PROJECT CONCEPT STATEMENT

Abutment Scour Repair on IA 92 MP41.5 over North Fork Long Creek
Located approximately 0.7 mi. W of Jct. US 218
FHWA No. 51841, Maint. No. 9241.5S092
T75N, R6W, Section 21
Washington County, MB-092-5(501)242--77-92

Highway Division
Bridges and Structures Bureau

Matt Erickson
matthew.erickson@iowadot.us
May 15th, 2020

Project Description

The abutment berms have started to erode. The project site is located approximately 0.7 mi. W of Jct. US 218.

Need for Project

If left unchecked the abutments will continue to be undermined and material behind the abutment will be lost.

The current scheduled letting date is 7-20-2021.

Concept

Abutment Scour Repair with Revetment (See Attachment)

Install 2 foot thick class E revetment along the abutment berms as shown on attachment.

Revetment Estimate:

ITEM	QTY.	UNIT	UNIT COST	COST EST.
Revetment, Class E	850	TON	$50	$42,500
Engineering Fabric	750	SY	$5	$3,750
Traffic Control			5%	$2,313
Mobilization			10%	$4,856
Contingency			15%	$8,013
Total Cost				$61,432

NOTE: Easement and/or right of way costs are not included in the above cost estimate.

Recommendation

Install revetment as described above and on attached drawing.

Special Considerations

We are anticipating temporary easements may be needed during construction. Permanent easements and/or right of way acquisition will not be required for future maintenance needs.

The project is not located within a FEMA flood hazard area. Base flood elevations have not been established in this zone.

Since the basin is greater than 100 square miles in area a DNR Floodplain Development Permit will be required.

The river is not a protected stream.

A ground survey will be required. A drawing that shows the limits of survey will be provided.

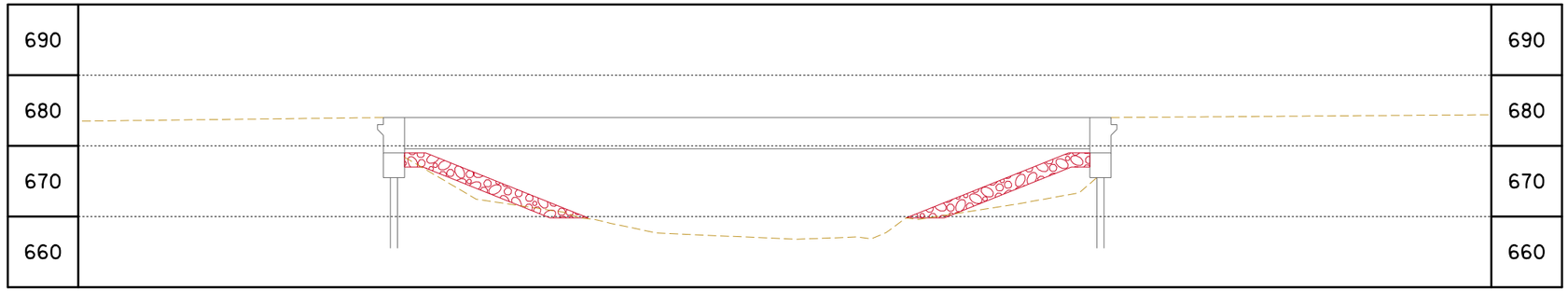
Extant of existing utilities unknown.

Railroads are not present in the project area and railroad expansion is not expected.

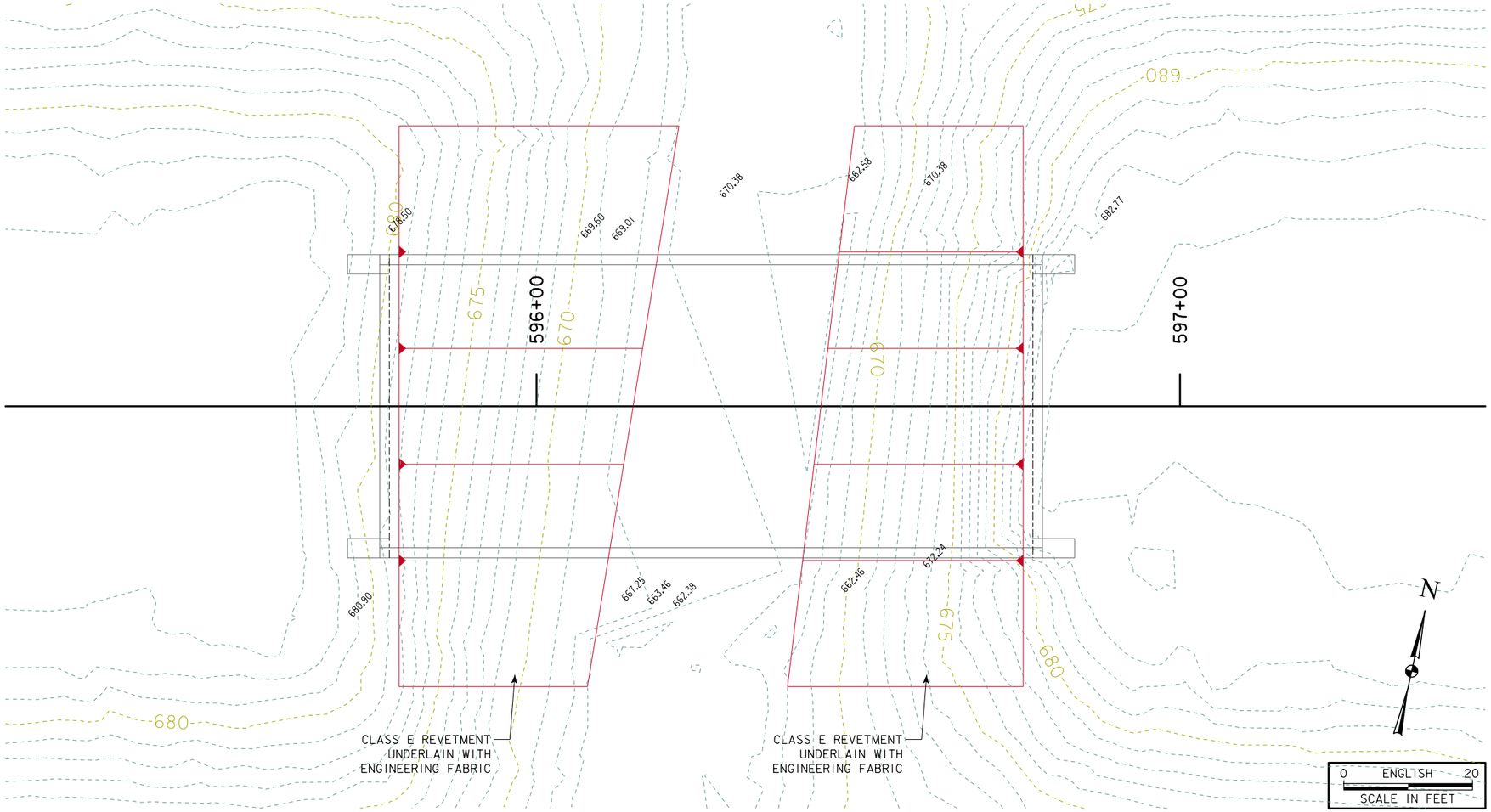
It is anticipated the work for the primary project would be awarded to one prime contractor. The Bridges and Structures Bureau will coordinate the plan preparation with assistance from the Design Bureau.

Trails are not present within the immediate project area and trail expansion is not expected in this area.

BENCH MARK NO.



LONGITUDINAL SECTION ALONG ℄ APPROACH ROADWAY



LOCATION

IA 92 OVER NORTH FORK LONG CREEK
T-75N R-06W
SECTION 21
OREGON TOWNSHIP
WASHINGTON COUNTY
FHWA NO. 51841
BRIDGE MAINT. NO. 9241.5S092
LATITUDE 41.28833855°
LONGITUDE -91.54708414°

PRELIMINARY - CONCEPT

DESIGN FOR REPAIRS TO A 0° SKEW

100'-0 X 44'-0 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

SITUATION PLAN - CONCEPT

STATION 596+27.13 (℄ IA 92) MAY, 2020

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. ____ OF ? FILE NO. 31927 DESIGN NO. ?

DESIGN TEAM	WASHINGTON COUNTY	PROJECT NUMBER MB-092-5(501)242--77-92	SHEET NUMBER

BRF-92-9(78)--38-92
BRIDGE-REPLACEMENT

CADD FILE: H920299.S00
10-26-99 WDT 299 WASHINGTON (CADWELL)

WASHINGTON COUNTY

WASHINGTON 299

CONVENTIONAL SIGNS

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

IOWA
DEPARTMENT OF TRANSPORTATION
Project Development Division
PLANS OF PROPOSED IMPROVEMENTS ON THE

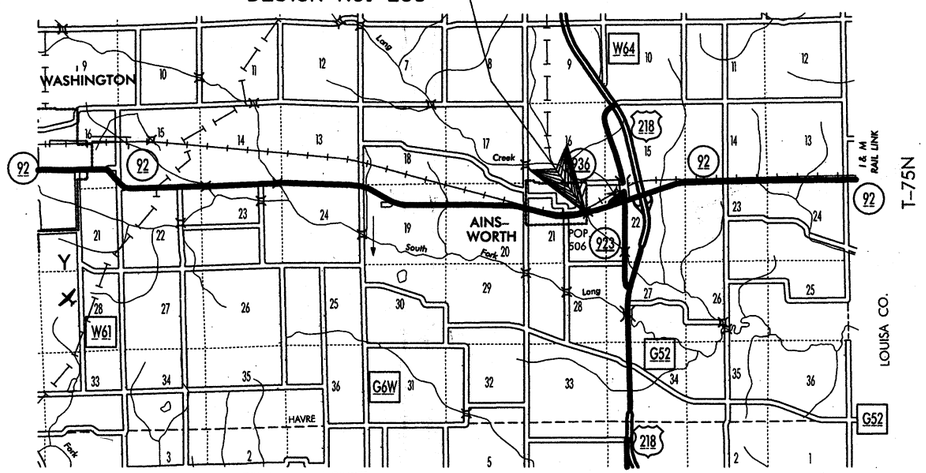
PRIMARY ROAD SYSTEM
WASHINGTON COUNTY

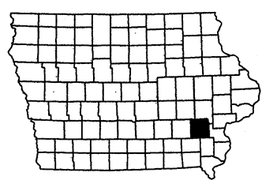
BRIDGE-REPLACEMENT
ON IOWA 92 OVER NORTH FORK LONG CREEK

