Letting Date April 21, 2009

BRIDGE REPLACEMENT

IBRC-C011(86)--8E-11

BUENA VISTA COUNTY

DRAWING APPROVAL
ALL SHOP DRAWINGS AND FALSEWORK DRAWINGS THAT REQUIRE APPROVAL SHALL BE SUBMITTED TO AND APPROVED BY THE CONTRACTOR, WHO SHALL THEN SUBMIT FOR REVIEW AND APPROVAL.

ADDRESS: IOWA DOT OFFICE OF BRIDGES & STRUCTURES
800 LINCOLN WAY
AMES, IA 50010

IOWA
DEPARTMENT OF TRANSPORTATION

Project Development Division

PLANS OF PROPOSED IMPROVEMENT ON THE

SECONDARY ROAD SYSTEM

BUENA VISTA COUNTY
BRIDGE REPLACEMENT

50'-0" x 28'-0" PRECAST PRETENSIONED BOX GIRDER BRIDGE

Located in the NE 1/4, Section 26, T90N, R36W

The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2001, plus the applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions, shall apply to construction work on this project.

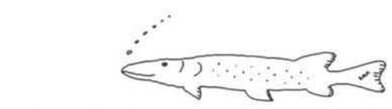
Scales: As Noted

PROJECT TRAFFIC CONTROL PLAN

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 Street and Highways' as adopted by the Department of Transportation per 761 of the Iowa Administrative Code (IAC) Chapter 130.

PROJ. IBRC-C011(86)--8J-11

REPLACE EXISTING 25'x 17'-7" I BEAM BRIDGE WITH A 50'-0" X 28'-0" PRECAST PRETENSIONED BOX GIRDER BRIDGE



Location Map Scale
0 1 2 3
miles

IOWA ONE CALL
800 / 292-8989
TOLL FREE
CALL - BEFORE - YOU - DIG

2003 AADT 45 V.P.D.

Project No. IBRC-C011(86)--8E-11

INDEX OF SHEETS

MILEAGE SUMMARY

Div.	Location	Lin.Ft.	Miles
	ROAD FROM STA 6+00 - STA 14+00	800	0.15
	BRIDGE AT STA 11+35.40	50	-0.01
			0.14

ROAD STANDARD PLANS

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

Identification	Revision	Identification	Revision	Identification	Revision
RE-28	04-03-01				
RE-12B	10-19-04				
RL-14	10-17-06				
RE-33B	10-29-02				
RE-48A	10-19-04				
RE-68	10-19-04				
TC-252	04-15-08				

INDEX OF SEALS

SHEET NO.	NAME	TYPE
1	Jon L. Ites	COUNTY
V.1	Stuart S. Nielsen	STRUCTURAL

JON L. ITES LICENSED 12256 IOWA PROFESSIONAL ENGINEER

I hereby certify that this plan was prepared under my supervision and that engineering decisions with regard to the design were made by me or by other duly licensed Professional Engineers under the laws of the State of Iowa.

Signature Jon L. Ites Date 1/29/09

Printed or Typed Name Jon L. Ites

My license renewal date is December 31, 2009

Pages or sheets covered by this seal: Pages 1, 1A, 12, 13 & 14

Approved Buena Vista County Board of Supervisors

DESIGN NO. 109 FILE NO. FHWA NO.: 084510 Buena Vista County Project Number: IBRC-C011(86)--8E-11 Sheet No. 1 of 14

ESTIMATED PROJECT QUANTITIES

ESTIMATED PROJECT QUANTITIES				
ITEM CODE	NO.	DESCRIPTION	UNIT	TOTAL
2102-2710070	1.	EXCAVATION, CLASS 10, RDWY & BORROW	CU.YDS.	10
2401-6745625	2.	REMOVAL OF EXISTING BRIDGE	L.S.	1
2402-2720000	3.	EXCAVATION, CLASS 20	CU.YDS.	36
2501-0201057	4.	PILE, HP10 X 57	L.F.	600
2505-4008200	5.	INSTALLATION OF GUARDRAIL, BRIDGE	L.F.	137.5
2505-4021332	6.	GUARDRAIL END ANCHORAGE BEAM, RE-33B	EACH	4
2507-3250005	7.	ENGINEER FABRIC	SQ.YDS.	160
2507-6800061	8.	REVETMENT, CLASS E	TON	200
2518-6910000	9.	SAFTEY CLOSURES	EACH	2
2528-8445110	10.	TRAFFIC CONTROL	L.S.	1
2533-4980005	11.	MOBILIZATION	L.S.	1
2599-9999005	12.	PRECAST ABUTMENT FOOTING	EACH	2
2599-9999005	13.	PRETENSIONED PRECAST 48" x 21" DECK BEAM	EACH	7
2599-9999005	14.	PRECAST BACKWALL - ABUTMENT	EACH	4
	15.			

SEE SHEEET V.1 FOR REFERENCE NOTES

ESTIMATED BRIDGE QUANTITIES

ITEM NO.	ITEM CODE	ITEM DESCRIPTION	UNIT	TOTAL	AS BUILT QUANTITY
1	2102-2710070	EXCAVATION, CL 10, RDWY+BORROW	CY	10.0	
2	2401-6745625	REMOVAL OF EXISTING BRIDGE	LS	1.0	
3	2402-2720000	EXCAVATION, CL 20	CY	36.0	
4	2501-0201057	PILE, HP10x57	LF	600.0	
5	2505-4008200	INSTALLATION OF GUARDRAIL, BRIDGE	LF	87'-6	
6	2507-3250005	ENGINEER FABRIC	SY	160.0	
7	2507-6800061	REVETMENT, CLASS E	TON	200.0	
8	2533-4980005	MOBILIZATION	LS	1.0	
9	2599-9999005	PRECAST ABUTMENT FOOTING	EACH	2.0	
10	2599-9999005	PRETENSIONED PRECAST 48" X 21" DECK BEAM	EACH	7.0	
11	2599-9999005	PRECAST BACKWALL - ABUTMENT	EACH	4.0	
12					
13					
14					

ESTIMATE REFERENCE INFORMATION

ITEM NO.	ITEM CODE	DESCRIPTION
4	2501-0201057	INCLUDES PROVIDING AND INSTALLING SHEAR STUDS
5	2505-4008200	INCLUDES ALL COSTS ASSOCIATED WITH FURNISHING AND PLACING THE BRIDGE GUARDRAIL.
9	2599-9999005	THIS ITEM INCLUDES ALL COSTS FOR FURNISHING AND PLACING THE PRECAST ABUTMENT FOOTING INCLUDING (ONE ABUTMENT - 8.7 C.Y. OF STRUCTURAL CONCRETE, 1384 LBS. REINFORCING STEEL, WITH MECHANICAL SPLICERS FOR THE BACKWALL, 18.0 L.F. OF 21" CMP, AND 1.5 C.Y. OF STRUCTURAL CONCRETE TO BACKFILL THE PILE VOIDS.) INCLUDES COST OF TEMPORARILY BLOCKING THE ABUTMENT FOOTING UNTIL THE CONCRETE BACKFILL IN THE PILE VOIDS HAS OBTAINED THE REQUIRED STRENGTH. THE METHOD OF MEASUREMENT AND BASIS OF PAYMENT WILL BE FOR EACH PRECAST ABUTMENT FOOTING (2 REQUIRED) FURNISHED AND PLACED. INCLUDES ALL PREFORMED EXPANSION JOINT FILLER REQUIRED. INCLUDES ANY FLOWABLE MORTAR PLACED UNDER THE PRECAST ABUTMENT TO FILL VOIDS OR TO HELP SUPPORT THE ABUTMENT DURING PLACEMENT.
10	2599-9999005	INCLUDES ALL COSTS ASSOCIATED WITH FURNISHING AND PLACING THE PRETENSIONED PRECAST DECK BEAMS. INCLUDES ABUTMENT BEARING MATERIAL, MATERIAL (1" DIA. TIE RODS, WASHERS, NUTS, ETC) NEEDED FOR THE TRANSVERSE ASSEMBLY OF THE PANELS AND GROUTING OF THE TIE RODS. INCLUDES 1.5 C.Y. OF GROUT FOR SHEAR KEYS BETWEEN PANELS. 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 CUTTING OFF AND GROUTING OF LIFTING HOOPS. INCLUDES COATING THE ENDS OF THE BEAMS WITH CONCRETE SEALER.
11	2599-9999005	THIS ITEM INCLUDES ALL COSTS FOR FURNISHING AND PLACING THE PRECAST ABUTMENT BACKWALLS INCLUDING (FOUR BACKWALLS - 5.2 C.Y. OF STRUCTURAL CONCRETE (BRIDGE), 1181 LBS. REINFORCING STEEL), INCLUDES EPOXY GROUT AND SLAB DOWELS FOR THE BACKWALL. THE METHOD OF MEASUREMENT AND BASIS OF PAYMENT WILL BE FOR EACH PRECAST ABUTMENT BACKWALL FURNISHED AND PLACED.

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER
Stuart S. Nielsen
14852
IOWA

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.

Signature — Date: 1/23/2009

Stuart S. Nielsen
Printed or Typed Name

My license renewal date is December 31, 2010

Pages or sheets covered by this seal: SHEETS V. 1 THRU V. 10

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

QUANTITIES

STA. 11+35.4

APRIL 2009

BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 10 FILE NO. 30365 DESIGN NO. 109

DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER BRC-C011(86)-8E-11 | SHEET NUMBER V. 1

GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 25' X 17'-7 SINGLE SPAN CONCRETE BRIDGE CONSTRUCTED IN 1936. NO KNOWN COPIES OF THE ORIGINAL PLAN EXIST. THE EXISTING BRIDGE SUPERSTRUCTURE CONSISTS OF A CONCRETE DECK. THE EXISTING SUBSTRUCTURE CONSISTS OF CONCRETE WINGS AND BACKWALLS. THE INTENT IS TO REPLACE THE EXISTING STRUCTURE WITH AN INNOVATIVE BRIDGE RESEARCH AND CONSTRUCTION (IBRC) ACCELERATED BRIDGE CONSTRUCTED WITH PRECAST ABUTMENT FOOTINGS AND PRECAST PRESTRESSED DECK BEAMS.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING BRIDGE" SHALL INCLUDE THE REMOVEL OF THE EXISTING 25' X 17'-7 CONCRETE SUPERSTRUCTURE AND SUBSTRUCTURE OF THE EXISTING BRIDGE.

REMOVALS SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS, EXCEPT THAT THE EXISTING BRIDGE SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

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 HL-93 LOADING, PLUS 50 LBS. PER SQUARE FOOT OF ROADWAY FOR FUTURE OVERLAY.

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 STATE OR COUNTY.

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.

BUENA VISTA COUNTY SHALL BE RESPONSIBLE FOR THE CONSTRUCTION STAKING.
THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PRESERVATION OF STAKES AND MARKS IN ACCORDANCE WITH STANDARD SPECIFICATION 1105.06.

SOUNDING AND TEST BORING DATA SHOWN ON PLANS WERE ACCUMULATED FOR DESIGNING AND ESTIMATING PURPOSES. THEIR APPEARANCE ON THE PLAN DOES NOT CONSTITUTE A GUARANTEE THAT CONDITIONS OTHER THAN THOSE INDICATED WILL NOT BE ENCOUNTERED.

THE BRIDGE CONTRACTOR IS TO CLEAR AND/OR SHAPE THE CHANNEL WITHIN THE APPROXIMATE LIMITS OF THE RIPRAP AREAS AS SHOWN ON THE SITUATION PLAN.

NOTE:
THIS PLAN USES NON-STANDARD PILE HEAD SPIRALS. SEE DETAILS FOR ADDITIONAL INFORMATION.

THESE BRIDGE PLANS LABEL ALL REINFORCING STEEL WITH ENGLISH NOTATION (5a) IS $\frac{5}{8}$ 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

SPECIFICATIONS:

DESIGN: AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION, 2007.
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, INCLUDING "DEVELOPMENTAL SPECIFICATIONS FOR HIGH PERFORMANCE CONCRETE FOR PRESTRESSED CONCRETE BEAMS" SHALL APPLY TO CONSTRUCTION WORK ON THIS PROJECT.

