

BRIDGE REPLACEMENT - PPCB

PROJECT NO. BROS - C024(52) -- 8J-24

CRAWFORD COUNTY  
LETTING DATE : AUGUST 22, 2000

STANDARD ROAD PLANS					
THE FOLLOWING STANDARD ROAD PLANS SHALL BE CONSIDERED APPLICABLE TO CONSTRUCTION WORK ON THIS PROJECT.					
IDENT.	DATE	IDENT.	DATE	IDENT.	DATE
RC-16A	10-27-95	RE-69A	4-27-99	RS-2	10-27-98
RC-16B	9-21-99	RE-76	1-12-99	RS-26A	10-28-97
RE-7	10-28-97	RL-1A	12-03-96		
RE-12A	4-27-99	RL-1B	12-03-96		
RE-12B	4-27-99	RL-7	12-03-96		
RE-47	10-28-97	RL-9	9-21-99		
RE-48A	12-08-95	RL-14	1-12-99		
RE-65A	1-12-99				
RE-68	4-27-99	RP-1	4-28-98		

PROJECT TRAFFIC CONTROL PLAN

THIS ROAD IS TO REMAIN OPEN TO TRAFFIC DURING BRIDGE CONSTRUCTION AND WILL BE CLOSED TO THROUGH TRAFFIC DURING GRADING CONSTRUCTION. LOCAL TRAFFIC TO ADJACENT PROPERTIES WILL BE MAINTAINED AS PROVIDED FOR IN ARTICLE 1107.08 OF THE CURRENT STANDARD SPECIFICATIONS. TRAFFIC CONTROL DEVICES, PROCEDURES, AND LAYOUTS SHALL BE AS PER PART VI OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) REVISION 3, DATED SEPTEMBER 3, 1993.

THIS PROJECT (COE #382650) IS COVERED BY THE CORPS OF ENGINEERS NATIONWIDE 404 PERMIT #14.

IOWA DEPARTMENT OF NATURAL RESOURCES PERMIT NO. FP 00-68, DATED : 4-10-00

IOWA  
DEPARTMENT OF TRANSPORTATION  
Project Development Division  
PLANS OF PROPOSED IMPROVEMENT ON THE  
SECONDARY ROADS SYSTEM  
**CRAWFORD COUNTY**  
BRIDGE REPLACEMENT - PPCB

ON K AVENUE OVER BOYER RIVER

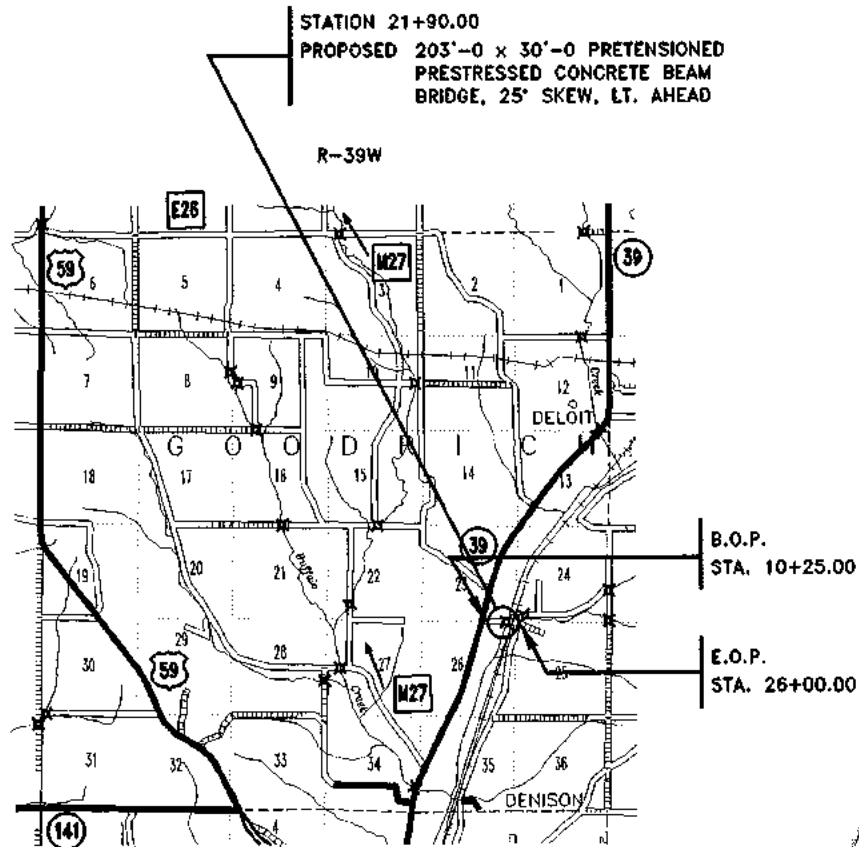
THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES OF 1997, PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DIVISION I - BRIDGE  
DIVISION II - GRADING

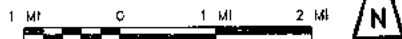
PROJECT NO. BROS-C024(52)--8J-24  
FHWA NO. 129160

INDEX OF SHEETS

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  - QUANTITY SUMMARY
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- SITUATION PLAN
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  - SOUNDING DATA
  - WEST ABUTMENT DETAILS
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PROJECT LOCATION



MILEAGE SUMMARY			
DIV.	LOCATION	LIN.FT.	MILES
	STA. 10+25 TO STA. 26+00	1575.00	0.2983
I	BRIDGE AT STA. 21+90.00	206.31	0.0391
II	TOTAL NET LENGTH OF PROJECT (GRADING)	1368.69	0.2592

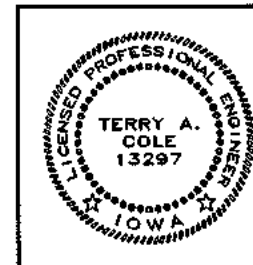
DRAWING APPROVAL

ALL SHOP DRAWINGS AND FALSEWORK DRAWINGS THAT REQUIRE APPROVAL SHALL BE APPROVED BY CALHOUN-BURNS AND ASSOCIATES, INC.

ADDRESS : 1801 FULLER ROAD, P.O. BOX 65859  
WEST DES MOINES, IOWA 50265  
TELEPHONE : (515) 224-4344

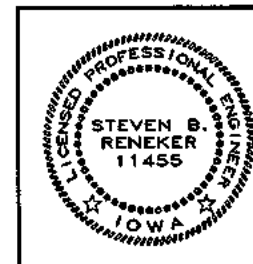
THESE SHOP DRAWINGS SHALL NOT BE SENT TO IOWA D.O.T. OFFICE OF BRIDGES AND STRUCTURES.

1988, TRAFFIC COUNT = 40 V.P.D.



I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

TERRY A. COLE, P.E.  
DATE: 5/26/00  
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2000.  
PAGES OR SHEETS COVERED BY THIS SEAL:  
1, 2 (DIV. I); 3-19 OF 27

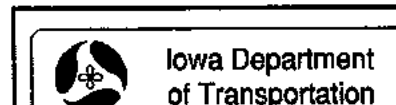


I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

STEVEN B. RENEKER, P.E.  
DATE: 5/26/00  
MY LICENSE RENEWAL DATE IS DECEMBER 31, 2000.  
PAGES OR SHEETS COVERED BY THIS SEAL:  
2 (DIV. II), 20-27

APPROVED  
H. Dale Wright 5-9-00  
CRAWFORD COUNTY ENGINEER DATE

5-9-00  
Robert A. Johnson  
John P. Lawrence  
Mark Seibert  
S. Dean Morgan  
BOARD OF SUPERVISORS DATE



Project Development Division

ACCEPTED FOR LETTING  
R. Boyd Bergman 6/12/00  
SECONDARY ROADS ENGINEER DATE

129160

**TOTAL ESTIMATED QUANTITIES : DIVISION I  
203'-0 x 30'-0 P.P.C.B. BRIDGE**

REF. NO.	CODE NO.	ITEM	UNIT	2 ABUTS.	2 PIERS	SUPER.	TOTAL
1	2104-2710020	EXCAVATION, CLASS 10, CHANNEL	CU.YDS.	-	-	-	2,107
2	2401-6745650	REMOVAL OF EXISTING STRUCTURES	L.S.	-	-	-	1
3	2402-2720000	EXCAVATION, CLASS 20	CU.YDS.	46	4	-	50
4	2402-2721000	EXCAVATION, CLASS 21	CU.YDS.	-	52	-	52
5	2403-0100010	STRUCTURAL CONCRETE, (BRIDGE)	CU.YDS.	44.1	147.0	236.2	427.3
6	2404-7775000	REINFORCING STEEL	LBS.	2,261	9,964	1,297	13,522
7	2404-7775005	REINFORCING STEEL, EPOXY COATED	LBS.	5,882	-	66,904	72,786
8	2407-0580450	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, LX050	EACH	-	-	10	10
9	2407-0580500	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, LX0100	EACH	-	-	5	5
10	2408-7800000	STRUCTURAL STEEL	LBS.	-	-	3,369	3,369
11	2414-6424120	CONCRETE OPEN RAIL	LIN.FT.	-	-	460.6	460.6
12	2501-5425042	PILES, DRIVE STEEL BEARING, HP 10 x 42; 18@65'	LIN.FT.	1,170	-	-	1,170
13	2501-5425053	PILES, DRIVE STEEL BEARING, HP 12 x 53; 28@75'	LIN.FT.	-	2,100	-	2,100
14	2501-5550042	PILES, FURNISH STEEL BEARING, HP 10 x 42; 18@65'	LIN.FT.	1,170	-	-	1,170
15	2501-5550053	PILES, FURNISH STEEL BEARING, HP 12 x 53; 28@75'	LIN.FT.	-	2,100	-	2,100
16	2501-6335010	PREBORED HOLES; 18 @ 8'	LIN.FT.	144	-	-	144
17	2507-3250005	ENGINEERING FABRIC	SQ.YDS.	-	-	-	1268
18	2507-6800060	REVTMENT, CLASS "E", RIPRAP	TON	-	-	-	1094
19	2533-4980005	MOBILIZATION	L.S.	-	-	-	1

**REF. NO. ESTIMATE REFERENCE INFORMATION**

- APPROXIMATELY 1,728 C.Y. OF SUITABLE MATERIAL SHALL BE USED TO CONSTRUCT GUARDRAIL BLISTERS AND APPROACH FILLS, 379 C.Y. IS CONSIDERED UNSUITABLE MATERIAL AND SHALL BE WASTED ON SITE. COST OF PLACING EXCAVATION IS TO BE INCLUDED IN THE COST OF "EXCAVATION, CLASS 10, CHANNEL".
- SEE "GENERAL NOTES", SHEET 4.
- 8-9. INCLUDES COST OF BEARING MATERIAL, COIL RODS AND COIL TIES.
10. INCLUDES WEIGHT OF INTERMEDIATE DIAPHRAGMS.

**TOTAL ESTIMATED QUANTITIES : DIVISION II  
GRADING**

REF. NO.	CODE NO.	ITEM	UNIT	TOTAL
20	2101-0850001	CLEARING AND GRUBBING	ACRE	0.58
21	2101-0850002	CLEARING AND GRUBBING	UNITS	100.0
22	2102-2710070	EXCAVATION, CLASS 10 ROADWAY AND BORROW	CU.YDS.	16,852
23	2312-8260051	GRANULAR SURFACING ON ROAD CLASS "A" CRUSHED STONE	TON	519
24	2505-4020251	GUARDRAIL, FORMED STEEL THRIE BEAM	LIN.FT.	125
25	2505-4020400	GUARDRAIL, POSTS, BEAM	EACH	24
26	2505-4021690	GUARDRAIL, END ANCHORAGE, BEAM, RE-69	EACH	4
27	2505-4021760	GUARDRAIL, TERMINAL, BEAM, RE-76	EACH	4
28	2505-5110300	OBJECT MARKER, TYPE 3	EACH	4
29	2518-6910000	SAFETY CLOSURE	EACH	2
30	2525-2638015	SILT BASIN	EACH	2
31	2525-2638030	SILT FENCE	LIN.FT.	260
32	2525-2638031	SILT FENCE FOR DITCH CHECKS	LIN.FT.	40
33	252B-8445110	TRAFFIC CONTROL	L.S.	1
34	2601-2634100	MULCHING	ACRE	4.2
35	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	4.2

**REF. NO. ESTIMATE REFERENCE INFORMATION**

- 20-21. ACTUAL MEASUREMENTS WILL BE MADE AT THE TIME OF CONSTRUCTION. SEE SITUATION PLAN SHEET 3 FOR LIMITS. UNIT MEASUREMENT INCLUDES TREES BETWEEN STA. 14+00 AND STA. 19+50 RT. AND TREES ALONG RIVER OUTSIDE LIMITS OF AREA MEASUREMENT.
22. ROADWAY CONSTRUCTION REQUIRES 18,580 C.Y. OF FILL MATERIAL. OF THIS, 8,137 C.Y. IS AVAILABLE FROM DITCH CUTS. 1,728 C.Y. IS AVAILABLE FROM, AND WILL BE PAID AS, "EXCAVATION, CLASS 10, CHANNEL". THE REMAINING 8,715 C.Y. IS TO BE FURNISHED AS BORROW. TYPE "A" COMPACTION WILL BE REQUIRED. SEE PLAN AND PROFILE SHEET FOR BREAKDOWN OF EXCAVATION QUANTITIES. CONTRACTOR IS TO PROVIDE HIS OWN BORROW AREA OF MATERIAL APPROVED BY THE ENGINEER. HE IS TO FAMILIARIZE HIMSELF WITH IOWA LAW AS IT PERTAINS TO REMOVAL AND REPLACEMENT OF TOPSOIL ON BORROW AREAS.
23. SURFACING SHALL BE FURNISHED AND PLACED BY THE CONTRACTOR IN TWO PASSES (1400 AND 600 TONS/MILE).
- 24-27. SEE "TABULATIONS", SHEET 21.
- 28-32. SEE "TABULATIONS", SHEET 21.
33. SEE SHEETS 1 AND 4.
- 34-35. SEEDING SHALL BE COMPLETED IN ACCORDANCE WITH ARTICLE 2601.04 OF THE STANDARD SPECIFICATIONS. INCLUDES AREAS WITHIN PROPOSED R.O.W. AND AREAS WITHIN TEMP. CONST. EASEMENTS THAT ARE NOT PART OF A CULTIVATED FIELD.

**QUANTITY SUMMARY**

CRAWFORD COUNTY,

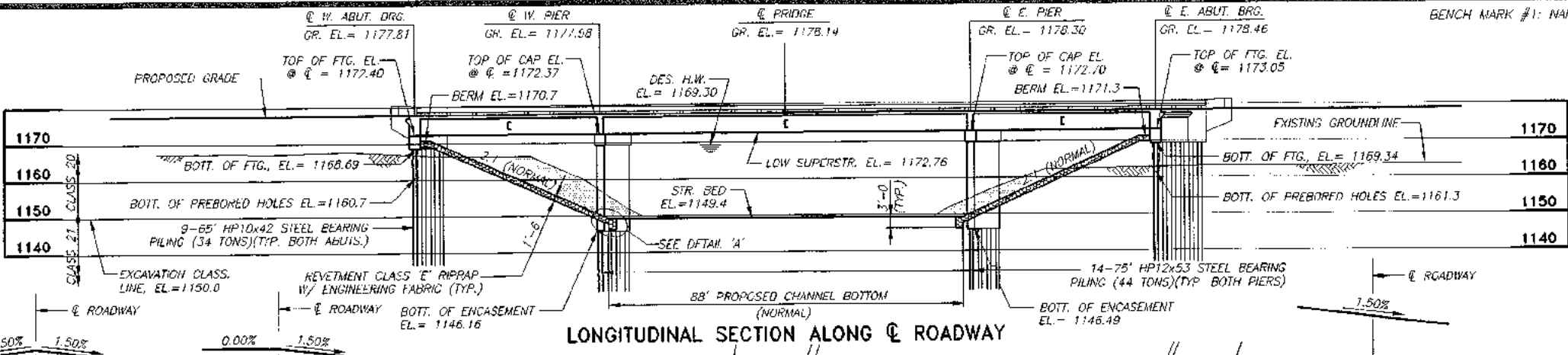
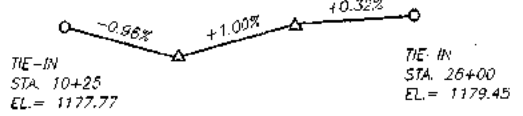
IOWA

SHEET 2 OF 27

BENCH MARK #1: NAIL IN S. FACE OF POWER POLE ±20' NORTH OF WEST END OF EXISTING BRIDGE. EL. = 1169.47

V.P.I. STA. 15+00  
EL. = 1173.21  
I.V.C. = 300'  
M.O. = 0.7356'

V.P.I. STA. 19+00  
EL. = 1177.21  
I.V.C. = 150'  
M.O. = 0.1275'

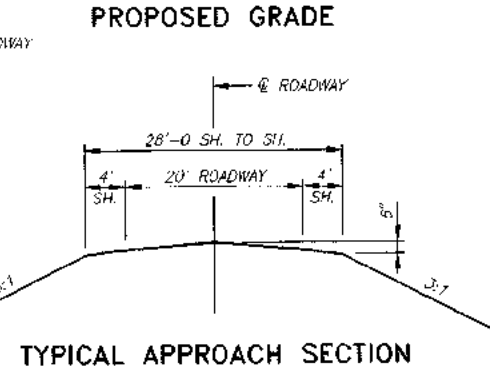


SECTION A-A  
STA. 22+36.02

SECTION B-B  
STA. 22+64.30

SECTION C-C  
STA. 22+92.59

SECTION D-D  
STA. 23+89.30



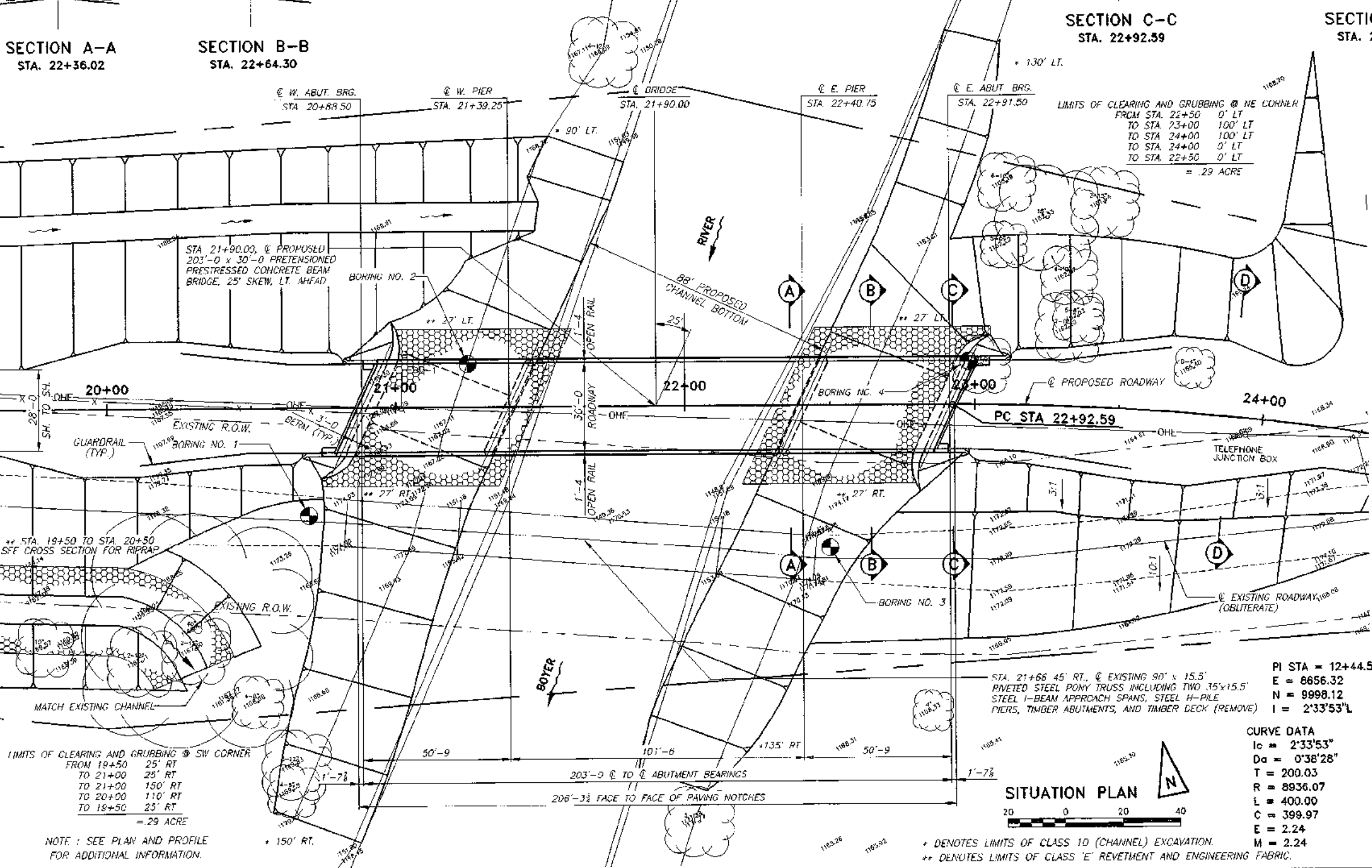
DETAIL 'A'

LOCATION

CRAWFORD COUNTY  
T-84N, R-39W  
SECTION 26  
GOODRICH TOWNSHIP  
OVER BOYER RIVER

HYDRAULIC DATA

DRAINAGE AREA = 345 SQ. MI.  
DESIGN DISCHARGE = 16,300 C.F.S.  
DESIGN HIGH WATER EL. = 1169.3  
MANNING SLOPE = 0.000735 FT./FT.  
BRIDGE WATERWAY AREA = 2,513 SQ. FT.  
DESIGN VELOCITY = 6.5 F.P.S.  
Q25 = 13,800 C.F.S. STAGE EL. = 1167.8  
Q50 = 16,300 C.F.S. STAGE EL. = 1169.6 (DESIGN)  
Q100 = 18,900 C.F.S. STAGE EL. = 1170.9  
Q500 = 23,200 C.F.S. STAGE EL. = 1172.3  
EXT. H.W. FL. = UNKNOWN  
ANTICIPATED SCOUR EL. = 1142.7

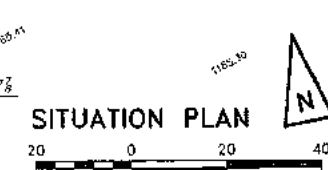


LIMITS OF CLEARING AND GRUBBING @ SW CORNER  
FROM 19+50 25' RT  
TO 21+00 25' RT  
TO 21+00 150' RT  
TO 20+00 110' RT  
TO 19+50 25' RT  
= .29 ACRE

NOTE: SEE PLAN AND PROFILE FOR ADDITIONAL INFORMATION.

LIMITS OF CLEARING AND GRUBBING @ NE CORNER  
FROM STA. 22+50 0' LT  
TO STA. 23+00 100' LT  
TO STA. 24+00 100' LT  
TO STA. 24+00 0' LT  
TO STA. 22+50 0' LT  
= .29 ACRE

PI STA = 12+44.56  
E = 8656.32  
N = 9998.12  
I = 2'33'53" L



\* DENOTES LIMITS OF CLASS 10 (CHANNEL) EXCAVATION.  
\*\* DENOTES LIMITS OF CLASS 'E' REVETMENT AND ENGINEERING FABRIC.

203'-0" x 30'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

INTEGRAL ABUTMENTS SINGLE ROW ENCASED PIERS  
50'-9" END SPANS 101'-6" INTERIOR SPAN

SITUATION PLAN

STATION 21+90.00 25' SKEW, LT. AHEAD  
CRAWFORD COUNTY, IOWA

SHEET 3 OF 27

**SPECIFICATIONS**

DESIGN: AASHTO SERIES OF 1996  
 CONSTRUCTION: STANDARD SPECIFICATION OF THE IOWA DEPARTMENT OF TRANSPORTATION, PROJECT DEVELOPMENT DIVISION, SERIES OF 1997, PLUS CURRENT SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.

**DESIGN STRESSES**

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1996, PLUS INTERIM SPECIFICATIONS.

CONCRETE	SECTION 8	$f_c$	=	3,500 PSI
REINFORCING STEEL	SECTION 8			
ASTM A615	GRADE 60	$f_s$	=	24,000 PSI
PRESTRESSING STEEL	SEE SHEETS 15, 16 AND 17			
PRESTRESSED CONCRETE	SEE SHEETS 15, 16 AND 17			
STRUCTURAL STEEL	SECTION 10			
ASTM A36		$f_s$	=	20,000 PSI

**GENERAL NOTES**

THIS DESIGN IS FOR A 203'-0" x 30'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE OVER THE BOYER RIVER IN CRAWFORD COUNTY, IOWA.  
 THIS BRIDGE IS DESIGNED FOR HS20-44 LOADING PLUS 20 LBS PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE.

THE EXISTING BRIDGE IS A 90' x 15.5' RIVETED STEEL PONY TRUSS WITH TWO 35' x 15.5' STEEL I - BEAM APPROACH SPANS. THE STRUCTURE HAS TIMBER ABUTMENTS AND STEEL H-PILE PIERS. THE STRUCTURE HAS A TIMBER DECK.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING STRUCTURES" SHALL INCLUDE REMOVAL AND DISPOSAL OF THE EXISTING STRUCTURE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS. THE EXISTING STRUCTURE SHALL BE REMOVED TO AN ELEVATION AT LEAST 1' ± BELOW FINISHED GROUND LINE AND TO THE EXTENT THAT IT WILL NOT INTERFERE WITH THE NEW CONSTRUCTION. ALL SALVAGEABLE MATERIAL SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR.

SCRAPE SAMPLES OF PAINT FROM THIS BRIDGE WERE TAKEN TO GET AN INDICATION OF THE EXISTENCE OF AND LEVEL OF TOTAL CHROMIUM AND TOTAL LEAD. THE ANALYSIS OF TOTAL CHROMIUM IN THESE SAMPLES WAS 174 PARTS PER MILLION (PPM). THE ANALYSIS OF TOTAL LEAD IN THESE SAMPLES WAS 105,000 PPM. THE ANALYSES SHOW THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS. THE LEVELS INDICATED BY THESE TESTS COULD CREATE CONDITIONS ABOVE REGULATORY LIMITS FOR HEALTH AND SAFETY REQUIREMENTS. NO OTHER SUBSTANCES WERE ANALYZED. THE BIDDER SHOULD NOT RELY ON THE CONTRACTING AUTHORITY'S TESTING AND ANALYSIS FOR ANY PURPOSE OTHER THAN AS AN INDICATION OF THE EXISTENCE OF THESE TWO TOXIC CONSTITUENTS.

A WASTE AREA SHALL BE PROVIDED BY THE CONTRACTOR FOR WASTE MATERIAL REMOVED FROM THE PROJECT SITE. THE SITE SHALL BE NOTED TO THE ENGINEER. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THIS SITE.

ALL UNSALVAGEABLE MATERIAL AND RUBBLE FROM THIS PROJECT SHALL BE REMOVED FROM THE HIGHWAY RIGHT-OF-WAY TO A WASTE AREA PROVIDED BY THE CONTRACTOR. THE WASTED MATERIAL MUST NOT CREATE AN UNSIGHTLY CONDITION WHEN VIEWED FROM PUBLIC HIGHWAYS. THE COST OF WASTING THIS MATERIAL IS TO BE INCLUDED IN THE LUMP SUM BID FOR "REMOVAL OF EXISTING STRUCTURES." NO PAYMENT WILL BE MADE FOR OVERHAUL.

THE CONTRACTOR IS ENCOURAGED TO CONDUCT CONSTRUCTION ACTIVITIES DURING A PERIOD OF LOW FLOW. ANY TEMPORARY CROSSINGS SHALL INCLUDE ENOUGH CULVERTS TO ACCOMMODATE LOW FLOWS AND MUST BE REMOVED AFTER COMPLETION OF WORK ON THIS PROJECT. THE CONTRACTOR IS REQUIRED TO REMOVE ALL FILL MATERIAL USED AS A TEMPORARY CROSSING TO AN UPLAND, NON-WETLAND SITE, TO SEED ALL DISTURBED AREAS WITH NATIVE GRASSES, AND TO IMPLEMENT APPROPRIATE MEASURES TO INSURE SEDIMENTS ARE NOT INTRODUCED INTO WATERS OF THE UNITED STATES DURING CONSTRUCTION OF THIS PROJECT. IF CLEAN EARTH IS USED AS FILL IN A TEMPORARY CROSSING, THE UPSTREAM FACE SHALL BE ARMORED. THE COST OF INSTALLATION, MAINTENANCE, AND REMOVAL OF TEMPORARY CROSSINGS, INCLUDING CULVERTS, SHALL BE INCIDENTAL TO THE PROJECT.

SUITABLE CLASS 10 (CHANNEL) EXCAVATION AND CLASS 20 EXCAVATION, AS DIRECTED BY THE ENGINEER, SHALL BE USED FOR CONSTRUCTION OF APPROACH FILLS. COST OF PLACEMENT SHALL BE INCLUDED IN THE COST OF THE RESPECTIVE BID ITEM. ANY UNSUITABLE AND/OR EXCESS MATERIAL SHALL BE WASTED AS DIRECTED BY THE ENGINEER. NO PAYMENT FOR OVERHAUL WILL BE MADE.

THE CONTRACTOR IS TO CLEAR THE CHANNEL TO THE SHAPE, DEPTH, AND EXTENT SHOWN IN THE "LONGITUDINAL SECTION ALONG CENTERLINE OF ROADWAY" AND THE LIMITS SHOWN ON THE "SITUATION PLAN." THIS WORK WILL BE PAID FOR AS "EXCAVATION, CLASS 10, CHANNEL."

THE APPROACH BERMS SHALL BE BUILT TO THE CONSTRUCTION LIMITS SHOWN AND SHALL BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE CONTRACTOR SHALL LEVEL AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN ON THE "SITUATION PLAN." DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE CONTRACTOR WILL BE PAID FOR AS EXTRA WORK.

