

BRIDGE & APPROACHES - PPCB LETTING DATE
IBRC-C008(39)--8E-08 4-18-2006



Iowa Department of Transportation
Highway Division

PLANS OF PROPOSED IMPROVEMENTS ON THE

SECONDARY ROAD SYSTEM
BOONE COUNTY
BRIDGE & APPROACHES - PPCB
ON 120th ST OVER SQUAW CREEK

Office
Copy
2/20/06

TOTAL SHEETS	38
PROJECT NUMBER	IBRC-C008(39)--8E-08
R.O.W. PROJECT NUMBER	
PROJECT IDENTIFICATION NUMBER	

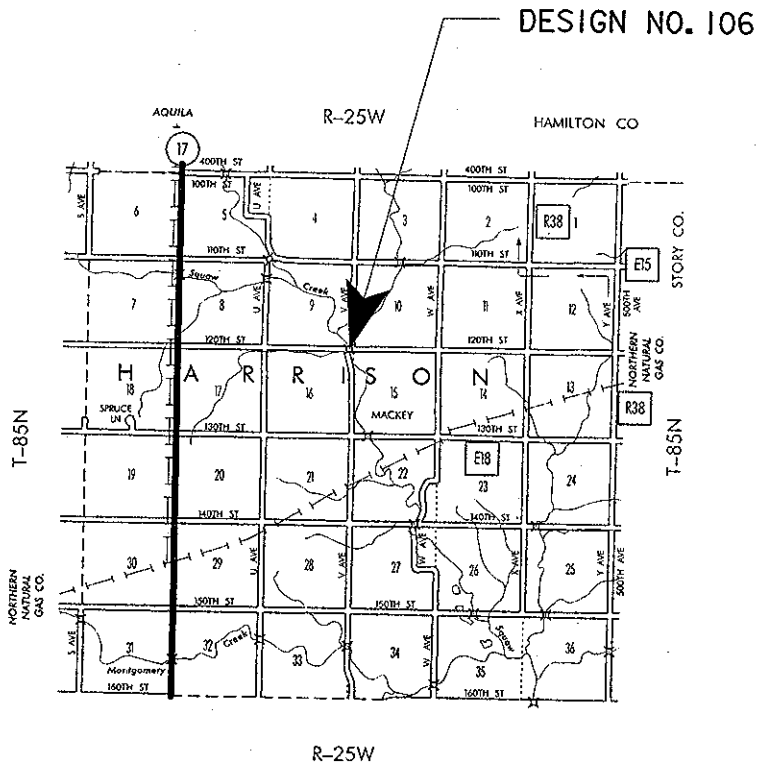
INDEX OF SHEETS	
NO.	DESCRIPTION
1	TITLE SHEET
2	BRIDGE ESTIMATE SHEET
2-23	BRIDGE DESIGN NO. 106
C.01	ROADWAY ESTIMATE SHEET
B.01-X.03	ROADWAY SHEETS
Q.01	SOIL BORING LOGS

CONVENTIONAL SIGNS	
	DIVIDED HIGHWAY
	PAVED ROAD
	BITUMINOUS ROAD
	GRAVEL ROAD
	EARTH ROAD
	INTERSTATE HIGHWAY
	UNITED STATES HIGHWAY
	STATE HIGHWAY
	COUNTY HIGHWAY
	RAILROAD
	PIPELINE
	AIRPORT
	HYDROLOGY
	BRIDGE
	STATE BOUNDARY
	COUNTY BOUNDARY
	CORPORATE LIMIT LINE
	TOWNSHIP LINE
	SECTION LINE

THE IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2001, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

VALUE ENGINEERING SAVES. REFER TO THE GENERAL NOTES IN THESE PLANS.

REVISIONS



LOCATION MAP

ALL WORKING DRAWINGS INCLUDED SHOP DRAWINGS AND FALSEWORK DRAWINGS WILL BE REVIEWED BY:
IOWA DOT - OFFICE OF BRIDGES AND STRUCTURES
800 LINCOLN WAY
AMES, IA 50010

STANDARD ROAD PLANS
STANDARD ROAD PLANS ARE LISTED ON SHEET C.01

STRUCTURAL DESIGN

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.

Stuart S. Nielsen 2/20/06
Signature Date
Stuart S. Nielsen
Printed or Typed Name
My license renewal date is December 31, 2006
Pages or sheets covered by this seal: SHEETS 15 THRU 21 OF 38

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	JAMES S. NELSON	STRUCTURAL DESIGN
1	STUART S. NIELSEN	STRUCTURAL DESIGN
C.01	DAVID T. ANTHONY	ROADWAY DESIGN

STRUCTURAL DESIGN

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.

James S. Nelson 2/20/06
Signature Date
James S. Nelson
Printed or Typed Name
My license renewal date is December 31, 2007
Pages or sheets covered by this seal: SHEETS 1 THRU 14 AND 22 THRU 23 OF 38

BOONE COUNTY - DESIGN NO. 106

PROJECT DIRECTORY NAME: W:\Projects\BridgesStructures\LocalSystem_PrimaryRoutes\BooneCounty\120 th St Over Squaw Creek

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM	UNIT	DIVISION 1	DIVISION 2	AS BUILT QUANTITY
1	2301-9091100	LONGITUDINAL GROOVING IN CONCRETE	SY	560.000		
2	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS		1.000	
3	2402-2720000	EXCAVATION, CLASS 20	CY	116.600		
4	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	56.800		
5	2404-7775000	REINFORCING STEEL	LB	15,019.000		
6	2407-0580146	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, SLXA46	EA	8.000		
7	2407-0580155	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, SLXA55	EA	4.000		
8	2408-7800000	STRUCTURAL STEEL	LB	2942.600		
9	2414-6424120	CONCRETE OPEN RAILING	LF	337.600		
10	2501-5425057	PILES, DRIVE STEEL BEARING, HP 10x57	LF	575.000		
11	2501-5550057	PILES, FURNISH STEEL BEARING, HP 10x57	LF	575.000		
12	2501-5610116	PILES, FURNISH STEEL PIPE, 16" (PIOA TYPEI)	LF	810.000		
13	2501-5620116	PILES, DRIVE STEEL PIPE, 16" (PIOA TYPEI)	LF	810.000		
14	2501-6335010	PREBORED HOLES	LF	50.000		
15	2506-4984000	FLOWABLE MORTAR	CY	5.000		
16	2508-0991000	PAINTING OF STRUCTURAL STEEL	LS	1.000		
17	2533-4980005	MOBILIZATION	LS	1.000		
18	2599-9999005	PRECAST POST-TENSIONED SLAB PANELS (INTERIOR)	EA	32.000		
19	2599-9999005	PRECAST POST-TENSIONED SLAB PANELS (END)	EA	4.000		
20	2599-9999005	PRECAST ABUTMENT FOOTING	EA	2.000		
21	2599-9999005	PRECAST PIER CAP	EA	2.000		

ITEM NO. ESTIMATE REFERENCE INFORMATION:

- 1 LONGITUDINAL GROOVING IS INTENDED TO CLEAN UP THE SURFACE OF THE DECK, REMOVE RIDGES IN THE CONCRETE POURS, AND ROUGHEN THE DRIVING SURFACE. SEE LONGITUDINAL GROOVING NOTES DESIGN SHEET NO. 15.
- 4 INCLUDES FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL AND SUBDRAIN OUTLETS AT ABUTMENTS. INCLUDES ALL PREFORMED EXPANSION JOINT FILLER REQUIRED.
- 6 & 7 INCLUDES PIER AND ABUTMENT BEARING MATERIAL AND COIL RODS. GRADATION OF COARSE AGGREGATES FOR PRESTRESSED CONCRETE BRIDGE UNITS SHALL MEET THE REQUIREMENTS OF SECTION 4115 CLASS 3 DURABILITY. GRADATION OF THE COARSE AGGREGATE SHALL MEET THE REQUIREMENTS OF SECTION 2407.02A. INCLUDES FURNISHING AND INSTALLING 2" VENT HOLES. NON-STANDARD BEAMS WITH HIGHER THAN USUAL CONCRETE STRENGTHS REVISED STRAND AND REINFORCING PATTERNS AND NO EPOXY STEEL ARE REQUIRED FOR THIS BRIDGE.
- 12 INCLUDES CONCRETE FILLING OF PIPE PILES
- 16 THE PAINT SYSTEM FOR PAINTING THE OUTSIDE OF THE PIPE PILING SHALL BE A SHOP APPLIED ZINC SILICATE SYSTEM IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE FINISH COAT (TOP COAT) SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. THE PRIMER COAT AND FINISH COAT SHALL BE APPLIED TO THE TOP 25' OF THE PIPE PILING.
- 18 THIS ITEM INCLUDES ALL COSTS ASSOCIATED WITH FURNISHING AND PLACING THE INTERIOR PRECAST PANELS, INCLUDING TRANSVERSE CONCRETE (5.8 CY), 5/8" TRANSVERSE BACKING ROD (562 LF), LEVELING DEVICES, AND CLOSURE POUR CONCRETE (4.2 CY).
- 19 THIS ITEM INCLUDES ALL COSTS ASSOCIATED WITH FURNISHING AND PLACING THE END PRECAST PANELS, INCLUDING ALL WORK INVOLVED IN INSTALLING THE 0.6" DIA. 270-LL POST TENSIONING STRANDS (7408 LF), BEAM P.T. CONCRETE (14.1 CY), DEBONDING SHIELDING, AND REQUIRED POST TENSION END ANCHORAGES.
- 20 THIS ITEM INCLUDES ALL COSTS FOR FURNISHING AND PLACING THE PRECAST ABUTMENT FOOTING INCLUDING (QUANTITIES FOR ONE FOOTING) 14.0 C.Y. STRUCTURAL CONCRETE (BRIDGE), 3171 LBS. REINFORCING STEEL, MECHANICAL SPLICERS, 18.2 L.F. OF 21" CMP, AND 1.6 C.Y. STRUCTURAL CONCRETE (MISC.) TO BACKFILL THE PILE VOID. INCLUDES THE COST OF TEMPORARILY BLOCKING THE ABUTMENT FOOTINGS UNTIL THE CONCRETE BACKFILL IN THE PILE VOID HAS OBTAINED THE REQUIRED STRENGTH. THE METHOD OF MEASUREMENT AND BASIS OF PAYMENT WILL BE FOR EACH PRECAST ABUTMENT FOOTING FURNISHED AND PLACED.
- 21 THIS ITEM INCLUDES ALL COSTS FOR FURNISHING AND PLACING THE PRECAST PIER CAP INCLUDING (QUANTITIES FOR ONE CAP) 11.3 C.Y. STRUCTURAL CONCRETE (BRIDGE), 2732 LBS. REINFORCING STEEL, 28.5 L.F. OF 21" CMP, AND 2.5 C.Y. STRUCTURAL CONCRETE (MISC.) TO BACKFILL THE PILE VOID. INCLUDES THE COST OF SHORING REQUIRED TO SUPPORT THE PIER CAPS UNTIL THE CONCRETE BACKFILL IN THE PILE VOID HAS OBTAINED THE REQUIRED STRENGTH. THE METHOD OF MEASUREMENT AND BASIS OF PAYMENT WILL BE FOR EACH PRECAST PIER CAP FURNISHED AND PLACED.

SPECIFICATIONS:

DESIGN: AASHTO SERIES OF 1996.
 CONSTRUCTION: IOWA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, SERIES 2001, PLUS APPLICABLE GENERAL SUPPLEMENTAL SPECIFICATIONS, DEVELOPMENTAL SPECIFICATIONS, SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT AND SPECIAL PROVISIONS FOR PRECAST POST-TENSIONED SLAB PANELS

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1996.
 REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.
 CONCRETE IN ACCORDANCE WITH SECTION 8, f'c = 3,500 PSI.
 PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET 11.
 PRECAST CONCRETE ABUTMENT FOOTING AND PRECAST CONCRETE PIER CAP IN ACCORDANCE WITH SECTION 8, f'c = 5,000 PSI.
 FULL DEPTH PRECAST DECK PANELS, SEE DESIGN SHEET 15.

GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 76' x 18' MARSH RAINBOW ARCH BRIDGE CONSTRUCTED IN 1917. NO KNOWN COPIES OF THE ORIGINAL PLANS EXIST. THE EXISTING BRIDGE SUPERSTRUCTURE CONSISTS OF A STEEL TRUSS ARCH, STEEL HANGERS AND STEEL FLOOR BEAMS ALL ENCASED IN CONCRETE. THE INTENT IS TO REPLACE THE EXISTING STRUCTURE WITH AN IBRC ACCELERATED BRIDGE CONSTRUCTED WITH PRECAST ABUTMENT FOOTINGS, PRECAST PIER CAPS, PPC BEAMS AND FULL-DEPTH PRECAST DECK PANELS POST-TENSIONED.

THE LUMP SUM BID FOR REMOVAL OF EXISTING BRIDGE SHALL INCLUDE ALL COSTS ASSOCIATED WITH THE REMOVING THE EXISTING 76' x 18' MARSH RAINBOW ARCH BRIDGE.

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE SPECIFICATIONS.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

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

THIS BRIDGE IS DESIGNED FOR HS20-44 LOADING, PLUS 20 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE WEARING SURFACE.

THE BRIDGE CONTRACTOR IS ENCOURAGED TO TAKE FULL ADVANTAGE OF SPECIFICATION 1105.15 -- VALUE ENGINEERING INCENTIVE PROPOSAL. A PAMPHLET AND CONCEPTUAL PROPOSAL FORM WILL BE AVAILABLE AT THE PRECONSTRUCTION CONFERENCE.

IF 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 AT NO EXTRA COST TO THE CONTRACTING AUTHORITY.

THE BRIDGE CONTRACTOR SHALL PREBORE HOLES FOR ABUTMENT PILES. HOLES SHALL BE BORED TO THE ELEVATIONS SHOWN ON THE "LONGITUDINAL SECTION ALONG CENTERLINE ROADWAY" ON DESIGN SHEET 2. PILES SHALL BE DRIVEN THROUGH THE HOLES TO AT LEAST THE SPECIFIED DESIGN BEARING.

ALL COARSE AGGREGATE FOR STRUCTURAL CONCRETE SHALL BE CRUSHED LIMESTONE

IT SHALL BE THE BRIDGE CONTRACTOR'S RESPONSIBILITY TO PROVIDE SITES FOR EXCESS EXCAVATED MATERIAL. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (501 IS 5/8 INCH DIAMETER BAR). ENGLISH REINFORCING STEEL RECEIVED IN THE FIELD MAY DISPLAY THE FOLLOWING "BAR DESIGNATION". THE "BAR DESIGNATION" IS THE STAMPED IMPRESSION ON THE REINFORCING BARS, AND IS EQUIVALENT TO THE BAR DIAMETER IN MILLIMETERS.

ENGLISH SIZE	BAR DESIGNATION
3	10
4	13
5	16
6	19
7	22
8	25
9	29
10	32
11	36

NOTE:

DIVISION 1 PAID FOR 100% WITH IBRC FUNDS.

DIVISION 2 PAID FOR 80% WITH HBRC FUNDS AND 20% LOCAL FUNDS.

NOTE:
 POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 30° SKEW (R.A.)

151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

47-5 END SPANS 56-6 INTERIOR SPAN

GENERAL NOTES & QUANTITIES

STATION: 50+59.59 FEBRUARY, 2006

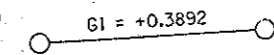
BOONE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 1 OF 22 FILE NO. 30101 DESIGN NO. 106

BENCH MARK: 50+11, 7' LT., NW CORNER HANDRAIL, ELEV. = 982.17.

**PROFILE GRADE
BRIDGE**

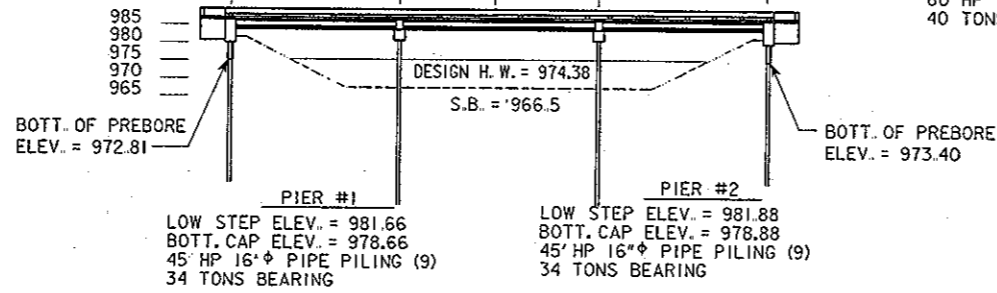
VPI STA. = 49+30.00
ELEV. = 985.11



VPI STA. = 51+35.60
ELEV. = 985.91

EAST ABUTMENT
LOW STEP ELEV. = 981.90
BOTT ABUT. ELEV. = 978.40
BERM ELEV. = 980.40
60' HP 10x57 PILING (5)
40 TONS BEARING

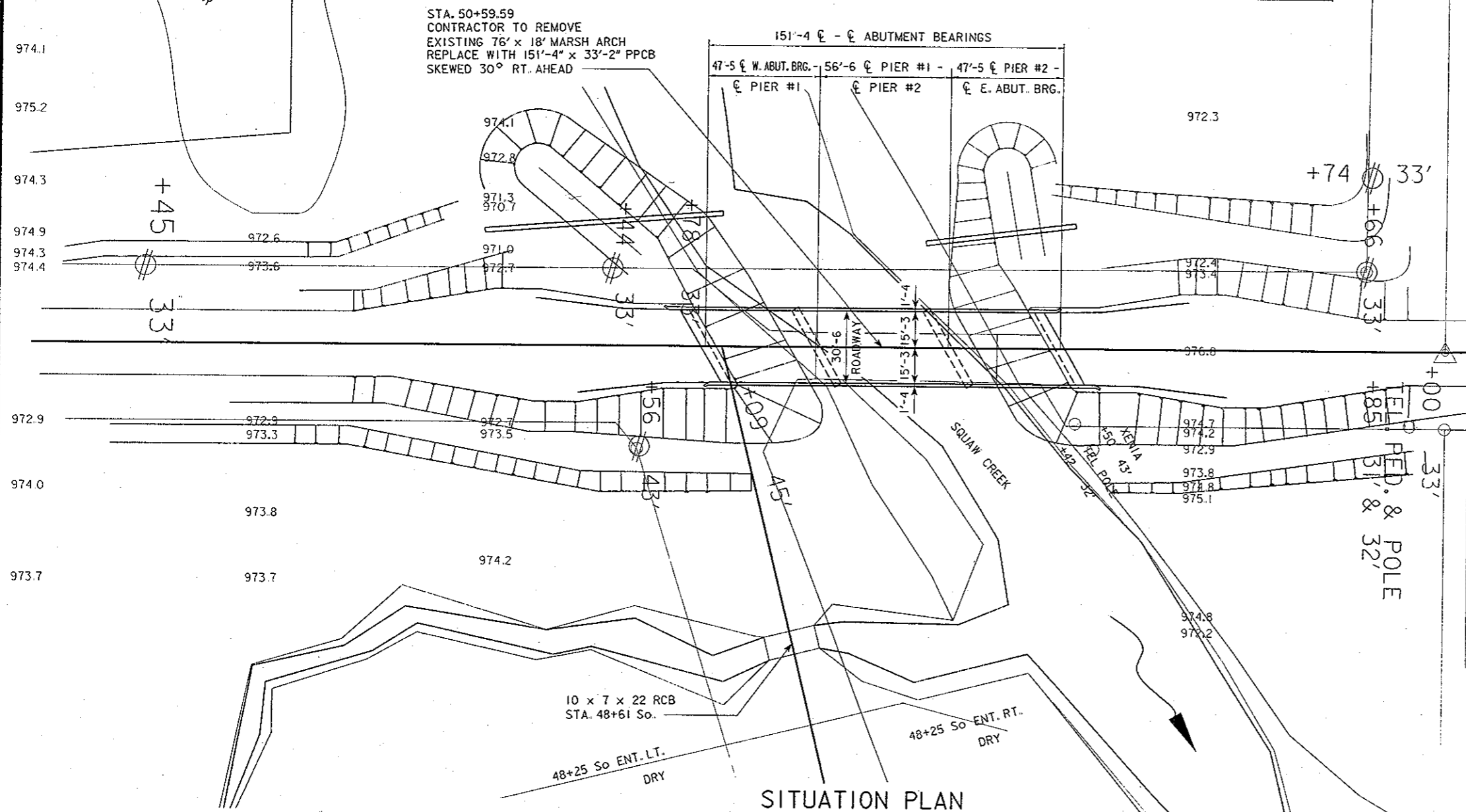
WEST ABUTMENT
LOW STEP ELEV. = 981.31
BOTT ABUT. ELEV. = 977.81
BERM ELEV. = 979.81
55' HP 10x57 PILING (5)
40 TONS BEARING



HYDRAULICS

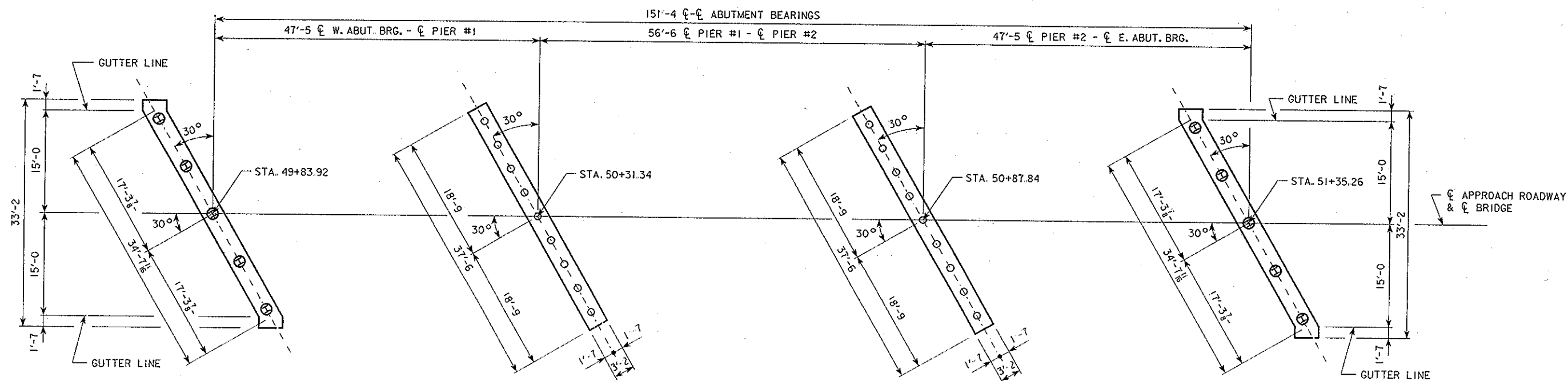
DRAINAGE AREA :	88.0	SQ. MILES
DESIGN DISCHARGE :	3456	CFS
SLOPE :	4.627	FT./MILE
DESIGN HIGH WATER :	974.38	
AREA BELOW DESIGN H.W. :	692.1	SQ. FT.
AVERAGE VELOCITY :	4.99	FPS
Q 50 = 3456 CFS	STAGE: 974.38	
Q 100 = 4168 CFS	STAGE: 974.84	
Q 500 = 5210 CFS	STAGE: 975.43	
EXTREME H.W. : 981.5 (1975 & 1993)		
Q EXTREME H.W. : 31,189 CFS		

LONGITUDINAL SECTION ALONG C ROADWAY



LOCATION:
120th STREET OVER SQUAW CREEK
SECTIONS 9, 10, 15 & 16
T-85N R-25W
HARRISON TWP.
BOONE COUNTY

DESIGN FOR 30° SKEW (R.A.)
**151'-4 x 30'-6 PRETENSIONED PRESTRESSED
CONCRETE BEAM BRIDGE**
47'-5 END SPANS 56'-6 INTERIOR SPAN
SITUATION PLAN
STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 2 OF 22 FILE NO. 30101 DESIGN NO. 106

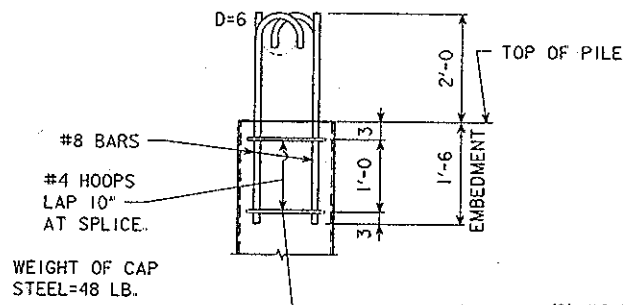


STAKING DIAGRAM

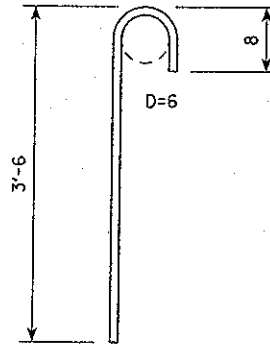


DESIGN FOR 30° SKEW (R.A.)
**151'-4 x 30'-6 PRETENSIONED PRESTRESSED
 CONCRETE BEAM BRIDGE**
 47'-5' END SPANS 56'-6' INTERIOR SPAN
STAKING DIAGRAM
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 3 OF 22 FILE NO. 30101 DESIGN NO. 106

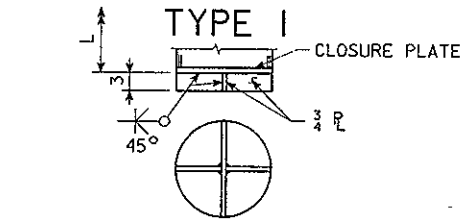
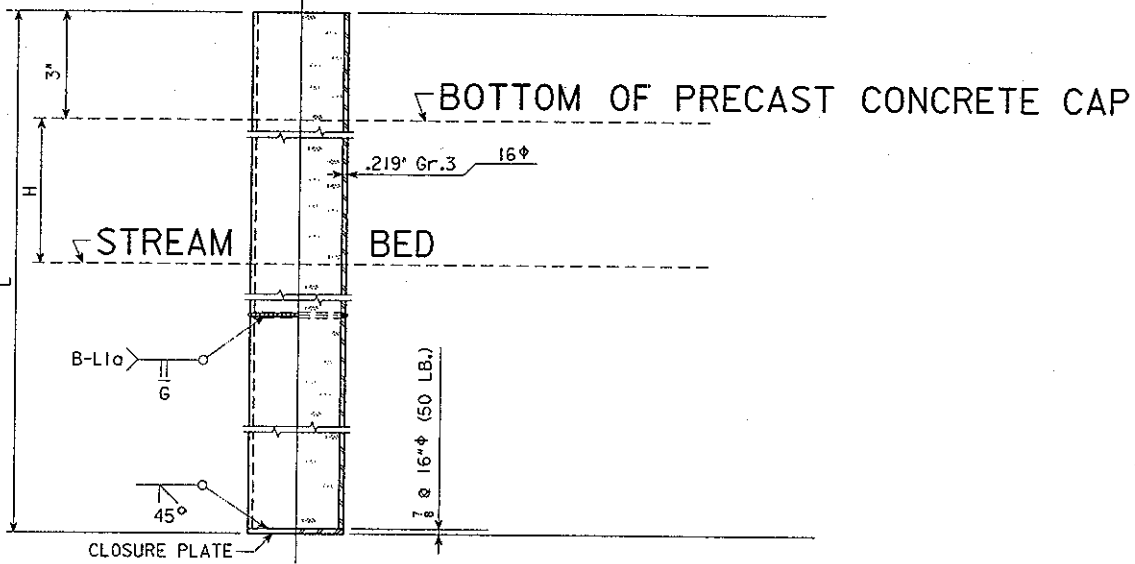
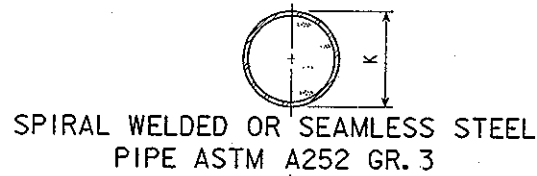
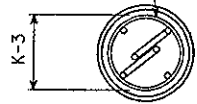
CAST IN PLACE



- (2) #8 BARS x 4'-1 BENT BARS
- (2) #8 BARS x 3'-6 BARS



CAP STEEL DETAILS



STEEL DRIVING POINTS
ASTM-A36

K DIMENSION		16"
H MAXIMUM	FT.	22
SHELL ASTM A-252		GR. 3
CONCRETE (L=40')	C.Y.	1.96
CONCRETE 1' CHANGE	C.Y.	.0490
① WT. OF SHELL (L=40')	LB.	1525
WT. OF SHELL 1' CHANGE	LB.	36.87
f'c (PSI)		3500
BEARING VALUE		36T

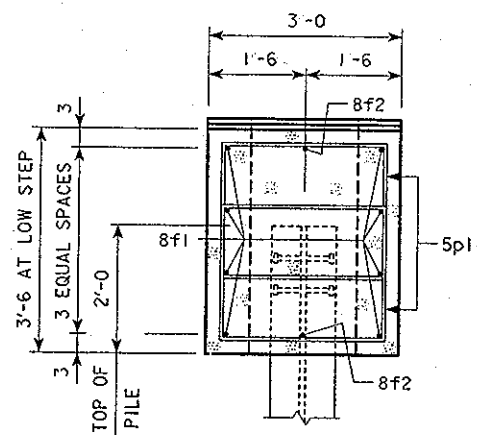
① INCLUDES WEIGHT OF CLOSURE PLATE

GENERAL NOTES:

EXCEPT AS NOTED ELSEWHERE, MATERIAL, CONSTRUCTION, DRIVING AND EXTENSIONS OR BUILD UPS WHEN NECESSARY SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS OF THE IOWA D.O.T. AND CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE.
 COST OF ALL DRIVING POINTS AND CAP STEEL IS TO BE INCLUDED IN THE PRICE BID PER LINEAL FOOT FOR PILING.
 SHELL THICKNESSES SHOWN ARE MINIMUM REQUIREMENTS. THE METHOD OF DRIVING STEEL SHELL PILES SHALL BE ADAPTED TO THE TYPE AND THICKNESS OF SHELL SPECIFIED. ANY SHELLS WHICH HAVE BEEN IMPROPERLY DRIVEN, BROKEN OR ARE OTHERWISE DEFECTIVE SHALL BE REMOVED AND REPLACED BY THE BRIDGE CONTRACTOR.
 ALL CAST IN PLACE PILES SHALL HAVE A CLOSURE PLATE. DRIVING POINTS SHALL BE USED.

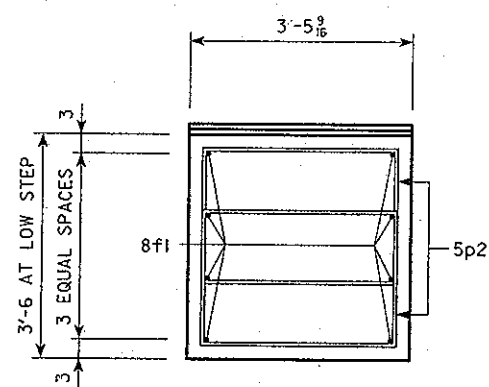
REVISED: 8-1-96 - SPIRAL PITCH CHANGED FOR TYPE 2 PILE, WEIGHTS CHANGED IN MATERIAL COMPONENTS BOX AND ASTM NO. ADDED FOR WIRE SPIRAL. ENGLISH MISCELLANEOUS BRIDGES, DGN P10A - THIS SHEET REISSUED 08-12-88.

DESIGN FOR 30° SKEW (R.A.)
151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 47'-5 END SPANS 56'-6 INTERIOR SPAN
TRESTLE PILE BENTS - P10A
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 4 OF 22 FILE NO. 30101 DESIGN NO. 106

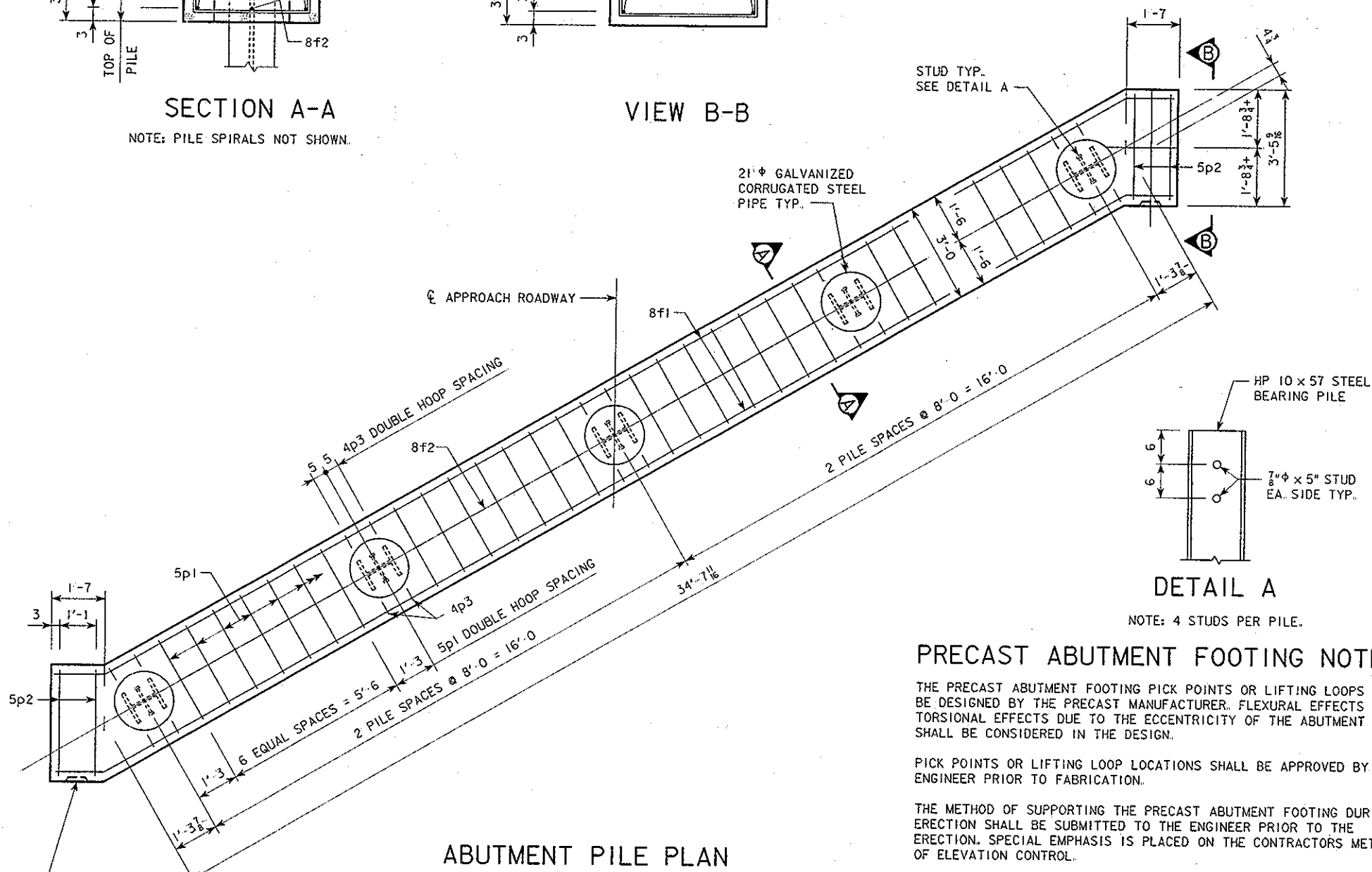


SECTION A-A

NOTE: PILE SPIRALS NOT SHOWN.