SCALES: As Noted

The standard specifications, series of 1997 of the Iowa Department of Transportation, shall apply to construction work on this project.
(PLUS CURRENT SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS)

DESIGN NO. 299





LOCATION MAP SCALE
0 1 Miles 2 3
1 2 3 4 5 Kilometers

101-4	
DESIGN DATA RURAL	
1991 AADT	3490 V.P.D.
2011 AADT	4290 V.P.D.
201X DHV	X V.P.H.
TRUCKS	16 %
ESALs per day	X

STATE	FHWA REGION	F.Y.	SHEET	TOTAL
IOWA	7		1	16

PROJECT NUMBER
BRF-92-9(78)--38-92
R.O.W. PROJECT NUMBER

PIN
86-92-040-2

INDEX OF SHEETS

NO.	DESCRIPTION
1	TITLE SHEET
2	BRIDGE ESTIMATE SHEET
2-15	BRIDGE DESIGN NO. 299
16	ROAD ESTIMATE SHEET

VALUE ENGINEERING SAVES
REFER TO THE GENERAL NOTES ON SHEET 2 OF 16

STANDARD ROAD PLANS

NUMBER	DATE	IDENT	DATE
RC-16A	10-27-98		
RC-16B	9-21-99		

STANDARD BRIDGE PLANS

STANDARD	ISSUED	REVISED

REVISIONS

15807

I hereby certify that this project was constructed in accordance With the contract documents, the "as-built" plans were prepared Under my supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Project Engineer — Date: 1-12-05

My license renewal date is December 31, 2006

Year: 12-11-2001 — Contractor: TAYLOR — Project Inspector: Dana Thomas

3 1/2 Bgc

150

INDEX OF SEALS

SHEET NO.	NAME
1	WILLIAM D. TUCKER - STRUCTURAL DESIGN
16	KEITH ALLEN CADWELL - ROAD DESIGN

STRUCTURAL DESIGN

LICENSED PROFESSIONAL ENGINEER — William D. Tucker 11362 — 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: William D. Tucker — Date: 7/21/99

Printed or Typed Name: William D. Tucker

My license renewal date is December 31, 1999

Pages or sheets covered by this seal: 1-15 OF 16

10-26-99 WDT 299 WASHINGTON

LETTING DATE 1-26-2001 | PROJECT DIRECTORY NAME: 92092040A86 | FILE NO. 28216 | WASHINGTON COUNTY | PROJECT NO. BRF-92-9(78)--38-92 | SHEET NO. 1 | CADD FILE: H920299.S00

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TOTAL ESTIMATED BRIDGE QUANTITIES

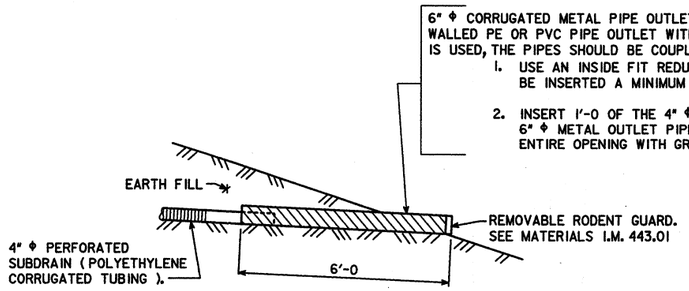
ITEM NUMBER	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUANTITY
1	2401-6745650	REMOVAL OF EXISTING STRUCTURES	LS	1.000	1
2	2402-2720000	EXCAVATION, CLASS 20	CY	137.400	137
3	2403-0100010	STRUCTURAL CONCRETE (BRIDGE)	CY	241.100	239
4	2404-7775000	REINFORCING STEEL	LB	6054.000	6054
5	2404-7775005	REINFORCING STEEL, EPOXY COATED	LB	41 371.000	41364
6	2407-0550000	BEAMS, PRETENSIONED PRESTRESSED CONCRETE, LXD100	EACH	7.000	7
7	2408-7800000	STRUCTURAL STEEL	LB	1992.000	1992
8	2414-6424110	CONCRETE BARRIER RAILING	LF	254.000	254
9	2501-5425042	PILES, DRIVE STEEL BEARING, HP10 x 42	LF	1710.000	1710
10	2501-5550042	PILES, FURNISH STEEL BEARING, HP10 x 42	LF	1710.000	1710
11	2533-4980005	MOBILIZATION	LS	1.000	1
END	2599-999900	RETARDER	CY		194
	2599-999901	10% FOR REIME CONTRACTOR	LS		1

ITEM NUMBER — ESTIMATE REFERENCE INFORMATION

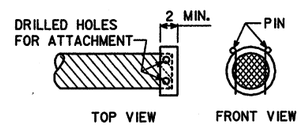
3 — INCLUDES COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL AND POROUS BACKFILL AT ABUTMENTS.

6 — INCLUDES COST OF BEARING MATERIALS REQUIRED.

7 — INCLUDES COST OF 4 DRAINS AT 106 LBS. EACH.



TYPICAL SECTION OF SUBDRAIN OUTLET



REMOVABLE RODENT GUARD DETAILS

OUTLET DETAILS

GENERAL NOTES:

THIS DESIGN IS FOR THE REPLACEMENT OF THE EXISTING 70' X 30' R.C. CONTINUOUS SLAB BRIDGE DES. NO. 3335 & 807. PLANS OF THE EXISTING STRUCTURE WILL BE MADE AVAILABLE TO THE CONTRACTOR. CONTACT THE OFFICE OF CONTRACTS - PROJECT DEVELOPMENT DIVISION - IOWA D.O.T. - AMES.

THE CITY AND 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 CONSTRUCTION STARTING DATE.

ALL DIMENSIONS AND DETAILS SHOWN IN THESE PLANS PERTINENT TO NEW CONSTRUCTION IN RELATION TO EXISTING PORTIONS OF THE STRUCTURE SHALL BE VERIFIED IN THE FIELD BY THE BRIDGE CONTRACTOR BEFORE STARTING CONSTRUCTION.

FAINT LINES ON PLANS INDICATE THE EXISTING STRUCTURE.

THE LUMP SUM BID FOR "REMOVAL OF EXISTING STRUCTURES" SHALL INCLUDE REMOVAL OF ABUTMENT SUBSTRUCTURE DOWN TO ELEVATION 669 AND REMOVAL OF PIER TO 1' BELOW STREAM BED ELEVATION.

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

THE APPROACH FILLS AS SHOWN ARE NOT A PART OF THIS CONTRACT, BUT ARE TO BE IN PLACE BEFORE ABUTMENT PILES ARE DRIVEN. THE BRIDGE CONTRACTOR IS TO LEVEL OFF AND SHAPE THE BERMS TO THE ELEVATIONS AND DIMENSIONS SHOWN. DRESSING OF SLOPES OUTSIDE THE BRIDGE AREA NOT DISTURBED BY THE BRIDGE CONTRACTOR SHALL BE PAID FOR AS EXTRA WORK.

CLASS 20 EXCAVATION QUANTITIES ARE BASED ON THE ASSUMPTION THAT THE CHANNEL EXCAVATION AND APPROACH FILLS ARE COMPLETED PRIOR TO STARTING CONSTRUCTION OF THE ABUTMENTS.

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

ALL REINFORCING SUPPLIED FOR THIS STRUCTURE IS TO BE GRADE 60.

THE BRIDGE CONTRACTOR IS TO INSTALL SUBDRAINS BEHIND THE ABUTMENTS AS DETAILED. THE SUBDRAINS SHALL BE 4" PERFORATED SUBDRAIN (POLYETHYLENE CORRUGATED TUBING). THE SUBDRAIN OUTLET WILL CONSIST OF A 6' LENGTH OF PIPE WITH A REMOVABLE RODENT GUARD AS DETAILED IN THESE PLANS.

GUARDRAIL IS TO BE PLACED BY OTHERS.

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.

DURING CONSTRUCTION OF THIS PROJECT THE BRIDGE CONTRACTOR WILL BE REQUIRED TO COORDINATE OPERATIONS WITH THOSE OF OTHER CONTRACTORS WORKING WITHIN THE SAME AREA. OTHER WORK IN PROGRESS DURING THE SAME PERIOD OF TIME WILL INCLUDE, BUT IS NOT LIMITED TO, CONSTRUCTION OF THE FOLLOWING PROJECTS:

STP-92-9 (56)--2C-92	GRADING

SPECIFICATIONS:

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

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 12.
STRUCTURAL STEEL IN ACCORDANCE WITH SECTION 10. ASTM A 36.

TRAFFIC CONTROL PLAN

NOTE: THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. ROAD CLOSURE WILL BE THE RESPONSIBILITY OF THE ROAD CONTRACTOR AS SHOWN ON THE ROAD PLANS.

NOTE:
POLLUTION PREVENTION PLAN SHOWN ELSEWHERE IN THESE PLANS.

