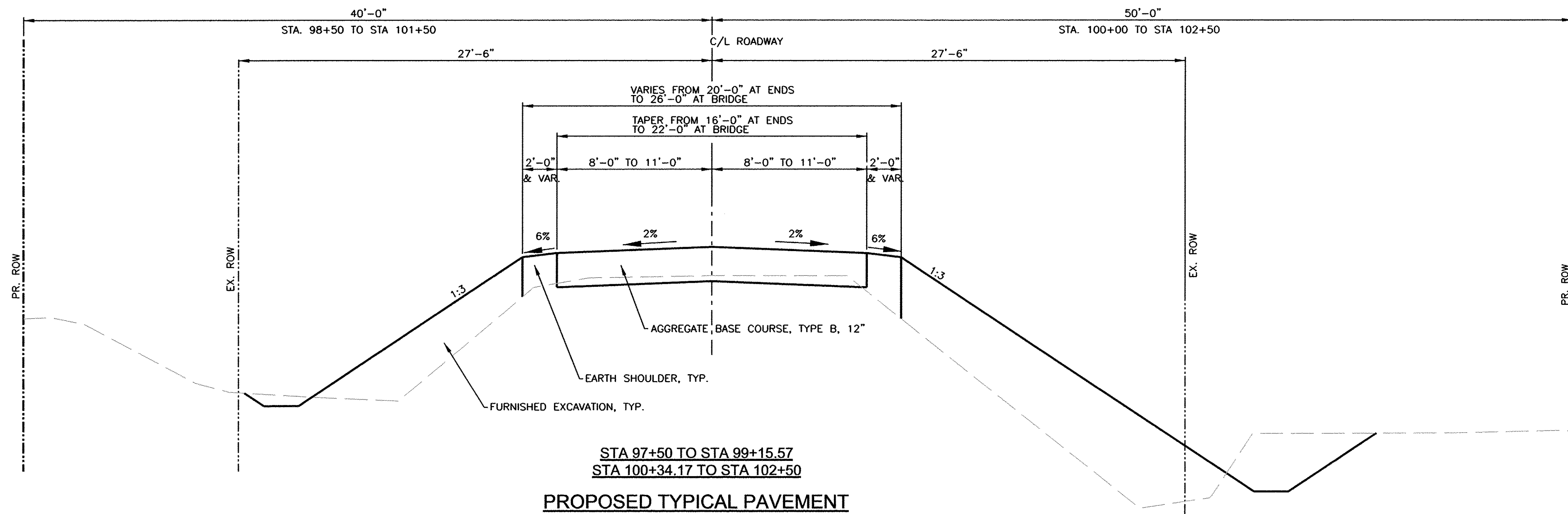
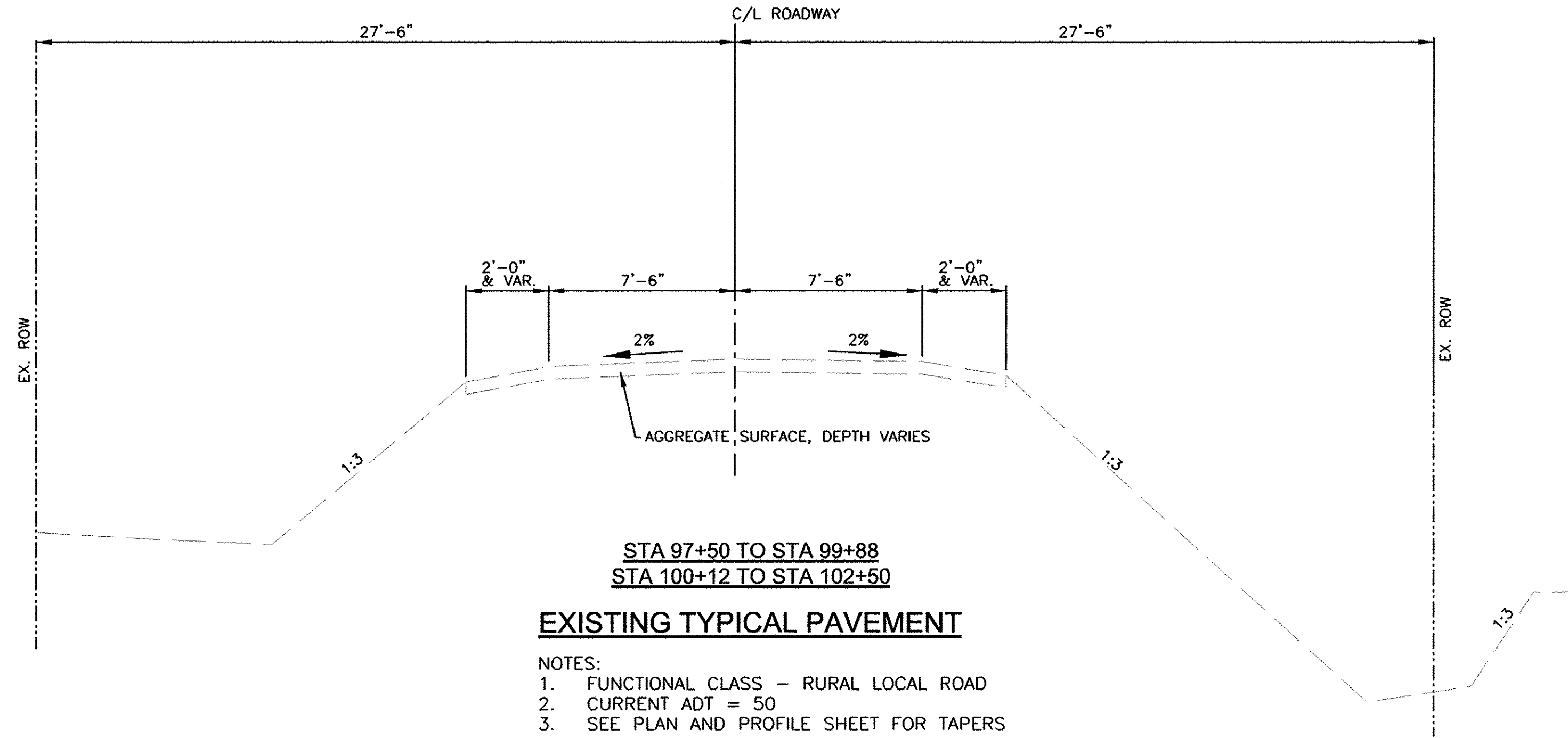
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APPROVED BY: RTM  
DATE: 3/24/2017  
SCALE: N/A

REVISIONS		
REV. NO.	DESCRIPTION	DATE

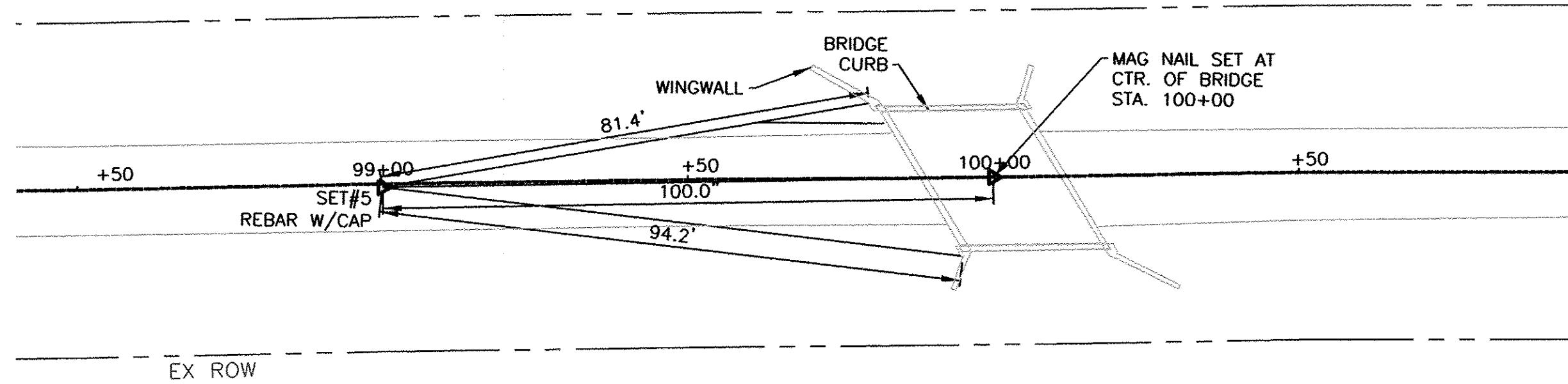
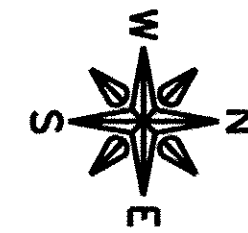
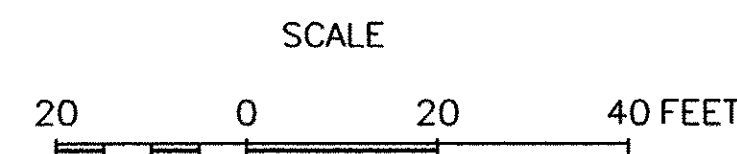
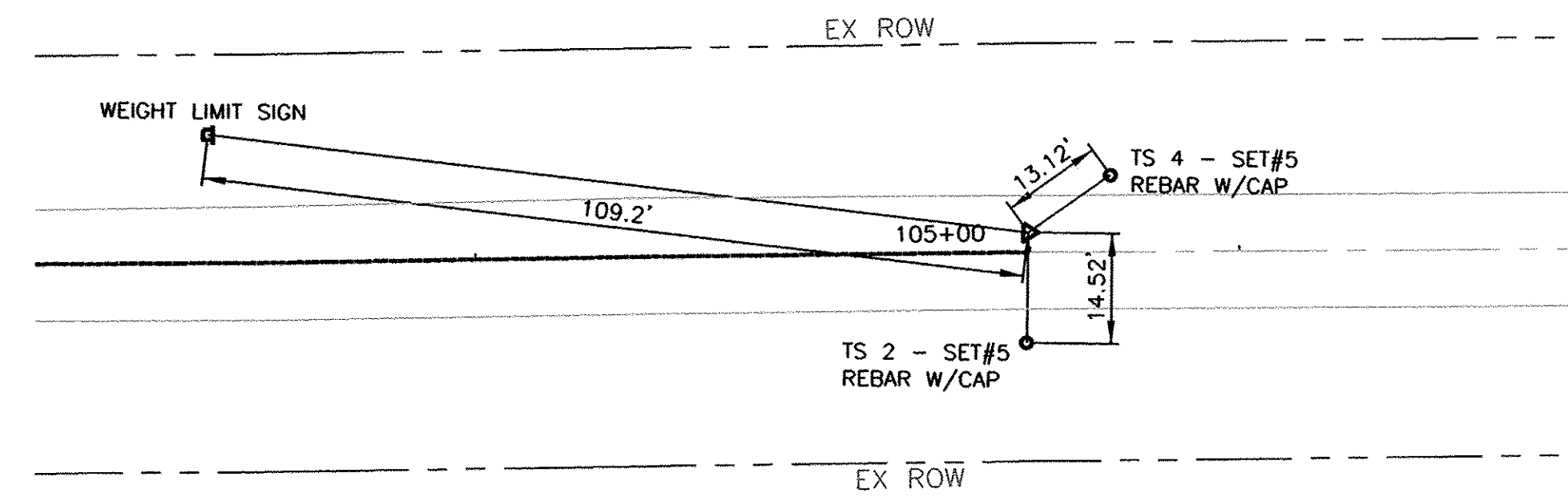
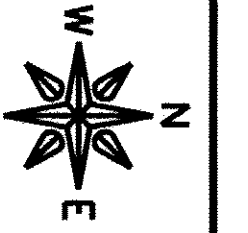
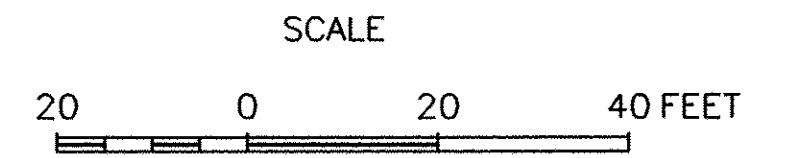
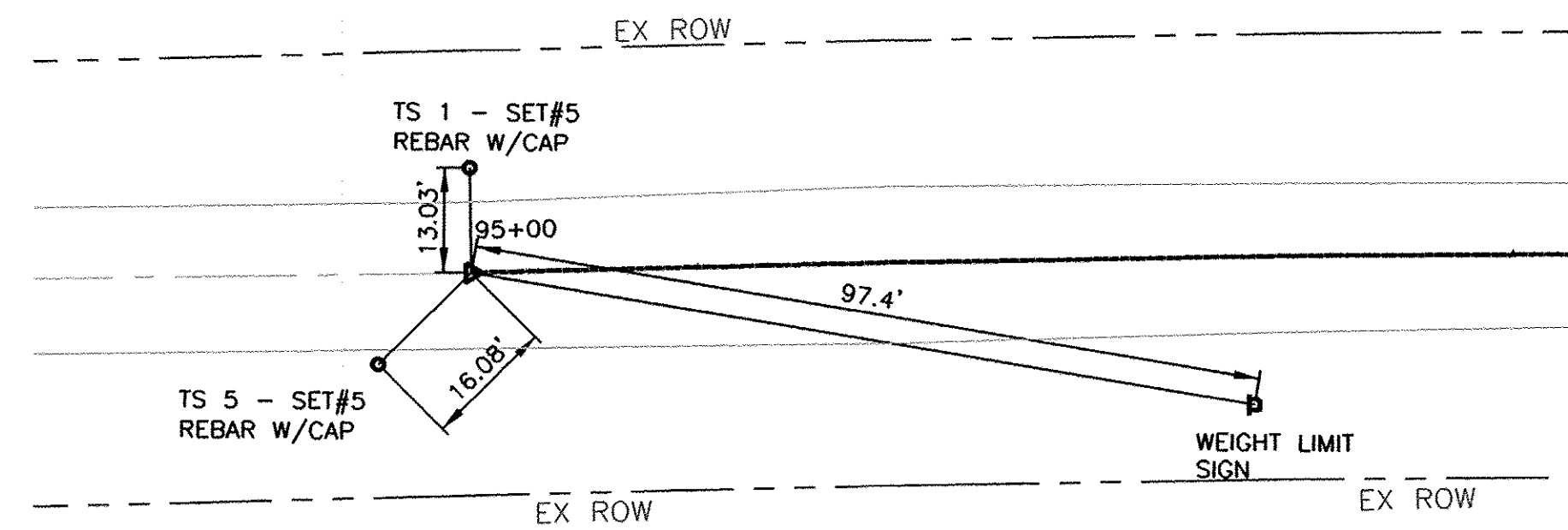
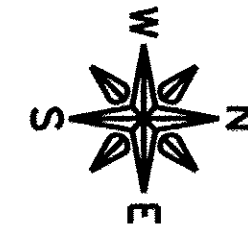
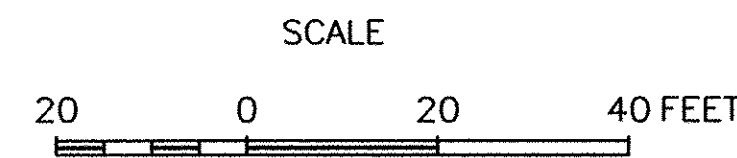
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SUMMARY AND SCHEDULE OF QUANTITIES

JOB NUMBER:  
15-148

SHEET NUMBER:  
03 of 21



REVISIONS		
REV. NO.	DESCRIPTION	DATE



**BENCHMARKS**

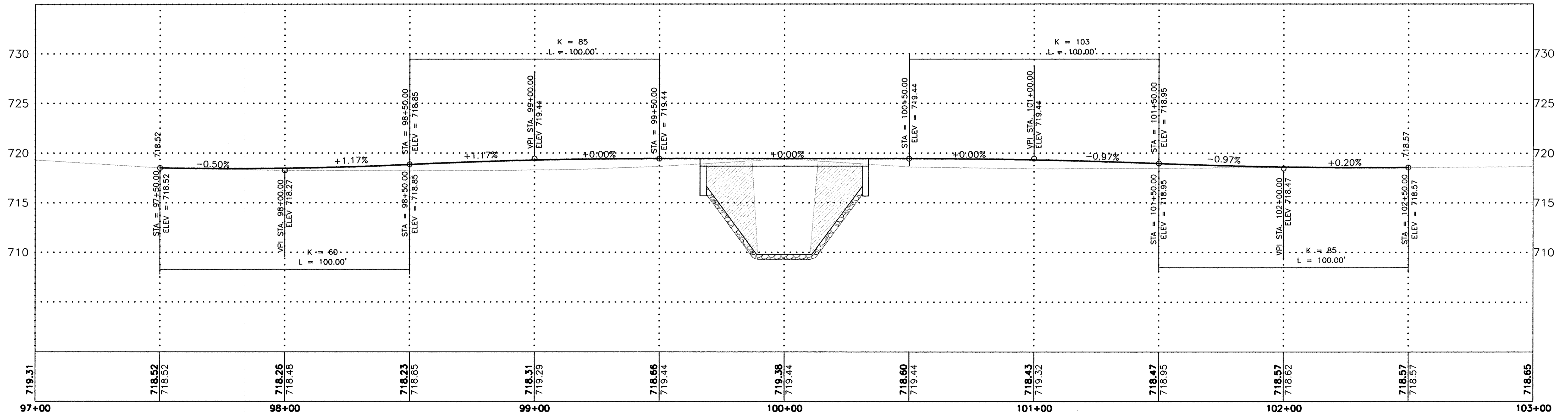
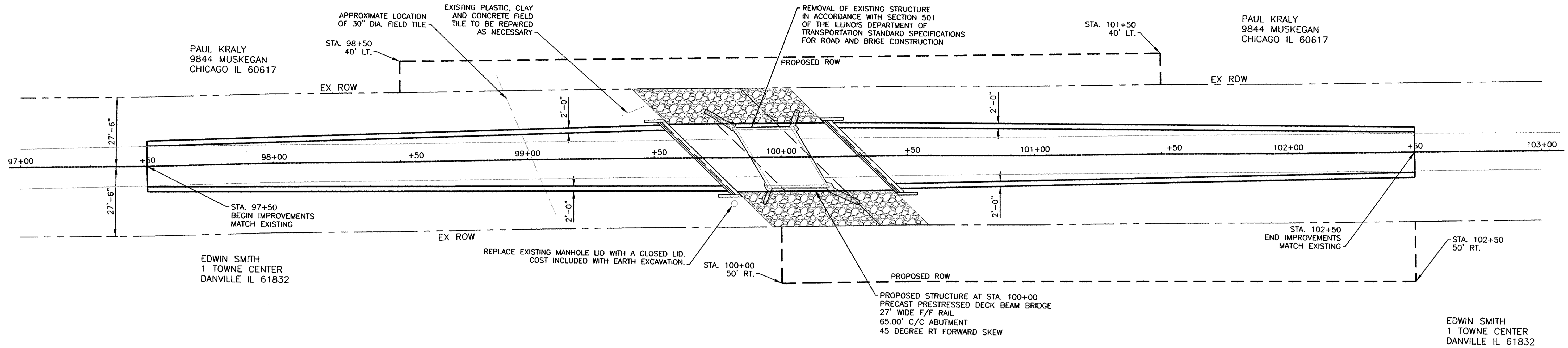
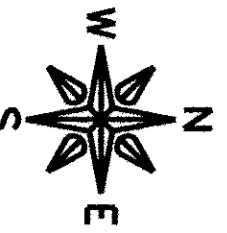
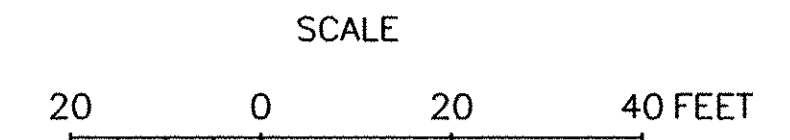
- BM#1 - TOP OF SOUTHEAST WINGWALL  
ELEV. 719.82
- BM#2 - REBAR W/CAP STA. 99+00  
ELEV. 718.31
- BM#400 - TOP OF RAIL ROAD SPIKE FOUND IN THE EAST FACE OF THE POWER POLE  
ON THE NW CORNER OF THE INTERSECTION OF VERMILION COUNTY HIGHWAY  
14 (3550 N) AND 470 E.  
ELEV. 717.90

REVISIONS		
REV. NO.	DESCRIPTION	DATE



**BENCHMARKS**

BM#1 - TOP OF SOUTHEAST WINGWALL  
ELEV. 719.82  
BM#2 - REBAR W/CAP STA. 99+00  
ELEV. 718.31



**FEHR GRAHAM**  
ENGINEERING & ENVIRONMENTAL  
ILLINOIS DESIGN FIRM NO. 184-003525  
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ILLINOIS  
IOWA  
WISCONSIN

OWNER/DEVELOPER:  
VERMILION COUNTY  
HIGHWAY DEPARTMENT  
2732 BATESTOWN ROAD  
OAKWOOD, IL 61858

PROJECT AND LOCATION:  
BRIDGE REPLACEMENT  
S.N. 092-3530  
SECTION NO: 13-02149-00-BR  
BUTLER TOWNSHIP

DRAWN BY: GM  
APPROVED BY: RTM  
DATE: 3/24/2017  
SCALE: AS SHOWN

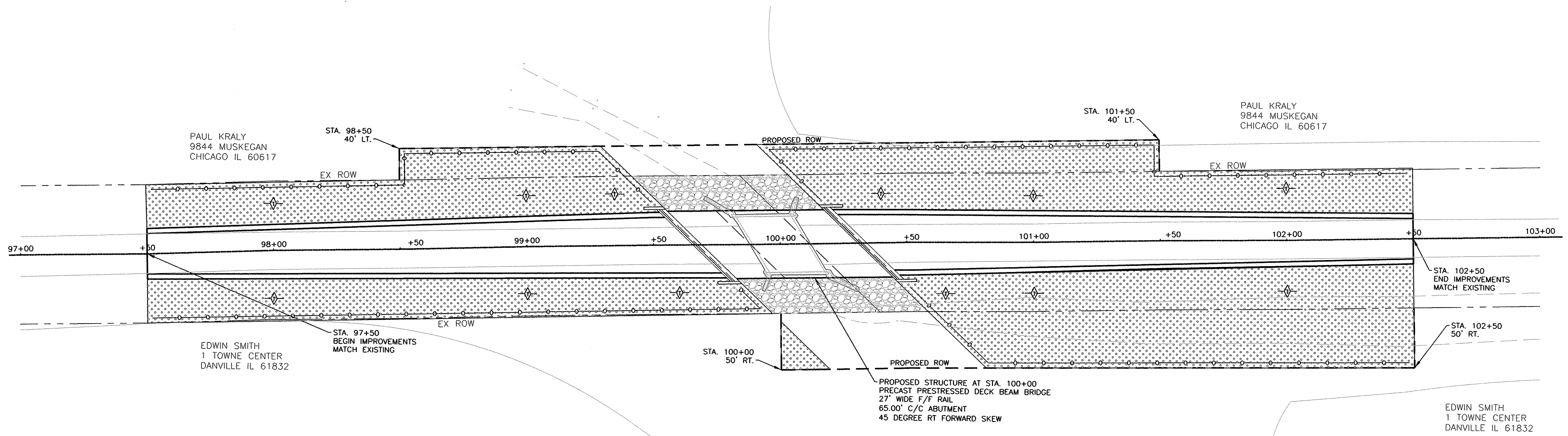
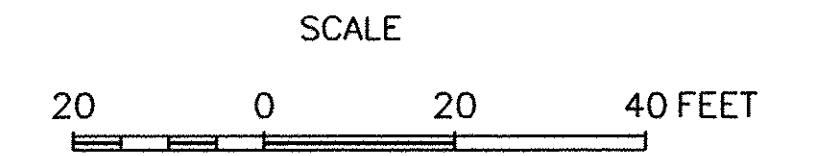
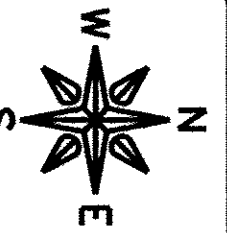
REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:  
**PLAN & PROFILE**

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JOB NUMBER:  
15-148

SHEET NUMBER:  
06 of 21



- EROSION CONTROL BARRIER
- ◇— TEMPORARY DITCH CHECKS
- ▨ SEEDING

**FEHR GRAHAM**  
ENGINEERING & ENVIRONMENTAL  
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS  
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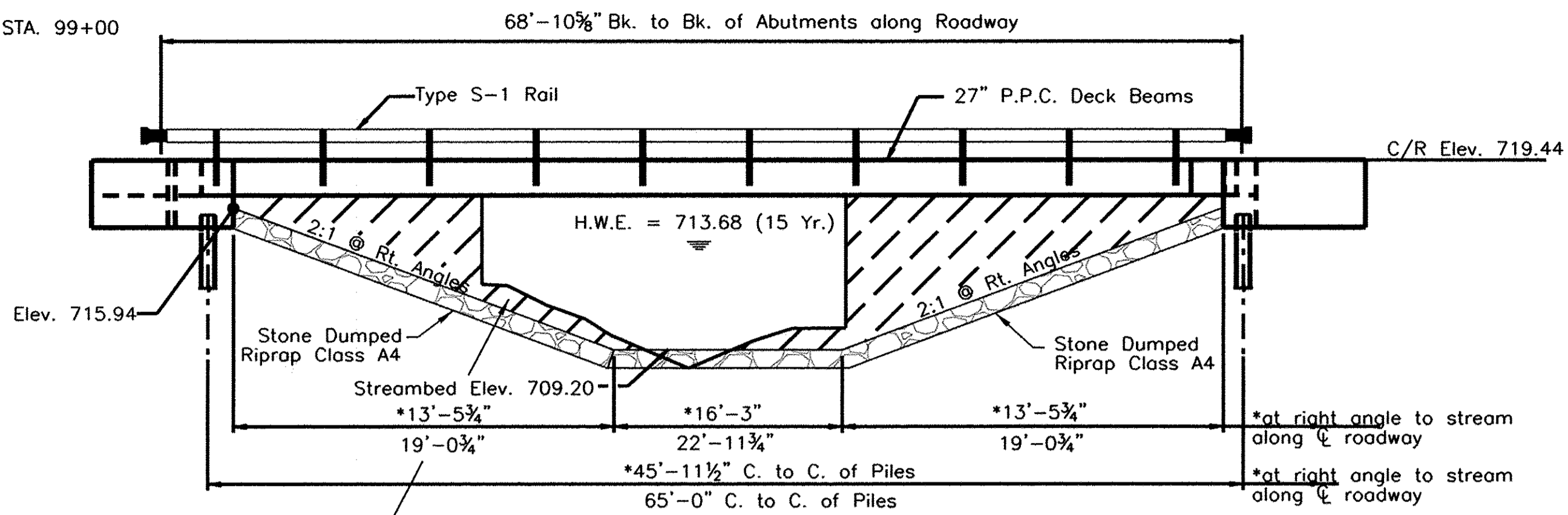
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**SEEDING AND EROSION CONTROL PLAN**  
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JOB NUMBER:  
**15-148**  
SHEET NUMBER:  
**07 of 21**



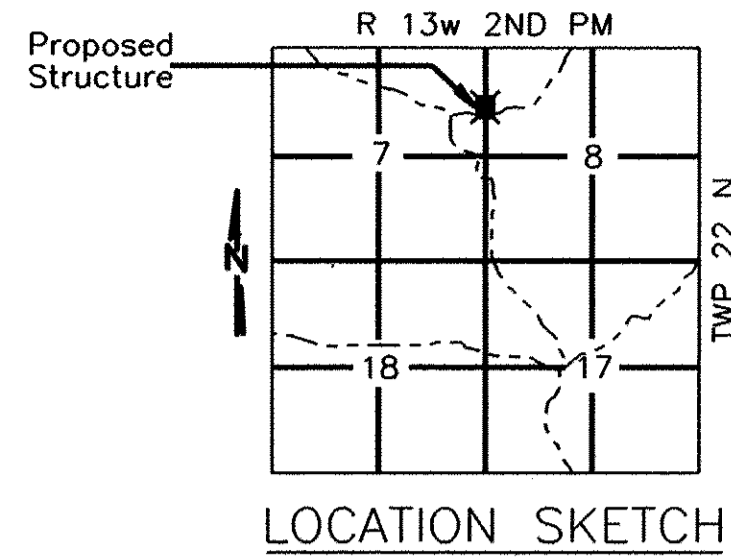
**BENCHMARKS**

- BM#1 - TOP OF SOUTHEAST WINGWALL  
ELEV. 719.82
- BM#2 - REBAR W/CAP STA. 99+00  
ELEV. 718.31



**ELEVATION**

All excavation for the new structure, back to back of abutment as shown, from ROW to ROW, will not be paid for separately, and the cost of excavation, hauling excess material, and disposal of excess material, shall be included in the cost of Removal of Existing Structures. No additional compensation will be allowed.