VIEW B-B



ABUTMENT PILE PLAN

THE DESIGN BEARING FOR THE ABUTMENT PILES IS 40 TONS.

5 - HP 10 x 57 STEEL BEARING PILING REQUIRED AT EACH ABUTMENT.

FINAL PILE HEAD POSITION SHALL NOT DEVIATE FROM THE LOCATION DESIGNATED IN THESE PLANS BY MORE THAN 3" IN ANY DIRECTION IN ORDER TO ALLOW THE PRECAST ABUTMENT FOOTING TO BE INSTALLED.

PRECAST ABUTMENT FOOTING NOTES:

THE PRECAST ABUTMENT FOOTING PICK POINTS OR LIFTING LOOPS SHALL BE DESIGNED BY THE PRECAST MANUFACTURER. FLEXURAL EFFECTS AND TORSIONAL EFFECTS DUE TO THE ECCENTRICITY OF THE ABUTMENT FOOTING SHALL BE CONSIDERED IN THE DESIGN.

PICK POINTS OR LIFTING LOOP LOCATIONS SHALL BE APPROVED BY THE ENGINEER PRIOR TO FABRICATION.

THE METHOD OF SUPPORTING THE PRECAST ABUTMENT FOOTING DURING ERECTION SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO THE ERECTION. SPECIAL EMPHASIS IS PLACED ON THE CONTRACTORS METHOD OF ELEVATION CONTROL.

THE STRUCTURAL CONCRETE (MISC.) USED TO FILL THE ABUTMENT PILING ENCASEMENTS SHALL BE CLASS C-4 CONCRETE WITH A HIGH RANGE WATER REDUCER. THE MAXIMUM SLUMP ACHIEVED WITH WATER SHALL BE 2 INCHES. THE HRWR SHALL BE ADDED AT THE POUR SITE. THE MAXIMUM ALLOWABLE SLUMP AFTER ADDITION OF THE HRWR SHALL BE 7 INCHES. COARSE AGGREGATE SHALL BE 1/2 INCH TOP SIZE.

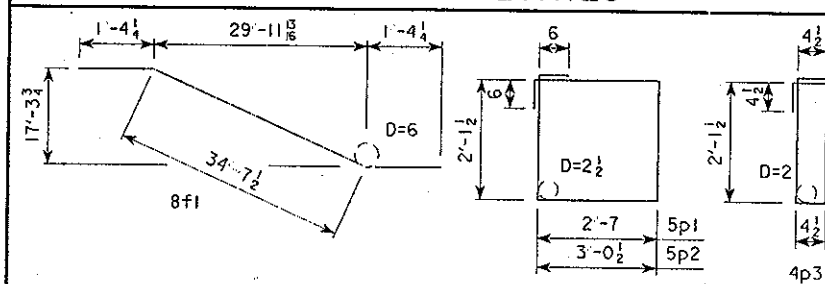
OTHER MIXES MAY BE CONSIDERED PROVIDED THEY HAVE BEEN REVIEWED AND APPROVED BY THE DISTRICT MATERIALS ENGINEER.

DISTRICT MATERIALS WILL PROVIDE COMPRESSIVE STRENGTH TESTING OF THE CONCRETE USED TO FILL THE ABUTMENT PILING ENCASEMENTS. BLOCKING AND TEMPORARY SHORING SHALL NOT BE REMOVED UNTIL 3500 PSI HAS BEEN ACHIEVED.

REINFORCING BAR LIST - ONE FOOTING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8f1	ABUT. FOOTING, BOTH FACES		8	37'-4"	797
8f2	ABUT. FOOTING, TOP & BOTTL.		8	5'-8"	121
* 8g1	ABUT. FOOTING, VERT., B.F.		44	3'-3"	382
* 8g2	ABUT. FOOTING, VERT., F.F.		35	3'-3"	304
* 8g4	ABUT. FOOTING, VERT., F.F.		35	3'-0"	280
* 8g5	ABUT. FOOTING, VERT., B.F.		44	3'-0"	352
* 5h3	ABUT. WING, HORIZ.		8	6'-10"	57
* 5h4	ABUT. TO WING, HORIZ		8	2'-6"	21
5p1	ABUT. FOOTING HOOPS		56	10'-5"	608
5p2	ABUT. FOOTING HOOPS, ENDS		8	11'-4"	95
4p3	ABUT. FOOTING HOOPS @ PILES		40	5'-9"	154
REINFORCING STEEL - TOTAL (LBS.)					3171

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

ESTIMATED QUANTITIES - ONE FOOTING

ITEM	UNITS	QUANTITY
STRUCTURAL CONCRETE (BRIDGE)	CY	14.0
STRUCTURAL CONCRETE (MISC.)	CY	1.6
REINFORCING STEEL	LBS	3171
EXCAVATION CLASS 20	CY	58.3
21"φ CMP	LF	18.2

***NOTE**

THE 8g4, 8g5 AND 5h3 BARS ARE SPLICED WITH MECHANICAL SPLICERS TO THE 8g2, 8g1 AND 5h4 BARS RESPECTIVELY. MECHANICAL SPLICERS SHALL BE IN ACCORDANCE WITH MATERIALS IM 451, APPENDIX E.

THE PILE SPIRAL AND SPIRAL SPACER ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.

DESIGN FOR 30° SKEW (R.A.)

151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

47-5 END SPANS 56-6 INTERIOR SPAN

PRECAST ABUTMENT & PILE DETAILS

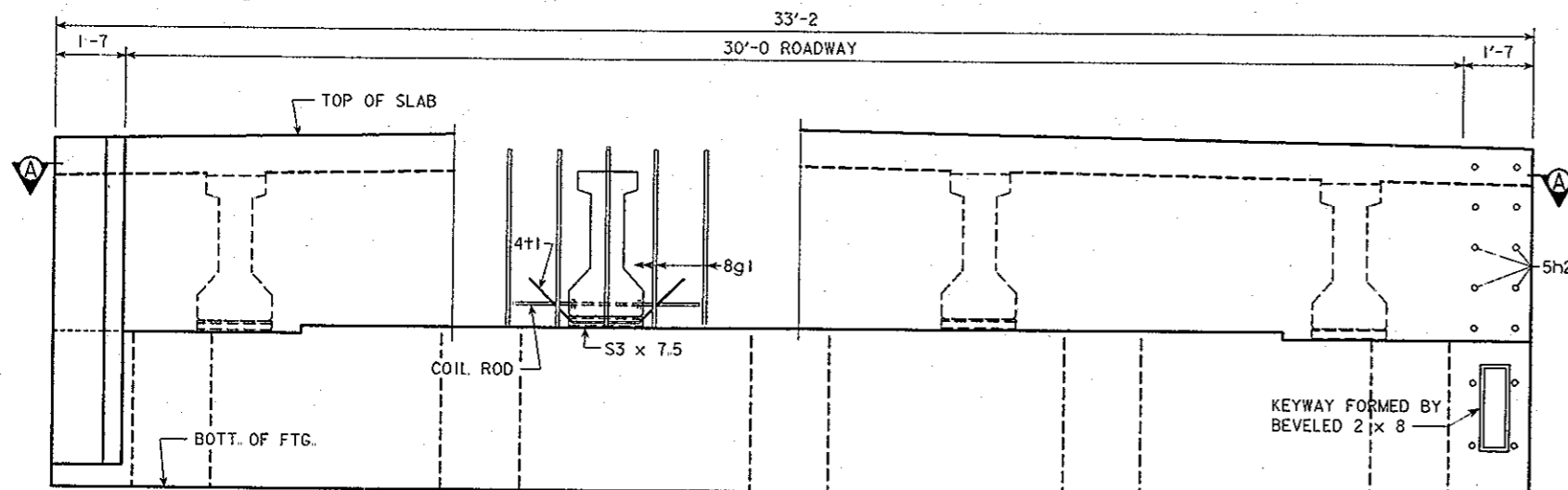
STATION: 50+59.59 FEBRUARY, 2006

BOONE COUNTY

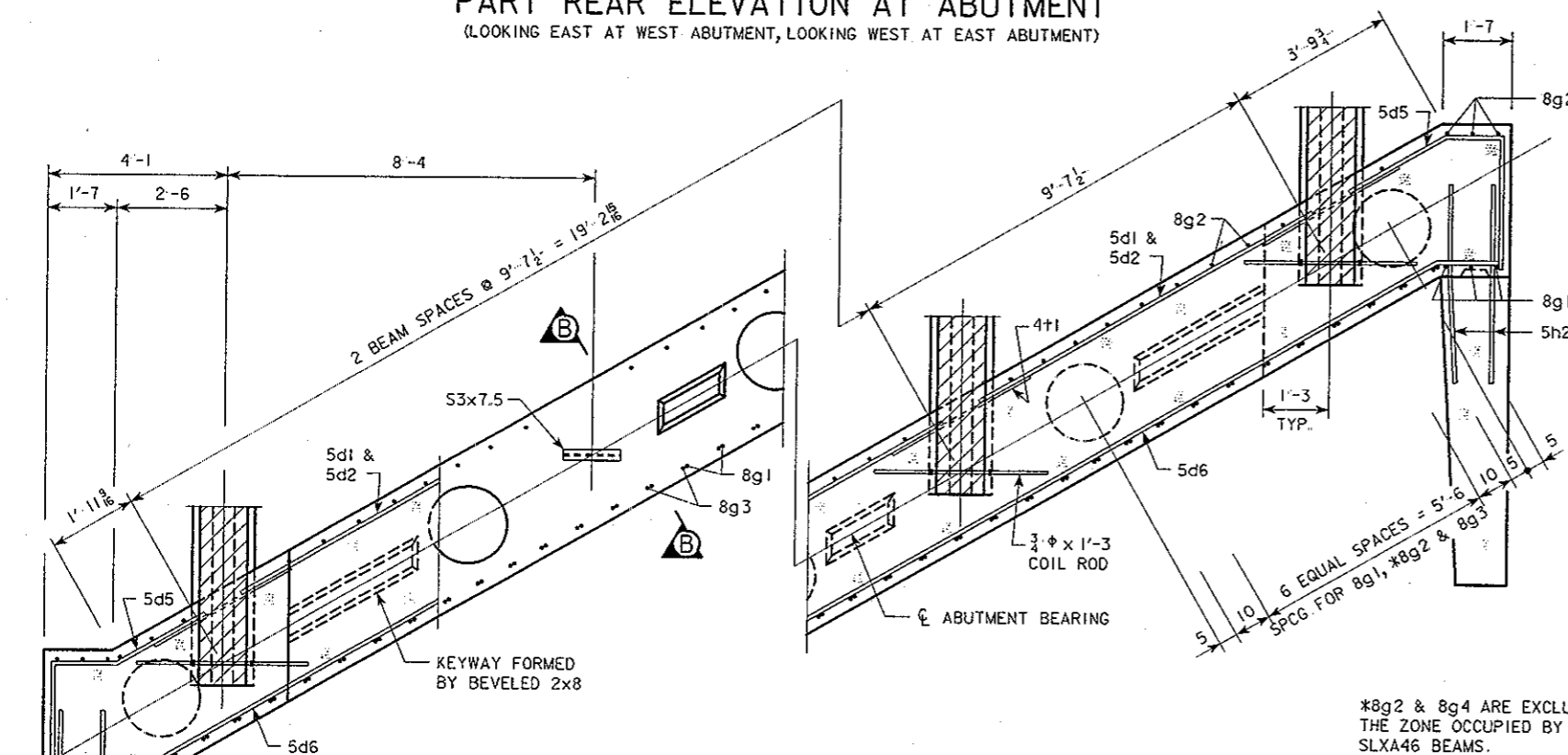
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 5 OF 22 FILE NO. 30101 DESIGN NO. 106

BENCH MARK: 50+11, 7' LT., NW CORNER HANDRAIL, ELEV. = 982.17.



PART REAR ELEVATION AT ABUTMENT
(LOOKING EAST AT WEST ABUTMENT, LOOKING WEST AT EAST ABUTMENT)

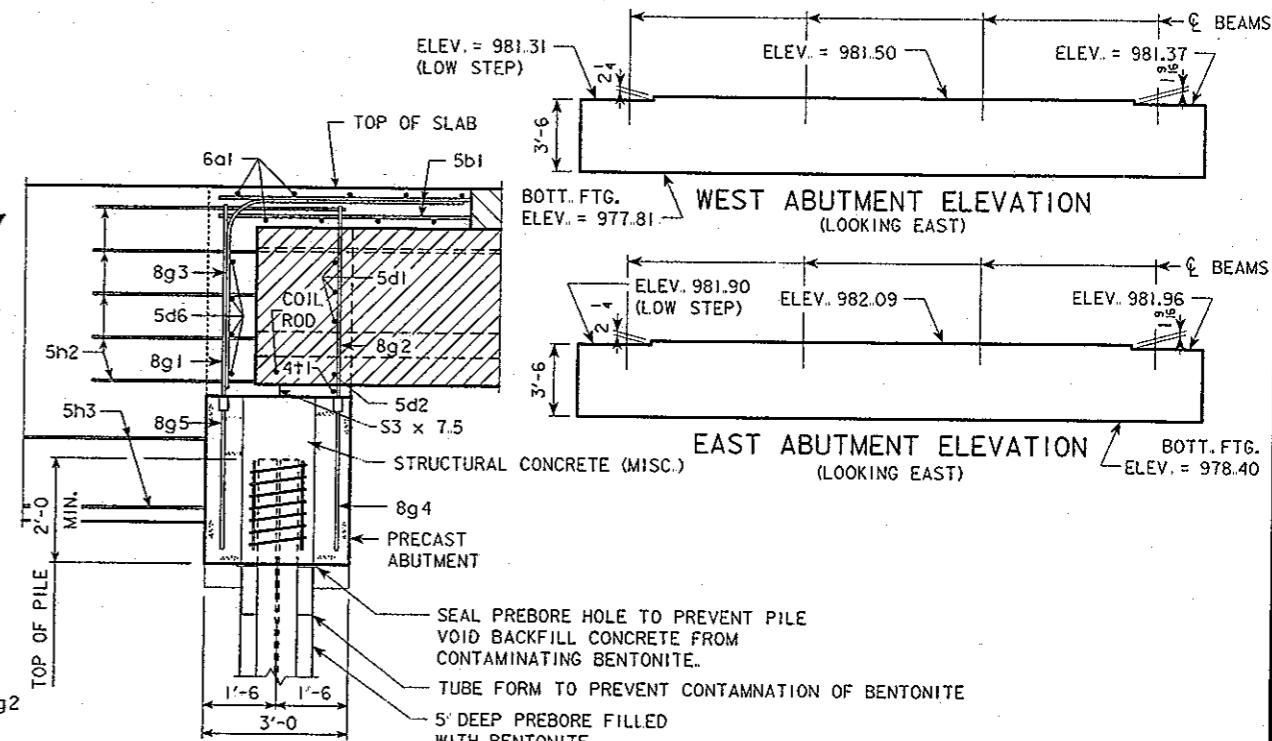


PART SECTION A - A

NOTE:
PLACE 8g3 BARS PARALLEL TO ϕ OF BRIDGE.
FIELD CUT TOP LEG OF 8g3 IF NECESSARY.

ABUTMENT NOTES:

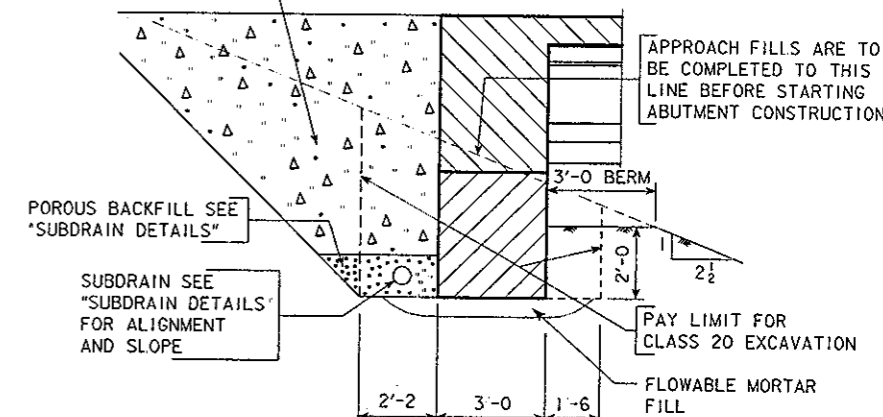
MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN.
IF NECESSARY TO PREVENT DAMAGE TO THE END OF THE BRIDGE DECK OR BACKWALL FROM CONSTRUCTION EQUIPMENT, AN APPROPRIATE METHOD OF PROTECTION APPROVED BY THE ENGINEER SHALL BE PROVIDED BY THE BRIDGE CONTRACTOR AT NO EXTRA COST TO THE CONTRACTING AUTHORITY.



PART SECTION B-B

NOTE: THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 18" DIAMETER, 3' PITCH WITH 2 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.

COMPACTED GRANULAR BACKFILL BETWEEN WINGS SEE "SUBDRAIN DETAILS"

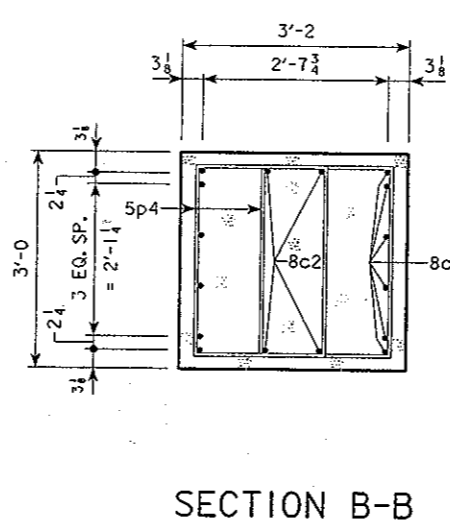
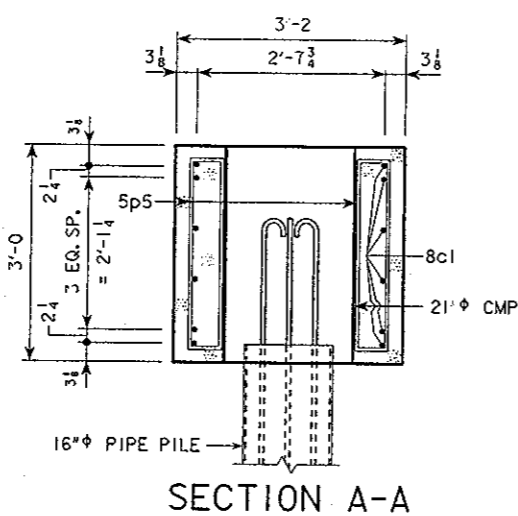
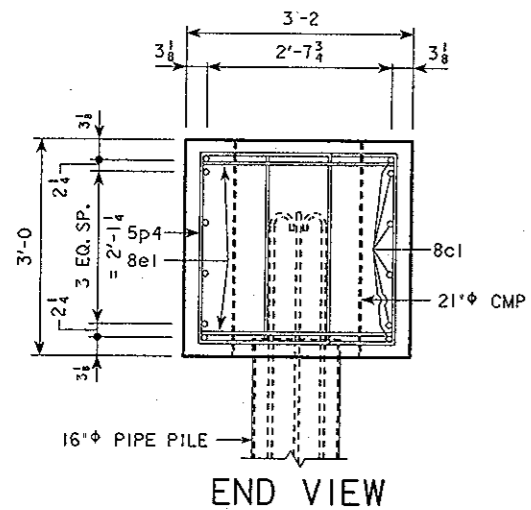
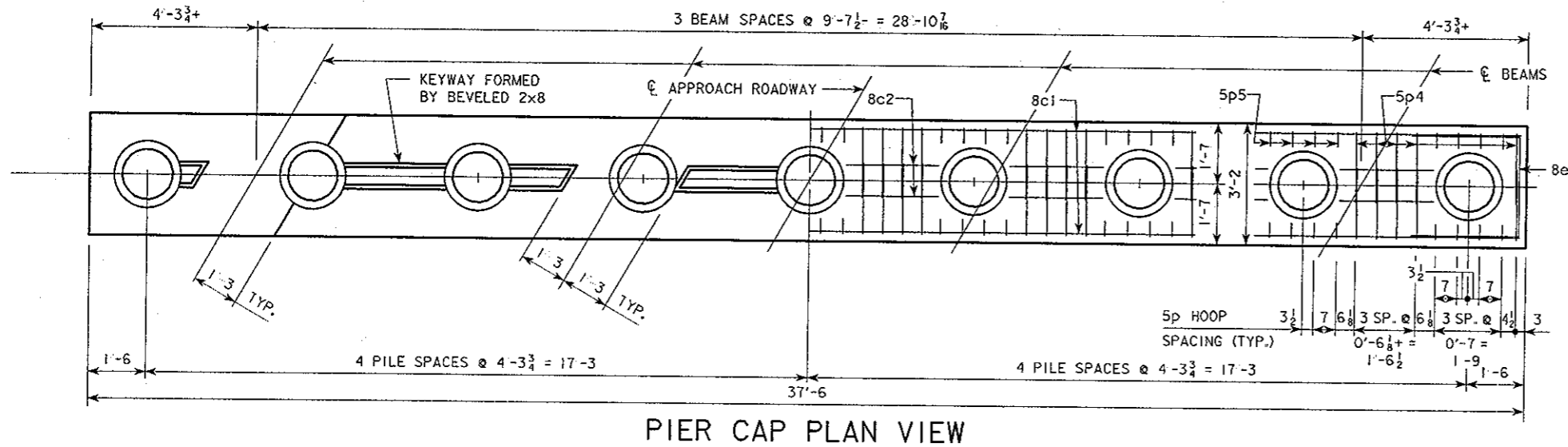
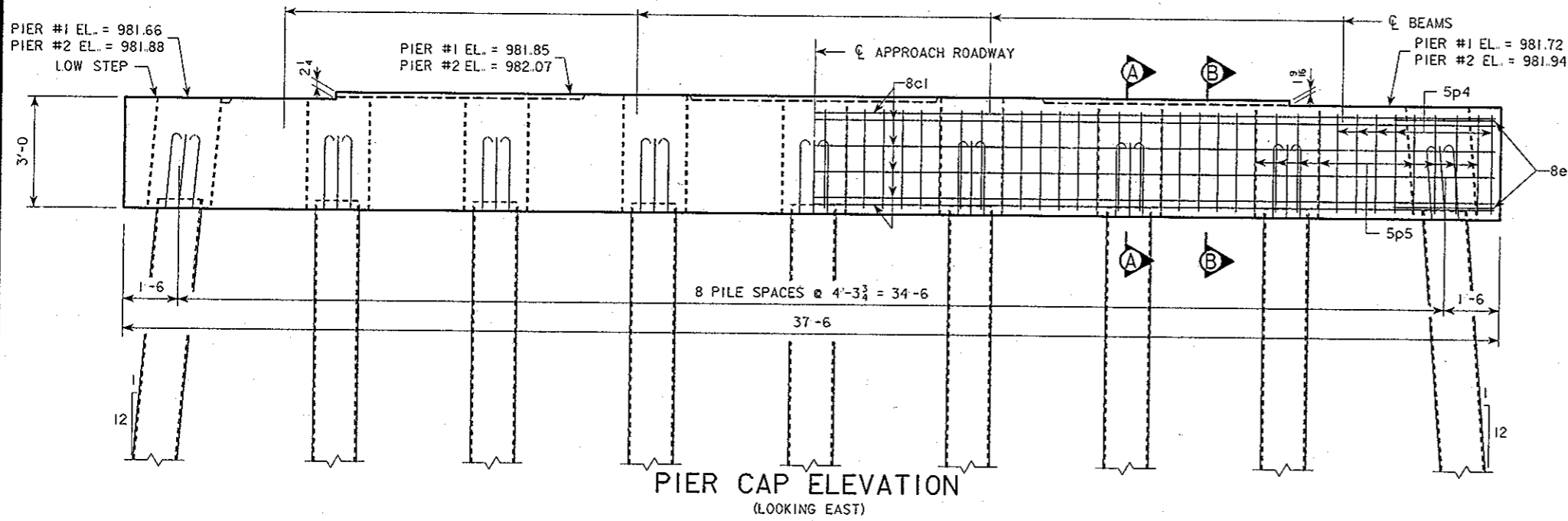


ABUTMENT EXCAVATION DETAILS

NOTE: BARRIER RAIL NOT SHOWN IN DETAILS.

DESIGN FOR 30° SKEW (R.A.)
151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 47'-5 END SPANS 56'-6 INTERIOR SPAN
ABUTMENT DETAILS
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 6 OF 22 FILE NO. 30101 DESIGN NO. 106

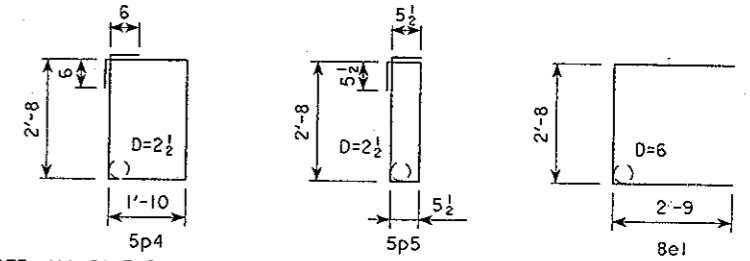
BENCH MARK: 50+11, 7' LT., NW CORNER HANDRAIL, ELEV. = 982.17.



REINFORCING BAR LIST - ONE PRECAST PIER CAP

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8c1	PIER CAP, LONGITUDINAL	—	12	37'-2	1191
8c2	PIER CAP, LONGITUDINAL	—	32	2'-5	207
8e1	PIER CAP, ENDS	□	4	8'-2	87
5p4	PIER CAP HOOPS	□	68	10'-0	709
5p5	PIER CAP HOOPS	□	72	7'-2	538
REINFORCING STEEL - TOTAL (LBS.)					2732

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

ESTIMATED QUANTITIES - ONE PRECAST PIER CAP

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE (BRIDGE)	CY	11.3
STRUCTURAL CONCRETE (MISC.)	CY	2.5
REINFORCING STEEL	LB	2732
21" diameter CMP	LF	28.5

PIER CAP NOTES:

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

THE DESIGN BEARING FOR THE PIER PILE IS 34 TONS.

PILE DIMENSIONS SHOWN ARE AT BOTTOM OF PIER CAP. BATTER EXTERIOR PILES 1:12 IN THE DIRECTION SHOWN.

THE STRUCTURAL CONCRETE (MISC.) USED TO FILL THE PIER PILING ENCASUREMENTS SHALL BE CLASS C-4 CONCRETE WITH A HIGH RANGE WATER REDUCER. THE MAXIMUM SLUMP ACHIEVED WITH WATER SHALL BE 2 INCHES. THE HRWR SHALL BE ADDED AT THE POUR SITE. THE MAXIMUM ALLOWABLE SLUMP AFTER ADDITION OF THE HRWR SHALL BE 7 INCHES. COARSE AGGREGATE SHALL BE 1/2 INCH TOP SIZE.

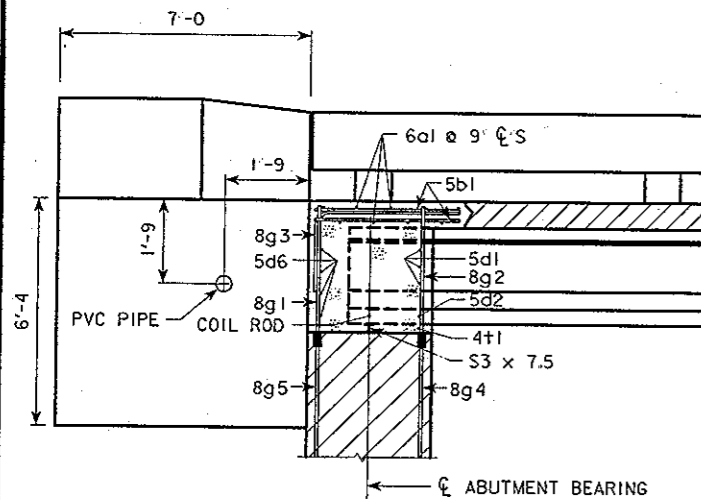
OTHER MIXES MAY BE CONSIDERED PROVIDE THEY HAVE BEEN REVIEWED AND APPROVED BY THE DISTRICT MATERIALS ENGINEER.

DISTRICT MATERIALS WILL PROVIDE COMPRESSIVE STRENGTH TESTING OF THE CONCRETE USED TO FILL THE ABUTMENT AND PIER PILING ENCASUREMENTS. BLOCKING AND TEMPORARY SHORING SHALL NOT BE REMOVED UNTIL 3500 PSI HAS BEEN ACHIEVED.

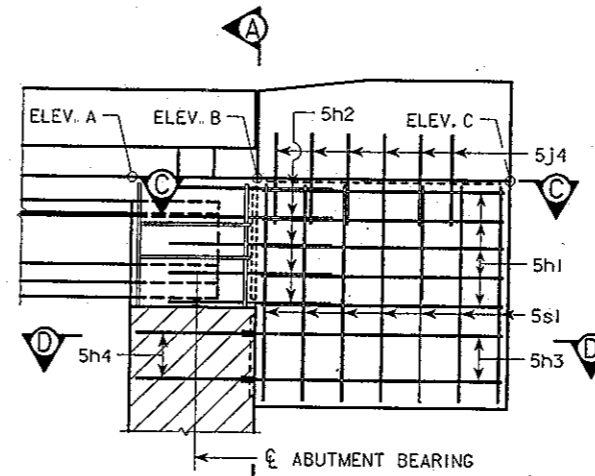
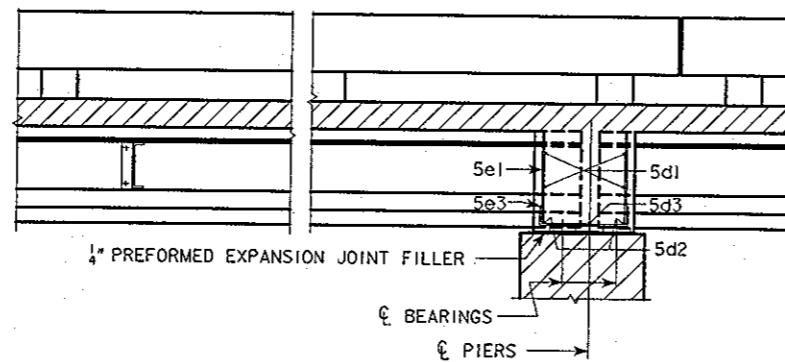
FINAL PILE HEAD POSITION SHALL NOT DEVIATE FROM THE LOCATION DESIGNATED IN THESE PLANS BY MORE THAN 2" IN ANY DIRECTION IN ORDER TO ALLOW THE PRECAST PIER CAP TO BE INSTALLED.

PICK POINTS OR LIFTING LOOP LOCATIONS SHALL BE APPROVED BY THE ENGINEER PRIOR TO FABRICATION.