DESIGN STRESSES:

DESIGN STRESSES FOR THE FOLLOWING MATERIALS ARE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION, 2007.
REINFORCING STEEL IN ACCORDANCE WITH SECTION 5, GRADE 60.
CONCRETE IN ACCORDANCE WITH SECTION 5, f'c = 3,500 PSI.
PRESTRESSED CONCRETE BEAMS, SEE DESIGN SHEET.
PRECAST ABUTMENT FOOTING CONCRETE IN ACCORDANCE WITH SECTION 5, f'c = 5,000 PSI.

ROADWAY GRADING

NOTE: ALL ROAD GRADING TO BE PERFORMED BY BUENA VISTA COUNTY FORCES.

TRAFFIC CONTROL PLAN

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

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

GENERAL NOTES

STA. 11+35.4 APRIL 2009

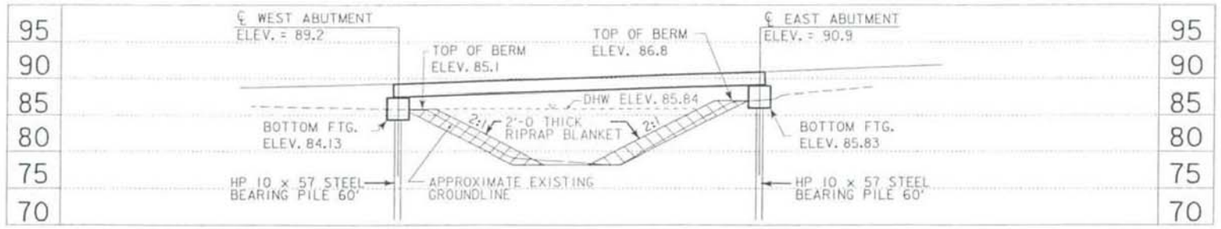
BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

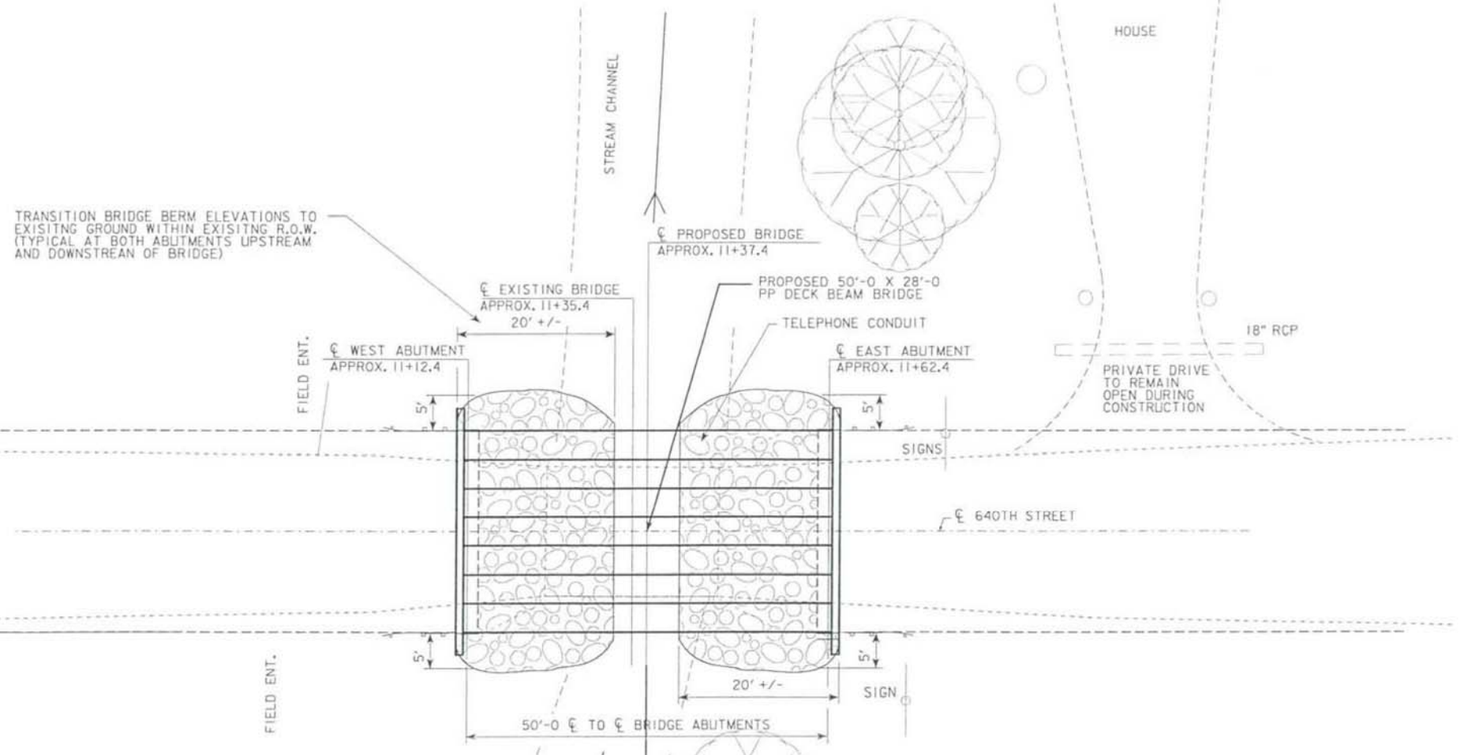
DESIGN SHEET NO. 2 OF 10 FILE NO. 30365 DESIGN NO. 109

DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER IBRC-C011(86)-8E-11 | SHEET NUMBER V.2

BENCHMARK: RR SPIKE ON NORTH SIDE OF PP ELEV. = 100.00'



LONGITUDINAL SECTION ALONG ℄ ROADWAY



TYPICAL CROSS SECTION
(NEAR BRIDGE)

SITUATION PLAN

VPI STA = 9+75 VC = 600'
VPI ELEV = 78'

PROPOSED PROFILE
GRADE 640TH STREET

HYDRAULIC DATA

DRAINAGE AREA= 42.8 SQUARE MILES

Q_{50}= 1660 CFS
STAGE W/BACKWATER= 85.8
NATURAL STAGE AT BRIDGE= 84.8

RIRAP NOTE:
PLACE RIPRAP ON ENGINEERING FABRIC ACCORDING TO THE IOWA DOT STANDARD SPECIFICATIONS.

LOCATION

640TH STREET OVER
BRANCH RACCOON RIVER
T-90 N R-36 W
SECTION NORTH SIDE 26
PROVIDENCE TOWNSHIP
BUENA VISTA COUNTY
EXISTING BRIDGE
FHWA #084510

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

SITUATION PLAN

STA. 11+35.4 APRIL 2009

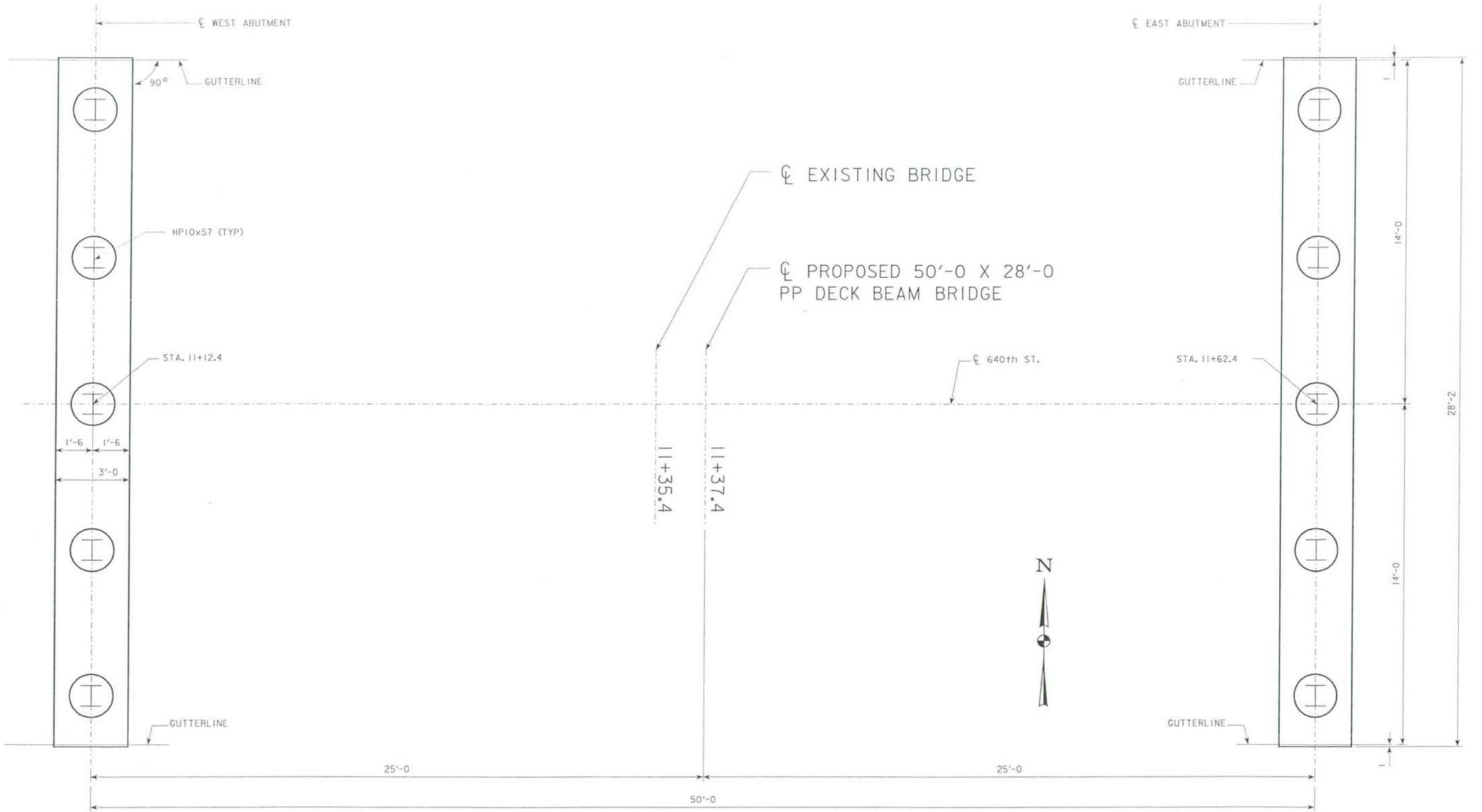
BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 10 FILE NO. 30365 DESIGN NO. 109

DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER BRC-C011(86)-8E-11 | SHEET NUMBER V. 3

23-JAN-2009 10:49 snielse W:\Projects\BridgesStructures\LocalSystem_PrimaryRoutes\Buena_Vista\BRFinal\BRC86_Bridge_Plans.brg 610106s003 \\ntpprtsvr2\BrgPDF



STAKING DIAGRAM

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

STAKING DIAGRAM

STA. 11+35.4 APRIL 2009

BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 4 OF 10 FILE NO. 30365 DESIGN NO. 109

DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER BRC-C011(86)-8E-11 | SHEET NUMBER V. 4

23-JAN-2009 10:49 snielse W:\Projects\BridgesStructures\LocalSystem_PrimaryRoutes\Buena_Vista\BRFinal\BRC86_Bridge_Plans.brg 610106s004 \\ntpprtsvr2\BrgPDF

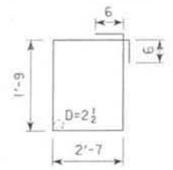
REINFORCING BAR LIST

ONE PRECAST ABUTMENT FOOTING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
8f1	ABUTMENT FOOTING LONGITUDINAL - FACES		8	27'-8	591
5f2	ABUTMENT FOOTING LONGITUDINAL - TOP		8	4'-0	34
5p1	ABUTMENT HOOPS		56	9'-8	565
8a2	MECHANICAL SPLICE FOR BACKWALL DOWELS		14	2'-8	100
#2	PILE SPIRAL		10	33'-0	55
	SPIRAL SPACER L $\frac{3}{8}\times\frac{3}{8}\times\frac{3}{8}\times$ 0.70		30	1'-10	39
		REINFORCING STEEL (LBS.)			1384

NOTE: THE 8a1 BARS ARE SPLICED TO THE 8a2 MECHANICAL SPLICERS IN THE ABUTMENT. MECHANICAL SPLICERS SHALL BE IN ACCORDANCE WITH MATERIALS IM 451, APPENDIX E.

BENT BAR DETAILS



5p1

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

PRECAST ABUTMENT FOOTING & PILE 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 ABUTMENT PILES IS 47 TONS.