**LOCATION SKETCH**

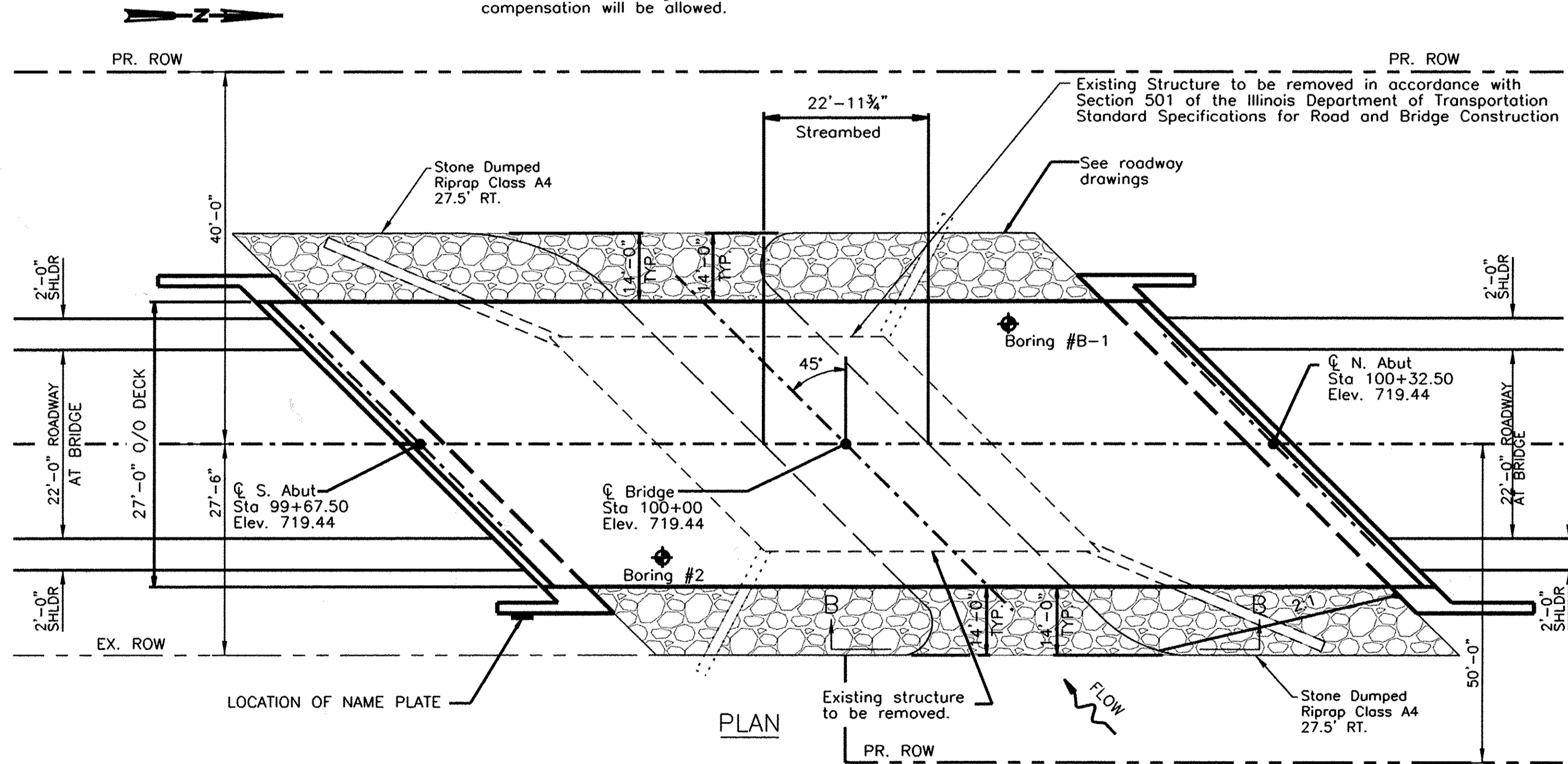
STRUCTURE NO. 092-3530  
SEC. 13-02149-00-BR BUILT 20  
BUTLER ROAD DISTRICT  
VERMILION COUNTY  
LOADING HL-93

**NAME PLATE**

See Standard 515001

**TOTAL BILL OF MATERIAL**

ITEM	UNIT	SUPER	SUB	TOTAL
Removal of Existing Structures	Each	1		1
Precast Prestressed Concrete Deck Beams (27" Depth)	Sq. Ft.	1799		1799
Steel Railing, Type S-1	Foot	134		134
Concrete Structures	Cu. Yds.		40.6	40.6
Furnishing Steel Piles, HP10X42	Foot		600	600
Driving Steel Piles	Foot		600	600
Test Piles, Steel HP10X42	Each		2	2
Pile Shoes	Each		14	14
Conc. Cut-off Wall	Cu. Yds.		10.2	10.2
Name Plate	Each		1	1
Reinforcement Bars	Pound		5050	5050
Structure Excavation	Cu. Yds.		162	162
Stone Dumped Riprap Class A4	Tons		318	318
Controlled low strength material	Cu. yds.		68	68



**PLAN**

**GENERAL NOTES**

1. THE CONTRACTOR SHALL DRIVE 1 STEEL TEST PILE IN A PERMANENT LOCATION AT EACH ABUTMENT AS DIRECTED BY THE ENGINEER BEFORE ORDERING THE REMAINDER OF PILES.
2. BORING DATA IS SHOWN ONLY AS AS GUIDE TO BIDDERS IN ESTIMATING SOIL CONDITIONS WHICH MAY BE ENCOUNTERED DURING CONSTRUCTION.
3. CLASS SI OR MS CONCRETE SHALL BE USED IN THE ABUTMENTS.
4. MASONRY MATERIAL SALVAGED FROM THE EXISTING STRUCTURE SHALL NOT BE REUSED AND SHALL BE DISPOSED OF OFF THE SITE BY THE CONTRACTOR.
5. CONTROLLED LOW STRENGTH MATERIAL SHALL BE IDOT MIX 2 PER THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.



**PROFILE GRADE**

**DESIGN SPECIFICATIONS**

AASHTO (2012) and Applicable Interims

**DESIGN LOADING**

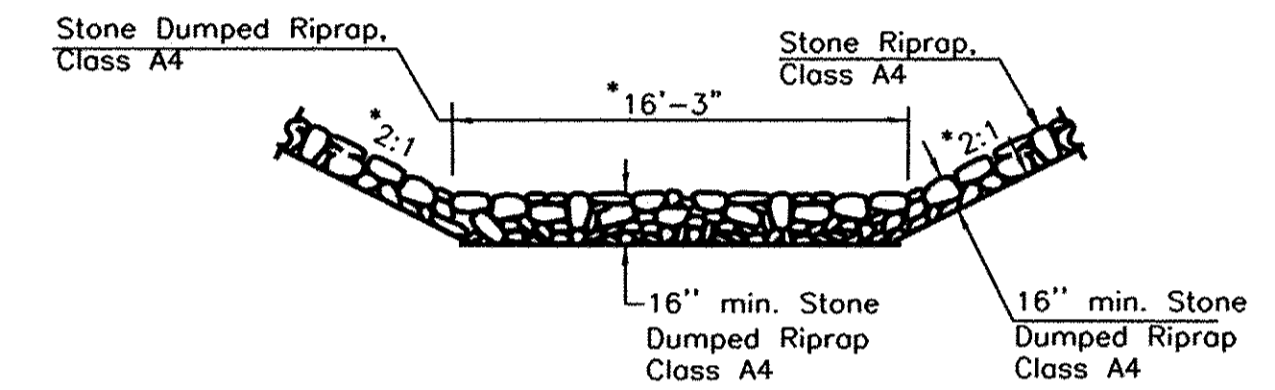
HL-93  
25 P.S.F Future Wearing Surface

**DESIGN STRESSES**

- $f'_c = 3,500$  psi (Cast in Place Concrete)
- $f'_c = 6,000$  psi (P.P.C. Units)
- $f'_{ci} = 5,000$  psi (P.P.C. Units)
- $f_y = 60,000$  psi (Reinforcement)
- $f_s = 270,000$  psi ( $\frac{1}{2}$ " Strands)
- $f_{si} = 201,960$  psi ( $\frac{1}{2}$ " Strands)

**WATERWAY DATA**

DRAINAGE AREA	2.28 SQ. MI.
EXISTING OPENING (15 YR.)	54.6 SQ. FT.
REQUIRED OPENING (15 YR.)	112.8 SQ. FT.
PROPOSED OPENING (15 YR.)	112.8 SQ. FT.
DESIGN DISCHARGE (15 YR.)	782 C.F.S.
COMPUTED DISCHARGE (100 YR.)	1360 C.F.S.
15 YR. HEAD	0.07 FT.
100 YR. HEAD	0.28 FT.



\* At right angle to stream

**SECTION A-A  
RIPRAP PLACEMENT**

Note: Excavation will not be paid for as separate items and shall be considered as included in Stone Riprap, Class A4.

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 THE REQUIREMENTS OF THE CURRENT "AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES."

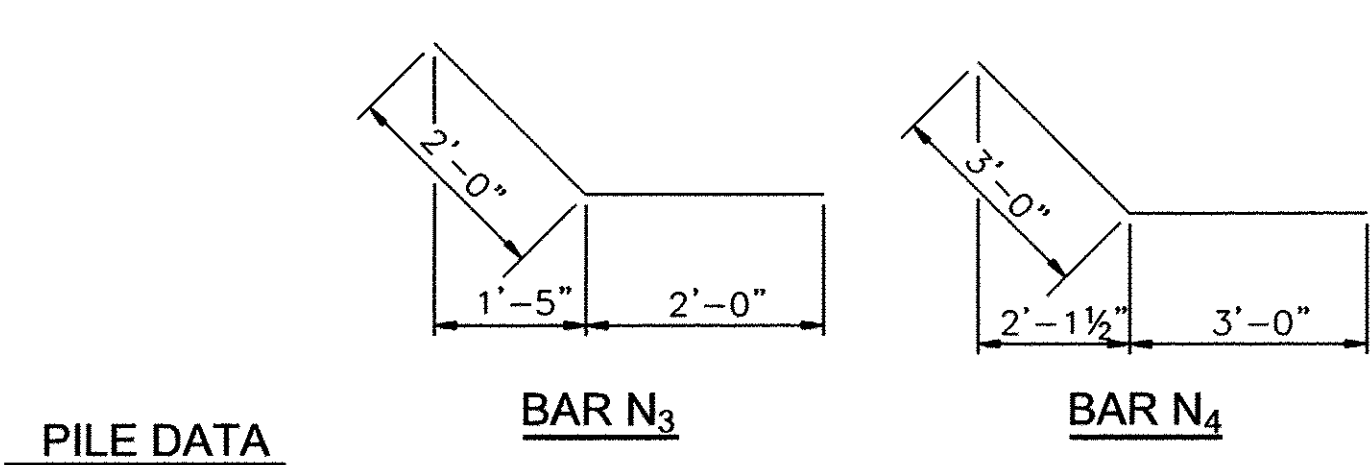
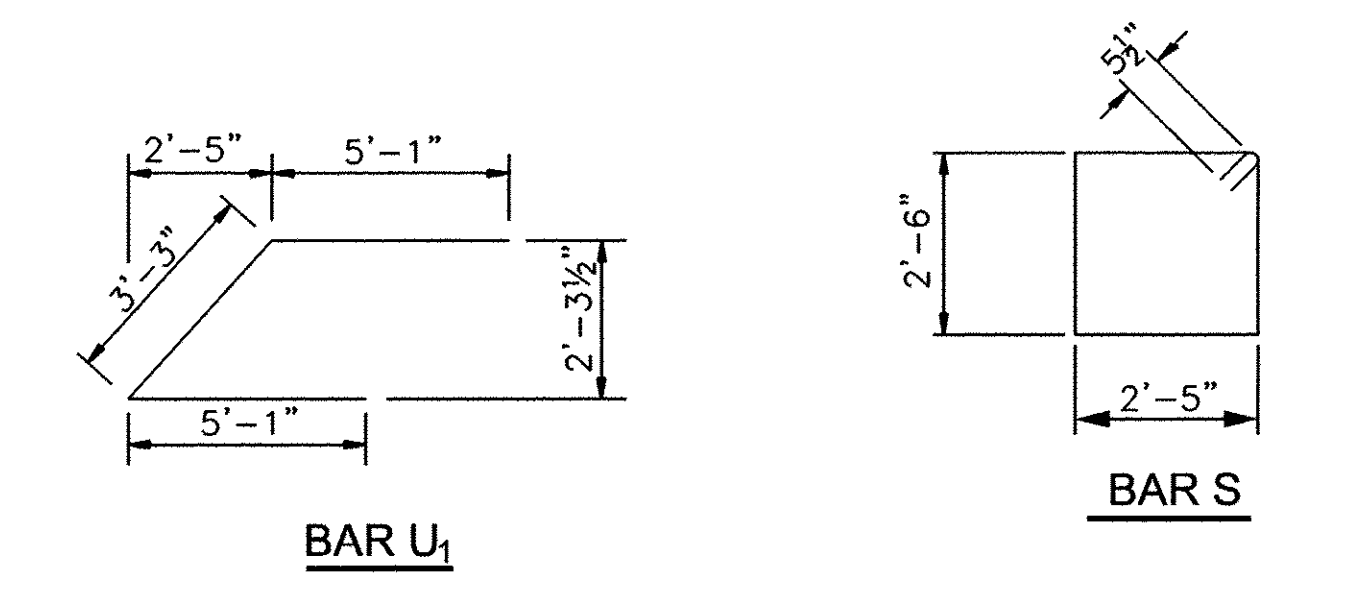
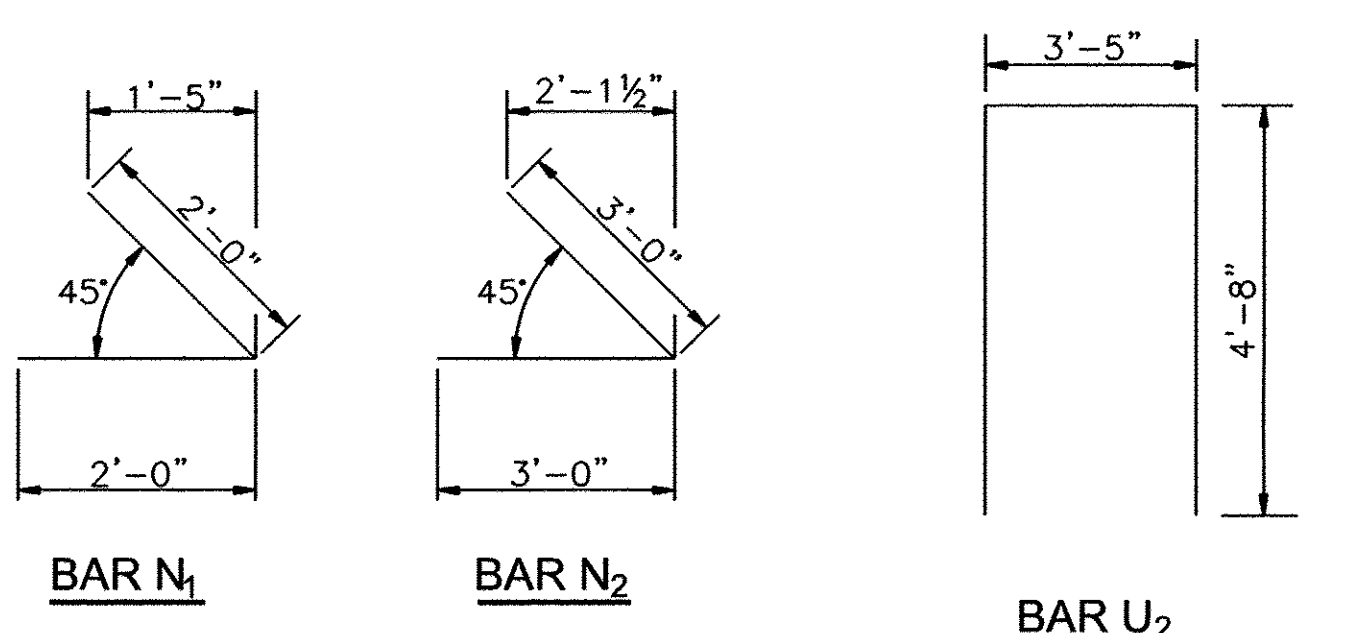
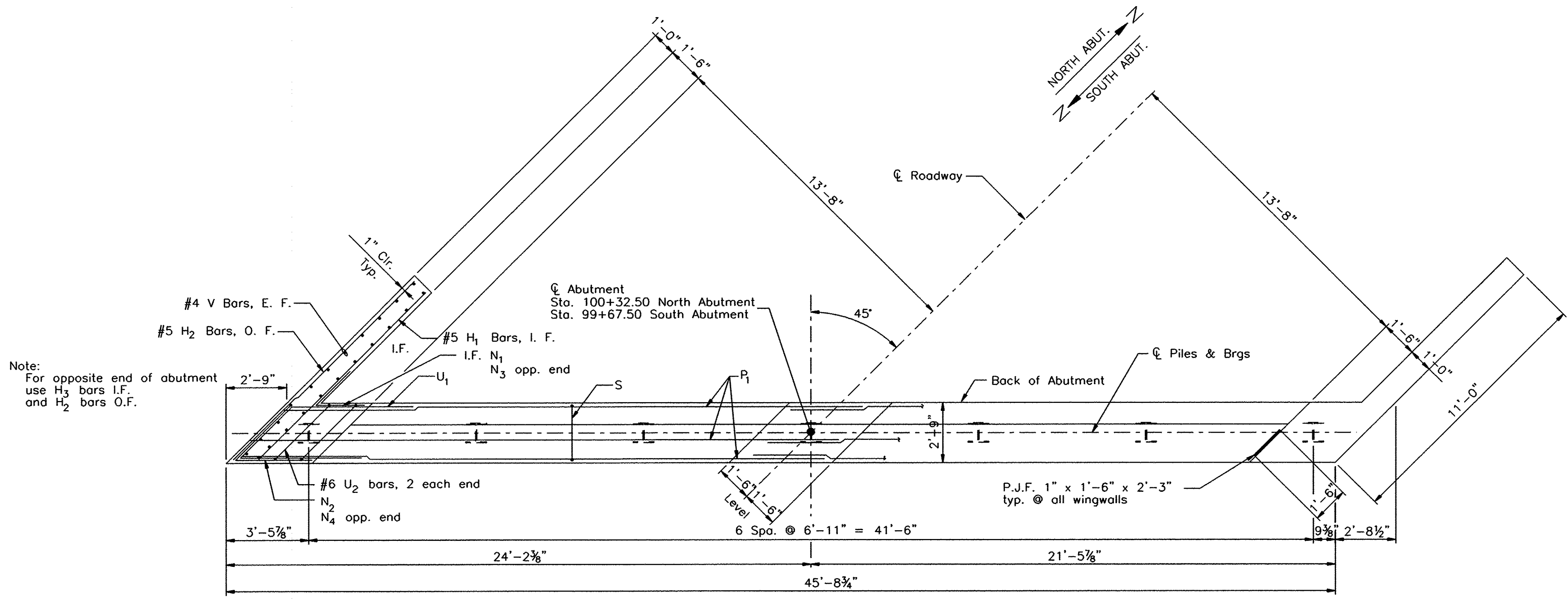
*Keith E. Brandau* 3/24/17