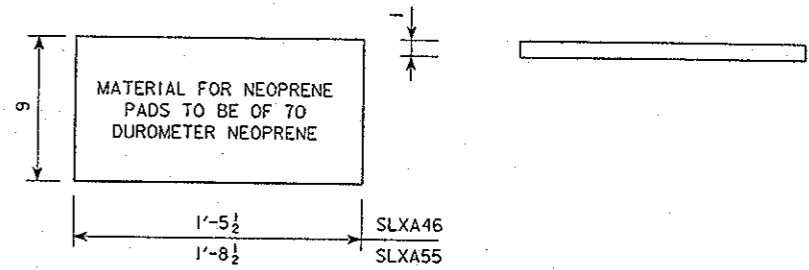
DESIGN FOR 30° SKEW (R.A.)
151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 47'-5 END SPANS 56'-6 INTERIOR SPAN
SUBSTRUCTURE DETAILS
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 7 OF 22 FILE NO. 30101 DESIGN NO. 106



PART LONGITUDINAL SECTION NEAR GUTTER

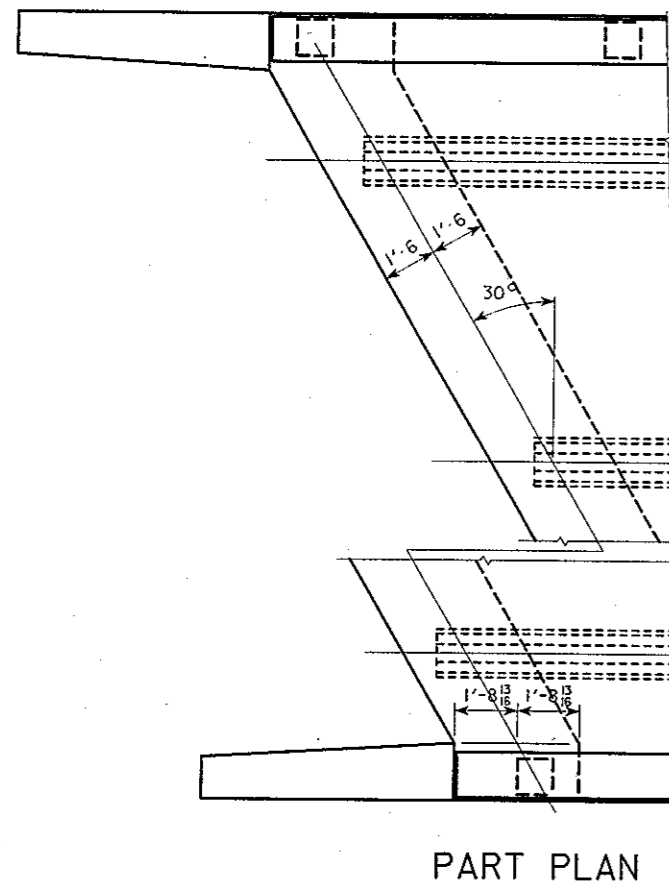


PART END VIEW AT ABUTMENT

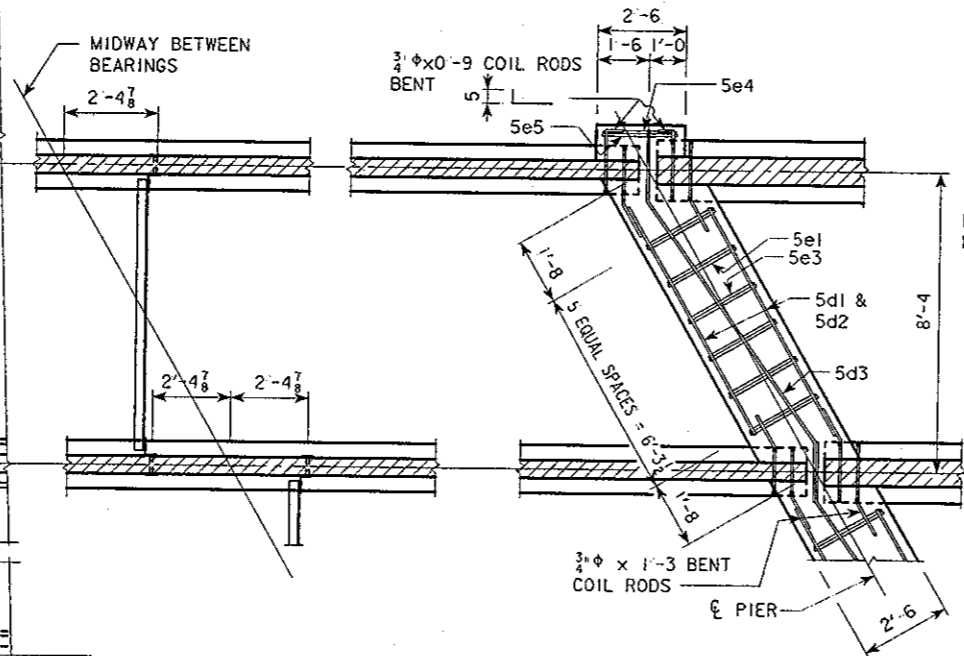


NEOPRENE PAD DETAILS

NOTE: COST OF NEOPRENE PADS SHALL BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS."

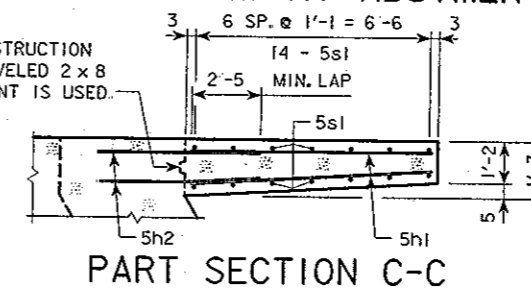


PART PLAN

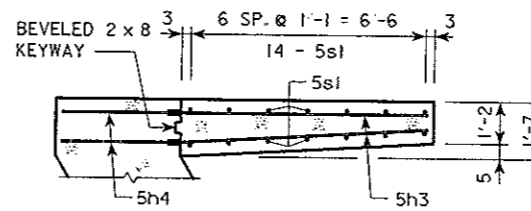


PART SECTION AT MID SPAN

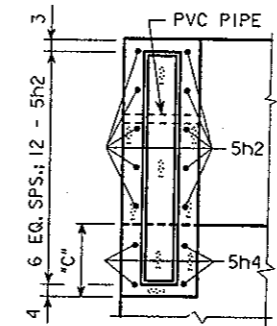
PART SECTION AT PIER



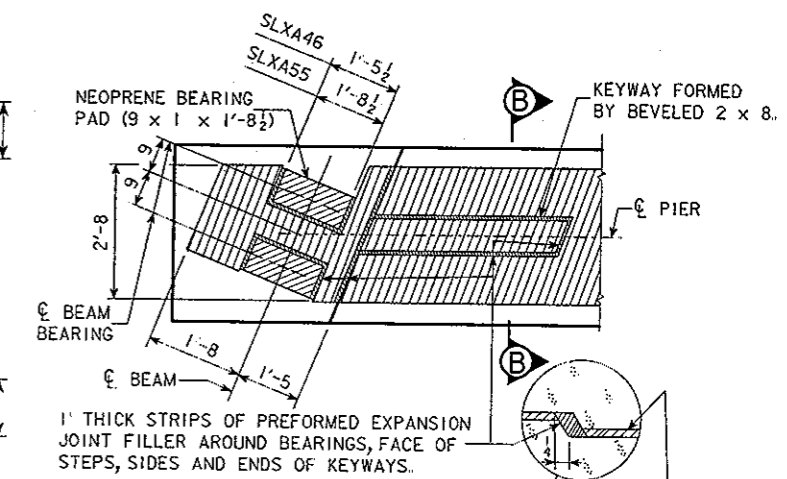
PART SECTION C-C



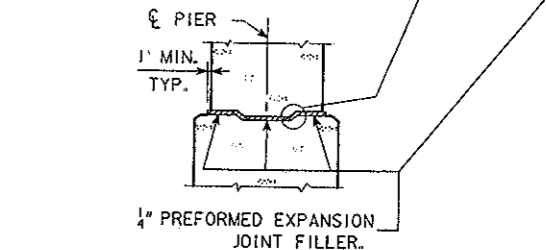
PART SECTION D-D



SECTION A-A
OPEN BARRIER RAIL NOT SHOWN.



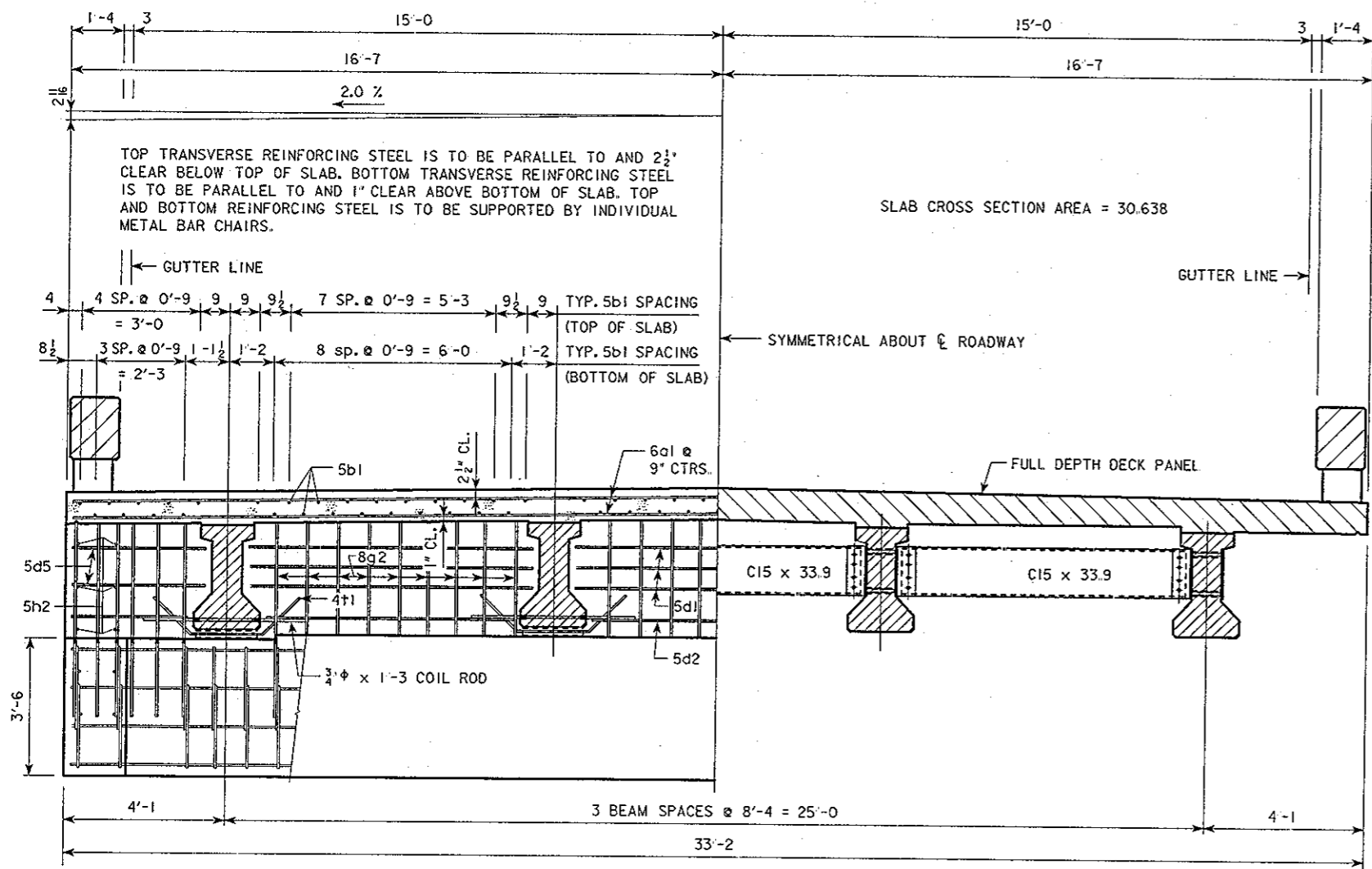
PART PLAN



SECTION B-B
TOP OF PIER DETAILS

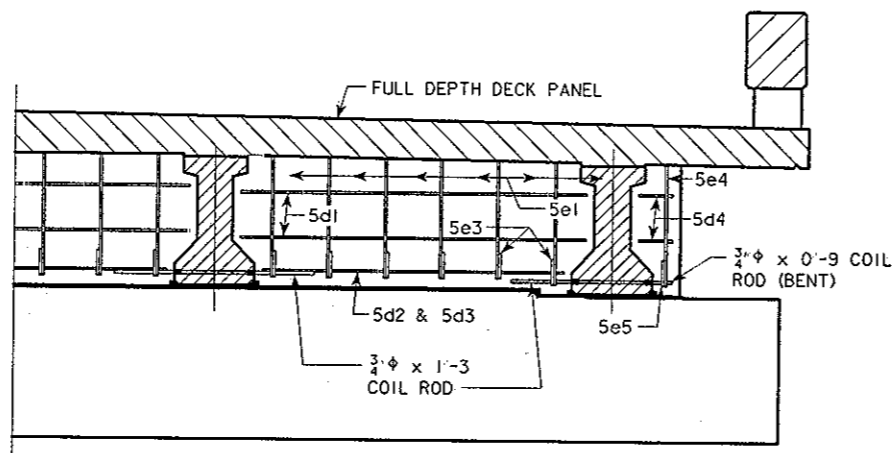
TABLE OF WING ELEVATIONS				
LOCATION	DIM "C"	ELEV. A	ELEV. B	ELEV. C
S.W. CORNER	2'-7 13/16	985.06	985.05	985.02
N.W. CORNER	2'-7 15/16	984.99	984.98	984.95
S.E. CORNER	2'-7 3/4	985.64	985.65	985.68
N.E. CORNER	2'-7 13/16	985.57	985.57	985.61

DESIGN FOR 30° SKEW (R.A.)
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SUPERSTRUCTURE DETAILS
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 8 OF 22 FILE NO. 30101 DESIGN NO. 106

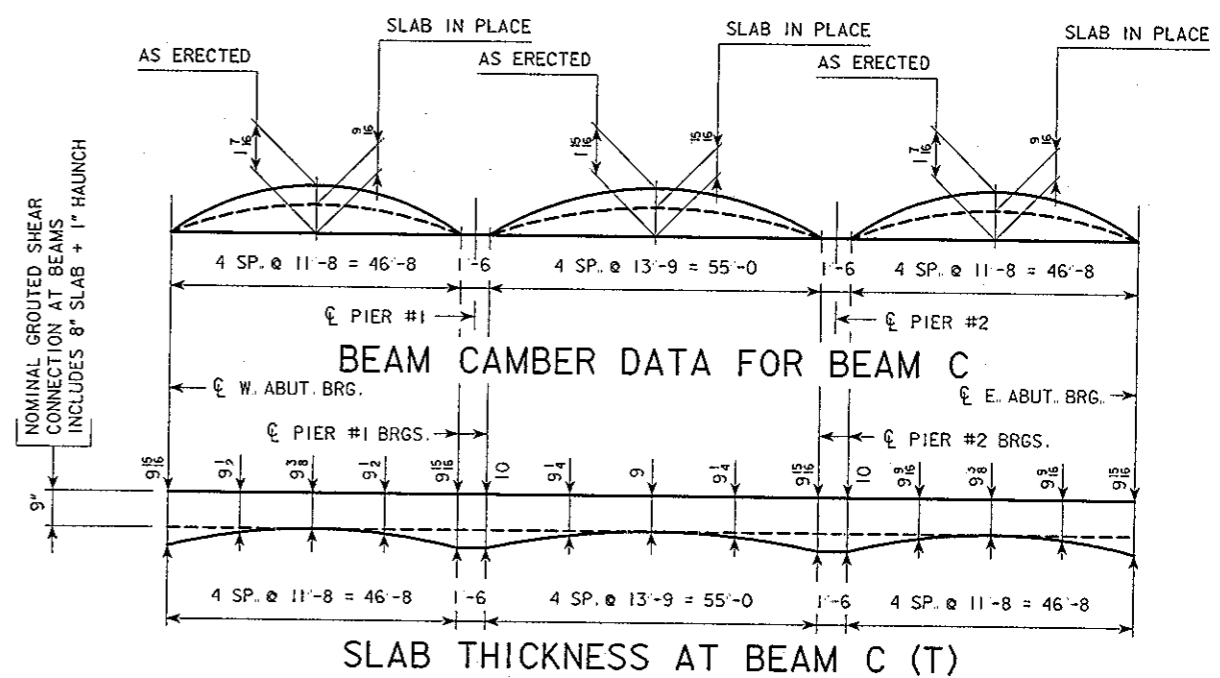
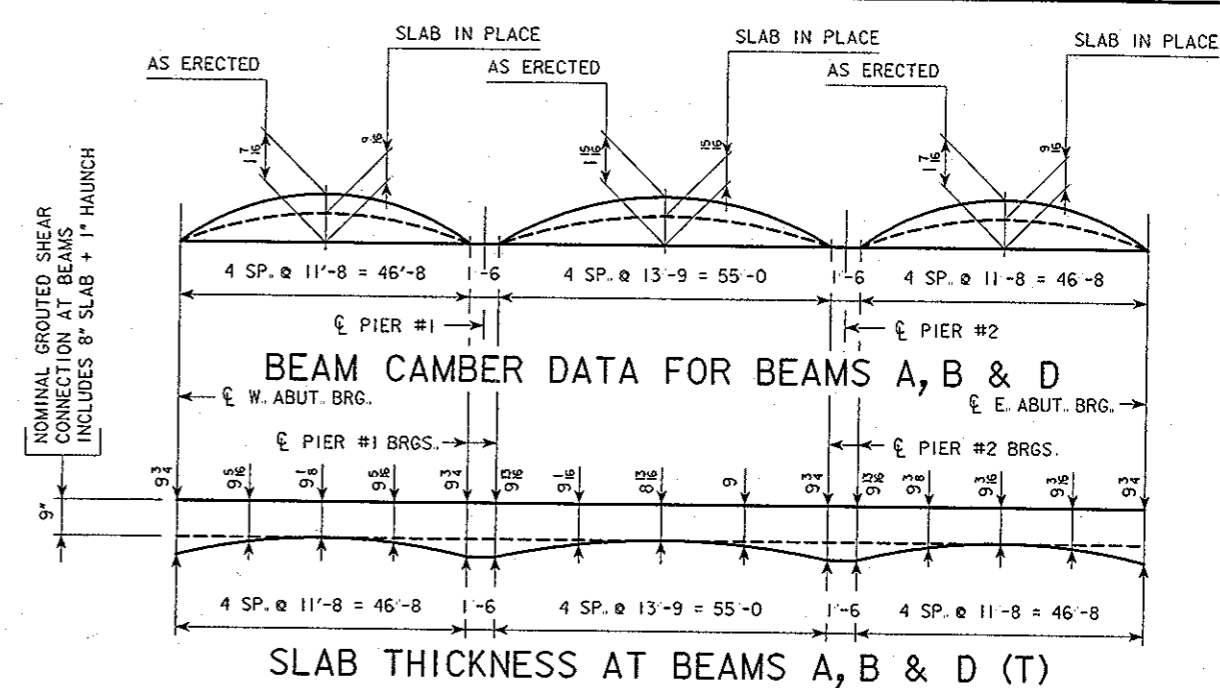


HALF SECTION NEAR ABUTMENT

HALF SECTION NEAR MID SPAN

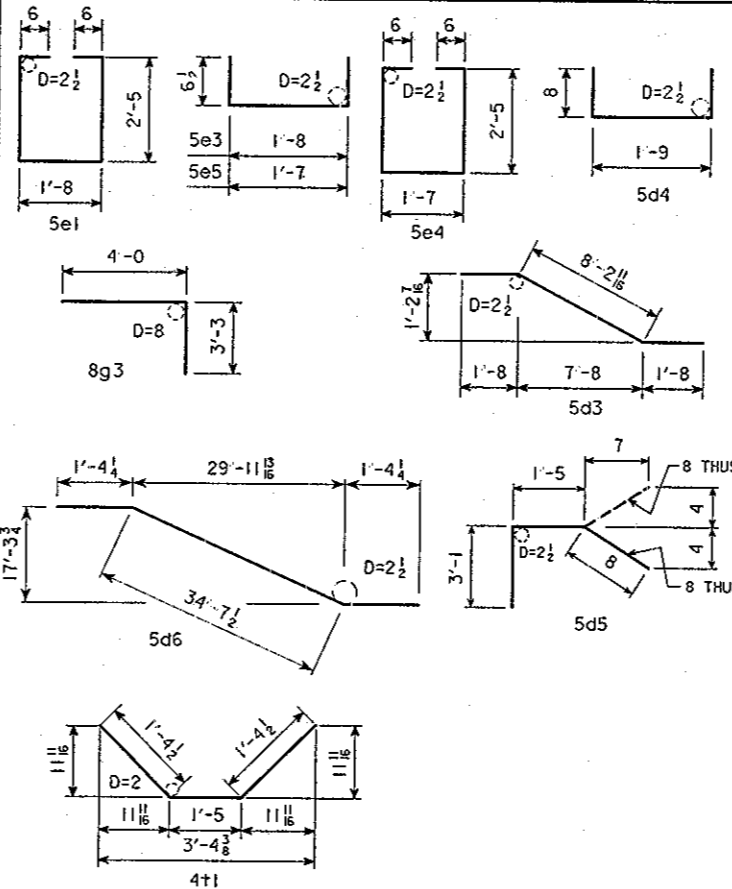


HALF SECTION NEAR PIER



DESIGN FOR 30° SKEW (R.A.)
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SUPERSTRUCTURE DETAILS
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 9 OF 22 FILE NO. 30101 DESIGN NO. 106

BENT BAR DETAILS



NOTE: ALL DIMENSIONS ARE OUT TO OUT. D = PIN DIAMETER.

REINFORCING BAR LIST

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6d1	SLAB, TRANSV., TOP & BOTT.	---	18	37'-9"	1021
5b1	SLAB, LONGIT., TOP & BOTT.	---	150	3'-2"	495
5d1	PIER & ABUT. DIAPHR., LONGIT.	---	42	8'-4"	365
5d2	PIER & ABUT. DIAPHR., LONGIT.	---	18	6'-3"	117
5d3	PIER DIAPHR., LONGIT.	---	6	11'-7"	72
5d4	PIER DIAPHR., ENDS	---	8	3'-1"	26
5d5	ABUT. DIAPHR., LONGIT. ENDS	---	16	5'-2"	86
5d6	ABUT. DIAPHR., LONGIT.	---	8	37'-4"	312
5d7	LONGITUDINAL CLOSURE POUR STEEL	---	16	39'-4"	657
5e1	PIER DIAPHR., HOOPS	□	36	7'-6"	282
5e3	PIER DIAPHR., TIES	---	36	2'-9"	103
5e4	PIER DIAPHR., HOOPS, ENDS	□	4	7'-5"	31
5e5	PIER DIAPHR., TIES, ENDS	---	4	2'-8"	11
8g3	ABUT. DIAPHR., VERT., B.F.	---	76	7'-3"	1471
5h1	ABUT. WING, HORIZ.	---	40	6'-8"	278
5h2	ABUT. TO WING, HORIZ.	---	40	4'-0"	167
5s1	WING, VERT.	---	56	6'-0"	350
4t1	UNDER BEAMS AT ABUTS.	---	8	4'-2"	22
#2	PILE SPIRAL	WWW	10	33'-0"	54
	SPIRAL SPACER, L $\frac{7}{8} \times \frac{7}{8} \times \frac{1}{8} \times 0.70$	---	20	1'-10"	26
BARRIER RAIL REINFORCING - SEE DES. SHT. NO. 21					9073
TOTAL (LBS.)					15,019

CONCRETE PLACEMENT QUANTITIES - ONE SUPERSTR.

SECTION	TOTAL
SLAB ENDS, ABUTMENT DIAPHRAGMS	33.2
PIER DIAPHRAGMS	14.6
ABUTMENT WINGS (4 AT 2.25 CY EA.)	9.0
TOTAL C.Y.	56.8

DESIGN FOR 30° SKEW (R.A.)

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47'-5 END SPANS 56'-6 INTERIOR SPAN

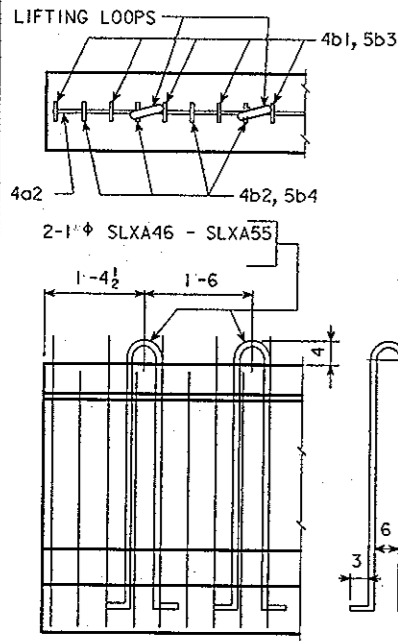
SUPERSTRUCTURE DETAILS

STATION: 50+59.59 FEBRUARY, 2006

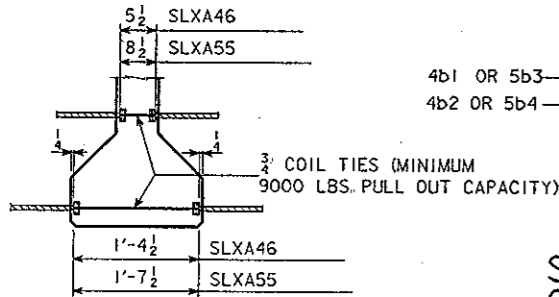
BOONE COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

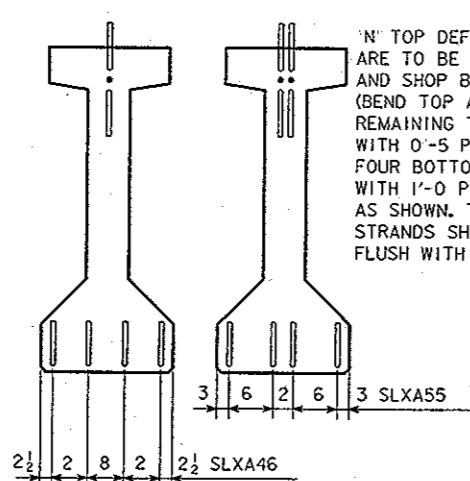
DESIGN SHEET NO. 10 OF 22 FILE NO. 30101 DESIGN NO. 106



LIFTING LOOP DETAIL
ALTERNATE TYPES MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. LIFTING LOOPS ARE TO BE STRUCTURAL GRADE.

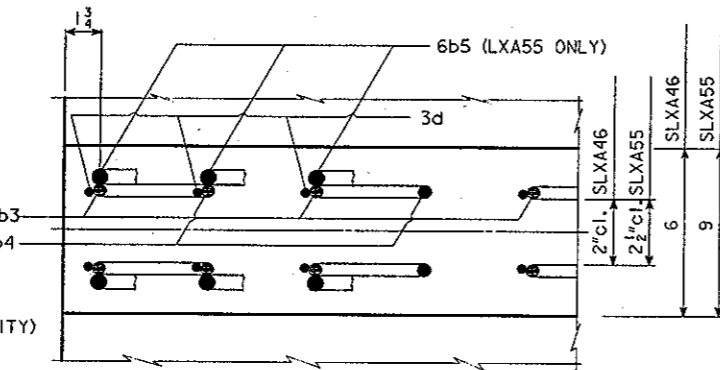


COIL TIE DETAIL
NUMBER AND EXACT LOCATION OF COIL TIES TO BE AS DETAILED ON SPECIFIC BRIDGE DESIGN.



STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS

BEAM	"N"
SLXA46	2
SLXA55	4



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

SLXA BEAM DATA

BEAM	SPAN LENGTH @ BEARING	OVERALL BEAM LENGTH (L)	STRAND SIZE	NO. OF STRANDS		TOTAL INITIAL PRESTRESS (KIPS)	HOLD DOWN FORCE (KIPS)	CAMBER (in.)		DEFLECTION (in.) Δ_D				PERMISSIBLE SPACING		WEIGHT (TONS)	CONCRETE (C. Y.)	REINFORCING STEEL (YD)
				STRAIGHT	DEFLECTED			AT RELEASE	AFTER LOSSES	IMMEDIATE (ELASTIC) Δ_I		TIME (PLASTIC) Δ_T		HS20 LOADING				
										CONC. DIAPH.	STEEL DIAPH.	CONC. DIAPH.	STEEL DIAPH.	CONC. DIAPH.	STEEL DIAPH.			
SLXA46	46'-8"	47'-8"	1/2"	12	3	450	10.5	0.81	1.44	0.62	0.32			8'-4"	7.7	3.82	474	
SLXA55	55'-0"	56'-0"	1/2"	18	6	743.6	13.6	1.10	1.96	0.87	0.27			8'-4"	11.9	5.87	703	

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 TRANSVERSELY TO A FULL AMPLITUDE OF APPROXIMATELY 1/4" EXCEPT A 2 INCH WIDE FINISH SHALL BE PROVIDED ON THE TOP EDGE ON ONE SIDE ONLY OF THE BEAM.
BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS. BEAMS ARE TO BE AT LEAST 28 DAYS OLD BEFORE THE GROUTING OF THE FULL-DEPTH PRECAST DECK PANEL JOINTS IS DONE.
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 2403.14 OF THE SPECIFICATIONS. UNLESS OTHERWISE NOTED ALL BEAMS ARE TO BE INCREASED IN LENGTH BY .0005L TO COMPENSATE FOR ELASTIC SHORTENING, CREEP AND SHRINKAGE.

① DEFLECTIONS AT MID-SPAN DUE TO WEIGHT OF SLAB AND DIAPHRAGM. THE DEFLECTIONS SHOWN ARE FOR A SLAB WEIGHT OF 865 #/FT. (PRECAST SLAB AND 8'-4" BEAM SPACING) AND ONE STEEL DIAPHRAGM (330 #) AT ℓ OF SPAN.

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

TOTAL BEAM DEFLECTIONS AT ℓ OF SPAN, Δ_D , DUE TO WEIGHT OF SLAB AND DIAPHRAGMS FOR DETAILING PURPOSE:

- (A) $\Delta_D = \Delta_I + \Delta_T$ FOR SIMPLE SPAN.
- (B) $\Delta_D = \Delta_I + \frac{3}{4}\Delta_T$ FOR END SPANS OF CONTINUOUS BRIDGE.
- (C) $\Delta_D = \Delta_I + \frac{1}{2}\Delta_T$ FOR INTERIOR SPANS OF CONTINUOUS BRIDGE.

③ TOTAL INITIAL PRESTRESS FOR SLXA46 IS BASED ON 72.664% f_s , AND FOR SLXA55 ON 75% f_s . $f_s = 270$ ksi AND $A_s = 0.153$ sq. in.

SPECIFICATIONS:

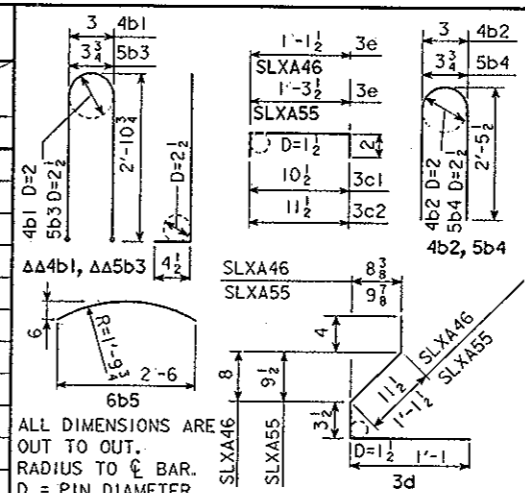
CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.
DESIGN: A.A.S.H.T.O., SERIES OF 1989, WITH MINOR MODIFICATIONS.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE TO BE IN ACCORDANCE WITH A.A.S.H.T.O. STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SERIES OF 1989:
REINFORCING STEEL IN ACCORDANCE WITH SECTION 8, GRADE 60.
SLXA46 - CONCRETE IN ACCORDANCE WITH SECTION 9, $f_c = 5000$ psi, $f_{ci} = 4500$ psi.
SLXA55 - CONCRETE IN ACCORDANCE WITH SECTION 9, $f_c = 6000$ psi, $f_{ci} = 5500$ psi.
PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 9, $f_s = 270,000$ psi.

REINFORCING BAR LIST

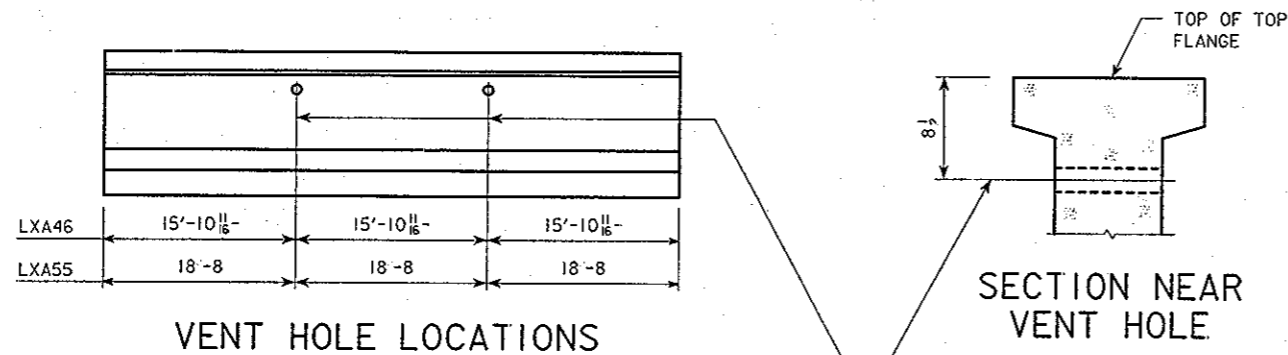
BEAM	SPAN	SLXA46		SLXA55	
		NO.	LENGTH	NO.	LENGTH
5a1		4	24'-11"	4	29'-1"
4a2		2	3'-3"	2	3'-3"
4b1		44	6'-8"		
4b2		10	5'-0"		
5b3				48	6'-8"
5b4				8	5'-0"
6b5				12	2'-9"
3c1		44	1'-3"		
3c2				48	1'-4"
3d		108	2'-8"	112	2'-10"
3e		12	1'-6"	14	1'-8"



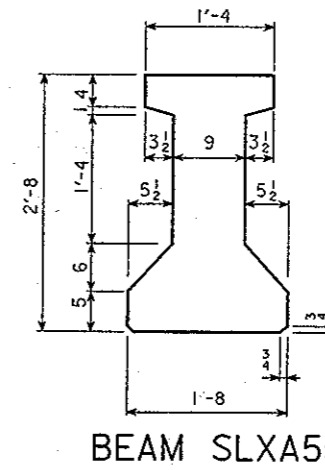
1/2" DIAMETER STRANDS STRESSED TO NOT MORE THAN 3,000 LBS. EACH MAY BE USED IN LIEU OF THE α BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

DESIGN FOR 30° SKEW (R.A.)
151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
47'-5 END SPANS 56'-6 INTERIOR SPAN
LXA BEAM DETAILS
STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 11 OF 22 FILE NO. 30101 DESIGN NO. 106

REVISED 05-04 - BARS 4b1 AND 4b3 CHANGED TO EPOXY COATED. HLXA4600.S01 - ISSUED 06-01-90

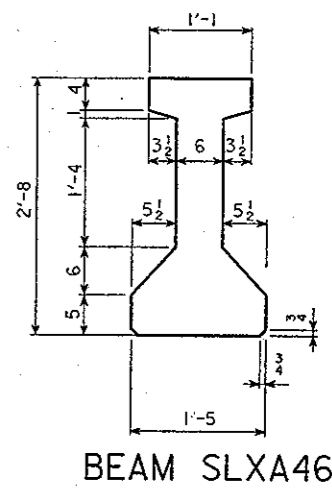


NOTE: 2" ϕ HOLES TO BE PROVIDED IN EVERY PRESTRESSED BEAM. 2" ϕ HOLES MAY BE PRODUCED WITH A REMOVABLE OR NON-REMOVABLE FORM. THEY MAY BE SHIFTED SLIGHTLY TO AVOID INTERFERENCE WITH REINFORCING.