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

BRIDGE QUANTITIES AND NOTES

STA. 596+27.13

MARCH 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 1 OF 14 — FILE NO. 28216 — DESIGN NO. 299

DESIGNED BY J. NELSON — CHECKED BY G. HAIG
DETAILED BY C.F. RIECKEN — CADD FILE

WASHINGTON COUNTY

PROJECT NUMBER: BRF-92-9(78)--38-92

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		2	16

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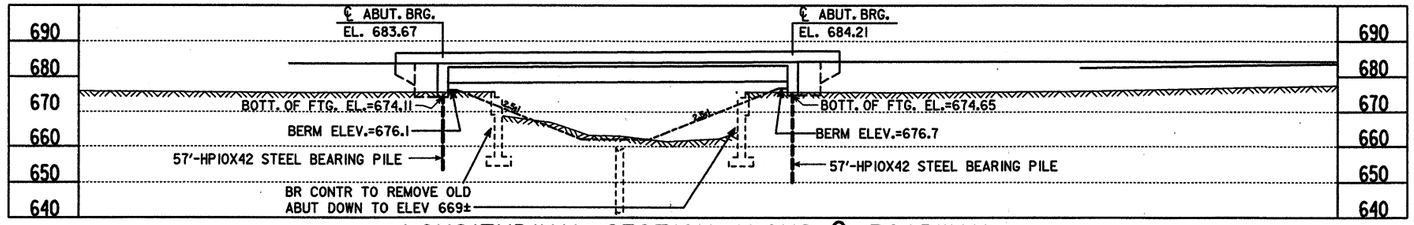
~~BM #51 STA 595+77.5--16.7 LT FOUND IHC BM ON TOP OF NW WING POST OF BR--ELEV=678.30~~

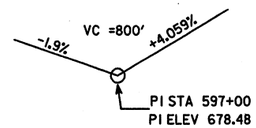
NOTE

ROAD CLOSED TO TRAFFIC DURING CONSTRUCTION



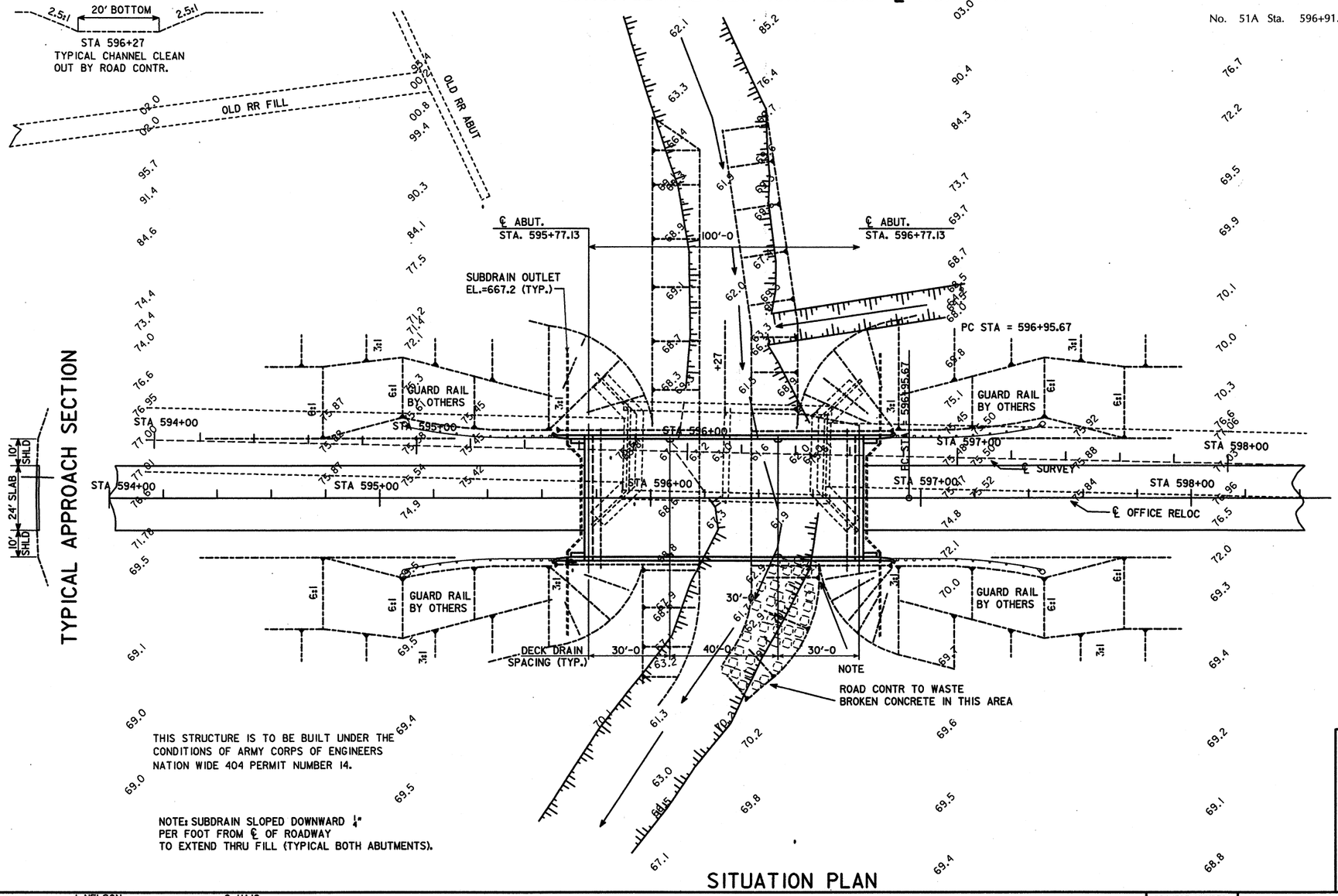
LONGITUDINAL SECTION ALONG ℄ ROADWAY

PROFILE



PROPOSED GRADE ON HIGHWAY #92

No. 51A Sta. 596+91.20 23.10 Lt. NEW-IHC-BM NE Wing Wall of Bridge. - EL. 686.60



TYPICAL APPROACH SECTION

THIS STRUCTURE IS TO BE BUILT UNDER THE CONDITIONS OF ARMY CORPS OF ENGINEERS NATION WIDE 404 PERMIT NUMBER 14.

NOTE: SUBDRAIN SLOPED DOWNWARD ¼" PER FOOT FROM ℄ OF ROADWAY TO EXTEND THRU FILL (TYPICAL BOTH ABUTMENTS).

C.L. CURVE DATA (1992 O.R.)

< 5°21'29"
D= 0°22'00"
T= 731.18
L= 1461.29
E= 17.10
R= 15,626.12
e= NC

HYDRAULIC DATA

DRAINAGE AREA= 29.6 SQ MILES
STREAM SLOPE= 7.54 FT./MI.

Q50= 4330 CFS
NATURAL STAGE= 674.8

Q100 = 5125 CFS
NATURAL STAGE= 675.4

Q500= 6750 CFS
STAGE W/BACKWATER= 678.2

TRAFFIC ESTIMATE

1991: 3490 VPD
2011: 4290 VPD
16% TRUCKS

LOCATION

IA. 92 OVER N. FORK OF LONG CREEK
T 75 N R 6 W
SECTION 21
OREGON TOWNSHIP
WASHINGTON COUNTY
FHWA NO. 051841

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

SITUATION PLAN

STATION: 596+27.13

MARCH 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 2 OF 14 FILE NO. 28216 DESIGN NO. 299

DESIGNED BY	CHECKED BY	WASHINGTON COUNTY	PROJECT NUMBER	STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
J. NELSON	G. HAIG			IOWA	7		3	16
DETAILED BY C. F. RIECKEN	CADD FILE							

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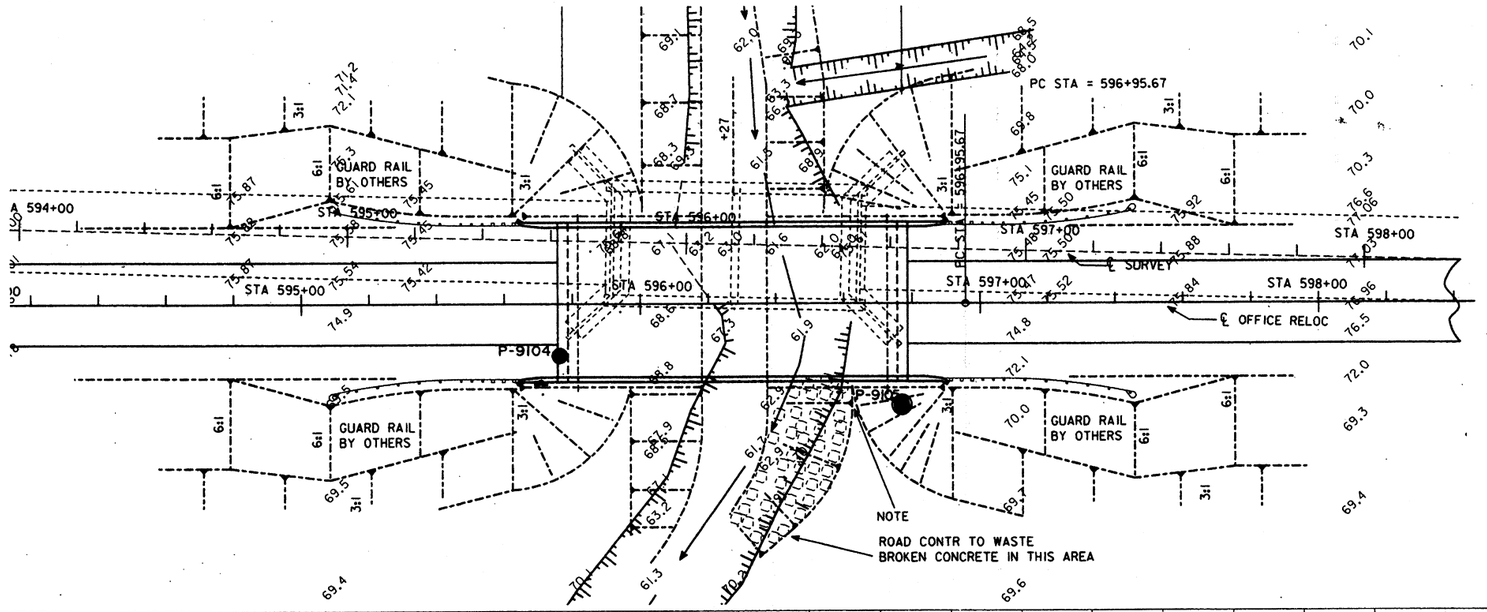
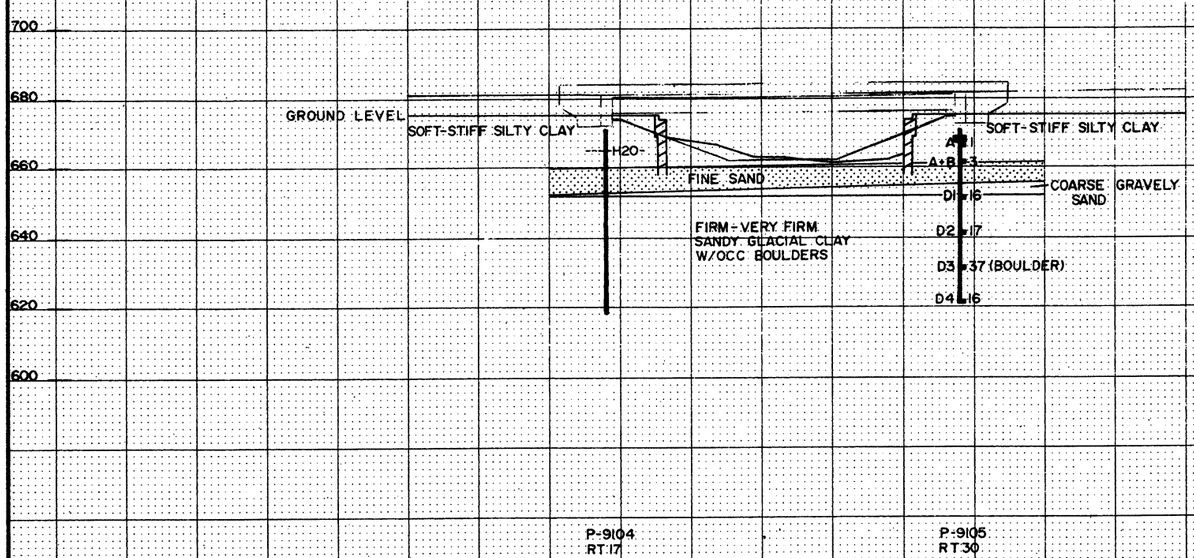