KEITH E. BRANDAU  
ILLINOIS LICENSED STRUCTURAL ENGINEER NUMBER 4905  
LICENSE EXPIRES 11/30/18



REVISIONS		
REV. NO.	DESCRIPTION	DATE





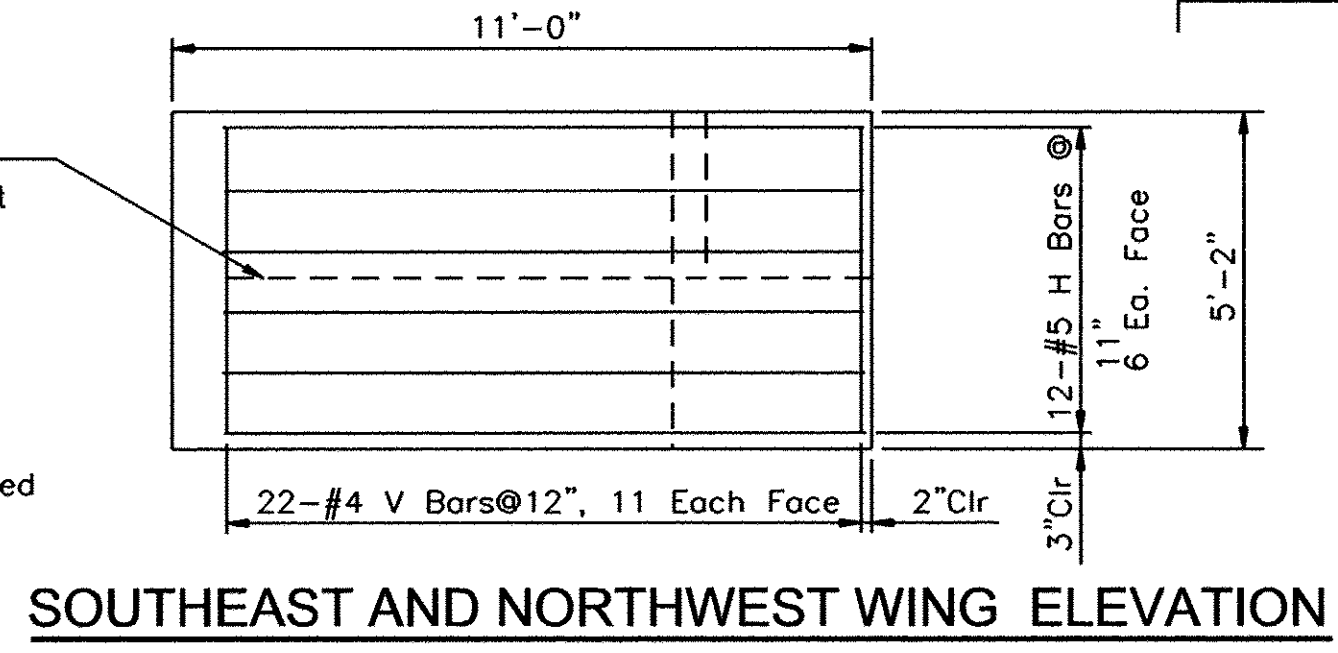
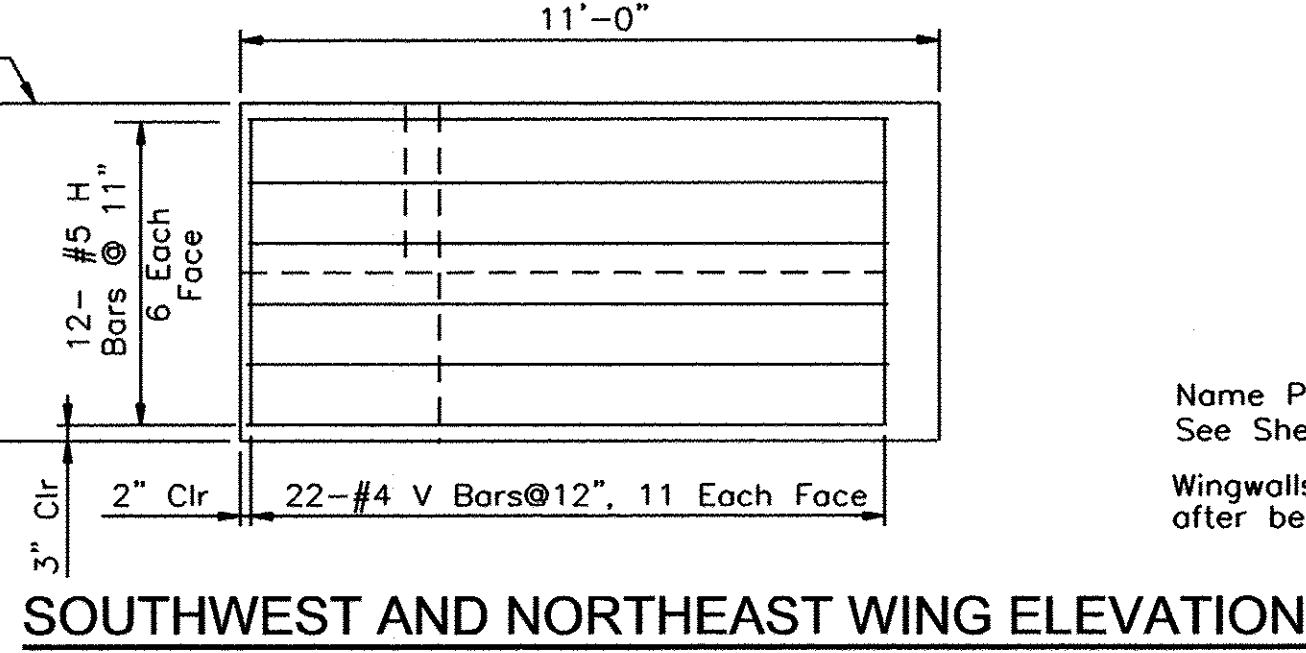
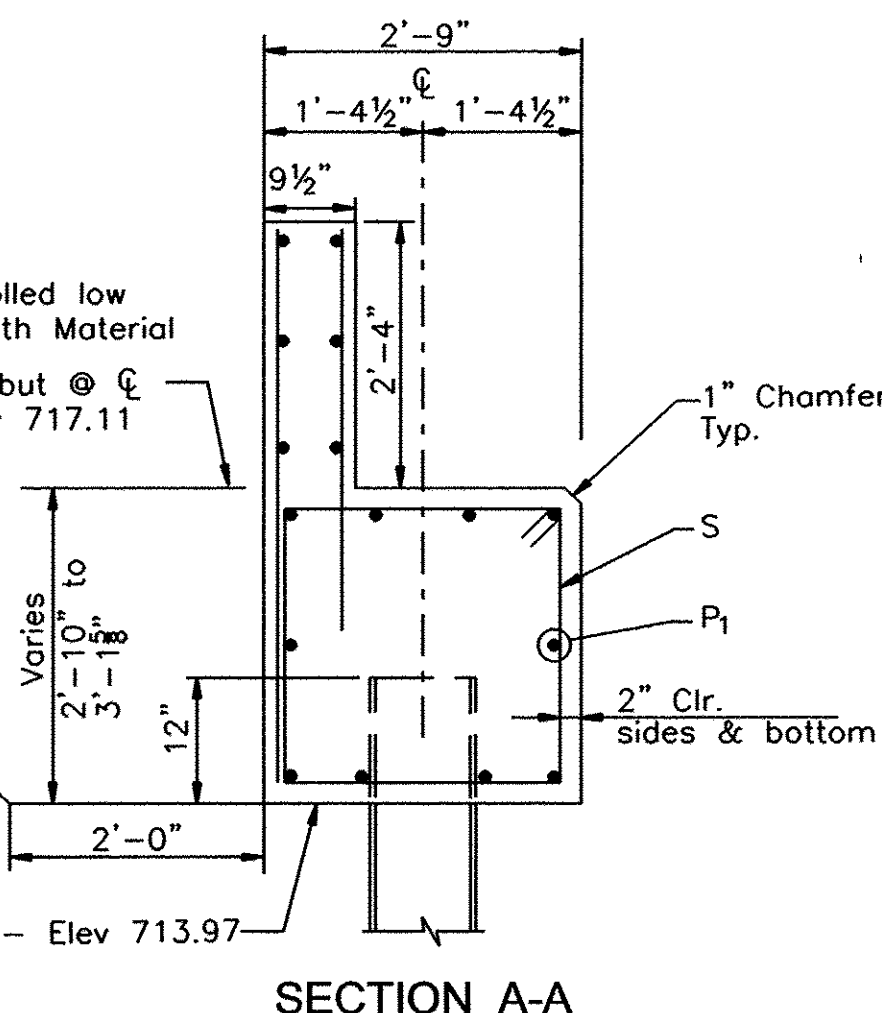
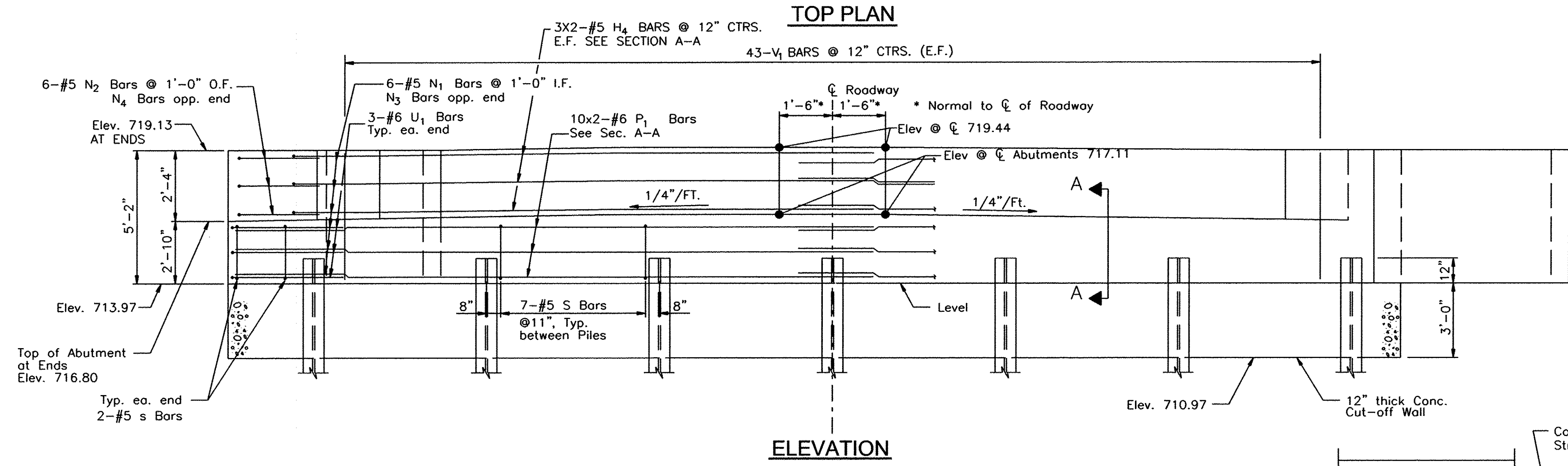
**PILE DATA**

Type: Steel HP 10X42  
No. Required: 6 North Abutment  
6 South Abutment  
Nominal Required Bearing: 217 kips  
Factored Resistance Available: 119 kips  
Est. Length: 50 Ft. N. Abutment  
50 Ft. S. Abutment  
Test Piles: 1 North Abutment  
1 South Abutment

**MINIMUM LAP**  
#5 - 2'-9"  
#6 - 3'-4"

**BILL OF MATERIAL-2 ABUTS.**

Bar	No.	Size	Length	Shape
H <sub>1</sub>	12	#5	9'-9"	—
H <sub>2</sub>	24	#5	10'-8"	—
H <sub>3</sub>	12	#5	11'-6"	—
H <sub>4</sub>	24	#5	23'-10"	—
N <sub>1</sub>	12	#5	4'-0"	—
N <sub>2</sub>	12	#5	6'-0"	—
N <sub>3</sub>	12	#5	4'-0"	—
N <sub>4</sub>	12	#5	6'-0"	—
P <sub>1</sub>	40	#6	24'-3"	—
s	92	#5	10'-9"	—
U <sub>1</sub>	12	#6	13'-5"	—
U <sub>2</sub>	8	#6	12'-9"	—
V	88	#4	4'-8"	—
V <sub>1</sub>	172	#4	4'-6"	—
Concrete Structures			Cu. Yds.	40.6
Reinforcement Bars			Lbs.	5050
Test Pile, Steel HP10x42			Each	2
Steel Piles, HP10x42			Foot	600
Metal Shoes			Each	14
Name Plate			Each	1
Concrete Cut-off Wall			Cu. Yds.	10.2
Structure Excavation			Cu. Yds.	162
Controlled Low Strength Material			Cu. Yds.	68



NOTE: ALL EDGES SHALL HAVE STANDARD 1" CHAMFER, EXCEPT AS NOTED.

**FEHR GRAHAM**  
ENGINEERING & ENVIRONMENTAL  
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS  
IOWA  
WISCONSIN

OWNER/DEVELOPER:  
**VERMILION COUNTY  
HIGHWAY DEPARTMENT  
2732 BATESTOWN ROAD  
OAKWOOD, IL 61858**

PROJECT AND LOCATION:  
**BRIDGE REPLACEMENT  
S.N. 092-3530  
SECTION NO: 13-02149-00-BR  
BUTLER TOWNSHIP**

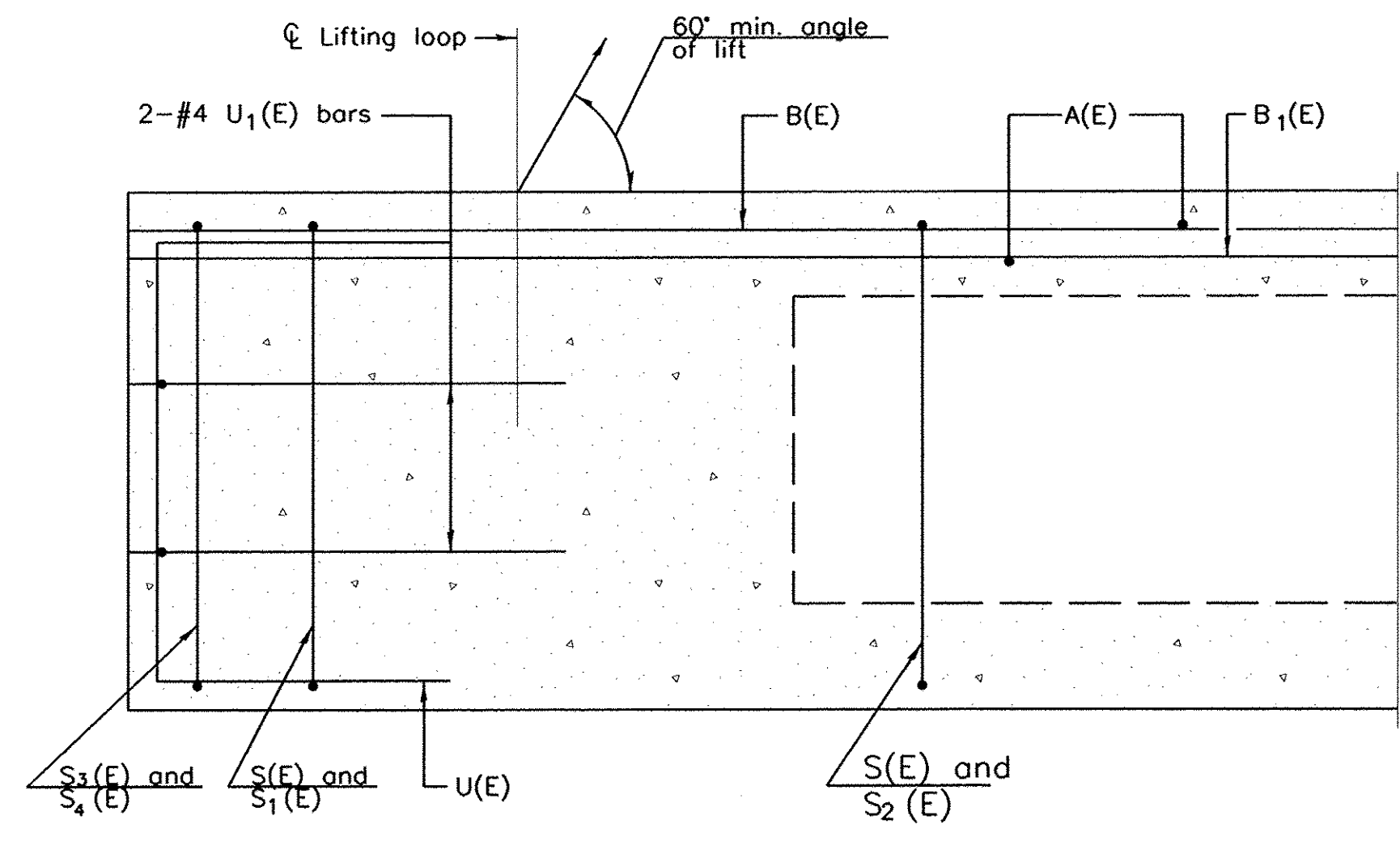
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APPROVED BY: **RTM**  
DATE: **3/24/2017**  
SCALE: **NTS**

REV. NO.	DESCRIPTION	DATE

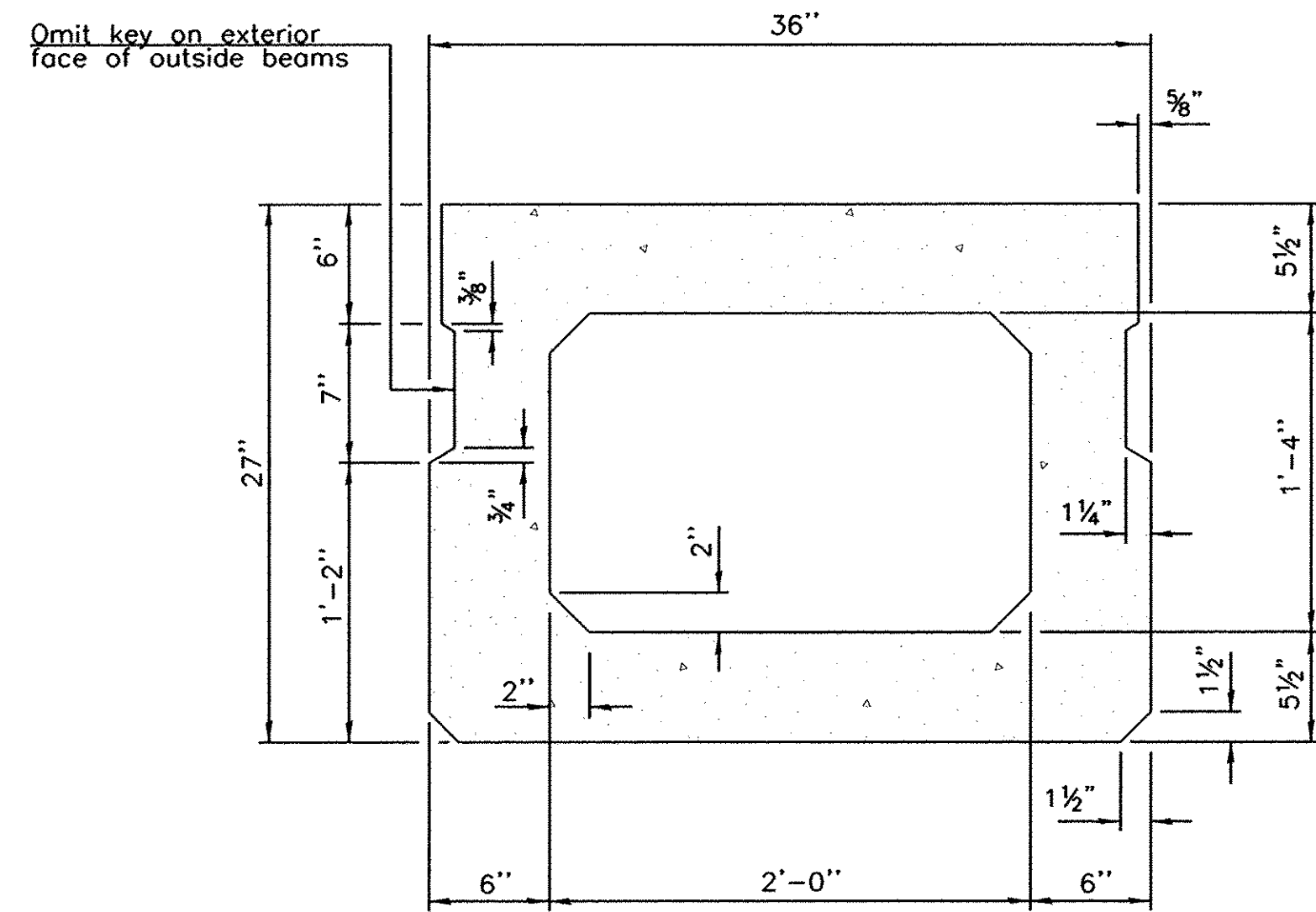
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**BRIDGE ABUTMENTS**