THE PRECAST ABUTMENT FOOTING PICK POINT OR LIFTING LOOPS SHALL BE DESIGNED BY THE PRECAST MANUFACTURER. FLEXURAL EFFECTS 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 ONE WEEK PRIOR TO THE ERECTION FOR REVIEW AND APPROVAL.

THE STRUCTURAL CONCRETE 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 $\frac{1}{2}$"Φ 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.

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

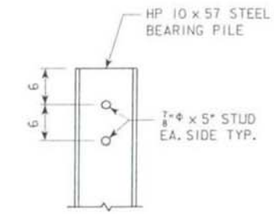
ESTIMATED QUANTITIES ONE PRECAST ABUTMENT FOOTING

ITEM	UNIT	QUANTITY
STRUCTURAL CONCRETE	CY	8.7
STRUCTURAL CONCRETE FOR PILE ENCASEMENTS	CY	1.5
REINFORCING STEEL	LBS	1384
EXCAVATION CLASS 20	CY	36.0
21" Φ CMP	LF	18.0

PILE QUANTITIES BOTH ABUTMENTS

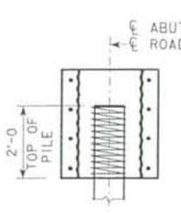
E. ABUT.	5 - HP10X57 @ 60'-0	300'-0
W. ABUT.	5 - HP10X57 @ 60'-0	300'-0
	TOTAL	600'-0

PRECAST ABUTMENT WEIGHT = 17.2 TONS

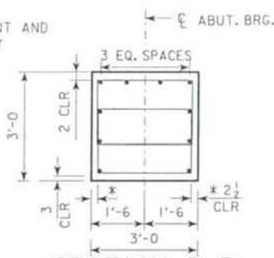


DETAIL A

NOTE: 4 STUDS PER PILE.

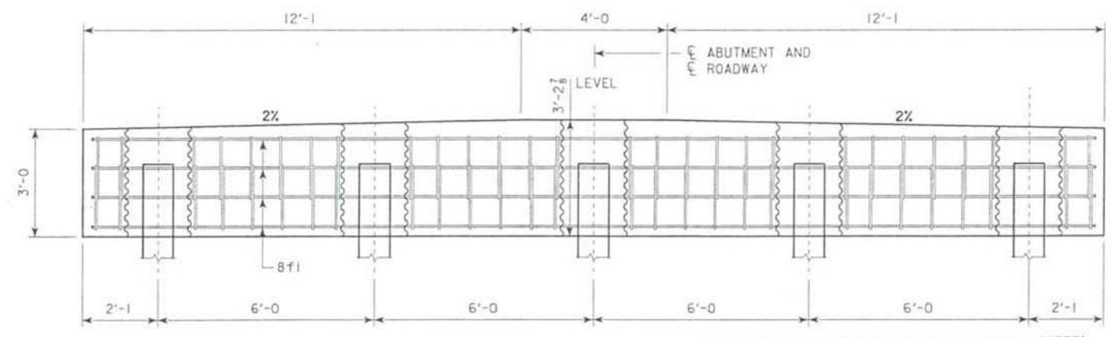


SECTION A-A



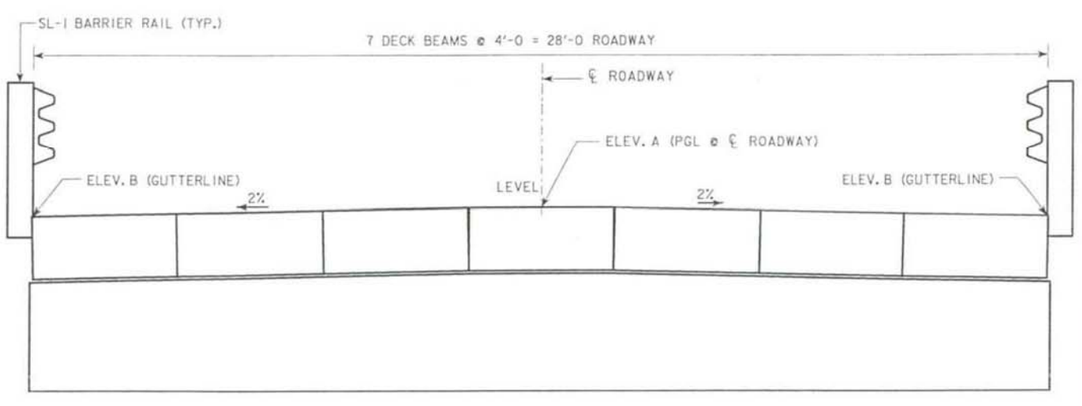
SECTION B-B

NOTE: THE SPIRAL AT THE TOP OF EACH PILE TO HAVE 7 TURNS OF NO. 2 BAR, 18" DIAMETER, 3" PITCH WITH 3 - L $\frac{3}{8}\times\frac{3}{8}\times\frac{3}{8}$ SPACERS PUNCHED TO HOLD SPIRAL.



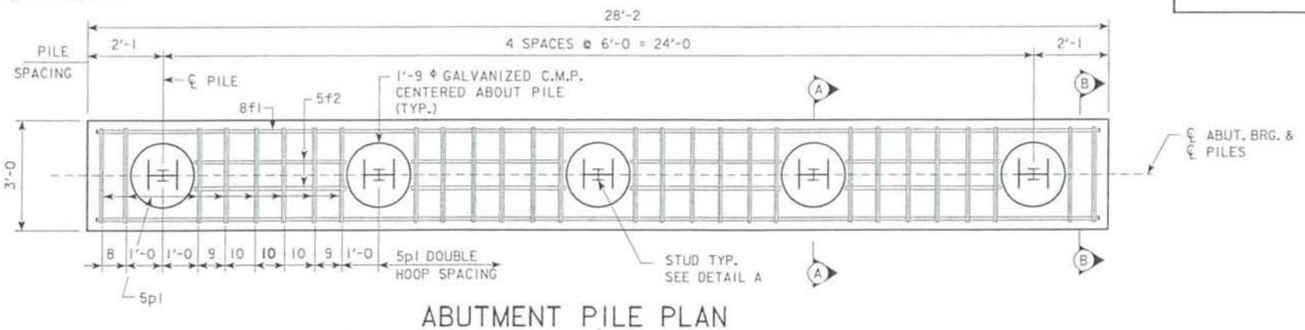
(8a2 MECH. SPLICERS SHOWN ON BACKWALL SHEET)

ABUTMENT ELEVATION



REAR ELEVATION AT ABUTMENT

(BACKWALL NOT SHOWN FOR CLARITY)



ABUTMENT PILE PLAN

TABLE OF ABUTMENT ELEVATIONS		
ELEV.	W. ABUT.	E. ABUT.
A	89.20	90.90
B	88.96	90.66
BOTT. OF FOOTING	84.13	85.83

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

PRECAST ABUTMENT DETAILS

STA. 11+35.4 APRIL 2009

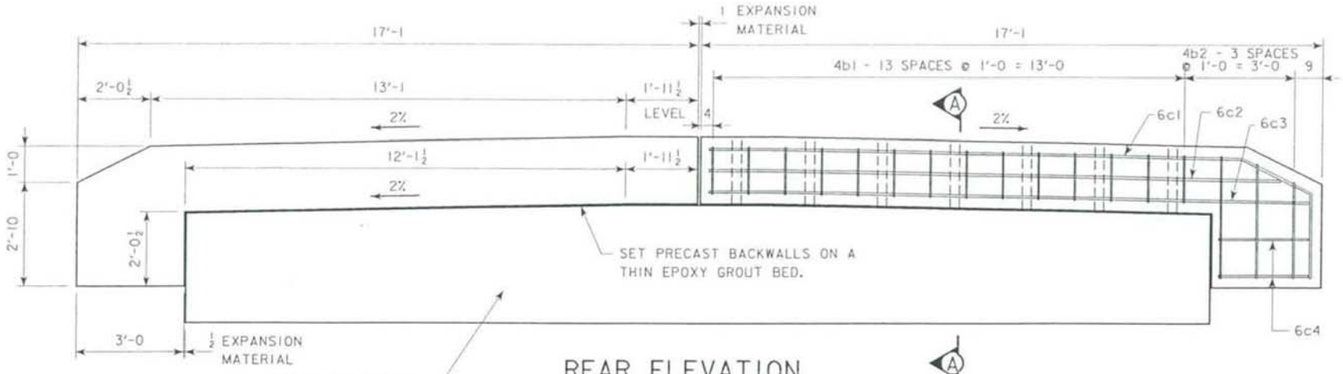
BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

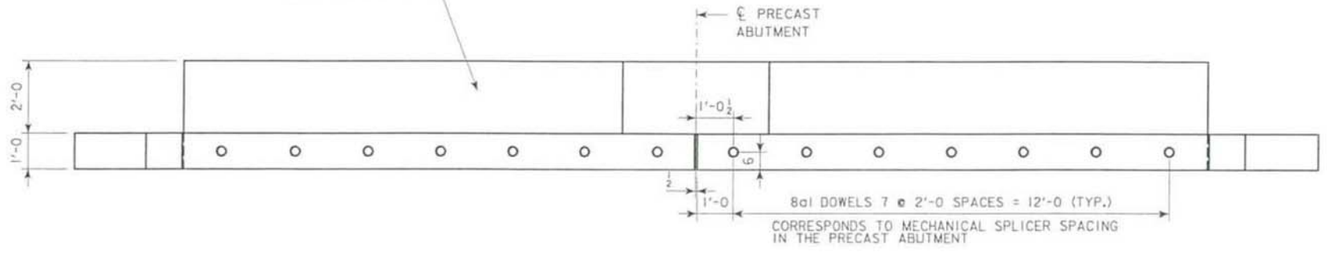
DESIGN SHEET NO. 5 OF 10 FILE NO. 30365 DESIGN NO. 109

DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER BRC-C011(86)-8E-11 | SHEET NUMBER V.5

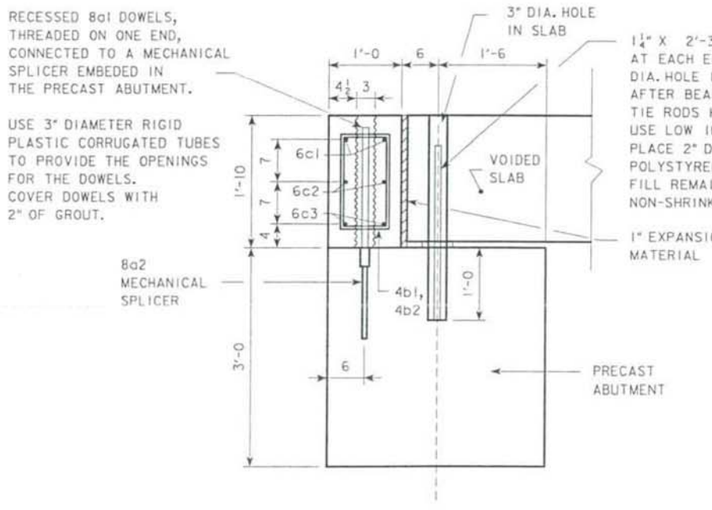
23-JAN-2009 10:49 snielse W:\Projects\BridgesStructures\LocalSystem_PrimaryRoutes\Buena_Vista\BRFinal\IBRC86_Bridge_Plans.brg 610106s005 \\ntpprtsvr2\BrgPDF



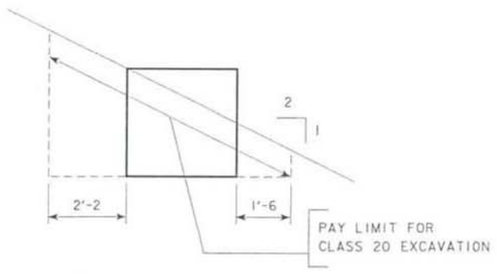
REAR ELEVATION



PLAN ELEVATION



SECTION A-A
(SHOWING SLAB)



ABUTMENT EXCAVATION DETAILS

BACKWALL CONCRETE QUANTITIES	
SECTION	TOTAL
BACKWALL (4 @ 1.3)	5.2
TOTAL (C.Y.)	5.2

NOTE:

THE PRECAST BACKWALLS SHALL BE DRY FITTED TO THE PRECAST ABUTMENTS IN THE PRECASTER'S YARD OR SHOP BEFORE SHIPPING THE PIECES TO THE FIELD.