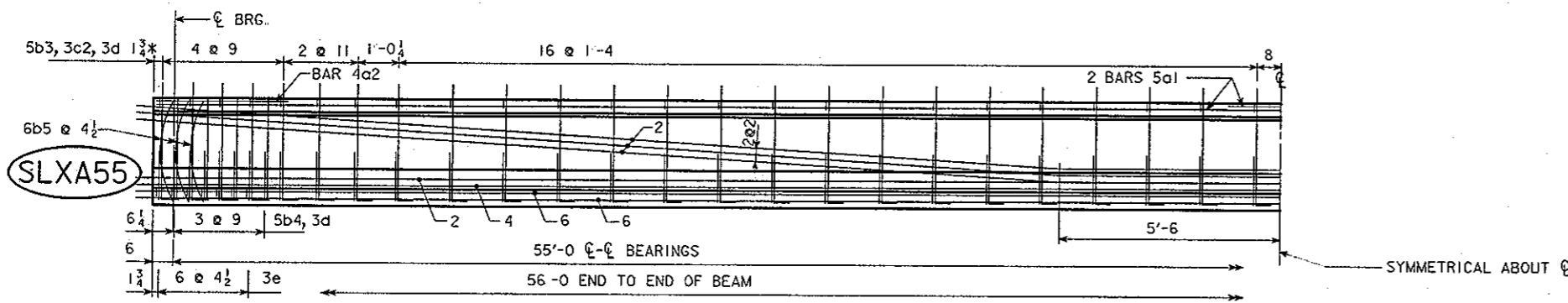
BEAM SLXA55

A = 407.5 in.²
 Y_b = 14.51 in.
 I = 42,552 in.⁴



BEAM SLXA46

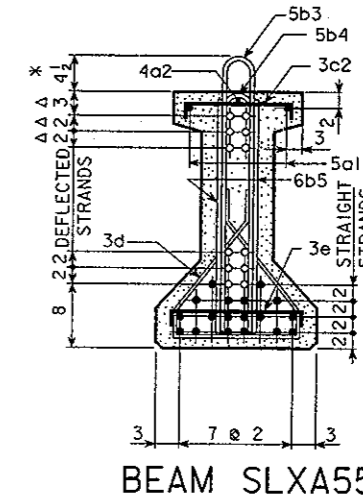
A = 311.5 in.²
 Y_b = 14.05 in.
 I = 34,082 in.⁴



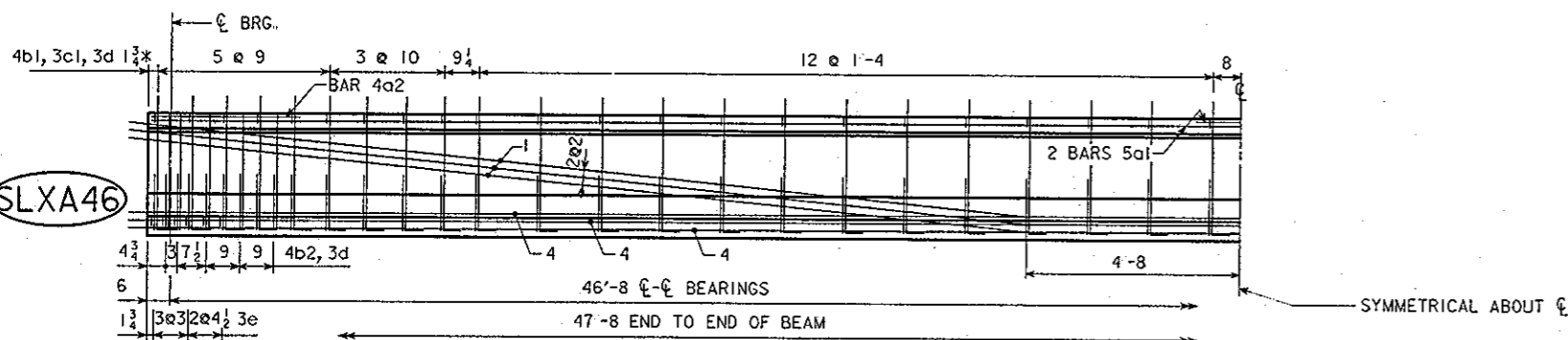
SLXA55

SYMMETRICAL ABOUT ϕ

NOTE: BARS 6b5 AND 3d ARE TO BE PLACED IN PAIRS.



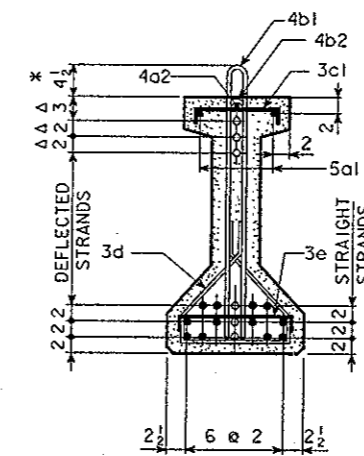
BEAM SLXA55



SLXA46

SYMMETRICAL ABOUT ϕ

○ DEFLECTED STRANDS
 * KEEP
 Δ DIMENSIONS AT END OF BEAM



BEAM SLXA46

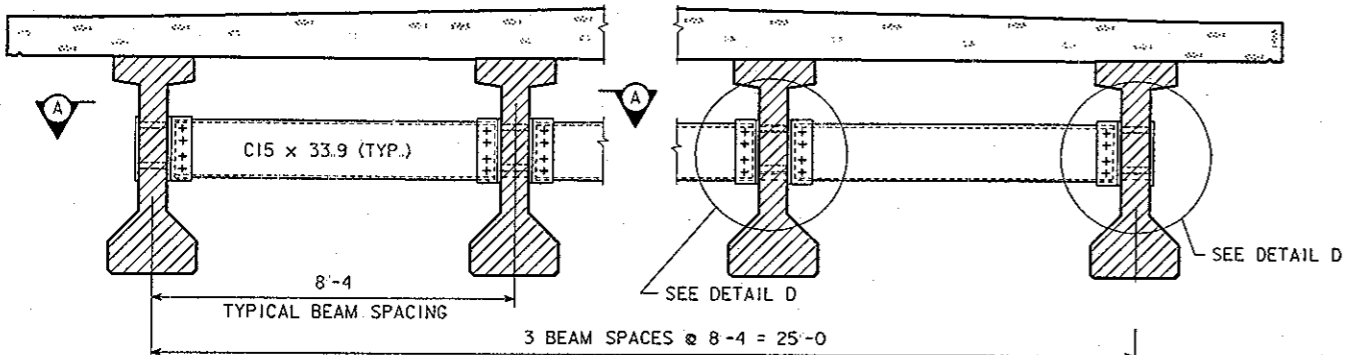
NOTE: SHEAR STIRRUPS PROJECTING OUT OF THE PRECAST CONCRETE BEAMS THAT ARE IN CONFLICT WITH THE PRECAST DECK PANEL POST-TENSIONING ANCHORAGE ZONES SHALL BE FIELD CUT.

DESIGN FOR 30° SKEW (R.A.)
151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 47'-5 END SPANS 56'-6 INTERIOR SPAN
LXA46-LXA55 BEAM DETAILS
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 12 OF 22 FILE NO. 30101 DESIGN NO. 106

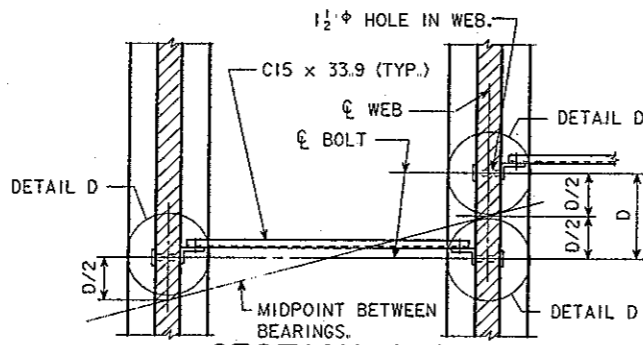
REVISED 05-04 - BARS 4b1 CHANGED TO EPOXY COATED.
 HLXA4601.S01 - ISSUED 06-01-90

9-8-88

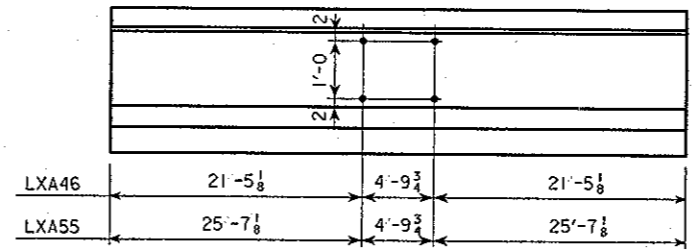
REVISED 09-03 - MINOR WASHER SIZE CHANGED. CHANGE TO NOTES ABOUT BOLT REQUIREMENTS. SEAL END OF BEAM AT STUB ABUTMENTS. DATE 02/20/06
 HE1036.S01 (HST001036.S01) - LEP: THIS SHEET REDRAWN, DEVICEZHA0:(200,004)ARCH.TAPE NO.



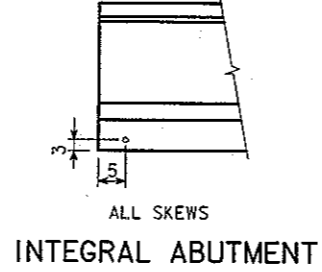
SECTION SHOWING INTERMEDIATE DIAPHRAGM



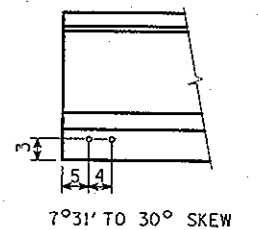
SECTION A-A FOR BRIDGES SKEWED GREATER THAN 7°30'.



INTERMEDIATE DIAPHRAGM BOLT LOCATIONS

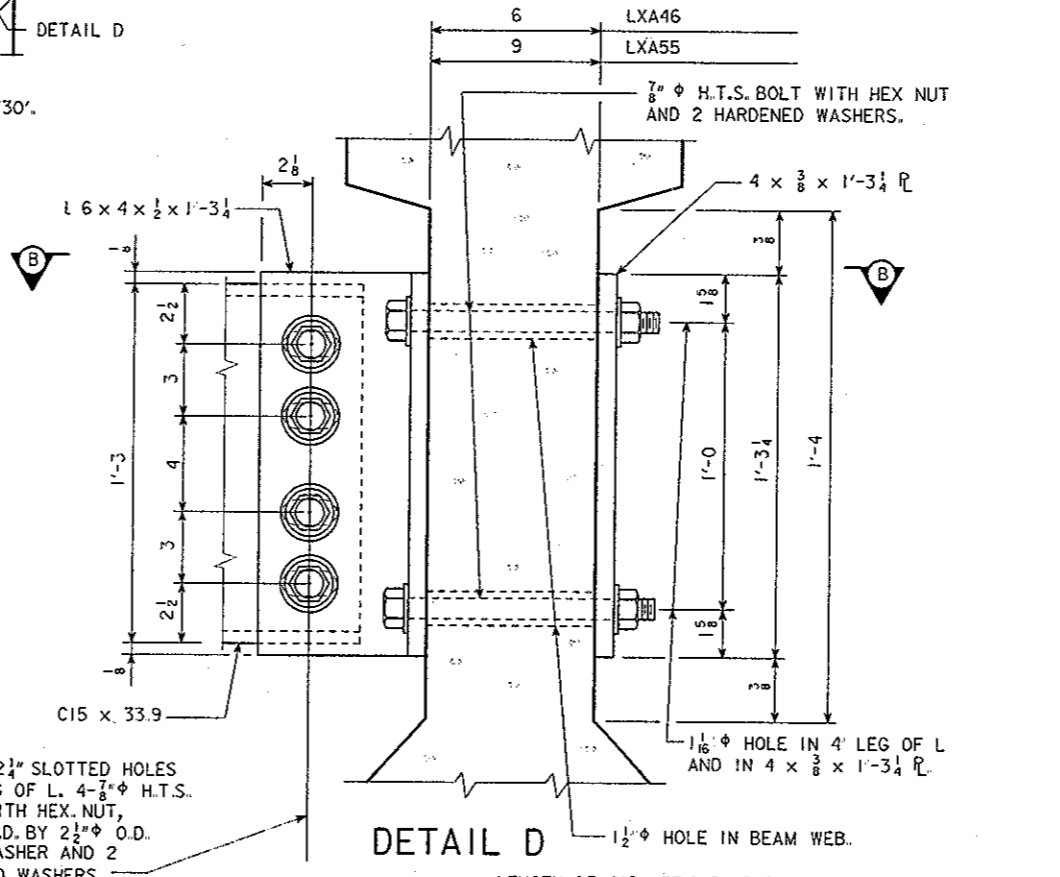


INTEGRAL ABUTMENT

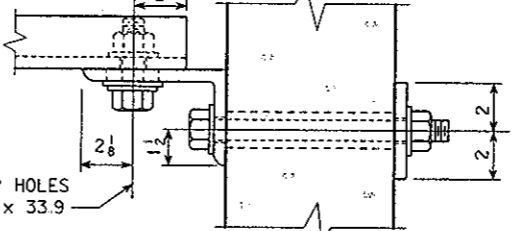


FIXED PIER

BEAM COIL TIE LOCATIONS



DETAIL D



SECTION B-B

INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL				WEIGHT
ONE CONNECTION DETAIL "D"				
2 - 7/8" x LENGTH H.T.S. BOLTS WITH NUTS AND WASHERS				
WEB THICKNESS	LENGTH OF H.T.S. BOLTS	WEIGHT PER DETAIL "D"	NUMBER OF DETAIL "D"	
6"	9"	4.30 LB	12	51.6
9"	12"	5.34 LB	6	32.0
1 - BACKING PL 4 x 3/8 x 1'-3 1/4 = 6.5 LB				18
1 - L 6 x 4 x 1/2 x 1'-3 1/4 = 20.6 LB				18
ONE C15 x 33.9 DIAPHRAGM				
BEAM SPACING	WEB THICKNESS	* LENGTH	UNIT WEIGHT (LB)	
8'-4"	6"	7'-6 5/8"	256.0	
	9"	7'-3 3/8"	247.5	
* THE LENGTH OF THE C15 x 33.9 SHOWN IN THE TABLE IS BASED ON A VARIABLE CLEARANCE OF 1 1/16" TO 2 1/16" BETWEEN THE FACE OF BEAM WEB AND END OF C15 x 33.9.				
DIAPHRAGM WEIGHTS				
UNIT WEIGHT	NUMBER OF DIAPHRAGMS			
256.0 LB	6	1536.0		
247.5 LB	3	742.5		
DIAPHRAGM CONNECTION BOLTS				
8 - 7/8" x 0'-2 3/4" H.T.S. BOLTS WITH NUTS AND WASHERS, PER UNIT DIAPHRAGM		NUMBER OF DIAPHRAGMS		
10.3 LB		9		
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL (TOTAL LB) = 2942.6				

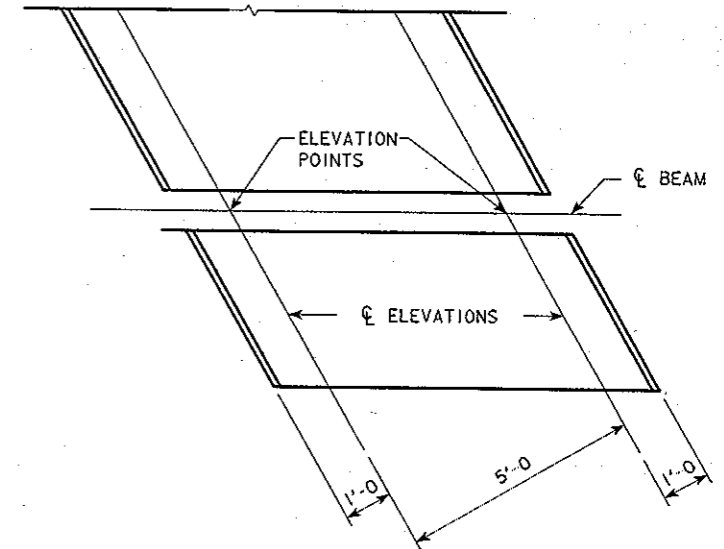
NOTES:
 ALL DIAPHRAGM MATERIALS, INCLUDING BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED.
 SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.
 ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.
 THE 1 1/2" HOLES FOR THE 7/8" H.T.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.
 THE 7/8" H.T.S. BOLTS THROUGH THE WEB SHALL HAVE A THREAD LENGTH OF 3" MIN. AND 4" MAX. AND SHALL MEET THE REQUIREMENTS OF ASTM A449.
 ALL BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING PRECAST CONCRETE DECK PANELS.

DESIGN FOR 30° SKEW (R.A.)
151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 47'-5 END SPANS 56'-6 INTERIOR SPAN
INTERMEDIATE DIAPHRAGM DETAILS
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 13 OF 22 FILE NO. 30101 DESIGN NO. 106

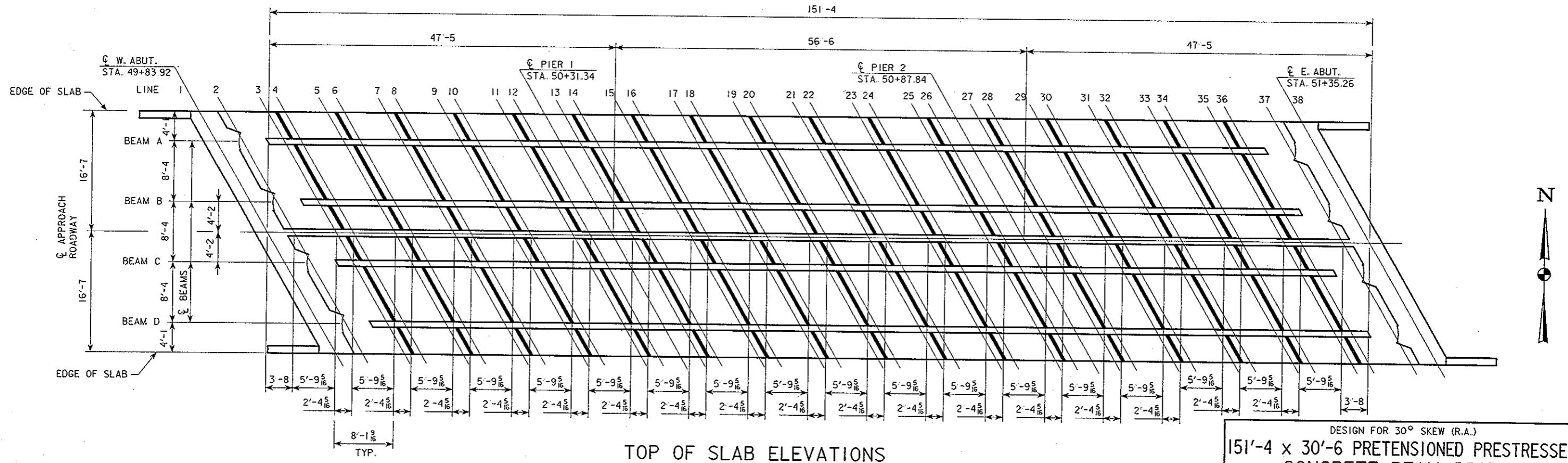
TOP OF SLAB ELEVATIONS																			
LOCATION	LINE 1	LINE 2	LINE 3	LINE 4	LINE 5	LINE 6	LINE 7	LINE 8	LINE 9	LINE 10	LINE 11	LINE 12	LINE 13	LINE 14	LINE 15	LINE 16	LINE 17	LINE 18	LINE 19
EDGE OF SLAB	984.95	984.97	984.99	985.00	985.02	985.03	985.05	985.06	985.08	985.09	985.11	985.12	985.15	985.16	985.18	985.19	985.21	985.22	985.24
BEAM LINE A	985.04	985.06	985.08	985.09	985.11	985.12	985.14	985.15	985.17	985.18	985.21	985.21	985.24	985.25	985.27	985.28	985.30	985.31	985.33
BEAM LINE B	985.23	985.24	985.26	985.27	985.30	985.30	985.33	985.34	985.36	985.37	985.39	985.40	985.42	985.43	985.45	985.46	985.49	985.49	985.52
☐ APPROACH ROADWAY	985.32	985.33	985.36	985.37	985.39	985.40	985.42	985.43	985.45	985.46	985.48	985.49	985.51	985.52	985.55	985.56	985.58	985.59	985.61
BEAM LINE C	985.25	985.26	985.28	985.29	985.31	985.32	985.35	985.36	985.38	985.39	985.41	985.42	985.44	985.45	985.47	985.48	985.50	985.51	985.54
BEAM LINE D	985.10	985.11	985.13	985.14	985.17	985.18	985.20	985.21	985.23	985.24	985.26	985.27	985.29	985.30	985.32	985.33	985.36	985.37	985.39
EDGE OF SLAB	985.03	985.04	985.06	985.07	985.09	985.10	985.13	985.13	985.16	985.17	985.19	985.20	985.22	985.23	985.25	985.26	985.28	985.29	985.32

TOP OF SLAB ELEVATIONS																			
LOCATION	LINE 20	LINE 21	LINE 22	LINE 23	LINE 24	LINE 25	LINE 26	LINE 27	LINE 28	LINE 29	LINE 30	LINE 31	LINE 32	LINE 33	LINE 34	LINE 35	LINE 36	LINE 37	LINE 38
EDGE OF SLAB	985.25	985.27	985.28	985.30	985.31	985.34	985.35	985.37	985.38	985.40	985.41	985.43	985.44	985.46	985.47	985.49	985.50	985.53	985.54
BEAM LINE A	985.34	985.36	985.37	985.40	985.40	985.43	985.44	985.46	985.47	985.49	985.50	985.52	985.53	985.55	985.56	985.58	985.59	985.62	985.63
BEAM LINE B	985.53	985.55	985.56	985.58	985.59	985.61	985.62	985.64	985.65	985.68	985.68	985.71	985.72	985.74	985.75	985.77	985.78	985.80	985.82
☐ APPROACH ROADWAY	985.62	985.64	985.65	985.67	985.68	985.70	985.71	985.74	985.75	985.77	985.78	985.80	985.81	985.83	985.84	985.86	985.87	985.89	985.91
BEAM LINE C	985.55	985.57	985.58	985.60	985.61	985.63	985.64	985.66	985.67	985.69	985.70	985.73	985.73	985.76	985.77	985.79	985.80	985.82	985.84
BEAM LINE D	985.40	985.42	985.43	985.45	985.46	985.48	985.49	985.51	985.52	985.55	985.56	985.58	985.59	985.61	985.62	985.64	985.65	985.67	985.69
EDGE OF SLAB	985.32	985.35	985.36	985.38	985.39	985.41	985.42	985.44	985.45	985.47	985.48	985.51	985.51	985.54	985.55	985.57	985.58	985.60	985.61

NOTE: DECK ELEVATIONS SHOWN ARE BASED ON THE FINAL BRIDGE DECK GRADE.

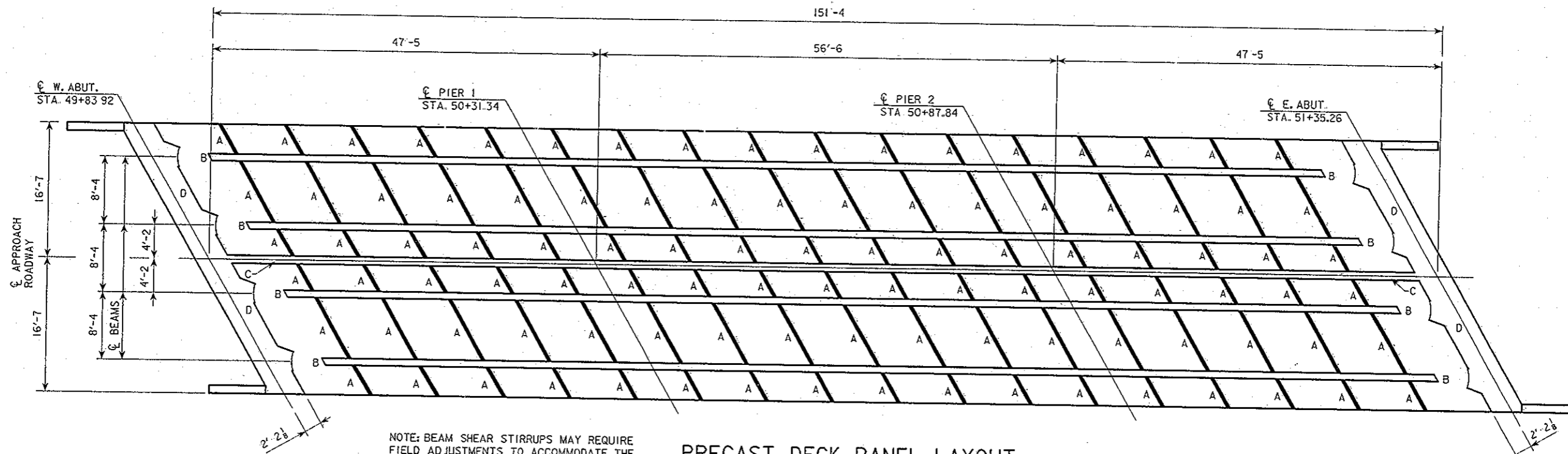


TYPICAL PANEL
(NOTE: PANEL ADJUSTMENTS MAY AFFECT HOW ELEVATIONS ARE LOCATED.)



TOP OF SLAB ELEVATIONS

DESIGN FOR 30° SKEW (R.A.)
151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 47'-5 END SPANS 56'-6 INTERIOR SPAN
TOP OF SLAB ELEVATIONS
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 14 OF 22 FILE NO. 30101 DESIGN NO. 106



NOTE: BEAM SHEAR STIRRUPS MAY REQUIRE FIELD ADJUSTMENTS TO ACCOMMODATE THE PRECAST PANELS. ALL ADJUSTMENTS SHALL BE APPROVED BY THE ENGINEER.

PRECAST DECK PANEL LAYOUT

PRESTRESSED CONCRETE DECK PANEL CONSTRUCTION SEQUENCE

- 1) ALL OF THE GIRDERS SHALL BE PLACED ON THE ENTIRE BRIDGE, PRIOR TO PLACEMENT OF DECK PANELS.
- 2) ALL OF THE PRECAST DECK PANELS SHALL BE PLACED AS SHOWN IN THE PANEL LAYOUT. CARE SHOULD BE TAKEN TO ENSURE THAT THE PANELS ARE IN TIGHT CONTACT WITH THE BACKER ROD SEPARATING THEM AND THAT PROPER ALIGNMENT AND GRADE ARE ACHIEVED.
- 3) REMOVE THE PANELS OVER THE PIERS AND POUR THE PIER DIAPHRAGMS. AFTER THE DIAPHRAGM HAS REACHED MATURITY STRENGTH REMOVE THE FORMS
- 4) REPLACE THE PANELS OVER THE PIERS.
- 5) THREAD THE 0.6" POST-TENSIONING STRANDS THROUGH THE POST-TENSIONING CHANNELS AND ANCHOR SYSTEMS. POSITION THEM AS SHOWN IN THESE PLANS.
- 6) THE TRANSVERSE JOINTS (A) SHALL BE CONCRETED LEVEL WITH THE TOPS OF THE DECK PANELS WITH THE SPECIFIED CONCRETE MIX.
- 7) ALLOW CONCRETE TO ATTAIN A COMPRESSIVE STRENGTH OF 4000 PSI BEFORE PROGRESSING.
- 8) BEGINNING AT EITHER END OF THE DECK, TENSION TWO OF THE INNERMOST STRANDS IN EACH POST-TENSIONING CHANNEL, TO THE SPECIFIED FORCE.
- 9) REPEAT STEP EIGHT, TENSIONING FROM THE CENTROID OF THE STRAND PATTERN OUTWARD IN BOTH HORIZONTAL DIRECTIONS, SO AS TO MAINTAIN SYMMETRY DURING THE POST-TENSIONING OPERATION. REPEAT UNTIL ALL OF THE STRANDS AT ONE END OF THE DECK HAVE BEEN TENSIONED.
- 10) RE-TENSION ALL STRANDS AT THE OPPOSITE END OF THE DECK TO THE REQUIRED FORCE.
- 11) FILL ALL VOIDS (B) IN THE POST-TENSIONING CHANNELS WITH THE SPECIFIED CONCRETE MIX.
- 12) FILL THE LONGITUDINAL CLOSURE POUR (C). (STEP 11 AND STEP 12 CAN BE COMBINED)
- 13) POUR THE REMAINING DECK ENDS AND ABUTMENTS (D).
- 14) GRIND UP TO 1/4" FROM THE TOP LAYER OF DECK TO REDUCE VALLEYS AND CRESTS, CAUSED BY THE CONCRETE.
- 15) PLACE BARRIER RAIL POSTS AND RAILS.

PRECAST DECK PANEL NOTES:

FABRICATOR SHALL BE RESPONSIBLE FOR EXERCISING EXTREME CARE IN LIFTING, HANDLING, STORING, AND TRANSPORTATION OF THE PRESTRESS DECK PANELS TO PREVENT CRACKING OR DAMAGE. PANELS SHALL BE LIFTED BY DEVICES AT THE GIRDER LINES, DESIGNED BY THE FABRICATOR.

PRETENSIONING STRAND FOR THE PRECAST PANELS SHALL BE UNCOATED, SEVEN-WIRE, LOW-RELAXATION STEEL STRAND OF 1/2" NOMINAL DIAMETER AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A416, GRADE 270. STRANDS SHALL BE TENSIONED TO 31 KIPS BEFORE RELEASE, UNLESS SPECIFIED OTHERWISE. ALL METHODS EMPLOYED AND PROCEDURES TO BE FOLLOWED IN TENSIONING THE STRANDS SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL. THE METHOD CHOSEN SHALL BE EXECUTED IN A MANNER TO ASSURE THAT BOTH ENDS OF ALL STRANDS IN THE PANEL ARE UNIFORMLY TENSIONED. THE PRESTRESSED STRAND SHALL BE RELEASED IN A MANNER THAT WILL MINIMIZE ECCENTRICITY.

POST-TENSIONING STRAND SHALL BE UNCOATED, SEVEN-WIRE, LOW-RELAXATION STEEL STRAND OF 0.6" NOMINAL DIAMETER, AND SHALL CONFORM TO THE REQUIREMENTS OF ASTM A416, GRADE 270. STRANDS SHALL BE TENSIONED TO 41.0 KIPS BEFORE RELEASE, UNLESS OTHERWISE SPECIFIED. ALL METHODS EMPLOYED AND PROCEDURES TO BE FOLLOWED IN POST-TENSIONING THE STRANDS SHALL BE SUBJECT TO THE ENGINEER'S APPROVAL. THE METHOD CHOSEN SHALL BE EXECUTED IN A MANNER TO ASSURE THAT BOTH ENDS OF ALL STRANDS IN THE PANEL ARE UNIFORMLY TENSIONED. THE POST-TENSIONING STRAND SHALL BE RELEASED IN A MANNER THAT WILL MINIMIZE ECCENTRICITY.

END ANCHORAGES TO BE APPROVED BY THE ENGINEER.

CONCRETE IN THE PANELS SHALL HAVE CONCRETE STRENGTHS AT STRESS TRANSFER OF 4000 PSI AND AT 28 DAYS OF 6000 PSI. NO BOND STRESS SHALL BE TRANSFERRED TO THE CONCRETE NOR THE END ANCHORAGE RELEASED UNTIL THE CONCRETE HAS ATTAINED THE SPECIFIED STRENGTH.

SPIRALS SHALL BE 1/4" DIAMETER HIGH CARBON SPRING WIRE AND CONFORM TO THE REQUIREMENTS OF ASTM A227.

STRANDS AT PANEL ENDS SHALL BE REMOVED TO A DEPTH OF 1 INCH INSIDE THE PANEL EDGE. THE RESULTING POCKET SHALL BE GROUTED WITH HIGH STRENGTH, NON-SHRINK GROUT.

REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION A615 GRADE 60. BLACK STEEL REINFORCING BAR SHALL BE USED FOR THE PRECAST PANELS.

LONGITUDINAL GROOVING NOTES:

ESTABLISHMENT OF LONGITUDINAL GROOVING IN CONCRETE;

LONGITUDINAL GROOVING SHALL BE DONE WITH A MECHANICAL CUTTING DEVICE INTO THE HARDENED CONCRETE. EACH GROOVE SHALL BE 1/8 INCH ± 1/64 INCH IN WIDTH, 1/8 INCH ± 1/16 INCH IN DEPTH, AND UNIFORMLY SPACED AT 3/4 INCH INTERVALS. LONGITUDINAL GROOVING SHALL NOT BE WITHIN THE AREA APPROXIMATELY 2 FOOT FROM THE CURBS.

METHOD OF MEASURE AND BASIS OF PAVEMENT;

THE QUANTITY OF LONGITUDINAL GROOVING IN CONCRETE, IN SQUARE YARDS, WILL BE THE QUANTITY SHOWN IN THE CONTRACT DOCUMENTS.

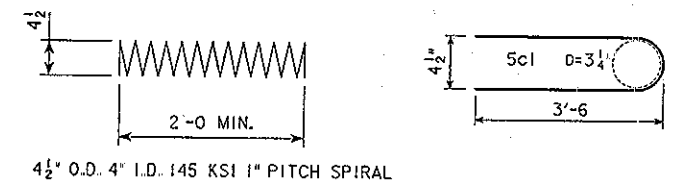
THE CONTRACTOR WILL BE PAID THE CONTRACT UNIT PRICE FOR LONGITUDINAL GROOVING IN CONCRETE PER SQUARE YARD.