JOB NUMBER:  
**15-148**

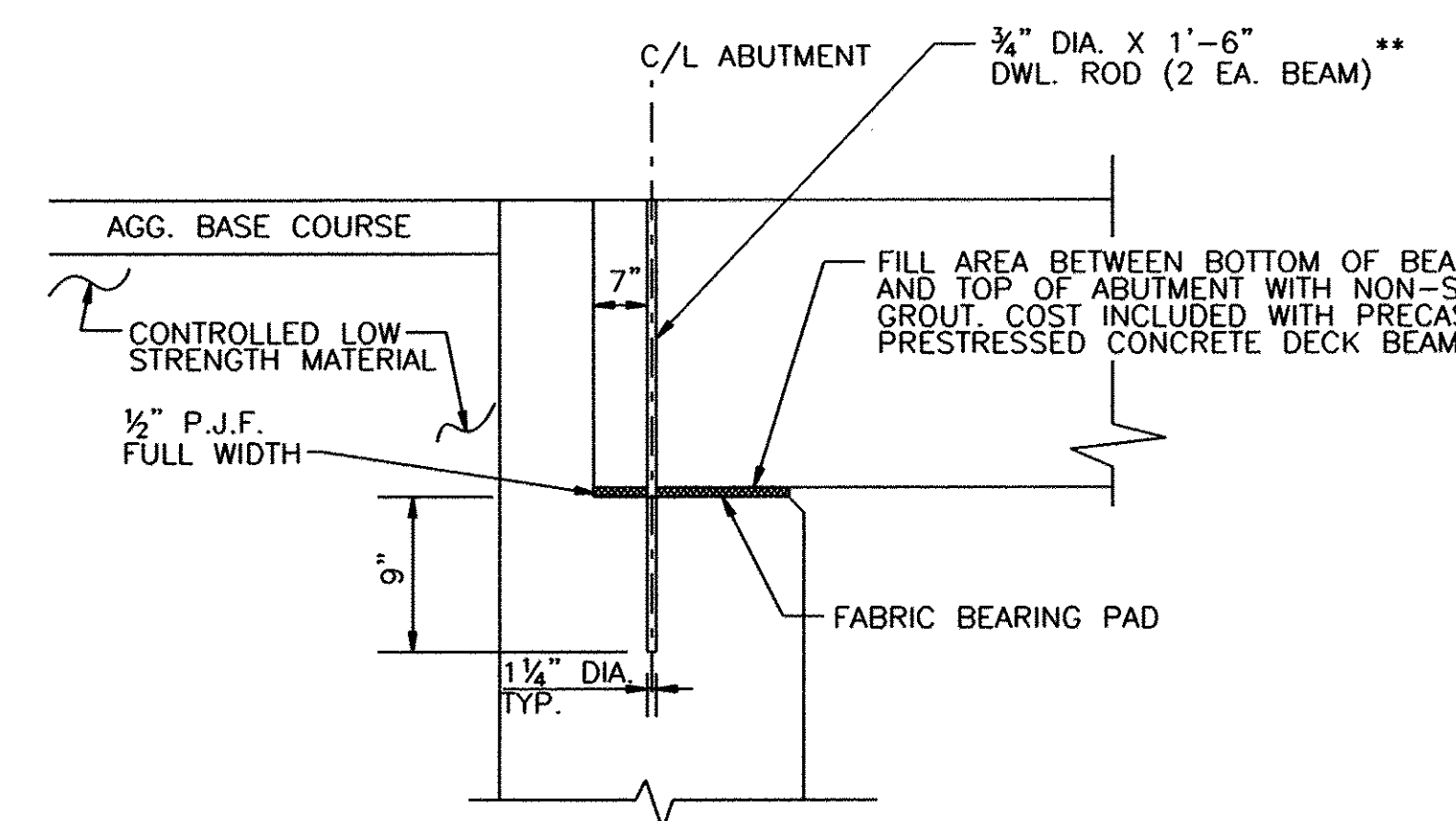
SHEET NUMBER:  
**09 of 21**



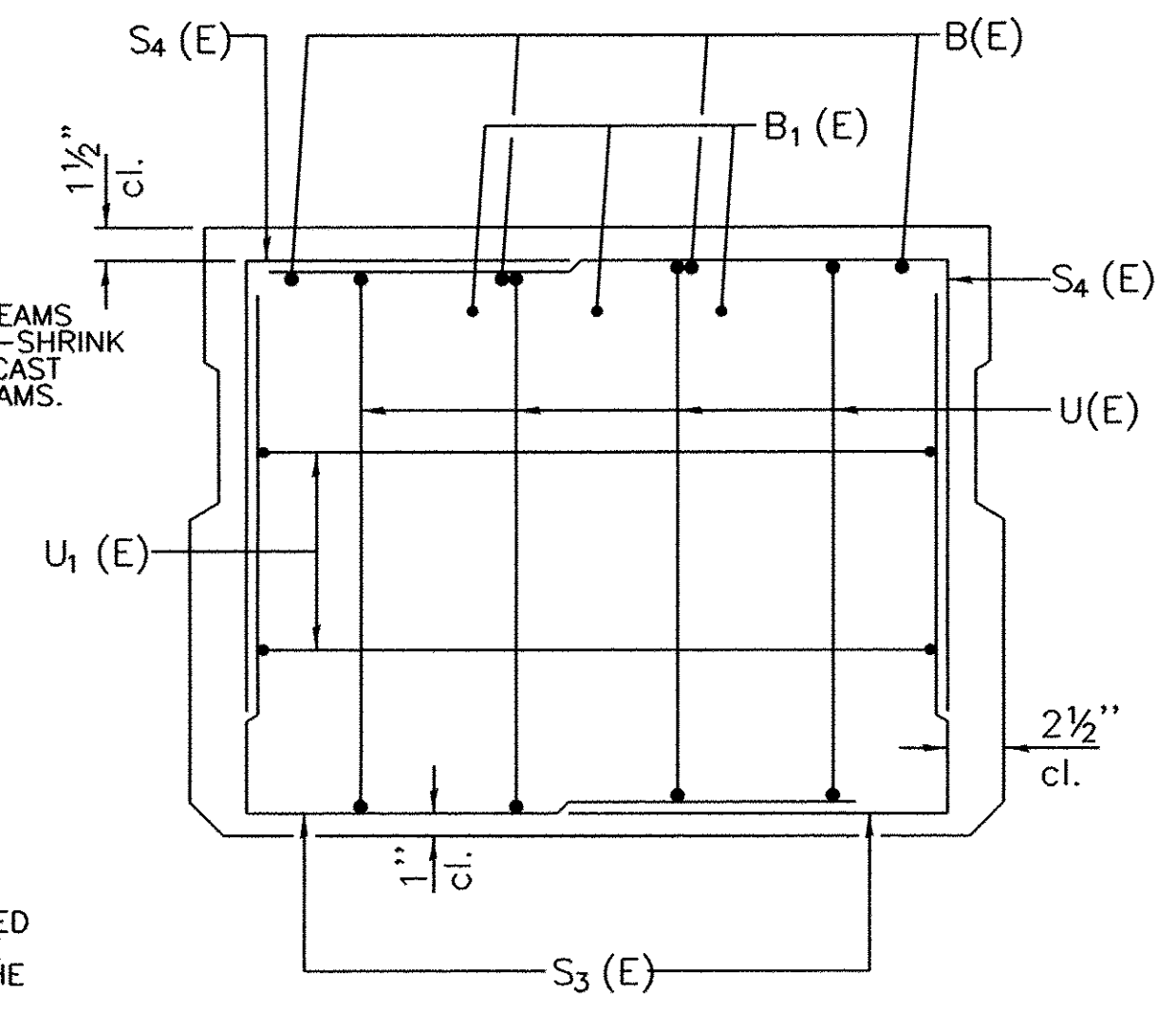
SECTION A-A



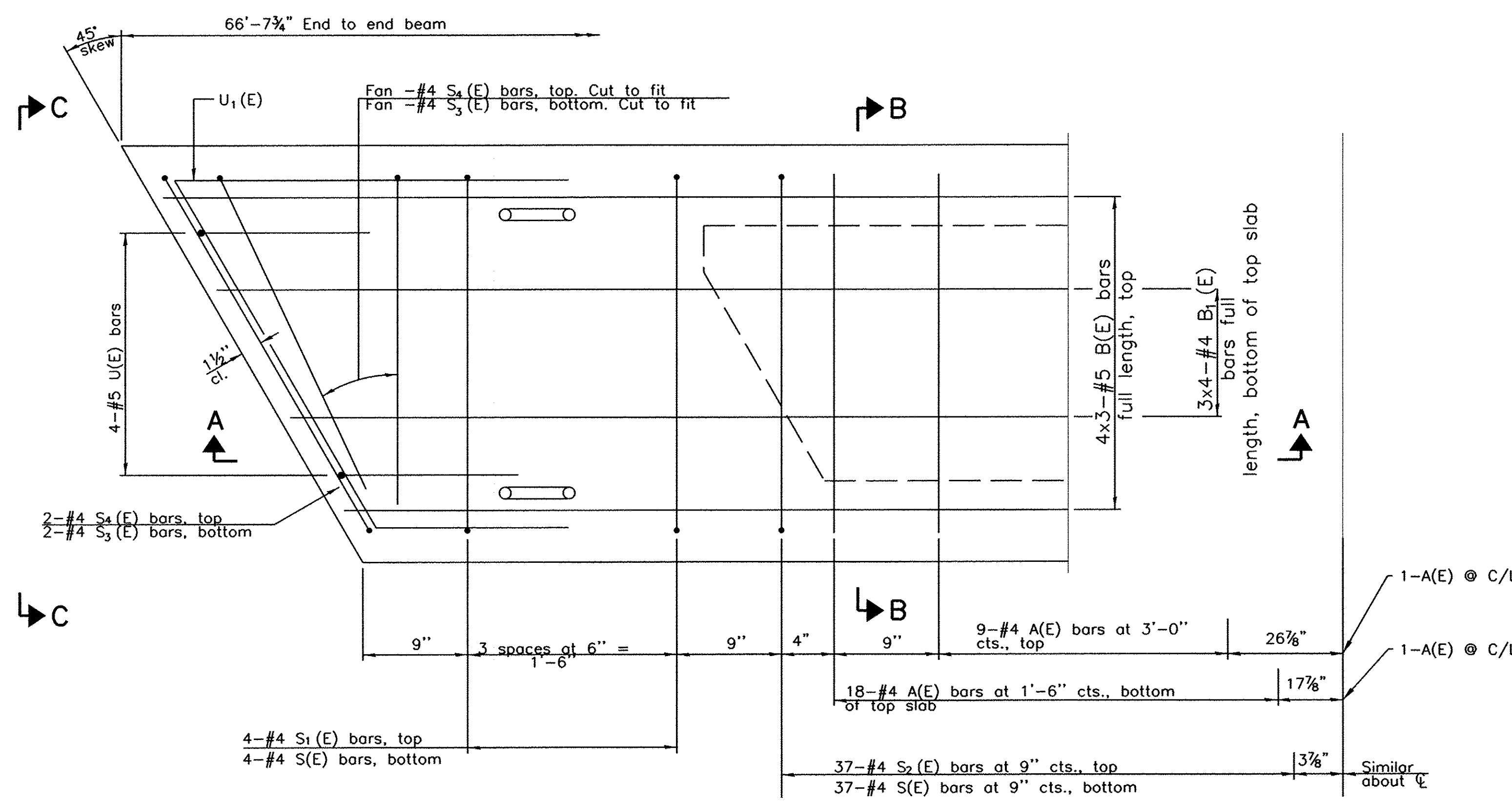
SECTION B-B  
(Showing dimensions)



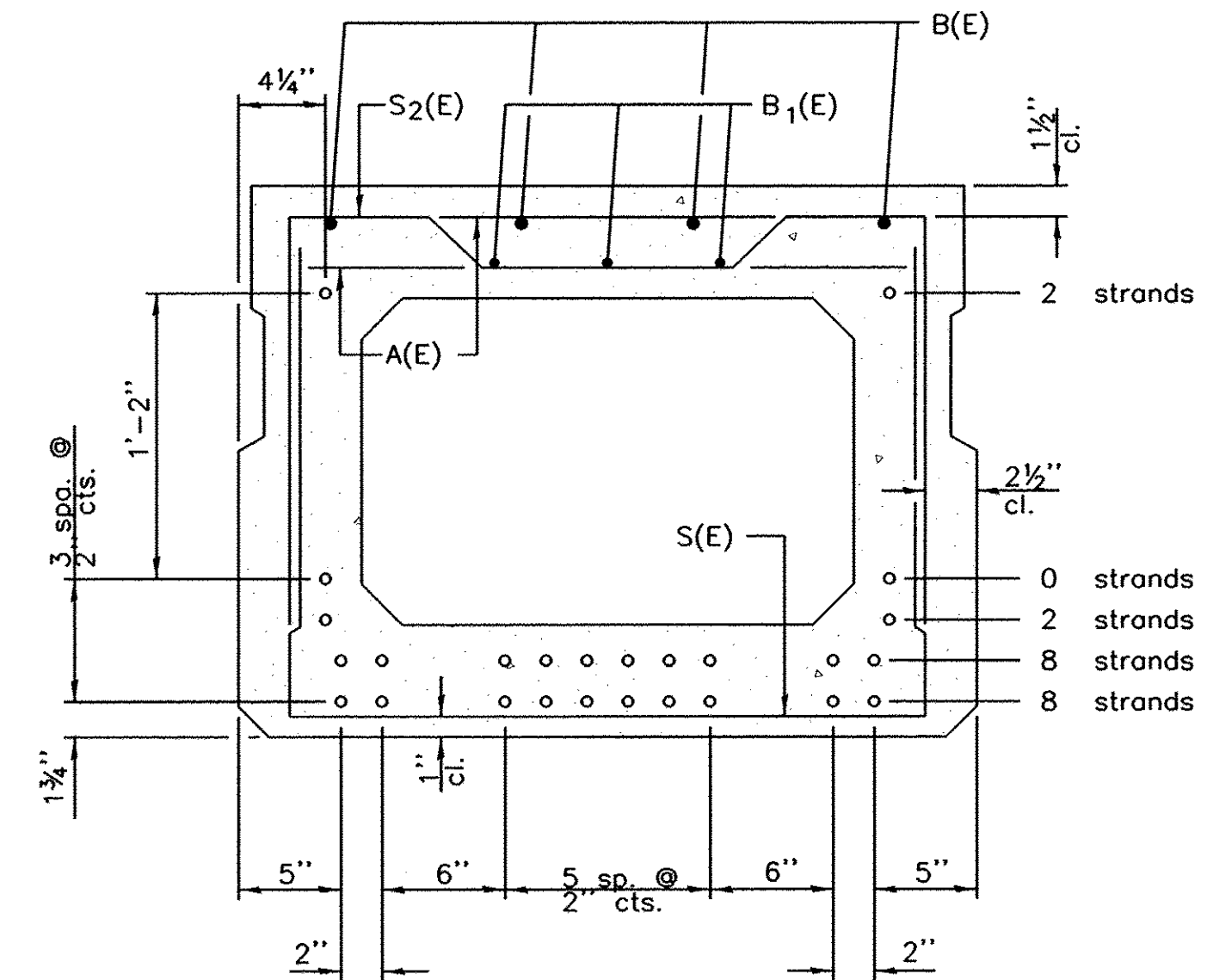
SECTION AT ABUTMENT



VIEW C-C

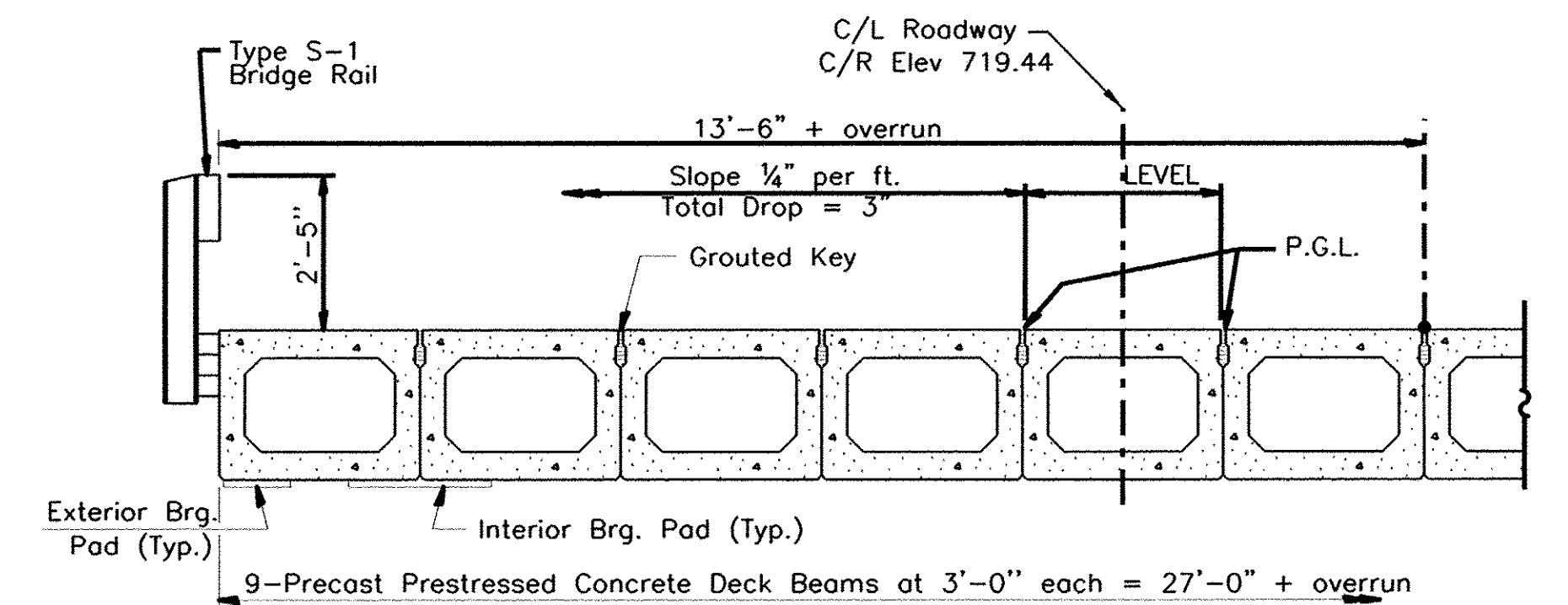


PLAN VIEW



SECTION B-B

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



HALF CROSS SECTION

BAR LIST  
ONE BEAM ONLY

(For information only)

Bar	No.	Size	Length	Shape
A(E)	56	#4	2'-7"	—
B(E)	12	#5	23'-10"	—
B1(E)	12	#4	18'-2"	—
S(E)	83	#4	6'-5"	┌
S1(E)	8	#4	5'-11"	┌
S2(E)	75	#4	6'-2"	┌
S3(E)	12	#4	5'-11"	┌
S4(E)	12	#4	5'-8"	┌
U(E)	8	#5	4'-6"	┌
U1(E)	4	#4	8'-6"	┌

Note: See sheet 10 of 20 for additional details and Bill of Material.

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.

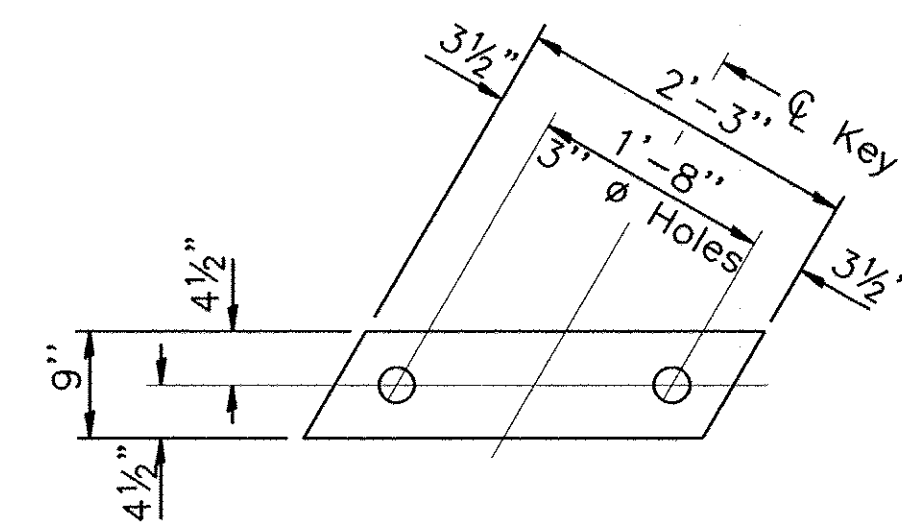
MINIMUM BAR LAP

#4 bar = 2'-0"  
#5 bar = 2'-9"

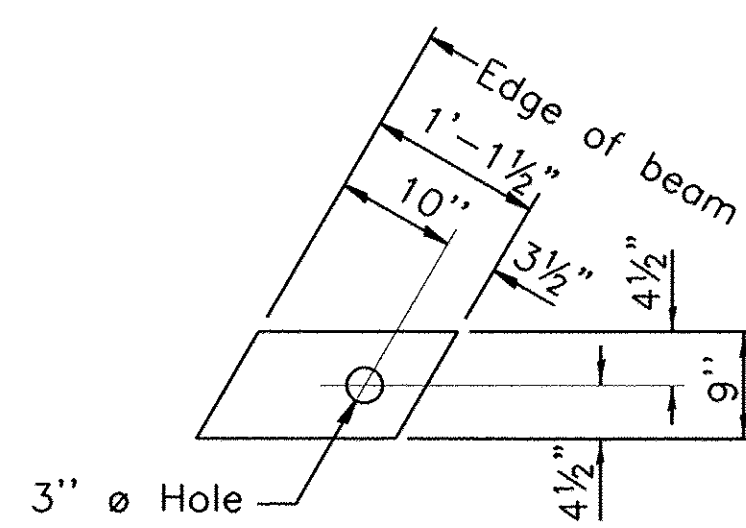
PD-2736-R

REVISIONS		
REV. NO.	DESCRIPTION	DATE

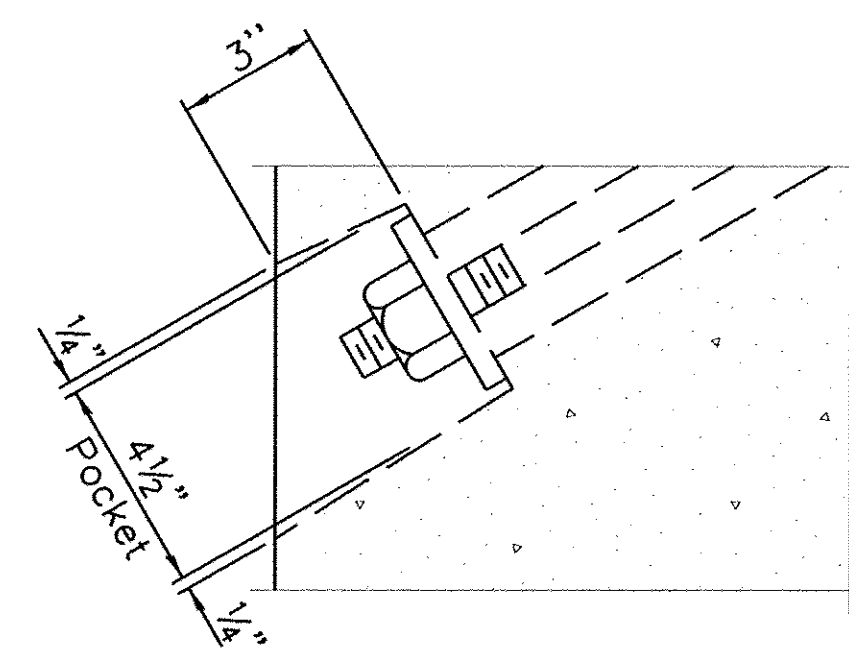




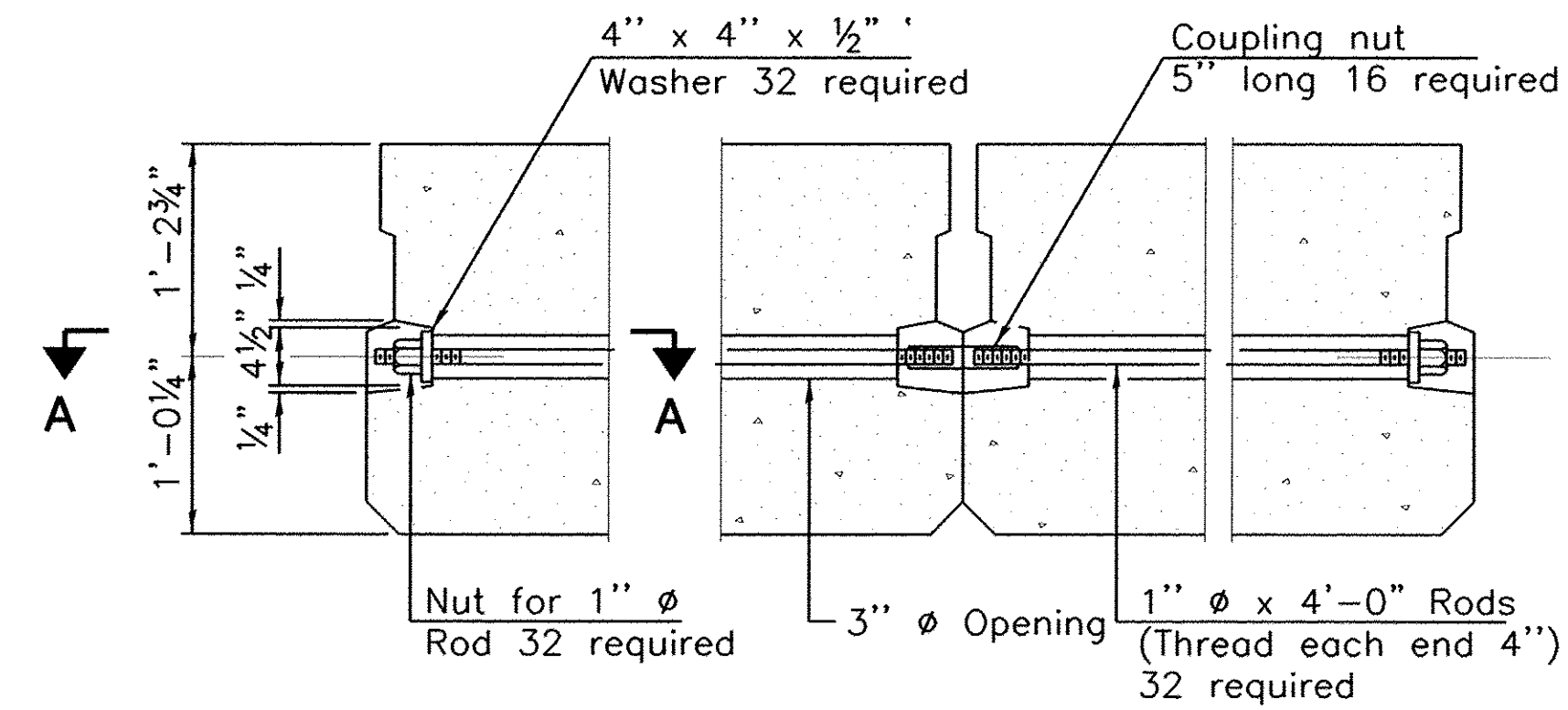
**FABRIC BEARING PAD**  
(Interior)