CLASS 20 AND 21 EXCAVATION QUANTITIES ARE BASED ON THE ASSUMPTION THAT THE APPROACH FILLS ARE IN PLACE.

DUE TO DEPTH OF APPROACH FILLS, THE EXISTING SOIL IS EXPECTED TO CONSOLIDATE. IN ORDER TO AVOID "DOWN DRAG" FORCES ON THE ABUTMENT PILES, PILE DRIVING SHALL BE DONE AT LEAST 4 WEEKS AFTER THE PLACEMENT OF THE APPROACH FILLS.

THE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. MINIMUM DIAMETER OF THE HOLES SHALL BE 18 INCHES. HOLES SHALL BE BORED TO ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE" ON THE "SITUATION PLAN" SHEET. HOLES SHALL BE FILLED WITH A NATURAL BENTONITE SLURRY. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING. FOR HOLES DRILLED IN NONCOLLAPSING SOILS THE BENTONITE SLURRY MAY BE PLACED AFTER PILES ARE DRIVEN. IN COLLAPSING SOILS THE BENTONITE SLURRY SHALL BE PLACED AT THE TIME THE HOLE IS DRILLED. THE COST OF ALL LABOR AND MATERIALS FOR FURNISHING AND PLACING THE BENTONITE SLURRY SHALL BE INCLUDED IN THE UNIT PRICE BID FOR "PREBORED HOLES."

MINIMUM BEARING CAPACITY IS TO BE 44 TONS PER PILE AT PIERS AND 34 TONS PER PILE AT ABUTMENTS.

**GENERAL NOTES (CONTINUED)**

THE UNIT PRICE BID FOR "REVETMENT, CLASS E, RIP-RAP" SHALL INCLUDE COST OF LABOR, EQUIPMENT, AND MATERIALS REQUIRED TO PLACE CLASS E REVETMENT STONE ON BOTH BANKS OF THE CHANNEL TO THE EXTENT SHOWN ON SHEET 3 AND IN ACCORDANCE WITH SECTION 4130 OF THE STANDARD SPECIFICATIONS.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE FACT THAT THE REINFORCING BARS IN THE SLAB AND MANY OF THE REINFORCING BARS IN THE ABUTMENT ARE TO BE EPOXY COATED. SEE RESPECTIVE REINFORCING BAR LISTS OF DESIGN SHEETS. EPOXY COATING SHALL BE IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS OF THE IOWA D.O.T. HIGHWAY DIVISION.

ALL REINFORCING SHALL BE GRADE 60.  
 ALL REINFORCING STEEL SHALL BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED. BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS IN EITHER DIRECTION SHALL BE USED TO SUPPORT ALL REINFORCING IN ACCORDANCE WITH THE SECTION 2404 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL CONCRETE FOR THE BRIDGE DECK IS TO BE CLASS "C". SUBSTITUTION OF CLASS "D" CONCRETE IS NOT ALLOWED.

CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

THE CONTRACTOR SHALL VISIT THE CONSTRUCTION SITE TO ENSURE THAT HE IS FAMILIAR WITH THE EXISTING SITE CONDITIONS. THE CONTRACTOR WILL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. SHOULD ANY UTILITIES BE FOUND, THEY SHALL BE PROTECTED IN PLACE AND THE ENGINEER IMMEDIATELY NOTIFIED. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UTILITIES.

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS. THEREFORE, THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT IS POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS PRESENTLY NOT KNOWN OR SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND TO AVOID DAMAGE THERETO.

UTILITY COMPANIES WHOSE FACILITIES ARE KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

WHERE PUBLIC UTILITY FIXTURES ARE SHOWN AS EXISTING ON THE PLANS OR ENCOUNTERED WITHIN THE CONSTRUCTION AREA, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNERS OF THOSE UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION. ACCESS SHALL BE AFFORDED TO THESE FACILITIES FOR NECESSARY MODIFICATION OF SERVICES. NO CLAIMS FOR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR INTERFERENCE, OR DELAY CAUSED BY SUCH WORK.

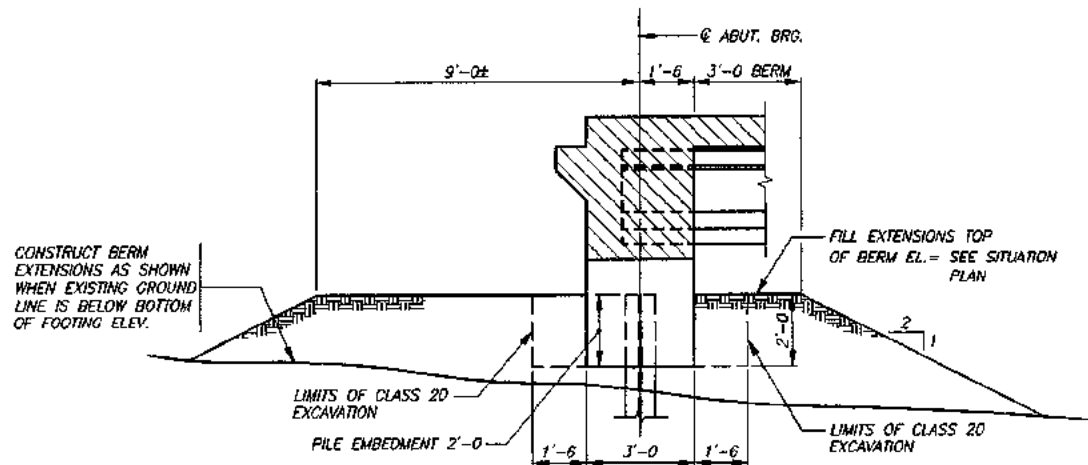
CONCRETE PAVING BLOCKS ARE NOT REQUIRED, HOWEVER, IF IT BECOMES NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR. NO ADDITIONAL PAYMENT WILL BE AUTHORIZED FOR THIS WORK.

THE CONTRACTOR'S WORK AND MATERIAL STORAGE AREA SHALL BE DEFINED BY THE CONTRACTOR AND NOTED TO THE ENGINEER. THE CONTRACTOR SHALL SHAPE, FERTILIZE, AND SEED THIS CONTRACTOR'S AREA IN ORDER TO RETURN IT TO ITS ORIGINAL CONDITION. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR "SEEDING AND FERTILIZING" AND "MULCHING" BID ITEM. AREAS OUTSIDE THE CONTRACTOR'S AREA DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED TO THEIR ORIGINAL CONDITION, AS DETERMINED BY THE ENGINEER. NO ADDITIONAL PAYMENT WILL BE AUTHORIZED FOR THIS WORK.

IF ARCHAEOLOGICAL MATERIALS ARE ENCOUNTERED DURING THE CONSTRUCTION PHASE OF THE PROJECT, THE OFFICE OF PROJECT PLANNING (DDT) MUST BE CONTACTED IMMEDIATELY SO THE PROPER AUTHORITIES CAN BE NOTIFIED ACCORDING TO THE EXISTING FEDERAL REGULATIONS AND STATE PROCEDURES. ADDITIONALLY, IT SHOULD BE NOTED THAT FINDINGS AND RECOMMENDATIONS FOR CLEARANCE OR FURTHER TESTING CANNOT BE CONSIDERED FINAL UNTIL CONCURRENCE IS RECEIVED FROM THE STATE HISTORICAL PRESERVATION OFFICER. PHONE: OFFICE OF PROJECT PLANNING 515-239-1225.

THE CONTRACTOR IS TO RESHAPE, FERTILIZE, SEED AND MULCH ANY AREAS DISTURBED DURING CONSTRUCTION TO THEIR ORIGINAL CONDITION. THIS SHALL BE INCLUDED IN THE PRICE BID FOR "SEEDING AND FERTILIZING" AND "MULCHING."

STANDARD ROAD PLANS ARE AVAILABLE FROM THE IOWA DEPARTMENT OF TRANSPORTATION, PROJECT DEVELOPMENT DIVISION, AMES, IOWA.



**BERM EXTENSION DETAILS**  
 (NORMAL TO & ABUTMENT BEARING)

**203'-0" x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**

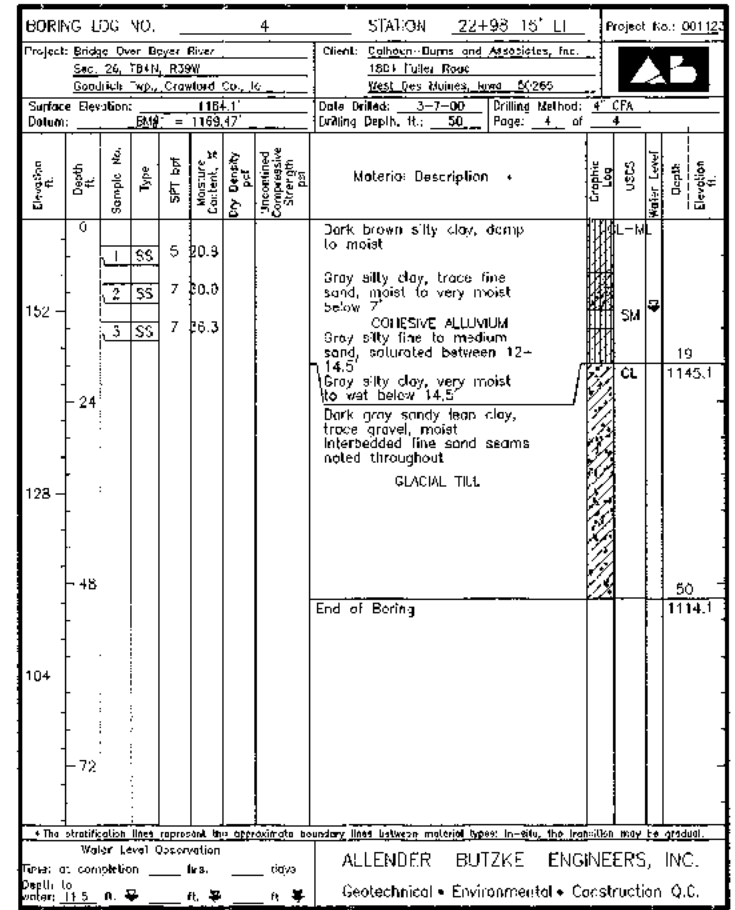
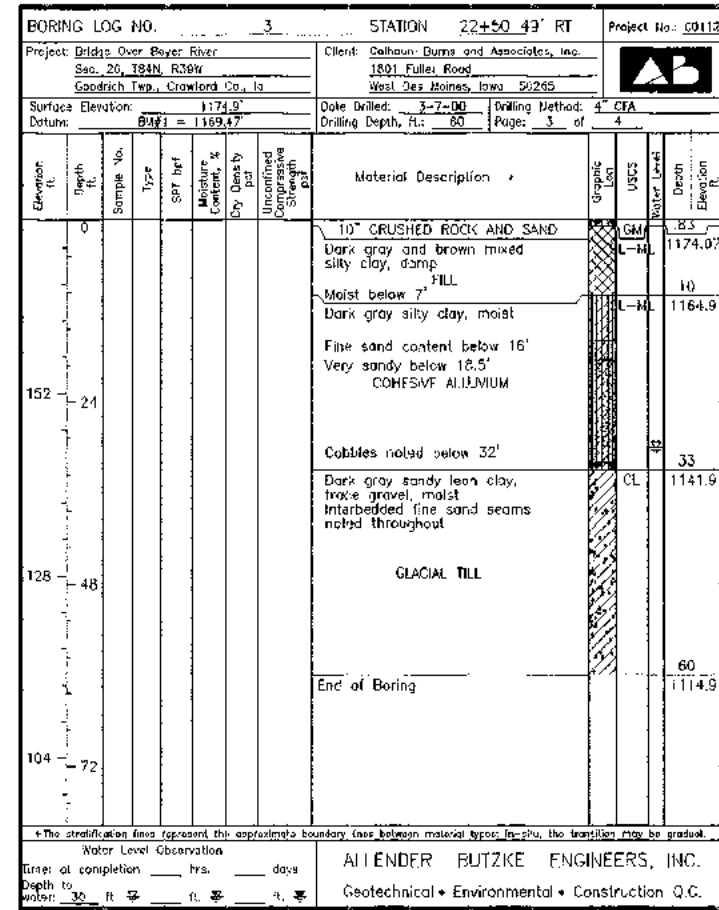
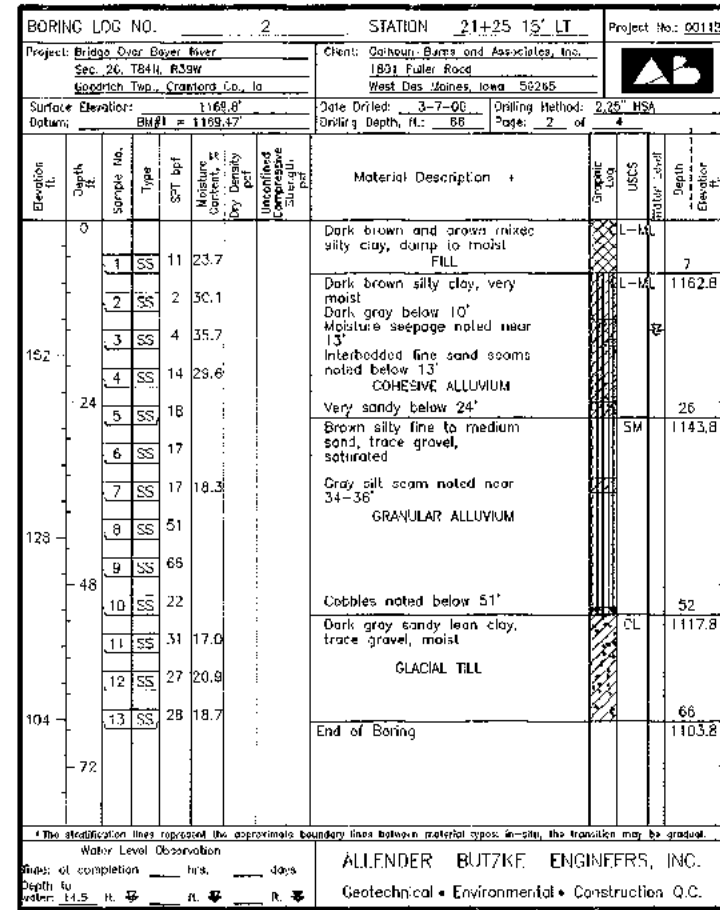
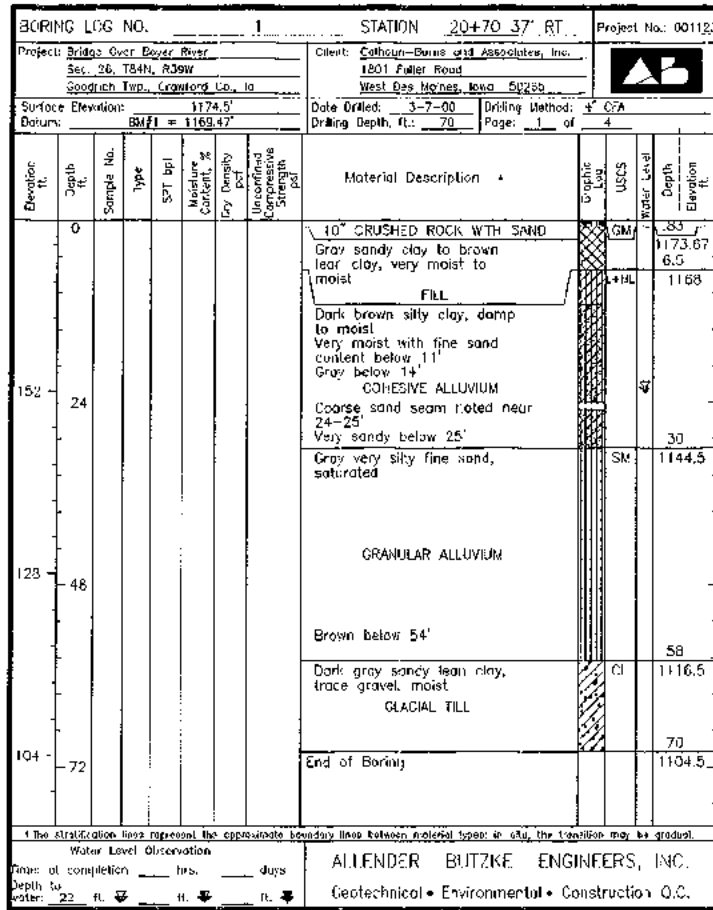
INTEGRAL ABUTMENTS                      SINGLE ROW ENCASED PIERS  
 50'-9" END SPANS                              101'-6" INTERIOR SPAN

**GENERAL NOTES & MISC. DETAILS**

STATION 21+90.00                              25° SKEW, LT. AHEAD

CRAWFORD COUNTY,                              IOWA

SHEET 4 OF 27



**SOUNDING DATA**

(SEE "SITUATION PLAN", SHEET 3, FOR BORING LOCATIONS)

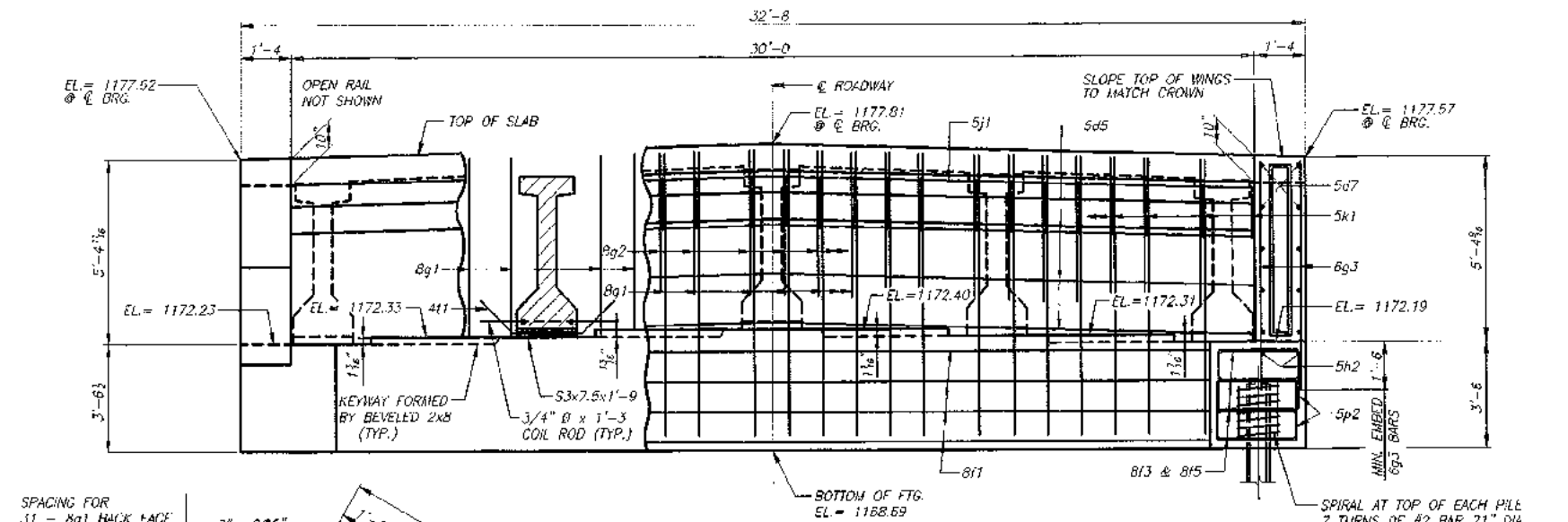
GEOTECHNICAL INFORMATION PROVIDED HEREWITH IS THE SOLE RESPONSIBILITY OF ALLENDER BUTZKE ENGINEERS, INC., WHOSE GEOTECHNICAL REPORT DATED 03-15-00, COMPLETE WITH THE LICENSED ENGINEER'S SEAL AND CERTIFICATION, IS AVAILABLE FOR VIEWING AT CALHOUN-BURNS AND ASSOCIATES, INC., 1801 FULLER ROAD, WEST DES MOINES, IOWA, OR AT THE OFFICE OF THE DRAWORD COUNTY ENGINEER.

203'-0 x 30'-0 PRETENSIONED PRESTRESSED  
 CONCRETE BEAM BRIDGE

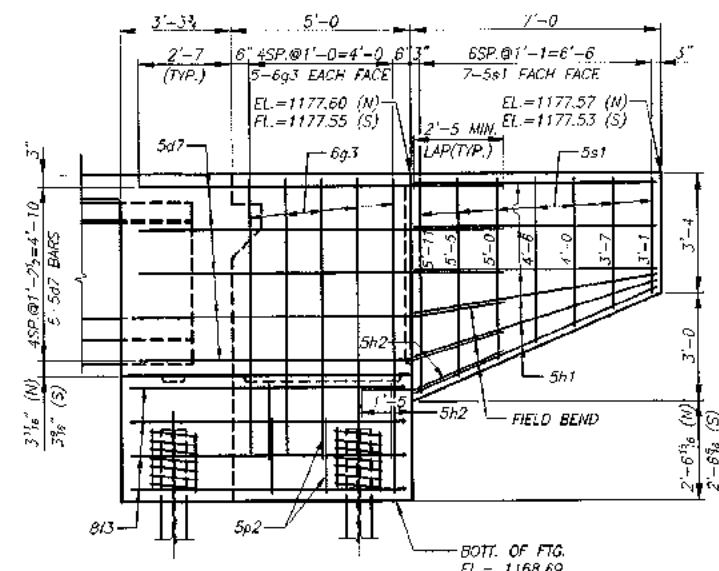
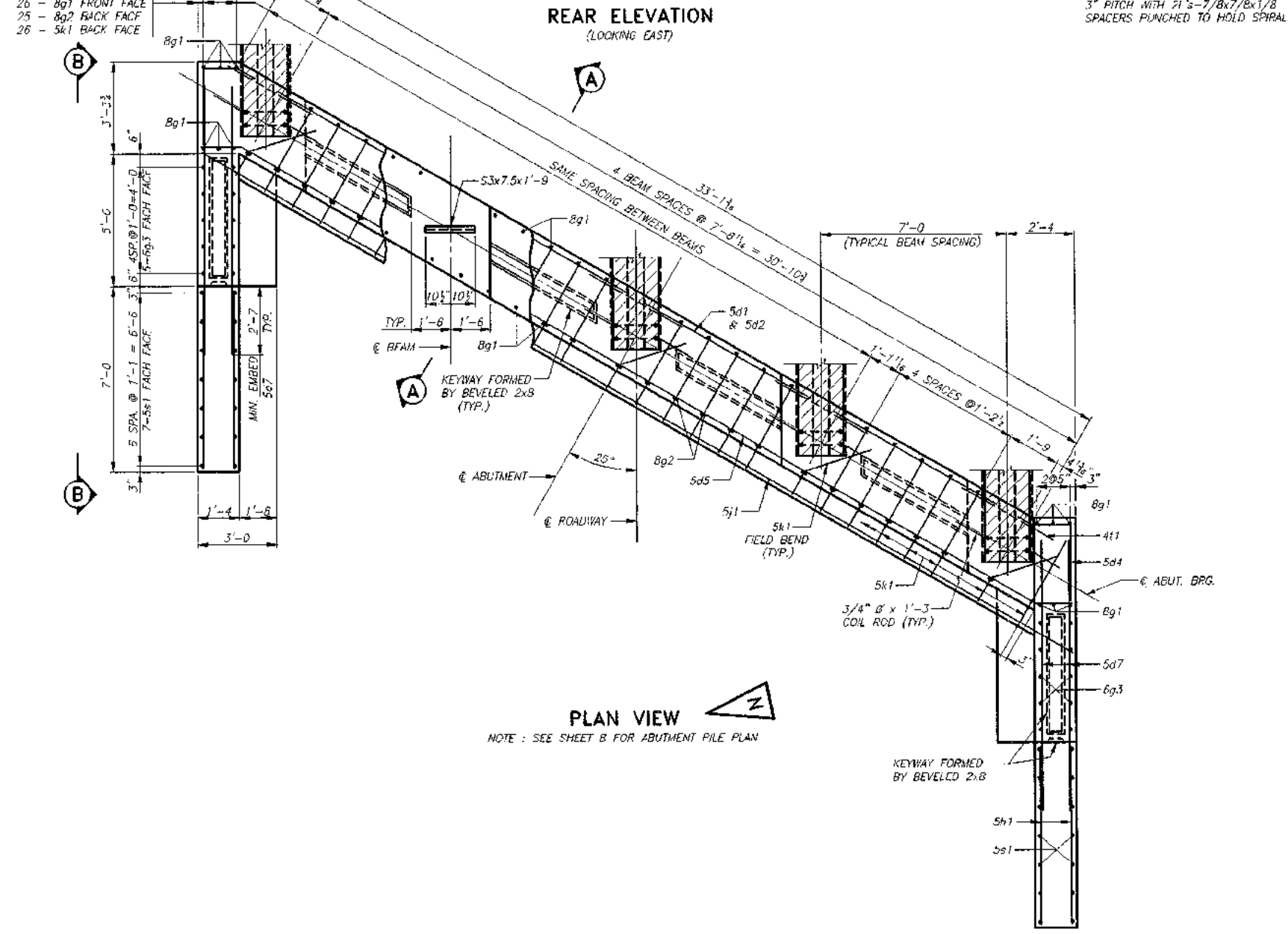
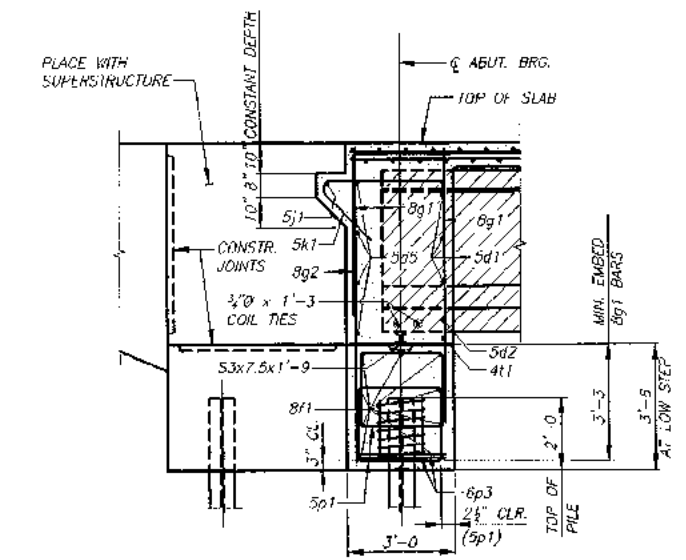
INTEGRAL ABUTMENTS SINGLE ROW ENCASED PIERS  
 50'-9 END SPANS 101'-6 INTERIOR SPAN