0 20
SCALE IN FEET

PRELIMINARY

DESIGN FOR 0° SKEW

100'-0 X 44 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

SITUATION PLAN

STATION: 596+27.13

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION--HIGHWAY DIVISION

DESIGN SHEET NO. 3 OF 14 FILE NO. 28216 DESIGN NO. 299

SCALE

0 20

BLOW COUNT LAYER - NO. BLOWS

SHELBY TUBE CORE DATA

CORE NO. F-9105
CLASSIFICATION(AASHO) A-6(9)
COEFF.CONSOL. FT²/DAY 0.521
TRIAXIAL COMPRESSION CU
COHESION-PSF 400
FRICTION COEFF. 0.05
MOISTURE CONTENT % 22
DENSITY-PCF 99
UU-UNCONSOLIDATED & UNDRAINED
CU-CONSOLIDATED & UNDRAINED

DESIGN NO. 299
FILE NO. 28216
DESIGN SHEET NO. 3 OF 14

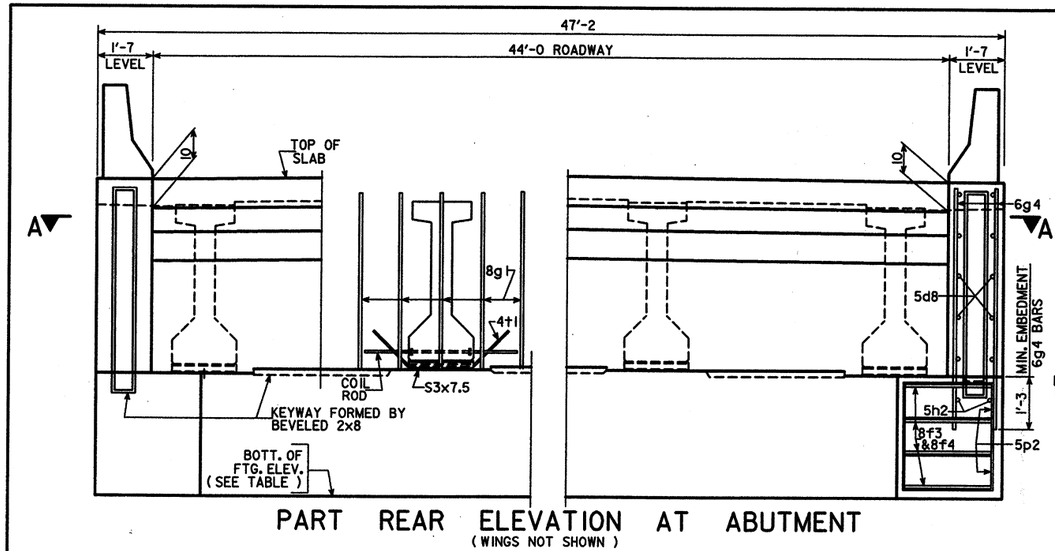
DESCRIPTION REPLACE BRIDGE OVER N. FORK LONG CREEK
SOIL SURVEYOR CHESTER DATE 2-17-91
DESIGNER/CADD TRAINUM DATE 4-2-93
SOILS BOOK NO.

SAMPLE, SHELBY, DENS. CORE, BLOW, H20, WATER, PLUGGED, MOISTURE
SELECT SOIL, UNSUITABLE, SHALE, SELECT SAND, SANDY SOIL, ROCK

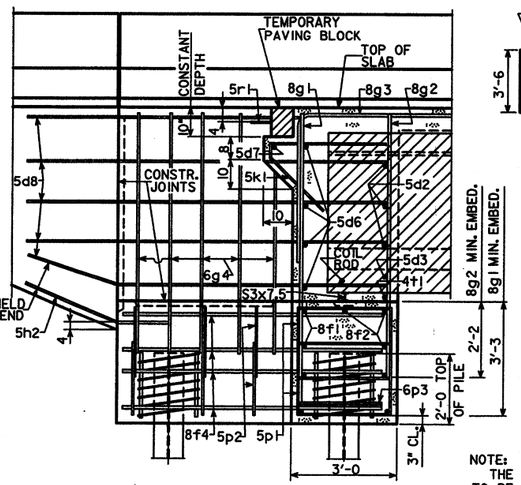
ROAD DESIGN • CADD • PRODUCED	STATE OF IOWA	FHWA REGION 7	FISCAL YEAR	WASHINGTON COUNTY	PROJECT NUMBER	SHEET NUMBER 4 OF 16

01-JUN-1999 08:17 kolson s:\projects\92092040a86\brfinal\h920299.s03

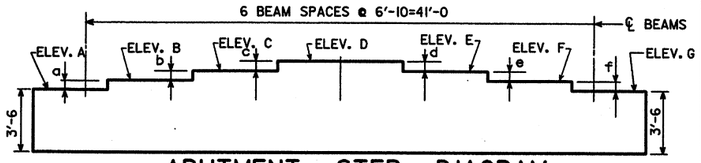
BM #51 STA 595+77.5--16.7 LT FOUND IHC BM ON TOP OF NW WING POST OF BR--ELEV=678.30



PART REAR ELEVATION AT ABUTMENT
(WINGS NOT SHOWN)



PART SECTION B - B



ABUTMENT STEP DIAGRAM
(REAR ELEVATION)

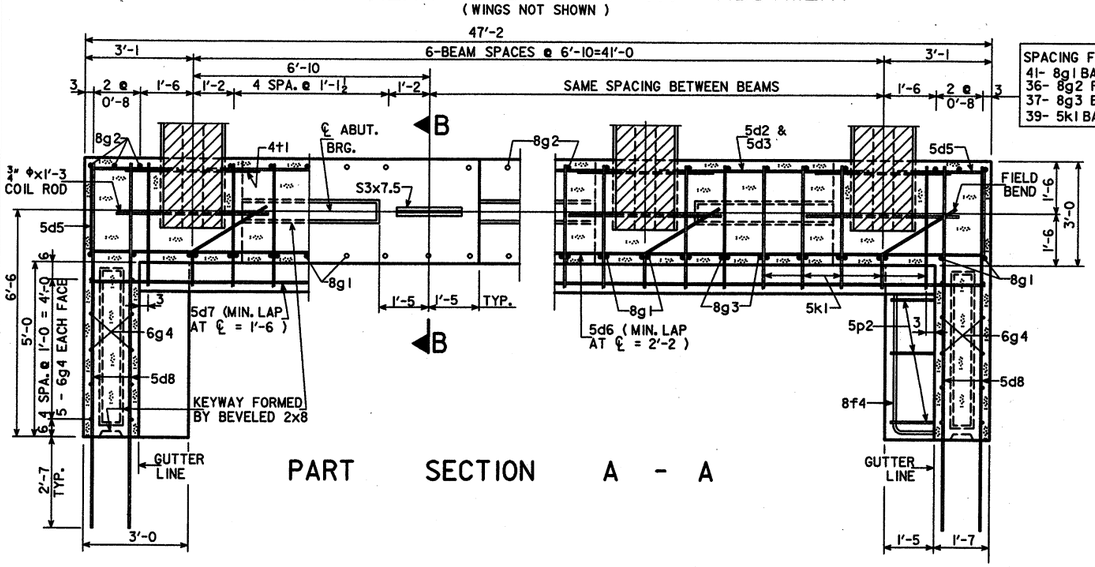
TABLE OF ABUTMENT STEPS

STEP	WEST ABUTMENT	EAST ABUTMENT
a	1 3/8	1 3/8
b	1 15/16	1 11/16
c	1 3/8	1 5/8
d	1 3/16	1 5/8
e	1 15/16	1 11/16
f	1 9/16	1 9/16

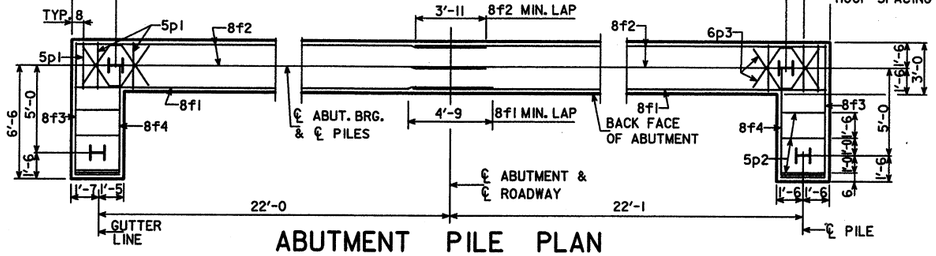
TABLE OF ABUTMENT ELEVATIONS

POINT	WEST ABUTMENT	EAST ABUTMENT
ELEV. A	677.61	678.15
ELEV. B	677.74	678.28
ELEV. C	677.89	678.42
ELEV. D	677.99	678.53
ELEV. E	677.89	678.42
ELEV. F	677.74	678.28
ELEV. G	677.61	678.15
BOTTOM FTG. ELEV.	674.11	674.65

NOTE:
THE SPIRAL AT THE TOP OF EACH PILE TO BE 7 TURNS OF No. 2 BAR, 21" DIAMETER, 3" PITCH WITH 2 - L 7/8 x 7/8 x 1/8 SPACERS PUNCHED TO HOLD SPIRAL.