**FABRIC BEARING PAD**  
(Exterior)

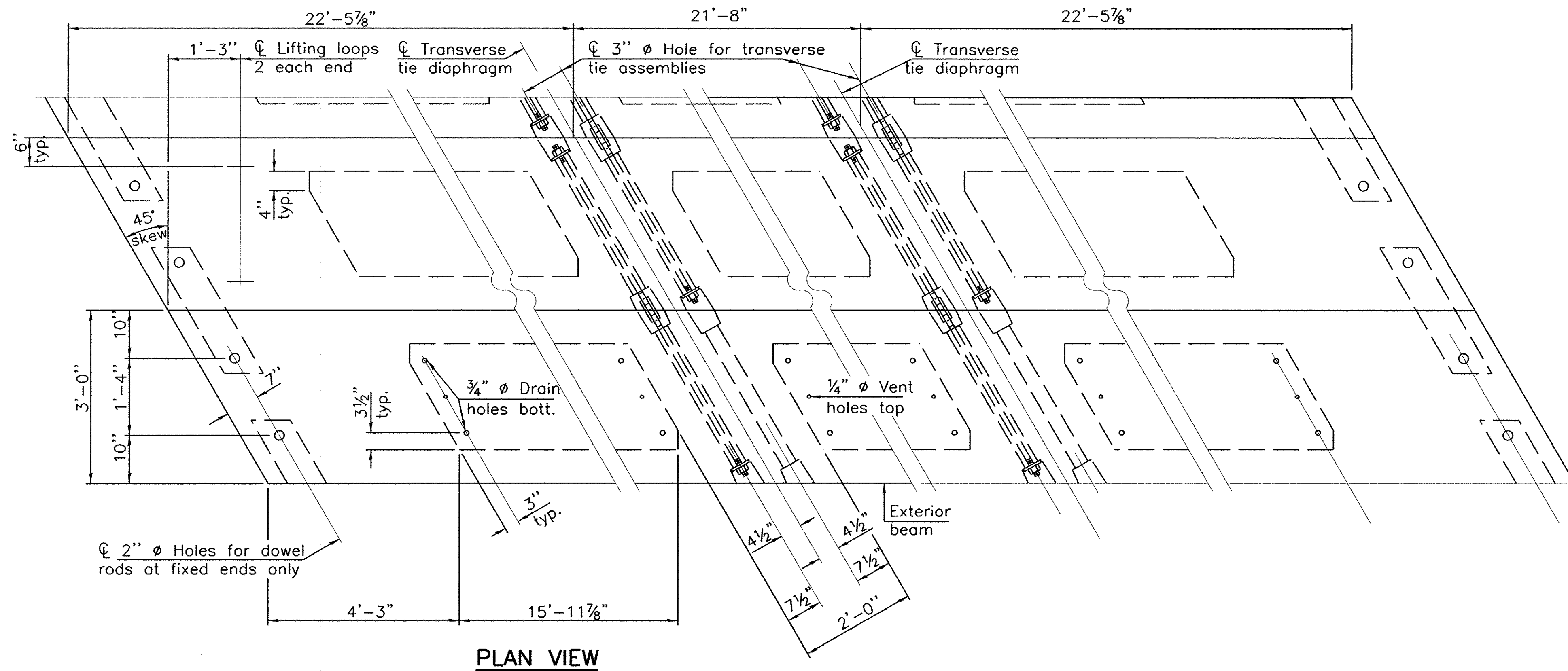


**SECTION A-A**

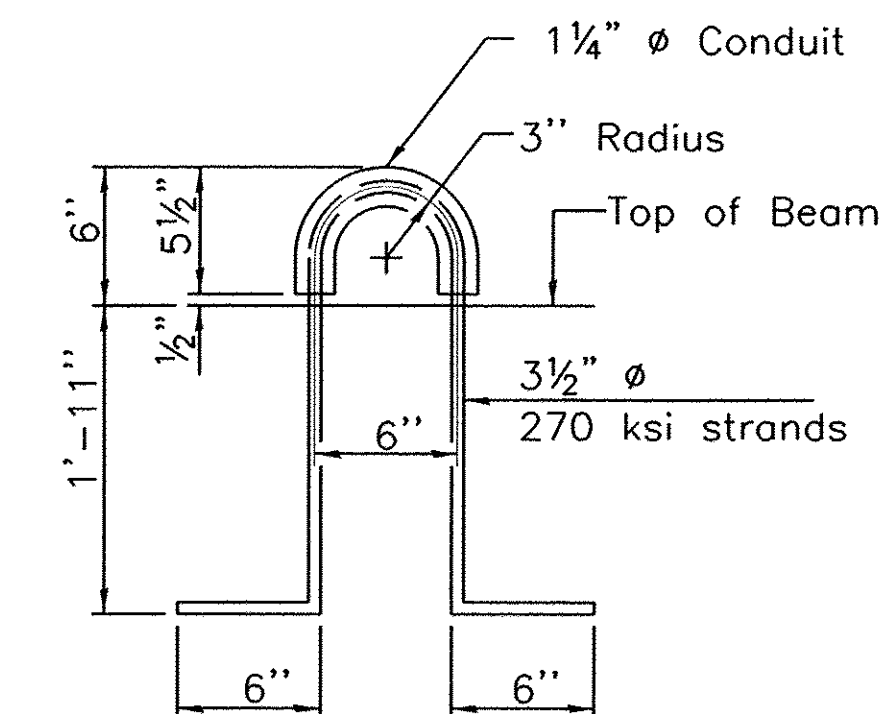


**TYPICAL TRANSVERSE TIE ASSEMBLY**

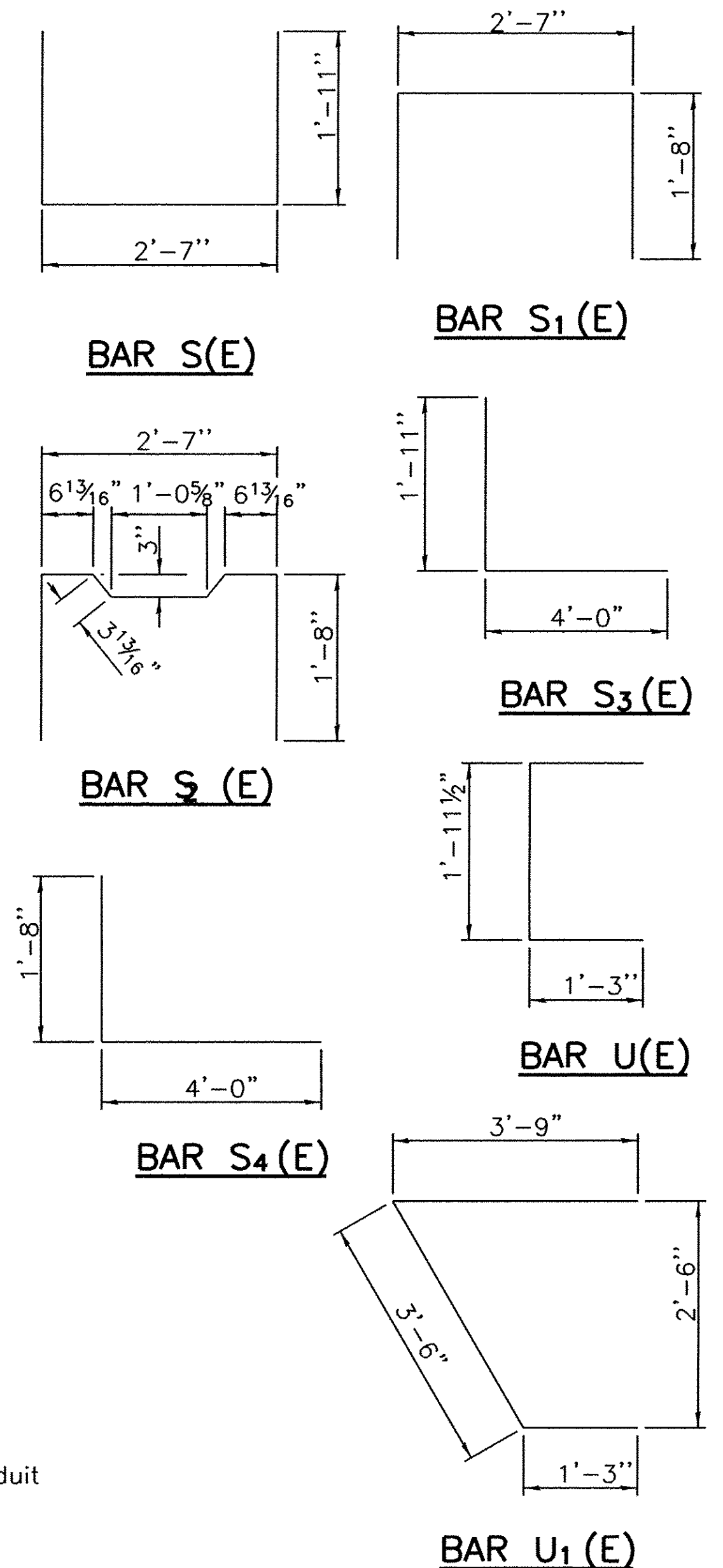
**FIXED**  
Notes:  
All bearing pads shall be 1" thick.  
Omit holes when using expansion bearings.  
Expansion bearing pad shall be bonded to the substructure.



**PLAN VIEW**



**LIFTING LOOP DETAIL**



**BILL OF MATERIAL**

Material	Sq. Ft.	Quantity
Precast Prestressed Conc. Deck Bms. (27" depth)		1799

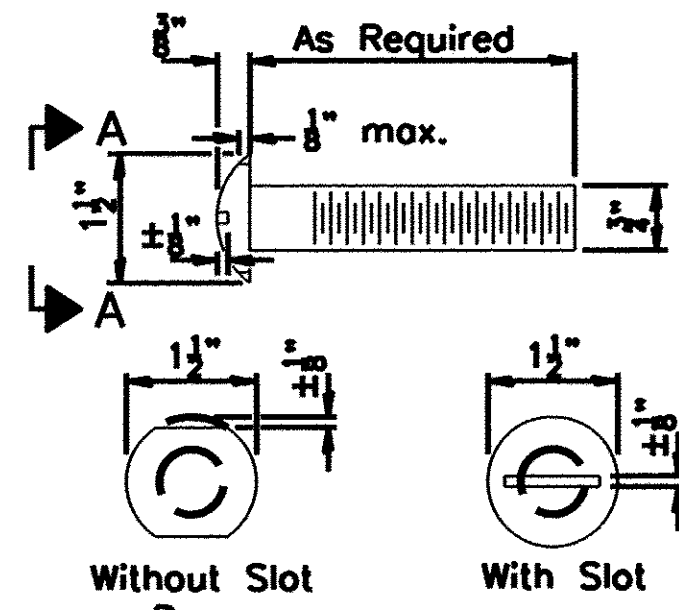
**NOTES**

- 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" diameter rods in the transverse tie assembly shall be tightened to a snug fit and the threads set. Pockets on exterior faces of bridge shall be filled with grout after transverse tie assembly is in place.
- Reinforcement bars shall conform to ASTM A 706, Grade 60. (See Special Provisions).
- Two 1/8" fabric adjusting shims of the dimensions of the exterior bearing pad shall be provided for each bearing pad location.
- A minimum 2 1/2" diameter lifting pin shall be used to engage the lifting loops during handling.
- Corrosion Inhibitor, per Article 1020.05(b)(12) and 1021.06 of the Standard Specifications, shall be used in the concrete for precast prestressed concrete deck beams.
- Compressive strength of prestressed concrete, f'c, shall be 6000 psi.
- Compressive strength of prestressed concrete at release, f'ci, shall be 5000 psi.

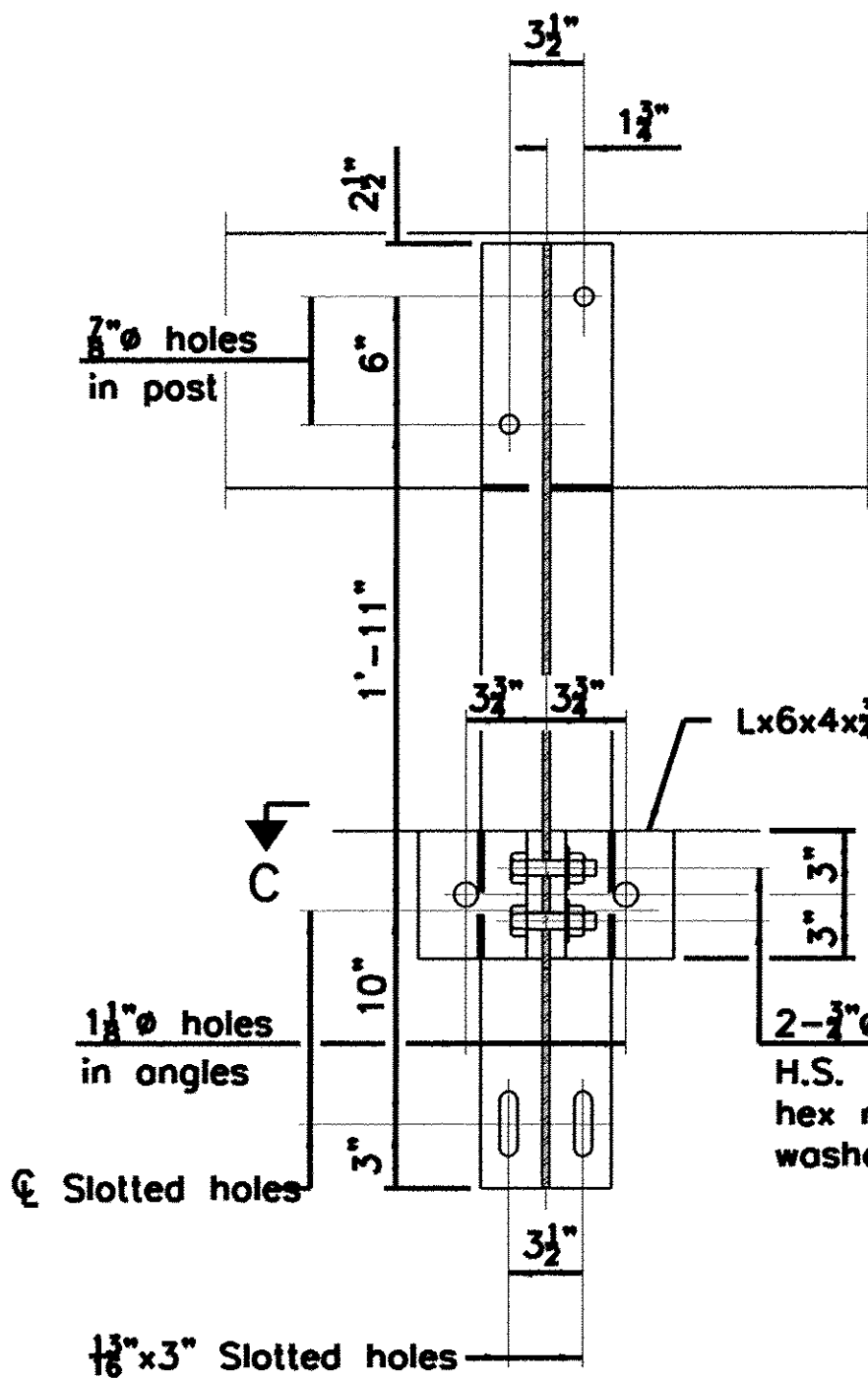
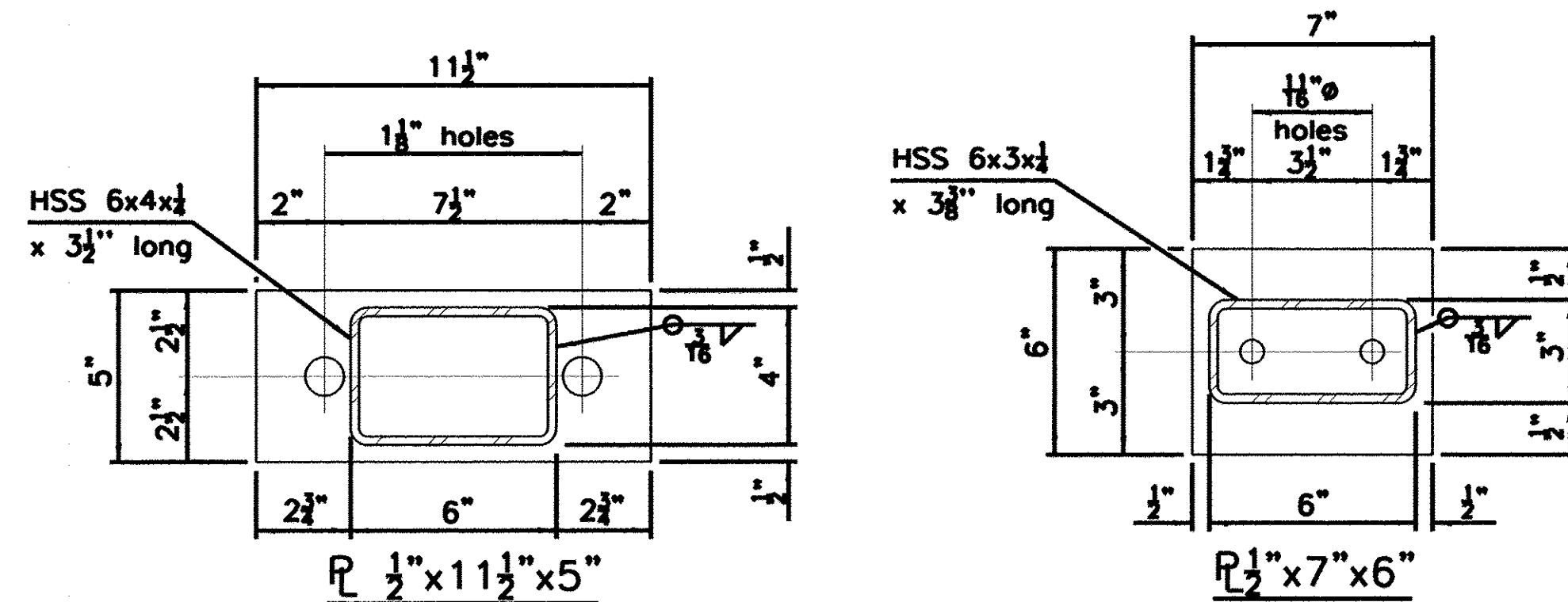
Note: Connect beams in pairs with the transverse tie configuration shown.

PD-2736-RD

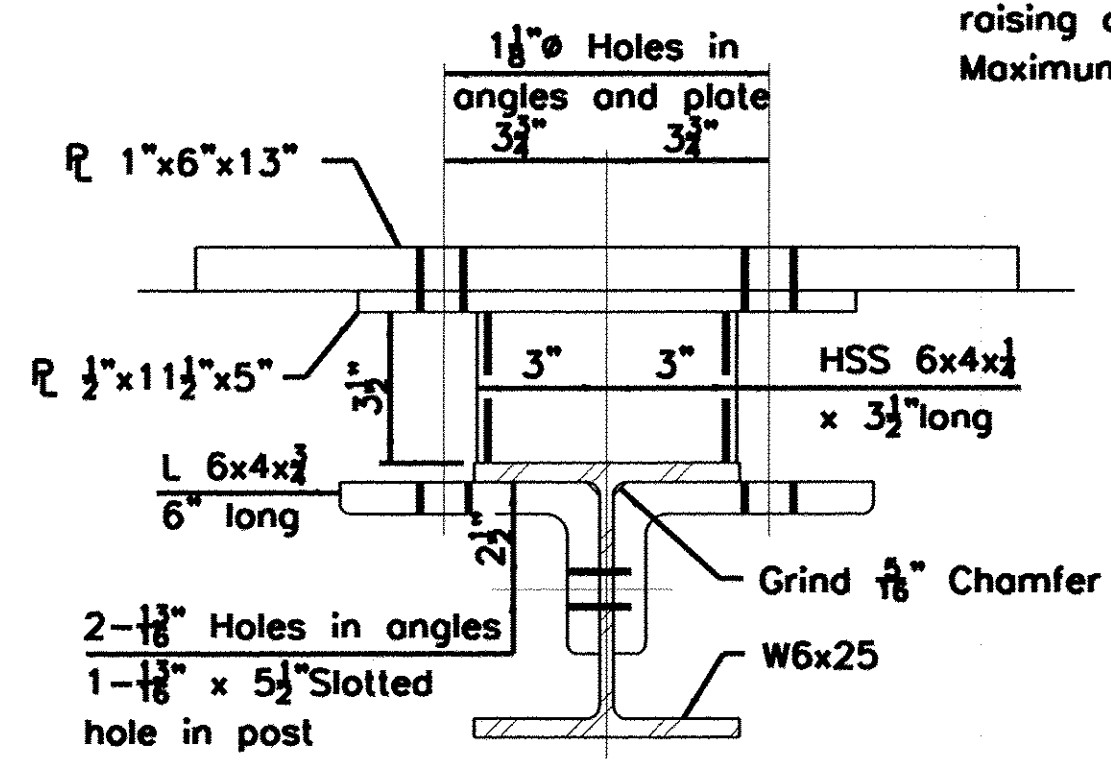
REV. NO.	DESCRIPTION	DATE



VIEW A-A  
ROUND HEAD BOLT

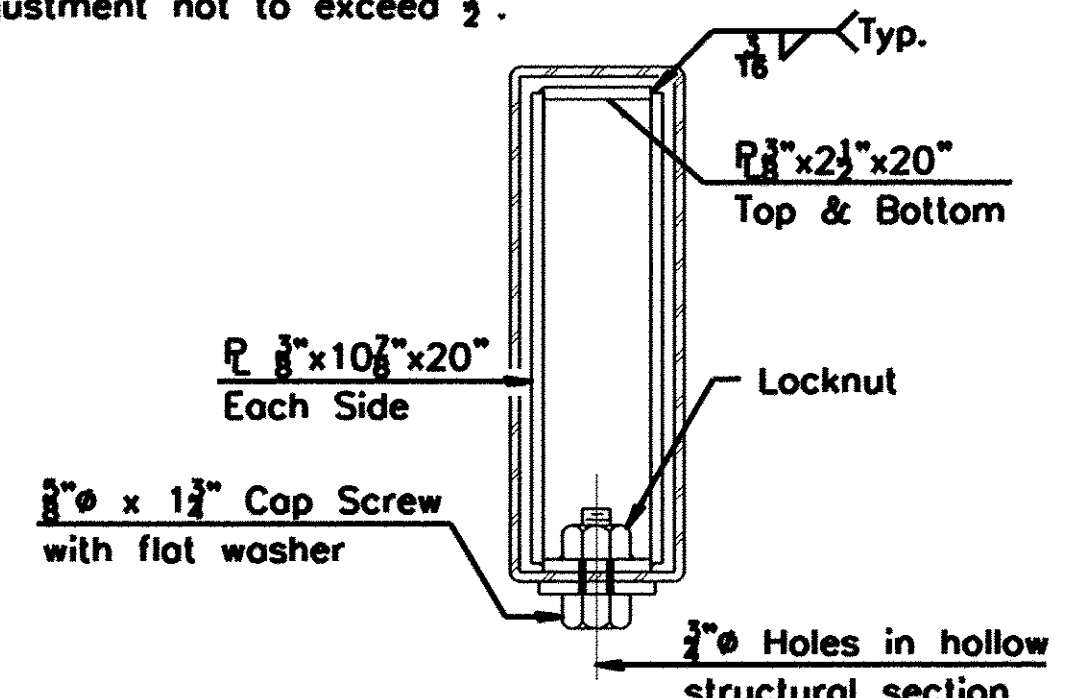


SECTION B-B

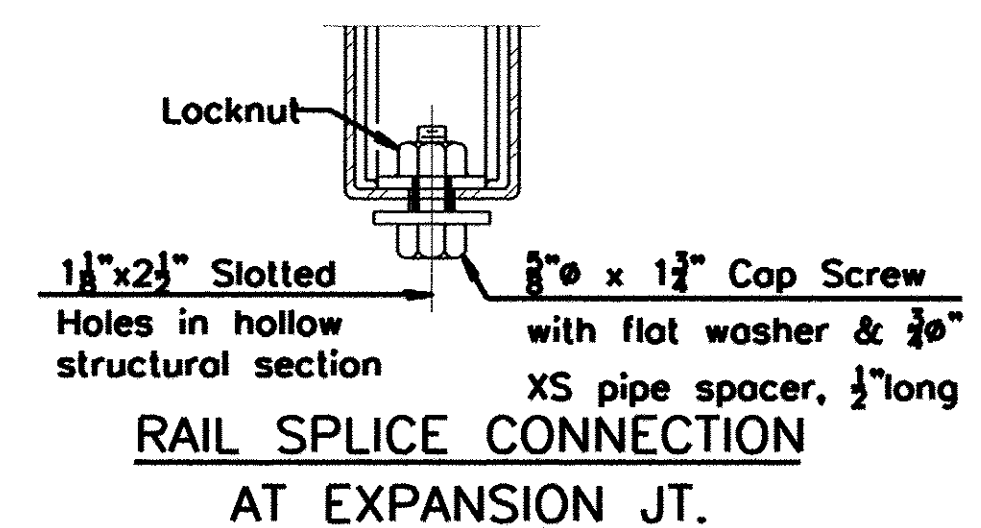


SECTION C-C

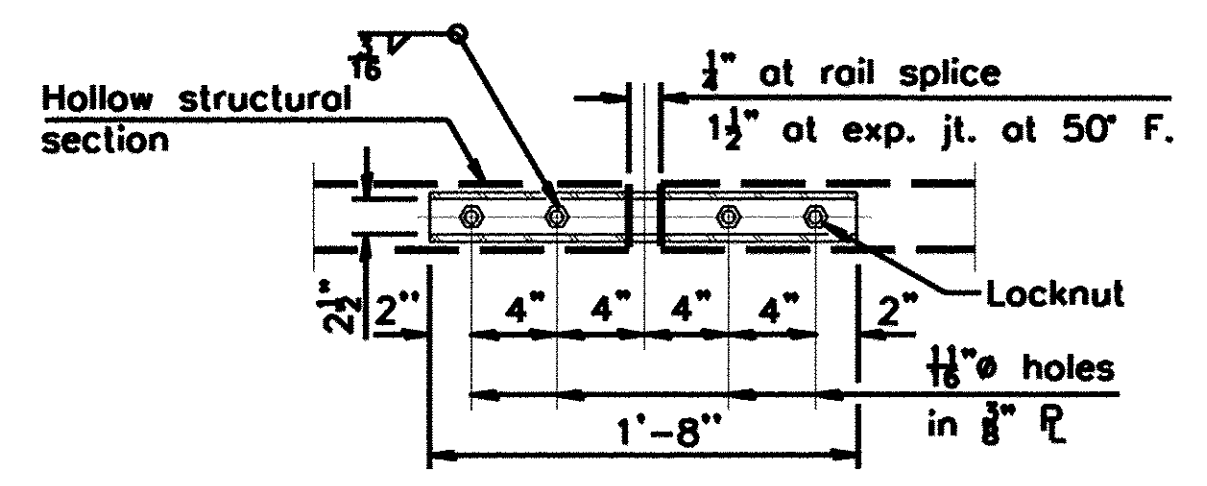
•• Whenever the lower insert assemblies interfere with strand locations, the #3 bars shall be cut and adjusted in order to allow raising or lowering of the lower inserts. Maximum adjustment not to exceed 1/2".



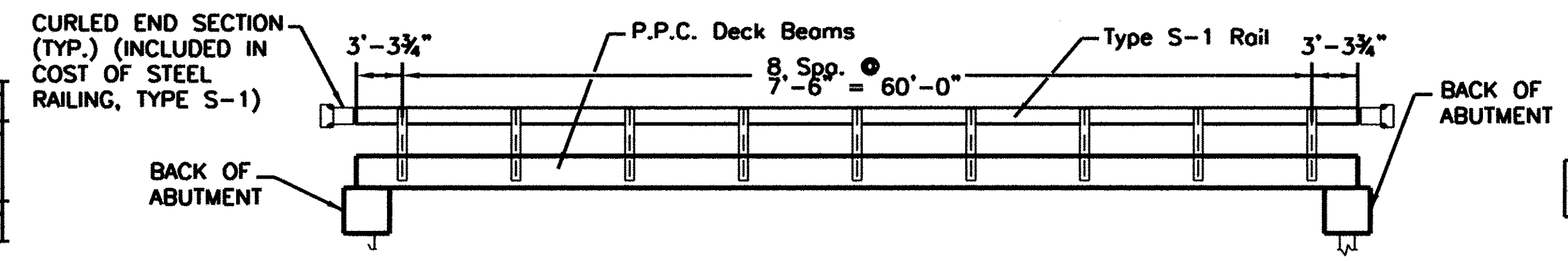
SECTIONS AT RAIL SPLICE



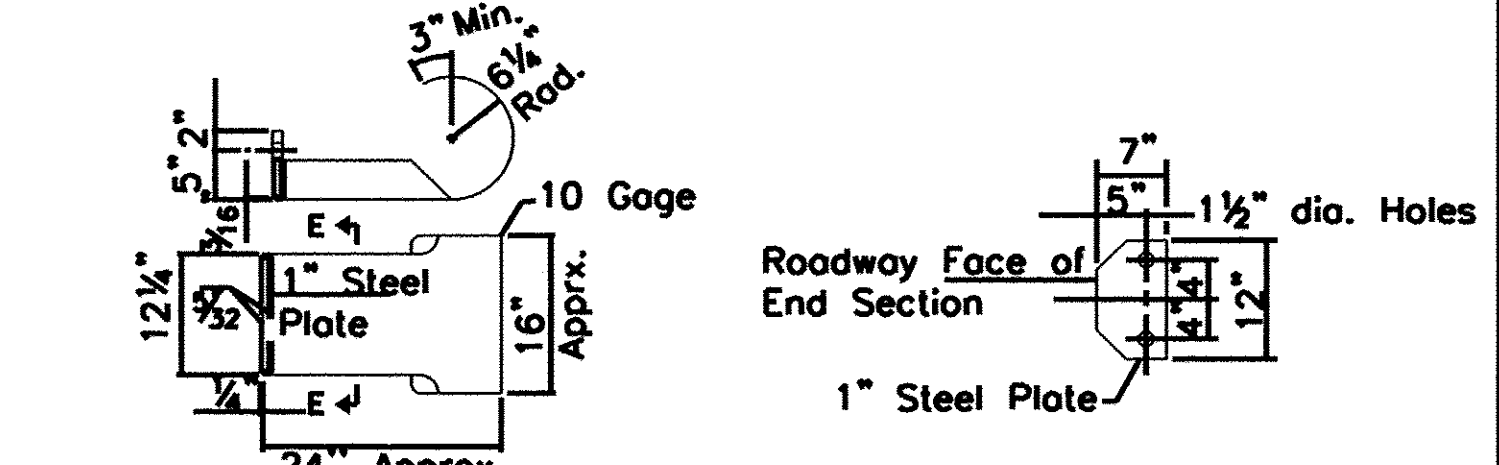
RAIL SPLICE CONNECTION  
AT EXPANSION JT.