**SOUNDING DATA**

STATION 21+90.00 25' SKEW, LT. AHEAD  
 CRAWFORD COUNTY, IOWA

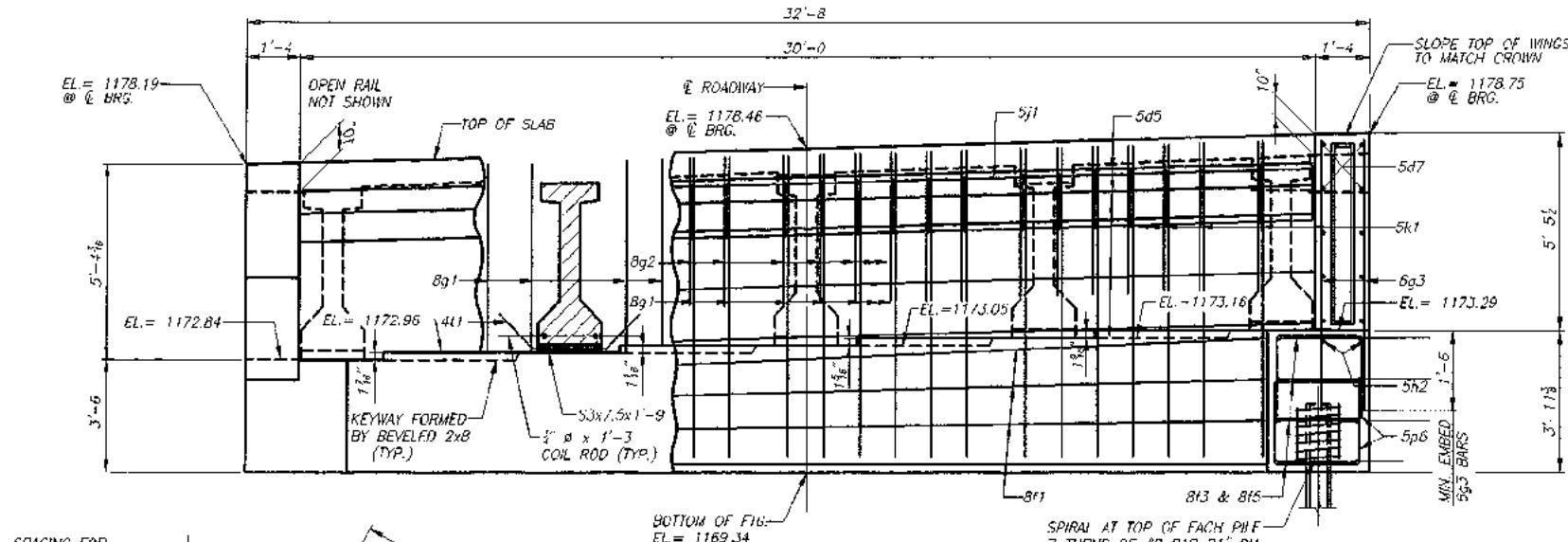


SPACING FOR  
 31 - 8g1 BACK FACE  
 26 - 8g1 FRONT FACE  
 25 - 8g2 BACK FACE  
 26 - 5k1 BACK FACE

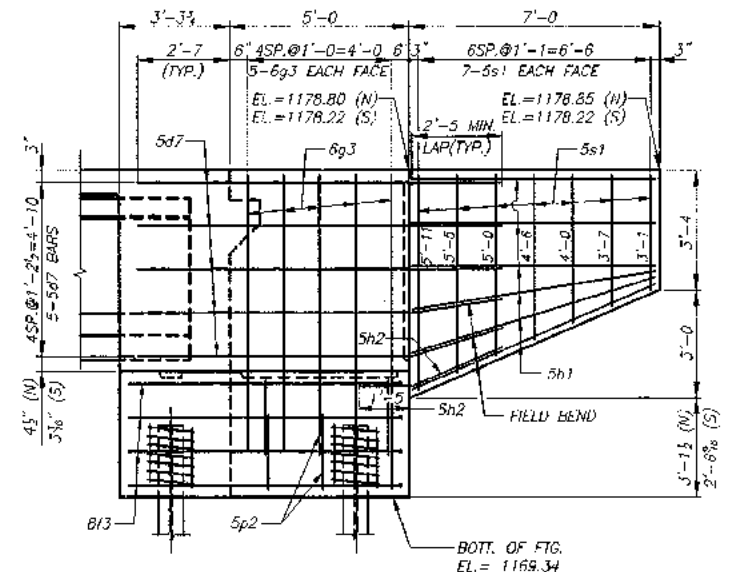
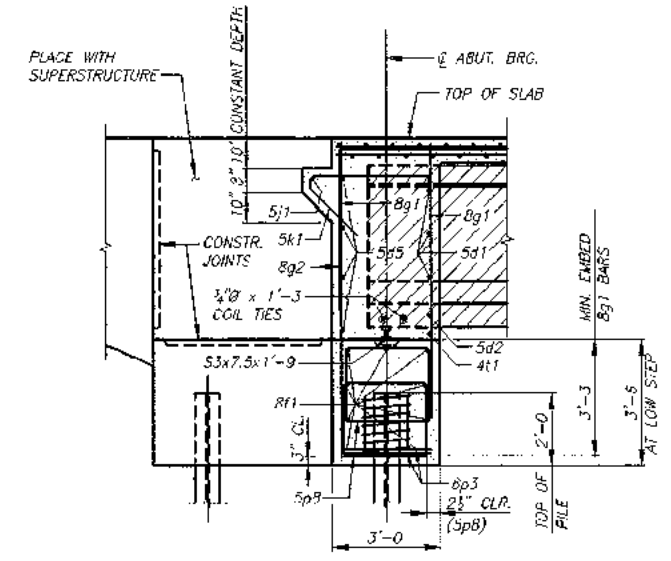
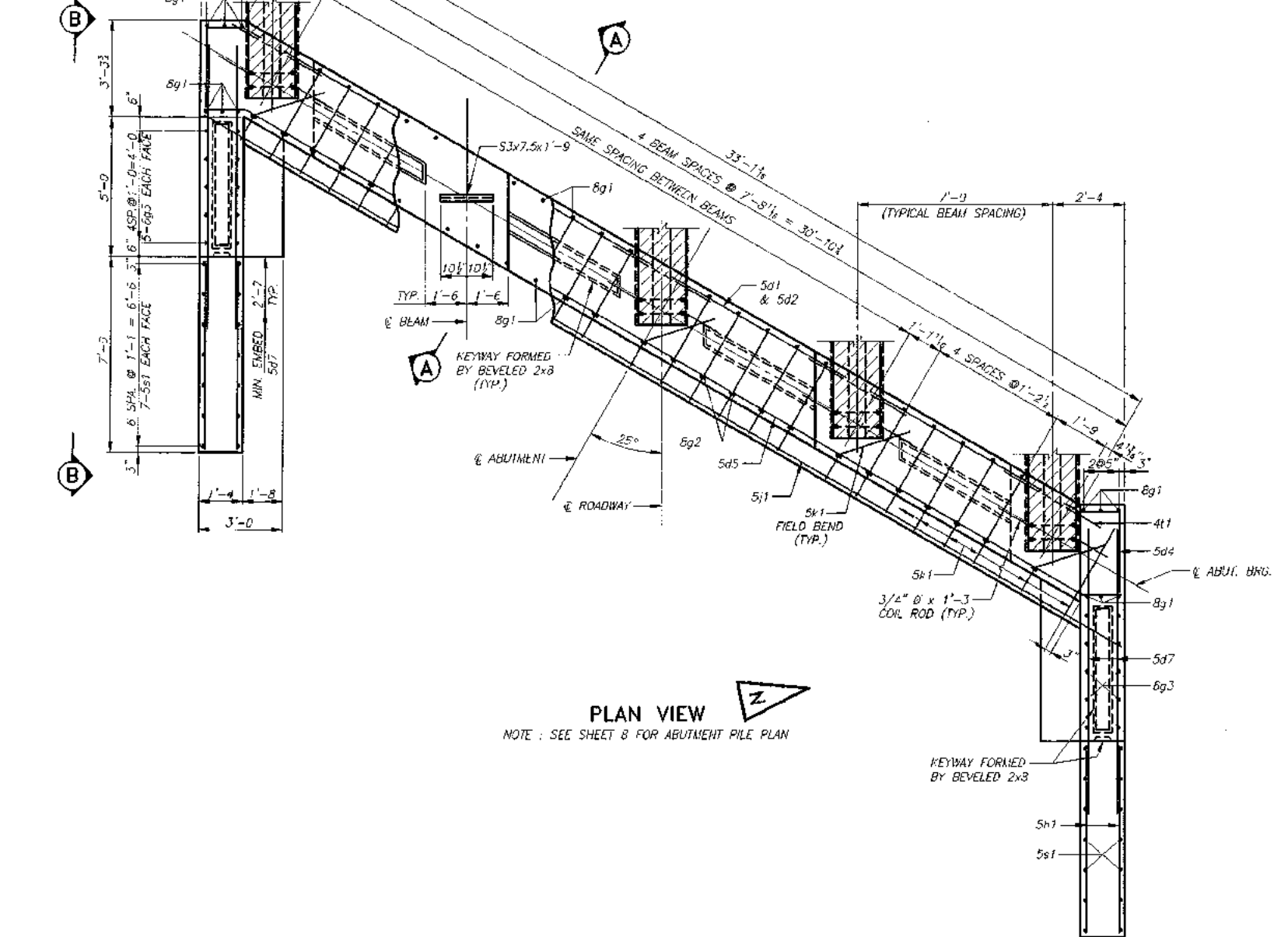


NOTE: ELEVATIONS AND VERTICAL DIMENSIONS SHOWN ARE AT OUTSIDE FACE.

**203'-0 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**  
 INTEGRAL ABUTMENTS SINGLE ROW ENCASED PIERS  
 50'-9 END SPANS 101'-6 INTERIOR SPAN  
**WEST ABUTMENT DETAILS**  
 STATION 21+90.00 25' SKEW, LT. AHEAD  
 CRAWFORD COUNTY, IOWA  
 SHEET 6 OF 27



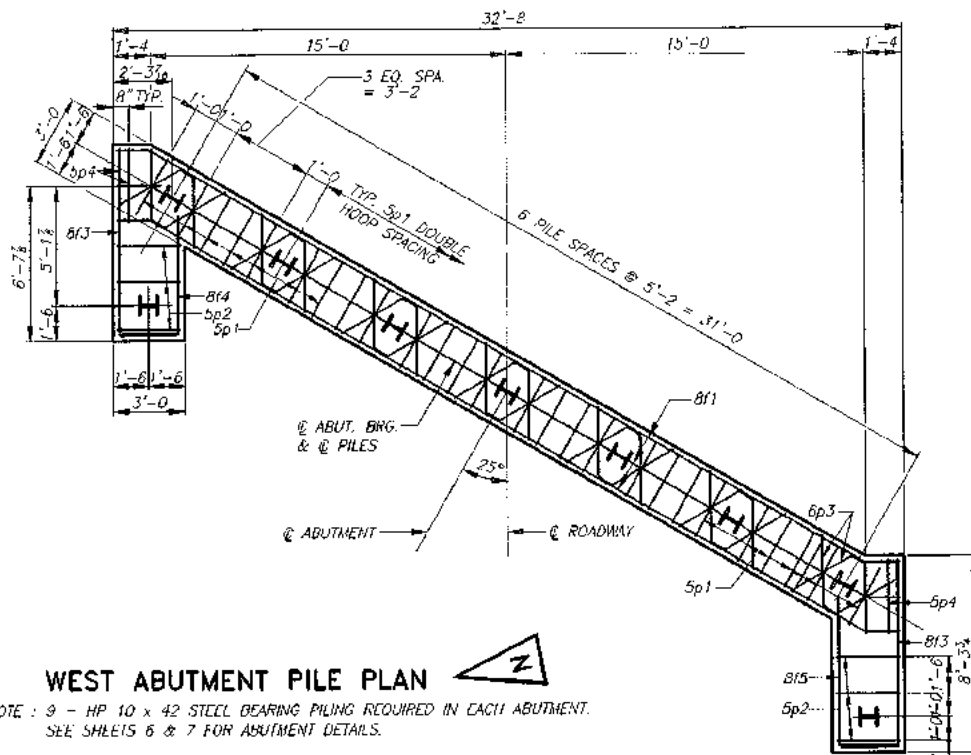
- SPACING FOR  
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 26 - 5k1 BACK FACE



NOTE: ELEVATIONS AND VERTICAL DIMENSIONS SHOWN ARE AT OUTSIDE FACE.

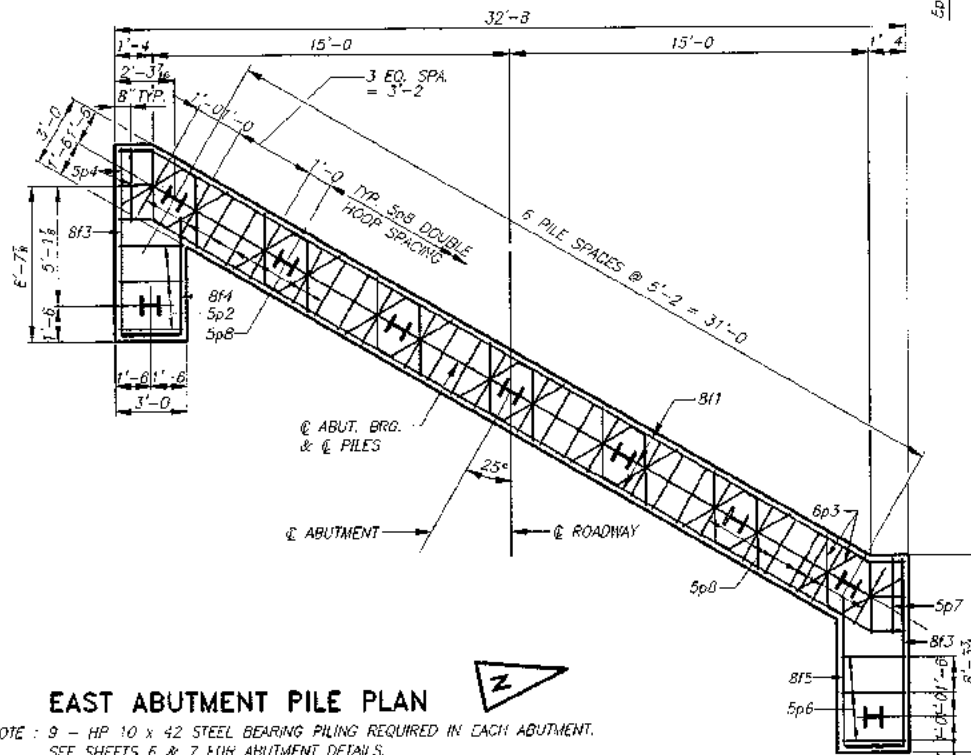
**203'-0 x 30'-0 PRETENSIONED PRESTRESSED  
 CONCRETE BEAM BRIDGE**  
 INTEGRAL ABUTMENTS      SINGLE ROW ENCASED PIERS  
 50'-9 END SPANS                  101'-6 INTERIOR SPAN

**EAST ABUTMENT DETAILS**  
 STATION 21+90.00                  25' SKEW, LT. AHEAD  
 CRAWFORD COUNTY, IOWA  
 SHEET 7 OF 27



**WEST ABUTMENT PILE PLAN**

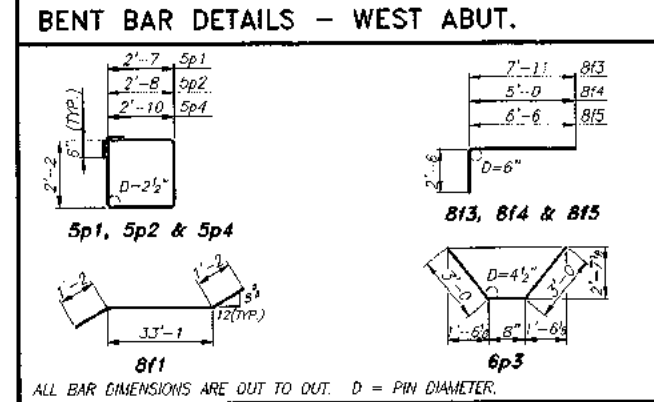
NOTE: 9 - HP 10 x 42 STEEL BEARING PILING REQUIRED IN EACH ABUTMENT. SEE SHEETS 6 & 7 FOR ABUTMENT DETAILS.



**EAST ABUTMENT PILE PLAN**

NOTE: 9 - HP 10 x 42 STEEL BEARING PILING REQUIRED IN EACH ABUTMENT. SEE SHEETS 6 & 7 FOR ABUTMENT DETAILS.

REINFORCING BAR LIST - WEST ABUTMENT					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
B11	ABUT. FOOTING, LONGITUDINAL	—	9	35'-5"	851
B13	ABUT. EXTENSION, LONGITUDINAL	—	8	10'-5"	223
B14	ABUT. EXTENSION, LONGITUDINAL	—	4	7'-6"	80
B15	ABUT. EXTENSION, LONGITUDINAL	—	4	9'-0"	96
Bg1	ABUT. VERTICAL, F. F. & B. F.	—	57	8'-5"	1,281
Bg3	ABUT. DIAPHRAGM, WING EXT., VERT.	—	20	6'-8"	200
5h1	ABUT. WING, HORIZONTAL	—	24	6'-8"	167
5h2	ABUT. TO WING, DOWELS	—	4	4'-0"	17
5p1	ABUT. HOOPS	□	52	10'-8"	569
5p2	ABUT. EXTENSION, HOOPS	□	12	10'-8"	134
5p3	ABUT. BOTTOM, AT PILES	—	14	6'-8"	140
5p4	ABUT. HOOPS, ENDS	□	8	11'-0"	92
5s1	WING, VERTICAL	—	28	SHOWN	131
	PILE SPIRAL - #2 BAR	—	9	38'-6"	58
	SPIRAL SPACERS - 7/8 x 7/8 x 1/2 L	—	18	1'-10"	23
EPOXY COATED BARS					2,933
UNCOATED TOTAL (LBS.)					1,129



CONCRETE PLACEMENT QUANT.-WEST ABUT.		
LOCATION	UNIT	QUANTITY
FOOTING AND STEPS	CU.YDS.	18.5
WINGS 2 @ 1.67	CU.YDS.	3.3
TOTAL	CU.YDS.	21.8

ESTIMATED QUANTITIES - WEST ABUTMENT		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE	CU.YDS.	21.8
REINFORCING STEEL - UNCOATED	LBS.	1,129
REINFORCING STEEL - EPOXY COATED	LBS.	2,933
HP 10 x 42 STEEL FURNISH 9 @ 65'	L.F.	585
BEARING PILING DRIVE 9 @ 65'	L.F.	585
EXCAVATION CLASS 20	CU.YDS.	23
PREBORED HOLES, AS PER PLAN 9 @ 8'	L.F.	72

**ABUTMENT NOTES**

ALL EXPOSED CORNERS 90 DEGREES OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

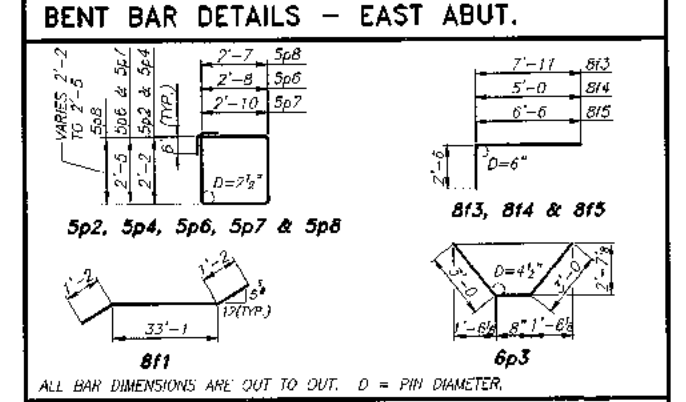
THE HP10x42 STEEL BEARING PILING SHALL BE DRIVEN TO FULL PENETRATION WHERE PRACTICABLE.

THE DESIGN BEARING FOR THE HP10x42 ABUTMENT PILES IS 34 TONS.

REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS POURED.

DUE TO DEPTH OF APPROACH FILLS, THE EXISTING SOIL IS EXPECTED TO CONSOLIDATE. IN ORDER TO AVOID "DOWN DRAG" FORCES ON THE ABUTMENT PILES, PILE DRIVING SHALL BE DONE AT LEAST 4 WEEKS AFTER THE PLACEMENT OF THE APPROACH FILLS.

REINFORCING BAR LIST - EAST ABUTMENT					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
B11	ABUT. FOOTING, LONGITUDINAL	—	9	35'-5"	851
B13	ABUT. EXTENSION, LONGITUDINAL	—	8	10'-5"	223
B14	ABUT. EXTENSION, LONGITUDINAL	—	4	7'-6"	80
B15	ABUT. EXTENSION, LONGITUDINAL	—	4	9'-0"	96
Bg1	ABUT. VERTICAL, F. F. & B. F.	—	57	8'-5"	1,281
Bg3	ABUT. DIAPHRAGM, WING EXT., VERT.	—	20	6'-8"	200
5h1	ABUT. WING, HORIZONTAL	—	24	6'-8"	167
5h2	ABUT. TO WING, DOWELS	—	4	4'-0"	17
5p2	ABUT. EXTENSION, HOOPS, S.	□	6	10'-8"	67
5p3	ABUT. BOTTOM, AT PILES	—	14	6'-8"	140
5p4	ABUT. HOOPS, ENDS, S.	□	4	11'-0"	48
5p6	ABUT. EXTENSION HOOPS, N.	□	6	11'-2"	70
5p7	ABUT. HOOPS, ENDS N.	□	4	11'-6"	48
5p8	ABUT. HOOPS	□	52	VARIES	583
5s1	WING, VERTICAL	—	28	SHOWN	131
	PILE SPIRAL - #2 BAR	—	9	38'-6"	58
	SPIRAL SPACERS - 7/8 x 7/8 x 1/2 L	—	18	1'-10"	23
EPOXY COATED BARS					2,949
UNCOATED TOTAL (LBS.)					1,132



CONCRETE PLACEMENT QUANT.-EAST ABUT.		
LOCATION	UNIT	QUANTITY
FOOTING AND STEPS	CU.YDS.	18.0
WINGS 2 @ 1.67	CU.YDS.	3.3
TOTAL	CU.YDS.	22.3

ESTIMATED QUANTITIES - EAST ABUTMENT		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE	CU.YDS.	22.3
REINFORCING STEEL - UNCOATED	LBS.	1,132
REINFORCING STEEL - EPOXY COATED	LBS.	2,949
HP 10 x 42 STEEL FURNISH 9 @ 65'	L.F.	585
BEARING PILING DRIVE 9 @ 65'	L.F.	585
EXCAVATION CLASS 20	CU.YDS.	23
PREBORED HOLES, AS PER PLAN 9 @ 8'	L.F.	72

**203'-0" x 30'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**

INTEGRAL ABUTMENTS      SINGLE ROW ENCASED PIERS

50'-9" END SPANS      101'-6" INTERIOR SPAN

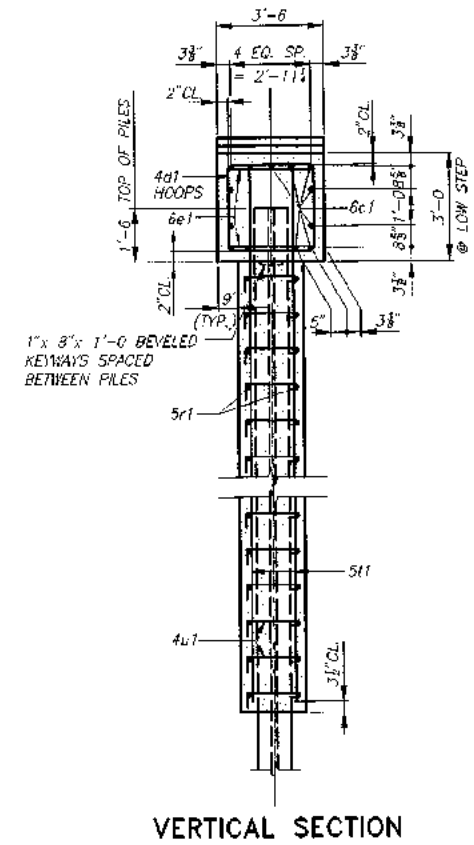
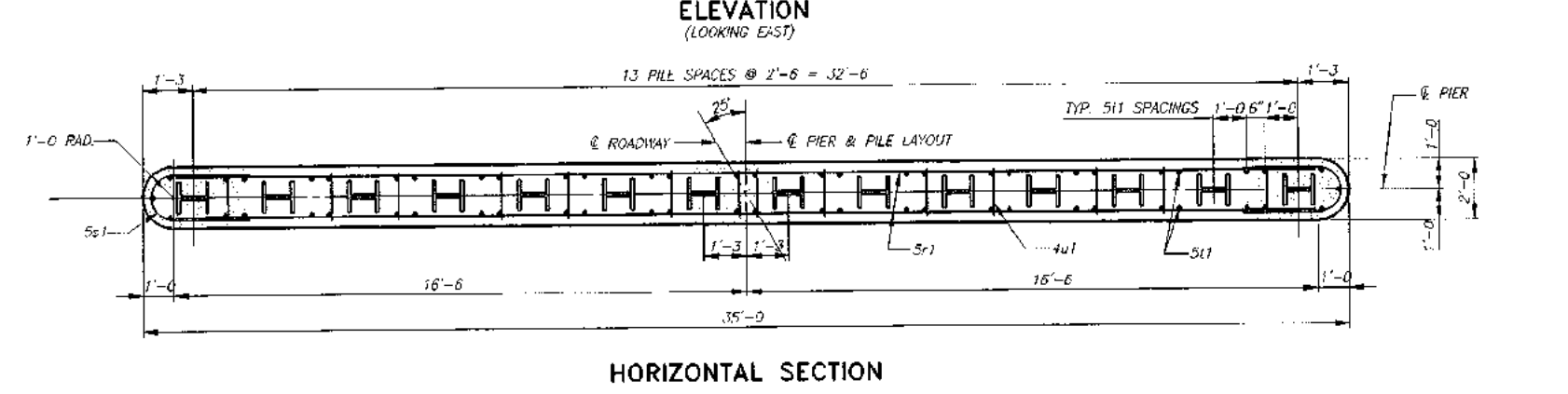
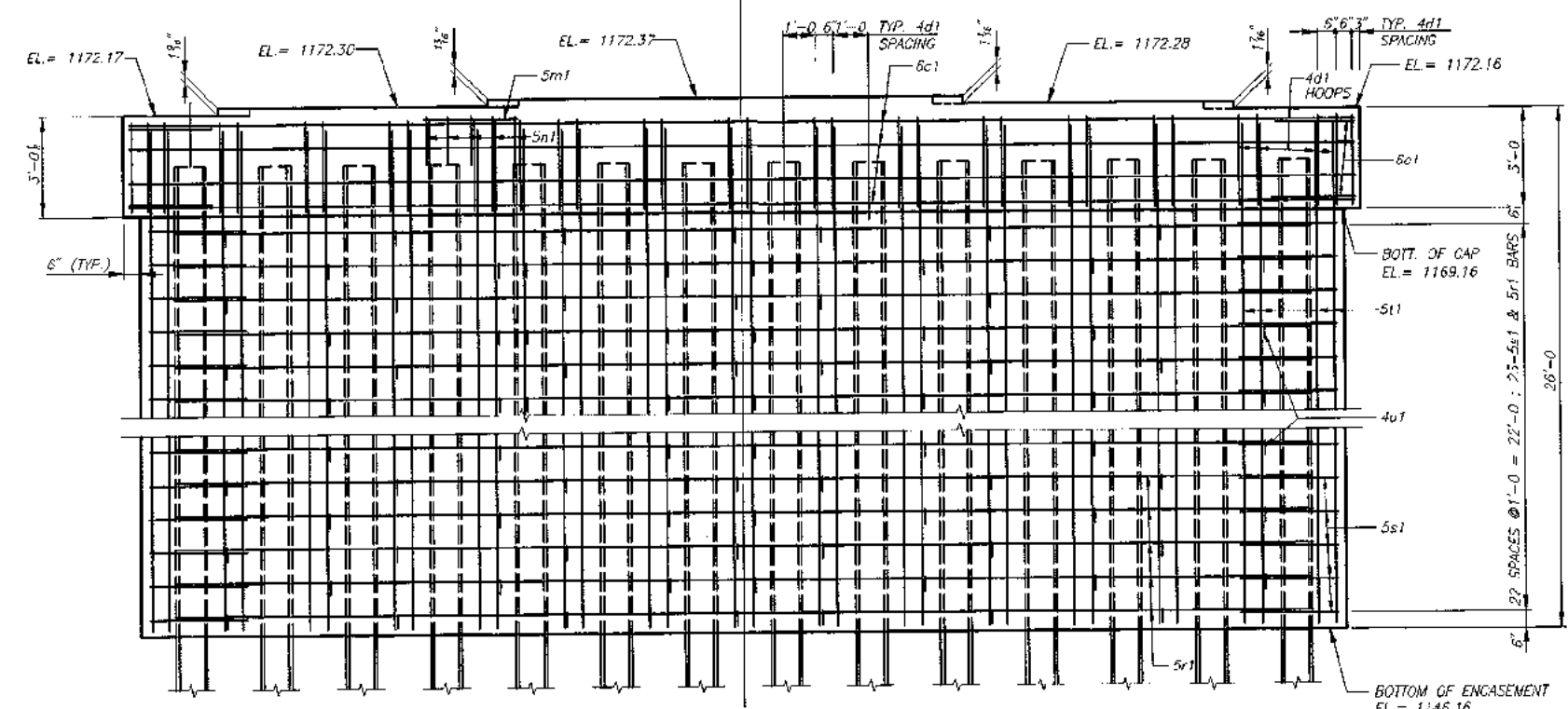
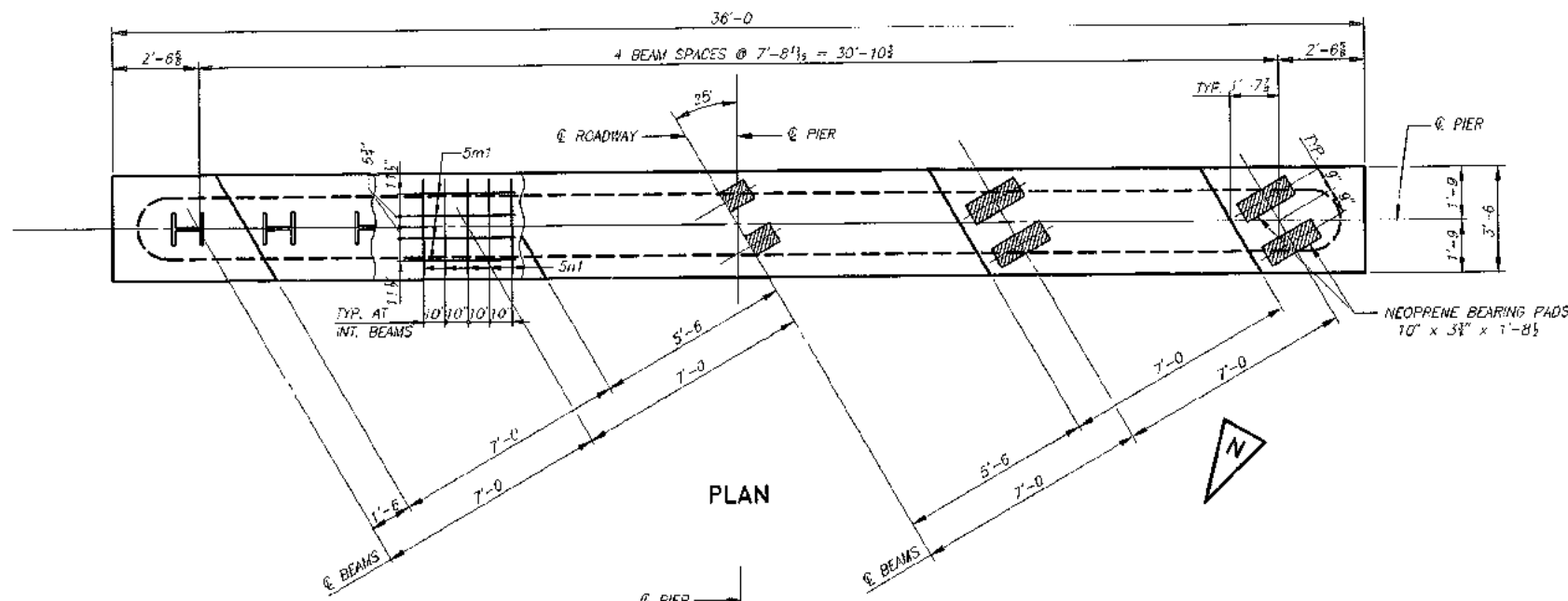
**ABUTMENT DETAILS**

STATION 21+90.00      25' SKEW, LT. AHEAD

CRAWFORD COUNTY, IOWA

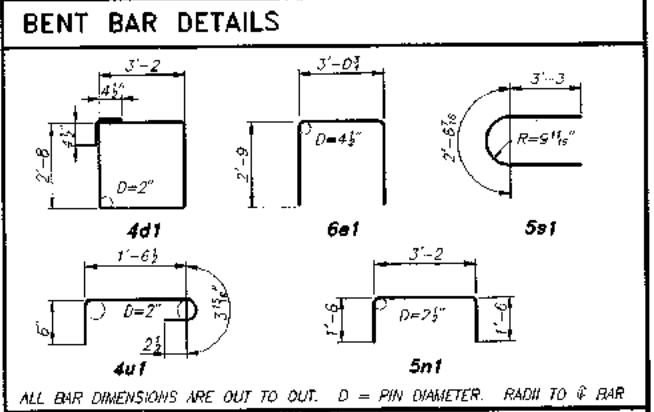
SHEET 8 OF 27





### REINFORCING BAR LIST - WEST PIER

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	PIER CAP, LONGITUDINAL	—	13	35'-8	695
4d1	PIER CAP, HOOPS	⊠	32	12'-5	265
6e1	PIER CAP, ENDS	⊠	4	8'-7	52
5m1	PIER CAP, STEP, LONGIT.	—	12	3'-10	40
5n1	PIER CAP, STEP, TRANSV.	—	15	6'-2	97
5r1	PIER WALL, HORIZONTAL	—	46	33'-0	1,563
5s1	PIER WALL, ENDS	—	46	9'-1	435
5t1	PIER WALL, VERTICAL	—	58	25'-3	1,527
4u1	PIER WALL, TIES	—	161	7'-7	278
TOTAL (LBS.)					4,982



### CONCRETE PLACEMENT QUANT. - WEST PIER

LOCATION	UNIT	QUANTITY
PIER CAP	CU. YDS.	14.6
PIER WALL	CU. YDS.	58.9
TOTAL	CU. YDS.	73.5

### ESTIMATED QUANTITIES - WEST PIER

ITEM	UNIT	QUANTITY	
STRUCTURAL CONCRETE	CU. YDS.	73.5	
REINFORCING STEEL	LBS.	4,982	
HP 12x53 STEEL	FURNISH 14 @ 75'	L.F.	1,050
BEARING PILING	DRIVE 14 @ 75'	L.F.	1,050
EXCAVATION, CLASS 21	CU. YDS.	27	

### WEST PIER NOTES

ALL EXPOSED CORNERS 90 DEGREES OR SHARPER ARE TO BE FILLETED WITH 1/4 INCH DRESSED AND BEVELLED STRIP.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

THE HP12x53 STEEL BEARING PILING SHALL BE DRIVEN TO A MINIMUM OF 44 TONS BEARING VALUE PER PILE.