PART SECTION A - A



ABUTMENT PILE PLAN

NOTE:
15- HP10x42 STEEL BEARING PILING REQUIRED AT EACH ABUTMENT.

NOTE:
SEE FOUNDATION PLAN DESIGN SHEET 5 OF 14 FOR 5p1 DOUBLE HOOP SPACING.

ABUTMENT NOTES :

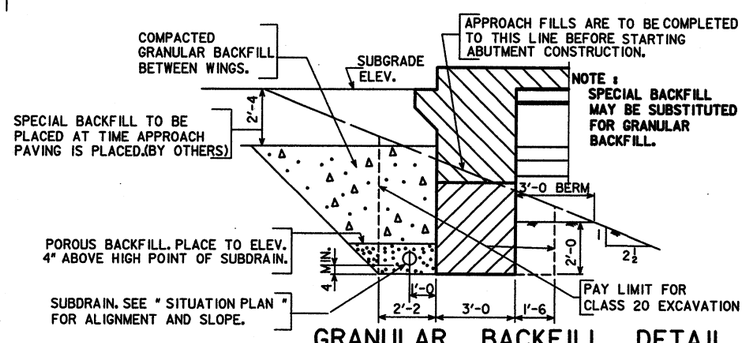
ALL EXPOSED CORNERS OF 90° OR SHARPER ARE TO BE FILLETED WITH A ¾" DRESSED AND BEVELED STRIP.

MINIMUM CLEAR DISTANCE FROM FACE OF CONCRETE TO NEAR REINFORCING BAR IS TO BE 2" UNLESS OTHERWISE NOTED OR SHOWN. REINFORCING STEEL IS TO BE SECURELY TIED IN PLACE BEFORE CONCRETE IS PLACED.

ALL BACKFILL BEHIND THE ABUTMENT BETWEEN WINGS IS TO BE AS SHOWN. THE REMAINDER OF THE ABUTMENT EXCAVATION IS TO BE BACKFILLED WITH SOIL.

THE DESIGN BEARING FOR THE ABUTMENT PILES IS 36 TONS.

THE COST OF FURNISHING AND PLACING SUBDRAIN (INCLUDING EXCAVATION), GRANULAR BACKFILL AND POROUS BACKFILL IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE".



GRANULAR BACKFILL DETAIL

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

ABUTMENT DETAILS

STATION: 596+27.13 MARCH, 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 4 OF 14 FILE NO. 28216 DESIGN NO. 299

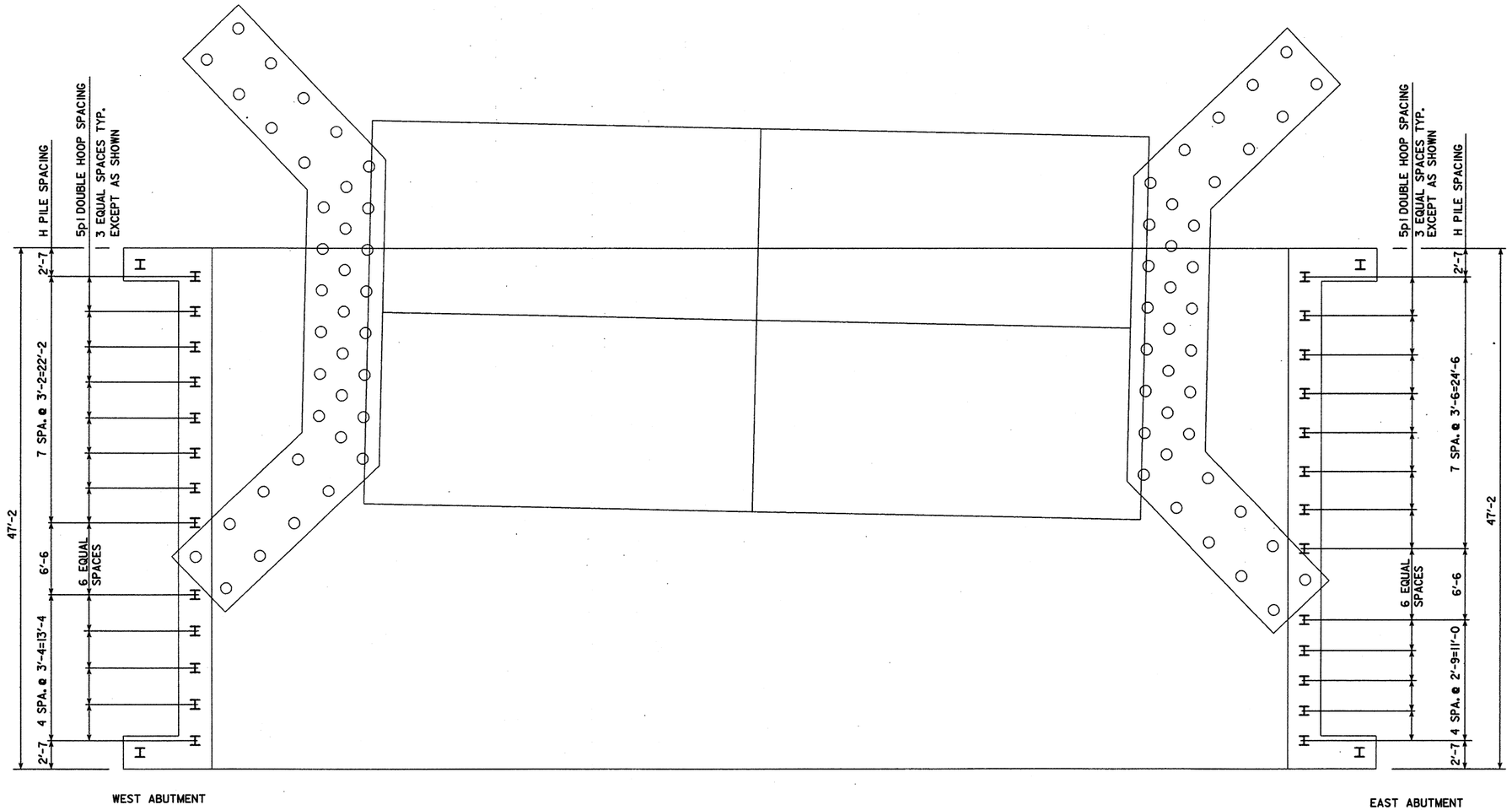
DESIGNED BY J. NELSON CHECKED BY G. HAIG
DETAILED BY C. F. RIECKEN CADD FILE

" D " BEAMS - INTEGRAL ABUT. DETAILS - 0° SKEW | STANDARD SHEET 2085 | WASHINGTON COUNTY | PROJECT NUMBER

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		5	16

04-AUG-1999 09:37 criecke s:\projects\92092040a86\brfinal\h920299.s04

REVISED: "ABUTMENT NOTES" CHANGED AND VARIOUS NOTES CHANGED ON "GRANULAR BACKFILL DETAIL". TAPE NO. 19, DATED 11-9-92.
REVISED: SPIRAL SPACERS CHANGED. TAPE NO. 17 DATED 10-28-91.
REVISED: 5-23-91 LAP LENGTHS AND EMBEDMENT LENGTHS CHANGED AND BEARING NOTE ADDED. DEVICE : ZGA1HE200,0033ARCH. TAPE No. 000016 DATE 5-23-91
HEZ085.S01 (HS)TD02085.S01--WRJ:THIS SHEET REDRAWN, DEVICE:ZGA1HE200,0033ARCH.TAPE N°. 000015 DATE 5-23-91.



FOUNDATION PLAN

NOTE: VERIFY LOCATION OF EXISTING ABUTMENT FOOTING BEFORE DRIVING HP10 X 42 PILING.

N

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

FOUNDATION PLAN

STATION: 596+27.13

MARCH 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 5 OF 14 FILE NO. 28216 DESIGN NO. 299

RD DESIGNED BY J. NELSON CHECKED BY G. HAIG
BD DETAILED BY C. F. RIECKEN CADD FILE

WASHINGTON COUNTY

PROJECT NUMBER

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		6	16

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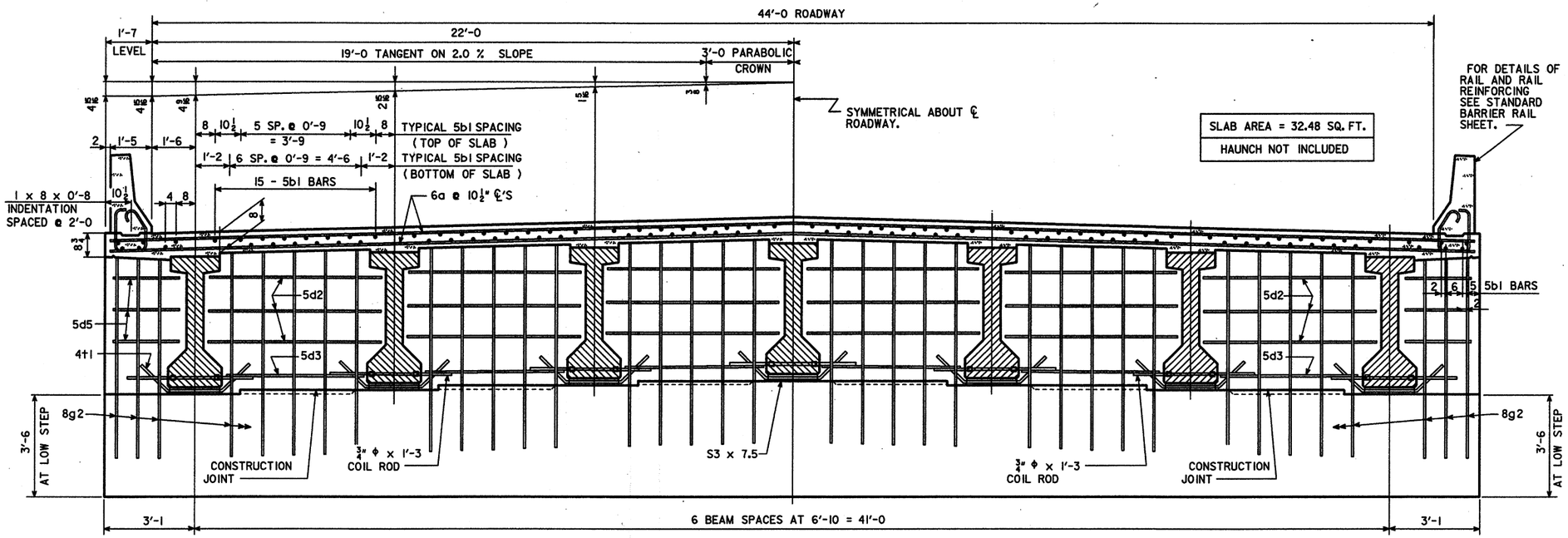
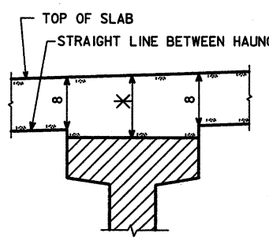
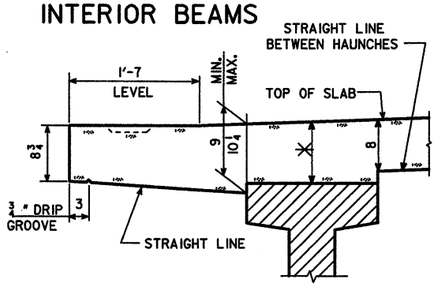