THE ENGINEER SHALL HAVE 48 HOURS NOTICE TO VIEW AND APPROVE THE CONNECTED PRECAST PIECES BEFORE THEY ARE SHIPPED TO THE FIELD.

DOWEL SETTING NOTE:
THE 8a1 BARS SHALL BE SET AS DOWELS IN PREFORMED HOLES. THE DOWELS SHALL BE INSTALLED IN ACCORDANCE WITH THE GROUT MANUFACTURER'S RECOMMENDATIONS. THE FOLLOWING SYSTEM MAY BE USED AS A BONDING AGENT FOR VERTICAL DOWELS:

A. POLYMER GROUT SYSTEM IN ACCORDANCE WITH STANDARD SPECIFICATIONS.

BACKWALL SETTING NOTE:

SET PRECAST BACKWALLS ON A EXPOXY GROUT BED TO HELP LEVEL AND CONNECT THE PRECAST ELEMENTS.

FOLLOW ALL MANUFACTURER RECOMMENDATIONS FOR INSTALLATION.

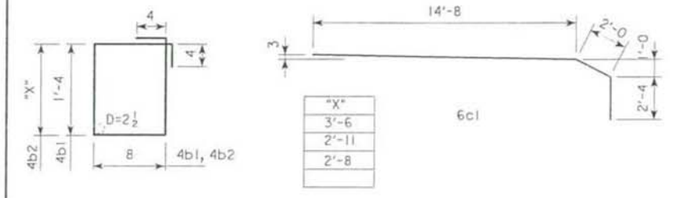
CARE SHOULD BE TAKEN TO AVOID SPILLS.

NOTE: THE 8a1 BARS ARE SPLICED WITH MECHANICAL SPLICERS TO THE ABUTMENT. MECHANICAL SPLICERS SHALL BE IN ACCORDANCE WITH MATERIALS IM 451, APPENDIX E.

REINFORCING BAR LIST-FOUR BACKWALLS

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
4b1	BACKWALL, VERTICAL STIRRUPS	□	56	4'-8	175
4b2	BACKWALL, VERTICAL STIRRUPS	□	12	VARIES	65
6c1	BACKWALL, HORIZONTAL	⌐	8	19'-0	228
6c2	BACKWALL, HORIZONTAL	—	8	16'-0	192
6c3	BACKWALL, HORIZONTAL	—	8	16'-7	200
6c4	BACKWALL, HORIZONTAL	—	16	2'-8	64
8a1	THREADED (ONE END) BACKWALL DOWELS	—	28	1'-8	125
	1¼" DIAMETER SMOOTH SLAB DOWELS	—	14	2'-3	132
				REINFORCING STEEL (LBS.)	1181

BENT BAR DETAILS



NOTE: ALL DIMENTIONS ARE OUT OT OUT. D = PIN DIAMTER.

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

ABUTMENT BACKWALL

STA. 11+35.4

APRIL 2009

BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 6 OF 10 FILE NO. 30365 DESIGN NO. 109

DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER BRC-C011(86)-8E-11 | SHEET NUMBER V. 6

BEAM NOTES:

THESE BEAMS ARE DESIGNED FOR HL-93 LOADING, PLUS 50 LBS. PER SQUARE FOOT FOR A FUTURE WEARING SURFACE.

ALL PRESTRESSING STRANDS SHALL CONFORM TO ASTM A416 GRADE 270 LOW RELAXATION STRANDS.
THE TOTAL INITIAL PRESTRESS FOR THE DECK BEAMS IS BASED ON 72.664% f's. f's = 270 ksi AND As = 0.153 SQ. IN.. THE MINIMUM STRAND BREAKING STRENGTH SHALL BE 41.3 KIPS.

THE RELEASE AND FINAL CONCRETE STRENGTHS SHALL BE A MINIMUM OF f'ci = 6 ksi at AT RELEASE AND f'c = 7 KSI AT 28 DAYS.

WHEN A TIGHT, UNIFORM SURFACE HAS BEEN ACHIEVED, THE BEAM SURFACES SHALL BE GIVEN A SUITABLE GROOVING USING A MECHANICAL DEVICE SUCH AS A WIRE BROOM OR A COMB. THE BROOM OR COMB SHALL HAVE A SINGLE ROW OF TINES $\frac{1}{8}$" ± " IN WIDTH. THE DEPTH OF THE GROOVE IN THE PLASTIC CONCRETE SHALL BE $\frac{1}{8}$" AS A TARGET WITH A $\pm\frac{1}{16}$" TOLERANCE. GROOVING SHALL BE TRANSVERSE TO THE CENTERLINE OF THE ROADWAY. TRANSVERSE GROOVING SHALL BE RANDOMLY SPACED FROM $\frac{3}{4}$" INCH TO $1\frac{5}{8}$" INCHES WITH NO MORE THAN 50% OF THE SPACINGS EXCEEDING $1\frac{1}{4}$ INCH AND WITH A MINIMUM OF FOUR DIFFERENT SPACINGS IN A 2' WIDTH. THIS OPERATION SHALL BE DONE AT A TIME AND MANNER THAT THE DESIRED TEXTURE WILL BE ACHIEVED WHILE MINIMIZING THE DISPLACEMENT OF THE LARGER AGGREGATE PARTICLES.

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

FOR TRANSPORTING, THE OVERHANG SHALL BE IN ACCORDANCE WITH ART. 2407.13 OF THE STANDARD SPECIFICATIONS.

BEARINGS SHALL BE AS DETAILED ON THIS SHEET. 70 DUROMETER NEOPRENE SHALL BE USED FOR THE BEARING PADS. THE COST OF THE NEOPRENE PADS SHALL BE INCLUDED IN THE PRICE BID FOR PRETENSIONED PRECAST 48" X 21" DECK BEAM.

LIFTING LOOPS LOCATIONS SHALL BE DESIGNED BY THE PRECAST MANUFACTURER AND SHALL BE APPROVED BY THE ENGINEER PRIOR TO FABRICATION OF THE BEAMS. ONCE IN PLACE THE LIFTING LOOPS SHALL BE CUT OFF 2" INCHES BELOW THE TOP SURFACE OF THE PRECAST BEAMS AND THE RECESSED AREA SHALL BE GROUTED WITH A GROUT MATERIAL APPROVED BY THE ENGINEER.

THE 1" ϕ RODS IN THE TRANSVERSE TIE ASSEMBLY SHALL BE TIGHTENED TO A SNUG FIT AND THE THREADS SET. THE POCKETS THAT RECEIVE THE TRANSVERSE TIE BARS SHALL BE FILLED WITH GROUT AFTER THE TRANSVERSE TIE ASSEMBLY IS IN PLACE.

THE 1" ϕ THREADED GALVANIZED RODS SHALL BE IN ACCORDANCE WITH ASTM A 307-04, GRADE A. THE STRUCTURAL STEEL FOR THE $\frac{3}{8}$" PLATE WASHERS SHALL BE IN ACCORDANCE WITH ASTM A 709, GRADE 50. THE HEX NUTS FOR THE 1" ϕ THREADED RODS SHALL BE IN ACCORDANCE WITH ASTM A 563, GRADE A. THE HEX COUPLING NUTS SHALL BE IN ACCORDANCE WITH STANDARD IFI-128 2000 UNDER ANSI/ASME B18.22.

IF NECESSARY, BEARING SEAT SURFACES SHALL BE ADJUSTED BY SHIMMING TO ASSURE FIRM AND EVEN BEARING OF THE DECK BEAMS. TWO $\frac{1}{8}$" NEOPRENE ADJUSTING SHIMS WITH THE DIMENSIONS OF THE EXTERIOR BEARING PAD SHALL BE PROVIDED FOR EACH BEARING. THE COST OF SHIMS SHALL BE INCLUDED IN THE PRICE BID FOR PRETENSIONED PRECAST 48" X 21" DECK BEAM.

BEAM KEYWAY SURFACES SHALL BE CLEANED TO REMOVE FORM OIL OR OTHER BOND BREAKING MATERIAL PRIOR TO SHIPMENT OF THE BEAMS. CLEANING SHALL BE DONE BY SANDBLASTING THE KEYWAY AREAS BETWEEN THE TOP OF THE BEAM AND THE BOTTOM OF THE KEY.

CONCRETE SEALER SHALL BE APPLIED TO THE PRESTRESSED DECK BEAM ENDS IN ACCORDANCE WITH STANDARD SPECIFICATION 2403.21 D.

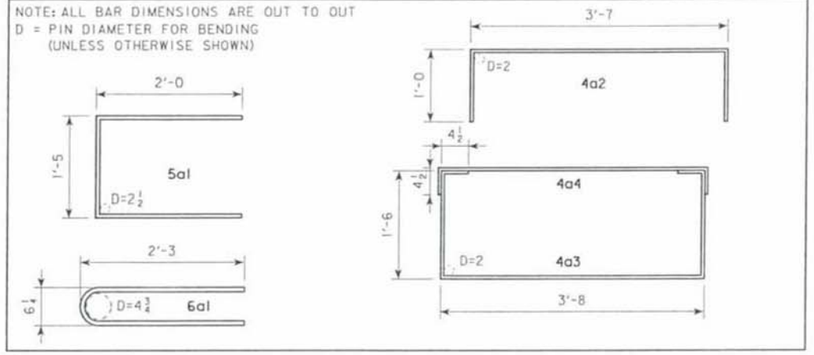
NOTE:
THE 4a1 BARS CAN BE DIVIDED INTO TWO PIECES WITH A 1'- 8 SPLICE, FOR EASE OF CONSTRUCTION.

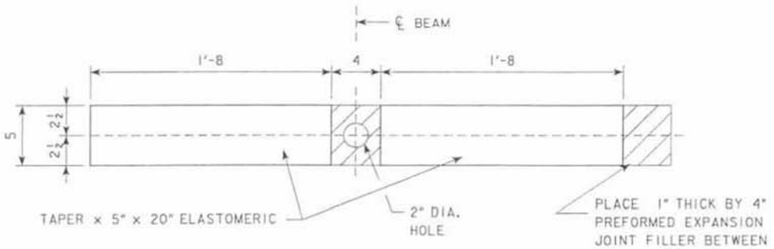
REINFORCING BAR LIST - ONE BEAM

BAR	SHAPE	NO.	LENGTH	WEIGHT
4a1		8	50'-6	270
4a2		4	5'-7	15
4a3		63	7'-5	313
4a4		63	4'-5	186
5a1		8	5'-5	45
6a1		2	5'-0	15
TOTAL WT. (LBS.)				844

BENT BAR DETAILS

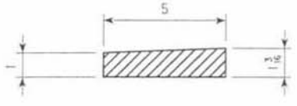
NOTE: ALL BAR DIMENSIONS ARE OUT TO OUT
D = PIN DIAMETER FOR BENDING
(UNLESS OTHERWISE SHOWN)





BEARING PADS

(28 REQUIRED)