DESIGN FOR 30° SKEW (R.A.)	
151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE	
47'-5 END SPANS	56'-6 INTERIOR SPAN
DECK PANEL DETAILS	
STATION: 50+59.59	FEBRUARY, 2006
BOONE COUNTY	
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION	
DESIGN SHEET NO. 15 OF 22	FILE NO. 30101
DESIGN NO. 106	

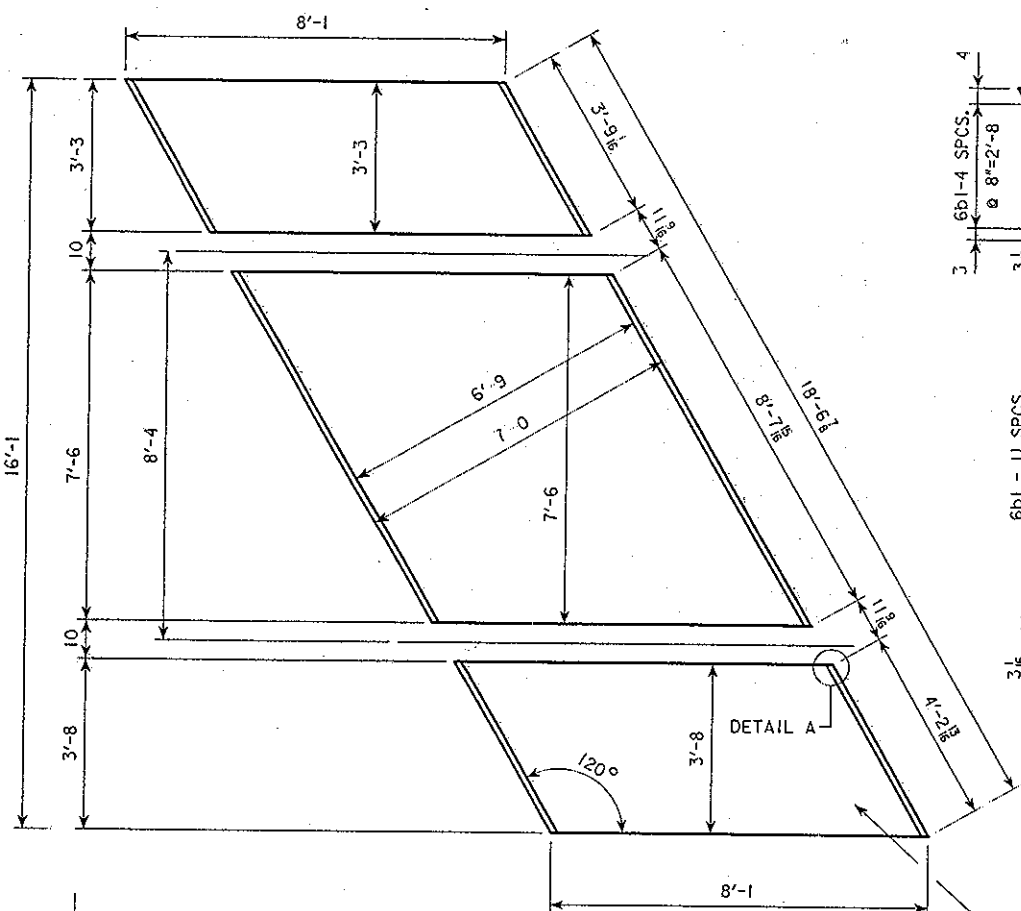
REINFORCING BAR LIST- ONE INTERIOR PANEL

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT		
7a1	TRANSVERSE PANEL	—	16	18'-1	592		
6b1	LONGITUDINAL PANEL	—	23	7'-0	242		
7b3	BARRIER RAIL PANEL STEEL	—	3	3'-0	19		
5c1	CLOSURE POUR HOOKS	U	16	7'-5	124		
1/2" ϕ PRESTRESSED STRANDS 270 KSI-LL					8	18'-4	78
4 1/2" O.D. 4" I.D. 145 KSI 1" PITCH SPIRAL					8	27'-4	228
TOTAL (LBS.)					1283		

BENT BAR DETAILS

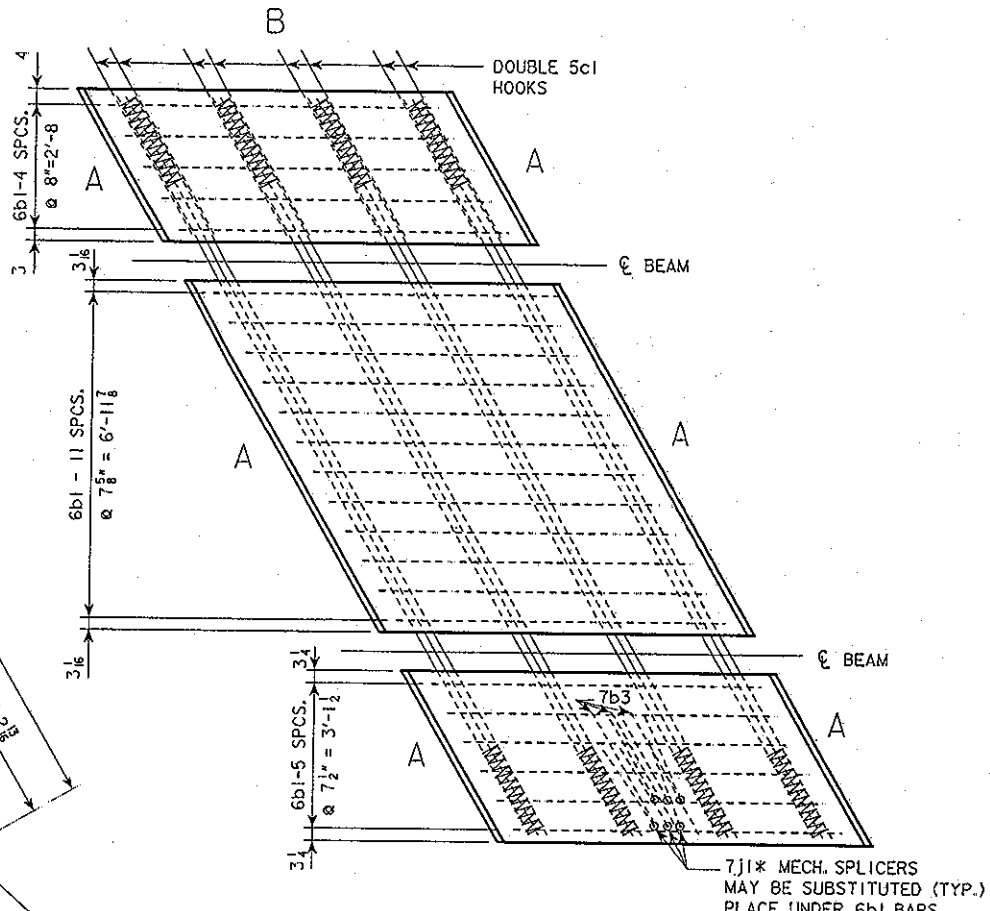


NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.



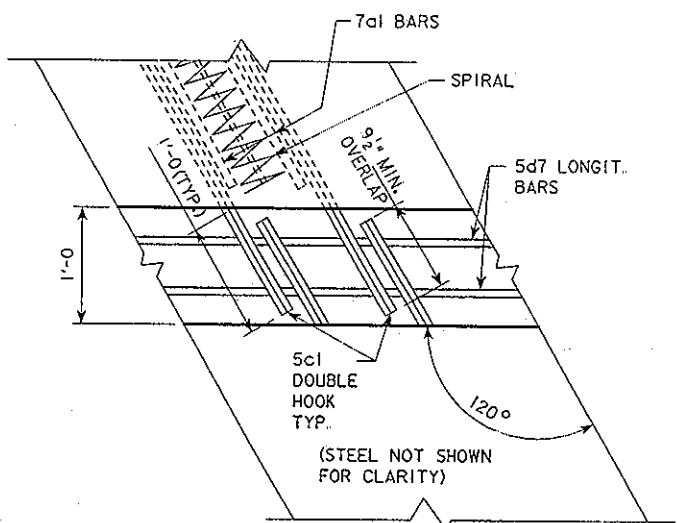
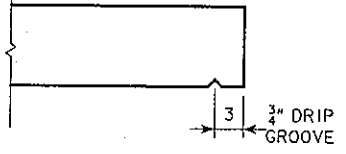
PLAN VIEW OF PANEL

PANEL SURFACE SHOULD BE ROUGHENED FOR USE AS FINAL DRIVING SURFACE (TYP).



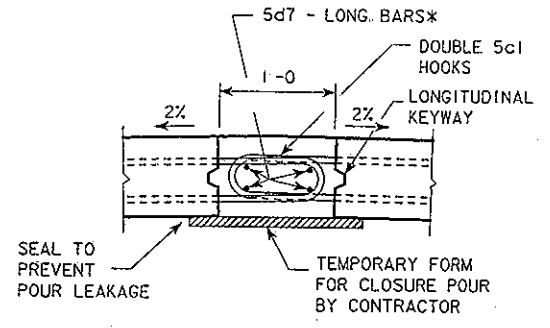
PLAN VIEW OF PANEL

DRIP EDGE

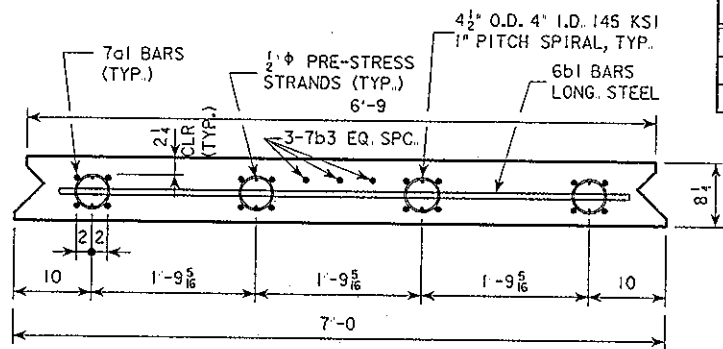


TYPICAL LONGITUDINAL CLOSURE POUR - DETAIL SIDE "B"

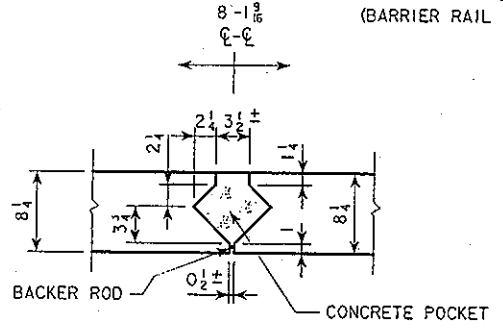
TYPICAL EDGE SIDE "B" LONGITUDINAL CLOSURE POUR



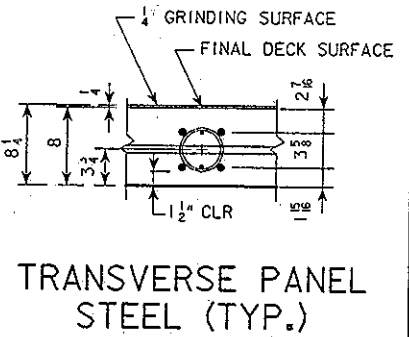
NOTE: THE MANUFACTURER SHALL OFFSET THE PLACEMENT OF THE 5c1 HOOKS BETWEEN THE TWO HALVES OF THE DECK TO AVOID CLOSURE POUR INTERFERENCE. THE HOOKS SHALL BE PLACED UP TO A MAXIMUM OF 5' IN. AWAY FROM THE 7a1 TRANSVERSE BARS.
*5d7 BARS ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.



END VIEW (BARRIER RAIL BARS 7J1 NOT SHOWN FOR CLARITY)



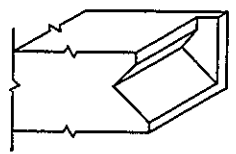
TYPICAL TRANSVERSE EDGE SIDE "A"



TRANSVERSE PANEL STEEL (TYP.)

INTERIOR PANEL CONC. QUANT.

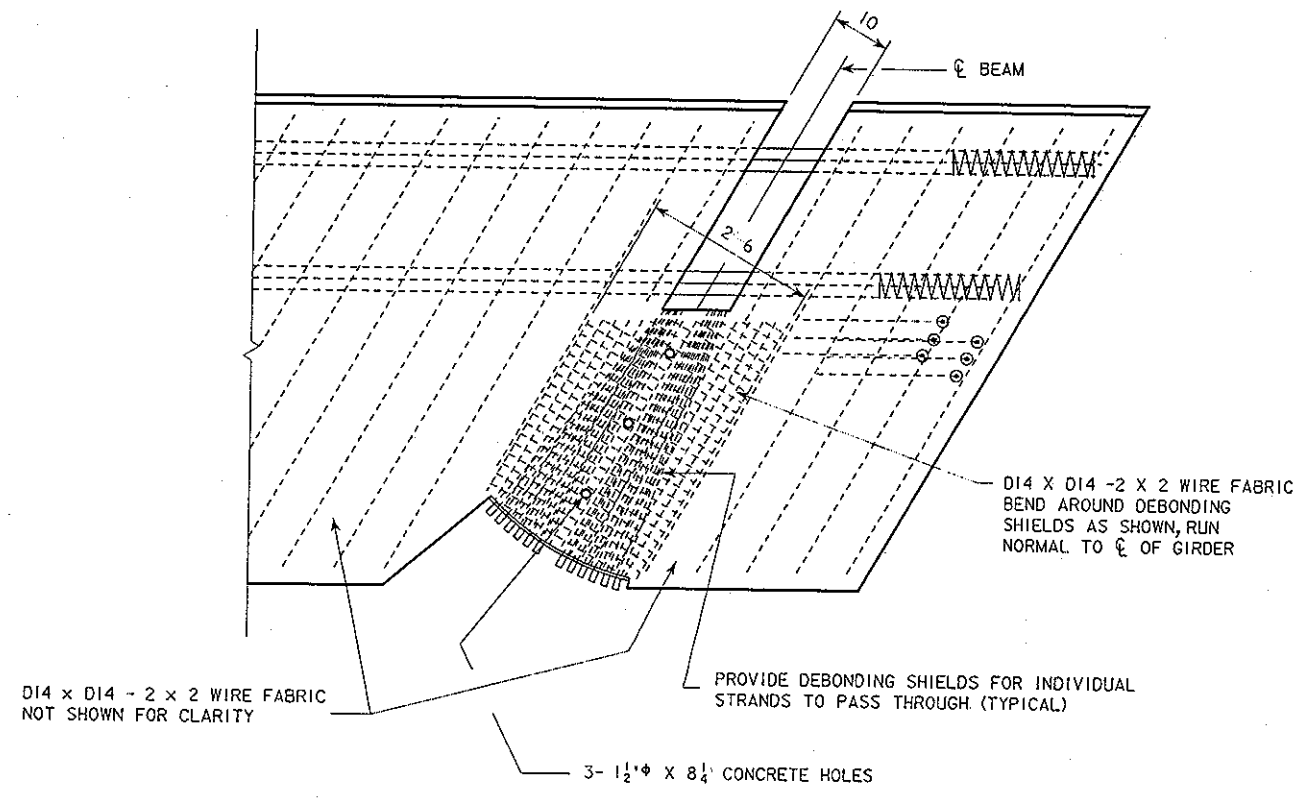
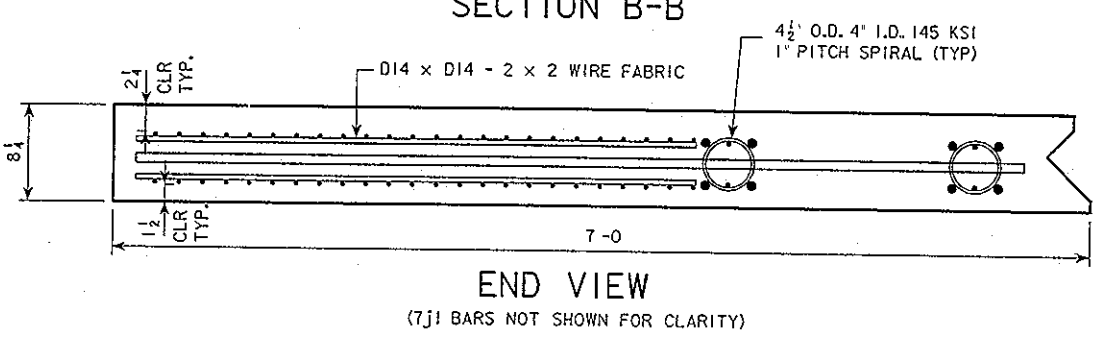
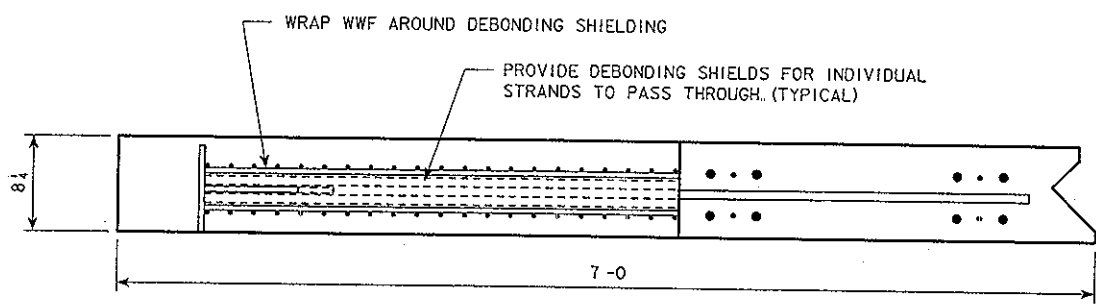
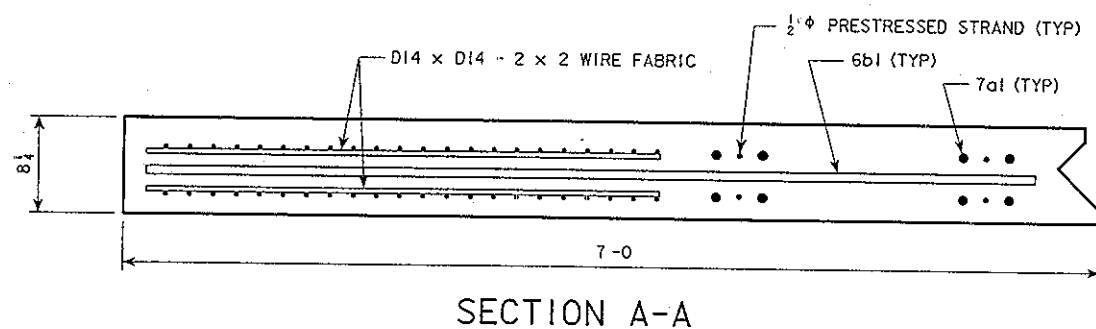
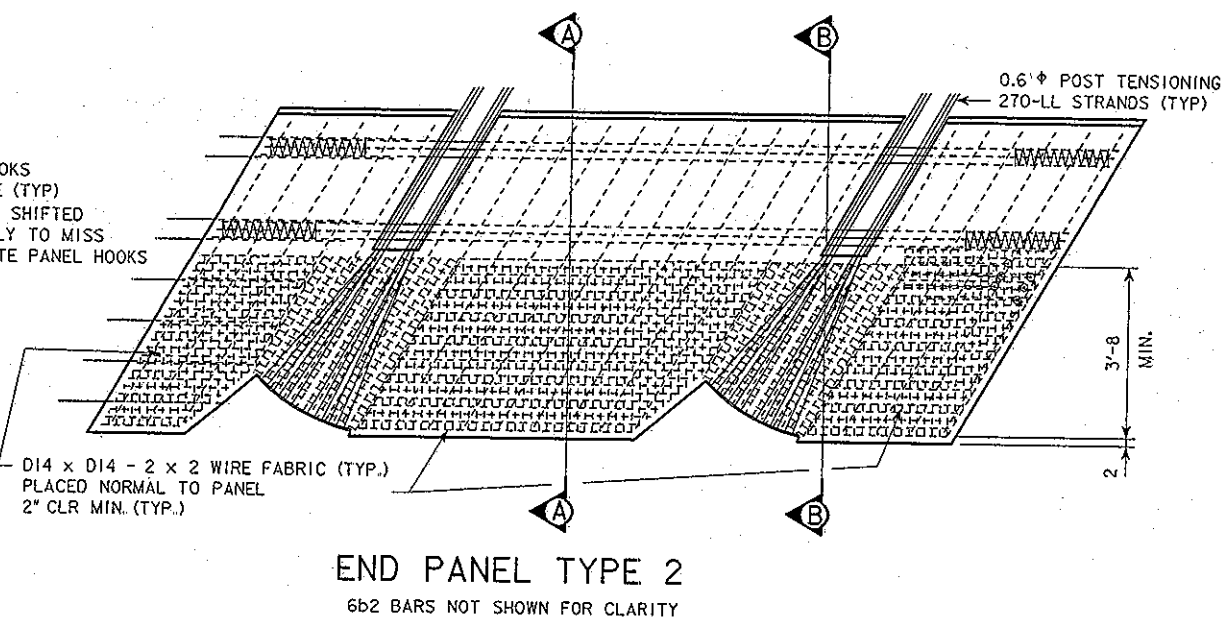
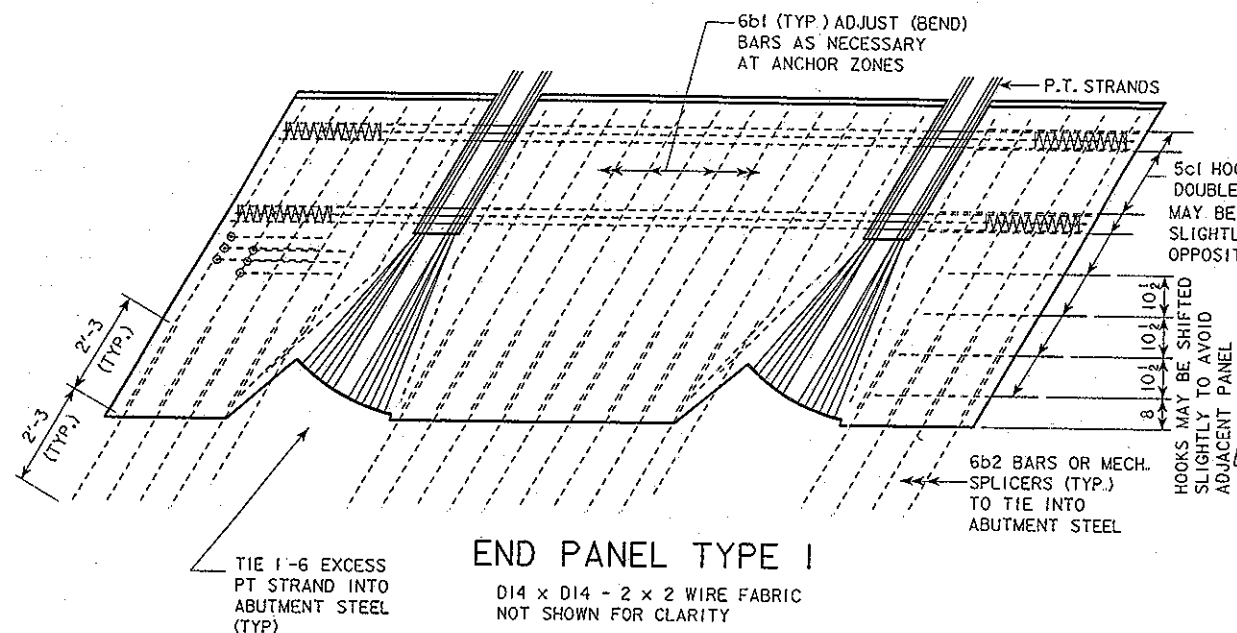
CONCRETE	TOTAL
ONE INTERIOR PANEL	2.9
TOTAL (CY)	2.9



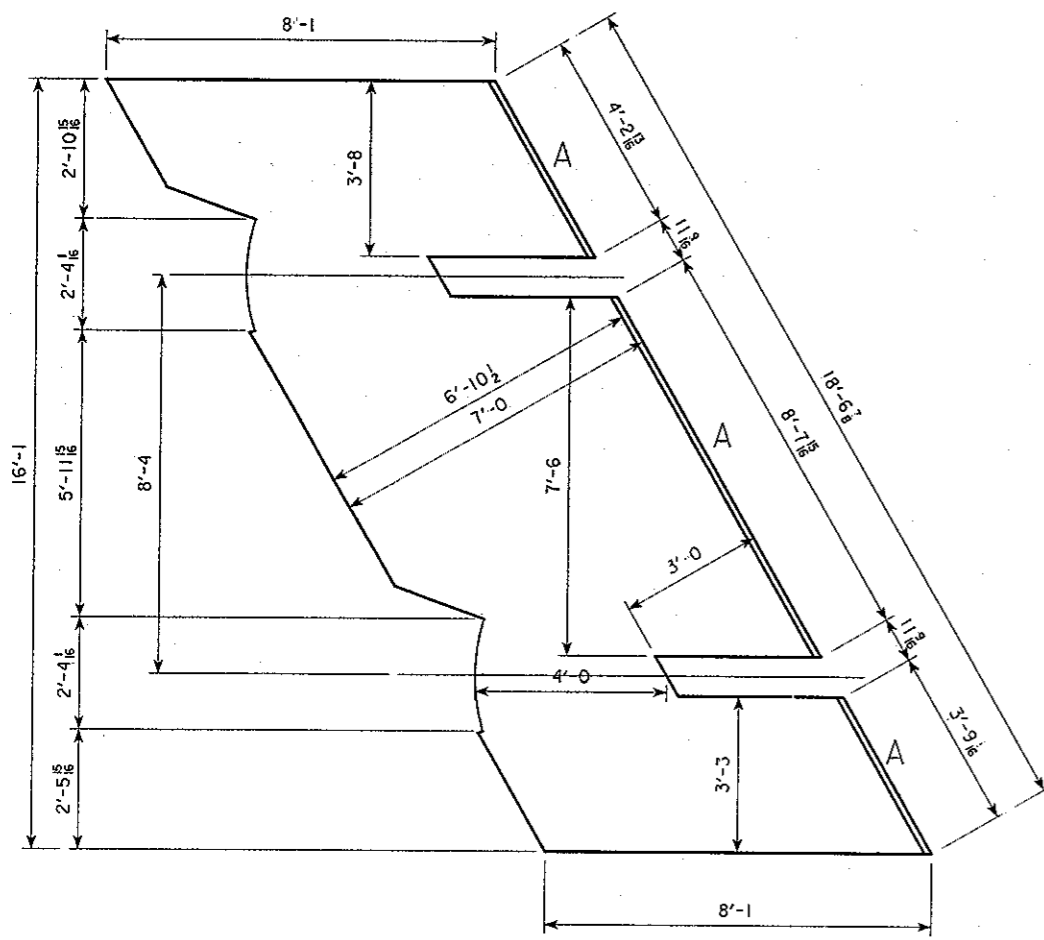
DETAIL A

NOTE: TO PREVENT TRANSVERSE CONCRETE LEAKAGE DURING CONSTRUCTION, THE PRECAST MANUFACTURER CAN USE DETAIL A ON ALL CORNERS OF THE PANEL. OTHERWISE THE CONTRACTOR IS REQUIRED TO BLOCK THE ENDS OF THE PANEL, TO PREVENT TRANSVERSE CONCRETE LEAKAGE DURING CONSTRUCTION.

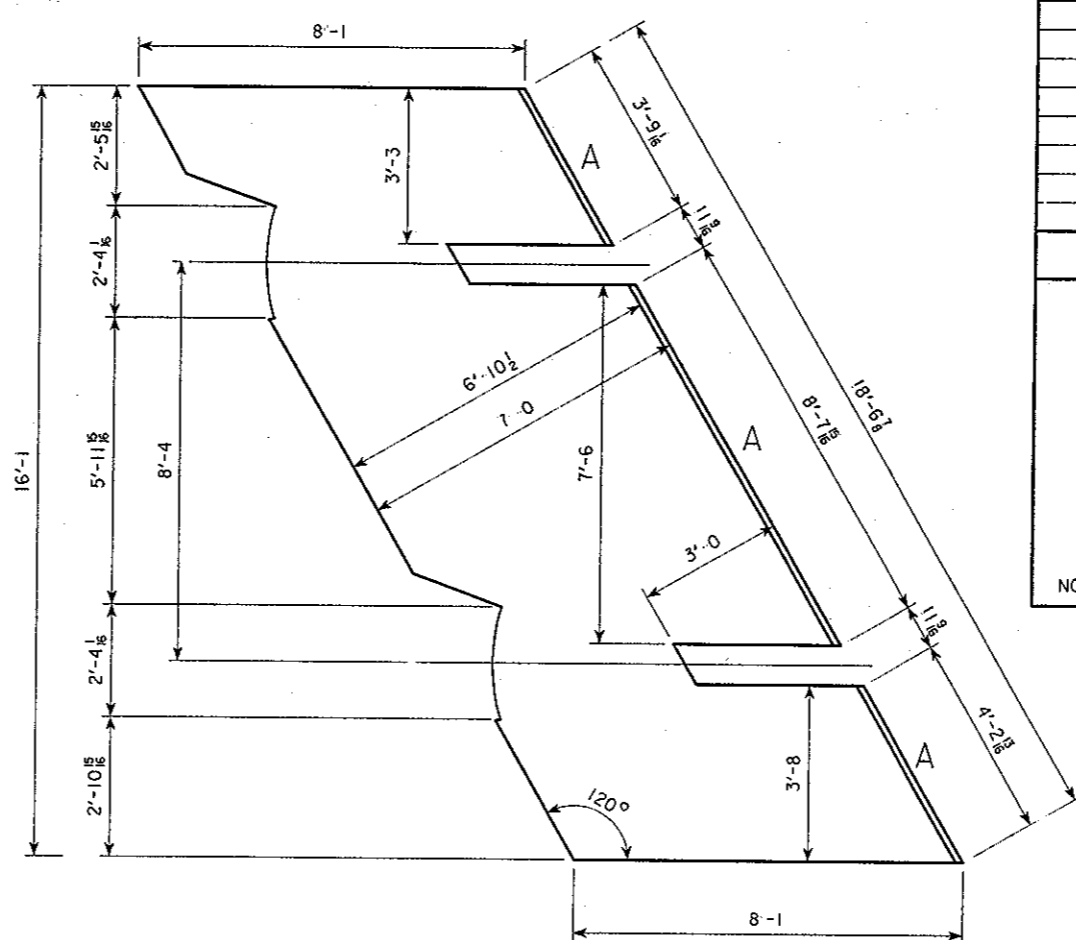
DESIGN FOR 30° SKEW (R.A.)
151'-4 x 30'-6 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 47'-5 END SPANS 56'-6 INTERIOR SPAN
DECK PANEL DETAILS
 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 16 OF 22 FILE NO. 30101 DESIGN NO. 106



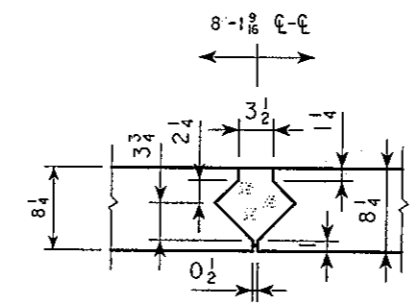
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END PANEL TYPE 1



END PANEL TYPE 2



TYPICAL EDGE SIDE "A"

REINFORCING BAR LIST - ONE END PANEL					
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
7a1	TRANSVERSE PANEL	—	8	18'-1	296
6b1	LONGITUDINAL PANEL	—	23	7'-4	253
6b2	ABUTMENT TIE-IN STEEL	—	19	4'-6	128
5c1	CLOSURE POUR HOOKS	U	16	7'-5	124
1/2" PH PRESTRESSED STRANDS 270 KSI-LL		—	4	18'-4	39
4 1/2" O.D. 4" I.D. 145 KSI 1" PITCH SPIRAL		—	4	27'-4	114
D14 X D14-2X2 WELDED WIRE REINFORCEMENT		—		124 SF	732
REINFORCING STEEL - TOTAL (LBS.)					1686

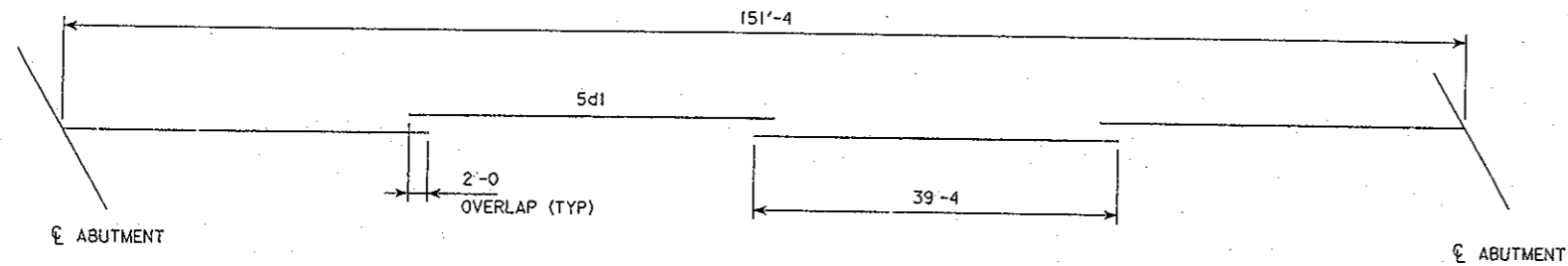
BENT BAR DETAILS

4 1/2" O.D. 4" I.D. 145 KSI 1" PITCH SPIRAL

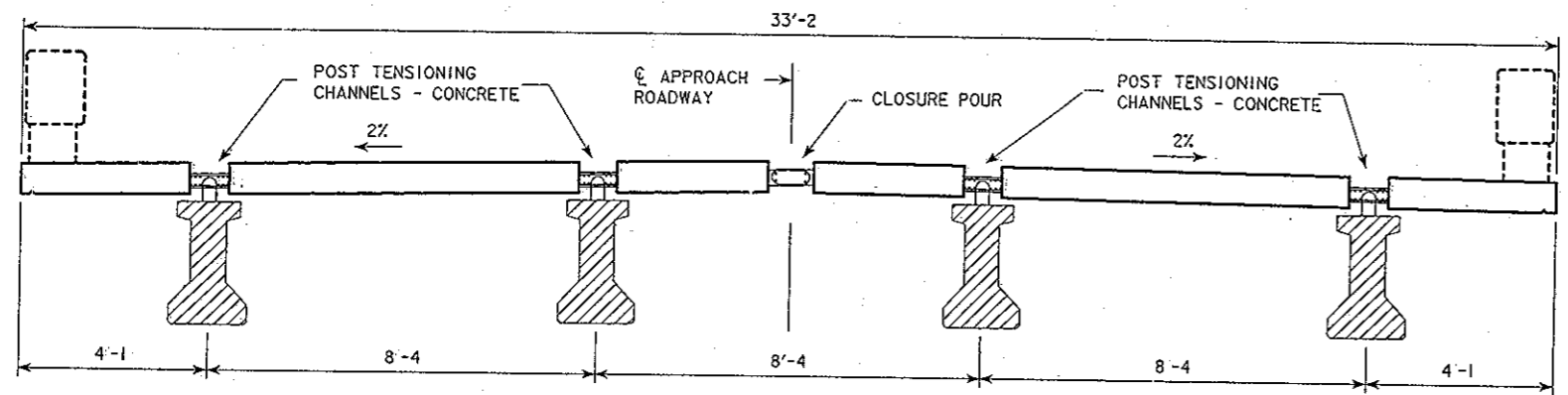
NOTE: ALL DIMENSIONS ARE OUT TO OUT. D=PIN DIAMETER.