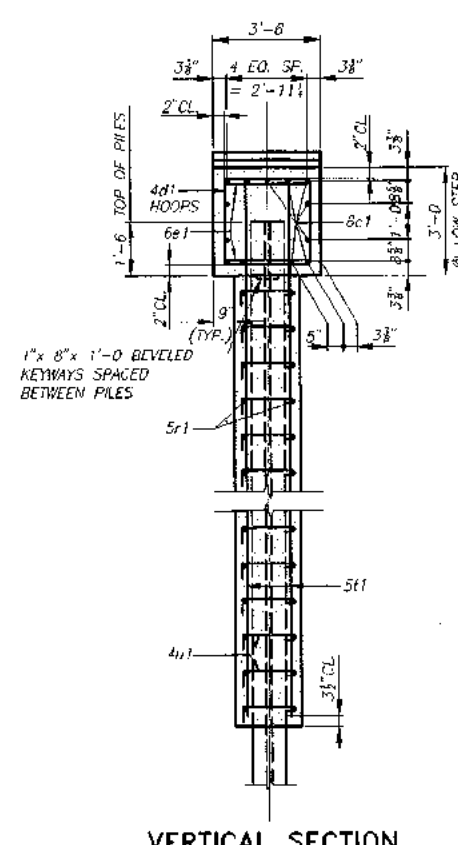
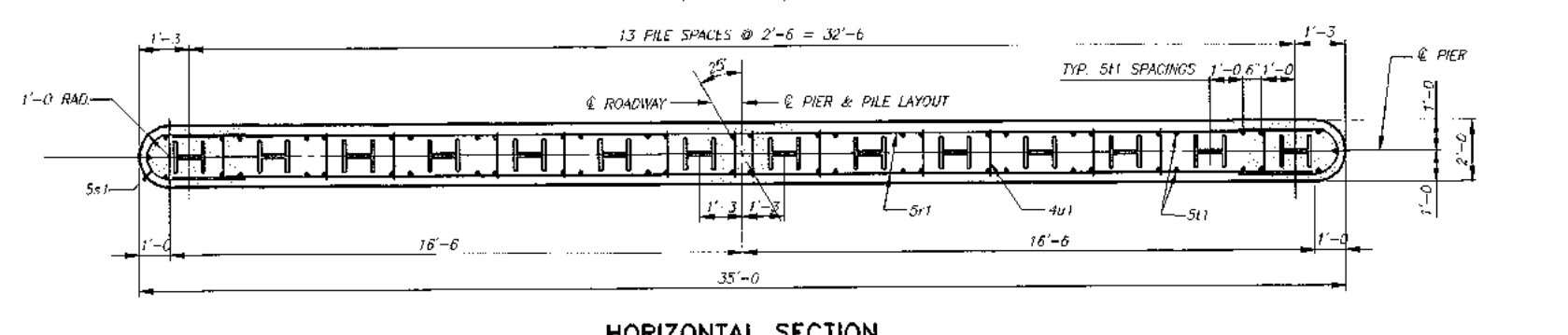
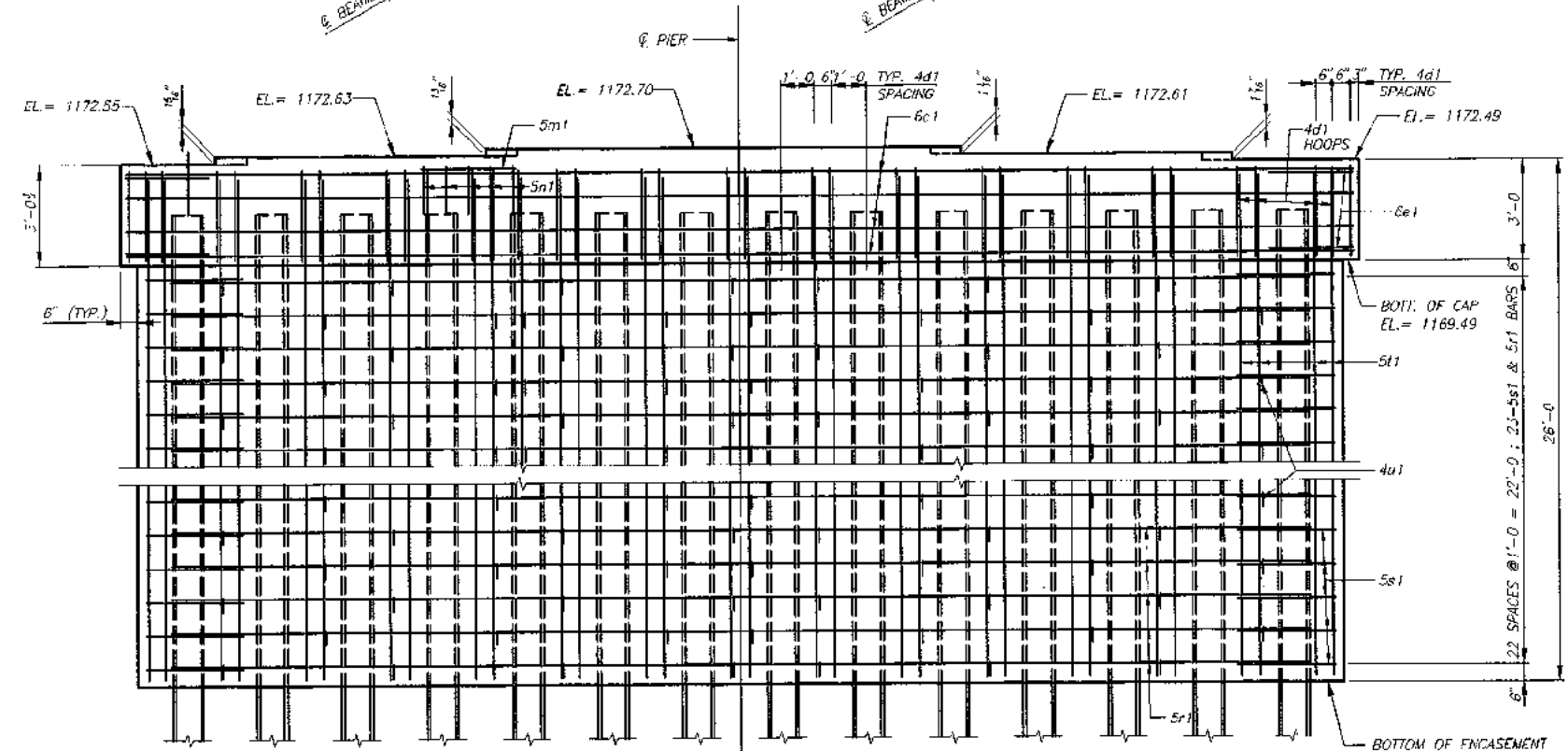
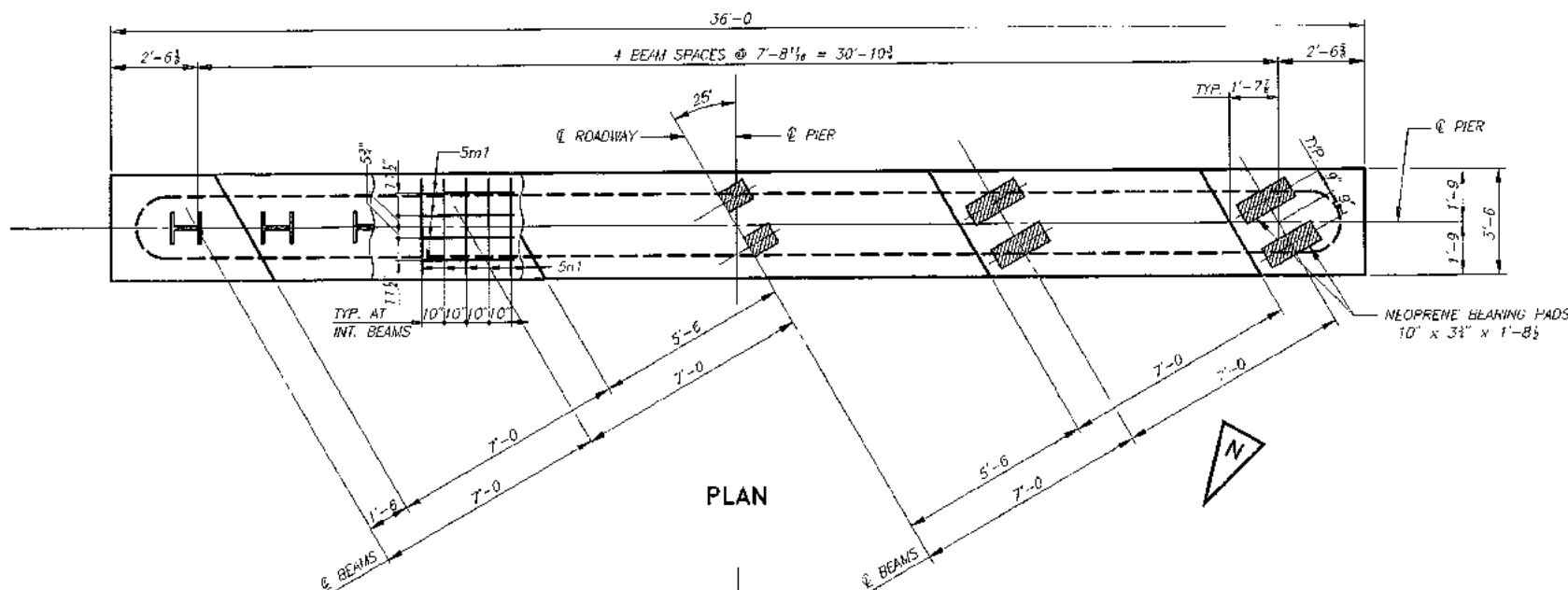
REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.

ALL REINFORCING SHALL BE GRADE 60.

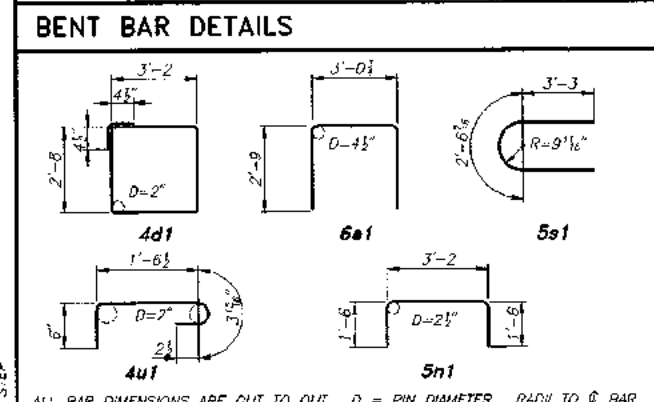
203'-0 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE  
 INTEGRAL ABUTMENTS SINGLE ROW ENCASED PIERS  
 50'-9 END SPANS 101'-6 INTERIOR SPAN

### WEST PIER DETAILS

STATION 21+90.00 25' SKEW, LT. AHEAD  
 CRAWFORD COUNTY, IOWA  
 SHEET 9 OF 27



REINFORCING BAR LIST - EAST PIER					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6c1	PIER CAP, LONGITUDINAL	—	13	35'-8	696
4d1	PIER CAP, HOOPS	□	32	12'-5	265
6n1	PIER CAP, ENDS	—	4	8'-7	52
5m1	PIER CAP, STEP, LONGIT.	—	12	3'-10	48
5n1	PIER CAP, STEP, TRANSV.	—	15	6'-2	97
5r1	PIER WALL, HORIZONTAL	—	46	33'-0	1,563
5s1	PIER WALL, ENDS	—	46	9'-7	436
5t1	PIER WALL, VERTICAL	—	58	25'-3	1,527
4u1	PIER WALL, TIES	—	161	2'-7	278
TOTAL (LBS.)					4,982



CONCRETE PLACEMENT QUANT. - EAST PIER		
LOCATION	UNIT	QUANTITY
PIER CAP	CU.YDS.	14.6
PIER WALL	CU.YDS.	58.9
TOTAL	CU.YDS.	73.5

ESTIMATED QUANTITIES - EAST PIER		
ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE	CU.YDS.	73.5
REINFORCING STEEL	LBS.	4,982
HP 12x53 STEEL BEARING PILING	L.F.	1,050
EXCAVATION, CLASS 21	CU.YDS.	25
EXCAVATION, CLASS 20	CU.YDS.	4

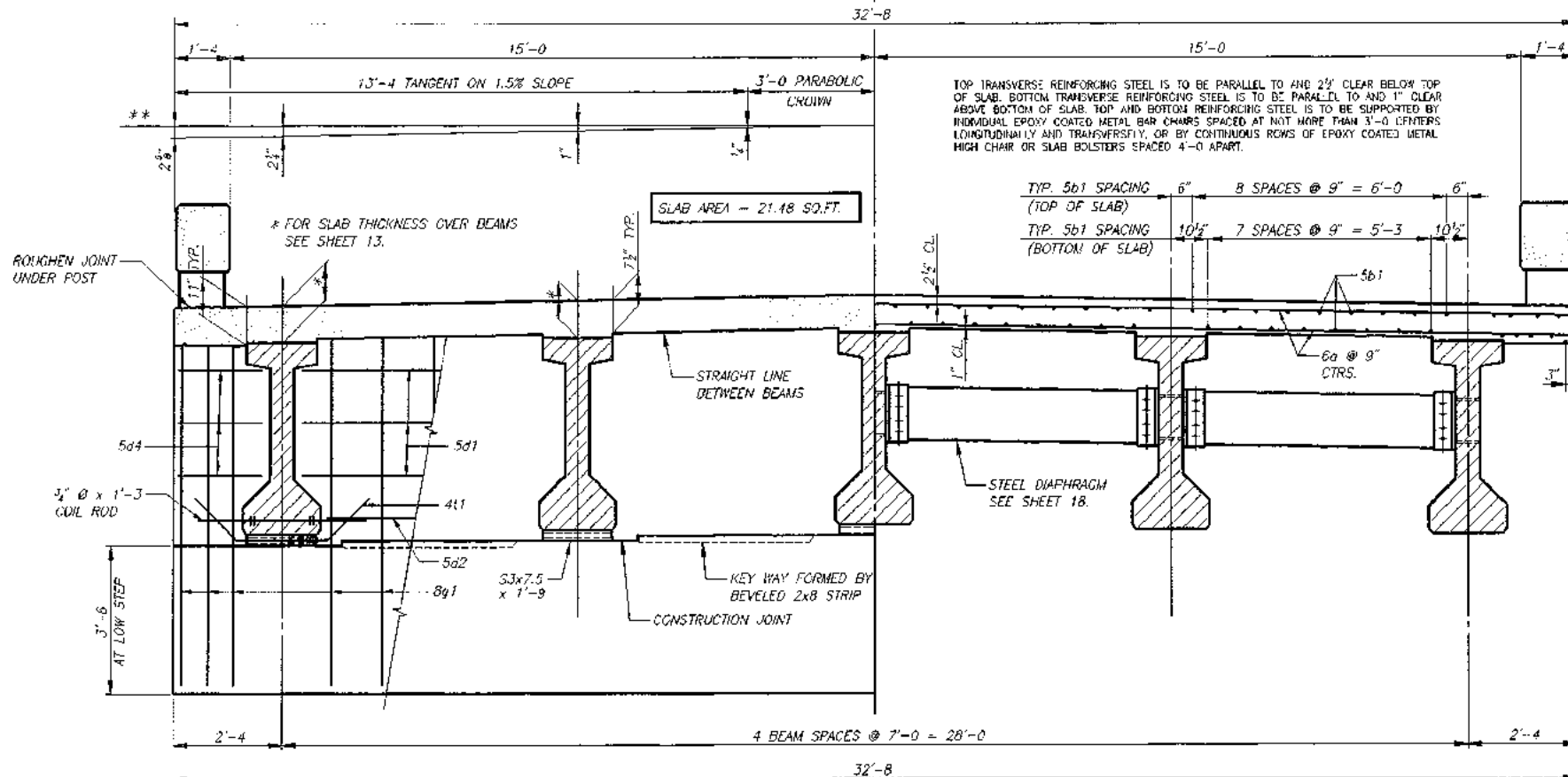
**EAST PIER NOTES**

- ALL EXPOSED CORNERS 90 DEGREES OR SHARPER ARE TO BE FILLETED WITH 3/4 INCH DRESSED AND BEVELED STRIP.
- MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
- THE HP12x53 STEEL BEARING PILING SHALL BE DRIVEN TO A MINIMUM OF 44 TONS BEARING VALUE PER PILE.
- REINFORCING STEEL IS TO BE SECURELY WIRED IN PLACE BEFORE CONCRETE IS PLACED.
- ALL REINFORCING SHALL BE GRADE 60.

**203'-0 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**  
 INTEGRAL ABUTMENTS SINGLE ROW ENCASED PIERS  
 50'-9 END SPANS 101'-6 INTERIOR SPAN

**EAST PIER DETAILS**  
 STATION 21+90.00 25' SKEW, LT. AHEAD  
 CRAWFORD COUNTY, IOWA  
 SHEET 10 OF 27

\*\* ORDINATES SHOWN FOR WEST ABUTMENT TO STA. 22+36.02.  
SEE "TOP OF SLAB ELEVATIONS" FOR OTHER ORDINATES

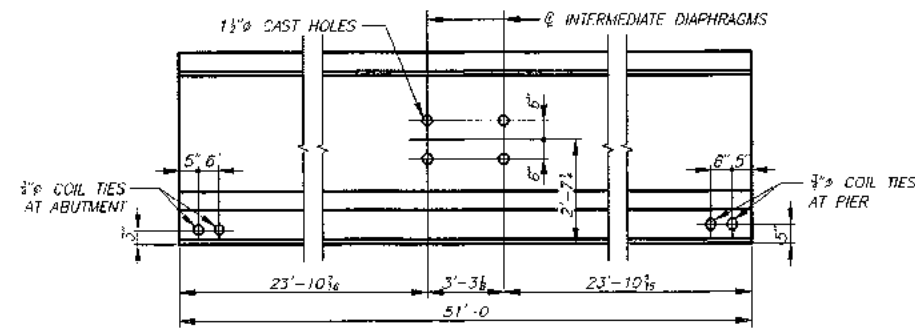


HALF SECTION NEAR WEST ABUTMENT

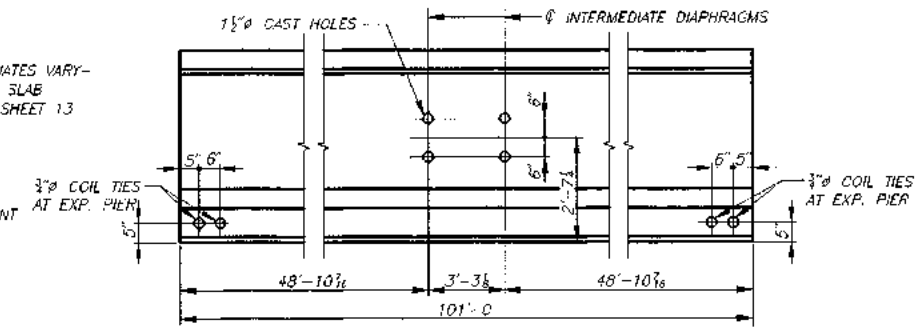
HALF SECTION NEAR MID SPAN

**SUPERSTRUCTURE NOTES**

THIS BRIDGE IS DESIGNED FOR HS20-44 LOADING PLUS 20 LBS. PER SQ. FT. OF ROADWAY FOR FUTURE WEARING SURFACE.  
SLAB THICKNESS INCLUDES 1/2" INTEGRAL WEARING SURFACE.  
ALL EXPOSED CORNERS OF 90 DEGREES OR SHARPER ARE TO BE FORMED WITH A 3/4" DRESSED AND BEVELED STRIP. CLEAR DISTANCE FROM FACE OF CONCRETE TO REAR REINFORCING BAR SHALL BE 2" UNLESS OTHERWISE NOTED OR SHOWN. ALL REINFORCING BARS ARE TO BE SECURELY WIRED IN PLACE.  
SLAB REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL EPOXY COATED METAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0" CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF EPOXY COATED METAL HIGH CHAIRS OR SLAB BOLSTERS SPACED 4'-0" APART.  
THE EPOXY COATING OF CERTAIN REINFORCING BARS, AS DESIGNATED ON THE PLANS, SHALL BE IN ACCORDANCE WITH ARTICLE 4151.03B OF THE STANDARD SPECIFICATIONS OF THE IOWA D.O.T.-HIGHWAY DIVISION.  
ALL BEAMS ARE TO BE SET VERTICAL.  
FORMS FOR THE SLAB AND RAIL ARE TO BE SUPPORTED BY THE PRESTRESSED BEAMS. BEARING MATERIAL, COIL HOUS AND COIL TIES ARE INCIDENTAL TO THE COST OF "PRETENSIONED PRESTRESSED CONCRETE BEAMS".  
THE COST OF INTERMEDIATE DIAPHRAGMS IS INCLUDED IN THE PRICE BID FOR "STRUCTURAL STEEL".  
EXCEPT FOR PRESTRESSED CONCRETE BEAMS, ALL REINFORCING IS TO BE GRADE 60.  
THE BRIDGE SLAB SHALL BE PLACED IN SECTIONS AND IN THE SEQUENCE INDICATED BY CIRCLED NUMBERS ON SLAB PLAN SHEETS. ALTERNATE PROCEDURES FOR PLACING CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHODS AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULTS. ABUTMENT AND PIER DIAPHRAGMS SHALL BE PLACED SIMULTANEOUSLY WITH APPROPRIATE SLAB SECTIONS.  
CROWN ORDINATES SHOWN IN "HALF SECTION NEAR WEST ABUTMENT" ARE TO BE SYMMETRICAL ABOUT @ ROADWAY FROM WEST ABUTMENT TO STA. 22+36.02. THE CROSS SLOPE SHALL THEN VARY AS SHOWN BY SECTION A-A TO D-D ON THE "SITUATION PLAN" SEE "TOP OF SLAB ELEVATIONS" FOR ADDITIONAL INFORMATION.



LXD 50



LXD 100

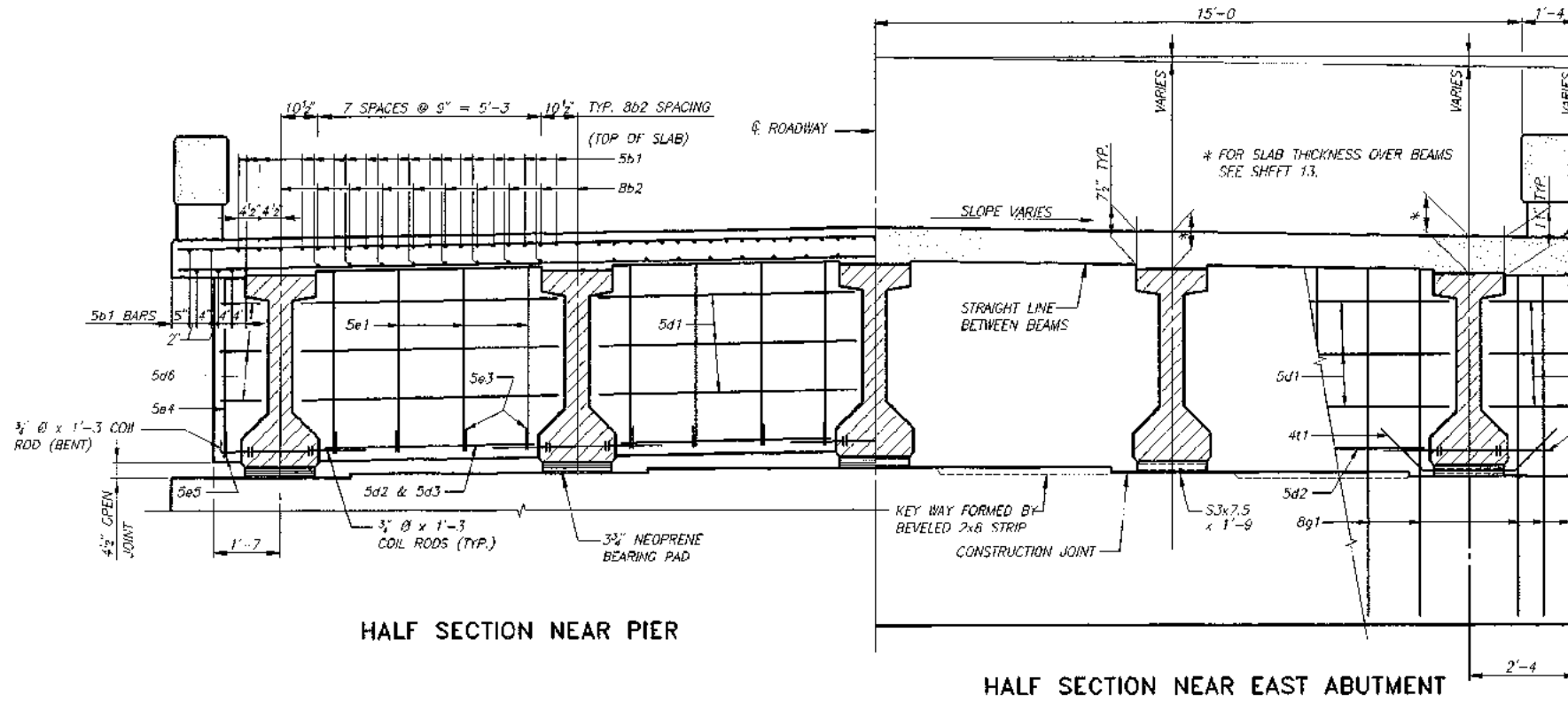
**BEAM COIL TIE AND BOLT HOLE LOCATIONS**