BEARING PAD - TAPER

AREA = 695 in²
ȳb = 10.3 in.
I = 34,517 in⁴
Sb = 3,287 in³
St = 3,287 in³

BEAM SECTION PROPERTIES

NOTE:
CUT STRANDS FLUSH
WITH THE END OF THE BEAM

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

DECK BEAM DETAILS

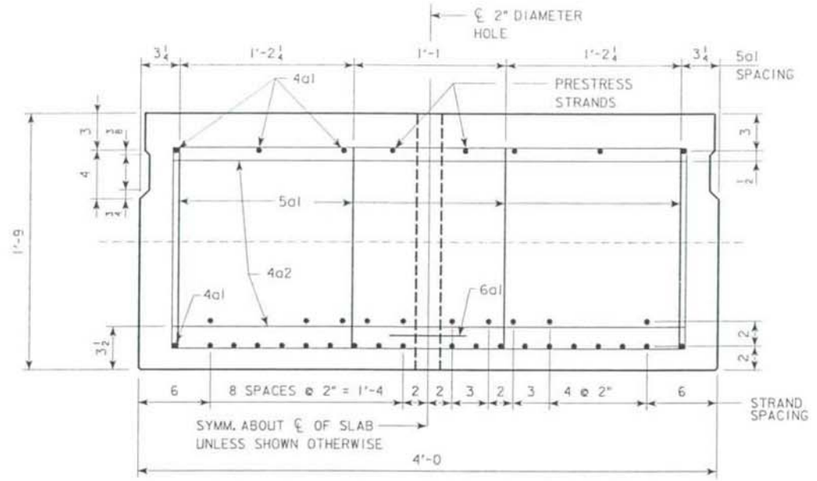
STA. 11+35.4 APRIL 2009

BUENA VISTA COUNTY

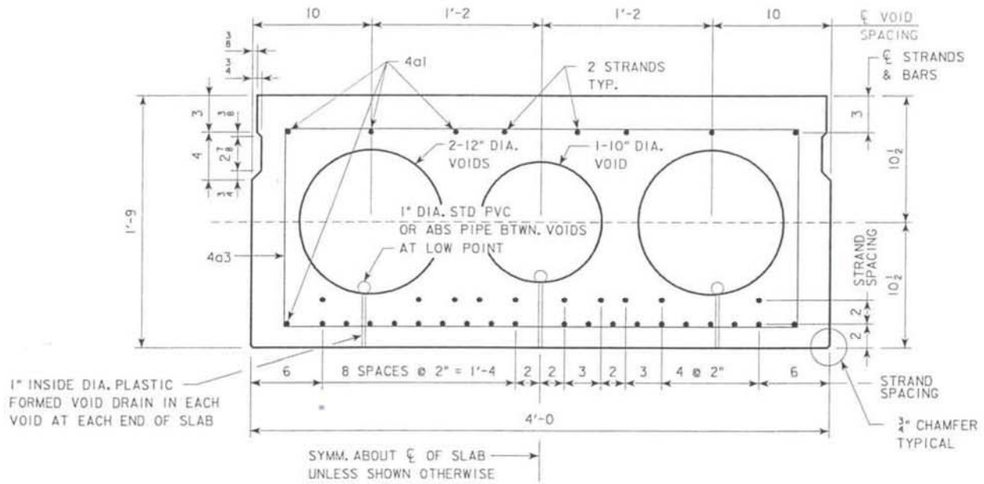
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 7 OF 10 FILE NO. 30365 DESIGN NO. 109

DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER IBRC-C011(86)-8E-11 | SHEET NUMBER V. 7

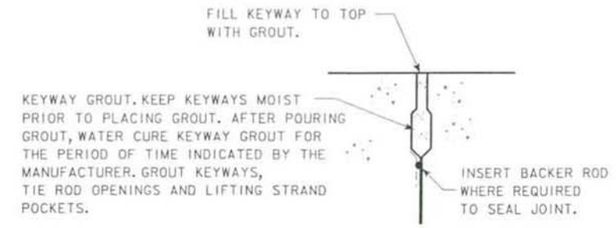


SECTION AT ℄ BEARING

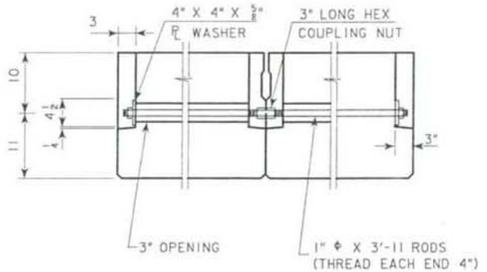


SECTION AT MIDSPAN

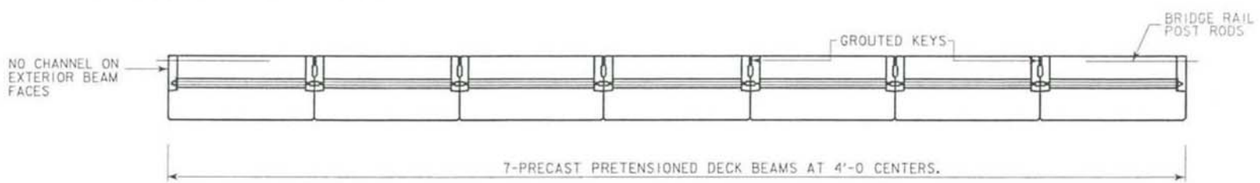
PRETENSIONED PRECAST 48" X 21" DECK BEAMS													
21" SLAB	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	CONCRETE STRENGTH f'ci (ksi)	CONCRETE STRENGTH f'c (ksi)	STRAND SIZE DIA. (in)	NO. OF STRAND STRAIGHT	NO. OF STRAND DEFLECTED	TOTAL INITIAL PRESTRESS ③ Kips		CAMBER (in) AT RELEASE	CAMBER (in) AFTER LOSSES	WEIGHT (TONS)	CONCRETE (CU YD.)	REINFORCING STEEL (WEIGHT-LBS)
21" SLAB	50'-0	50'-10	6.0	7.0	0.5	30	0	900.5		1.2	1.0	19	9.1	844



KEYWAY GROUT



TRANSVERSE TIE ASSEMBLY



DECK BEAM ASSEMBLY

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

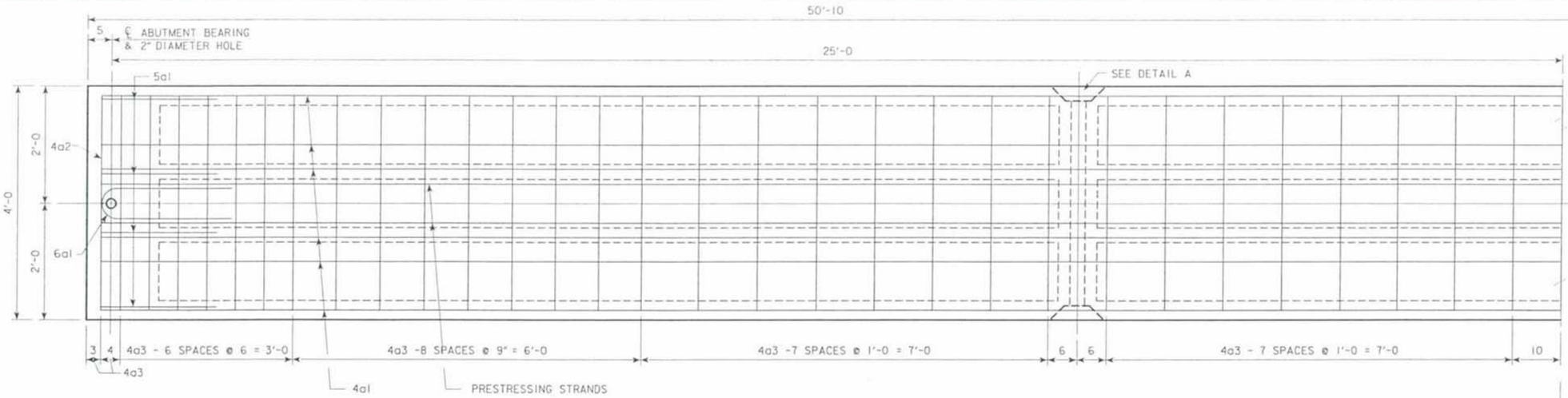
DECK BEAM DETAILS

STA. 11+35.4 APRIL 2009

BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

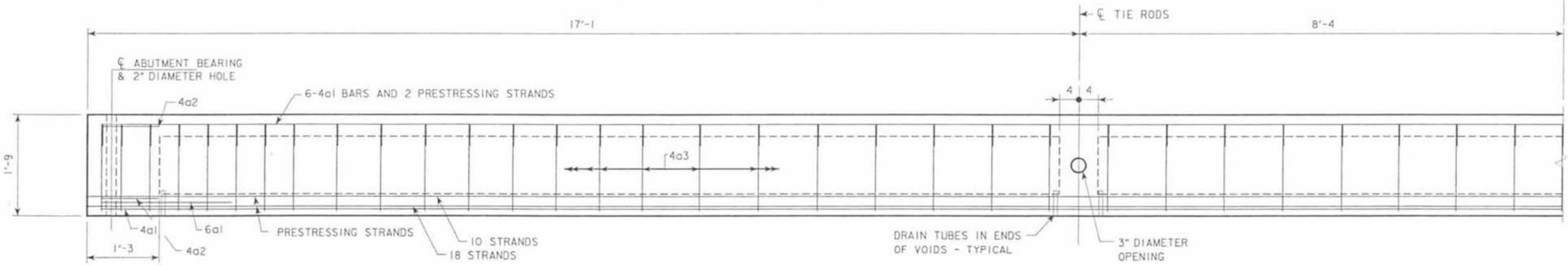
DESIGN SHEET NO. 8 OF 10 FILE NO. 30365 DESIGN NO. 109



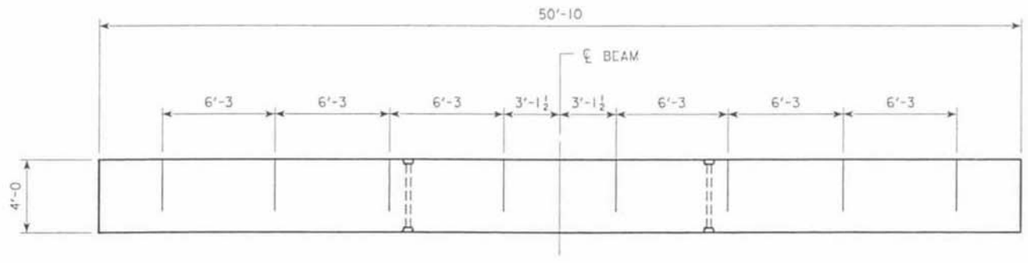
DECK BEAM DETAILS - PLAN VIEW

(NOTE: BOTTOM PRESTRESSING STRANDS NOT SHOWN FOR CLARITY)

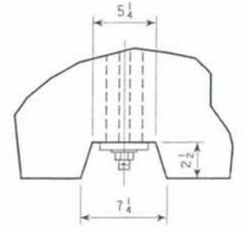
SYMM. ABOUT ℄ OF SLAB
UNLESS SHOWN OTHERWISE



DECK BEAM DETAILS - ELEVATION VIEW



RAILING TIE BAR SPACING - PLAN VIEW



DETAIL A

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

DECK BEAM DETAILS

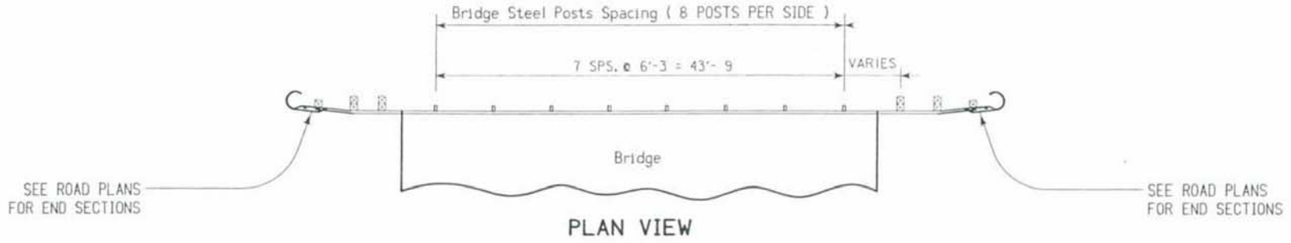
STA. 11+35.4 APRIL 2009

BUENA VISTA COUNTY

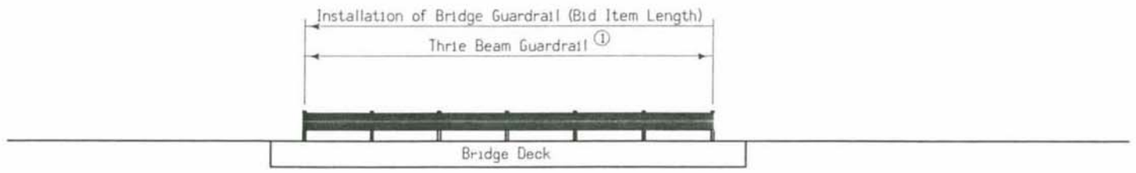
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 9 OF 10 FILE NO. 30365 DESIGN NO. 109