END PANEL CONC. QUANT.	
CONCRETE	TOTAL
ONE END PANEL	3.0
TOTAL (CY)	3.0

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 DESIGN SHEET NO. 18 OF 22 FILE NO. 30101 DESIGN NO. 106

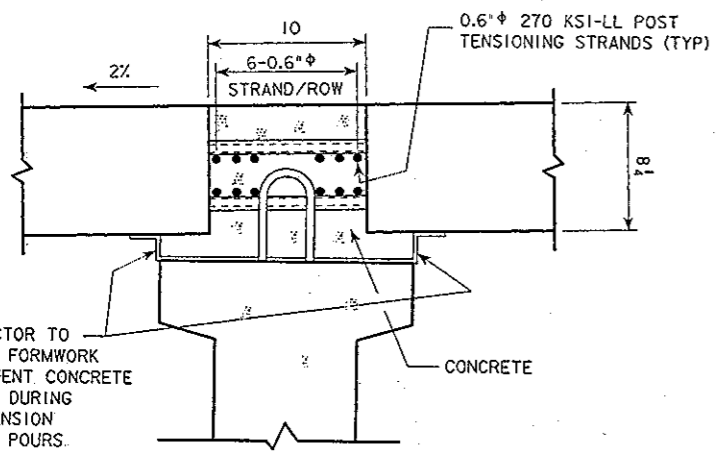


LONGITUDINAL CLOSURE POUR BARS



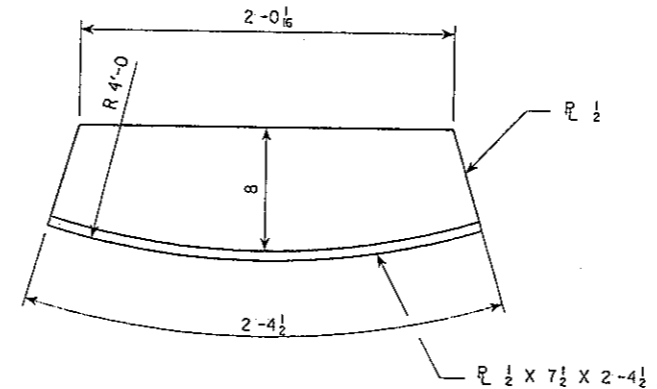
PANEL LAYOUT

(BARRIER RAILS INSTALLED AFTER P.T. GROUTING AND LONGITUDINAL CLOSURE POUR)

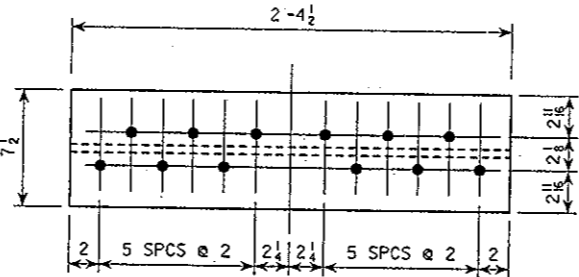


PRECAST DECK PANEL POST-TENSIONING CHANNEL

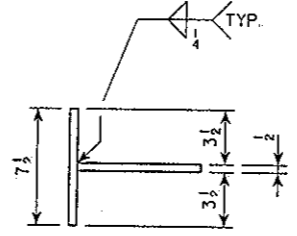
CONTRACTOR TO PROVIDE FORMWORK TO PREVENT CONCRETE LEAKAGE DURING POST TENSION CHANNEL POURS.



PANEL ANCHOR SYSTEM



NOTE: LOCATIONS OF ANCHOR HOLES MAY REQUIRE ADJUSTMENT DEPENDING ON THE FINAL ANCHORAGE SYSTEM CHOSEN BY THE CONTRACTOR. ANY CHANGES SHALL BE APPROVED BY THE ENGINEER.



NOTES:

CONTRACTOR SHALL USE MANUFACTURING RECOMMENDED POST-TENSIONING MATERIALS, EQUIPMENT AND INSTALLATION GUIDELINES FOR THE POST TENSIONING OPERATIONS.

LEVELING DEVICES, DESIGNED BY THE CONTRACTOR, SHALL BE USED ON EACH PRECAST PANEL, AND SHALL BE APPROVED BY THE ENGINEER.

PLATES SHALL MEET THE REQUIREMENTS OF ASTM A709 GRADE 36. ALL PLATES SHALL BE GALVANIZED. GALVANIZING SHALL BE IN ACCORDANCE WITH ARTICLE 4100.07 OF THE STANDARD SPECIFICATIONS.

MATERIAL, INSTALLATION AND MANUFACTURING OF ALL COMPONENTS OF THE LEVELING DEVICES WILL BE CONSIDERED INCIDENTAL TO THE COSTS OF THE PRECAST PANELS.

THE LEVELING DEVICES SHALL BE TESTED ON THE FIRST PANEL PRODUCED, IN THE MANUFACTURER'S SHOP, BEFORE PROCEEDING TO THE FIELD INSTALLATION. NOTE THE PANELS WILL BE ON A 2% GRADE IN THE FIELD AND THE LEVELING DEVICES SHOULD BE CHECKED FOR SLIPPAGE AT THIS ANGLE.

LEVEL DEVICES MAY BE LEFT IN PLACE AND COVERED BY CONCRETE.

THE CONCRETE USED TO FILL THE TRANSVERSE JOINTS, LONGITUDINAL TENSIONING CHANNELS AND LONGITUDINAL CLOSURE POUR SHALL BE A CLASS 0-4WR, WITH THE FOLLOWING REQUIREMENTS:

MAXIMUM TOP SIZE OF AGGREGATE SHALL BE 3/8".
 35% REPLACEMENT WITH GGBFS.
 MAXIMUM WATER CEMENT RATIO OF 0.38.
 THE SLUMP SHALL BE A MAXIMUM OF 3 INCHES AT THE PLANT AND A MID RANGE OR HIGH RANGE WATER REDUCER SHALL BE ADDED AT THE SITE.
 THE MAXIMUM SLUMP FOR A MID RANGE WATER REDUCER SHALL BE 6 INCHES AND THE MAXIMUM SLUMP FOR A HIGH RANGE WATER REDUCER SHALL BE 8 INCHES.
 CONCRETE TEMPERATURE AT PLACEMENT SHALL BE A MINIMUM OF 70 F.

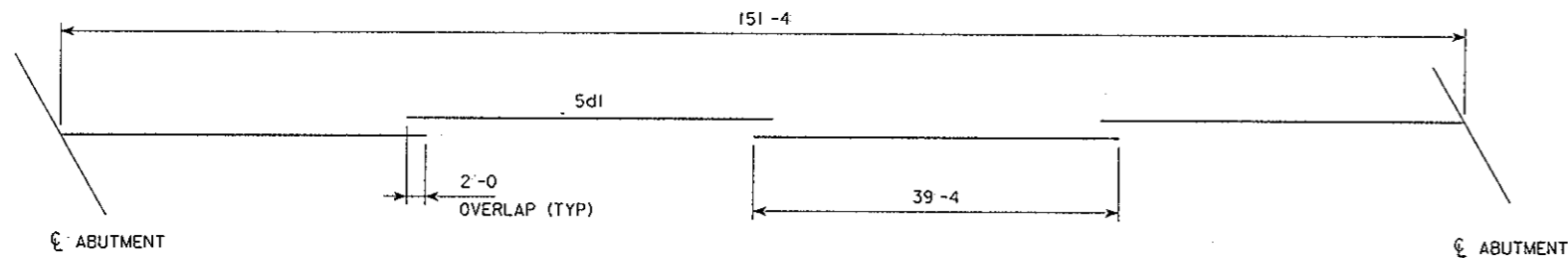
THE MAXIMUM EVAPORATION RATE SHALL BE 0.1 PERCENT. WET BURLAP CURING SHALL BE PLACED IMMEDIATELY AFTER FINISHING AND COVERED WITH PLASTIC. CURING SHALL REMAIN IN PLACE AND KEPT WET UNTIL THE SPECIFIED STRENGTH IS REACHED. TEMPERATURES WILL BE MONITORED BY THE DISTRICT MATERIALS ENGINEER AND INSULATING BLANKETS MAY BE REQUIRED TO MAINTAIN TEMPERATURE.

OTHER MIXES MAY BE CONSIDERED PROVIDED THEY HAVE BEEN REVIEWED AND APPROVED BY THE DISTRICT MATERIALS ENGINEER.

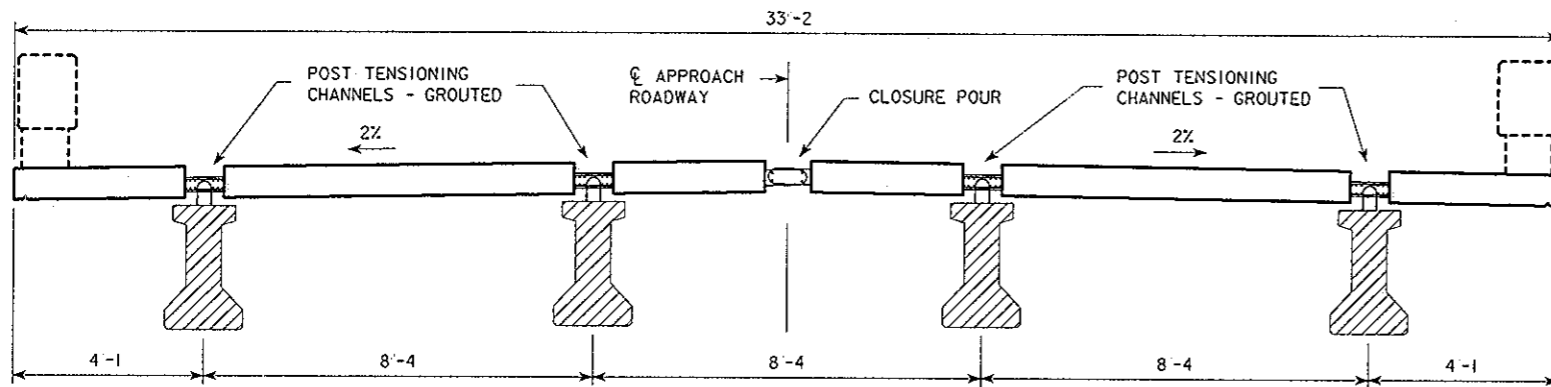
SIDES OF THE PANELS SHALL BE SANDBLASTED BY THE FABRICATOR.

DISTRICT MATERIALS WILL PROVIDE COMPRESSIVE STRENGTH TESTING OF THE CONCRETE USED TO FILL THE TRANSVERSE AND LONGITUDINAL JOINTS. DISTRICT MATERIALS WILL SURE CURE THE CYLINDERS WITH THE ELEMENTS. POST TENSIONING SHALL NOT COMMENCE UNTIL THE CONCRETE IN THE TRANSVERSE JOINTS HAS REACHED 4000 PSI COMPRESSIVE STRENGTH. NO EQUIPMENT SHALL BE PLACED ON THE DECK UNTIL THE CONCRETE IN THE JOINTS HAS REACHED 6000 PSI.

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 STATION: 50+59.59 FEBRUARY, 2006
BOONE COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 19 OF 22 FILE NO. 30101 DESIGN NO. 106



LONGITUDINAL CLOSURE POUR BARS



PANEL LAYOUT

(BARRIER RAILS INSTALLED AFTER P.T. GROUTING AND LONGITUDINAL CLOSURE POUR)

NOTES:

CONTRACTOR SHALL USE MANUFACTURING RECOMMENDED POST-TENSIONING MATERIALS, EQUIPMENT AND INSTALLATION GUIDELINES FOR THE POST TENSIONING OPERATIONS.

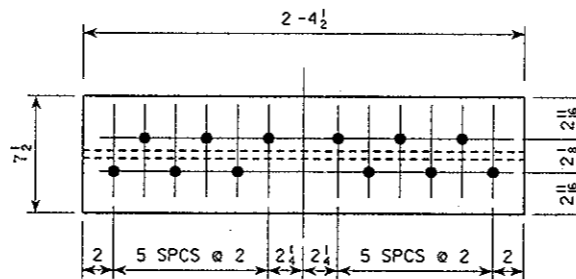
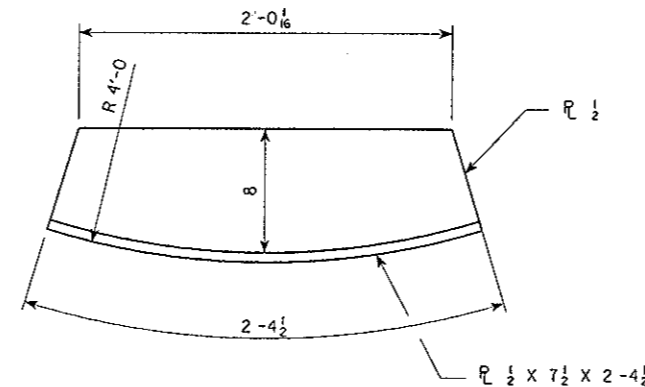
LEVELING DEVICES, DESIGNED BY THE CONTRACTOR, SHALL BE USED ON EACH PRECAST PANEL, AND SHALL BE APPROVED BY THE ENGINEER.

PLATES SHALL MEET THE REQUIREMENTS OF ASTM A709 GRADE 36. ALL PLATES SHALL BE GALVANIZED. GALVANIZING SHALL BE IN ACCORDANCE WITH ARTICLE 4100.07 OF THE STANDARD SPECIFICATIONS.

MATERIAL, INSTALLATION AND MANUFACTURING OF ALL COMPONENTS OF THE LEVELING DEVICES WILL BE CONSIDERED INCIDENTAL TO THE COSTS OF THE PRECAST PANELS.

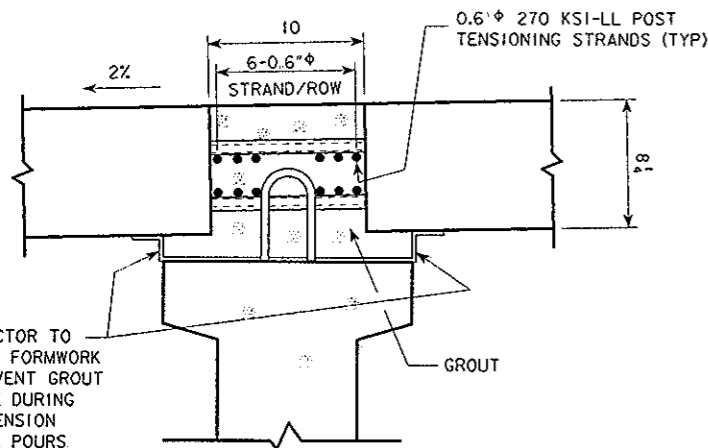
THE LEVELING DEVICES SHALL BE TESTED ON THE FIRST PANEL PRODUCED, IN THE MANUFACTURER'S SHOP, BEFORE PROCEEDING TO THE FIELD INSTALLATION. NOTE THE PANELS WILL BE ON A 2% GRADE IN THE FIELD AND THE LEVELING DEVICES SHOULD BE CHECKED FOR SLIPPAGE AT THIS ANGLE.

LEVEL DEVICES MAY BE LEFT IN PLACE AND COVERED BY GROUT.

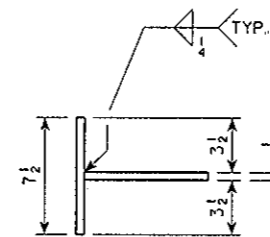


PANEL ANCHOR SYSTEM

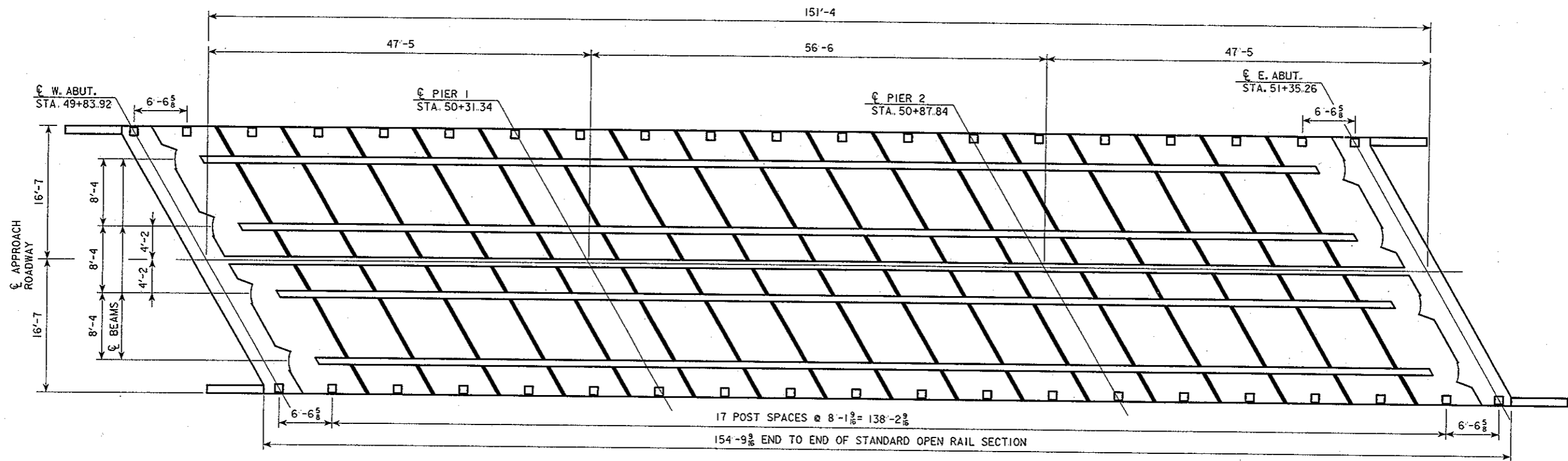
NOTE:
LOCATIONS OF ANCHOR HOLES MAY REQUIRE ADJUSTMENT DEPENDING ON THE FINAL ANCHORAGE SYSTEM CHOSEN BY THE CONTRACTOR, ANY CHANGES SHALL BE APPROVED BY THE ENGINEER



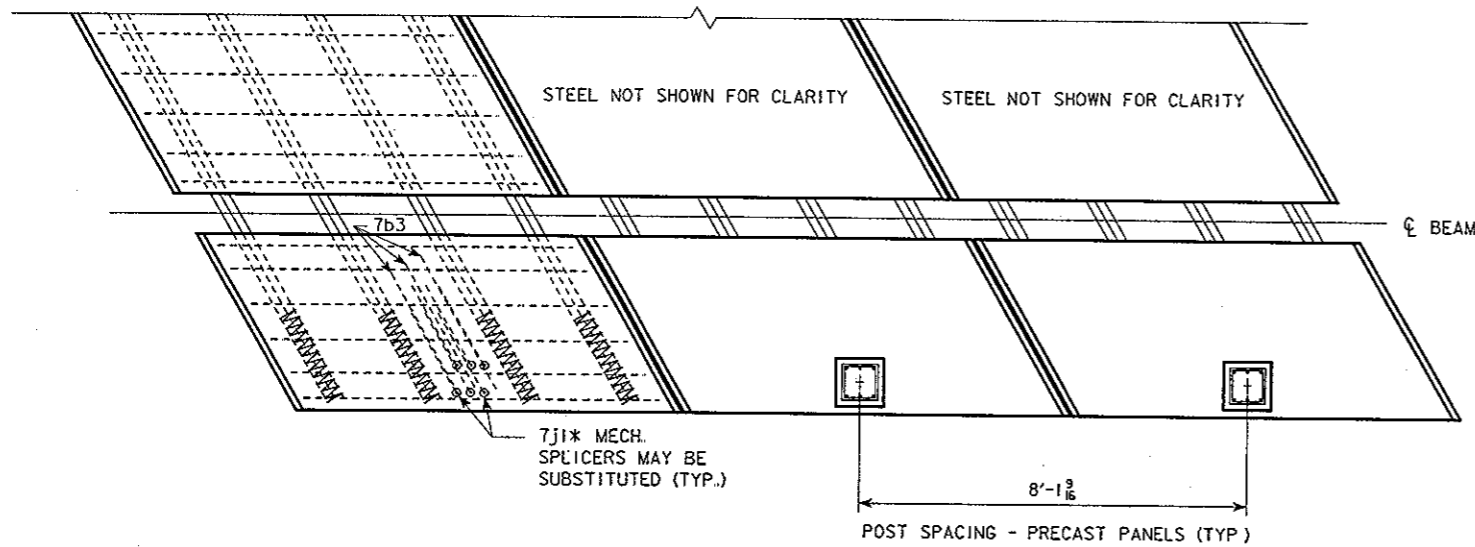
PRECAST DECK PANEL POST-TENSIONING CHANNEL



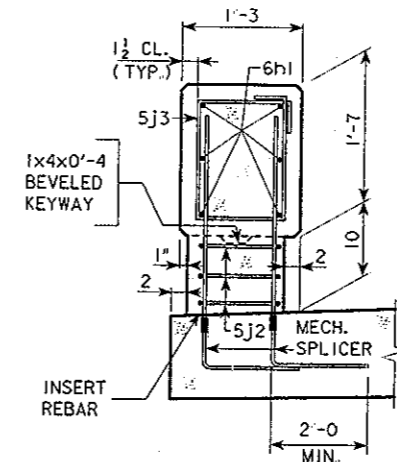
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 DESIGN SHEET NO. 19 OF 22 FILE NO. 30101 DESIGN NO. 106



BARRIER RAIL LAYOUT



TYPICAL BARRIER POST LOCATIONS



ALTERNATIVE BARRIER RAIL PART SECTION B-B USING MECH. SPLICERS

(APPROVAL REQUIRED BY THE ENGINEER)

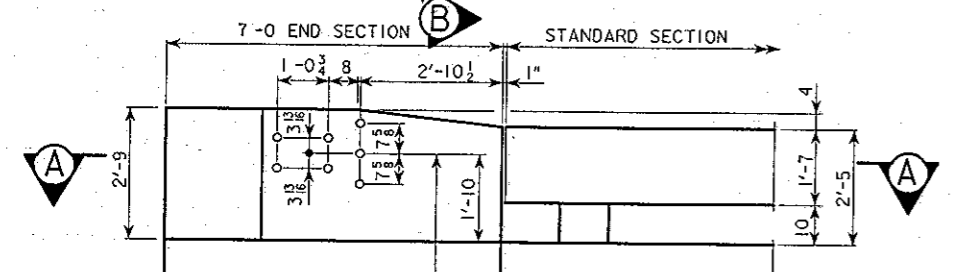
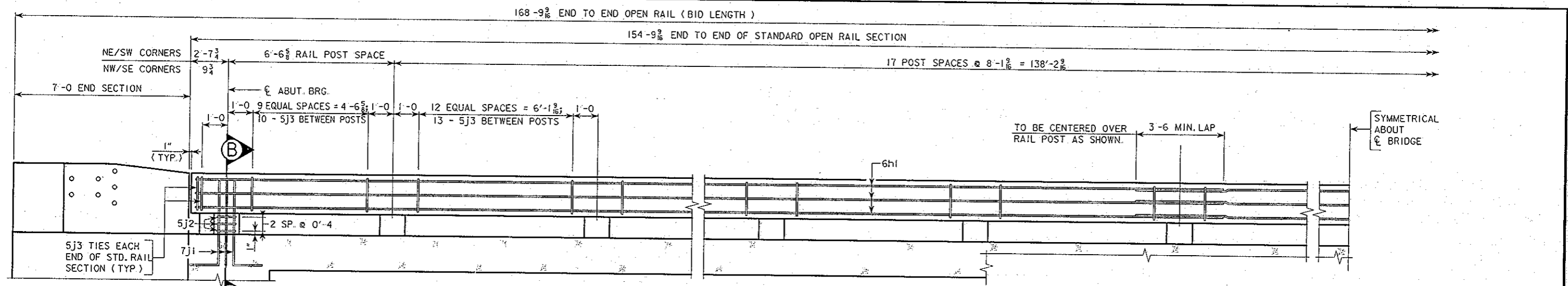
BARRIER RAIL NOTES:

THE 7j1 BAR QUANTITY IS INCLUDED IN THE SUPERSTRUCTURE REINFORCING QUANTITIES.

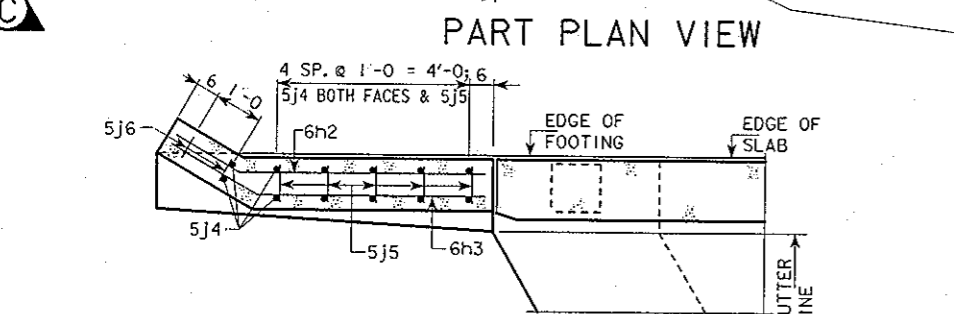
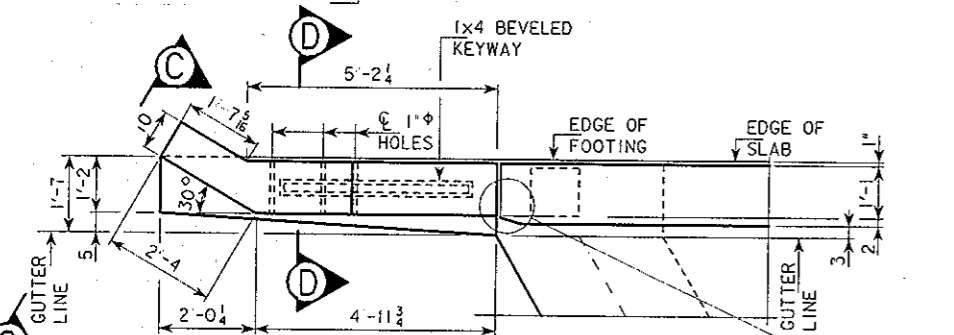
WITH THE ENGINEERS APPROVAL MECHANICAL SPLICERS IN ACCORDANCE WITH IM451, APPENDIX E MAY BE USED TO ELIMINATE THE 7j1 BAR PROJECTION FROM THE DECK PANELS. THE BARS SUBSTITUTED FOR THE 7j1 WITH MECHANICAL SPLICERS SHALL HAVE THE SAME EMBEDMENT AS THE 7j1.

THE SUBSTITUTION OF MECHANICAL SPLICERS, IF APPROVED, SHALL BE AT NO ADDITIONAL COST TO THE CONTRACTING AUTHORITY.

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 DESIGN SHEET NO. 20 OF 22 FILE NO. 30101 DESIGN NO. 106



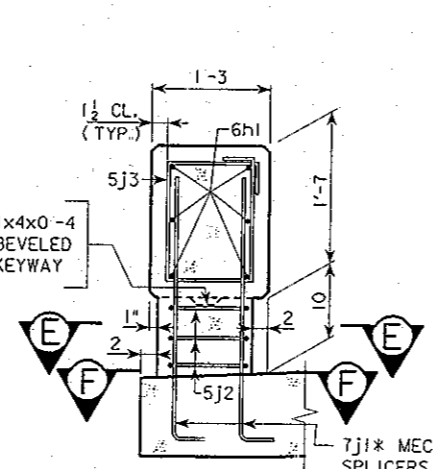
PROVIDE SEVEN HOLES FORMED WITH 1" ϕ PLASTIC CONDUIT. COST TO BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER RAILING.



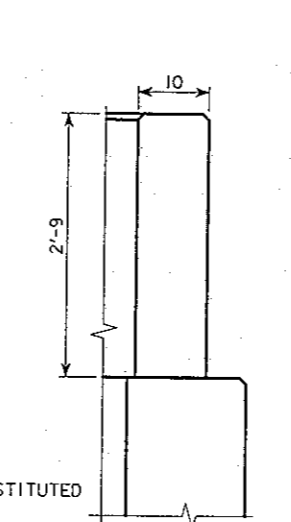
PART SECTION A-A
END SECTION DETAILS

ESTIMATED OPEN RAIL QUANTITIES		
ITEM	UNIT	QUANTITY
CONCRETE OPEN RAILING	L.F.	337.6

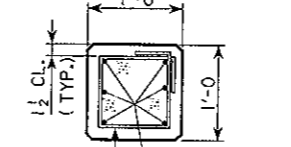
ELEVATION OF RAIL



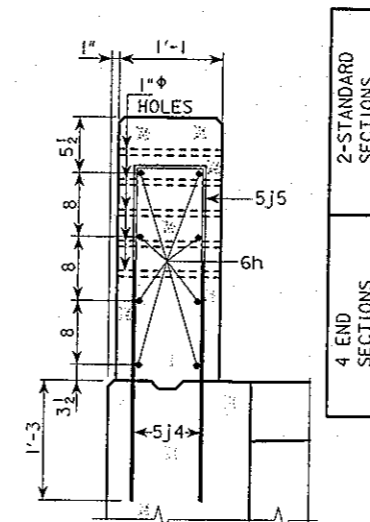
PART SECTION B-B
NOTE: ROUGHEN AREA OF SLAB AT EACH RAIL POST.



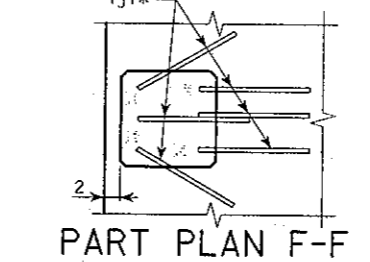
END VIEW C-C



PART SECTION E-E



PART SECTION D-D

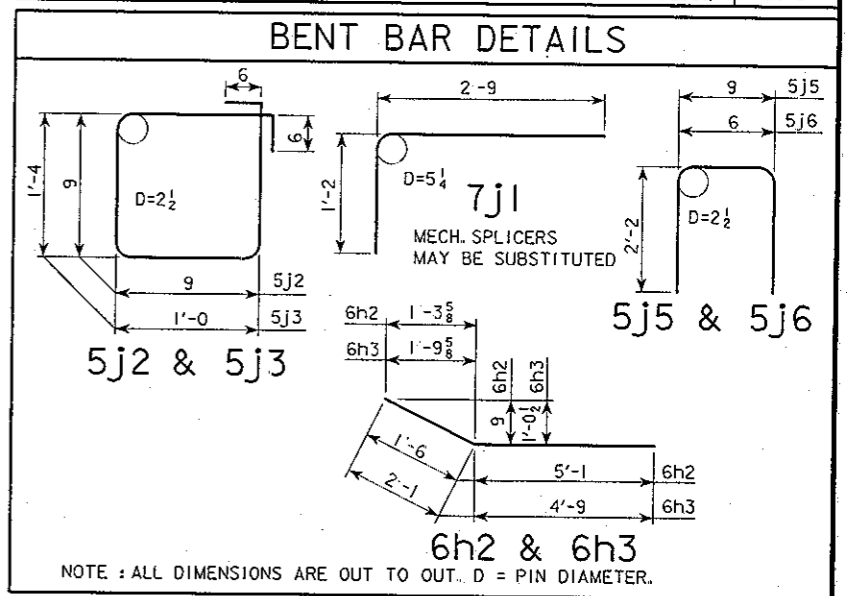


PART PLAN F-F

OPEN RAIL NOTES :

- ALL EXPOSED CORNERS OF 90° 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.
- ALL OPEN RAIL CONCRETE IS TO BE CLASS C.
- ALL OPEN RAIL REINFORCING STEEL IS TO BE INCLUDED WITH THE SUPERSTRUCTURE REINFORCING.
- 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.

REINFORCING BAR LIST						
BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT	
7j1	RAIL POST VERTICAL	L	240	3'-11"	1922	
5j2	RAIL POST TIES	□	120	4'-0"	501	
5j3	RAIL TIES	□	490	5'-8"	2896	
6h1	RAIL LONGITUDINAL	—	48	43'-10"	3161	
2-STANDARD SECTIONS						
5j4	ANCHOR TO SLAB	—	48	2'-6"	125	
5j5	VERTICAL	—	20	5'-1"	106	
5j6	VERTICAL	—	8	4'-10"	40	
4 END SECTIONS						
6h2	LONGITUDINAL	—	16	6'-7"	158	
6h3	LONGITUDINAL	—	16	6'-10"	164	
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)					TOTAL (LBS.)	9073



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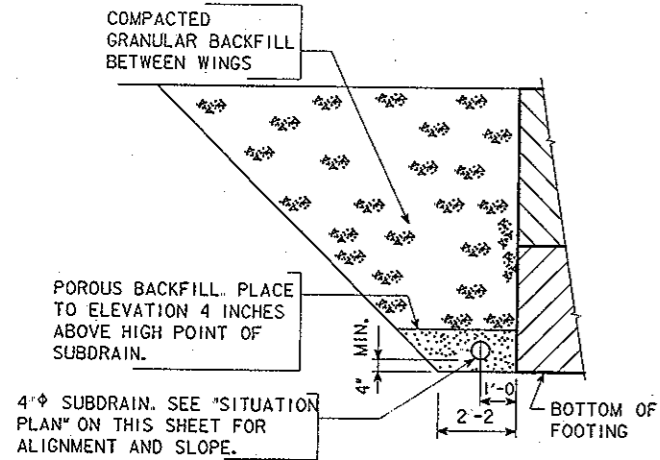
SUBDRAIN NOTES :

THIS PLAN SHEET SHOWS DETAILS FOR PLACING ALL SUBDRAINS AND SUBDRAIN OUTLETS REQUIRED FOR THIS STRUCTURE.