**203'-0 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**

INTEGRAL ABUTMENTS 50'-9 END SPANS  
SINGLE ROW ENCASED PIERS 101'-6 INTERIOR SPAN

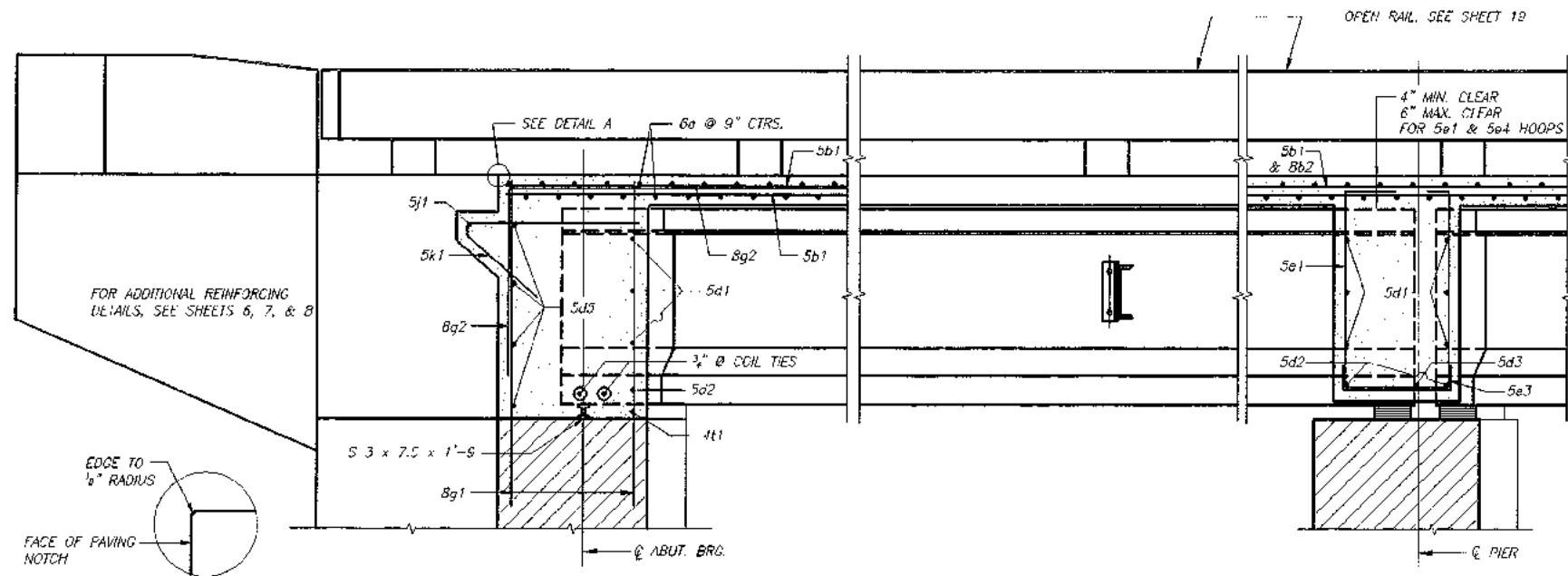
**SUPERSTRUCTURE DETAILS**

STATION 21+90.00 25' SKEW, LT. AHEAD  
CRAWFORD COUNTY, IOWA  
SHEET 11 OF 27

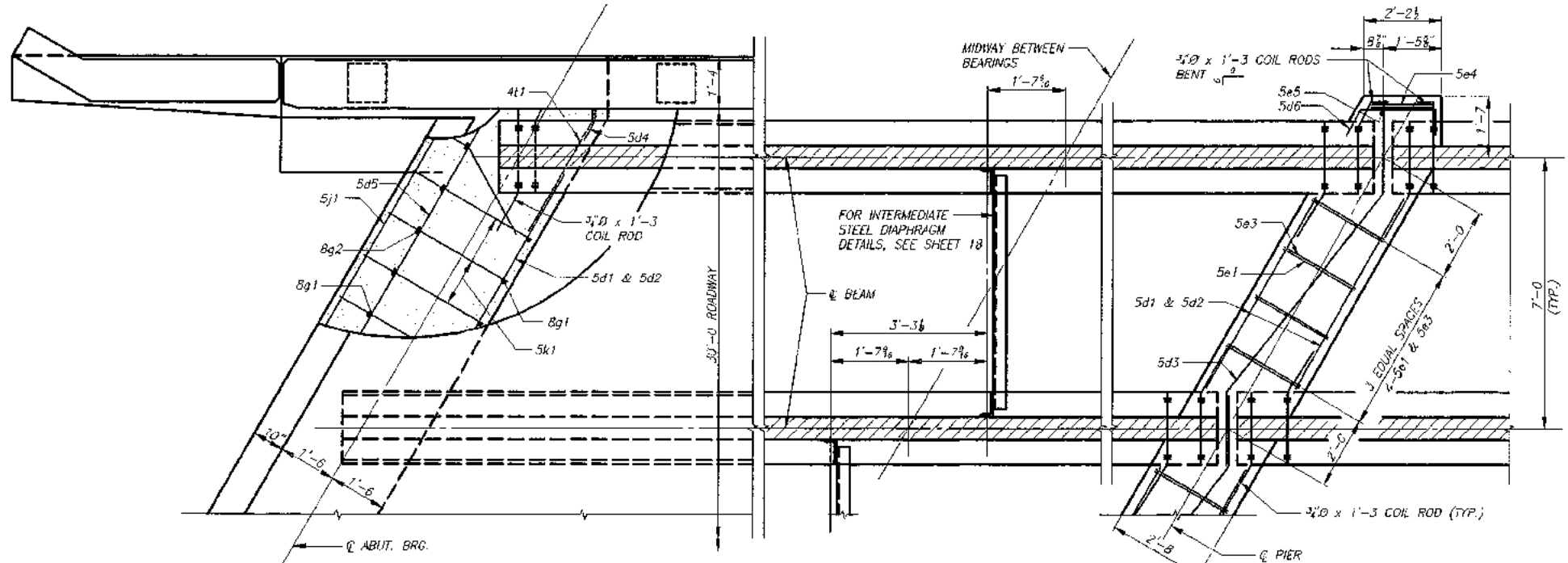


HALF SECTION NEAR PIER

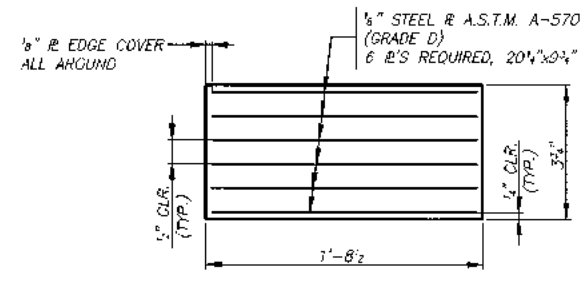
HALF SECTION NEAR EAST ABUTMENT



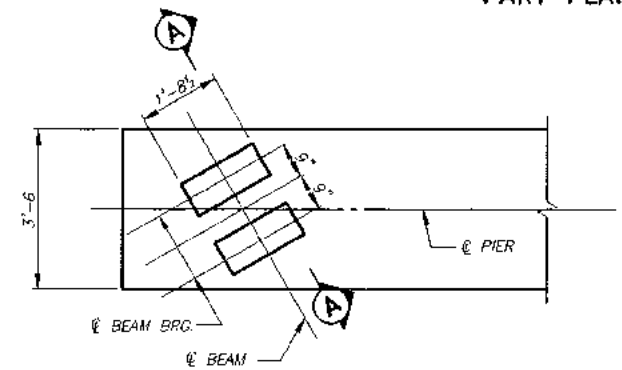
LONGITUDINAL SECTION NEAR RAIL (EXP.)



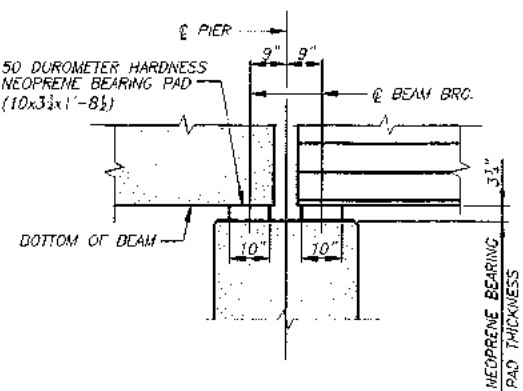
PART PLAN



NEOPRENE BEARING PAD ELEVATION - BOTH PIERS (EXP.) (20 REQUIRED)

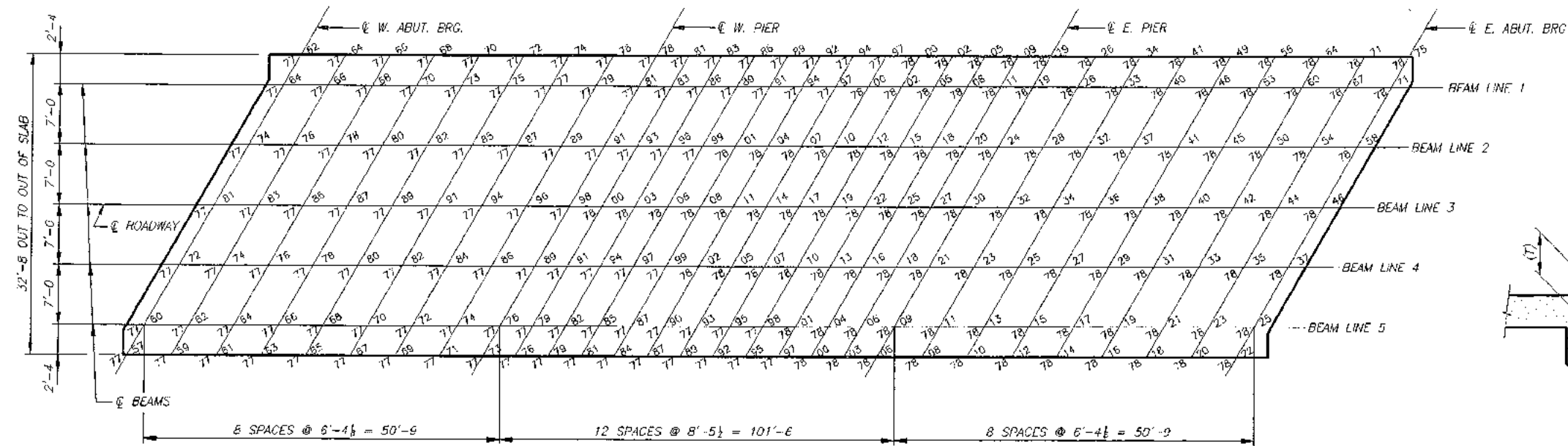


PART PLAN - BOTH PIERS (EXP.)

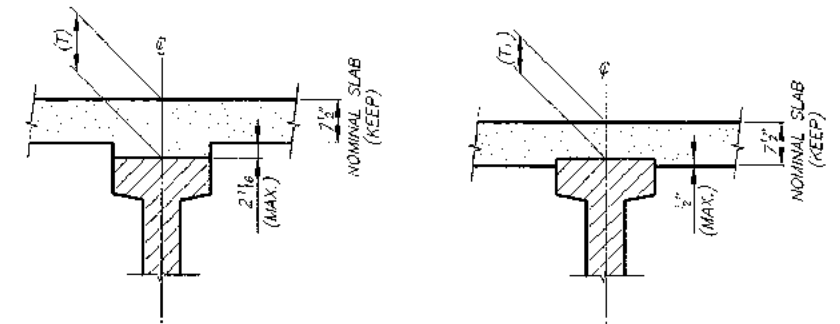


SECTION A - A

203'-0 x 30'-0 PRETENSIONED PRESTRESSED  
 CONCRETE BEAM BRIDGE  
 INTEGRAL ABUTMENTS SINGLE ROW ENCASED PIERS  
 50'-9 END SPANS 101'-6 INTERIOR SPAN  
 SUPERSTRUCTURE DETAILS  
 STATION 21+90.00 25' SKEW, LT. AHEAD  
 CRAWFORD COUNTY, IOWA  
 SHEET 12 OF 27

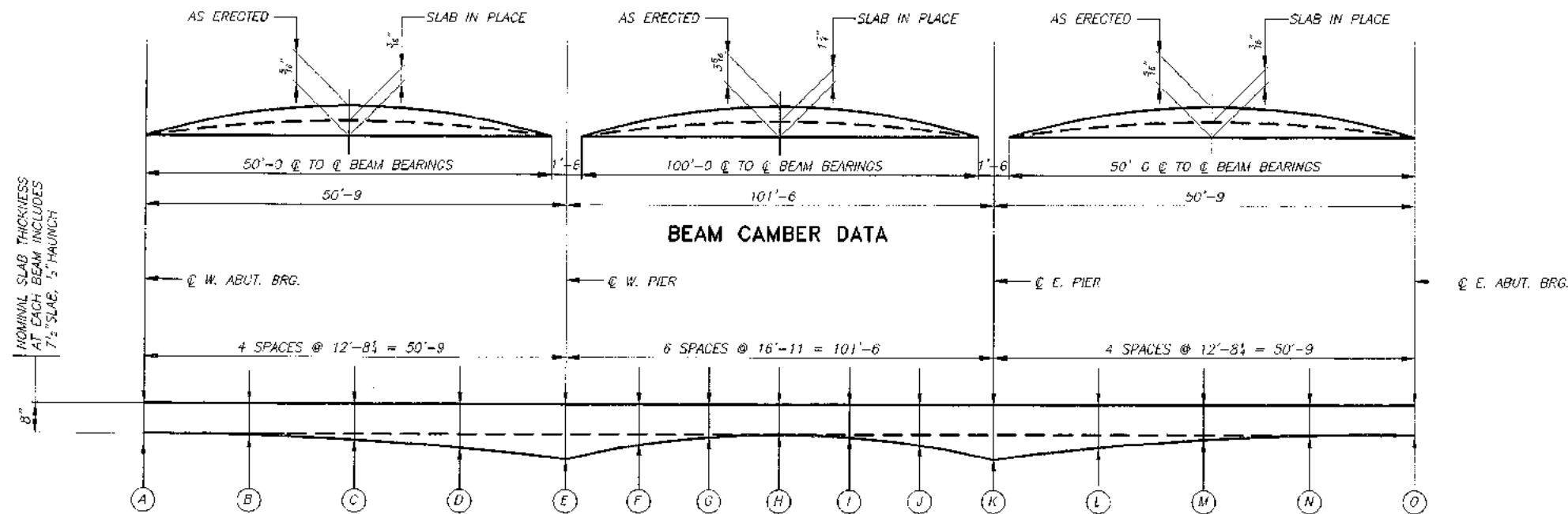


**TOP OF SLAB ELEVATIONS**  
ADD 1100.00 TO ABOVE ELEVATIONS



**SLAB THICKNESS DETAILS**

NOTE: THE SLAB THICKNESS (T) AT BEAMS IS BASED ON THE ANTICIPATED BEAM CAMBER REMAINING AFTER PLACING THE SLAB, BUT IS NOT GUARANTEED FOR CONSTRUCTION. IF BEAM IS UNDER CAMBERED, INCREASE SLAB THICKNESS (T) AT BEAMS TO COMPENSATE. IF BEAM IS OVER CAMBERED, THE SLAB THICKNESS (T) MAY BE DECREASED A MAXIMUM OF 1/2" EMBEDMENT AT THE BEAM (T1). IF MORE THAN 1/2" EMBEDMENT IS REQUIRED, OR IF THE HAUNCH EXCEEDS 2 1/2", THE GRADE LINE IS TO BE REVISED. THE ABOVE DIAGRAMS DO NOT APPLY TO THE CANTILEVERED SLAB SIDE OF THE EXTERIOR BEAM.



**BEAM CAMBER DATA**

**SLAB THICKNESS AT BEAM (T)**

NOTE: HAUNCH THICKNESSES ARE SHOWN FOR ESTIMATING ONLY AND ARE NOT GUARANTEED FOR CONSTRUCTION.

LOCATION	W. ABUT. BRG.				W. PIER								E. PIER				E. ABUT. BRG.
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O		
BEAM LINE 1	8"	8 3/8"	9 3/8"	9 3/8"	10 3/8"	9 1/2"	8 3/8"	8"	8 1/8"	8 3/8"	10 1/8"	9 1/8"	9 1/8"	8 3/8"	8"		
BEAM LINE 2	8"	8 1/8"	8 3/8"	9 1/8"	9 1/8"	8 1/8"	8 1/8"	8"	8 1/8"	8 3/8"	9 1/8"	9 1/8"	8 3/8"	8 1/8"	8"		
BEAM LINE 3	8"	8 1/8"	8 1/8"	9 1/8"	9 1/8"	8 1/8"	8 1/8"	8"	8 1/8"	8 1/8"	9 1/8"	9 1/8"	8 1/8"	8 1/8"	8"		
BEAM LINE 4	8"	8 1/8"	8 1/8"	9 1/8"	9 1/8"	8 1/8"	8 1/8"	8"	8 1/8"	8 1/8"	9 1/8"	9 1/8"	8 1/8"	8 1/8"	8"		
BEAM LINE 5	8"	8 1/8"	8 1/8"	9 1/8"	9 1/8"	8 1/8"	8 1/8"	8"	8 1/8"	8 1/8"	9 1/8"	9 1/8"	8 1/8"	8 1/8"	8"		

**SLAB HAUNCHING TABLE**

**203'-0 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**

INTEGRAL ABUTMENTS SINGLE ROW ENCASED PIERS  
50'-9 END SPANS 101'-6 INTERIOR SPAN

**SUPERSTRUCTURE DETAILS**

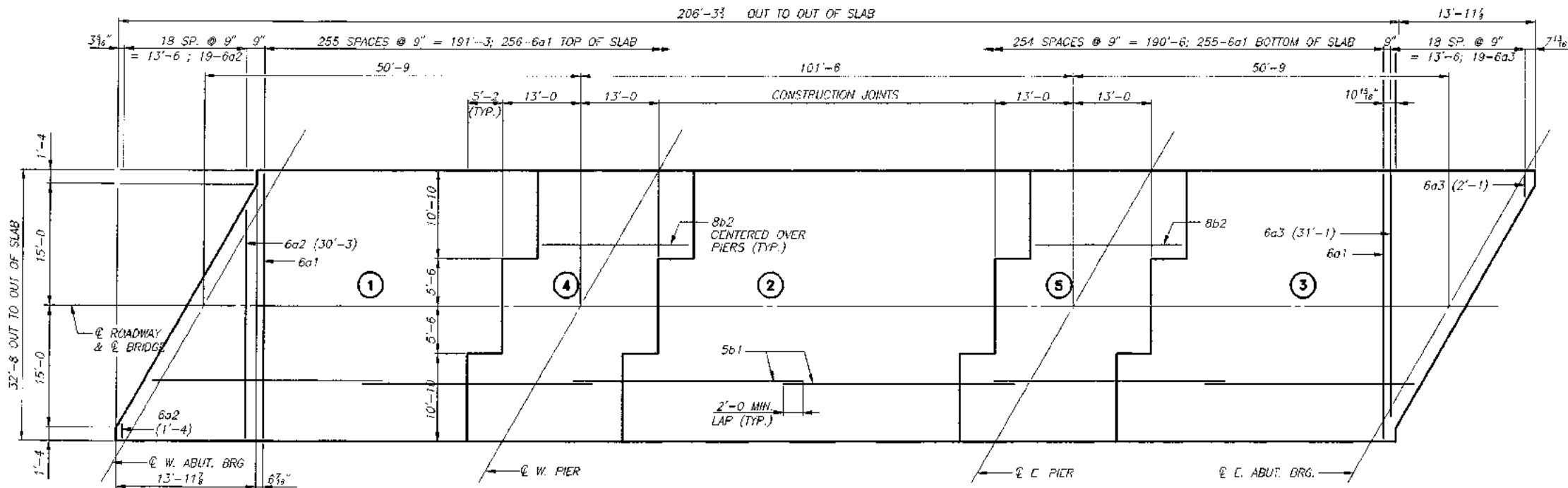
STATION 21+90.00

CRAWFORD COUNTY,

25' SKEW, LT. AHEAD

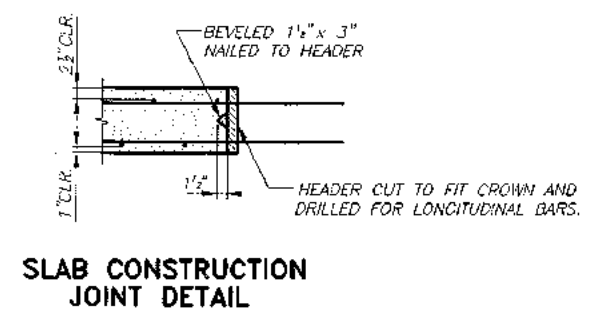
IOWA

SHEET 13 OF 27



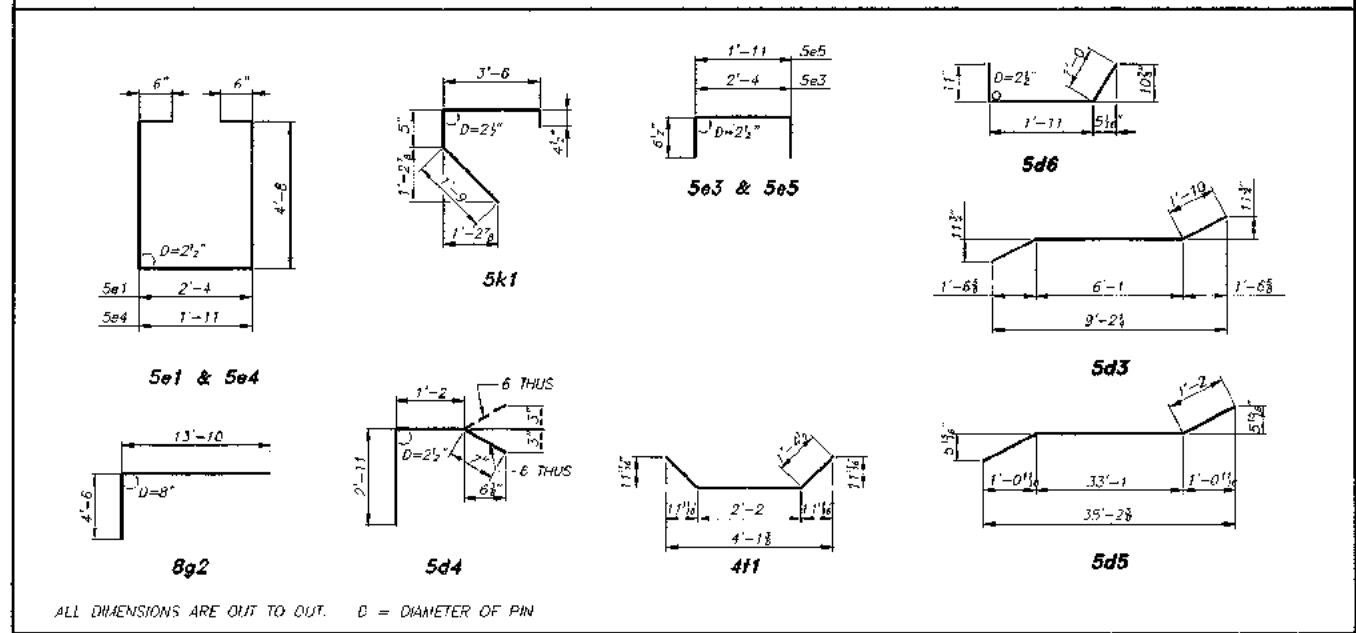
**CONCRETE PLACEMENT DIAGRAM AND SLAB REINFORCING LAYOUT**

ROADWAY SLAB SHALL BE PLACED IN SECTIONS AND IN SEQUENCE INDICATED. ALTERNATE PROCEDURES FOR PLACING SLAB CONCRETE MAY BE SUBMITTED FOR APPROVAL TOGETHER WITH A STATEMENT OF THE PROPOSED METHOD AND EVIDENCE THAT THE CONTRACTOR POSSESSES THE NECESSARY EQUIPMENT AND FACILITIES TO ACCOMPLISH THE REQUIRED RESULT.



**SLAB CONSTRUCTION JOINT DETAIL**

**BENT BAR DETAILS**



ALL DIMENSIONS ARE OUT TO OUT. D = DIAMETER OF PIN

**REINFORCING BAR LIST - SUPERSTRUCTURE**

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6a1	SLAB, TRANSVERSE, TOP & BOTT.	—	511	32'-4"	24,816
6a2	SLAB, TRANSVERSE, TOP	—	38	VARIES	901
6a3	SLAB, TRANSVERSE, BOTTOM	—	38	VARIES	947
5b1	SLAB, LONGIT., TOP & BOTTOM	—	504	36'-0"	18,924
6b2	SLAB, LONGITUDINAL, OVER PIERS	—	74	25'-8"	5,072
5d1	DIAPHRAGMS, LONGITUDINAL	—	1/2	6'-8"	501
5d2	ABUT. & PIER DIAPHRAGM, LONGIT.	—	24	5'-3"	131
5d3	PIER DIAPHRAGM, LONGITUDINAL	—	8	9'-9"	81
5d4	ABUTMENT DIAPHRAGM, ENDS	—	12	4'-9"	58
5d5	ABUTMENT DIAPHRAGM, LONGIT.	—	8	35'-5"	296
5d6	PIER DIAPHRAGM, ENDS	—	12	3'-10"	48
5d7	ABUT. DIAPH. WING EXT., LONGIT.	—	40	10'-2"	424
5e1	PIER DIAPHRAGM HOOPS	—	32	12'-8"	423
5e3	PIER DIAPHRAGM, TIES	—	32	3'-5"	114
5e4	PIER DIAPHRAGM, HOOPS, ENDS	—	4	12'-3"	51
5e5	PIER DIAPHRAGM, TIES, ENDS	—	4	3'-0"	13
8g2	ABUTMENT, VERTICAL, BACK FACE	—	50	18'-4"	2,447
5j1	PAVING NOTCH, LONGITUDINAL	—	2	35'-8"	74
5k1	PAVING NOTCH, TRANSVERSE	—	52	6'-1"	330
4a1	ABUT. DIAPH. HORIZ., FRONT FACE	—	10	1'-11"	33
OPEN RAIL, SEE SHEET 19					12,517
UNCOATED TOTAL (LBS.)					1,297
EPOXY COATED TOTAL (LBS.)					66,904

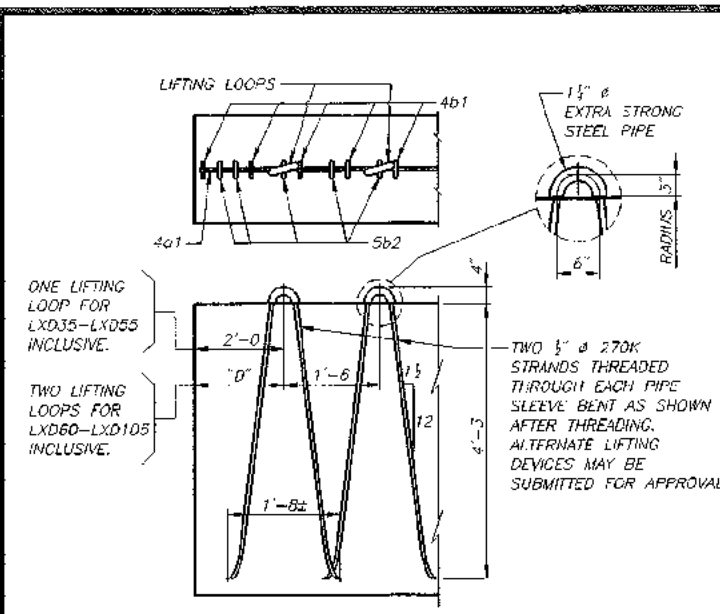
**CONCRETE PLACEMENT QUANT.-SUPERSTR.**

LOCATION	QUANTITY	
SLAB AND DIAPHRAGM, SECTION (1) & (3) @ 52.74 C.Y.	105.5	
SLAB, SECTION (2)	60.7	
SLAB AND DIAPHRAGM, SECTION (4) & (5) @ 35.00 C.Y.	70.0	
TOTAL (CU.YDS.)		236.2

**ESTIMATED QUANTITIES - SUPERSTRUCTURE**

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE	CU.YDS.	236.2
REINFORCING STEEL - UNCOATED	LBS.	1,297
REINFORCING STEEL - EPOXY COATED	LBS.	66,904
STRUCTURAL STEEL	LBS.	3,369
PRETENSIONED PRESTRESSED CONCRETE BEAMS	NO.	10
	NO.	5

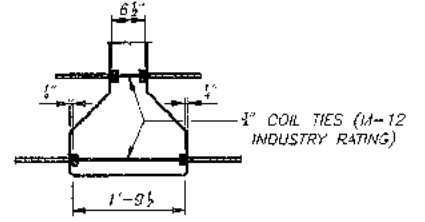
**203'-0 x 30'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**  
 INTEGRAL ABUTMENTS SINGLE ROW ENCASED PIERS  
 50'-9 END SPANS 101'-6 INTERIOR SPAN  
**SUPERSTRUCTURE DETAILS**  
 STATION 21+90.00 25' SKEW, LT. AHEAD IOWA  
 CRAWFORD COUNTY, IOWA  
 SHEET 14 OF 27



**LIFTING LOOP DETAIL**

"D" = 1'-3" FOR LX060 - LX095  
 "D" = 3'-9" FOR LX0100  
 "D" = 6'-3" FOR LX0105

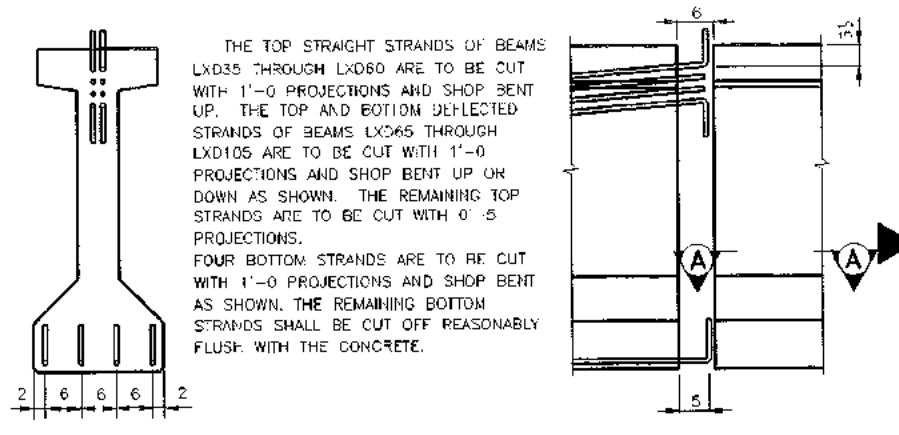
NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON SPECIFIC BRIDGE DESIGN.



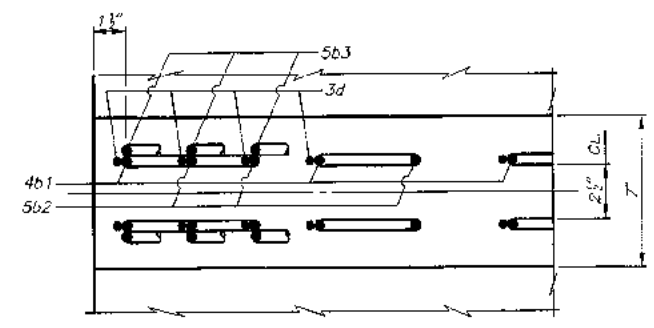
**COIL TIE DETAIL**

**SPECIFICATIONS:**

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.  
 DESIGN: A.A.S.H.T.O., SERIES OF 1989, WITH MINOR MODIFICATIONS.



**STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS**



**SECTION A-A SHOWING PLACEMENT OF STIRRUPS NEAR END OF BEAM**

BEAM	SPAN LENGTH @ BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE	STRAIGHT	DEFLECTED	TOTAL INITIAL PRESTRESS KIPS	HOLD DOWN FORCE-KIPS	CAMBER (in.)		DEFLECTION (in.) ΔD		PERMISSIBLE SPACING		WEIGHT (TONS)	CONCRETE (C.Y.)	REINFORCING STEEL (lbs.)		
								AT RELEASE	AFTER LOSSES	IMMEDIATE (1) (ELASTIC) ΔI	TIME (2) (PLASTIC) ΔT	HS20 LOADING						
										CONC. DIAPH.	STEEL DIAPH.	CONC. DIAPH.	STEEL DIAPH.				CONC.	STEEL
LXD35	35'-0"	36'-0"	5/8"	14	—	420	—	0.09	0.15	0.03	0.03	0.01	0.01	7'-6"	7'-6"	12.0	5.9	410
LXD40	40'-0"	41'-0"	5/8"	14	—	420	—	0.10	0.18	0.05	0.05	0.01	0.01	7'-6"	7'-6"	13.6	6.7	450
LXD45	45'-0"	46'-0"	5/8"	14	—	420	—	0.12	0.21	0.09	0.08	0.02	0.02	7'-6"	7'-6"	15.3	7.6	470
LXD50	50'-0"	51'-0"	5/8"	16	—	480	—	0.17	0.30	0.13	0.12	0.03	0.03	7'-6"	7'-6"	17.0	8.4	509
LXD55	55'-0"	56'-0"	5/8"	17	—	510	—	0.14	0.24	0.19	0.17	0.05	0.04	7'-6"	7'-6"	18.6	9.2	579
LXD60	60'-0"	61'-0"	5/8"	18	—	570	—	0.20	0.34	0.26	0.24	0.06	0.06	7'-6"	7'-6"	20.3	10.0	618
LXD65	65'-0"	66'-0"	5/8"	10	6	480	26.4	0.37	0.64	0.35	0.32	0.09	0.08	7'-6"	7'-6"	22.0	10.8	813
LXD70	70'-0"	71'-0"	5/8"	14	6	600	24.6	0.58	1.02	0.47	0.43	0.12	0.11	7'-6"	7'-6"	23.6	11.7	902
LXD75	75'-0"	76'-0"	5/8"	14	8	660	29.1	0.63	1.11	0.61	0.57	0.15	0.14	7'-6"	7'-6"	25.5	12.5	963
LXD80	80'-0"	81'-0"	5/8"	18	6	720	22.6	0.90	1.59	0.78	0.73	0.20	0.18	7'-6"	7'-6"	27.0	13.3	1014
LXD85	85'-0"	86'-0"	5/8"	18	8	780	20.4	0.99	1.73	0.99	0.93	0.25	0.23	7'-6"	7'-6"	28.6	14.1	1062
LXD90	90'-0"	91'-0"	5/8"	20	8	867	27.7	1.24	2.17	1.23	1.16	0.31	0.29	7'-6"	7'-6"	30.4	15.0	1227
LXD95	95'-0"	96'-0"	5/8"	24	8	991	26.2	1.62	2.85	1.51	1.42	0.38	0.36	7'-6"	7'-6"	31.9	15.8	1411
*LXD100	100'-0"	101'-0"	5/8"	28	8	1115	24.9	1.89	3.33	1.68	1.58	0.42	0.40	7'-6"	7'-6"	33.6	16.6	1439
*LXD105	105'-0"	106'-0"	5/8"	30	10	1239	26.9	2.15	3.78	2.00	1.92	0.50	0.48	7'-4 1/4"	7'-6"	35.3	17.4	1519

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB WEIGHT OF 760 #/FT. (8" SLAB AND 7'-6" BEAM SPACING) AND ONE CONCRETE DIAPHRAGM (3191 #) OR ONE STEEL DIAPHRAGM (285 #) AT @ OF SPAN. FOR DIFFERENT SLAB AND DIAPHRAGM WEIGHTS, DEFLECTIONS WILL BE DIRECTLY PROPORTIONAL.

② DEFLECTIONS DUE TO THE COMBINED EFFECT OF CREEP DUE TO WEIGHT OF SLAB AND SHRINKAGE OF SLAB.

③ TOTAL BEAM DEFLECTIONS AT @ OF SPAN, ΔD, DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:

- (A) ΔD = ΔI + ΔT FOR SIMPLE SPAN.
- (B) ΔD = ΔI + 3/4 ΔT FOR END SPANS OF CONTINUOUS BRIDGE.
- (C) ΔD = ΔI + 1/2 ΔT FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

④ TOTAL INITIAL PRESTRESS FOR LX035 THRU LX085 INCLUSIVE IS BASED ON 72.664% Fsu, AND FOR LX090 THRU LX0105 ON 75% Fsu. Fsu = 270 ksi AND As = 0.153 sq. in.

+ MINIMUM CONCRETE fc (AT 28 DAYS) SHALL BE 6000 psi. MINIMUM fc AT RELEASE SHALL BE 5000 psi.

Δ7'-4 1/4" BEAM SPACING FOR LX0105 WITH CONCRETE DIAPHRAGM.

**NOTES:**

- IF THE STEEL DIAPHRAGM OPTION IS ALLOWED AND USED, HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.
- IF SOLE PLATE IS REQUIRED FOR BEARING, SOLE PLATE IS TO BE SET IN FORMS WHEN BEAM IS CAST AND FORMED OUT BELOW TO EXCLUDE CONCRETE AS DETAILED ON THE BEARING SHEET.
- IF STUB ABUTMENTS ARE USED, ALL STRANDS AT THE ENDS OF BEAMS AT STUB ABUTMENTS SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.

**NOTES:**

THESE BEAMS ARE DESIGNED FOR AASHTO LIVE LOADS AS INDICATED IN ABOVE TABLE WITH AN ALLOWANCE OF 20 LB. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

HOLD DOWN POINTS FOR DEFLECTED STRANDS MAY BE MOVED TOWARD ENDS OF BEAM A DISTANCE OF 0.05 L MAXIMUM AT PRODUCER'S OPTION.

ALL PRESTRESSING STRANDS SHALL CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS.

TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY 1/4 INCH.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

BEAMS TO BE USED IN BRIDGES MADE CONTINUOUS BY THE POURED IN PLACE FLOOR, ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE FLOOR IS PLACED UNLESS A SHORTER CURING TIME IS APPROVED BY THE BRIDGE ENGINEER.

THE PORTIONS OF THE PRESTRESS BEAMS THAT ARE TO BE EMBEDDED IN THE ABUTMENT AND PIER DIAPHRAGMS SHALL BE ROUGHENED FOR A DISTANCE OF 10" FROM THE BEAM END BY SANDBLASTING OR OTHER APPROVED METHODS TO PROVIDE SUITABLE BOND BETWEEN THE BEAM AND THE DIAPHRAGM IN ACCORDANCE WITH ARTICLE 2-603.14 OF THE SPECIFICATIONS.

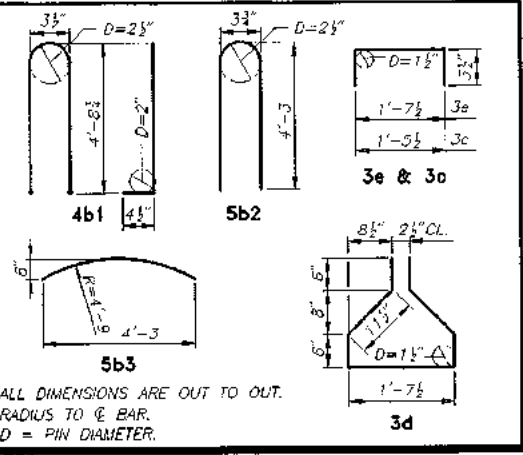
UNLESS OTHERWISE NOTED ALL BEAMS ARE TO BE INCREASED IN LENGTH BY .0005L TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.

FOR TRANSPORTING, THE OVERHANG SHALL BE IN ACCORDANCE WITH ART. 2407.13 OF STD. SPEC., EXCEPT THE OVERHANG MAY BE INCREASED TO A MAXIMUM OF 8 FEET FOR THE LX035 BEAM, 9 FEET FOR THE LX090 BEAM, 11 FEET FOR THE LX095 BEAM.

THE CONTRACTOR SHALL ASSURE THE LATERAL STABILITY OF THE LX0100 AND LX0105 BEAMS DURING HANDLING, TRANSPORTING AND ERECTION BY PROVIDING TEMPORARY BRACING AS NEEDED.

1/2" DIAMETER STRANDS STRESSED TO NOT MORE THAN 3,000 LBS. EACH MAY BE USED IN LIEU OF THE @ STRANDS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

BEAM	SPAN	LXD35	LXD40	LXD45	LXD50	LXD55	LXD60	LXD65	LXD70	LXD75	LXD80	LXD85	LXD90	LXD95	LXD100	LXD105	
		35'-0"	40'-0"	45'-0"	50'-0"	55'-0"	60'-0"	65'-0"	70'-0"	75'-0"	80'-0"	85'-0"	90'-0"	95'-0"	100'-0"	105'-0"	
BAR	SHAPE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
4a1	—	2	4'-0"	2	4'-0"	2	4'-0"	—	—	—	—	—	—	—	—	—	—
a2	—	—	—	—	—	—	—	5/4	22'-10"	5/4	24'-4"	5/4	25'-10"	5/4	27'-4"	5/4	29'-4"
a3	—	—	—	—	—	—	—	5/2	25'-0"	5/2	27'-0"	5/2	29'-0"	5/2	31'-0"	5/2	32'-0"
4b1	—	33	10'-4"	37	10'-4"	39	10'-4"	43	10'-4"	47	10'-4"	51	10'-4"	53	10'-4"	57	10'-4"
5b2	—	6	8'-8"	6	8'-8"	6	8'-8"	6	8'-8"	8	8'-8"	8	8'-8"	8	8'-8"	10	8'-8"
5b3	—	4	4'-4"	4	4'-4"	4	4'-4"	8	4'-4"	8	4'-4"	8	4'-4"	12	4'-4"	12	4'-4"
3c	—	33	2'-1"	37	2'-1"	39	2'-1"	43	2'-1"	47	2'-1"	51	2'-1"	53	2'-1"	57	2'-1"
3d	—	33	5'-7"	37	5'-7"	39	5'-7"	43	5'-7"	47	5'-7"	51	5'-7"	53	5'-7"	57	5'-7"
3e	—	12	2'-3"	12	2'-3"	12	2'-3"	12	2'-3"	12	2'-3"	12	2'-3"	14	2'-3"	14	2'-3"



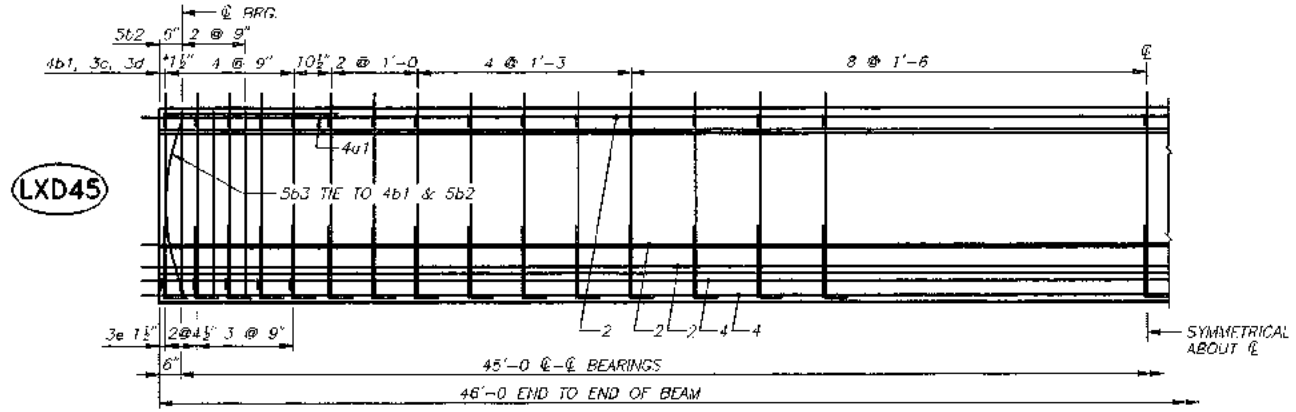
**203'-0" x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**

**INTEGRAL ABUTMENTS 50'-9" END SPANS**      **SINGLE ROW ENCASED PIERS 101'-6" INTERIOR SPAN**

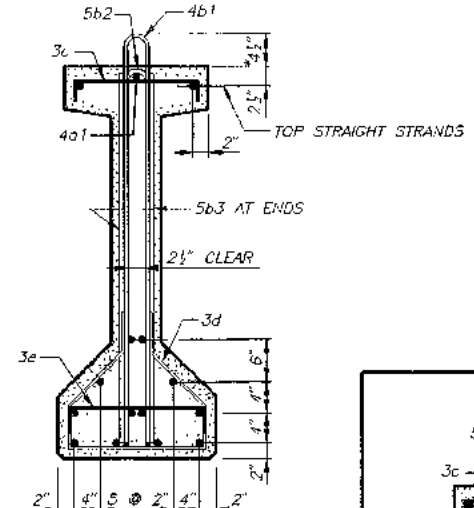
**BEAM DETAILS**

**STATION 21+90.00**      **25° SKEW, LT. AHEAD**  
**CRAWFORD COUNTY, IOWA**

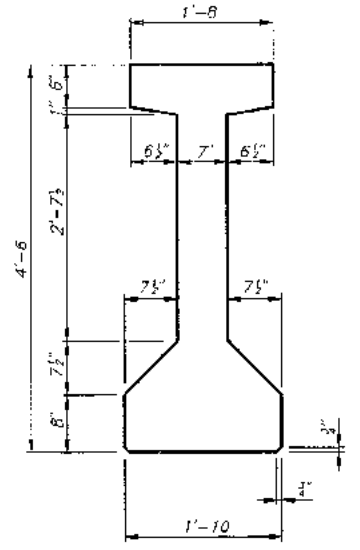
SHEET 15 OF 27



LXD45

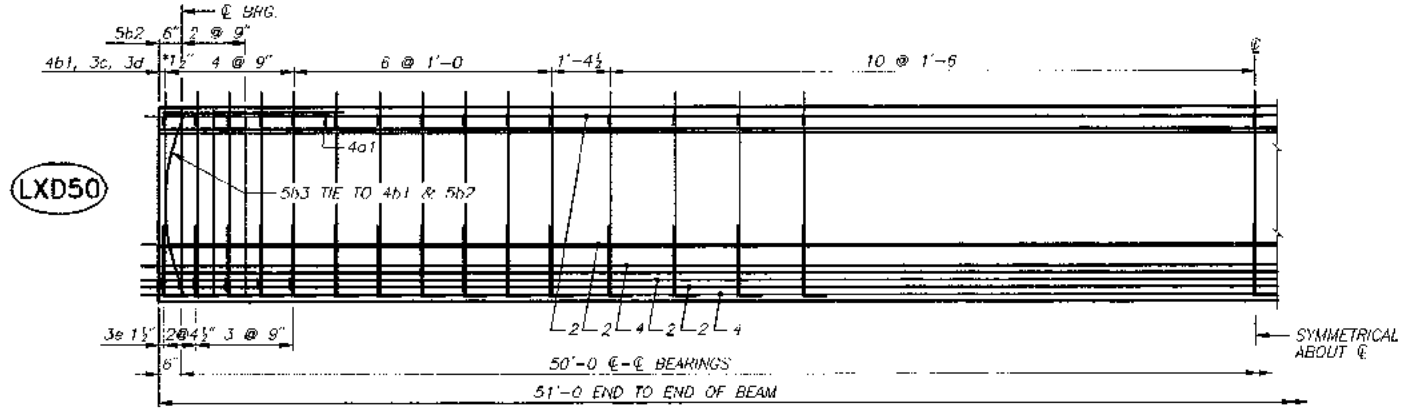


BEAM LX45

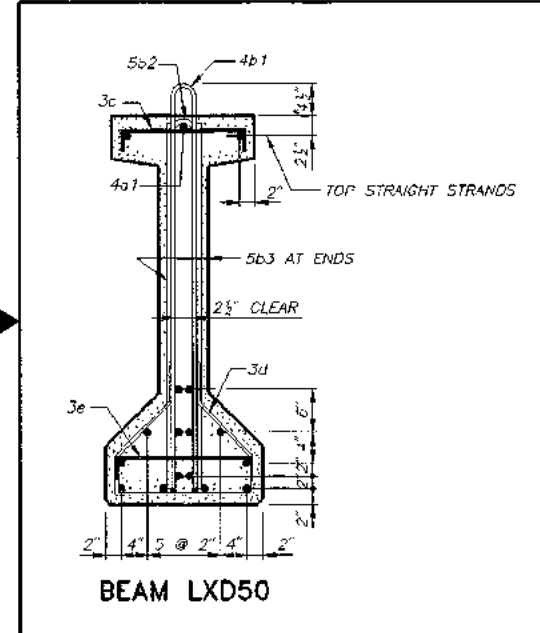


TYPICAL "LXD" BEAM CROSS SECTION

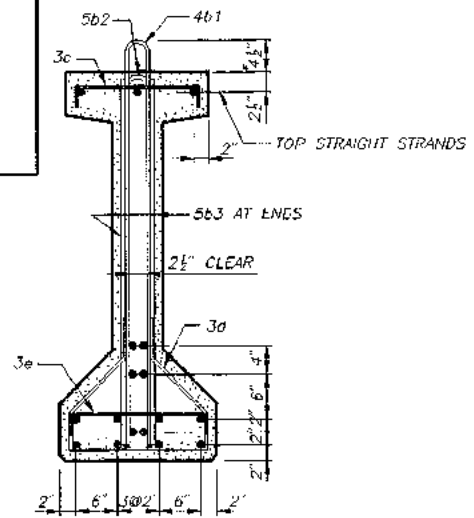
ARCA = 638.75 in<sup>2</sup>  
 Y<sub>b</sub> = 24.37 in  
 I = 214,974 in<sup>4</sup>



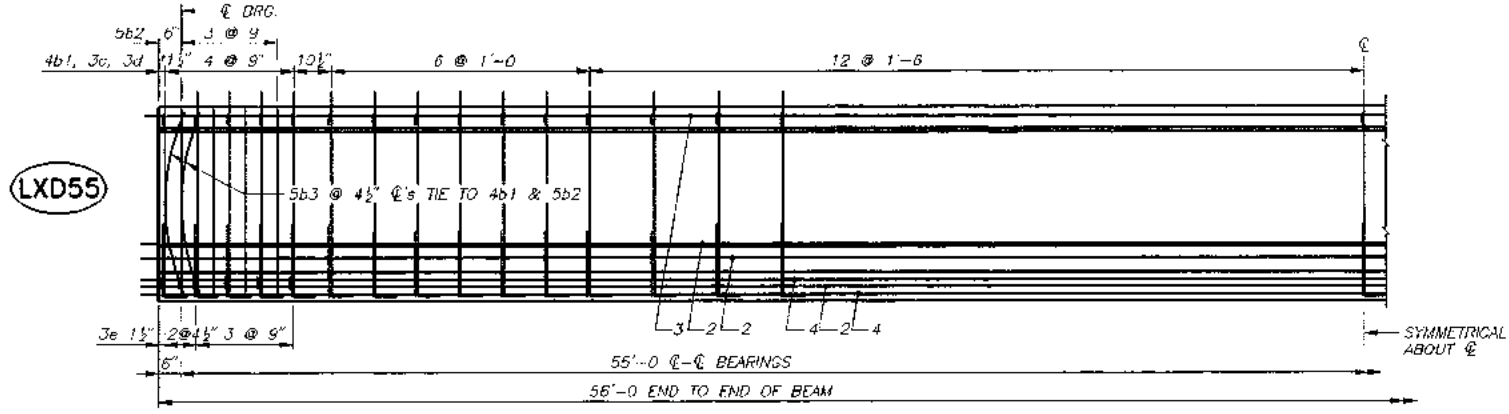
LXD50



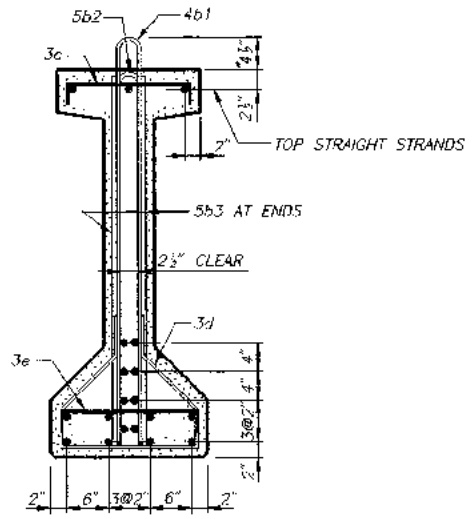
BEAM LX50



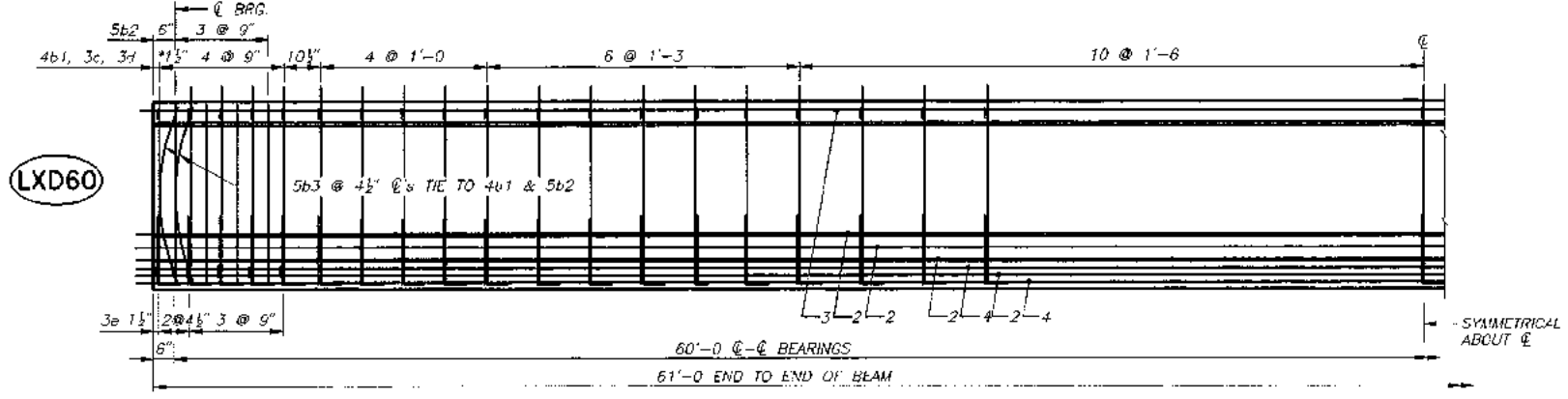
BEAM LX55



LXD55



BEAM LX60



LXD60

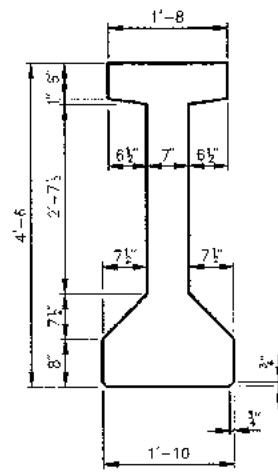
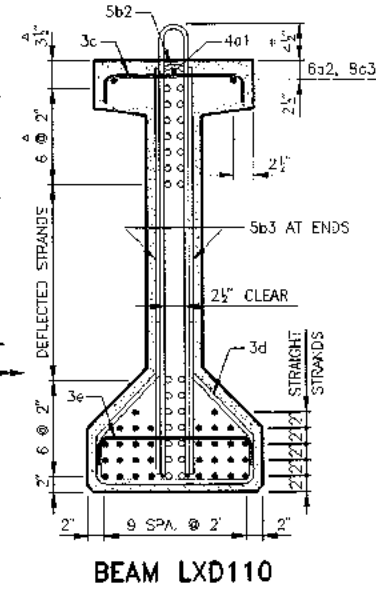
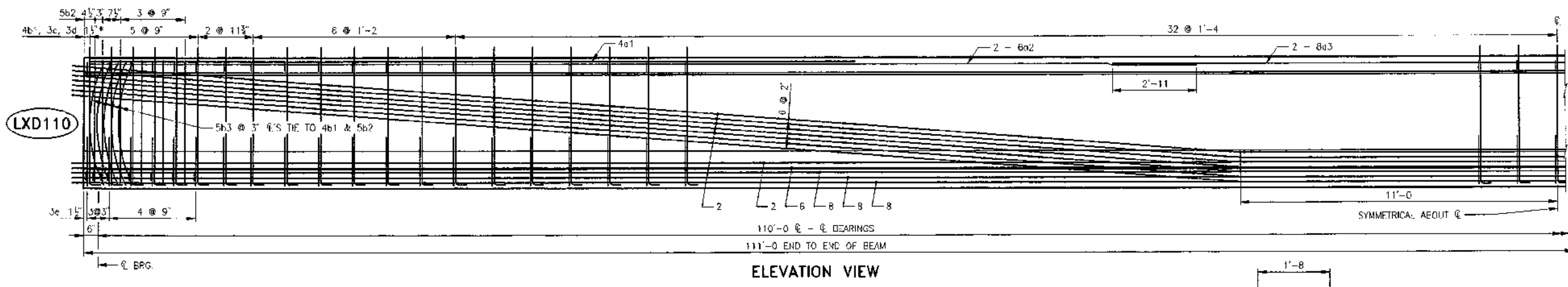
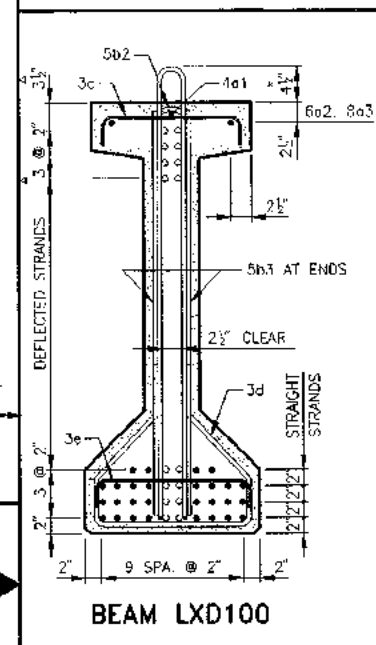
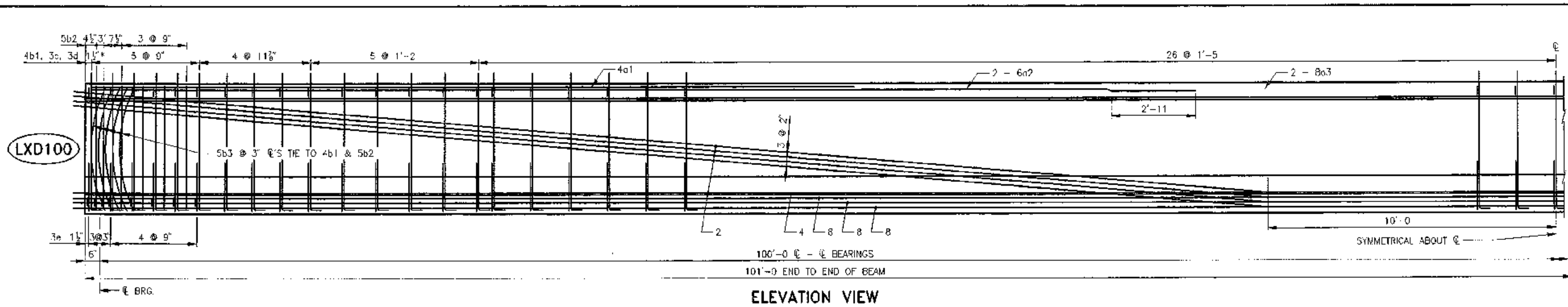
203'-0 x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

INTEGRAL ABUTMENTS 50'-9 END SPANS SINGLE ROW ENCASED PIERS 101'-6 INTERIOR SPAN

BEAM DETAILS

STATION 21+90.00 25' SKEW, LT. AHEAD CRAWFORD COUNTY, IOWA





AREA = 638.75 in<sup>2</sup>  
 Y<sub>c</sub> = 24.37 in.  
 I = 214,974 in<sup>4</sup>

**203'-0" x 30' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**

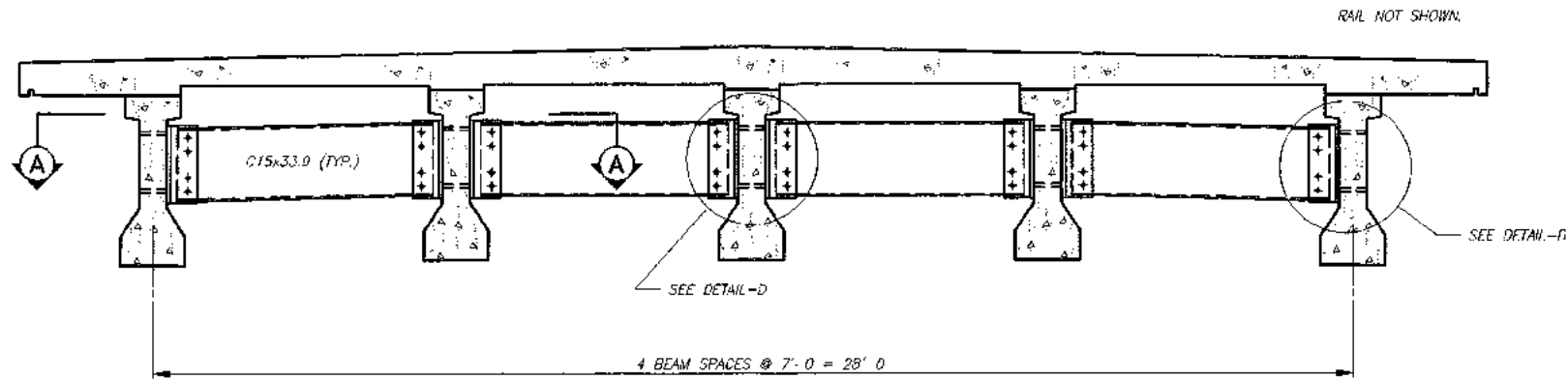
INTEGRAL ABUTMENTS  
 50'-9" END SPANS

SINGLE ROW ENCASED PIERS  
 101'-6" INTERIOR SPAN

**BEAM DETAILS**

STATION 21+90.00  
 CRAWFORD COUNTY, IOWA

25' SKEW, LT. AHEAD  
 SHEET 17 OF 27



SECTION SHOWING INTERMEDIATE DIAPHRAGMS

**NOTES:**

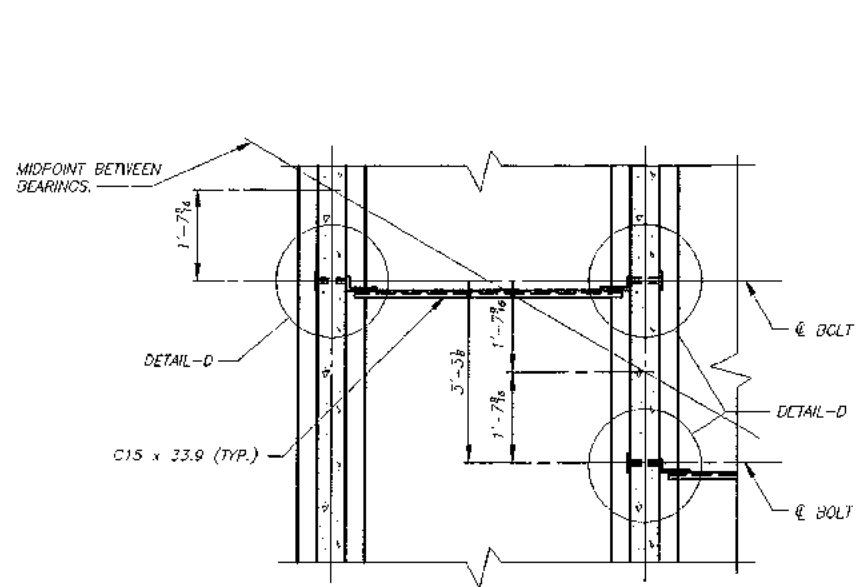
ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED.