PLAN-BOTT. SPLICE  
TYPICAL

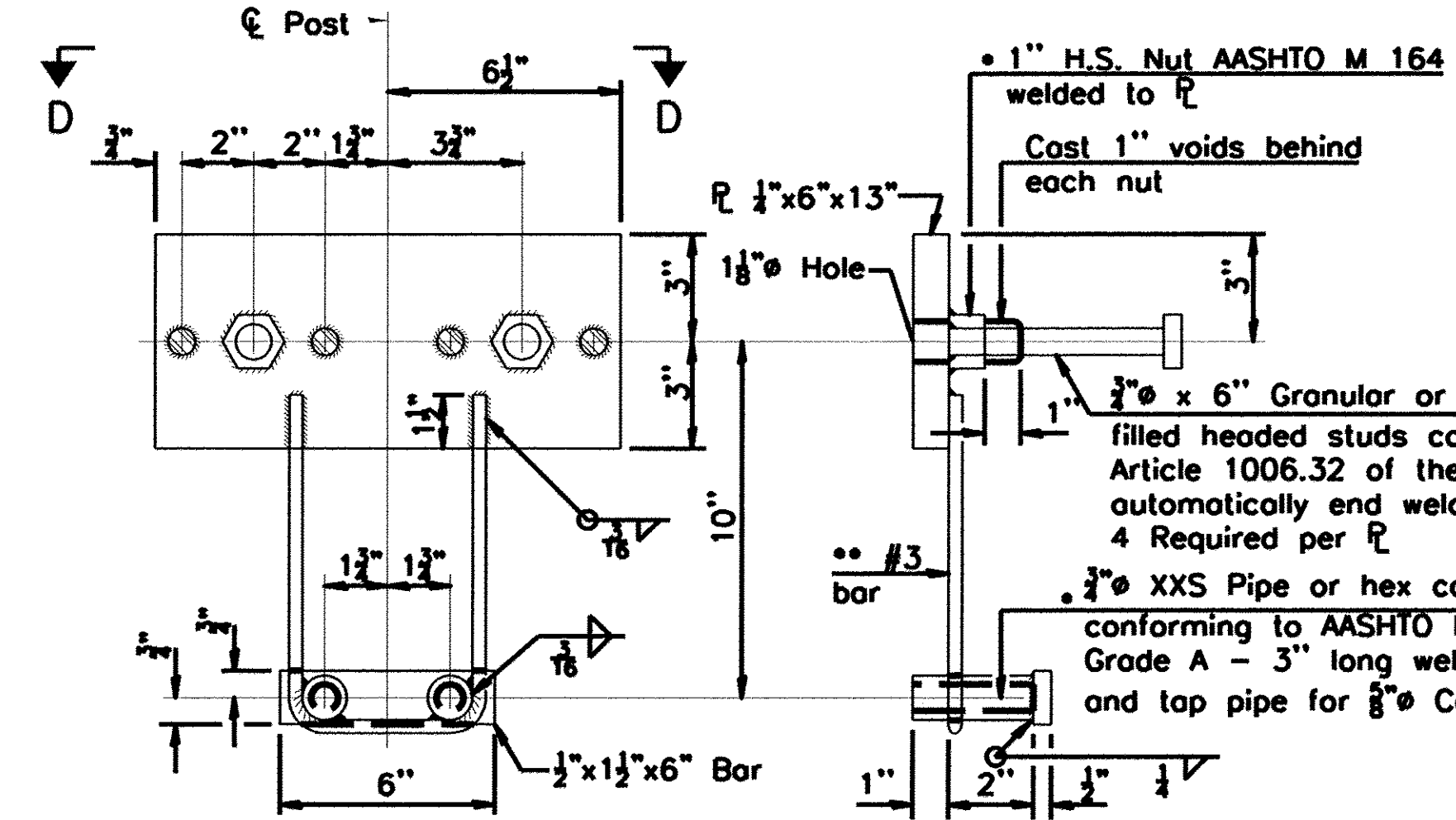


STEEL RAILING ELEVATION



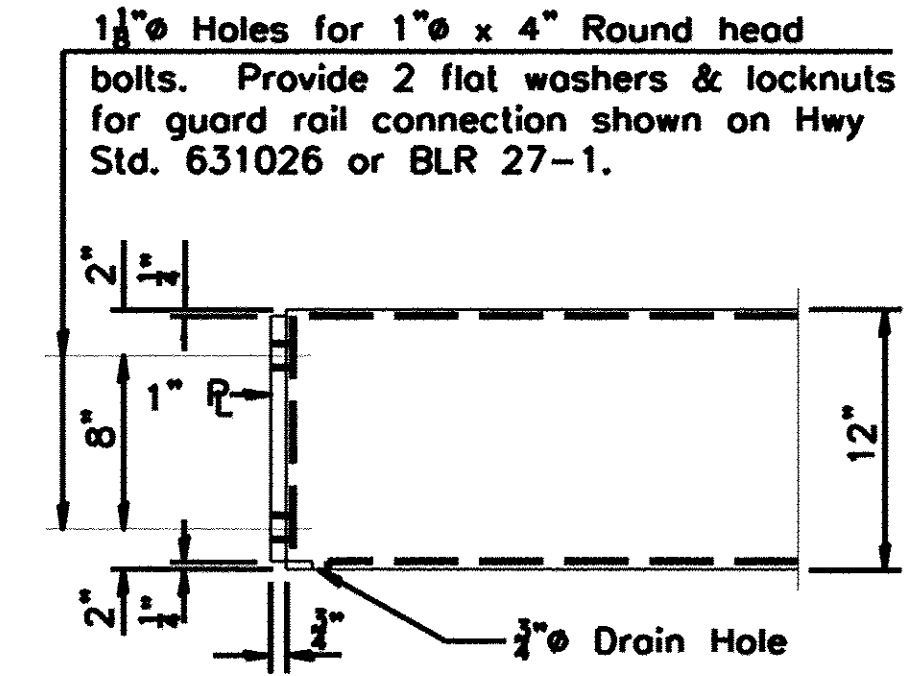
CURLED END SECTION DETAILS  
(4 Required)

SECTION E-E

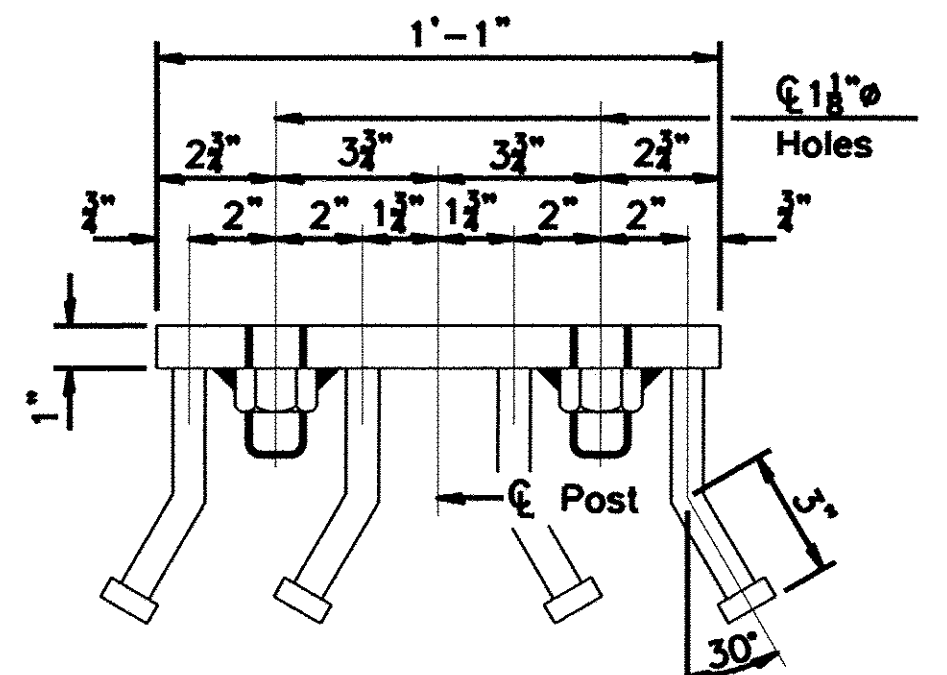


ANCHOR DEVICE

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



END OF RAIL DETAILS



VIEW D-D

**BILL OF MATERIAL**

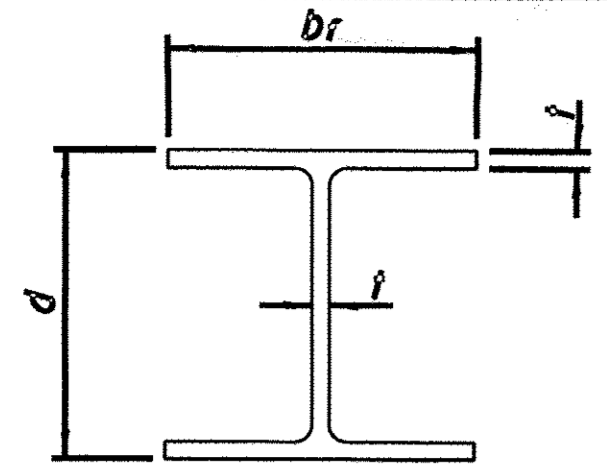
Item	Unit	Quantity
Steel Railing, Type S-1	Foot	134

Notes:  
 All field drilled holes shall be coated with an approved zinc rich paint before erection.  
 For multi-span bridges, sufficient 1/2" 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.

R-23A 7-1-10 (10'-9" Maximum Post Spacing)

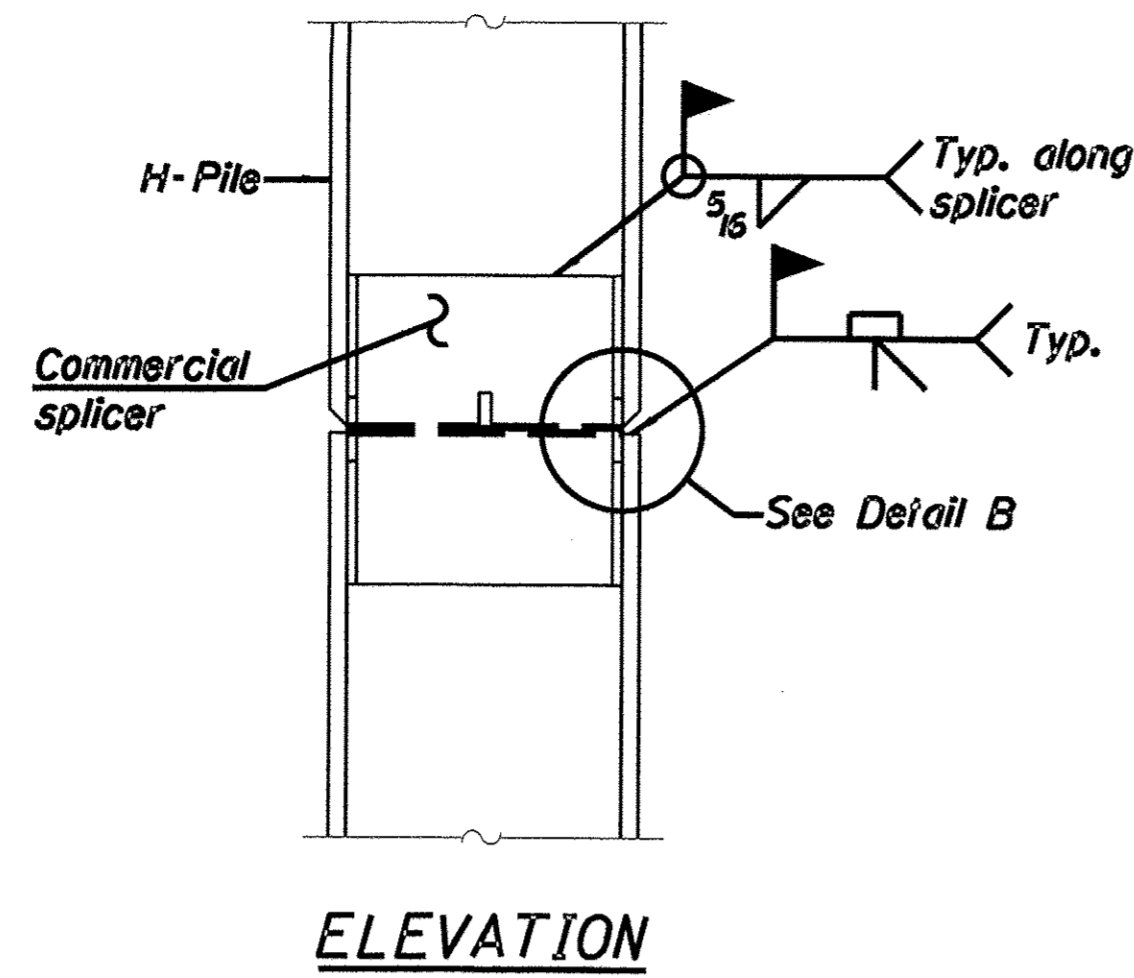
REVISIONS		
REV. NO.	DESCRIPTION	DATE



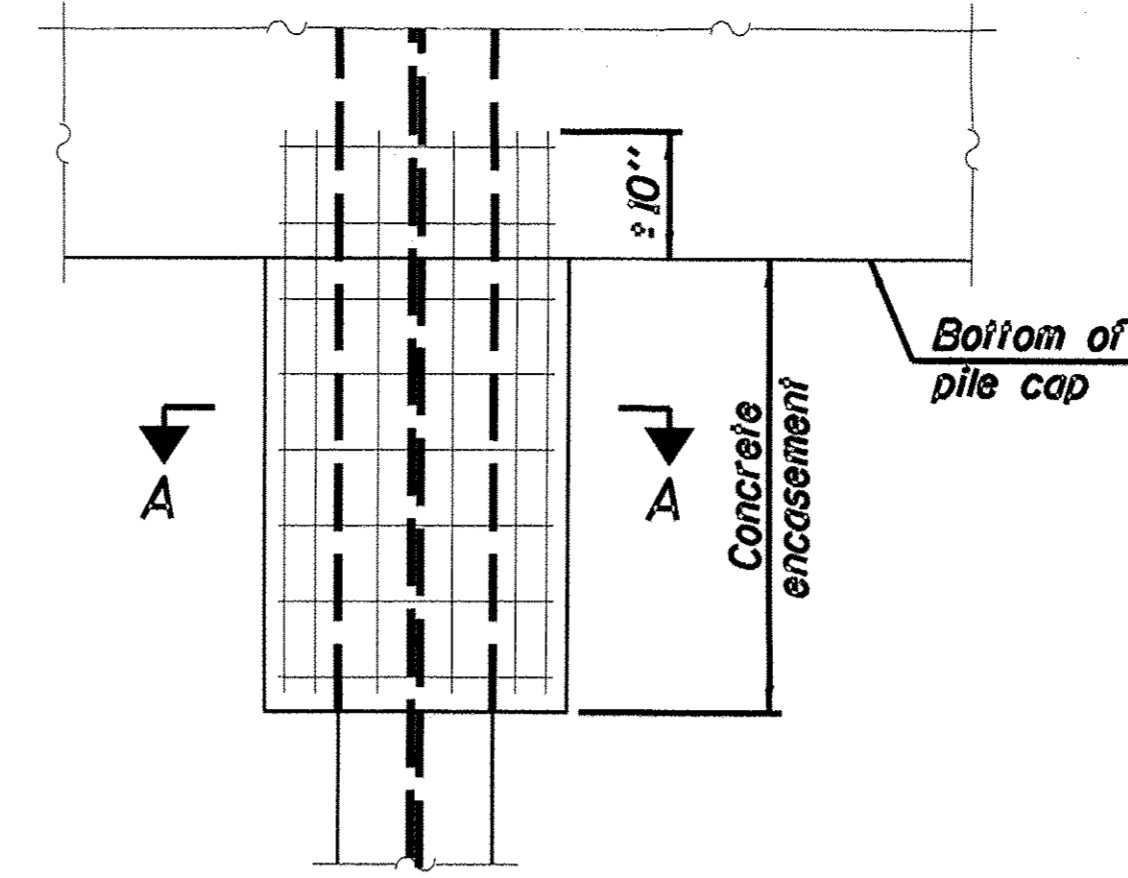


STEEL PILE TABLE

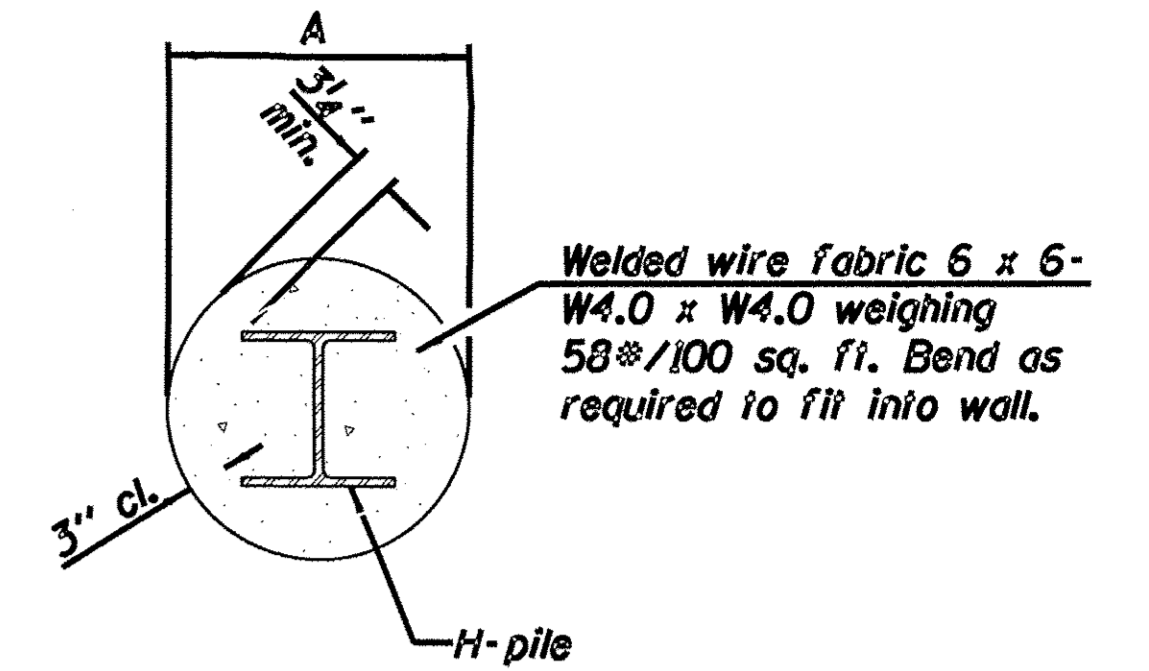
Designation	Depth d	Flange width b <sub>f</sub>	Web and Flange thickness t <sub>w</sub>	Encasement diameter A
HP 14x117	14 1/4"	14 7/8"	1 5/16"	30"
x102	14"	14 3/4"	1 1/8"	30"
x89	13 7/8"	14 3/4"	5/8"	30"
x73	13 5/8"	14 5/8"	1/2"	30"
HP 12x84	12 1/4"	12 1/4"	1 1/8"	24"
x74	12 1/8"	12 1/4"	5/8"	24"
x63	12"	12 5/8"	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 5/8"	7/16"	24"
HP 8x36	8"	8 5/8"	7/16"	18"