THE SUBDRAINS SHALL BE 4" IN DIAMETER AND MEET THE REQUIREMENTS OF SECTION 4143.01B OF THE CURRENT I.D.O.T. STANDARD SPECIFICATION. THE SUBDRAIN OUTLET SHALL CONSIST OF A 6'-0" LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED ON THIS SHEET.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL, POROUS BACKFILL, AND SUBDRAIN OUTLET IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE (BRIDGE)". NO EXTRA PAYMENT WILL BE MADE.

THE DIMENSIONS SHOWN FOR THE PROPOSED SUBDRAINS ARE BASED ON THE PROPOSED GRADING LAYOUT OF BRIDGE BERMS. THE DIMENSIONS SHOWN ARE FOR ESTIMATING ONLY. REQUIRED LENGTHS AND GENERAL LOCATIONS OF SUBDRAINS ARE SUBJECT TO CHANGE DUE TO FIELD ADJUSTMENTS OF THE GRADING LAYOUT.

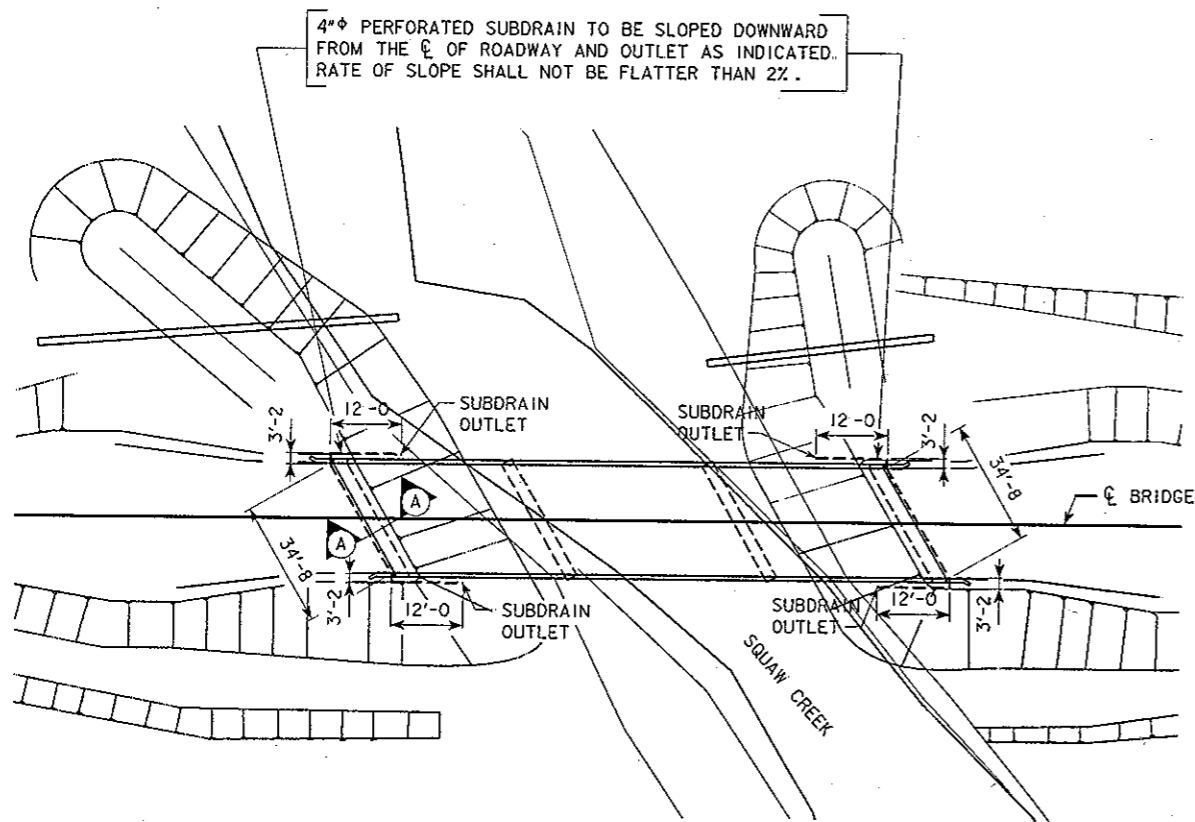


SECTION A-A

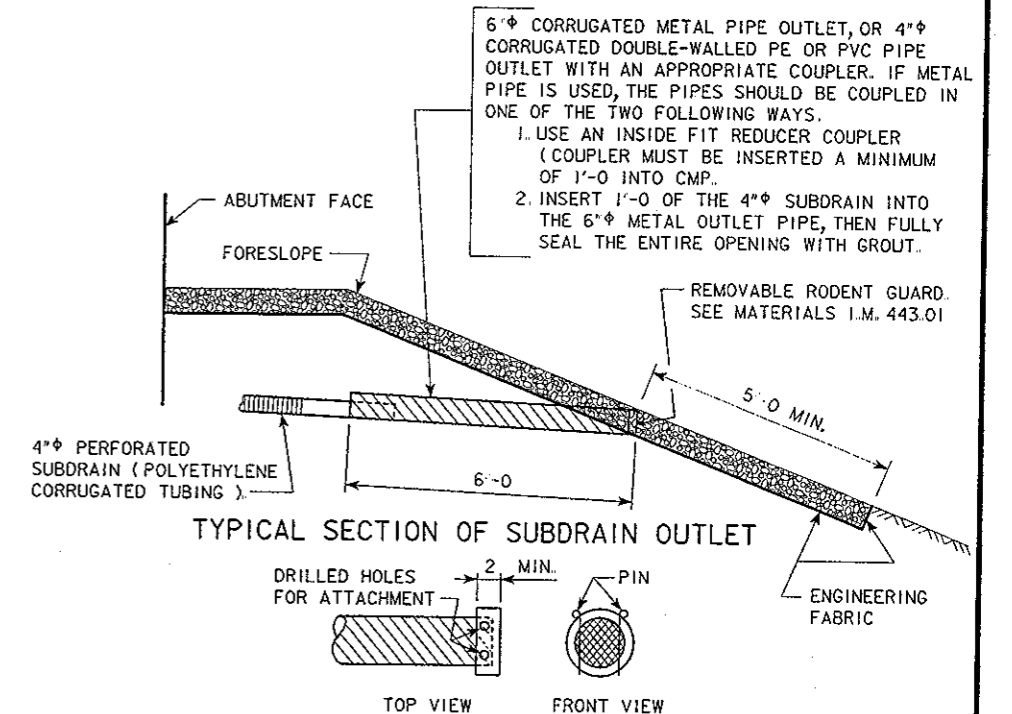
NOTE: SPECIAL BACKFILL MAY BE SUBSTITUTED FOR GRANULAR BACKFILL.

GRANULAR BACKFILL DETAILS

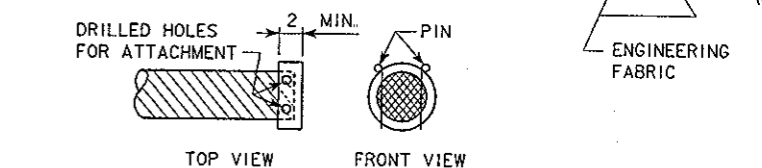
SUBDRAIN OUTLET ELEVATIONS	
LOCATION	ELEVATION
WEST ABUTMENT	977.9
EAST ABUTMENT	978.5



SITUATION PLAN
SHOWING SUBDRAIN LOCATIONS.



TYPICAL SECTION OF SUBDRAIN OUTLET



REMOVABLE RODENT GUARD DETAILS
OUTLET DETAILS

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 DESIGN SHEET NO. 22 OF 22 FILE NO. 30101 DESIGN NO. 106

HE1007C-S01 - THIS SHEET ISSUED 06-02 FOR WATER CROSSINGS.

ESTIMATE OF QUANTITIES - GRADING

REF. NO	CODE NO	ITEM DESCRIPTION	UNITS	TOTAL
1.	2101-0850001	CLEARING AND GRUBBING	ACRE	0.2
2	2102-2710070	EXCAVATION, CL. 10 ROADWAY AND BORROW	C.Y.	26,760
3.	2102-2712015	EXCAVATION, CL. 12 BOULDERS OR ROCK FRAGMENTS	C.Y.	15
4	2104-2710020	EXCAVATION, CL. 10, CHANNEL	C.Y.	1,580
5.	2312-8260051	GRAN. SURF. ON ROAD, CLASS A CRUSHED STONE	TONS	1,100
6.	2402-2720000	EXCAVATION, CL. 20	C.Y.	413
7.	2403-0100000	STRUCTURAL CONCRETE (MISCELLANEOUS)	C.Y.	4.0
8.	2404-7775000	STEEL, REINFORCING	LBS.	114
9.	2417-1007000	CULVERT, CORR. METAL ARCH RDWY. PIPE, 142 IN. X 91 IN.	L.F.	104
10.	2417-1040024	CULVERT, CORR. METAL ENT. PIPE, 24 IN DIA.	L.F.	54
11	2417-1060036	CULVERT, CORR METAL RDWY PIPE, 36 IN DIA.	L.F.	246
12.	2417-1060042	CULVERT, CORR. METAL RDWY PIPE, 42 IN DIA.	L.F.	86
13.	2505-4008200	INSTALLATION OF GUARDRAIL	L.F.	225
14	2505-4021690	GUARDRAIL, END ANCHORAGE, BEAM, RE-69	EACH	4
15.	2505-4021762	GUARDRAIL TERMINAL, BEAM, FLARED, RE-76	EACH	4
16.	2507-3250005	ENGINEERING FABRIC	S.Y.	740
17.	2507-6800042	REVTMENT, CLASS D	TONS	400
18.	2518-6910000	SAFETY CLOSURE	EACH	6
19.	2528-8445110	TRAFFIC CONTROL	LUMP SUM	1.0
20.	2533-4980005	MOBILIZATION	LUMP SUM	1.0
21	2601-2634100	MULCHING	ACRE	7.0
22.	2601-2636043	SEEDING AND FERTILIZING (RURAL)	ACRE	7.0
23.	2602-0000020	SILT FENCE	L.F.	420
24	2602-0000030	SILT FENCE FOR DITCH CHECKS	L.F.	436

ESTIMATE REFERENCE INFORMATION:

2. A. INCLUDES 35% SHRINKAGE.
- B. INCLUDES MATERIAL REQUIRED TO CONSTRUCT WING DIKES, (800 C.Y.) DRIVES, AND APPROACH GRADES.
- C. SEE CROSS SECTIONS FOR TEMPLATE DETAILS.
- D. NO OVERHAUL WILL BE ALLOWED FOR THIS ITEM.
- E. TEMPLATE CUT WITHIN PROJECT LIMITS TOTALS 10,502 C.Y. CONTRACTOR TO BE RESPONSIBLE FOR THE ACQUISITION OF 16,258 C.Y., INCLUDING ALL NECESSARY APPROVALS AND CLEARANCES
4. THE CROSS SECTIONS SHOW THE LOCATIONS OF 1277 C.Y. OF CHANNEL EXCAVATION. THE REMAINING 303 C.Y. SHALL BE REMOVED FROM THE CENTER OF THE CHANNEL JUST UPSTREAM OF THE BRIDGE
5. GRADATION FOR THIS ITEM SHALL BE WITHIN THE RANGES OF THE FOLLOWING SIEVE ANALYSIS:

SIEVE SIZE:	1 1/2"	1"	3/4"	1/2"	#4	#8	#200
% PASSING:	100	70-90	50-70	40-60	25-45	15-40	6-12
7. A. STRUCTURAL CONCRETE SHALL BE CLASS C
- B. COARSE AGGREGATE SHALL BE CLASS 2 DURABILITY LIMESTONE OR BETTER.
- C. TO BE PLACED IN CMP TIE DOWN, SEE DETAILS ON SHEET U.01.
8. STEEL REINFORCING TO BE PLACED IN CMP TIE-DOWN.
9. A. ARCH PIPE SHALL BE LAYED WITH ONE 36" PIECE IN THE MIDDLE AND A 34" SECTION ON EACH END.
- B. ALL BANDS SHALL BE 2' WIDE
- C. SEE TIE-DOWN DETAILS ON SHEET U.01
- 10-12. A. ALL C.M.P. SHALL BE OF THE RIVETED TYPE CONSTRUCTION.
- B. ALL BANDS SHALL BE 2 FEET WIDE.
- 13-15. SEE TABULATION ON SHEET NO. B.01
- 16-17. TO BE PLACED ON BERM SLOPES AND DIKES AND OTHER AREAS AS DIRECTED BY THE ENGINEER.
19. SEE TRAFFIC CONTROL NOTE ON SHEET C.02
22. A. SEED MIXTURE SHALL BE AS PER SECTION 2601.04 C.
- B. FERTILIZER AS PER SECTION 2601.04 B.
- 23 - 24. SEE TABULATIONS ON SHEET B.01

GENERAL NOTES:

- A. ALL SALVAGEABLE MATERIAL AND RUBBLE FROM THIS PROJECT SHALL BE REMOVED FROM THE ROAD RIGHT-OF-WAY TO A WASTE AREA PROVIDED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER. THE COST OF WASTING THIS MATERIAL IS TO BE INCLUDED IN THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" NO PAYMENT WILL BE MADE FOR OVERHAUL.
 - B. THE CONTRACTOR SHALL VISIT THE CONSTRUCTION SITE TO ENSURE THAT HE IS FAMILIAR WITH THE EXISTING SITE CONDITIONS. UTILITY COMPANIES WHOSE FACILITIES ARE KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.
 - C. THE CONTRACTOR'S WORK AND MATERIAL STORAGE AREA SHALL BE AT A LOCATION APPROVED BY THE ENGINEER.
 - D. ANY TEMPORARY CREEK CROSSING SHALL INCLUDE ADEQUATE CULVERTS TO ACCOMMODATE LOW FLOWS. AFTER COMPLETION OF WORK ON THIS PROJECT, THE CROSSING SHALL BE REMOVED TO THE NATURAL CHANNEL CONTOURS. THE COST OF INSTALLATION, MAINTENANCE AND REMOVAL OF TEMPORARY CROSSINGS, INCLUDING CULVERTS, SHALL BE INCIDENTAL TO THE PROJECT.
 - E. IF ARCHAEOLOGICAL MATERIALS ARE ENCOUNTERED DURING THE CONSTRUCTION PHASE OF THE PROJECT, THE OFFICE OF LOCATION AND ENVIRONMENT AND/OR THE DISTRICT OFFICE OF LOCAL SYSTEMS (I.D.O.T.) 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 FOR FURTHER TESTING CANNOT BE CONSIDERED AS FINAL UNTIL CONCURRENCE IS RECEIVED FROM THE OFFICE OF THE STATE HISTORIC PRESERVATION OFFICER.
- PHONE NUMBERS:
- IOWA DEPARTMENT OF TRANSPORTATION, OFFICE OF LOCATION AND ENVIRONMENT
515-239-1225
- IOWA DEPARTMENT OF TRANSPORTATION, DISTRICT OFFICE OF LOCAL SYSTEMS
515-239-1635
- F. BOONE COUNTY WILL PROVIDE THE BASIC CONSTRUCTION STAKING NECESSARY TO CONSTRUCT THE BRIDGE.


ROAD STANDARD PLANS

The following Standard Plans shall be considered applicable to construction work on this project.

Standard	Date	Standard	Date	Standard	Date
RC-17	4-18-06	RF-68	10-19-04	RL-3	10-31-95
RE-2B	4-03-01	RF-69A	10-19-04	RL-7	12-03-96
RE-7	4-15-03	RE-76	4-19-05	RI-14A(1)	4-19-05
RE-12A	10-19-04	RF-30A	10-18-05	RS-26A	10-18-05
RE-12B	10-19-04	RF-32	4-18-06		
RE-47	10-19-04	RF-33	3-28-95		
RE-48A	10-19-04				
RE-64A	4-19-05				

PROJECT TRAFFIC CONTROL NOTE

THIS ROAD WILL BE CLOSED TO THROUGH TRAFFIC DURING CONSTRUCTION. LOCAL TRAFFIC TO ADJACENT PROPERTIES WILL BE MAINTAINED AS PROVIDED FOR IN ARTICLE 1107.08 OF THE CURRENT STANDARD SPECS. TRAFFIC CONTROL DEVICES, PROCEDURES, LAYOUTS, SIGNING, AND PAVEMENT MARKINGS INSTALLED WITHIN THE LIMITS OF THIS PROJECT SHALL CONFORM TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AS ADOPTED BY THE DEPARTMENT PER 761 OF THE IOWA ADMINISTRATIVE CODE (IAC) CHAPTER 130.



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.

David T. Anthony 2/15/06
 Date
 My license renewal date is Dec 31, 2006

Pages or sheets covered by this seal: _____
 C.01, B.01, D.01, E.01, E.02, Q.02,
 U.01, U.02, W.01, W.02, W.03, W.04,
 X.01, X.02, X.03

BOONE COUNTY
 PROJECT NO. IBRC-CO08(39)--8E-08
 30'-6" x 151'-4" PPCB
 ESTIMATE OF QUANTITIES
 ESTIMATE REFERENCE INFORMATION
 GENERAL NOTES

STEEL BEAM GUARDRAIL AT BRIDGE END POST AND CONCRETE BARRIER
Refer to Standard Road Plans RE-48A, RE-64A, RE-64B, and RE-65B

108-8A
04-19-05

No	Location			Station	Case	Standard Road Plan	Layout Lengths					Materials Required			Delineators and Object Markers				Bid Items				Remarks				
	Direction of Traffic	End	Side				STS	VT1	VF	VT2	ET	STS		W Beam	Posts	Posts	CRT Posts	Delineator	Object Marker			Installation of Guardrail		Anchorage and Terminal Systems			
												Thine Beam	Transition Section						Type	Type 2	Type 3			RE-69A	RE-69B	RE-69C	RE-76
												(18.75)	(25.0)														
1	E	A		RE-64A	18.75				37.5	25.0	6.25	37.5	-	3	3	2		4	1	1	56.25	1				1	W. END RT.
2	W	T		RE-64A	18.75				37.5	25.0	6.25	37.5	-	3	3						56.25	1				1	W. END LT.
3	E	T		RE-64A	18.75				37.5	25.0	6.25	37.5	-	3	3	2		4	1	1	56.25	1				1	E. END RT.
4	W	A		RE-64A	18.75				37.5	25.0	6.25	37.5	-	3	3						56.25	1				1	E. END LT.

- ① Line(s) to which the obstacle is adjacent.
- ② Includes (1) special 12.5 section of W Beam, see RE-76.
- ③ (6) 6x8x7 posts required when RE-69C is specified.
- ④ The last two posts of the RE-76 Terminal section are included as part of that bid item.

TABULATION OF SAFETY CLOSURES 108-13A
10-28-97

Refer to Section 251b of the Standard Specifications

STATION	CLOSURE TYPE		REMARKS
	Road Qty.	Hazard Qty.	
41+00	1		W. END
51+35.26		1	W. END BR.
49+83.92		1	E. END BR.
57+00	1		E. END
144+00	1		S. END
258+00	1		N. END

TABULATION OF CROSS ROAD PIPES 104-3
MODIFIED

Location	Type	Size	Kind of Pipe	Length New Const.	Design Cover (ft)	Flow Line Elevations			Dimensions		Class 20
						Lt.	Rt.	Other	Total		
									Lt.	Rt.	
54+02		42"	CMP	86	8'-0"	972.0	971.0		42	44	25
147+18		142" x 91"	CMP ARCH	104	6'-6"	971.0	971.5		52	52	159
254+53		36"	CMP	70	3'-4"	971.0	971.5		36	34	47

TABULATION OF SILT FENCES FOR DITCH CHECKS 100-18
11-10-83

LOCATION STATION	SIDE	LN FT.	REMARKS
43+00	LT.	18	
43+00	RT.	17	
45+00	LT.	20	
45+00	RT.	18	
47+00	LT.	18	
47+00	RT.	24	
53+50	RT.	18	
55+00	LT.	15	
56+00	LT.	17	
56+00	RT.	15	
145+00	LT.	17	
145+00	RT.	80	
146+75	LT.	15	
146+75	RT.	80	
147+25	LT.	15	
147+25	RT.	15	
255+50	LT.	17	
255+50	RT.	17	

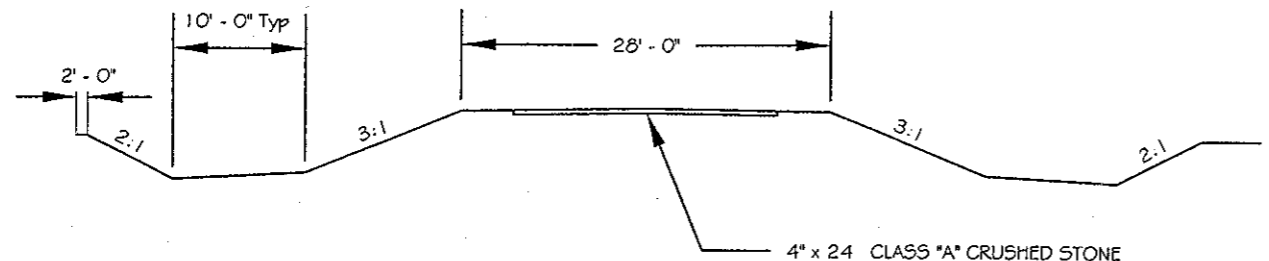
POINTS OF ACCESS (RL-7) 102-1
10-21-03

Refer to Detail Cross-Sections. For Pipe Culvert Details Refer to RF-30A, RF-30B and RF-30C

Location (RL-7)		W	Type	H	Size (Inches)	Length		Apron (No.)	Surface Material (Tons)
Station	Side					LT (Lin. Ft.)	RT (Lin. Ft.)		
41+09 U.A.C.	RT.								
55+00	RT.	20	C	2.5	24	23	31		

TABULATION OF SILT FENCES 100-17
11-10-83

STATION TO STATION	SIDE	LN FT	REMARKS
48+80	50+50	RT.	170
51+50	53+00	RT.	150
146+00	147+00	LT.	100



TYPICAL CROSS SECTION
ROADWAY TOP TO HAVE 3% CROWN

BOONE COUNTY
PROJECT NO IBRC-C008(39)--8E-08
TABULATIONS, TYPICAL CROSS SECTION.

SHEET B.01

HARRISON TWP.
T. 85 N. R. 25 W.
SECTION 9

HARRISON TWP.
T. 85 N. R. 25 W.
SECTION 10

STA 50+59.59
CONTRACTOR TO REMOVE EXISTING
18' X 76' MARSH ARCH BRIDGE
AND REPLACE WITH 30'-6" X 151'-4" PCB
SKEWED 30° R A

STA 254+53
24" Ø X 36' CMP
CONTRACTOR TO REMOVE
AND REPLACE WITH
36" Ø X 70' CMP
SEE TAB 104-3

STA 51+58
CONTRACTOR TO FURN. & PLACE
36" Ø X 92' CMP LETDOWN PIPE @ WINGDIKE
INLET ELEV. = 968.5
OUTLET ELEV. = 968.0
CLASS 20 EX = 95 C.Y.

STA 48+75
CONTRACTOR TO FURN. & PLACE
36" Ø X 84' CMP LETDOWN PIPE @ WINGDIKE
INLET ELEV. = 968.5
OUTLET ELEV. = 968.0
CLASS 20 EX = 87 C.Y.

DALE K. ANDERSON
KAY K. ANDERSON
CULTIVATED

MICHAEL L. DESHER

DALE K. ANDERSON
KAY K. ANDERSON
CULTIVATED

STA 147+18
CONTRACTOR TO PLACE
142" X 91" X 104' CMP ARCH
ALIGN WITH CHANNEL
SEE TAB 104-3

P.I. STA. 146+62.15
C Δ = 53°18'00" RT.
D = 13°00'00"
T = 151.34'
R = 280.53'
L = 301.56'
E = 35.84'

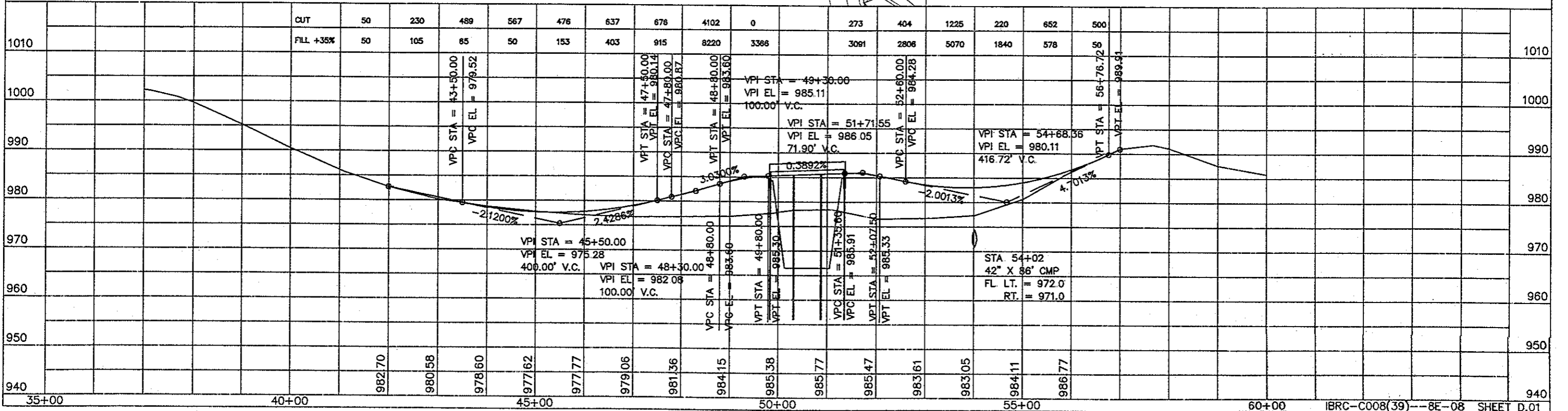
P.I. STA. 143+69.25
C Δ = 39°31'51" LT.
D = 13°22'50"
T = 153.87'
R = 295.43'
L = 428.20'
E = 26.80'

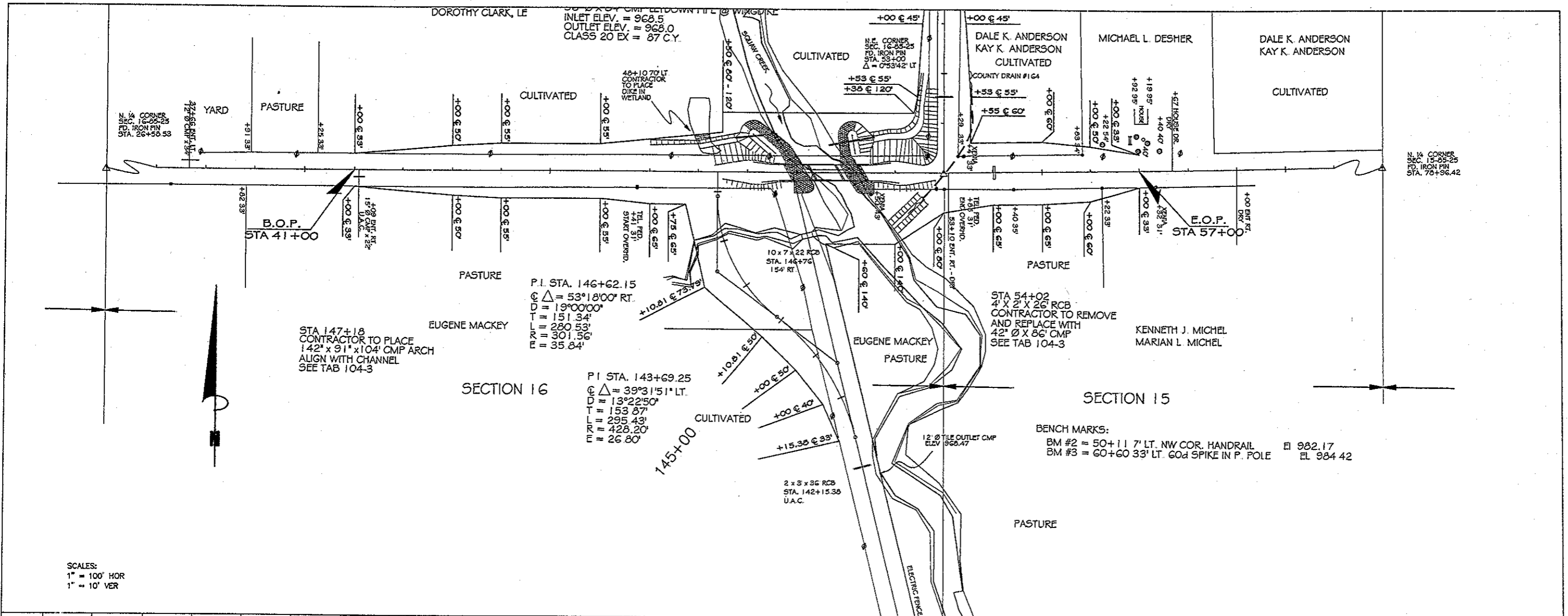
STA 54+02
4" X 2' X 26' RCB
CONTRACTOR TO REMOVE
AND REPLACE WITH
42" Ø X 86' CMP
SEE TAB 104-3

KENNETH J. MICHEL
MARIAN L. MICHEL

SCALES:
1" = 100' HOR
1" = 10' VER

BENCH MARKS:
BM #2 = 50+11 7' LT. NW COR. HANDRAIL EL. 982.17
BM #3 = 60+60 33' LT. God SPIKE IN P. POLE EL. 984.42





Station	CUT	FILL +35%
1000	38	83
990	359	333
980	1011	563
970	1080	785
960	637	1595
950	429	2078
940	213	470
930		

VPI STA = 143+00.00
 VPI EL = 975.50
 169.24' V.C.