SECTION NEAR ABUTMENT



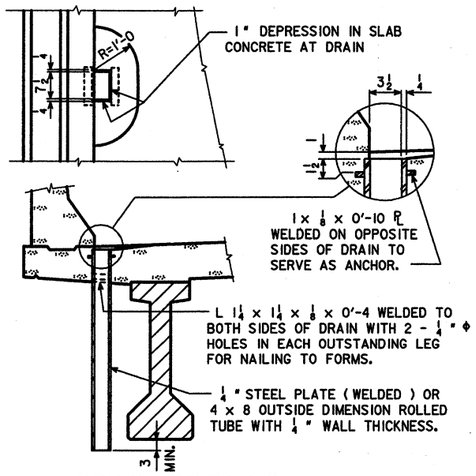
INTERIOR BEAMS



EXTERIOR BEAMS

TYPICAL SLAB AND HAUNCH DETAIL

* FOR SLAB THICKNESS OVER BEAMS SEE " SLAB THICKNESS DETAILS " ON DESIGN SHEET NO. 7.



DRAIN DETAILS

NOTE : DRAINS ARE TO BE GALVANIZED. 4 DRAINS REQUIRED. SEE " SITUATION PLAN " ON DESIGN SHEET 2 FOR LOCATION. WEIGHT OF DRAINS IS INCLUDED IN THE QUANTITY FOR "STRUCTURAL STEEL". WEIGHT IS BASED ON ROLLED TUBE.

DATA FOR ONE DRAIN				
BEAM SIZE	A	B	C	D
WT. LBS.	11	82	92	106
LENGTH FT.	3'-7¾	4'-2¾	4'-8¾	5'-5¾

LENGTH OF S3 x 7.5 (ABUTMENT BEAM SEAT)	
BEAM BOTTOM FLANGE WIDTH	LENGTH OF S3 x 7.5
1'-6	1'-3½
1'-8	1'-6½
1'-10	1'-8½

SUPERSTRUCTURE NOTES:

THE FLOOR SLAB AS SHOWN INCLUDES ½" INTEGRAL WEARING SURFACE.

THE PIER AND ABUTMENT DIAPHRAGM CONCRETE IS TO BE PLACED MONOLITHICALLY WITH THE FLOOR SLAB.

COST OF ALL PREFORMED EXPANSION JOINT FILLER MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "STRUCTURAL CONCRETE".

ALL BEAMS ARE TO BE SET VERTICAL.

FORMS FOR THE SLAB AND BARRIER RAIL ARE TO BE SUPPORTED BY THE PRESTRESSED CONCRETE BEAMS.

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

ALL SLAB AND DIAPHRAGM REINFORCING IS TO BE WIRED IN PLACE AND ADEQUATELY SUPPORTED BEFORE CONCRETE IS PLACED.

TOP TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 2½" CLEAR BELOW TOP OF SLAB. BOTTOM TRANSVERSE REINFORCING STEEL IS TO BE PARALLEL TO AND 1" CLEAR ABOVE BOTTOM OF SLAB. TOP AND BOTTOM REINFORCING STEEL IS TO BE SUPPORTED BY INDIVIDUAL EPOXY COATED METAL BAR CHAIRS SPACED AT NOT MORE THAN 3'-0 CENTERS LONGITUDINALLY AND TRANSVERSELY, OR BY CONTINUOUS ROWS OF EPOXY COATED METAL BAR HIGH CHAIRS OR SLAB BOLSTERS SPACED 4'-0 APART.

COST OF BEARING MATERIAL IS TO BE INCLUDED IN THE PRICE BID FOR "PRETENSIONED PRESTRESSED CONCRETE BEAMS".

TRANSVERSE SLAB REINFORCING MAY BE SPLICED WITH ONE LAP LOCATED AS FOLLOWS:

TOP BARS - LAP MIDWAY BETWEEN BEAMS (MIN. LAP = 2'-5).

BOTTOM BARS - LAP OVER BEAMS (MIN. LAP = 2'-5).

PAYMENT FOR REINFORCING BARS SHALL BE BASED ON NO SPLICES, AND NO ALLOWANCE SHALL BE MADE FOR THE ADDITIONAL LENGTH OF BAR REQUIRED FOR THE USE OF SPLICES.

DESIGN FOR 0° SKEW

100'-0 X 44 PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

SUPERSTRUCTURE DETAILS

STATION: 596+27.13 MARCH 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 6 OF 14 FILE NO. 28216 DESIGN NO. 299

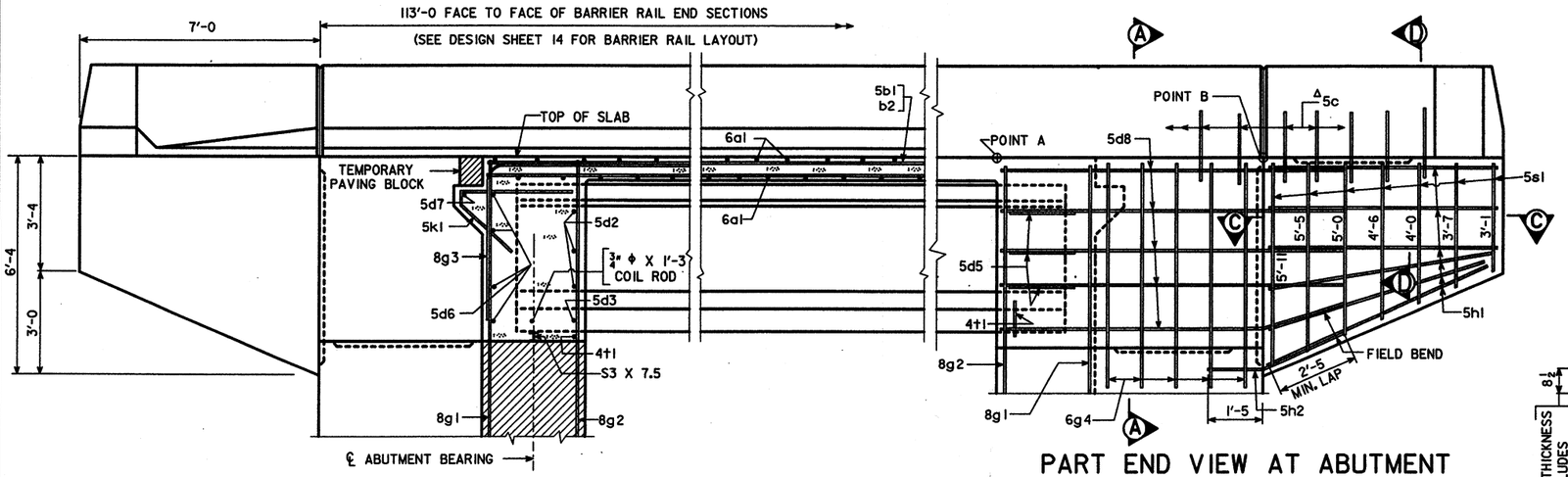
DESIGNED BY J. NELSON CHECKED BY G. HAIG
DETAILED BY C.F. RIECKEN CADD FILE

44' RDWY. PPCB (ALL BEAMS - INTEGRAL ABUT.) CROSS SECTION | STANDARD SHEET 4384 | WASHINGTON COUNTY | PROJECT NUMBER

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		7	16

REVISED: SPAN LENGTHS ADDED TO "b2" BAR TABLE, PERMISSIBLE LONGIT. CONSTR. JOINT DELETED, AND TANGENT SLOPE CHANGED TO 2% . TAPE NO. 16 DATED 5-23-91
HE4384.SOI (HSTD04384.SOI--LEP: THIS SHEET REDRAWN, DEVICE:ZHAO(200,004) ARCH.TAPE NO. 15 DATE 9-8-88)