SHOP DRAWINGS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.

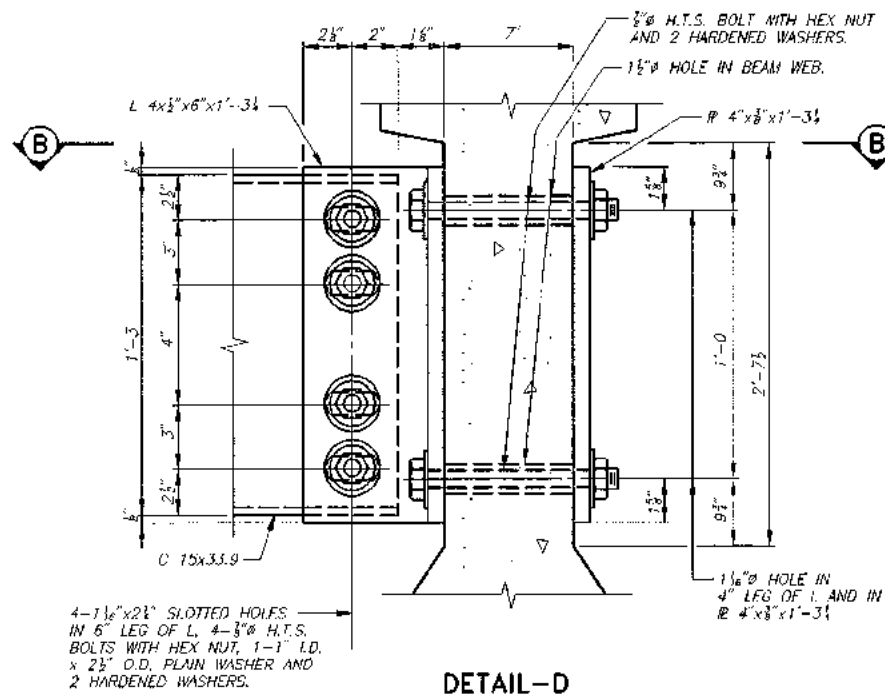
THE 1 1/2" HOLES SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.

THE 2 1/2" O.D. PLAIN WASHERS SHALL MEET THE DIMENSIONAL REQUIREMENTS OF A.S.I. B18.22.1, TYPE A PLAIN WASHERS.

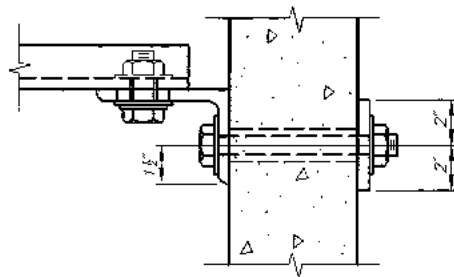
BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING BRIDGE FLOOR CONCRETE.



SECTION A-A  
FOR BRIDGE SKEW > 0'



DETAIL-D



SECTION B-B

LENGTH OF 3/8" H.T.S. BOLTS THRU WEB	
WEB THICKNESS (INCHES)	BOLT LENGTH (INCHES)
7	10

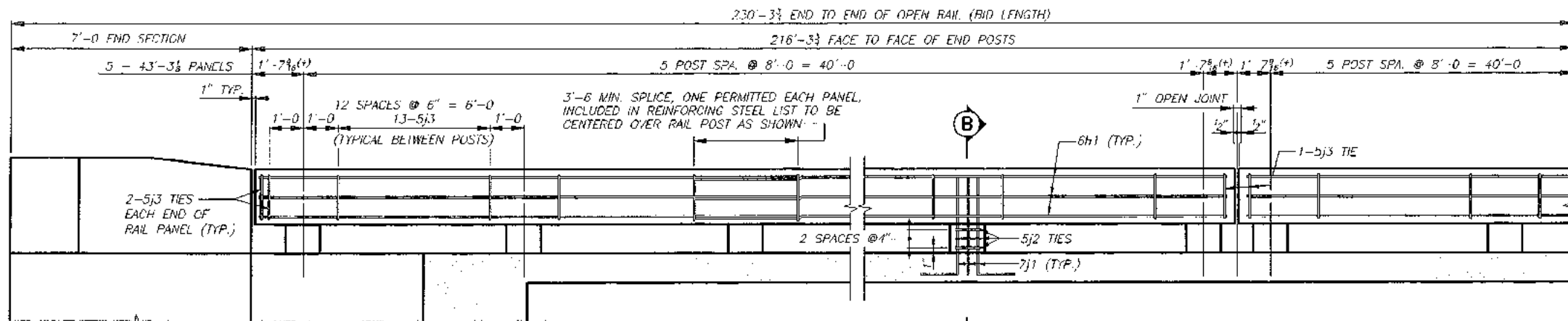
NOTE: THREAD LENGTH: MIN. 3"  
MAX. 4"

**203'-0" x 30' PRETENSIONED PRESTRESSED  
CONCRETE BEAM BRIDGE**

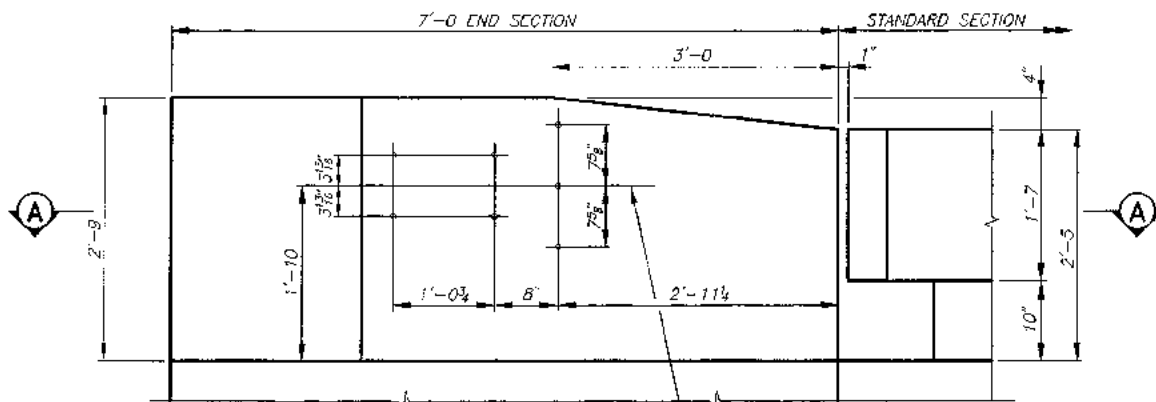
INTEGRAL ABUTMENTS                      SINGLE ROW ENCASED PIERS  
50'-9" END SPANS                              101'-6" INTERIOR SPAN

**STEEL DIAPHRAGM DETAILS**

STATION 21+90.00                              25' SKEW, LT. AHEAD  
CRAWFORD COUNTY,                              IOWA  
SHEET 18 OF 27

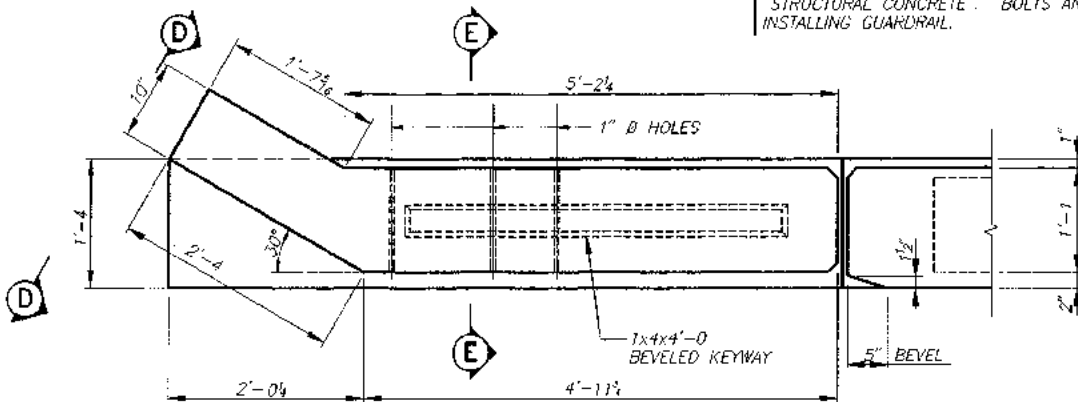


ELEVATION OF OPEN RAIL

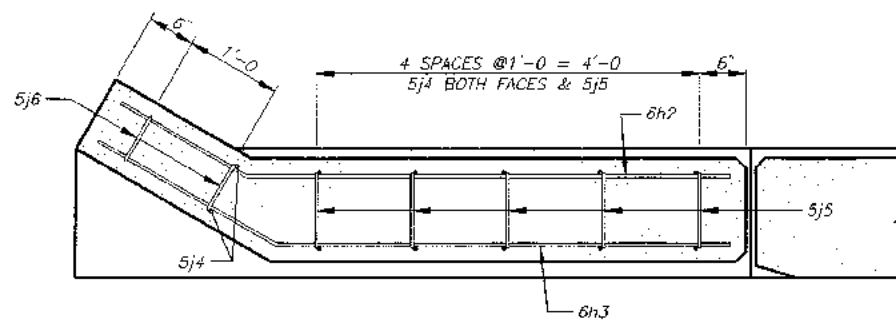


PART ELEVATION VIEW

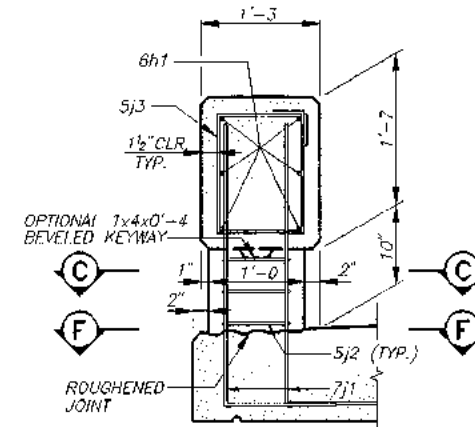
HOLES FOR 7/8" Ø BOLTS ARE TO BE FORMED WITH 1" Ø (NOMINAL I.D.) PLASTIC CONDUIT SLEEVES. THE SLEEVES SHALL BE SECURELY FIXED IN EXACT LOCATION AS SHOWN BEFORE CONCRETE IS POURED. COST OF SLEEVES TO BE INCLUDED IN PRICE BID FOR "STRUCTURAL CONCRETE". BOLTS AND WASHERS TO BE FURNISHED BY CONTRACTOR INSTALLING GUARDRAIL.



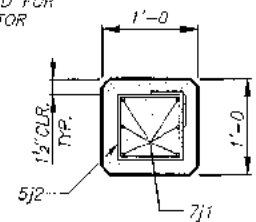
PART PLAN VIEW



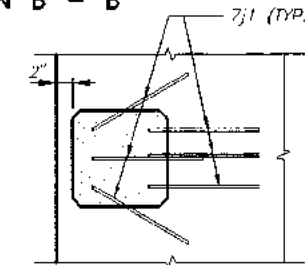
PART PLAN A - A



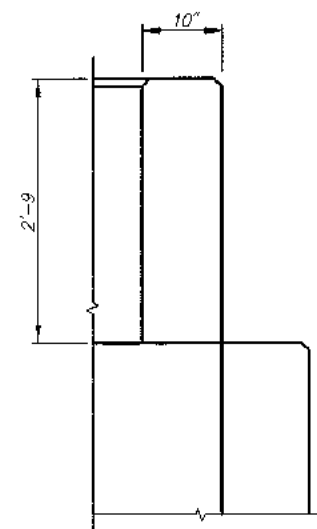
PART SECTION B - B



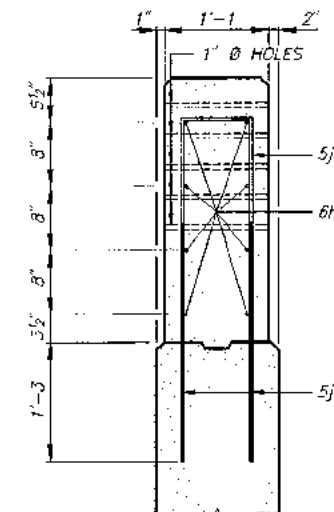
PART PLAN C - C



PART PLAN F - F

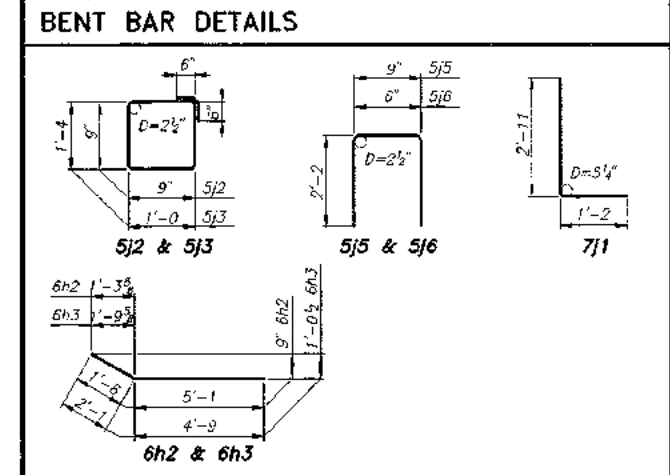


END VIEW D - D



PART SECTION E - E

REINFORCING BAR LIST - TWO RAILS							
SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
STANDARD SECTION	7j1	RAIL POST, VERTICAL	U	360	4'-1"	3,004	
	5j2	RAIL POST, TIES	U	180	4'-0"	751	
	5j3	RAIL, TIES	U	674	5'-8"	3,986	
	6h1	RAIL, LONGITUDINAL	U	60	46'-5"	4,183	
* LENGTH INCLUDES LAP SPLICE							
4 END SECTIONS	5j4	ANCHOR TO SLAB	U	48	2'-6"	125	
	5j5	VERTICAL	U	20	5'-1"	106	
	5j6	VERTICAL	U	8	4'-10"	40	
	6h2	LONGITUDINAL	U	16	6'-7"	158	
	6h3	LONGITUDINAL	U	16	6'-10"	164	
INCLUDE WITH SUPERSTRUCTURE REINFORCING						TOTAL (LBS.)	12,517



ALL BAR DIMENSIONS ARE OUT TO GUT. "D" = PIN DIAMETER

CONCRETE PLACEMENT SUMMARY		
SECTION		TOTAL
STANDARD SECTION	10 @ 3.35 C.Y.	33.5
END SECTIONS	4 @ 0.70 C.Y.	2.8
TOTAL (C.Y.)		36.3

CONCRETE OPEN RAIL QUANTITIES		
ITEM	UNIT	QUANTITY
CONCRETE OPEN RAIL	L.F.	460.6

**OPEN RAIL NOTES**

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.

ALL OPEN RAIL CONCRETE IS TO BE CLASS D.

THE CONCRETE OPEN RAIL IS TO BE BID ON A LINEAL FOOT BASIS MEASURED FROM END TO END OF RAIL. THE NUMBER OF LINEAL FEET OF OPEN RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT. PRICE BID FOR CONCRETE OPEN RAIL SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL, EXCLUDING REINFORCING STEEL AND ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

ALL OPEN RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING STEEL.

ALL REINFORCING STEEL IS TO BE GRADE 60 AND EPOXY COATED.

ALL EXPOSED CORNERS OF 90 DEGREES OR SHARPER ARE TO BE FILLETED WITH A 3/4" DRESSED AND BEVELED STRIP.

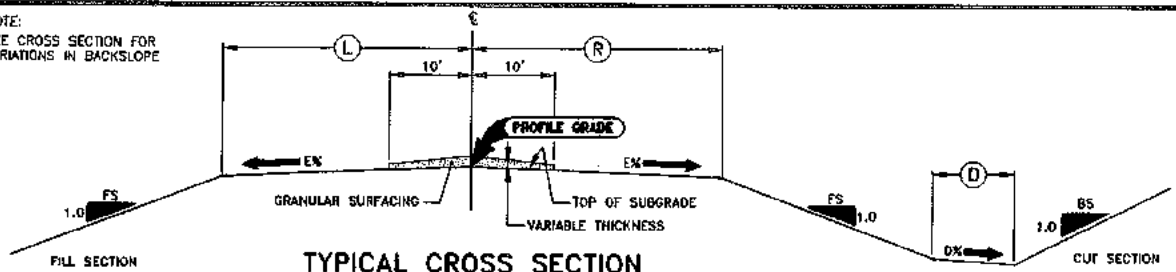
**203'-0" x 30'-0" PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE**

INTEGRAL ABUTMENTS SINGLE ROW ENCASED PIERS  
50'-9" END SPANS 101'-6" INTERIOR SPAN

**OPEN RAIL DETAILS**

STATION 21+90.00 25' SKEW, LT. AHEAD  
CRAWFORD COUNTY, IOWA  
SHEET 19 OF 27

NOTE:  
SEE CROSS SECTION FOR  
VARIATIONS IN BACKSLOPE



TYPICAL CROSS SECTION

ROAD IDENT.	LOCATION		L	R	EK	FS	DK	BS	D
	STATION TO	STATION							
MAIN LINE	10+25.00	11+00.00			TRANSITION FROM EXISTING				
MAIN LINE	11+00.00	20+75.00	14	14	3.57	3	2	3	10
MAIN LINE	23+00.00	25+00.00	14	14	3.57	3	2	3	10
MAIN LINE	25+00.00	26+00.00			TRANSITION TO EXISTING				

NOTE:  
NORMAL SECTIONS SHOWN MAY BE MODIFIED  
APPROPRIATELY IN AREAS OF SUPERELEVATION  
CURVES OR OTHER LOCATIONS SPECIFICALLY  
DESIGNATED BY THE ENGINEER.

**GRADING NOTES**

PLAN AND PROFILE SHEETS INCLUDED IN THE PROJECT ARE FOR PURPOSE OF ALIGNMENT, LOCATION AND SPECIAL DIRECTION FOR THE WORK TO BE PERFORMED UNDER THIS CONTRACT. IRRELEVANT DATA ON THESE SHEETS IS NOT TO BE CONSIDERED A PART OF THIS CONTRACT.

ACCESS SHALL BE MAINTAINED TO INDIVIDUAL PROPERTIES DURING CONSTRUCTION. RELOCATED ACCESS SHALL BE COMPLETED TO INDIVIDUAL PROPERTIES PRIOR TO REMOVAL OF EXISTING ACCESS. IF THE PERMANENT ACCESS CANNOT BE COMPLETED PRIOR TO REMOVAL OF THE EXISTING ACCESS, AN ALTERNATE ACCESS SHALL BE PROVIDED AND MAINTAINED. THIS WORK WILL BE CONSIDERED INCIDENTAL TO THE PROJECT.

IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE WASTE AREAS OR DISPOSAL SITES FOR EXCESS MATERIAL (EXCAVATED MATERIAL OR BROKEN CONCRETE) WHICH IS NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES. NO MATERIAL SHALL BE PLACED WITHIN THE RIGHT-OF-WAY, UNLESS SPECIFICALLY STATED IN THE PLANS OR APPROVED BY THE ENGINEER.

WHERE PUBLIC UTILITY FIXTURES ARE SHOWN AS EXISTING ON THE PLANS OR ENCOUNTERED WITHIN THE CONSTRUCTION AREA, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE OWNERS OF THOSE UTILITIES PRIOR TO THE BEGINNING OF CONSTRUCTION. ACCESS SHALL BE AFFORDED TO THESE FACILITIES FOR NECESSARY MODIFICATION OF SERVICES. UNDERGROUND FACILITIES, STRUCTURES, AND THEIR LOCATIONS MUST BE CONSIDERED APPROXIMATE ONLY. IT'S POSSIBLE THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS NOT PRESENTLY KNOWN OR SHOWN. IT IS THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THEIR EXISTENCE AND EXACT LOCATION AND AVOID DAMAGE THERETO. NO CLAIMS FOR ADDITIONAL COMPENSATION WILL BE ALLOWED TO THE CONTRACTOR FOR INTERFERENCE, OR DELAY CAUSED BY SUCH WORK.

UTILITY RELOCATIONS SHALL BE COORDINATED WITH WORK ON THIS PROJECT. BOTH REMOVAL AND RELOCATION WILL REQUIRE ASSISTANCE. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO OTHER WORK ON THIS PROJECT.

DUE CAUTION IS TO BE USED IN WORKING OVER AND AROUND ALL TILE LINES. BREAKS IN THE TILE LINE DUE TO THE CONTRACTOR'S CARELESSNESS ARE TO BE REPLACED AT HIS EXPENSE WITHOUT COST TO THE OWNER. ANY TILE LINES BROKEN OR DISTURBED BY OUR CUT LINES WILL BE REPLACED AS DIRECTED BY THE ENGINEER IN CHARGE OF CONSTRUCTION AND AT THE OWNER'S EXPENSE.

STANDARD ROAD PLANS ARE AVAILABLE FROM THE IOWA DEPARTMENT OF TRANSPORTATION, PROJECT DEVELOPMENT DIVISION, AMES, IOWA.

ALL PROPOSED DRIVES AND FIELD ENTRANCES SHALL BE CONSTRUCTED WITH A 20' TOP AND 3:1 SLOPES, UNLESS NOTED OTHERWISE.

THE EXISTING ROADWAY SHALL BE REMOVED TO A DEPTH OF FOUR INCHES PRIOR TO PLACEMENT OF THE FILL.

SELECTIVE CLEARING WILL BE REQUIRED ON THIS PROJECT. ALL DESIRABLE TREES OUTSIDE THE CONSTRUCTION AREA WILL BE SAVED. TREES AND SHRUBS WITHIN THE CONSTRUCTION LIMITS THAT DO NOT HINDER CONSTRUCTION SHALL BE SAVED UNLESS DIRECTED BY THE ENGINEER TO BE REMOVED.

TYPICAL SECTIONS AND GRADING NOTES

CRAWFORD COUNTY

IOWA

SHEET 20 OF 27

TABULATION OF STEEL BEAM GUARDRAIL AT BRIDGE END POST, CONCRETE BARRIER AND RAILROAD SIGNALS																									108-8A	
① Lane(s) to which the obstacle is adjacent.																										
② Applies to Standard Road Plan RE-63 only.																										
Refer to Standard Road Plan RE-63, RE-65A and RE-65B																										
③ Each STS includes 2-12.5' Thrie Beam Sections and 1-6.25' "W" to Thrie Beam Transition Section																									09-21-99	
NO.	DIRECTION OF TRAFFIC	LOCATION			STANDARD ROAD PLAN	L2	CASE		LAYOUT LENGTHS								BID ITEMS								REMARKS	
		STATION	SIDE	①			②	Approach Side (A)				Trailing Side (T)				Rail Elements		Posts		Anchorage and Terminal Systems						
								STS (18.75')	VT	VF	Terminal (37.5')	Total	STS (18.75')	VT	VF	Terminal (37.5')	Total	W-Beam - Terminal Section(s)	Thrie Beam (31.25' or 62.5') STS	with 8" x 8" Spacer Blocks		RE-33B	RE-69A	RE-89B		RE-76
																				8"x8"x8'	10"x10"x6'					
Feet	F or S	F or S	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	Lin.Ft.	No.	No.	No.	No.						
1	E	21+90.00	RT.	RE-65A	-	S	-	18.75	-	-	-	37.5	56.25	-	-	-	-	-	31.25	3	3	-	-	-	1	WEST END, RT.
2	W	21+90.00	LT.	RE-65A	-	S	-	-	-	-	-	-	-	18.75	-	-	-	-	31.25	3	3	-	-	-	1	WEST END, LT.
3	E	21+90.00	RT.	RE-65A	-	S	-	-	-	-	-	-	-	18.75	-	-	-	-	31.25	3	3	-	-	-	1	EAST END, RT.
4	W	21+90.00	LT.	RE-65A	-	S	-	18.75	-	-	-	37.5	56.25	-	-	-	-	-	31.25	3	3	-	-	-	1	EAST END, LT.

TABULATION OF GRADING FOR GUARDRAIL INSTALLATIONS												107-23
① Lane(s) to which the installation is adjacent.												01-12-99
② Refer to Standard Road Plans RL-12, RL-14, and Typical 4303 or 4306												
NO.	DIRECTION OF TRAFFIC	LOCATION POINT		DIMENSIONS				PIPE				REMARKS
		Station	TYPE	A/T	BY	Z	CLASS 10 EXCAV. Δ	EMBANK. IN PLACE	Size	Type	Length	
1	E	20+14.14	1	56.25	8.9	53.2	167	-	-	-	-	W END RT.
2	W	20+28.13	1	56.25	8.9	53.2	167	-	-	-	-	W END LT.
3	E	23+51.87	1	56.25	8.9	53.2	166	-	-	-	-	E END RT.
4	W	23+65.86	1	56.25	8.9	53.2	161	-	-	-	-	E END LT.

Δ INCLUDES 35% FOR SHRINKAGE

TABULATION OF DELINEATORS AND OBJECT MARKERS							108-17
Refer to Standard Road Plan RE-48A-B* and RE-29C							04-28-98
STATION	TYPE*	DELINEATOR		OBJECT MARKER		REMARKS	
		SINGLE WHITE D-1W	TYPE 2 OM2-3YV	TYPE 3			
				OM-3L	OM-3R		
Number	Number	Number	Number				
21+90	3	-	-	1	1	WEST END	
21+90	3	-	-	1	1	EAST END	

POINTS OF ACCESS (RL-7)											102-1
Refer to Detail Cross Sections											03-26-96
STATION	SIDE	W	TYPE	H	PIPE CULVERT (RF-30A or RF-30B)				APRONS NO.	SURFACE MATERIAL TONS	
					SIZE (LIN.FT.)						
					15"	18"	24"	LT. RT.			
24+40	LT.	20	C	-	-	-	-	-	-	-	
24+70	RT.	20	C	-	-	-	-	-	-	-	

TABULATION OF SAFETY CLOSURES				108-13A
Refer to Section 251B of the Standard Specifications				10-28-97
STATION	CLOSURE TYPE		REMARKS	
	Road Qty.	Hazard Qty.		
9+50	1		W. END	
26+50	1		E. END	

TABULATION OF SILT FENCES FOR DITCH CHECKS						100-18
Refer to Standard Road Plan RE-63, RE-65A and RE-65B						11-10-83
LOCATION STATION	SIDE	LIN. FT.	LOCATION STATION	SIDE	LIN. FT.	
17+00	LT.	20				
21+00	LT.	20				

TABULATION OF SILT FENCES				100-17
Refer to Standard Road Plan RE-63, RE-65A and RE-65B				11-10-83
STATION TO STATION	SIDE	LIN. FT.	REMARKS	
23+00	24+15	LT.	115	
23+00	24+45	RT.	145	

TABULATION OF SILT BASINS			100-14
Refer to Standard Road Plan RE-63, RE-65A and RE-65B			09-20-74
LOCATION STATION	SIDE	REMARKS	
15+00	RT.		
19+00	RT.		