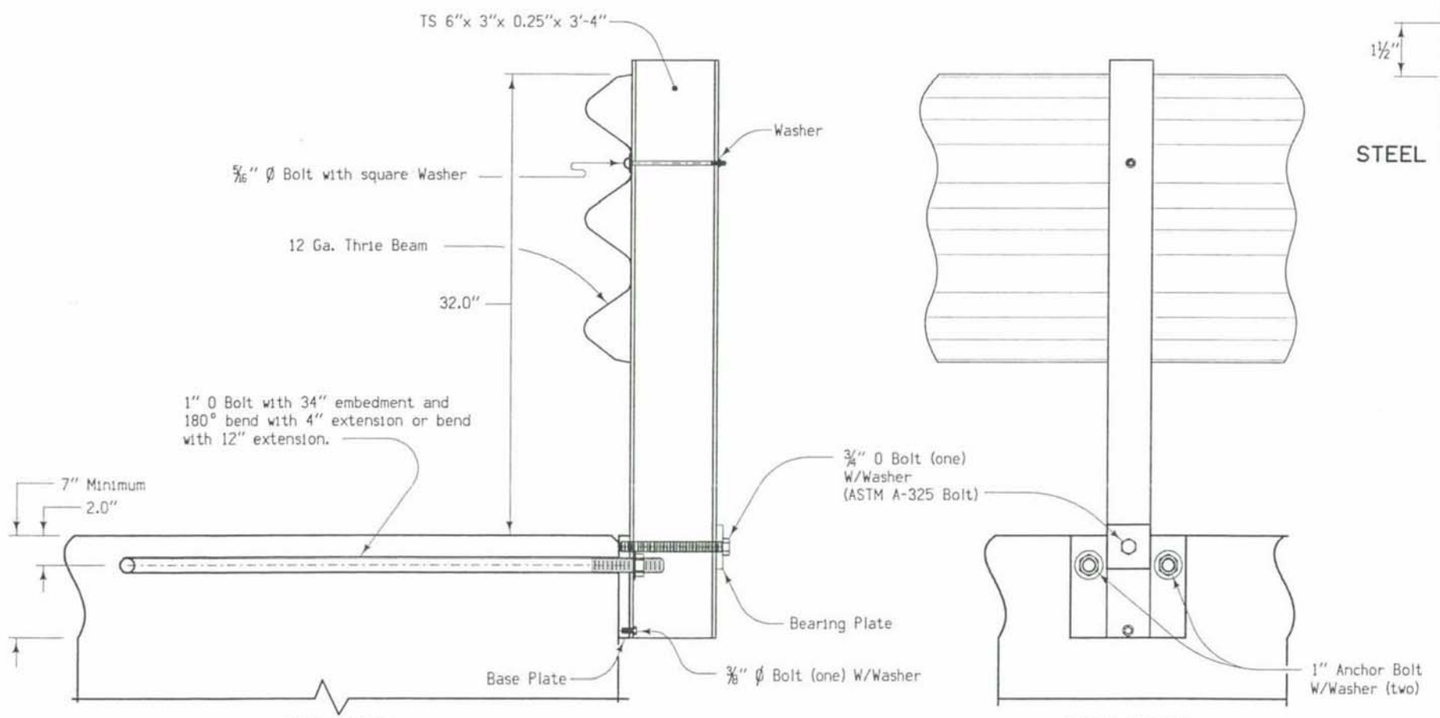
DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER BRC-C011(86)-8E-11 | SHEET NUMBER V. 9



PLAN VIEW



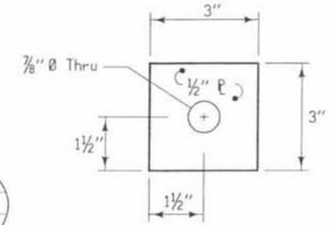
TYPICAL SECTION AT BRIDGE



END VIEW

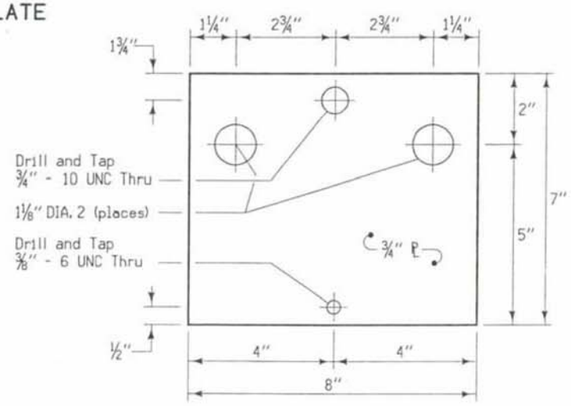
SIDE VIEW

TYPICAL BRIDGE RAILING



STEEL BEARING PLATE

① See Standard Road Plan RE-12B



STEEL BASE PLATE

General Notes:

This detail sheet shows the construction details for Service Level 1 Bridge Rail and the connecting Steel Beam Guardrail for use on the secondary road system.

Unless otherwise noted bolts shall conform to the requirements of ASTM A307 and nuts to the requirements of ASTM A563 grade A or better. Other bolts shall conform to the requirements of ASTM A325 and nuts to requirements of ASTM A563 grade C or better all nuts, bolts and washer shall be galvanized in accordance with ASTM A153.

Deck anchorage of the post assembly shall be provided by applying a 10 kip (45-kn) force to the post at 22 inches above the deck and designed according to the latest AASHTO bridge specifications.

Steel shall conform to the requirements of ASTM 36, or equivalent, and be galvanized according to ASTM A123.

Post elements shall conform to the requirements of ASTM grade B, or ASTM 501, and shall be galvanized in accordance with the requirements of ASTM A123.

Guardrail shall be lapped towards the obstacle.

Price bid for contract items shall be considered full compensation for furnishing all materials and constructing guardrail essentially as indicated hereon.

Contract items for guardrail construction are:

Installation of Bridge Guardrail in linear Feet

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

SERVICE LEVEL I BRIDGE RAIL DETAILS

STA. 11+35.4 APRIL 2009

BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 10 OF 10 FILE NO. 30365 DESIGN NO. 109

DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER IBRC-C011(86)-8E-11 | SHEET NUMBER V. 10

23-JAN-2009 10:50 snielse W:\Projects\BridgesStructures\LocalSystem_PrimaryRoutes\Buena_Vista\BRFinal\IBRC86_Bridge_Plans.brg 610106s010 \\ntpprtsvr2\BrgPDF

LOG OF EXPLORATORY BORING

Sheet of 1

Job Number: G2377
Project: Providence Bridge
Boring No.: B-2
Boring Location: STATION 11+12.4, 23' WEST
Drill Type: HOLLOW STEM
Date Started: 10/3/08
Date Completed: 10/3/08
Ground Elev.: 88.9

Shelby Tube | Standard Split Spoon | Water Level ATD
Modified California | Grab Sample | Water Level After 7 Days

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (PCF)	% Saturation	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Resistivity Test Ohm-cm
0			12 INCH GRAVEL LAYER											
			SILTY SAND, Medium Brown, Fill		6-5-3 N= 8									
5			STIFF SANDY CLAY, Medium Brown	CL	9-3-3 N= 6									
10			STIFF SILT, Dark Brown	CL	2-2-2 N= 4									
15			FIRM SILTY GLACIAL CLAY, Gray	CL	4-3-4 N= 7									
20					8-5-4 N= 9									
25					4-4-3 N= 7									
30					3-5-6 N= 11									
35			GLACIAL MATERIAL, Gray	CL	11-16-24 N= 40									
40					11-13-21 N= 34									
45			(Medium Brown)		9-16-20 N= 36									
50			END OF BORING AT 50 FEET		11-11-21 N= 32									
			FREE GROUNDWATER WAS ENCOUNTERED AT 18.3 FEET AT TIME OF DRILLING											

LOG OF BORING G2377.GPJ CERTIFIED TESTING.GDT 10/7/08

BORING TAKEN AT WEST ABUTMENT
OF THE EXISTING BRIDGE

LOG OF EXPLORATORY BORING

Sheet of 1

Job Number: G2377
Project: Providence Bridge
Boring No.: B-1
Boring Location: STATION 11+62.4, 27' EAST
Drill Type: HOLLOW STEM
Date Started: 10/3/08
Date Completed: 10/3/08
Ground Elev.: 86.8

Shelby Tube | Standard Split Spoon | Water Level ATD
Modified California | Grab Sample | Water Level After 7 Days

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (PCF)	% Saturation	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Resistivity Test Ohm-cm
0			12 INCH GRAVEL LAYER											
			FIRM SILTY CLAY, Medium Brown, Fill		7-4-8 N= 12									
5					13-5-3 N= 8									
10			FIRM-VERY FIRM GLACIAL CLAY, Medium Yellow Brown	CL	6-6-5 N= 11									
15			(Gray)		3-5-6 N= 11									
20					3-8-8 N= 16									
25					4-8-13 N= 21									
30			(Sand Seams)		4-8-13 N= 21									
35			GLACIAL MATERIAL, Medium Yellow Brown	CL	30-40-67 N= 107									
40			GRAVELLY SAND, Medium Yellow Brown	SW	20-14-18 N= 32									
45			GLACIAL MATERIAL, Gray	CL	13-14-20 N= 34									
50			END OF BORING AT 50 FEET		9-14-24 N= 38									
			FREE GROUNDWATER WAS ENCOUNTERED AT 18.3 FEET AT TIME OF DRILLING											

LOG OF BORING G2377.GPJ CERTIFIED TESTING.GDT 10/7/08

BORING TAKEN AT EAST ABUTMENT
OF THE EXISTING BRIDGE

DESIGN FOR 0° SKEW

50'-0 X 28' PRECAST PRETENSIONED DECK BEAM BRIDGE

50'-0 SPAN

SOILS INFORMATION

STA. 11+35.4

APRIL 2009

BUENA VISTA COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 11 OF 10 FILE NO. 30365 DESIGN NO. 109

DESIGN TEAM | BUENA VISTA COUNTY | PROJECT NUMBER BRC-C011(86)-8E-11 | SHEET NUMBER 12

16-MAR-2009 10:29 snielse W:\Projects\BridgesStructures\LocalSystem_PrimaryRoutes\Buena_Vista\BRFinal\BRC86_Bridge_Plans.brg 610106s011 \\ntpprtsvr2\BrgMethodsBW

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

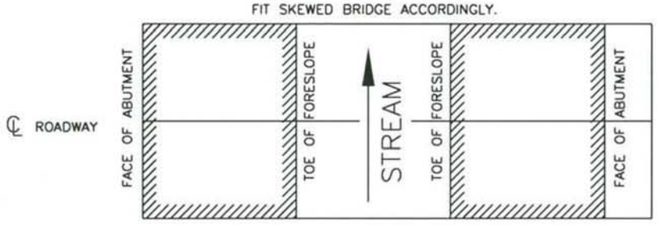
Location						Standard Road Plan	Layout Lengths					Materials Required						Delineators and Object Markers					Bid Items					Remarks
No.	(1) Direction of Traffic	End: A=Approach T=Trailing	Side: D = Outside M = Median	Station	Case		(STS) (18.75')	(VT1)	(VF)	(VT2)	(ET) Terminal (37.5')	STS: Thrie Beam (25.0')	STS: Transition Section (6.25')	'W' Beam (2) (VT1)+(VF)+(VT2)+(ET)	Posts (3) 6"x 8"x 7' with 6"x 8" Spacer Blocks (6 or 7)	Posts (4) 6"x 8"x 6' with 6"x 8" Spacer Blocks	CRT Posts 6"x 8"x 6' with 6"x 8" Spacer Blocks (5)	Type	Delineator: Single White D-1W	Object Marker: Type 2 OM2-3YV	Object Marker: Type 3 OM-3L	Object Marker: Type 3 OM-3R	Installation of Guardrail (STS)+(VT1)+(VF)+(VT2)+(ET)	Anchorage and Terminal Systems: RE-33B	RE-69B	RE-69C	RE-76	
							Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	Lin. Ft.	No.	No.	No.			No.	No.	No.	Lin. Ft.	No.	No.	No.	No.	
1	E	A		11+37.4		SL-1						34.375			2						1		34.375	1				
1	E	T		11+37.4		SL-1						34.375			2						1		34.375	1				
1	W	A		11+37.4		SL-1						34.375			2							1	34.375	1				
1	W	T		11+37.4		SL-1						34.375			2						1		34.375	1				

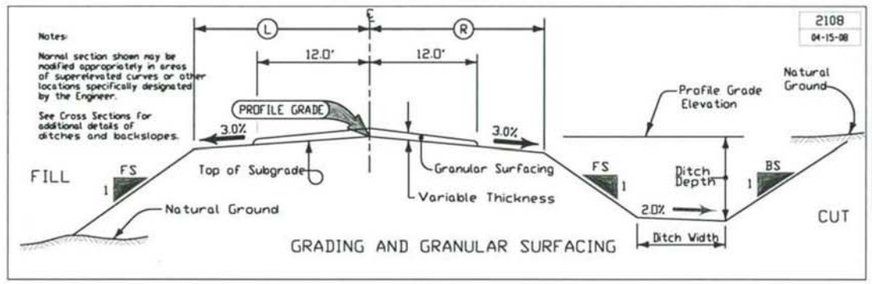
(1) Lane(s) to which the obstacle is adjacent.
(2) Includes (1) special 12.5' section of "W" Beam, see RE-76.
(3) (6) 6"x 8"x 7' posts required when RE-69C is specified.
(4) The last two posts of the RE-76 Terminal section are included as part of that bid item.