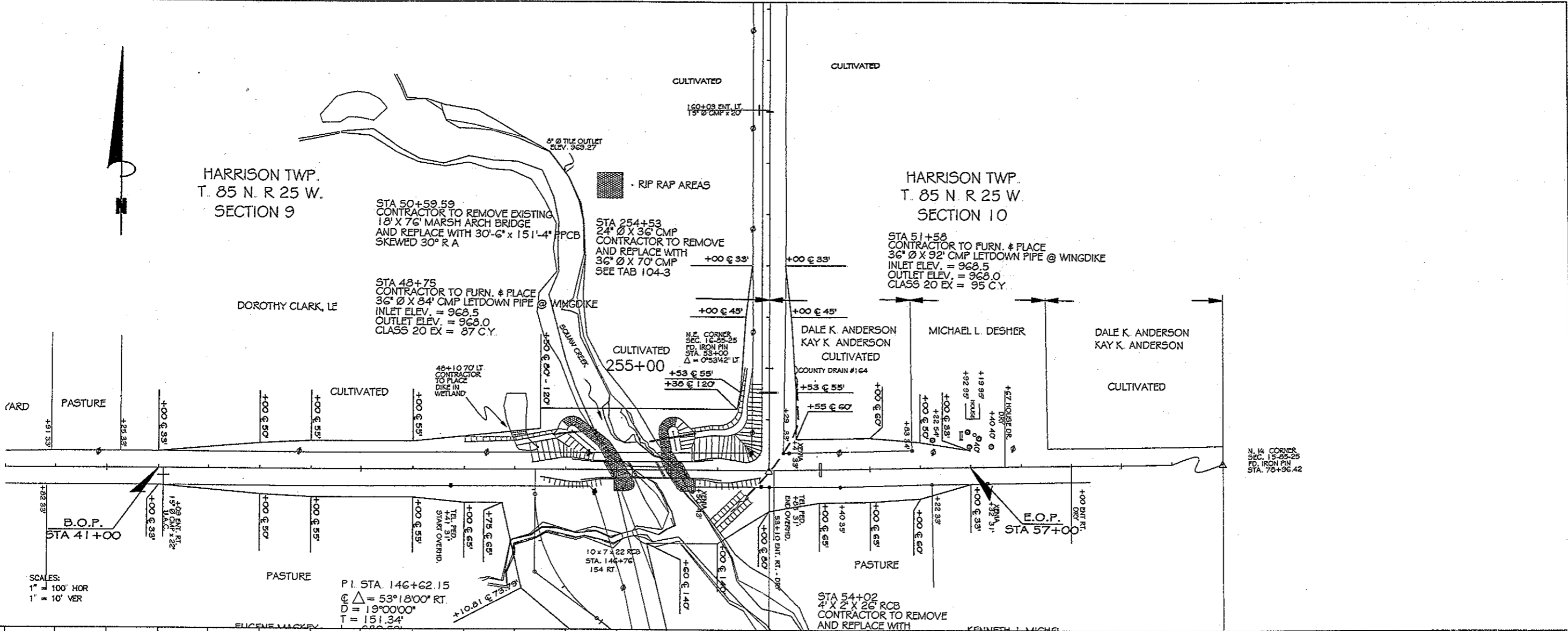
STA 147+18
 142" x 91" CMP ARCH PIPE
 FL LT. = 968.0
 FL RT. = 967.5

1.2630%



HARRISON TWP.
T. 85 N. R 25 W.
SECTION 9

HARRISON TWP.
T. 85 N. R 25 W.
SECTION 10



SCALES:
1" = 100' HOR
1" = 10' VER

P.I. STA. 146+62.15
C Δ = 53°18'00" RT.
D = 19°00'00"
T = 151.34'

Station	CUT	FILL +35%	1010	1000	990	980	970	960	950	940
255+00	256	968	334	1123	226	540	93	188		
			VPC STA = 253+50.00	VPC EL = 982.11	VP STA = 255+00.00	VP EL = 977.61	VPT STA = 256+50.00	VPT EL = 976.63		
						300.00' V.C.				
						-3.0000%				
						-0.6550%				
							STA 254+53			
							36" CMP x 70'			
							FL LT. = 971.0			
							FL RT. = 971.5			
			983.61	980.71	978.49	977.05				

LOG OF BORING NO. 1 Page 1 of 2

OWNER BOONE COUNTY ENGINEER		PROJECT REPLACEMENT BRIDGE	
SITE 120TH STREET OVER SQUAW CREEK BOONE COUNTY, IOWA		APPROX. BORING LOCATION: West Abutment Station 49+84, 8' North of Centerline.	
GRAPHIC LOG	DEPT. ft.	USCS SYMBOL	TESTS
	0.8	HS	
	5	1 SS	12 8
	7.5	HS	
	10	2 SS	16 11
	14	3 SS	18 10
	24	4 SS	18 11
DESCRIPTION		SAMPLER RECOVERY, %	
Approx. Surface Elev.: 99.5 ft		SPT - N* BLOWS / ft.	
9 Inches Gravel at Surface FILL: VERY SANDY LEAN CLAY With Sand Layers Dark Brown		WATER CONTENT, %	
		DRY UNIT WT pcf	
		UNCONFIRMED STRENGTH, pcf	
FINE TO MEDIUM SAND, Trace Gravel (DOT CLASSIFICATION: SILTY SAND) Brown Medium Dense			
SANDY LEAN CLAY, Trace Gravel and Sand Seams (DOT CLASSIFICATION: FIRM GLACIAL CLAY) Light Gray Stiff		3000*	
		3500*	
		8000*	
		9000*	

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual. *Hand Penetrometer; **140 Lbs Automatic SPT Hammer

WATER LEVEL OBSERVATIONS, ft		BORING STARTED 12-13-04	
WL 14	wd 8 AB	BORING COMPLETED 12-13-04	
WL 14	wd 8 AB	RIG 84 FOREMAN JG	
WL 14	CI @ 54' AB	APPROVED P.J.F. JOB # 08045163	

LOG OF BORING NO. 2 Page 1 of 2

OWNER BOONE COUNTY ENGINEER		PROJECT REPLACEMENT BRIDGE	
SITE 120TH STREET OVER SQUAW CREEK BOONE COUNTY, IOWA		APPROX. BORING LOCATION: 8' West of West Pier Station 50+23, 4' South of Centerline.	
GRAPHIC LOG	DEPT. ft.	USCS SYMBOL	TESTS
	0	HS	
	5	1 SS	18 4
	10	2 SS	18 5
	15	3 SS	18 6
	20	4 SS	18 10
	25	5 SS	18 13
DESCRIPTION		SAMPLER RECOVERY, %	
Approx. Surface Elev.: 100 ft		SPT - N* BLOWS / ft.	
12 Inches Gravel at Surface FILL: VERY SANDY LEAN CLAY With Sand Layers Dark Brown		WATER CONTENT, %	
		DRY UNIT WT pcf	
		UNCONFIRMED STRENGTH, pcf	
Concrete Rubble Noted From About 13 to 15'			
SANDY LEAN CLAY, Trace Gravel and Sand Seams (DOT CLASSIFICATION: FIRM SILTY GLACIAL CLAY) Light Gray Stiff		4000*	
		6000*	
		8000*	
		9000*	

Continued Next Page

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual. *Hand Penetrometer; **140 Lbs Automatic SPT Hammer

WATER LEVEL OBSERVATIONS, ft		BORING STARTED 12-14-04	
WL 15	wd 26 AB	BORING COMPLETED 12-14-04	
WL 15	wd 26 AB	RIG 84 FOREMAN JG	
WL 15	CI @ 46' AB	APPROVED P.J.F. JOB # 08045163	

LOG OF BORING NO. 1 Page 2 of 2

OWNER BOONE COUNTY ENGINEER		PROJECT REPLACEMENT BRIDGE		
SITE 120TH STREET OVER SQUAW CREEK BOONE COUNTY, IOWA		APPROX. BORING LOCATION: West Abutment Station 49+84, 8' North of Centerline.		
GRAPHIC LOG	DEPT. ft.	USCS SYMBOL	TESTS	
	35	7 SS	18 24	
	40	8 SS	18 27	
	45	9 SS	18 23	
	50	10 SS	18 19	
	55	11 SS	18 20	
	60	12 SS	18 19	
	DESCRIPTION		SAMPLER RECOVERY, %	
	SANDY LEAN CLAY, Trace Gravel and Sand Seams (DOT CLASSIFICATION: VERY FIRM GLACIAL CLAY) Gray Very Stiff to Hard		SPT - N* BLOWS / ft.	
			WATER CONTENT, %	
			DRY UNIT WT pcf	
			UNCONFIRMED STRENGTH, pcf	
			9000*	
		8000*		
		9000*		
		6000*		
		7000*		
		6500*		
		7000*		

BOTTOM OF BORING

The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual. *Hand Penetrometer; **140 Lbs Automatic SPT Hammer

WATER LEVEL OBSERVATIONS, ft		BORING STARTED 12-13-04	
WL 14	wd 8 AB	BORING COMPLETED 12-13-04	
WL 14	wd 8 AB	RIG 84 FOREMAN JG	
WL 14	CI @ 54' AB	APPROVED P.J.F. JOB # 08045163	

LOG OF BORING NO. 2 Page 2 of 2

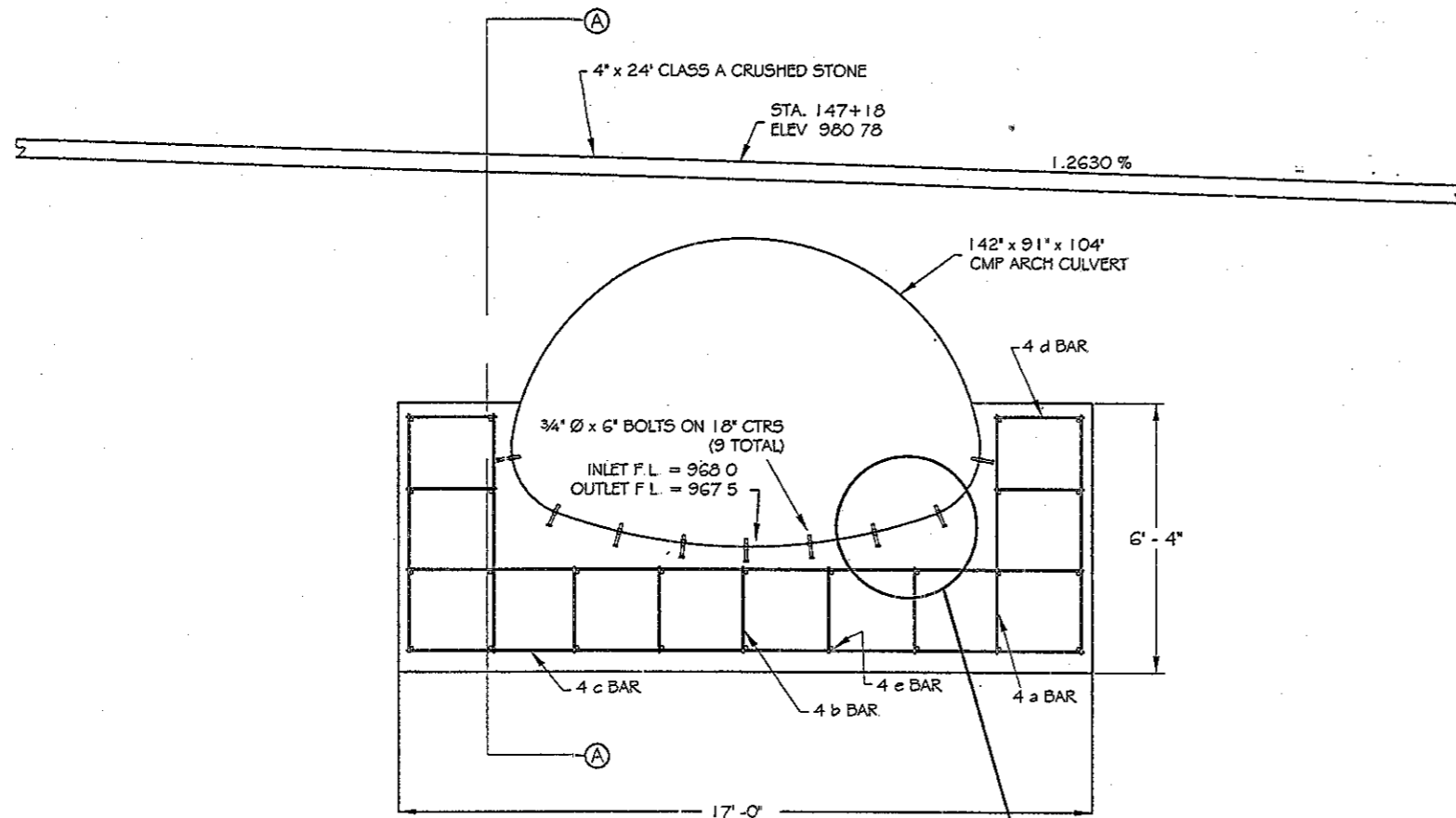
OWNER BOONE COUNTY ENGINEER		PROJECT REPLACEMENT BRIDGE		
SITE 120TH STREET OVER SQUAW CREEK BOONE COUNTY, IOWA		APPROX. BORING LOCATION: 8' West of West Pier Station 50+23, 4' South of Centerline.		
GRAPHIC LOG	DEPT. ft.	USCS SYMBOL	TESTS	
	35	7 SS	18 25	
	40	8 SS	18 23	
	45	9 SS	18 19	
	50	10 SS	18 24	
	55	11 SS	18 20	
	60	12 SS	18 19	
	DESCRIPTION		SAMPLER RECOVERY, %	
	SANDY LEAN CLAY, Trace Gravel and Sand Seams (DOT CLASSIFICATION: VERY FIRM GLACIAL CLAY) Gray Very Stiff to Hard Sand Seam in Sample #8		SPT - N* BLOWS / ft.	
			WATER CONTENT, %	
			DRY UNIT WT pcf	
			UNCONFIRMED STRENGTH, pcf	
			9000*	
		9000*		
		9000*		
		6500*		
		7000*		

BOTTOM OF BORING

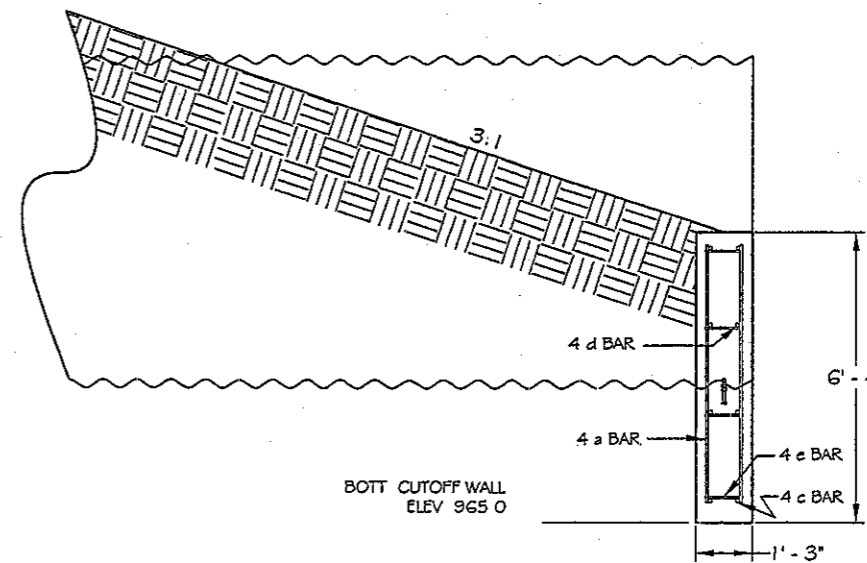
The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual. *Hand Penetrometer; **140 Lbs Automatic SPT Hammer

WATER LEVEL OBSERVATIONS, ft		BORING STARTED 12-14-04	
WL 15	wd 26 AB	BORING COMPLETED 12-14-04	
WL 15	wd 26 AB	RIG 84 FOREMAN JG	
WL 15	CI @ 46' AB	APPROVED P.J.F. JOB # 08045163	

BOONE COUNTY
PROJECT NO. IBRC-C008(39)--8E-08
151'-4" x 30'-6" PPCB
SOIL BORING LOGS

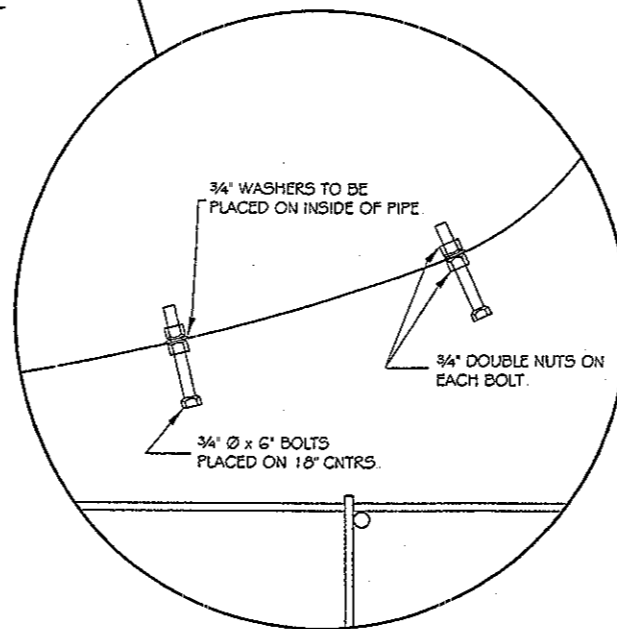


INLET CUTOFF WALL



SECTION A-A

BAR LIST			
BAR NO.	SHAPE	LENGTH	QTY.
4a	—	5' - 9"	8
4b	—	2' - 0"	10
4c	—	16' - 6"	4
4d	—	2' - 0"	8
4e	—	0' - 10"	26



ANCHOR BOLT DETAIL

PROJECT NO. IBRC-C008(39)---8E-08

CMP ARCH CULVERT TIE-DOWN DETAILS,
REINFORCING BAR LIST,

SHEET U.01

POLLUTION PREVENTION PLAN

All contractors/subcontractors shall conduct their operations in a manner that minimizes erosion and prevents sediments from leaving the road right-of-way. The prime contractor shall be responsible for compliance and implementation of the Pollution Prevention Plan (PPP) for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

1. SITE DESCRIPTION

This Pollution Prevention Plan (PPP) is for the construction of an 30'-6" x 151'-4" PPCB and associated grading operations. This bridge is located over Squaw Creek on 120th St, near the N.E. Corner of Section 16-85-25 approximately 14 miles North East of the city of Boone, Iowa.

This PPP covers approximately 7 acres, with an estimated 7 acres being disturbed.

The PPP is located in an area of 5 soil associations (Webster, Storden, Ridgeport, Coland, and Coland Channeled). The estimated average NRCS runoff curve number for this PPP after completion will be 73.

Refer to the project plans for locations of typical slopes, ditch grades, and major structural and non-structural controls. A copy of this plan will be on file at the Boone County Engineer's Office. Runoff from this work will flow into Squaw Creek.

POTENTIAL SOURCES OF POLLUTION:

Site sources of pollution generated as a result of this work relate to silts and sediment which may be transported as a result of a storm event. However, this PPP provides conveyance for other (non-project related) operations. These other operations have storm water runoff, the regulation of which is beyond the control of this PPP. Potentially, this runoff can contain various pollutants related to site-specific land uses. Examples are:

Rural Agricultural Activities:

Runoff from agricultural land use can potentially contain chemicals including herbicides, pesticides, fungicides and fertilizers.

Commercial and Industrial Activities:

Runoff from commercial and industrial land use may contain constituents associated with the specific operation. Such operations are subject to potential leaks and spills which could be commingled with runoff from the facility. Pollutants associated with commercial and industrial activities are not readily available since they are typically proprietary.

2. CONTROLS

At locations where runoff can move offsite, silt fence shall be placed along the perimeter of the areas to be disturbed prior to beginning grading, excavation or clearing and grubbing operations. Vegetation in areas not needed for construction shall be preserved. As areas reach their final grade, additional silt fences, silt basins, intercepting ditches, sod flumes, letdowns, bridge end drains and earth dikes shall be installed as specified in the project plans and/or required as required by the Boone County Engineer. This will include using silt fence as ditch checks and to protect intakes. Temporary stabilizing seeding shall be completed as the disturbed areas are constructed. If construction activity is not planned to occur in a disturbed area for at least 21 days, the area shall be stabilized by temporary seeding or mulching within 14 days.

This work shall be done in accordance with Section 2602 of the Standard Specifications. If the work involved is not applicable to any contract items, the work shall be paid for according to Article 1109.03 paragraph B.

As the work progresses, additional erosion control items may be required as determined by the Engineer after field investigation. Permanent perennial vegetation shall be placed by Boone County after construction during the next permanent seeding timeframe.

3. OTHER CONTROLS

Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.

APPROVED STATE OR LOCAL PLANS:

During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations arise, they will be handled according to all federal, state and local regulations in effect at the time.

4. MAINTENANCE

The contractor is required to maintain all temporary erosion control measures in proper working order, including cleaning, repairing or replacing them throughout the contract period. Cleaning of silt control devices shall begin when the features have lost 50% of their capacity.

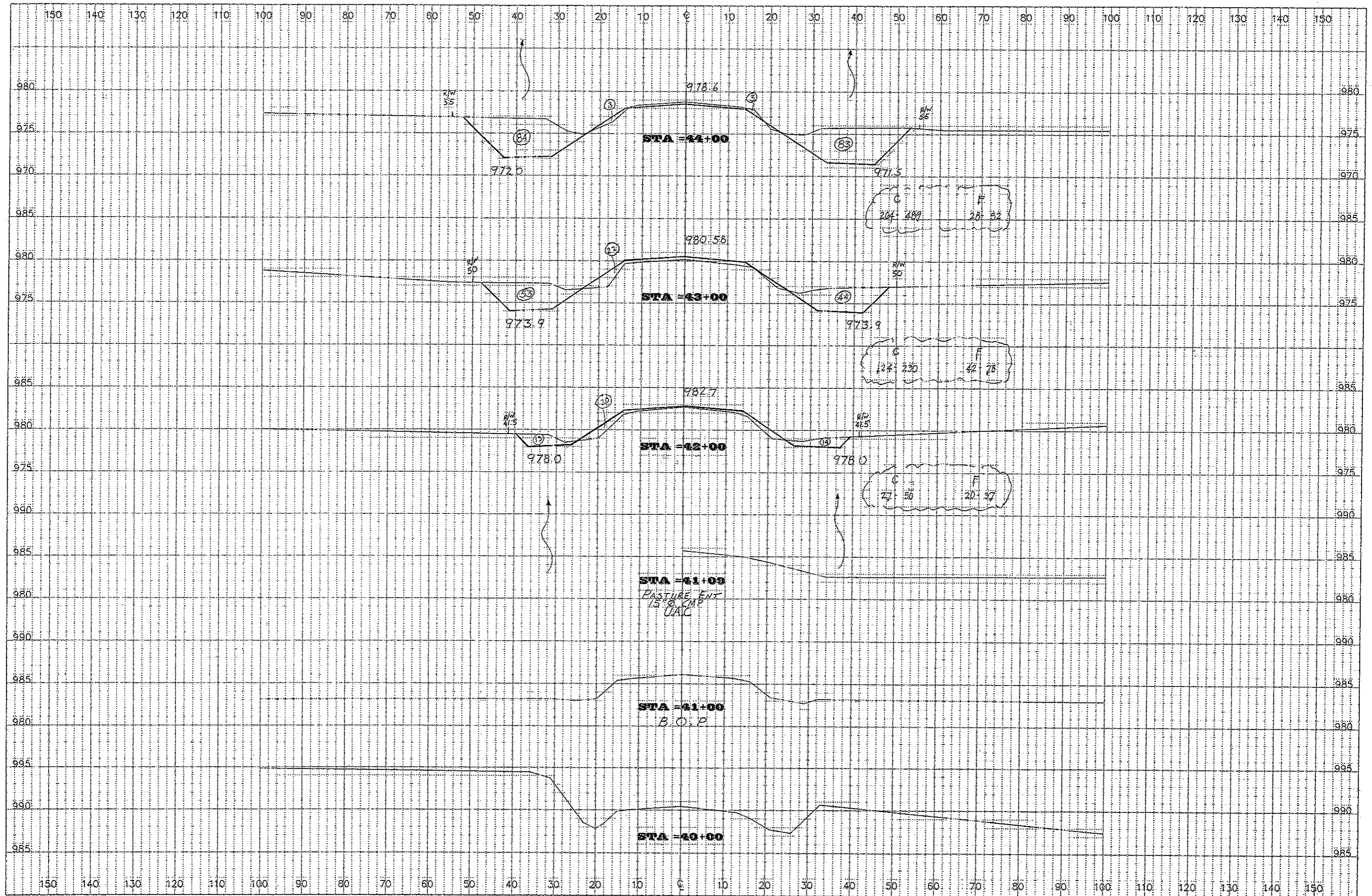
5. INSPECTIONS

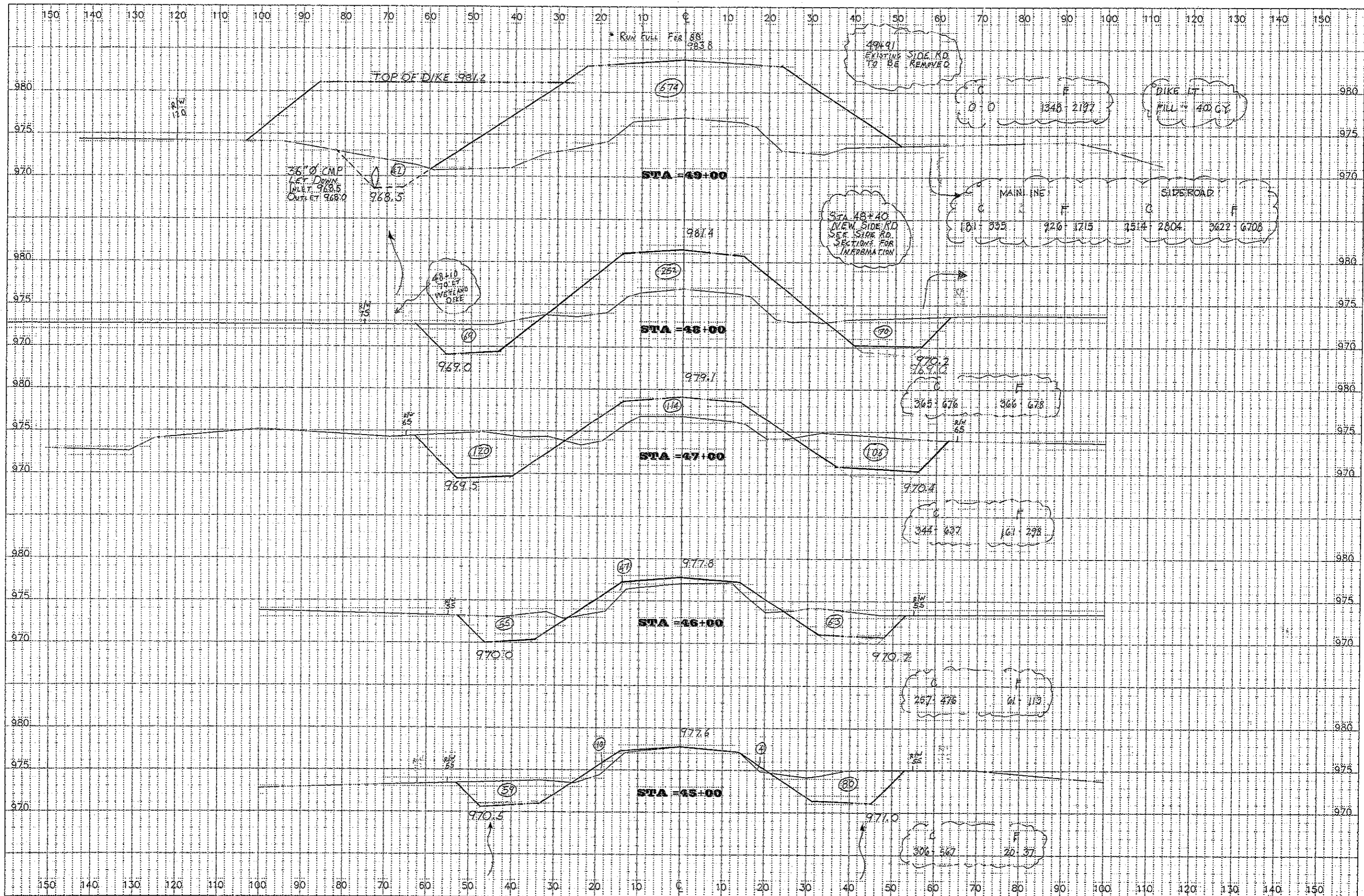
Inspections shall be made jointly by the contractor and the contracting authority every seven calendar days and after each rain event that is one-half inch or greater. The contractor shall immediately begin corrective action on all deficiencies found. The findings of this inspection shall be recorded in the project diary. This PPP may be revised based on the findings of the inspection. The contractor shall implement all revisions. All corrective actions shall be completed within 3 calendar days of the inspection.

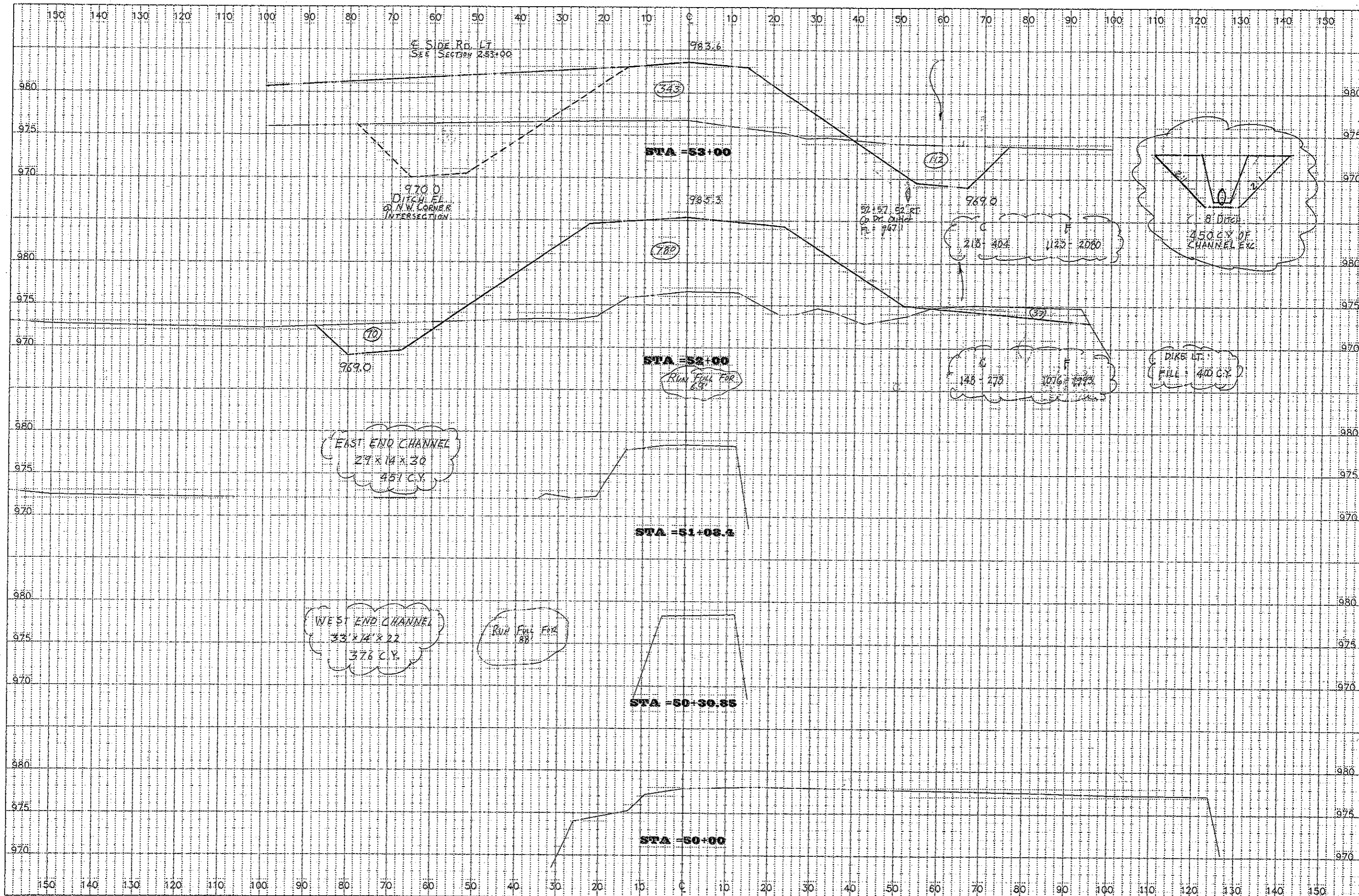
6. NON-STORM DISCHARGES

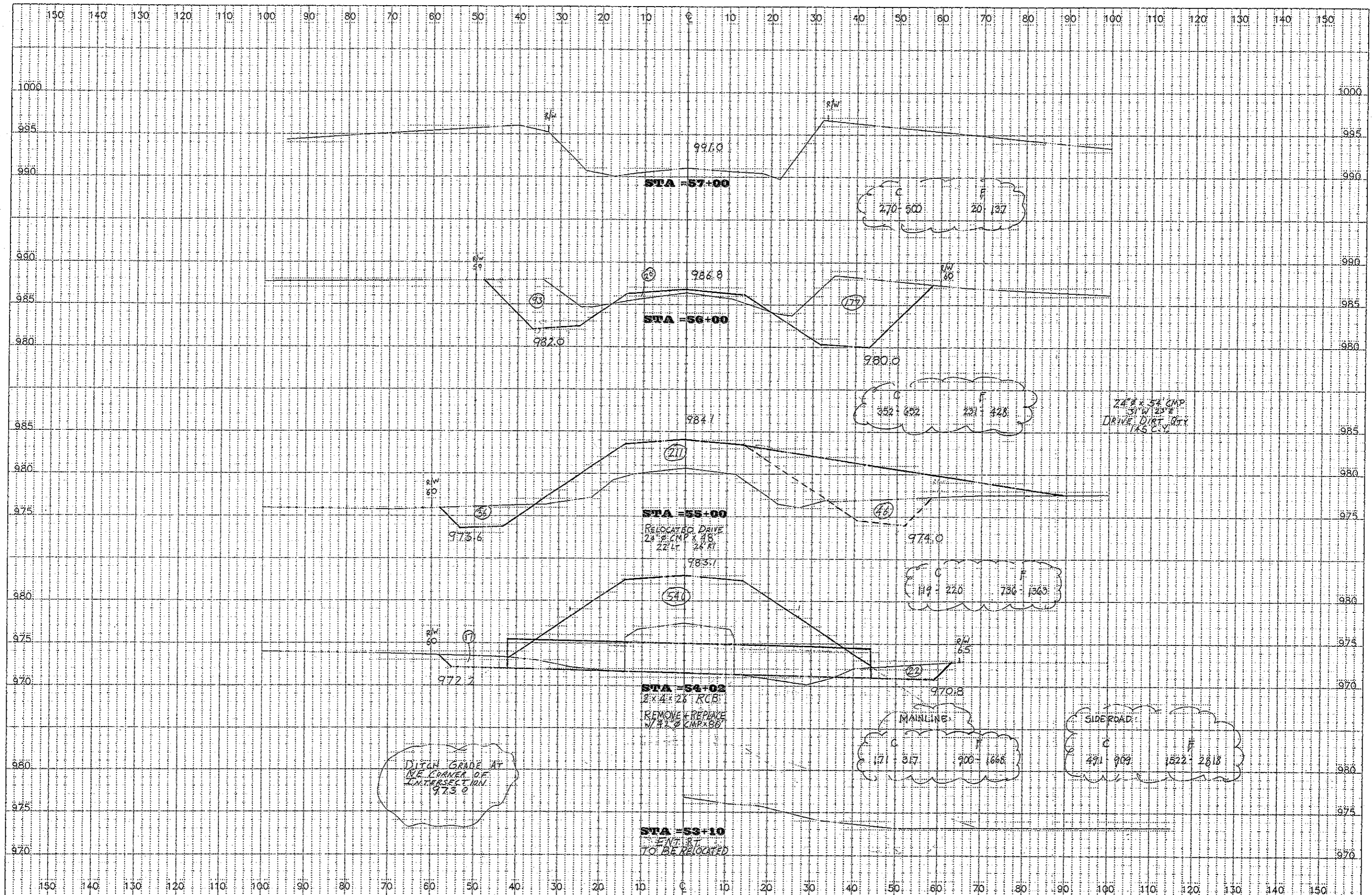
This includes subsurface drains, slope drains and bridge end drains. The velocity of the discharge from these features may be controlled by the use of patio blocks, Class A stone or erosion stone.

BOONE COUNTY
PROJECT NO. IBRC-C008(39)--8E-08
POLLUTION PREVENTION PLAN









STA - 57+00

STA - 56+00

STA - 55+00

STA - 54+02

STA - 53+10
 ENDT RT
 TO BE RELOCATED

C 270-500
 F 20-137

C 352-652
 F 231-428

C 119-220
 F 736-1363

C MAINLINE
 171-357
 F 900-1668

C SIDEROAD
 491-909
 F 1522-2818

24' x 54' CMP
 50' W/25' S
 DRIVE DIST. 145 C.Y.

DITCH GRADE AT
 NE CORNER OF
 INTERSECT. IN
 973.0

RELOCATED DRIVE
 24' x 54' CMP x 48'
 22' LT 24' RT

REMOVE & REPLACE
 7' x 4' x 28' RCB
 7' x 4' x 28' CMP x 88'