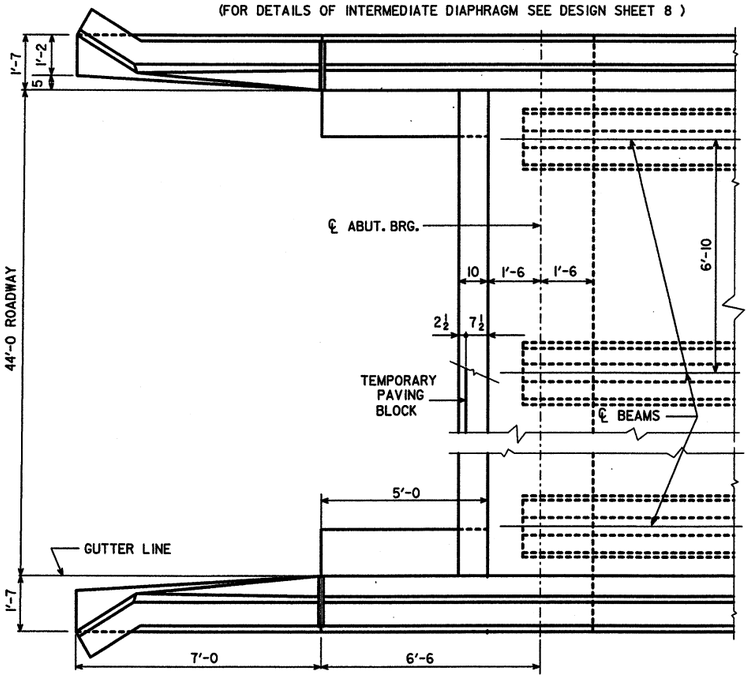
04-AUG-1999 06:37 criecke s:\projects\92092040a86\brfinal\h920299.s06



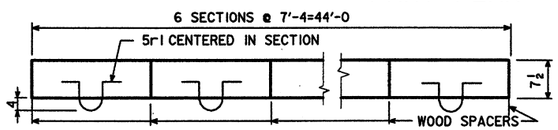
PART LONGITUDINAL SECTION NEAR GUTTER

PART END VIEW AT ABUTMENT

(FOR DETAILS OF INTERMEDIATE DIAPHRAGM SEE DESIGN SHEET 8)

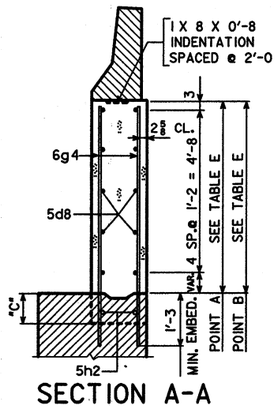


PART PLAN

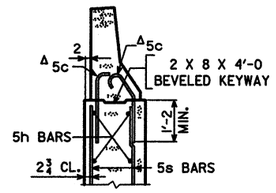


PLAN OF TEMPORARY PAVING BLOCK

NOTE: LINE PAVING NOTCH WITH TAR PAPER BEFORE PLACING THE TEMPORARY PAVING BLOCK.

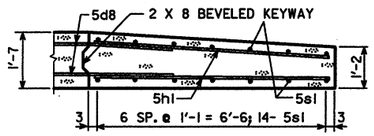


SECTION A-A

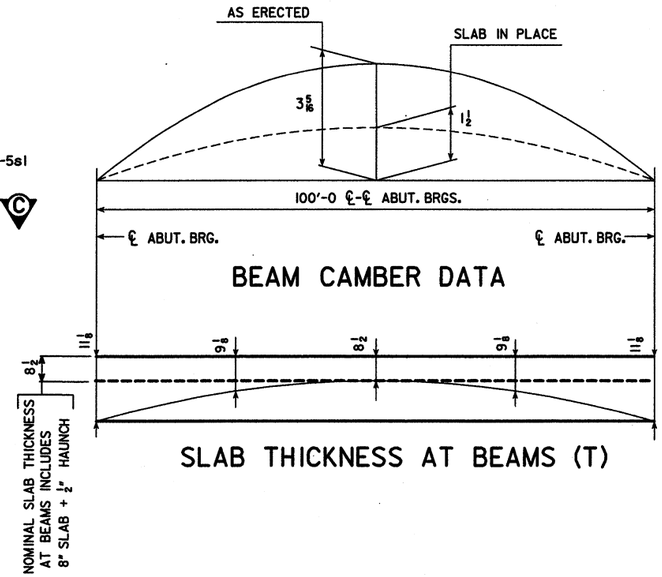


SECTION D-D

Δ NOTE:
SEE DESIGN SHEET NO. 14 FOR DETAILS OF BARRIER RAIL AND SPACING FOR 5c BARRIER RAIL BARS. REINFORCING BARS "5c" ARE INCLUDED IN THE SUPERSTRUCTURE QUANTITIES.

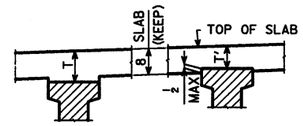


PART SECTION C-C



BEAM CAMBER DATA

SLAB THICKNESS AT BEAMS (T)



SLAB THICKNESS DETAILS

NOTE: THE SLAB THICKNESS (T) AT BEAMS IS BASED ON THE ANTICIPATED BEAM CAMBER REMAINING AFTER PLACING THE SLAB, BUT IS NOT GUARANTEED FOR CONSTRUCTION. IF BEAM IS UNDER CAMBERED, INCREASE SLAB THICKNESS (T) AT BEAMS TO COMPENSATE. IF BEAM IS OVER CAMBERED, THE SLAB THICKNESS (T) MAY BE DECREASED TO A MAXIMUM OF ½" EMBEDMENT AT THE BEAM (T'). IF MORE THAN ½" EMBEDMENT IS REQUIRED OR IF THE HAUNCH EXCEEDS 3½", THE GRADE LINE IS TO BE REVISED.

TABLE E			
LOCATION	"C"	POINT A	POINT B
S.W. CORNER	8 5/16	5'-7 13/16	5'-7 11/16
N.W. CORNER	8 5/16	5'-7 13/16	5'-7 11/16
S.E. CORNER	6 11/16	5'-7 9/16	5'-8½
N.E. CORNER	6 11/16	5'-7 9/16	5'-8½

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

SUPERSTRUCTURE DETAILS

STATION: 596+27.13 MARCH, 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 7 OF 14 FILE NO. 28216 DESIGN NO. 299

REVISED: 5c & 6g4 BAR EMBEDMENTS AND COIL ROD DETAILS CHANGED. TAPE NO. 16 DATED 5-5-91
REVISED: 6" MAX. CL. ADDED FOR 5e1 BARS. ARCH. TAPE NO. 14 DATED 5-23-89
HE4507.SOI (HSTD04507.SOI--LEP: THIS SHEET REDRAWN, DEVICE:ZHAO(200,004) ARCH.TAPE NO. 15 DATE 9-8-88)

BRF

DESIGNED BY J. NELSON CHECKED BY G. HAIG
DETAILED BY C. F. RIECKEN CADD FILE

"D" BEAMS - PART PLAN & LONGIT. SECTION - 0° SKEW | STANDARD SHEET 4507 | WASHINGTON COUNTY | PROJECT NUMBER

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		8	16

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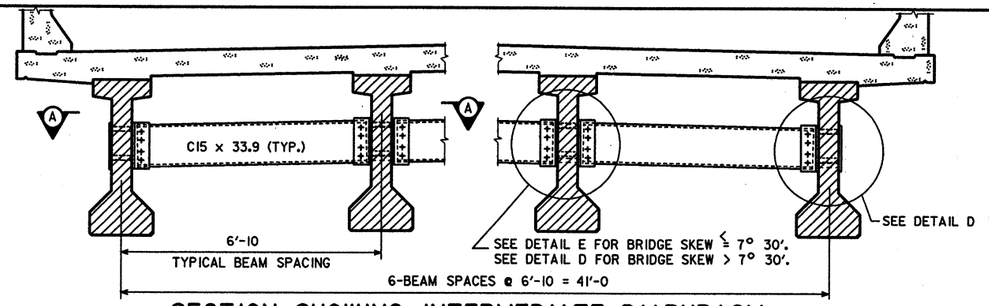
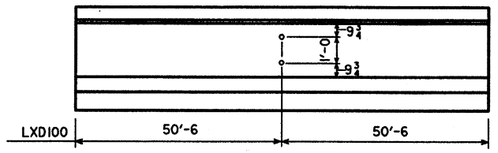


SECTION SHOWING INTERMEDIATE DIAPHRAGM



INTERMEDIATE DIAPHRAGM BOLT LOCATION

NOTES:

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

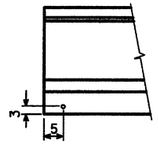
SHOP DRAWINGS OF THE STEEL DIAPHRAGMS SHOWING LAYOUT AND DETAILS OF THE DIAPHRAGMS SHALL BE SUBMITTED FOR APPROVAL.

ALL COSTS FOR FURNISHING AND INSTALLING STEEL INTERMEDIATE DIAPHRAGMS SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.

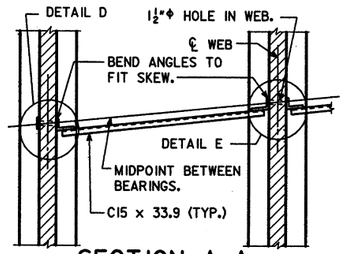
THE 1½"Φ HOLES FOR THE ⅞"Φ H.T.S. BOLTS SHALL BE CAST INTO THE WEB. DRILLING IS NOT ALLOWED.

THE ⅞"Φ H.T.S. BOLTS THROUGH THE WEB SHALL HAVE A THREAD LENGTH OF 3" MIN. AND 4" MAX.

ALL BOLTS ARE TO BE TIGHTENED PRIOR TO PLACING BRIDGE FLOOR CONCRETE WITH THE FOLLOWING EXCEPTION : BOLTS IN DIAPHRAGMS LOCATED UNDER LONGITUDINAL BRIDGE FLOOR CONSTRUCTION JOINTS SHALL NOT BE TIGHTENED UNTIL STAGE TWO OF THE BRIDGE FLOOR HAS BEEN PLACED.