ELEVATION



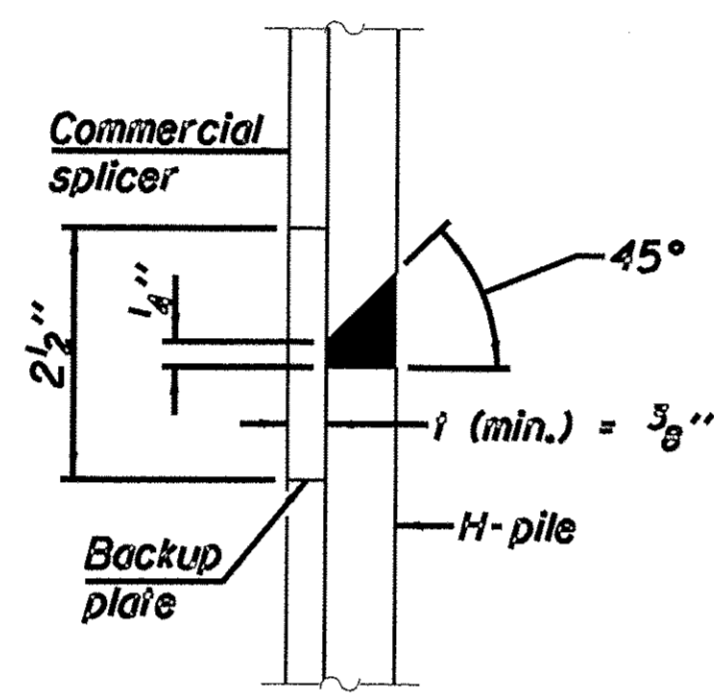
ELEVATION



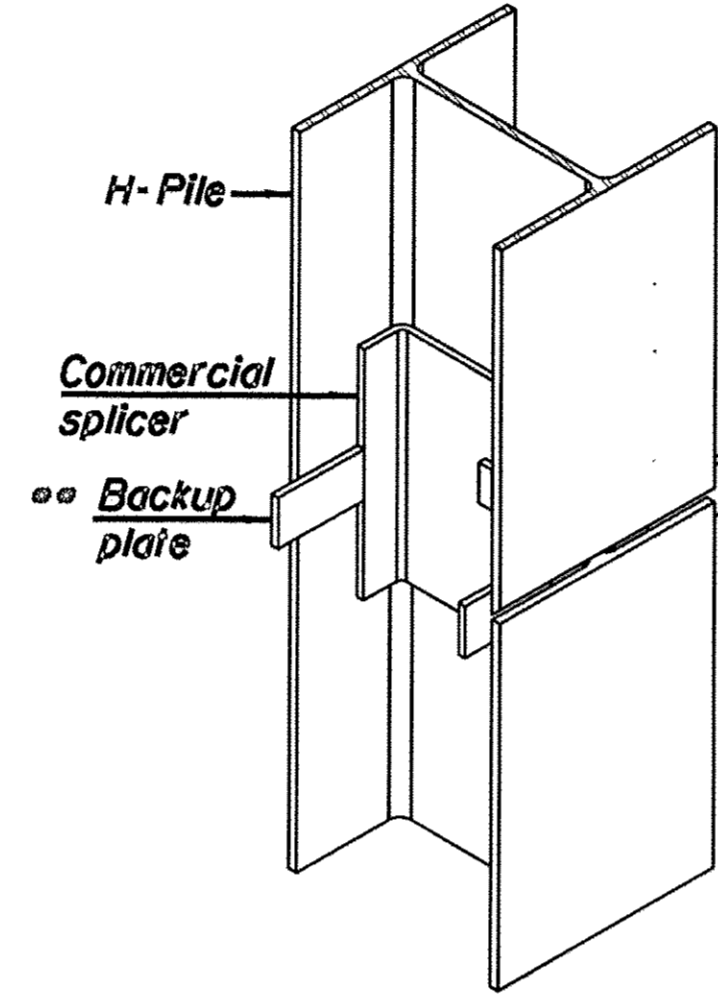
SECTION A-A

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

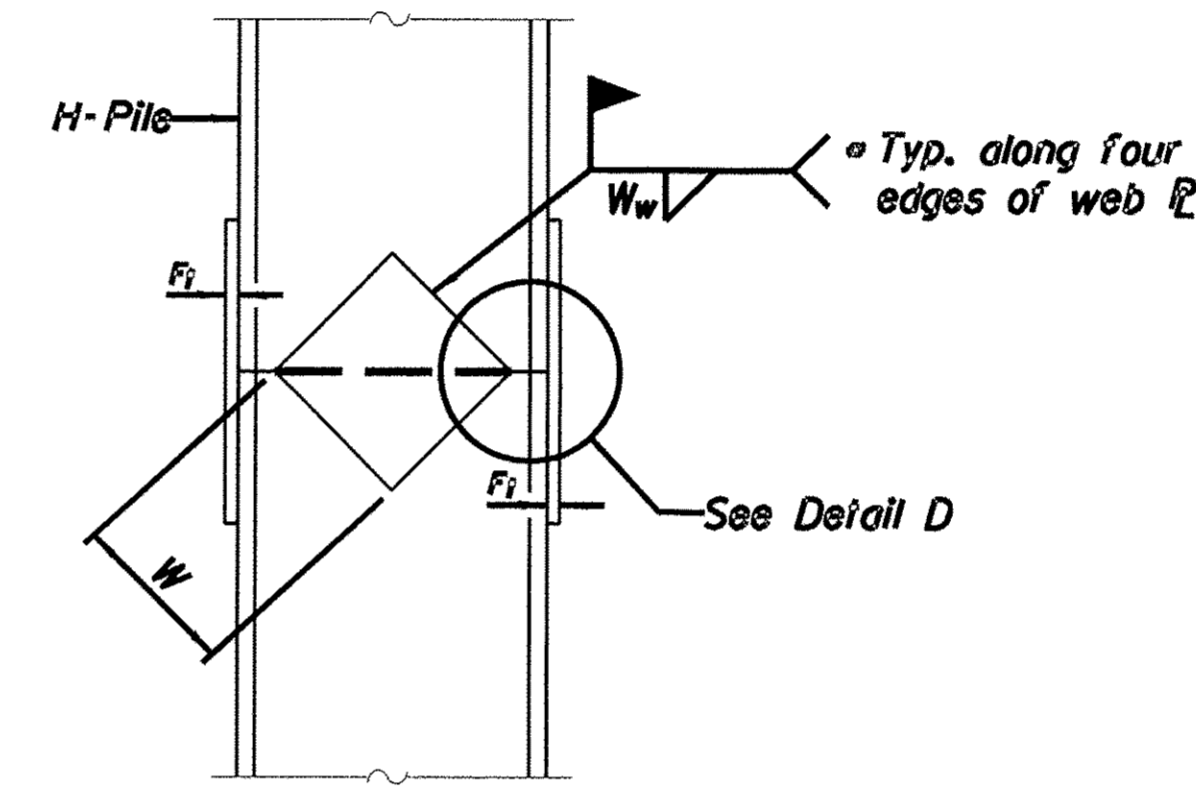
PILE ENCASEMENT



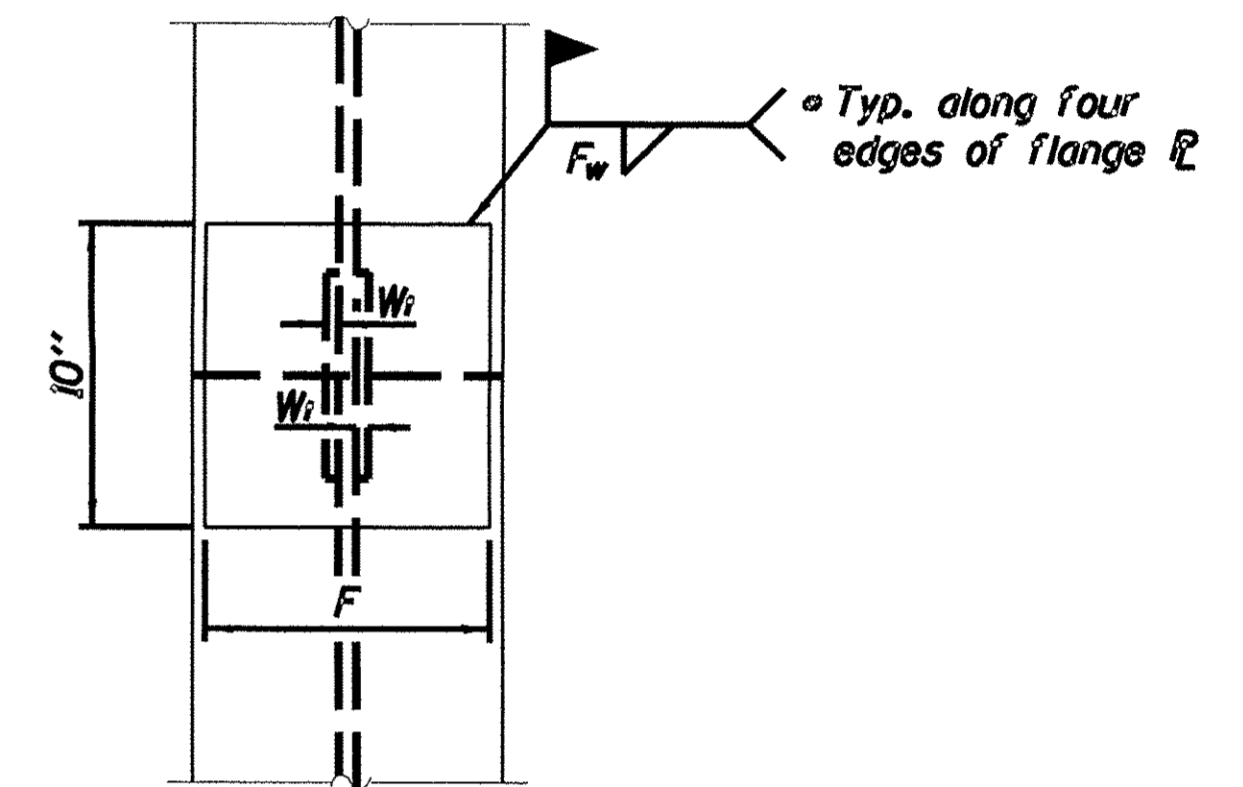
DETAIL "B"



ISOMETRIC VIEW

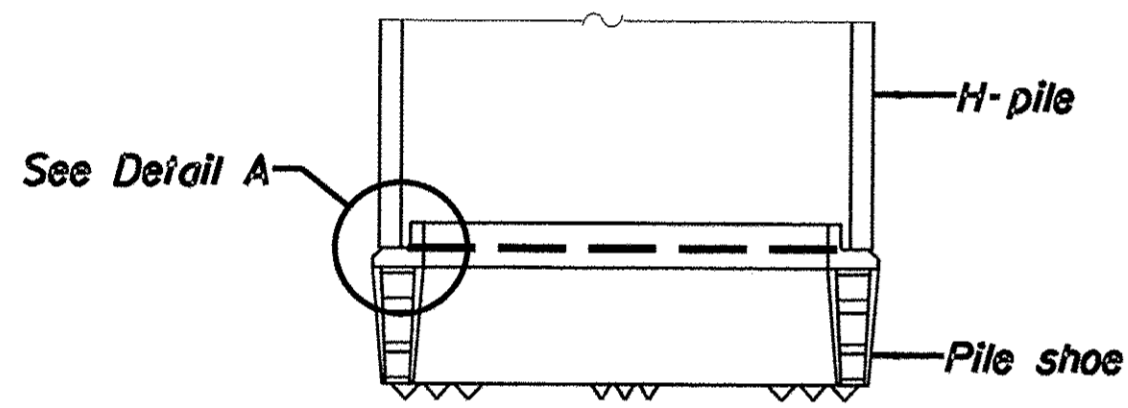


ELEVATION

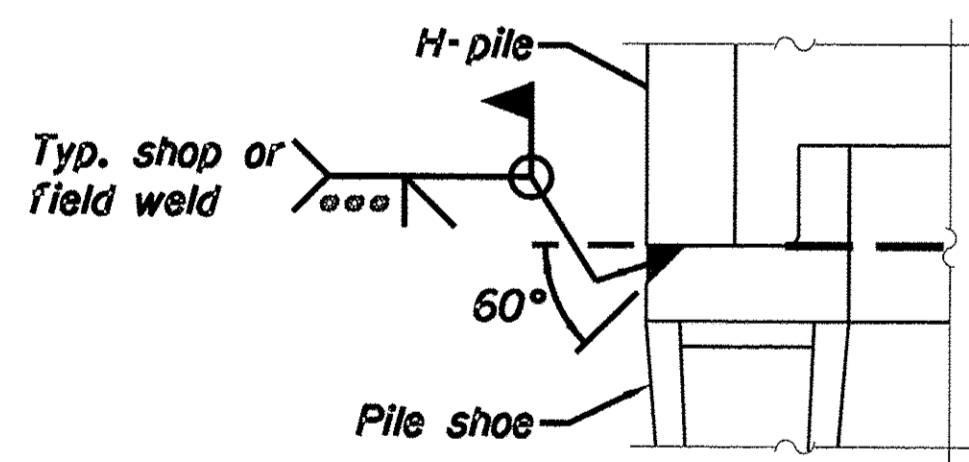


END VIEW

WELDED COMMERCIAL SPLICE

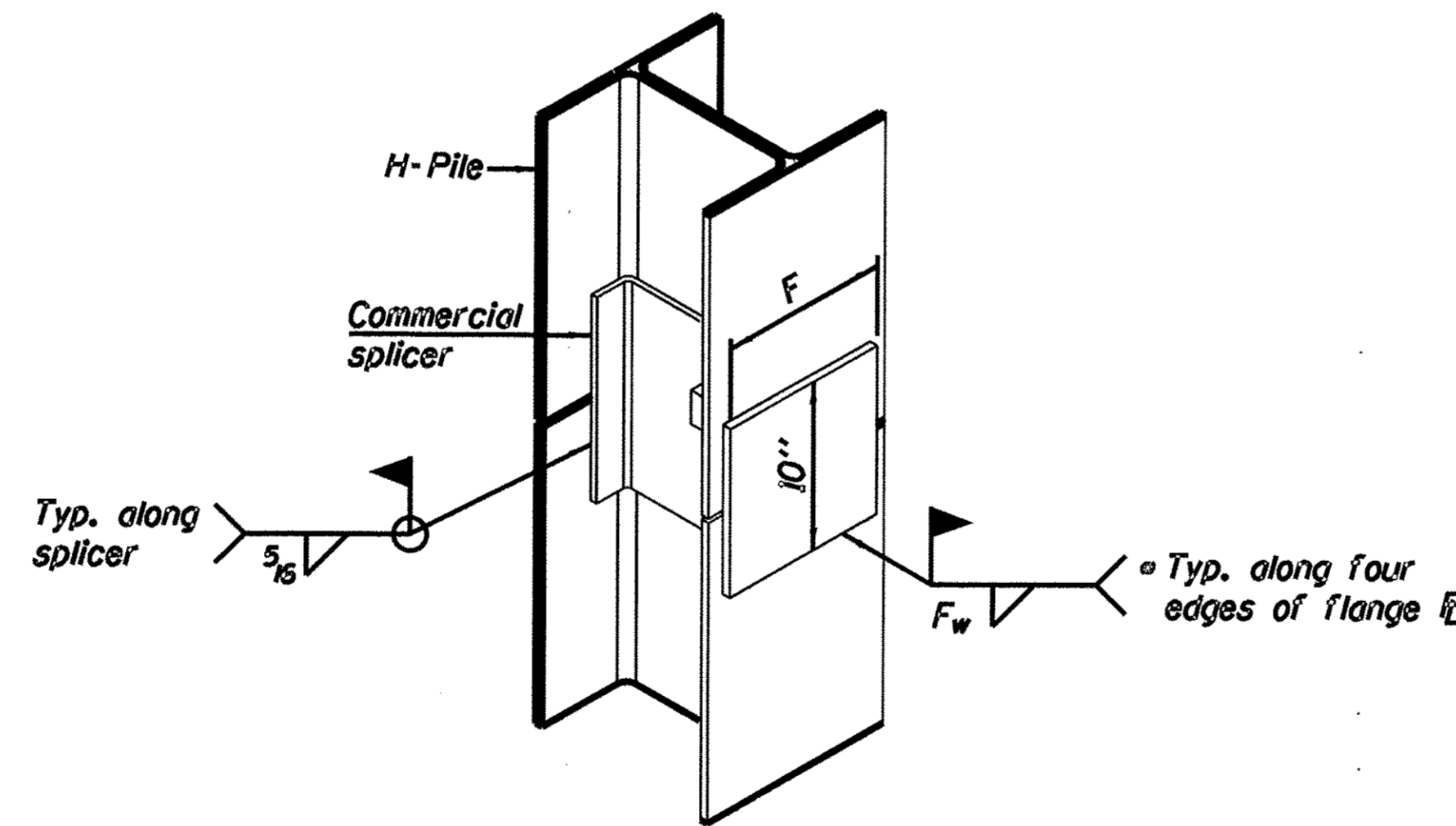


ELEVATION



DETAIL A

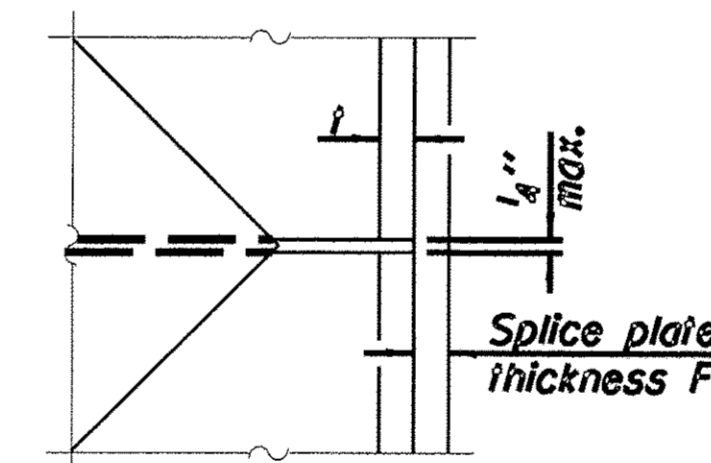
H-PILE SHOE ATTACHMENT



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 (3/16" min.).

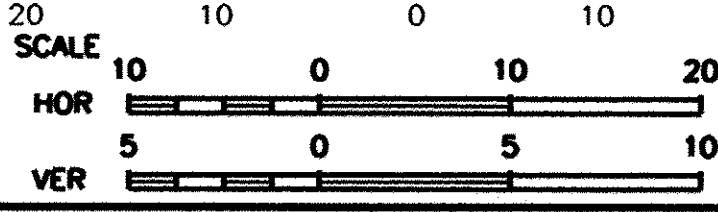
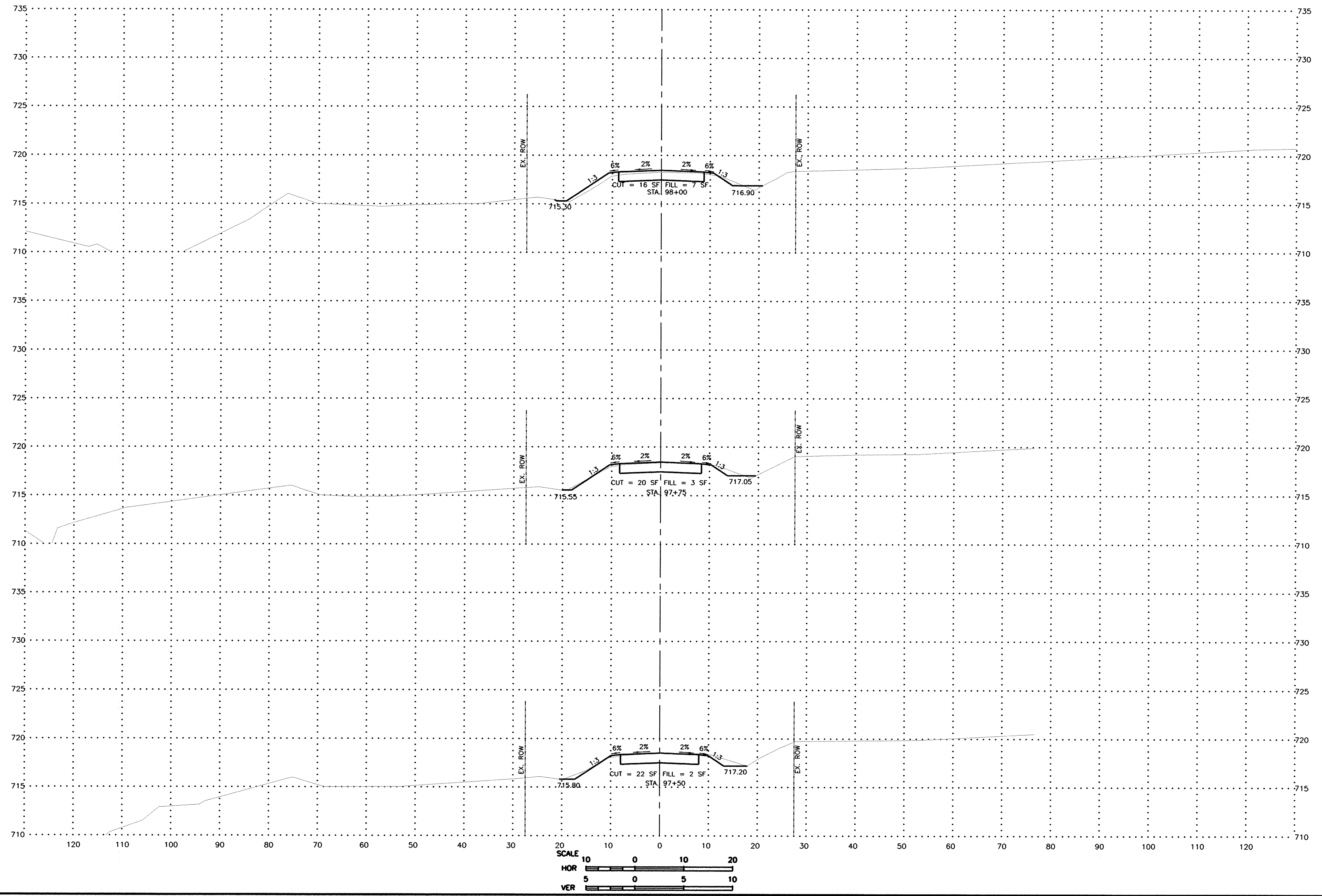


DETAIL D

WELDED PLATE FIELD SPLICE

Designation	F	F <sub>i</sub>	F <sub>w</sub>	W	W <sub>i</sub>	W <sub>w</sub>
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"	1/2"	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"	1/2"	6 1/2"	5/8"	1/2"
x74	10"	7/8"	1/2"	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"

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



**FEHR GRAHAM**  
 ENGINEERING & ENVIRONMENTAL  
 ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS  
 IOWA  
 WISCONSIN

OWNER/DEVELOPER:  
 VERMILION COUNTY  
 HIGHWAY DEPARTMENT  
 2732 BATESTOWN ROAD  
 OAKWOOD, IL 61858

PROJECT AND LOCATION:  
 BRIDGE REPLACEMENT  
 S.N. 092-3530  
 SECTION NO. 13-02149-00-BR  
 BUTLER TOWNSHIP

DRAWN BY: **GM**  
 APPROVED BY: **RTM**  
 DATE: **3/24/2017**  
 SCALE: **AS SHOWN**

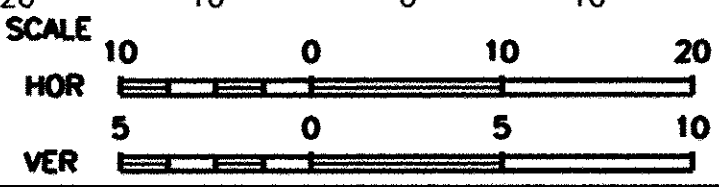
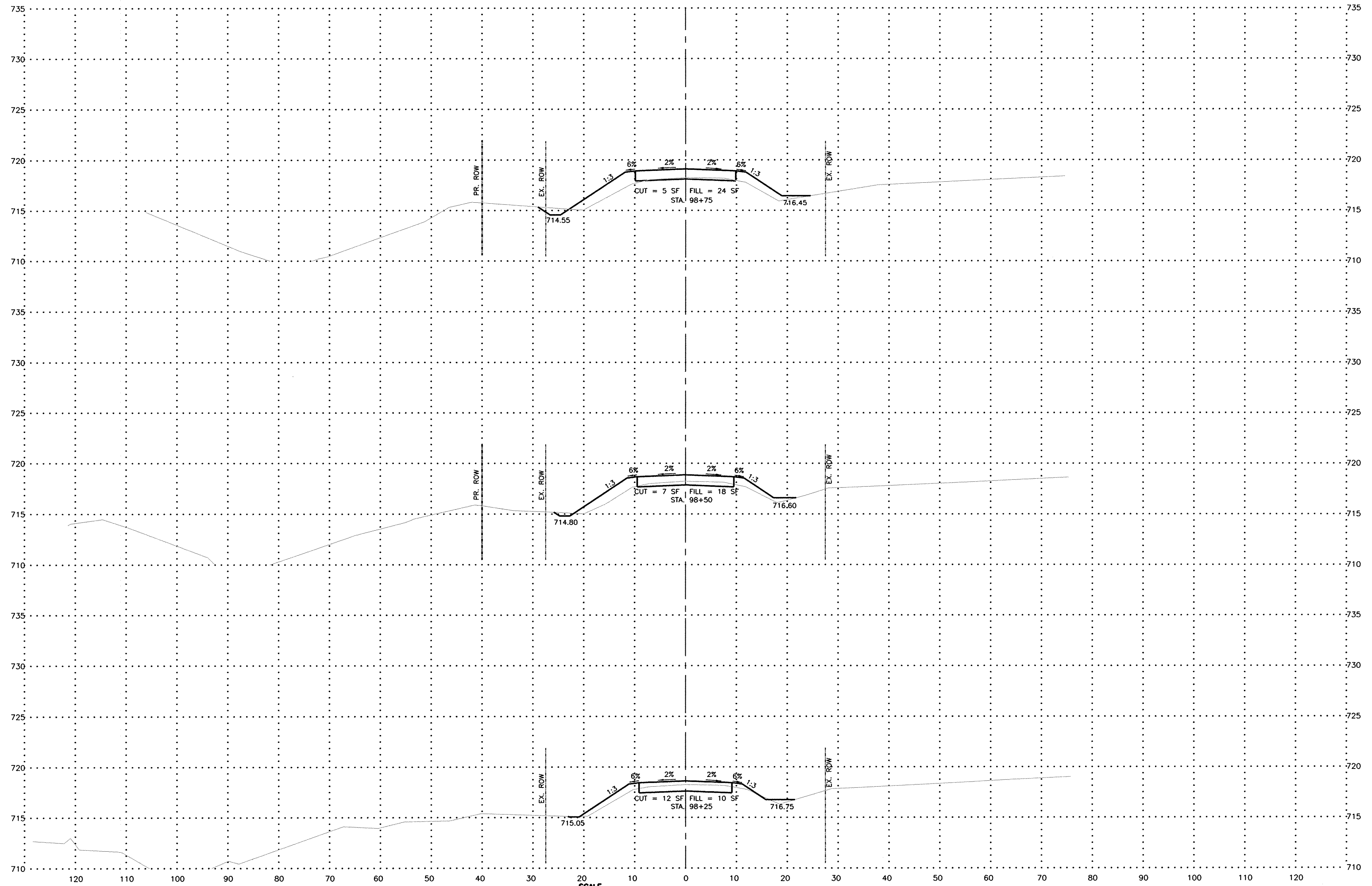
REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:  
**CROSS SECTIONS**

JOB NUMBER:  
**15-148**

SHEET NUMBER:  
**14 of 21**





**FEHR GRAHAM**  
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 2732 BATESTOWN ROAD  
 OAKWOOD, IL 61858

PROJECT AND LOCATION:  
 BRIDGE REPLACEMENT  
 S.N. 092-3530  
 SECTION NO: 13-02149-00-BR  
 BUTLER TOWNSHIP

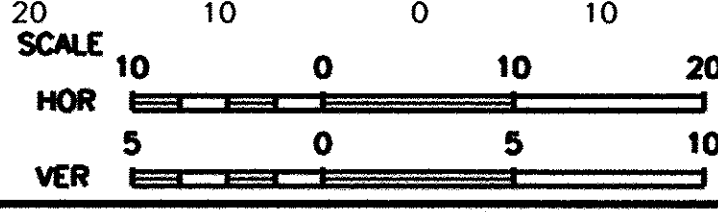
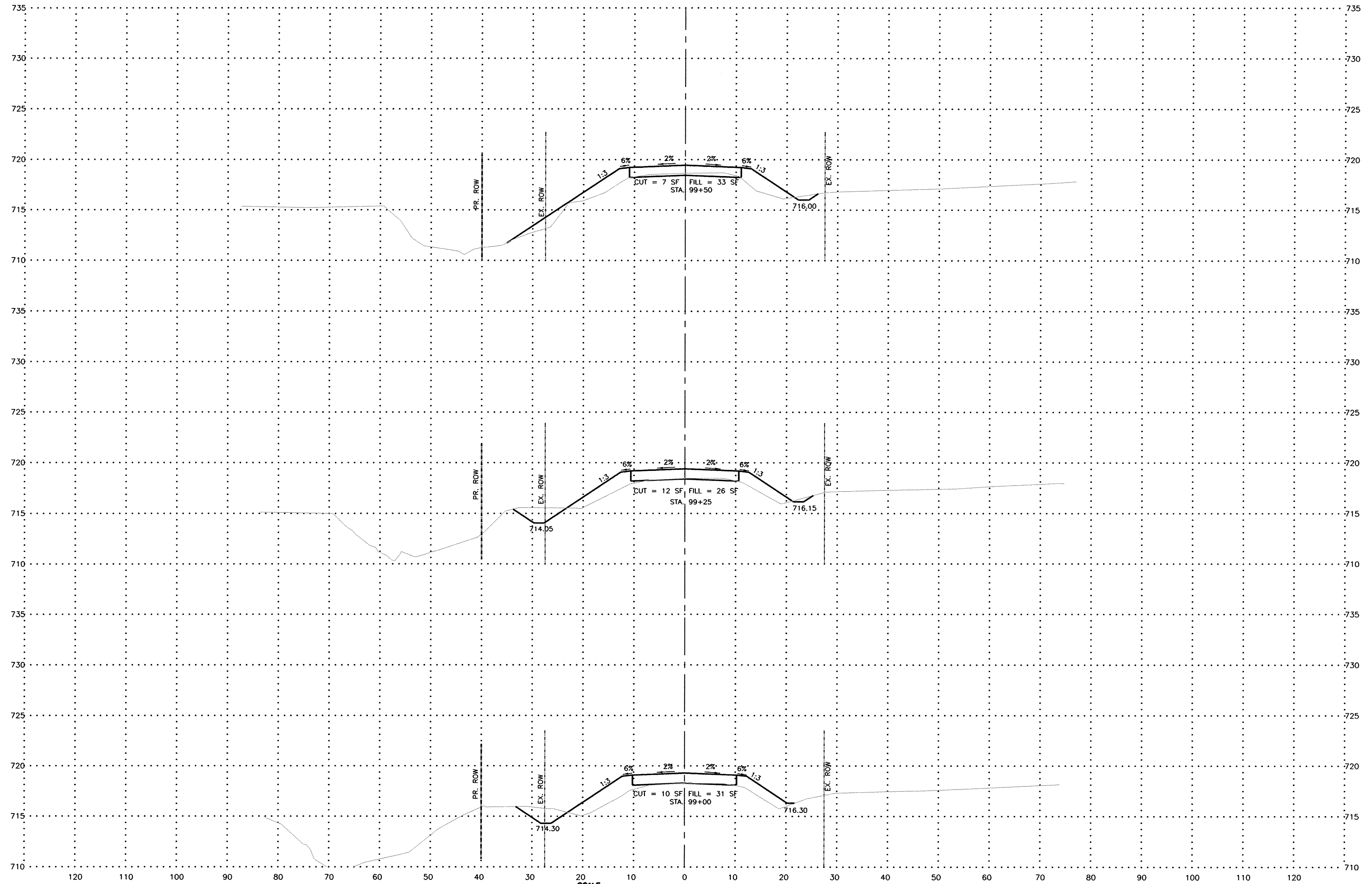
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 APPROVED BY: RTM  
 DATE: 3/24/2017  
 SCALE: AS SHOWN