SUMMARY OF EARTHWORK									
STATION	AREAS IN SQ. FT.		VOLUMES IN CU. YDS.						
	CUT	FILL	CUT	ADD'L CUT	FILL	ADD'L FILL	FILL+35%		
10+25	0	0	36	Δ 780	20		27		
11+00	27	14	105		55		74		
12+00	29	16	135		67		90		
13+00	44	20	204		98		132		
14+00	66	32	306		176		238		
15+00	99	63	430		330		446		
16+00	133	116	624		589		795		
17+00	204	202	929		971		1311		
18+00	298	322	1317		1290		1742		
19+00	413	375	1543		1498	248	2357		
20+00	421	434	927		1023		1381		
20+65	350	416		* 1733		354	478		
RIVER				* 1594		838	1131		
23+15	132	843	233		2376	212	3497		
24+00	25	555	26		761	722	2002		
24+40	12	465	5		603	509	1366		
24+70	0	432	1		446		602		
25+00	2	362	4		675		911		
26+00	0	0		Δ 7935					
TOTALS			5,828	11,752	10,880	2,883	18,580		

\* INCLUDE CLASS 10 "CHANNEL" EXC.  
Δ BORROW

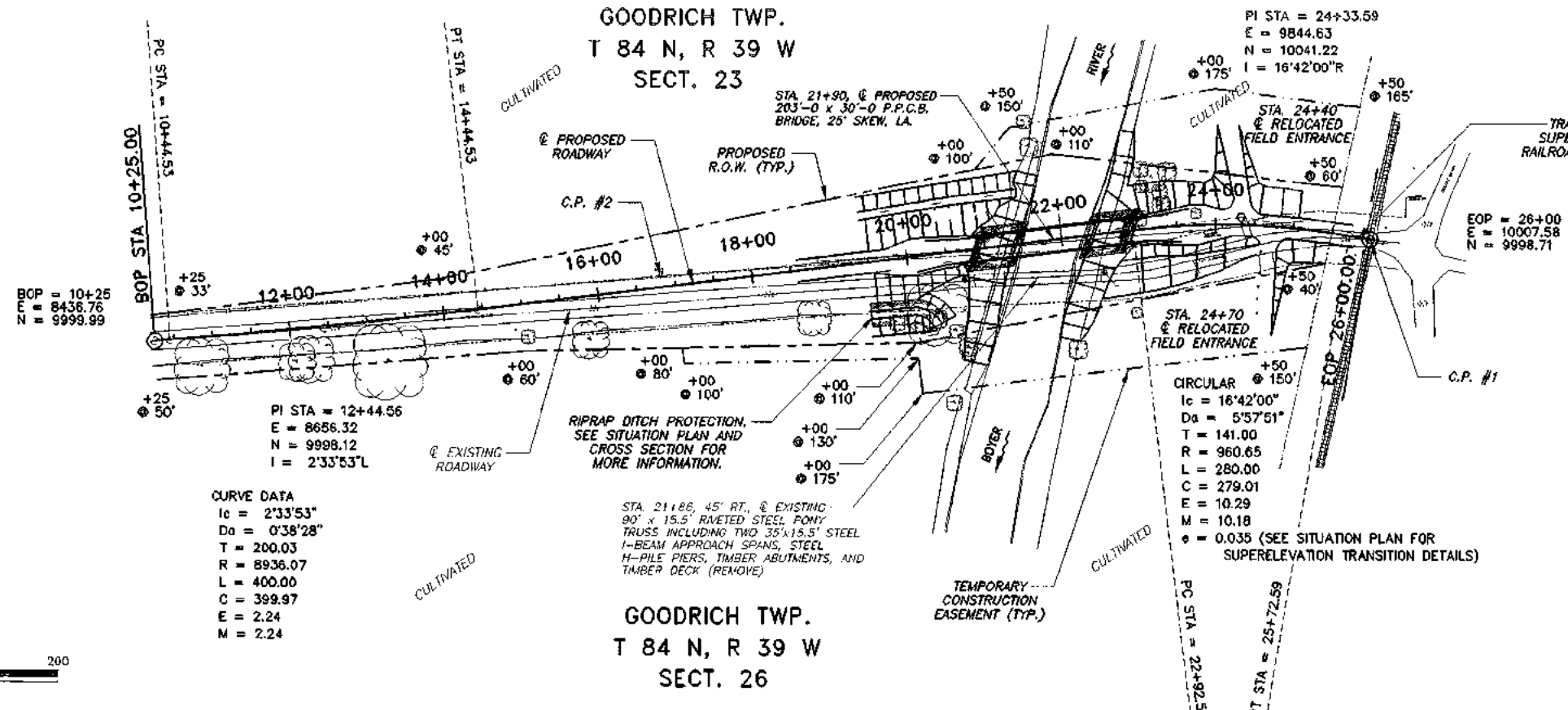
TABULATIONS

CRAWFORD COUNTY,

IOWA

SHEET 21 OF 27

GOODRICH TWP.  
T 84 N, R 39 W  
SECT. 23



**SURVEY CONTROL POINTS**

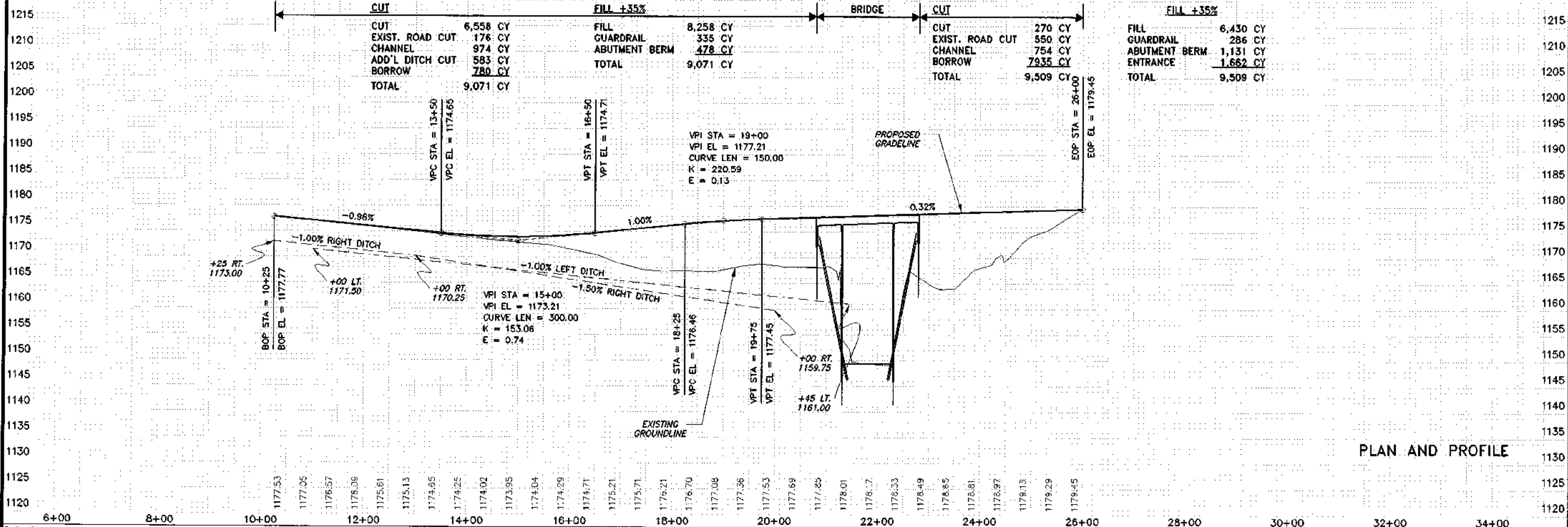
- C.P. #1 : SET P.K. NAIL @ RAILROAD TRACKS @ 'K' AVE.  
E = 10007.36  
N = 9997.90
- C.P. #2 : SET REBAR IN EAST/WEST FENCE LINE N. SIDE OF  
'K' AVE. ± 45' WEST OF W. EDGE OF BRIDGE  
E = 9094.32  
N = 10027.05

**CURVE DATA**  
Ic = 2'33"53"  
Da = 0'38"28"  
T = 200.03  
R = 8936.07  
L = 400.00  
C = 399.97  
E = 2.24  
M = 2.24

GOODRICH TWP.  
T 84 N, R 39 W  
SECT. 26

SEE SITUATION PLAN FOR  
ADDITIONAL INFORMATION

BENCH MARK #1: NAIL IN S. FACE OF POWER POLE ± 20' NORTH OF  
WEST END OF EXISTING BRIDGE, EL. = 1169.47



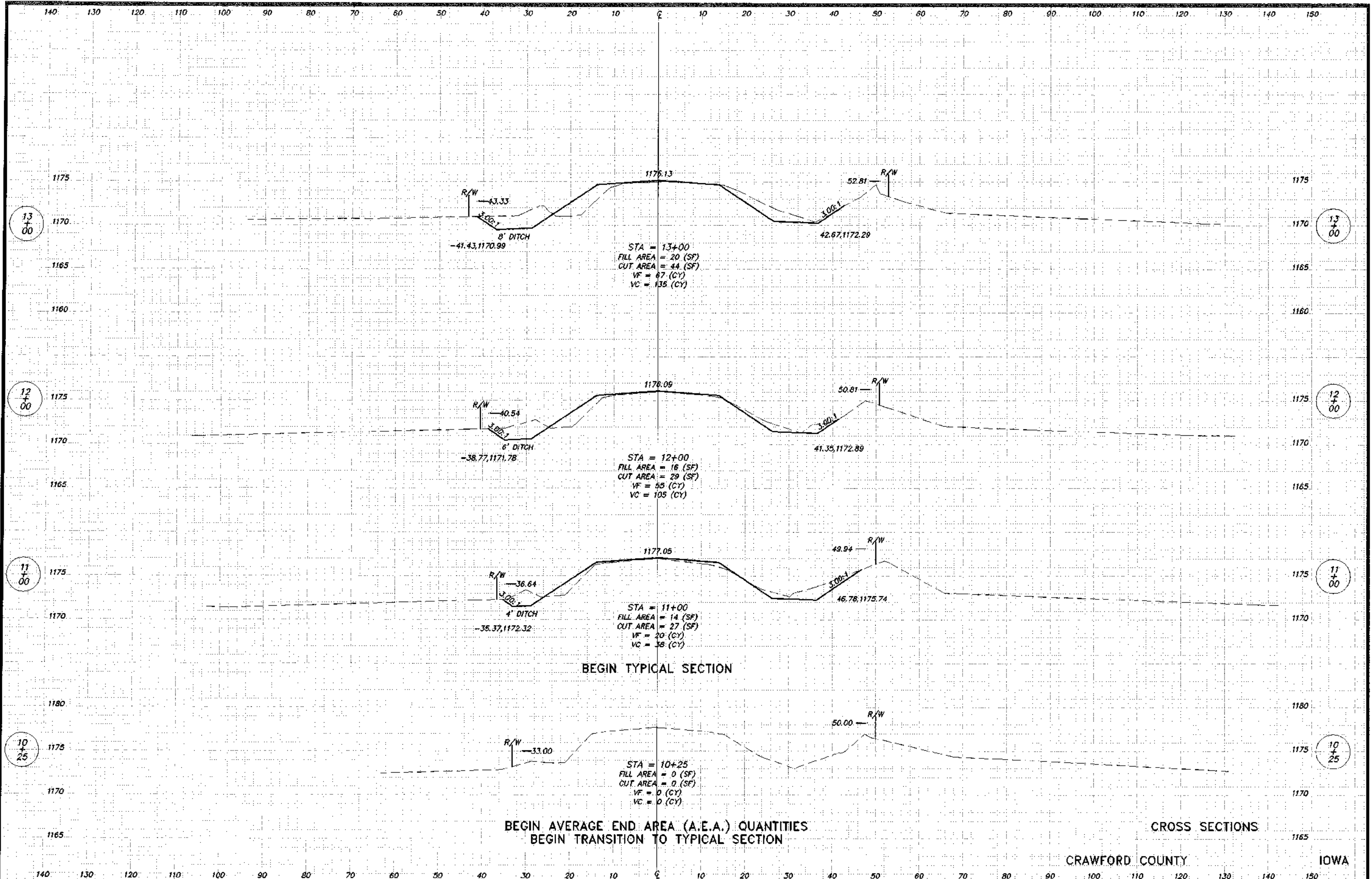
**PLAN AND PROFILE**

PLAN

DATE	
BY	
CHECKED	
NO. OF SHEETS	
NO. OF BOOK	
NO.	

PROFILE

DATE	
BY	
CHECKED	
NO. OF SHEETS	
NO. OF BOOK	
NO.	



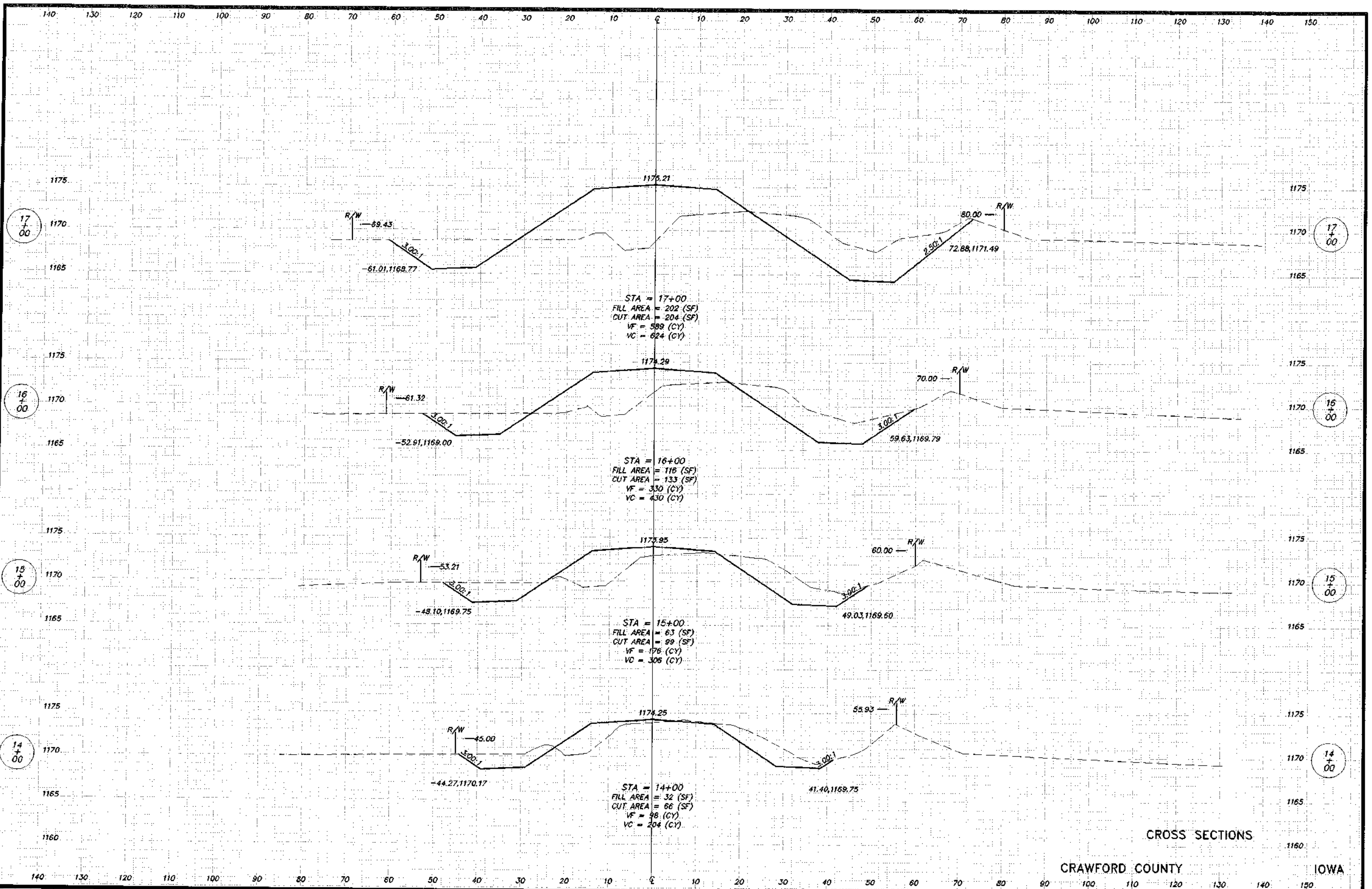
BEGIN TYPICAL SECTION

BEGIN AVERAGE END AREA (A.E.A.) QUANTITIES  
BEGIN TRANSITION TO TYPICAL SECTION

CROSS SECTIONS

CRAWFORD COUNTY

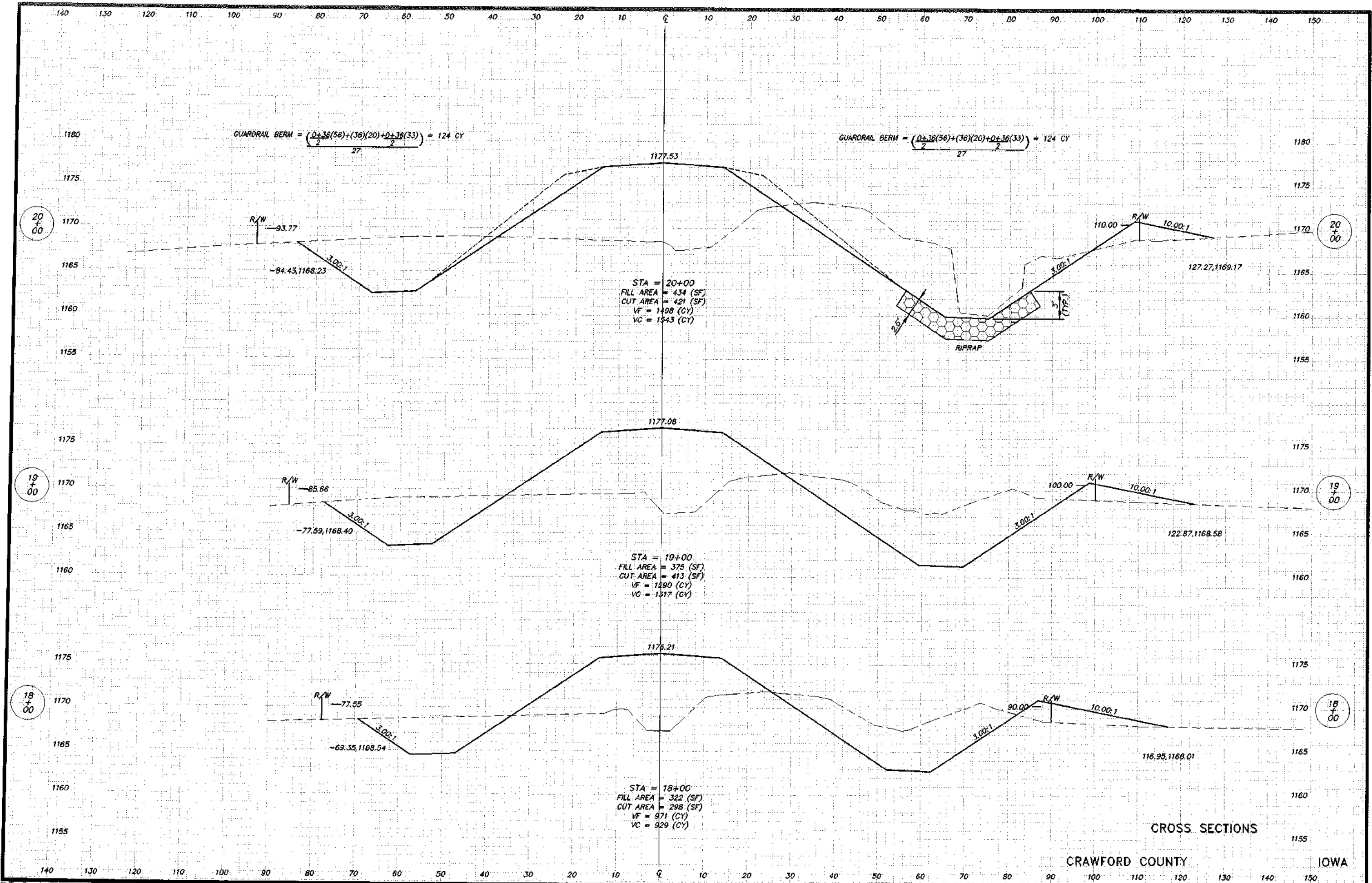
IOWA



CROSS SECTIONS

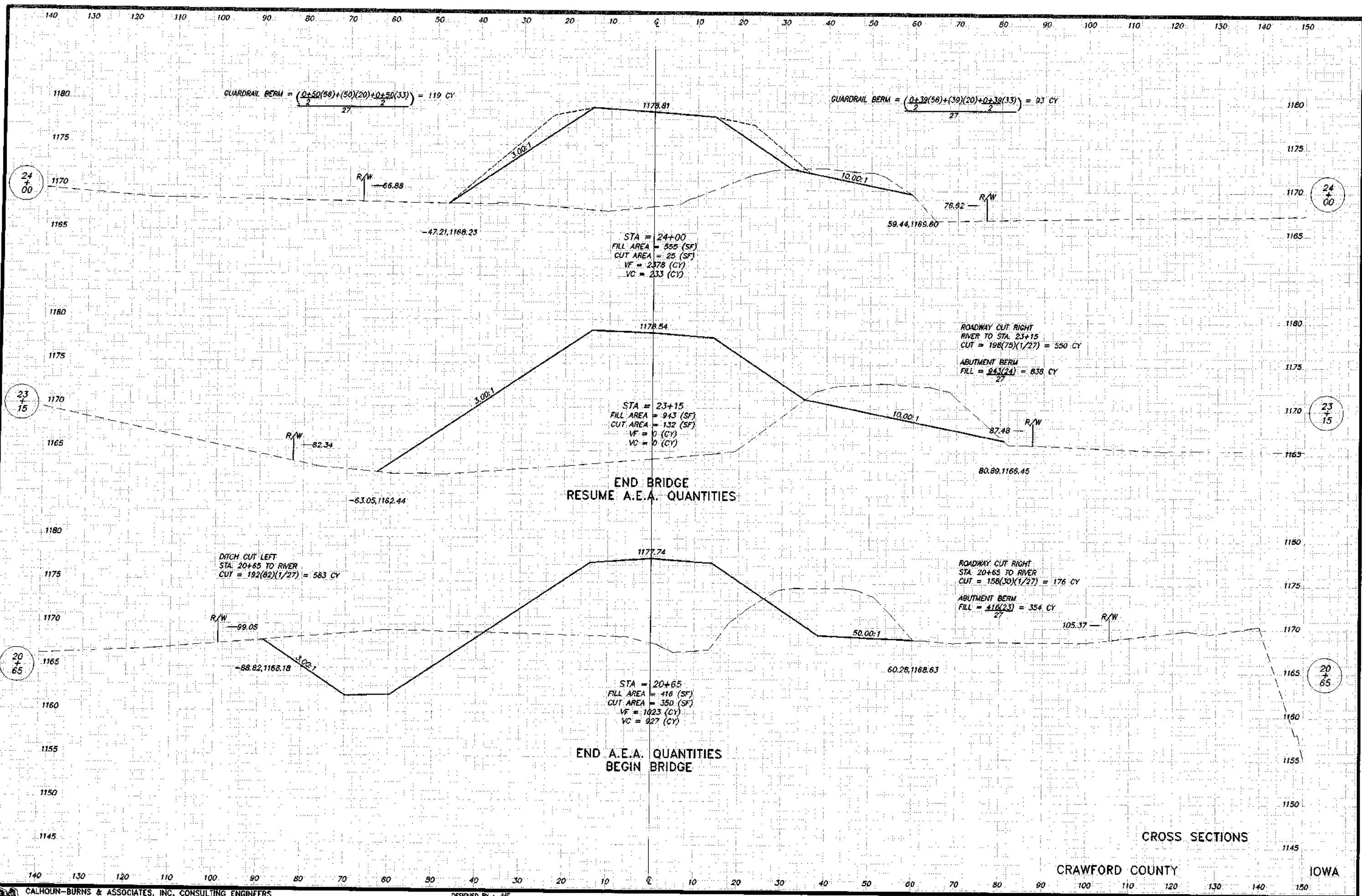
CRAWFORD COUNTY IOWA





CROSS SECTIONS

CRAWFORD COUNTY IOWA



GUARDRAIL BERM =  $\frac{(0+50(56)+(50)(20)+0+50(33))}{27} = 119 \text{ CY}$

GUARDRAIL BERM =  $\frac{(0+39(56)+(39)(20)+0+39(33))}{27} = 83 \text{ CY}$

STA = 24+00  
 FILL AREA = 555 (SF)  
 CUT AREA = 25 (SF)  
 VF = 2378 (CY)  
 VC = 233 (CY)

ROADWAY CUT RIGHT  
 RIVER TO STA. 23+15  
 CUT =  $198(75)(1/27) = 550 \text{ CY}$   
 ABUTMENT BERM  
 FILL =  $243(24) = 838 \text{ CY}$

STA = 23+15  
 FILL AREA = 943 (SF)  
 CUT AREA = 132 (SF)  
 VF = 0 (CY)  
 VC = 0 (CY)

ROADWAY CUT RIGHT  
 STA. 20+65 TO RIVER  
 CUT =  $158(30)(1/27) = 176 \text{ CY}$   
 ABUTMENT BERM  
 FILL =  $416(23) = 354 \text{ CY}$

STA = 20+65  
 FILL AREA = 416 (SF)  
 CUT AREA = 350 (SF)  
 VF = 1023 (CY)  
 VC = 927 (CY)

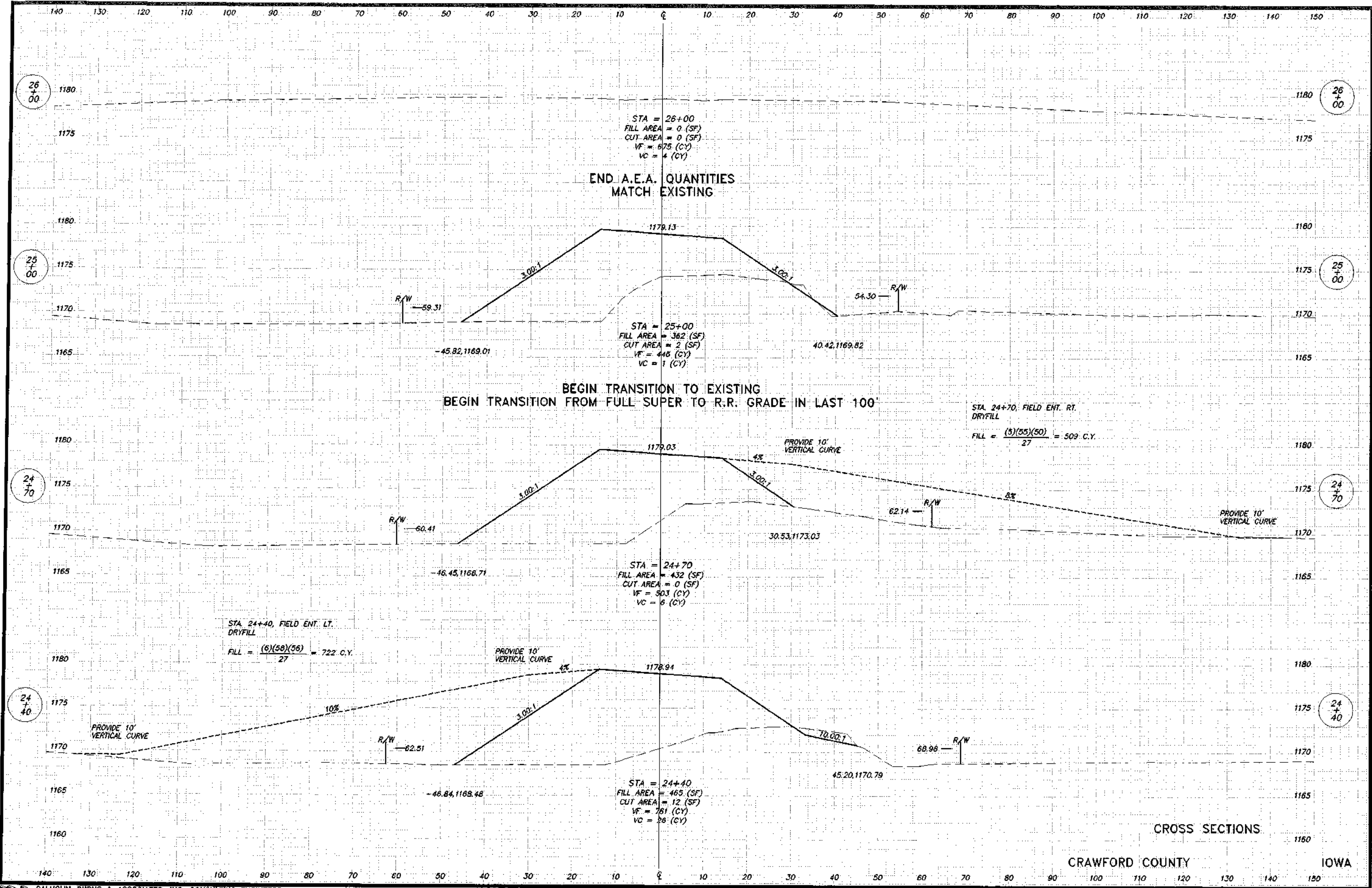
END BRIDGE  
 RESUME A.E.A. QUANTITIES

END A.E.A. QUANTITIES  
 BEGIN BRIDGE

CROSS SECTIONS

CRAWFORD COUNTY

IOWA



STA = 26+00  
 FILL AREA = 0 (SF)  
 CUT AREA = 0 (SF)  
 VF = 675 (CY)  
 VC = 4 (CY)  
**END A.E.A. QUANTITIES MATCH EXISTING**

STA = 25+00  
 FILL AREA = 362 (SF)  
 CUT AREA = 2 (SF)  
 VF = 446 (CY)  
 VC = 1 (CY)

**BEGIN TRANSITION TO EXISTING**  
**BEGIN TRANSITION FROM FULL SUPER TO R.R. GRADE IN LAST 100'**

STA. 24+70, FIELD ENT. RT.  
 DRYFILL  
 FILL =  $\frac{(5)(55)(50)}{27} = 509$  C.Y.

STA = 24+70  
 FILL AREA = 432 (SF)  
 CUT AREA = 0 (SF)  
 VF = 503 (CY)  
 VC = 6 (CY)

STA. 24+40, FIELD ENT. LT.  
 DRYFILL  
 FILL =  $\frac{(6)(58)(56)}{27} = 722$  C.Y.

STA = 24+40  
 FILL AREA = 465 (SF)  
 CUT AREA = 12 (SF)  
 VF = 761 (CY)  
 VC = 28 (CY)

CROSS SECTIONS

CRAWFORD COUNTY

IOWA