LIMITS FOR CLASS E REVEMENT STONE

ENGINEER FABRIC TO PLACED UNDER REVETMENT.
ENGINEER FABRIC SHALL BE OVERLAPPED A MINIMUM OF 1 FOOT.

DETAIL SHOWN FOR 0° SKEW
FIT SKEWED BRIDGE ACCORDINGLY.





GRADING AND GRANULAR SURFACING

POINTS OF ACCESS (RL-7)

Refer to Detail Cross-Sections

102-1
10-21-03

LOCATION (RL-7)				PIPE CULVERT (RF-30A or RF-30B)						
Station	Side	(W)	TYPE	(H)	Size: 18" Lin. Ft.	Size: 24" Lin. Ft.	Size:	Size:	APRON No.	SURFACE MATERIAL Tons
10+90	RT	20	FIELD	DRY						U.A.C.
12+08.86	LT	13	HOUSE	3'	28				0	U.A.C.

TABULATION OF SAFETY CLOSURES

108-13A
10-28-97

Refer to Section 2518 of the Standard Specifications

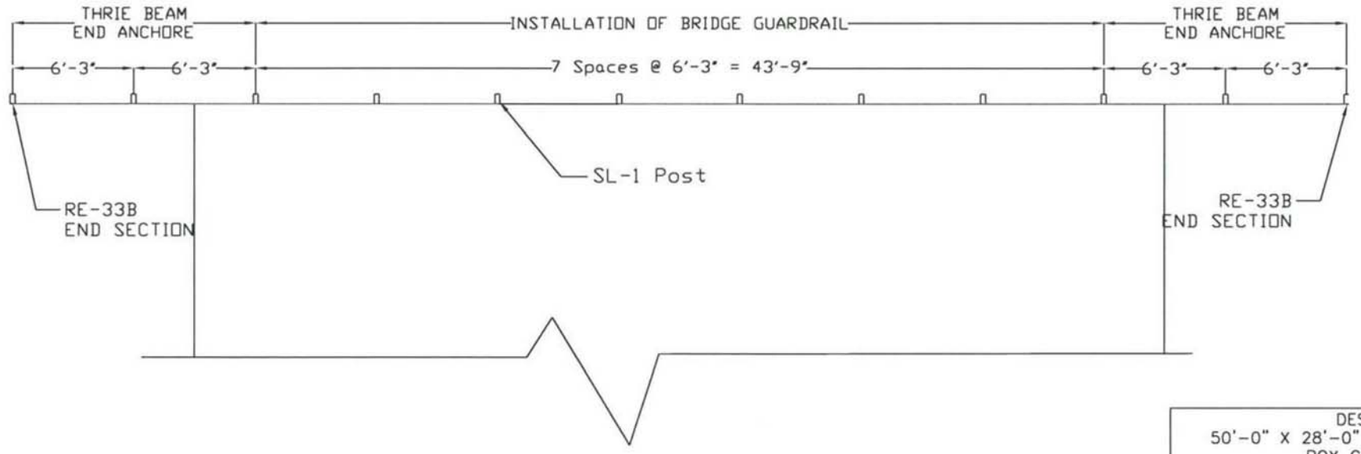
STATION	CLOSURE TYPE: Road Qty.	CLOSURE TYPE: Hazard Qty.	REMARKS
9+00	1	1	
12+00	1	1	

TABULATION OF ENGINEERING FABRIC

STATION	SIDE	SQ. YDS.	REMARKS
11+12 to 11+32	Rt/Lt	80	BERM & SLOPE PROTECTION
11+42 to 11+62	Rt/Lt	80	BERM & SLOPE PROTECTION

TABULATION OF REVETMENT

STATION	SIDE	TONS	REMARKS
11+12 to 11+32	Rt/Lt	100	BERM & SLOPE PROTECTION
11+42 to 11+62	Rt/Lt	100	BERM & SLOPE PROTECTION



GUARDRAIL INSTALLATION DETAIL

DESIGN FOR
50'-0" X 28'-0" PRECAST PRETENSIONED
BOX GIRDER BRIDGE
GUARD RAIL DETAILS
STA 11+35 0° SKEW

BUENA VISTA COUNTY
IOWA DEPARTMENT OF TRANSPORTATION–HIGHWAY DIVISION

PROVIDENCE TOWNSHIP
T-90N R-36W
SECTION 23

FOR INFORMATION ONLY

ROAD GRADING WILL BE PREFORMED BY COUNTY

Bert Martin

Bert Martin

Remove Existing 25' x 17.7' I-beam Bridge @ STA 11+35.4

TREES
GARAGE
WOOD DECK
WOOD FOOT BRIDGE
HOUSE
STUMP
GRAVEL DRIVE
STREAM CHANNEL
TELEPHONE CONDUIT
FLAGPOLE
TELEPED
PP
Right of Access
Existing ROW
42" CMP
TELEPHONE SIGN
FIELD ENT.
SIGNS
18" RCP
SIGN
MAILBOX
15" RCP
4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00

Install Proposed 50' x 28' PP Box Girder Bridge @ STA 11+62.4

BENCHMARK: RR SPIKE ON NORTH SIDE OF PP ELEV. = 100.00'

Virginia Hunter

Virginia Hunter

PROVIDENCE TOWNSHIP
T-90N R-36W
SECTION 26

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

BOP STA = 6+00.00
BOP EL = 102.98
-6.66%
VPC STA = 6+75.00
VPC EL = 97.98
LP STA = 9+87.94
LP EL = 87.56
VPT STA = 12+75.00
VPT EL = 96.33
6.11%
EOP STA = 14+00.00
EOP EL = 103.97

VPI STA = 9+75.00
VPI EL = 78.00
g1 = -6.66%
g2 = 6.11%
CURVE LEN = 600.00
K = 46.98
m = 9.58

110 105 100 95 90 85 80 75 70 65

3+00	3+50	4+00	4+50	5+00	5+50	6+00	6+50	7+00	7+50	8+00	8+50	9+00	9+50	10+00	0+50	11+00	1+50	12+00	2+50	13+00	3+50	14+00	4+50	15+00	5+50	16+00	6+50	17+00	7+50	18+00
				108.46		102.98	102.98	96.39	95.93	93.59	93.07	91.32	90.20	89.59	88.80	88.38	87.39	87.71	86.54	87.58	85.69	87.97	86.26	88.90	86.84	90.36	88.87	92.35	90.90	94.87	94.41	97.86	97.91		103.97		106.24		105.52		104.41			

IBRC-C011(86)--8E-11 Sheet Number 14

Form 830210 9/06

Iowa Department of Transportation

LOG OF PILING DRIVEN ~~BY FORMULA~~

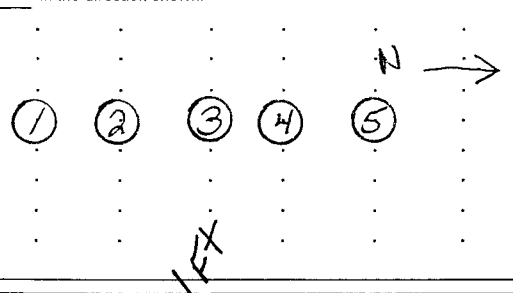
Project No. IBRC-CO11(86)- -8E-11
County Buena Vista
Design No.
Contractor Graves Construction
Iowa DOT Hammer No. 407
Gross Weight of Hammer 3528 **Effective Wt.**
Weight of Driving Parts
Weight of Anvil 865
Weight of Cap 720 **Cap No.** D3068
Weight of Pile 3360

Pile (Type and Size) Steel - HP10x57 (Wood, Steel or Concrete)
Hammer (Type & Model) Diesel - Delmag D16-32 (Gravity or Diesel manufacturer and model)
Foundation Description West Abutment (North abut, Pier 1, etc.)
Station of Foundation C.L. 11+12.4
Formula Used ~~P=2WH/(S+0.1) x W/(W+M)~~ Wave Equation

Plan Pile Length 60ft **Plan Driving Resistance** 47 Ton

Sketch foundation below, number each pile and show steel H-pile orientation as installed. Note battered piles on sketch,and give the amount of batter. Place name and certificate number of welder below if welding was necessary. Forward 2 copies to the Iowa DOT District Office upon completion of each foundation. Note on drawing which pile has been logged.

Batter Piling _____ in the direction shown.



Pile No.	Date Driven	(1) Plan Length (ft.)	Length Cutoff (0.0 ft.)	(2) Average Penetration Last Blows (inches)	Ram Rise (ft.)	Driven Resistance (Tons)	RETAP (3) Date	RETAP Ram Rise (ft.)	RETAP (2) Ave. Penetration Last Blows (inches)	RETAP Driven Resistance (Tons)	PILE EXTENSIONS (4) Length Added (0.0 ft.)	PILE EXTENSIONS Length Cutoff (0.0 ft.)	PILE EXTENSIONS Ram Rise (ft.)	PILE EXTENSIONS (2) Ave. Penetration Last Blows (inches)	PILE EXTENSIONS Driven Resistance (Tons)	Welds (Count)
1	09/11/09	60	0.0	48	7.5	~~47.22~~	55									
2	09/11/09	60	5.0	53	7.5	~~50.85~~	57									
3	09/11/09	60	6.5	53	7.5	~~50.85~~	57									
4	09/11/09	60	7.0	53	7.5	~~50.85~~	57									
5	09/11/09	60	3.0	80	7.5	66										

(1) Record in the Remarks section below if the pile length is anything other than the plan length at the beginning of drive.
(2) For gravity hammers, enter the penetration in the last 5 blows divided by 5. For steam or diesel hammers, enter the penetration in the last 10 blows divided by 10.
(3) Indicate date of retap in date column (1 day delay min.). List only pile actually checked.
(4) Additional pile length to be authorized by the Engineer.

Total Welds: _____

Plan Length: 300.0 Feet
Extensions: 0.0 Feet
Total: 300.0 Feet

Welders Name: _____ Lab No.: _____ Exp. Date: _____

Remarks: _____

Inspector — 09/11/09 Date — Project Engineer

Form 830210 9/06

Iowa Department of Transportation

LOG OF PILING DRIVEN BY FORMULA

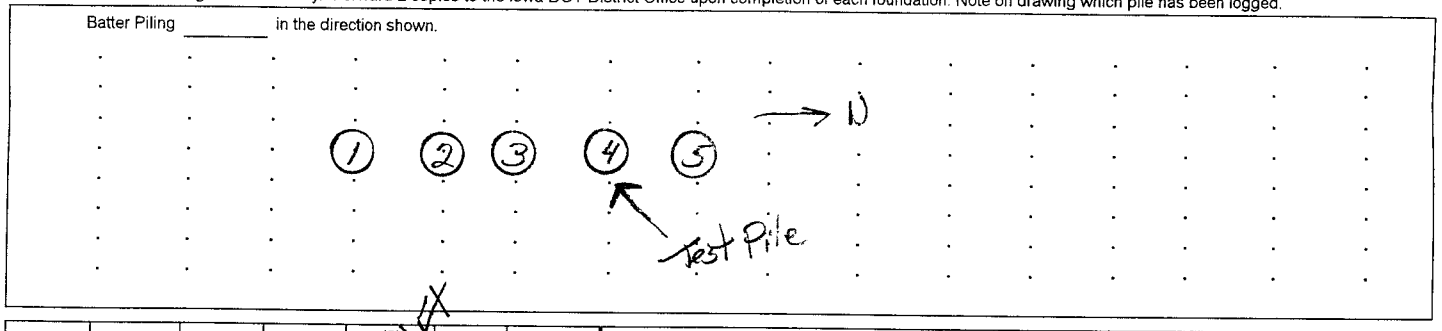
Project No. IBRC-CO11(86)- -8E-11
County Buena Vista
Design No. _____
Contractor Graves Construction
Iowa DOT Hammer No. 407
Gross Weight of Hammer 3528 **Effective Wt.** _____
Weight of Driving Parts _____
Weight of Anvil 865
Weight of Cap 720 **Cap No.** D3068
Weight of Pile 3360

Pile (Type and Size) Steel - HP10x57 (Wood, Steel or Concrete)
Hammer (Type & Model) Diesel - Delmag D16-32 (Gravity or Diesel manufacturer and model)
Foundation Description Logged Pile West Abutment (North abut, Pier 1, etc.)
Station of Foundation C.L. 11+12.4
Formula Used Wave Equation

Plan Pile Length 60ft
Plan Driving Resistance 47 Ton

Sketch foundation below, number each pile and show steel H-pile orientation as installed. Note battered piles on sketch,and give the amount of batter. Place name and certificate number of welder below if welding was necessary. Forward 2 copies to the Iowa DOT District Office upon completion of each foundation. Note on drawing which pile has been logged.