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:  
 CROSS SECTIONS

JOB NUMBER:  
 15-148

SHEET NUMBER:  
 15 of 21



**FEHR GRAHAM**  
 ENGINEERING & ENVIRONMENTAL  
 ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS  
 IOWA  
 WISCONSIN

OWNER/DEVELOPER:  
 VERMILION COUNTY  
 HIGHWAY DEPARTMENT  
 2732 BATESTOWN ROAD  
 OAKWOOD, IL 61858

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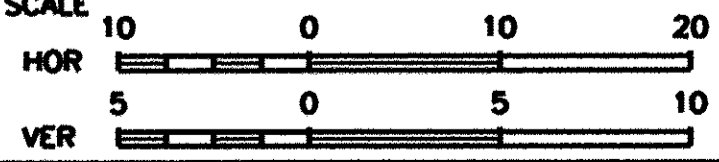
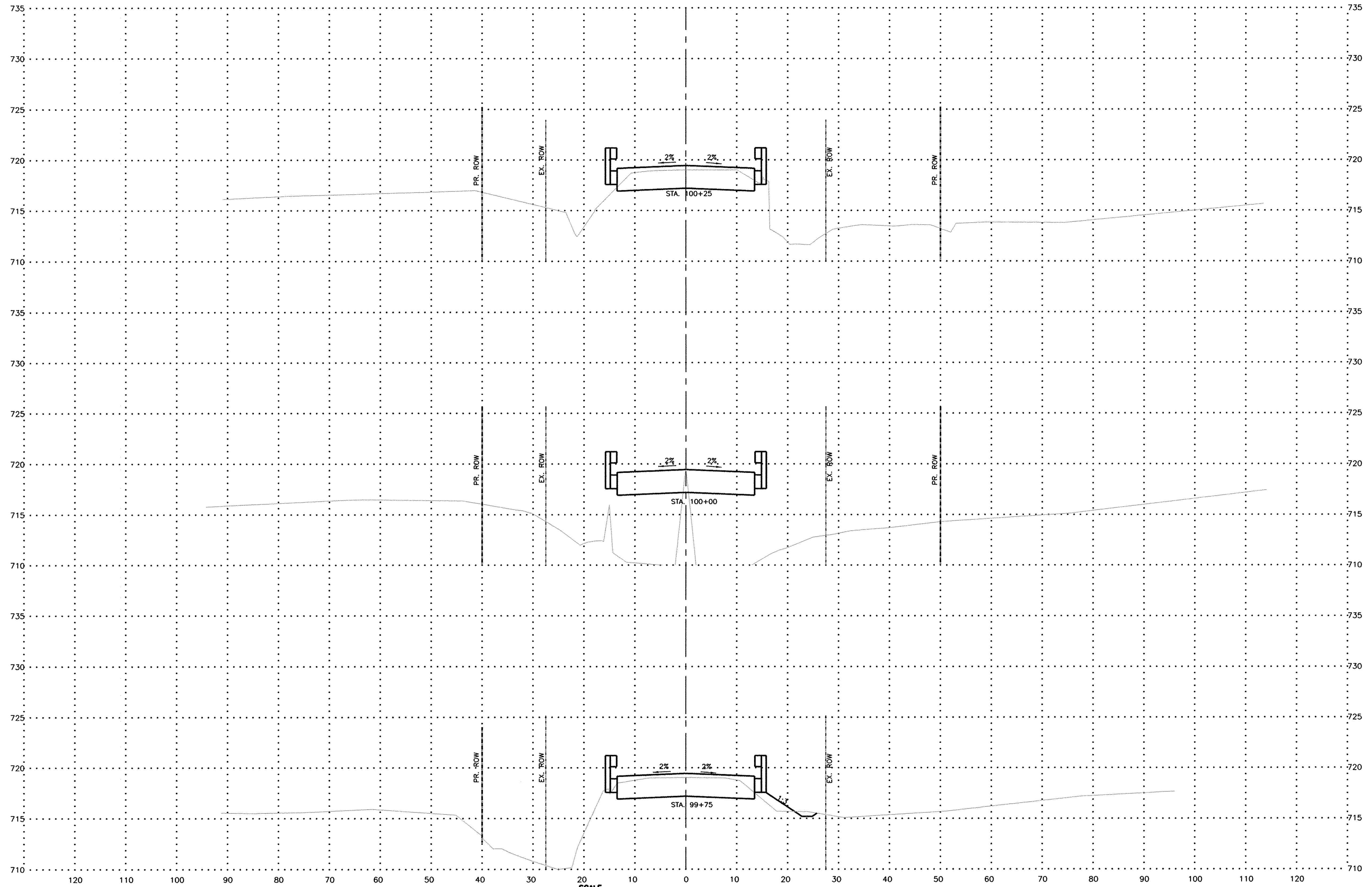
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JOB NUMBER:  
**15-148**

SHEET NUMBER:  
**16 of 21**





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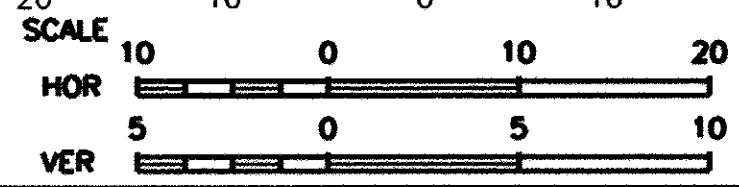
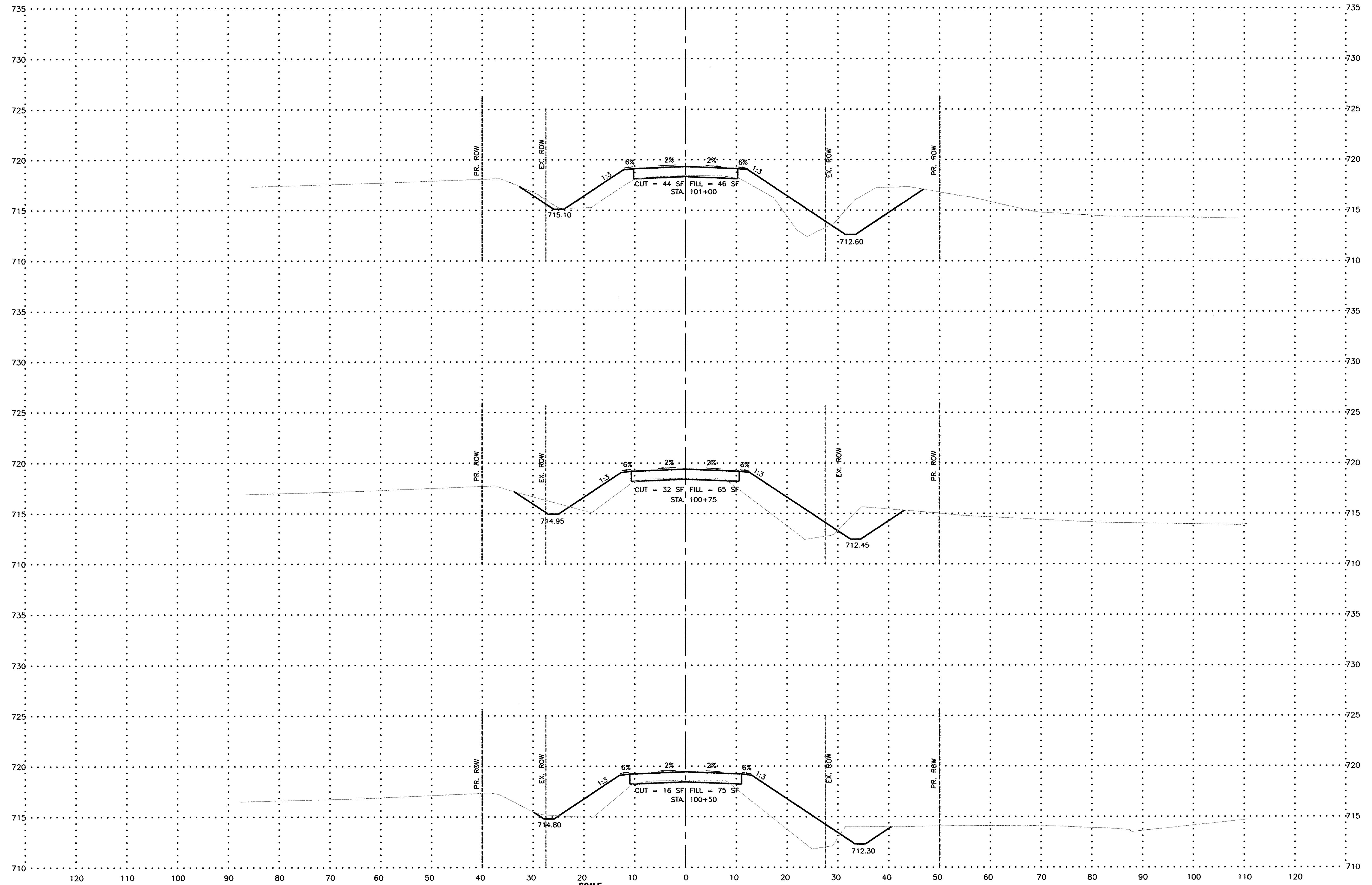
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JOB NUMBER:  
15-148

SHEET NUMBER:  
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S.N. 092-3530  
SECTION NO: 13-02149-00-BR  
BUTLER TOWNSHIP

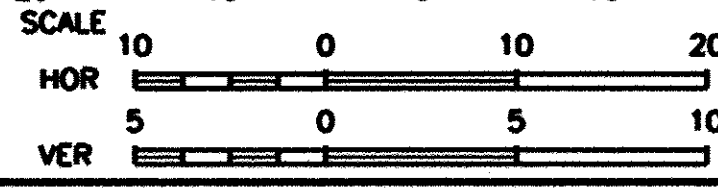
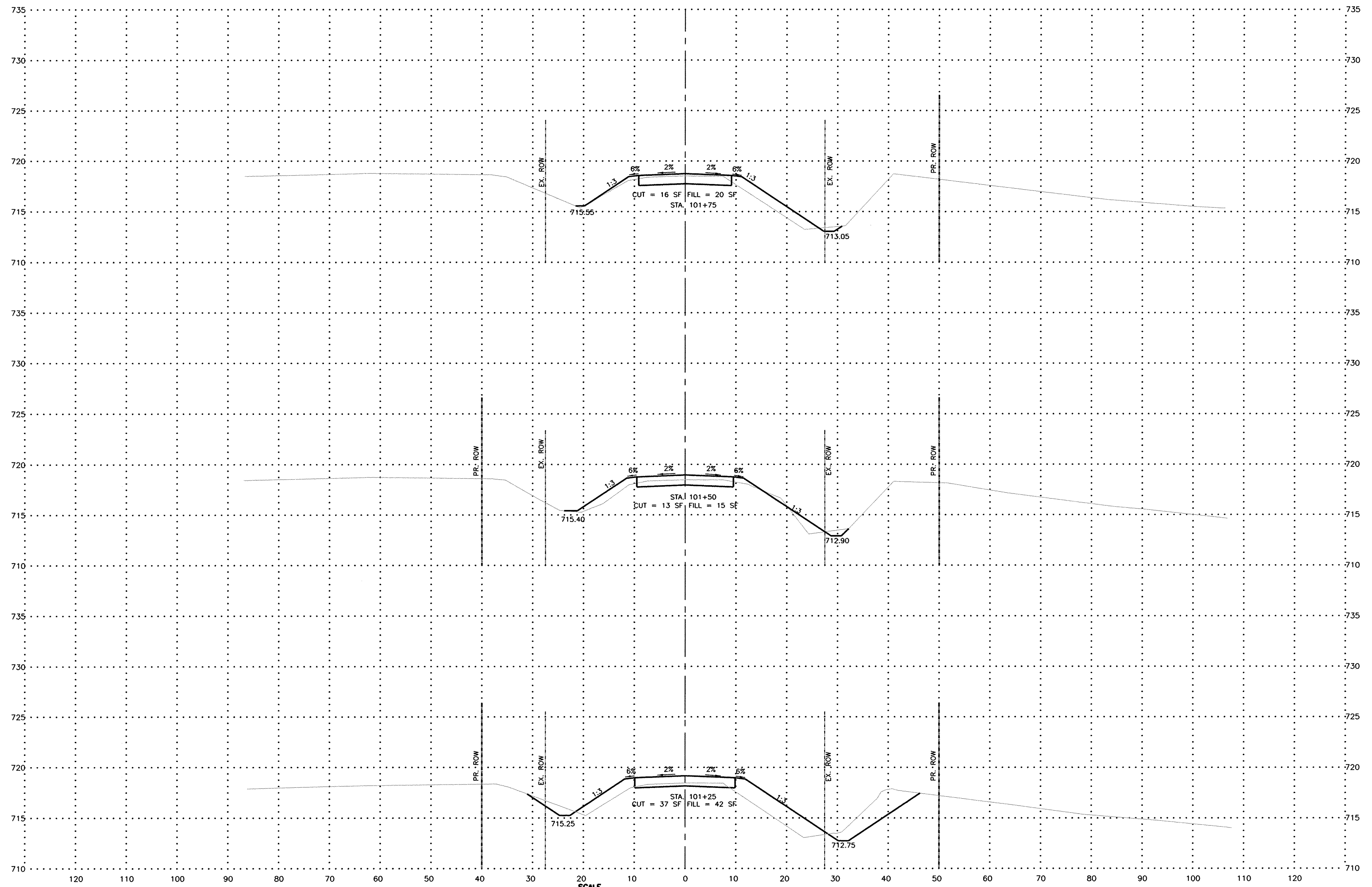
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DATE: 3/24/2017  
SCALE: AS SHOWN

REVISIONS		
REV. NO.	DESCRIPTION	DATE

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JOB NUMBER:  
**15-148**  
SHEET NUMBER:  
**18 of 21**





**FEHR GRAHAM**  
 ENGINEERING & ENVIRONMENTAL  
 ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS  
 IOWA  
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PROJECT AND LOCATION:  
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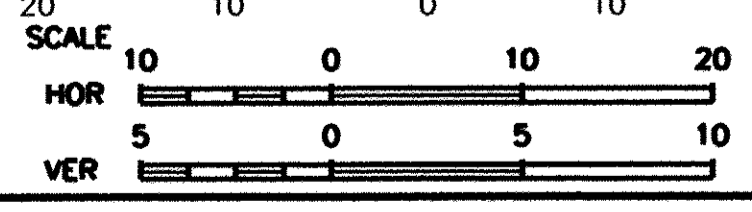
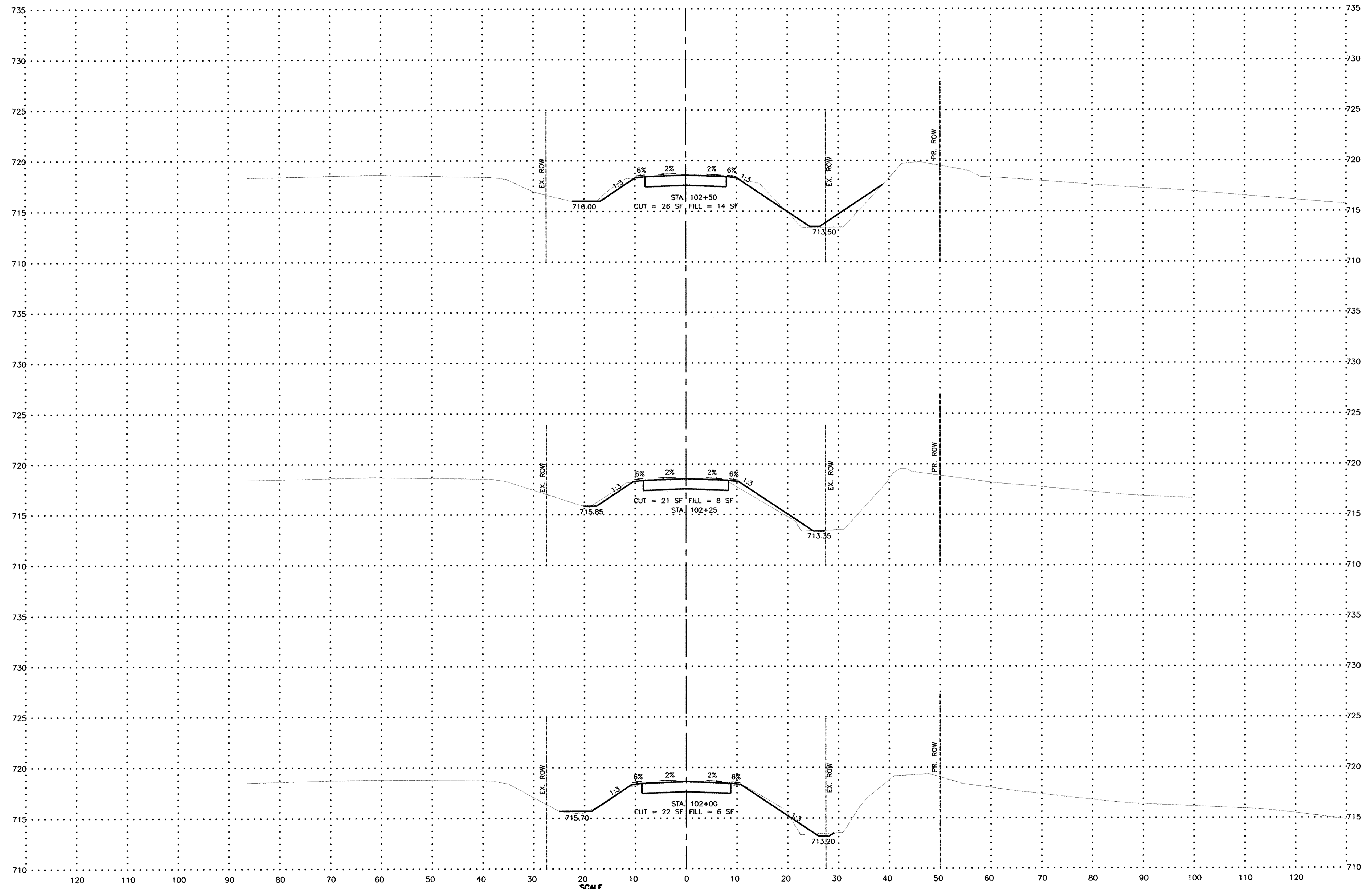
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REV. NO.	DESCRIPTION	DATE

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JOB NUMBER:  
**15-148**

SHEET NUMBER:  
**19 of 21**



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ENGINEERING & ENVIRONMENTAL  
ILLINOIS DESIGN FIRM NO. 184-003525

ILLINOIS  
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WISCONSIN

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S.N. 092-3530  
SECTION NO: 13-02149-00-BR  
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APPROVED BY: RTM  
DATE: 3/24/2017  
SCALE: AS SHOWN

REVISIONS		
REV. NO.	DESCRIPTION	DATE

DRAWING:  
**CROSS SECTIONS**  
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JOB NUMBER:  
**15-148**  
SHEET NUMBER:  
**20 of 21**



BRIDGE FOUNDATION SOIL BORING LOG

MET Midwest Engineering and Testing, Inc.

Route: N 470 East Road  
 Section: 13-02149-00-BR  
 County: Vermilion  
 Structure No. Existing 092-3069, Proposed 092-3530  
 Station: 15+15  
 Offset: 4' Left

Boring: B-1  
 Page: Page 1 of 1  
 Date of Boring: June 9, 2015  
 Drilled By: Zach Wilcoxon  
 Checked By: Daniel Tappendorf  
 MET Project No: 53046

Surface Water Elevation: 711 ft. Ground Water Elevation: when drilling: 674 ft. at completion: Plugged at 681 ft.	DEPTH (ft.)	BLOW S (6")	Q <sub>u</sub> (tsf)	MC (%)	Soil Description	DEPTH (ft.)	BLOW S (6")	Q <sub>u</sub> (tsf)	MC (%)
Ground Surface Elevation: 719.0 ft.				4	16" Crushed Stone				
							3 3 5	2.2B	23
					Dark brown and gray silty CLAY (CL) Possible Fill	30			
EL: 714.5 ft.		2 3 2	3.0P	22					
	5						4 5 6	1.6B	24
		3 3 2	1.7	25					
		4 5 6	5.3B	19	Brown and gray silty CLAY (CL)	35			
	10				Gray silty CLAY (CL)		6 7 9	2.4B	23
EL: 707 ft.		4 5 8	6.4B	20					
		3 4 6	2.4B	18	Gray silty CLAY with sand (CL)	40			
EL: 704.5 ft.							6 7 8	2.9B	22
	15				Gray fine to medium SAND (SP)				
EL: 702 ft.		4 5 7	-	14					
		5 8 13	4.1B	20		45			
	20						5 6 8	3.3P	27
		3 5 8	3.2B	21	Gray silty CLAY (CL)				
		3 5 7	2.2B	22		50			
					Gray clayey SILT with sand (ML)		4 7 9	2.3P	23
	25								
		3 3 4	2.1B	23					
					END OF BORING AT 51.5 FT.				

N - Standard Penetration Test (SPT) = Sum of last two blow values in sample  
 MC- Moisture Content - Percent of dry weight  
 Qu- Unconfined Compressive Strength- tons per square foot (tsf)

Type Failure Qu test  
 B-Bulge  
 S-Shear  
 P-Penetrometer

BRIDGE FOUNDATION SOIL BORING LOG

MET Midwest Engineering and Testing, Inc.

Route: N 470 East Road  
 Section: 13-02149-00-BR  
 County: Vermilion  
 Structure No. Existing 092-3069, Proposed 092-3530  
 Station: 14+88  
 Offset: 5' Right

Boring: B-2  
 Page: Page 1 of 1  
 Date of Boring: June 9, 2015  
 Drilled By: Zach Wilcoxon  
 Checked By: Daniel Tappendorf  
 MET Project No: 53046

Surface Water Elevation: 711 ft. Ground Water Elevation: when drilling: 669 ft. at completion: Plugged at 704 ft.	DEPTH (ft.)	BLOW S (6")	Q <sub>u</sub> (tsf)	MC (%)	Soil Description	DEPTH (ft.)	BLOW S (6")	Q <sub>u</sub> (tsf)	MC (%)
Ground Surface Elevation: 719.0 ft.				4	24" Crushed Stone				
							3 4 5	1.6B	24
EL: 717 ft.									
		4 5 6	2.3P	7	Dark brown and gray silty CLAY (CL) Possible Fill	30			
EL: 714.5 ft.							3 4 5	2.1B	23
	5				Dark brown silty CLAY (OH) Buried Topsoil				
		2 3 3	1.3B	27					
EL: 712 ft.									
		2 3 3	1.2B	28	Gray and dark gray silty CLAY (CL)	35			
EL: 709.5 ft.							5 6 7	2.4B	24
	10				Brown and gray silty CLAY (CL)				
EL: 707 ft.		4 7 9	3.9B	20					
		4 5 5	0.5P	18	Brown and gray sandy CLAY (SC)	40			
EL: 704.5 ft.							5 7 7	3.9B	24
	15								
		4 5 6	2.7B	13					
		4 5 7	3.3B	16		45			
	20				Gray silty CLAY (CL)		4 6 9	3.8B	25
		4 5 7	3.2B	22					
		3 4 6	2.1B	19		50			
					Gray clayey SILT (ML)		4 6 8	1.3P	22
	25								
		4 5 5	2.5B	23					
					END OF BORING AT 51.5 FT.				

N - Standard Penetration Test (SPT) = Sum of last two blow values in sample  
 MC- Moisture Content - Percent of dry weight  
 Qu- Unconfined Compressive Strength- tons per square foot (tsf)

Type Failure Qu test  
 B-Bulge  
 S-Shear  
 P-Penetrometer

REVISIONS		
REV. NO.	DESCRIPTION	DATE