Batter Piling _____ in the direction shown.



Pile No.	Date Driven	(1) Plan Length (ft.)	Length Cutoff (0.0 ft.)	(2) Averabe Penetration Last Blows (inches)	Ram Rise (ft.)	Driven Resistance (Tons)	RETAP (3) Date	RETAP (3) Ram Rise (ft.)	RETAP (3) (2) Ave. Penetration Last Blows (inches)	RETAP (3) Driven Resistance (Tons)	PILE EXTENSIONS (4) Length Added (0.0 ft.)	PILE EXTENSIONS (4) Length Cutoff (0.0 ft.)	PILE EXTENSIONS (4) Ram Rise (ft.)	PILE EXTENSIONS (4) (2) Ave. Penetration Last Blows (inches)	PILE EXTENSIONS (4) Driven Resistance (Tons)	Welds (Count)
4	09/11/09	5		0.00	7.5	0										
		10		0.00	7.5	0										
		15		2.00	7.5	6										
		20		5.00	7.5	15										
		25		6.00	7.5	16										
		30		7.00	7.5	20										
		35		14.00	7.5	28										
		40		26.00	7.5	38										
		45		33.00	7.5	46										
		50		44.00	7.5	53										
		53		51.00	7.5	56										
		54		55.00	7.5	58										

(1) Record in the Remarks section below if the pile length is anything other than the plan length at the beginning of drive.
(2) For gravity hammers, enter the penetration in the last 5 blows divided by 5. For steam or diesel hammers, enter the penetration in the last 10 blows divided by 10.
(3) Indicate date of retap in date column (1 day delay min.). List only pile actually checked.
(4) Additional pile length to be authorized by the Engineer.

Total Welds: _____

Plan Length: 300.0 Feet
Extensions: 0.0 Feet
Total: 300.0 Feet

Welders Name: _____ Lab No.: _____ Exp. Date: _____

Remarks: _____

Tom Cavanaugh
Inspector

09/11/09
Date

Project Engineer

Form 830210 9/06

Iowa Department of Transportation

LOG OF PILING DRIVEN BY FORMULA

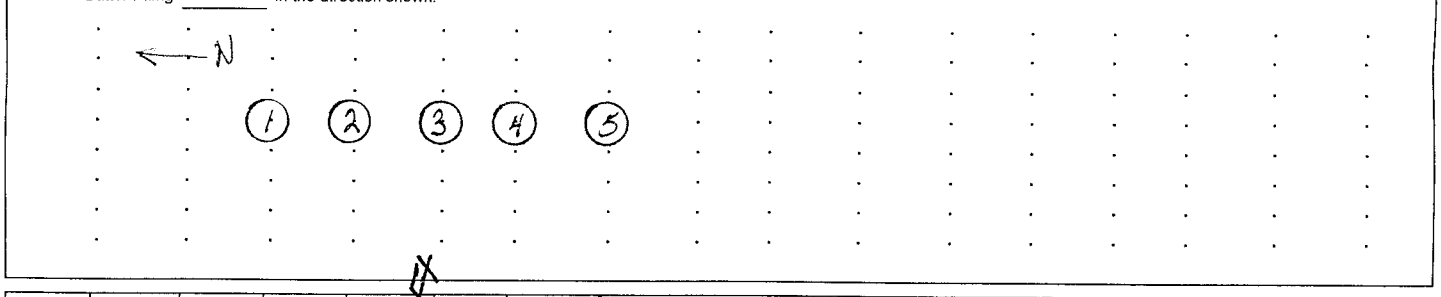
Project No. IBRC-CO11(86)- -8E-11
County Buena Vista
Design No.
Contractor Graves Construction
Iowa DOT Hammer No. 407
Gross Weight of Hammer 3528 **Effective Wt.**
Weight of Driving Parts
Weight of Anvil 865
Weight of Cap 720 **Cap No.** D3068
Weight of Pile 3360

Pile (Type and Size) Steel - HP10x57 (Wood, Steel or Concrete)
Hammer (Type & Model) Diesel - Delmag D16-32 (Gravity or Diesel manufacturer and model)
Foundation Description East Abutment (North abut, Pier 1, etc.)
Station of Foundation C.L. 11+62.4
Formula Used ~~P=2WH/(S+0.1) x W/(W+M)~~ Wave Equation

Plan Pile Length 60ft **Plan Driving Resistance** 47 Ton

Sketch foundation below, number each pile and show steel H-pile orientation as installed. Note battered piles on sketch,and give the amount of batter. Place name and certificate number of welder below if welding was necessary. Forward 2 copies to the Iowa DOT District Office upon completion of each foundation. Note on drawing which pile has been logged.

Batter Piling _____ in the direction shown.



Pile No.	Date Driven	(1) Plan Length (ft.)	Length Cutoff (0.0 ft.)	(2) Average Penetration Last Blows (inches)	Ram Rise (ft.)	Driven Resistance (Tons)	RETAP (3) Date	RETAP Ram Rise (ft.)	RETAP (2) Ave. Penetration Last Blows (inches)	RETAP Driven Resistance (Tons)	PILE EXTENSIONS (4) Length Added (0.0 ft.)	PILE EXTENSIONS Length Cutoff (0.0 ft.)	PILE EXTENSIONS Ram Rise (ft.)	PILE EXTENSIONS (2) Ave. Penetration Last Blows (inches)	PILE EXTENSIONS Driven Resistance (Tons)	Welds (Count)
1	09/11/09	60	7.5	53	7.5	~~50.85~~	57									
2	09/11/09	60	8.0	48	7.5	~~47.22~~	55									
3	09/11/09	60	8.0	60	7.5	~~56.00~~	60									
4	09/11/09	60	10.0	53	7.5	~~50.85~~	57									
5	09/11/09	60	9.0	53	7.5	~~50.85~~	57									

(1) Record in the Remarks section below if the pile length is anything other than the plan length at the beginning of drive.
(2) For gravity hammers, enter the penetration in the last 5 blows divided by 5. For steam or diesel hammers, enter the penetration in the last 10 blows divided by 10.
(3) Indicate date of retap in date column (1 day delay min.). List only pile actually checked.
(4) Additional pile length to be authorized by the Engineer.

Total Welds: _____

Plan Length: 300.0 Feet
Extensions: 0.0 Feet
Total: 300.0 Feet

Welders Name: _____ Lab No.: _____ Exp. Date: _____

Remarks: _____

Tim Cavanaugh — Inspector
09/11/09 — Date
Project Engineer

Form 830210 9/06

Iowa Department of Transportation

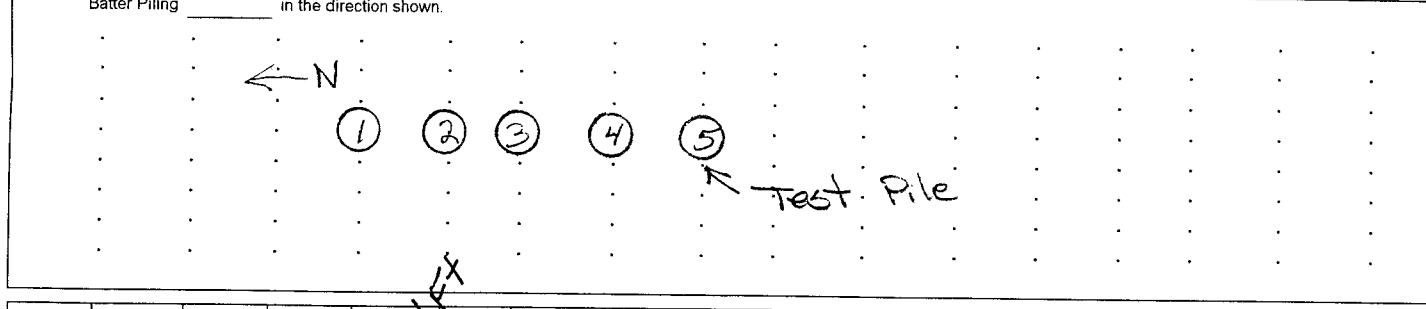
LOG OF PILING DRIVEN BY FORMULA

Project No. IBRC-CO11(86)- -8E-11
County Buena Vista
Design No. _____
Contractor Graves Construction
Iowa DOT Hammer No. 407
Gross Weight of Hammer 3528 **Effective Wt.** _____
Weight of Driving Parts _____
Weight of Anvil 865
Weight of Cap 720 **Cap No.** D3068
Weight of Pile 3360
Plan Pile Length 60ft

Pile (Type and Size) Steel - HP10x57 (Wood, Steel or Concrete)
Hammer (Type & Model) Diesel - Delmag D16-32 (Gravity or Diesel manufacturer and model)
Foundation Description Logged Pile East Abutment (North abut, Pier 1, etc.)
Station of Foundation C.L. 11+62.4
Formula Used Wave Equation
Plan Driving Resistance 47 Ton

Sketch foundation below, number each pile and show steel H-pile orientation as installed. Note battered piles on sketch,and give the amount of batter. Place name and certificate number of welder below if welding was necessary. Forward 2 copies to the Iowa DOT District Office upon completion of each foundation. Note on drawing which pile has been logged.

Batter Piling _____ in the direction shown.



Pile No.	Date Driven	(1) Plan Length (ft.)	Length Cutoff (0.0 ft.)	(2) Average Penetration Last 5 Blows (inches)	Ram Rise (ft.)	Driven Resistance (Tons)	RETAP (3) Date	RETAP Ram Rise (ft.)	RETAP (2) Ave. Penetration Last Blows (inches)	RETAP Driven Resistance (Tons)	PILE EXTENSIONS (4) Length Added (0.0 ft.)	PILE EXTENSIONS Length Cutoff (0.0 ft.)	PILE EXTENSIONS Ram Rise (ft.)	PILE EXTENSIONS (2) Ave. Penetration Last Blows (inches)	PILE EXTENSIONS Driven Resistance (Tons)	Welds (Count)
5	09/11/09	5		0.00	7.5	0										
		10		2.00	7.5	6										
		15		5.00	7.5	15										
		20		7.00	7.5	20										
		25		10.00	7.5	23										
		30		12.00	7.5	26										
		35		22.00	7.5	35										
		40		27.00	7.5	38										
		45		36.00	7.5	46										
		46		42.00	7.5	50										
		47		43.00	7.5	52										
		48		47.00	7.5	54										
		49		51.00	7.5	57										

(1) Record in the Remarks section below if the pile length is anything other than the plan length at the beginning of drive.
(2) For gravity hammers, enter the penetration in the last 5 blows divided by 5. For steam or diesel hammers, enter the penetration in the last 10 blows divided by 10.
(3) Indicate date of retap in date column (1 day delay min.). List only pile actually checked.
(4) Additional pile length to be authorized by the Engineer.

Total Welds: _____

Plan Length: 300.0 Feet
Extensions: 0.0 Feet
Total: 300.0 Feet

Welders Name: _____ Lab No.: _____ Exp. Date: _____

Remarks: _____

Inspector — 09/11/09 Date — Project Engineer

Special Driving Conditions	Stroke (ft)	**Monitor** at 10 Blow Increments	Do **NOT** Exceed
	6	-----	-----
	7	-----	-----
Blows per foot	8	-----	-----
	9	-----	-----

Project No:	IBRC-CO11(86)-8E-11	**Graph No:**	Buena Vista IBRC
Design No:	109	**Hammer No:**	Delmag D16-32
County:	Buena Vista	**Cap No:**	D3068, insert D3030
Location:	Both Abutments	**Pile Type:**	HP 10 x 57
Hammer:	Delmag D16-32	**Pile Length:**	60 feet