INTEGRAL ABUTMENT BEAM COIL TIE LOCATIONS



SECTION A-A

FOR BRIDGES SKEWED ≤ 7° 30'

INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL

ONE CONNECTION DETAIL "E"

2 - ⅞"Φx LENGTH H.T.S. BOLTS WITH NUTS AND WASHERS

WEB THICKNESS	LENGTH OF H.T.S. BOLTS	WEIGHT PER DETAIL "E"	NUMBER OF DETAIL "E"	WEIGHT
7"	10"	4.66 LB	5	23.3
2 - L 6 x 4 x ½ x 1'-3¼ =		41.2 LB	5	206

ONE CONNECTION DETAIL "D"

2 - ⅞"Φx 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"	
7"	10"	4.66 LB	2	9.3
1 - BACKING PL 4 x ⅜ x 1'-3¼ =		6.5 LB	2	13.0
1 - L 6 x 4 x ½ x 1'-3¼ =		20.6 LB	2	41.2

ONE C15 x 33.9 DIAPHRAGM

WEB THICKNESS \ BEAM SPACING	6'-10 * LENGTH	UNIT WEIGHT (LB)
7"	5'-11⅝	202.3

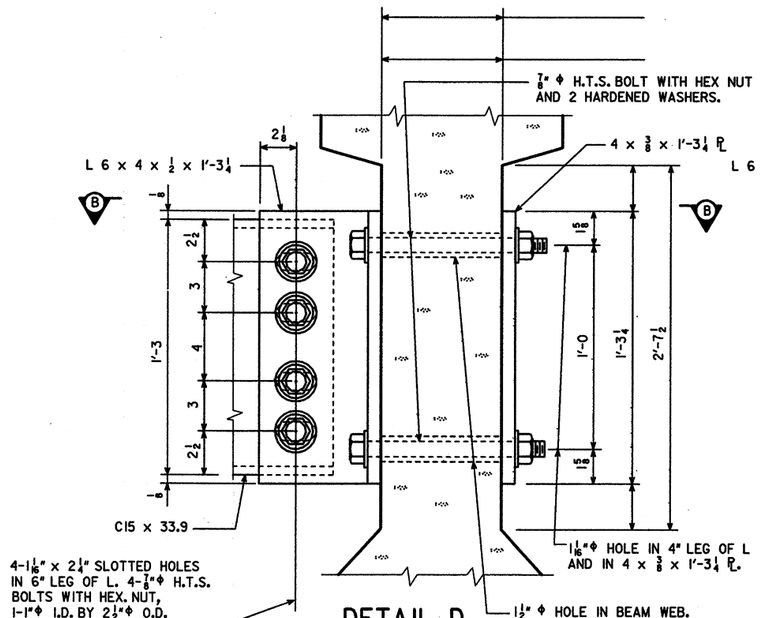
* THE LENGTH OF THE C15 x 33.9 SHOWN IN THE TABLE IS BASED ON A VARIABLE CLEARANCE OF 1 11/16 TO 2 1/16 BETWEEN THE FACE OF BEAM WEB AND END OF C15 x 33.9.

DIAPHRAGM WEIGHTS

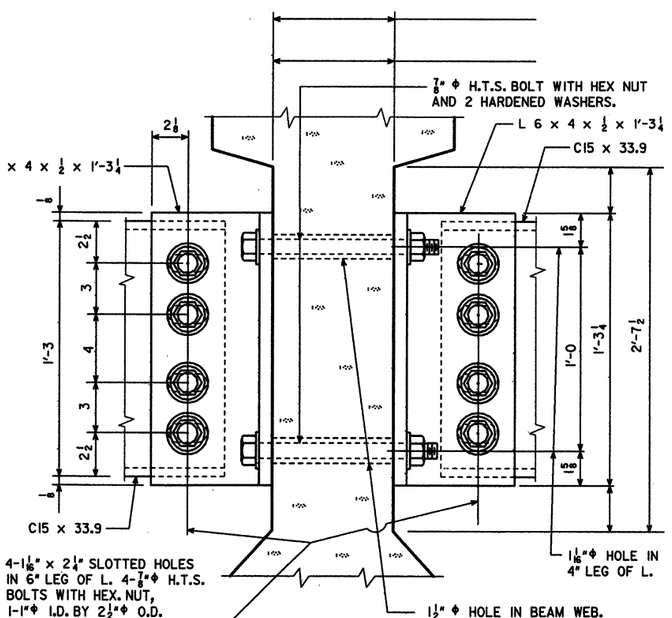
UNIT WEIGHT	NUMBER OF DIAPHRAGMS	
202.3 LB	6	1213.8

DIAPHRAGM CONNECTION BOLTS

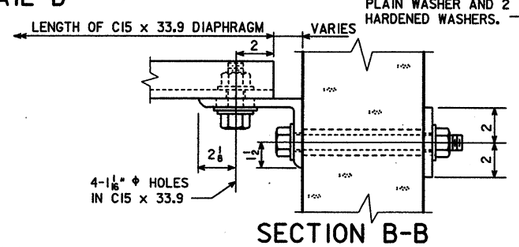
8 - ⅞"Φ x 0'-2¾ H.T.S. BOLTS WITH NUTS AND WASHERS, PER UNIT DIAPHRAGM	NUMBER OF DIAPHRAGMS	
10.3 LB	6	61.8
INTERMEDIATE DIAPHRAGM STRUCTURAL STEEL (TOTAL LB) =		1568



DETAIL D



DETAIL E



SECTION B-B

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

SUPERSTRUCTURE DETAILS

STATION: 596+27.13

MARCH, 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 8 OF 14 FILE NO. 28216 DESIGN NO. 299

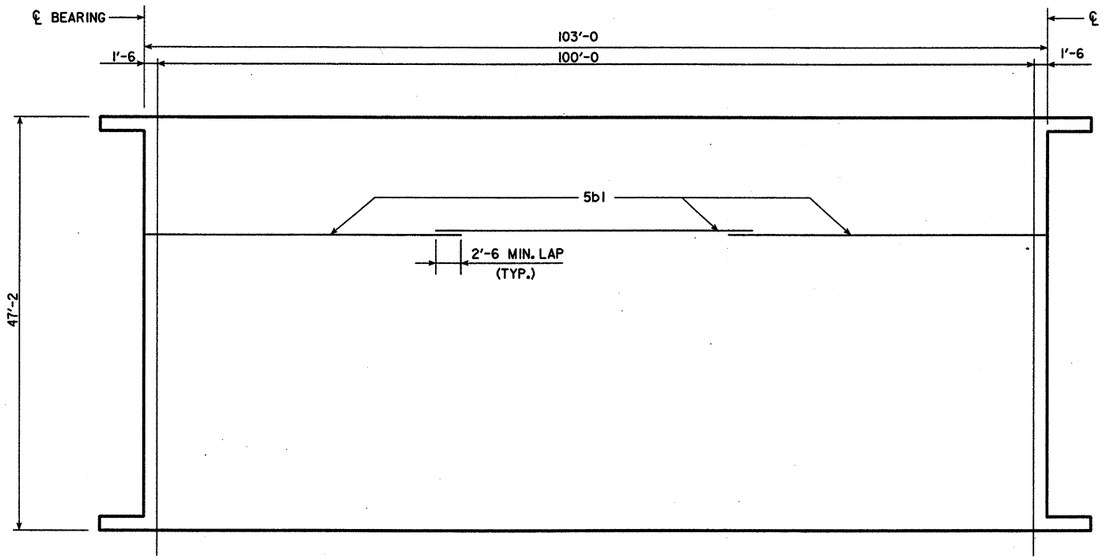
REVISED: NOTE PERTAINING TO WASHERS CORRECTED. DEVICE: ZHAO(200,7) ARCH. TAPE NO. 000016 DATE 11-28-88
REVISED: LENGTH OF BACKING PLATES AND ANGLES CHANGED. TAPE NO. II DATE 11-29-90
REVISED: 10-31-95: NOTE TO TIGHTEN DIAPHRAGM BOLTS ADDED.
HE1036.SOI (HSTD01036.SOI--LEP: THIS SHEET REDRAWN, DEVICE:ZHAO=(200,004) ARCH.TAPE NO. 15 DATE

DESIGNED BY J. NELSON CHECKED BY G. HAIG
DETAILED BY C. F. RIECKEN CADD FILE

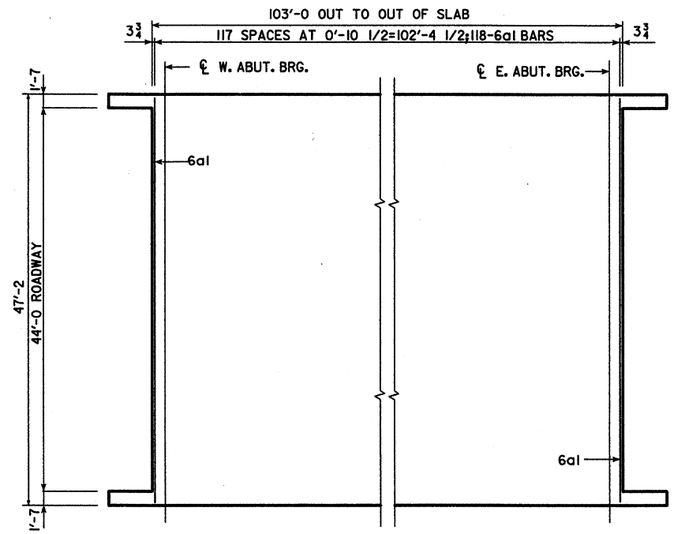
STEEL INTERMEDIATE DIAPHRAGMS FOR PC BM. BRIDGES | STANDARD SHEET 1036 | WASHINGTON COUNTY | PROJECT NUMBER

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		9	16

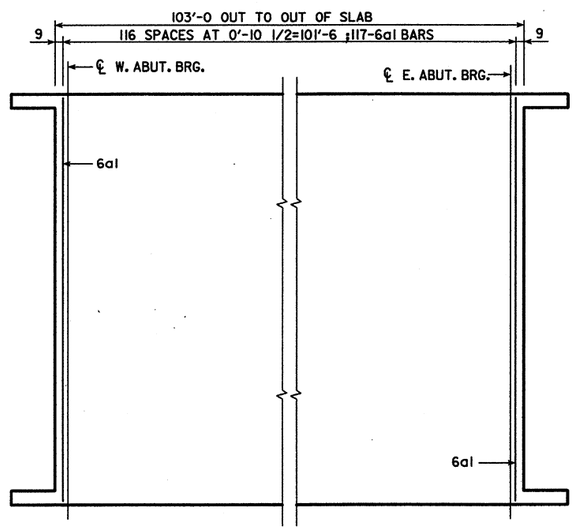
20-MAY-1999 14:36 criecke s:\projects\92092040a86\brfinal\h920299.s08



SLAB REINFORCING LAYOUT



TOP SLAB TRANSVERSE REINFORCING



BOTTOM SLAB TRANSVERSE REINFORCING

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

SUPERSTRUCTURE DETAILS

STATION: 596+27.13 MARCH 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

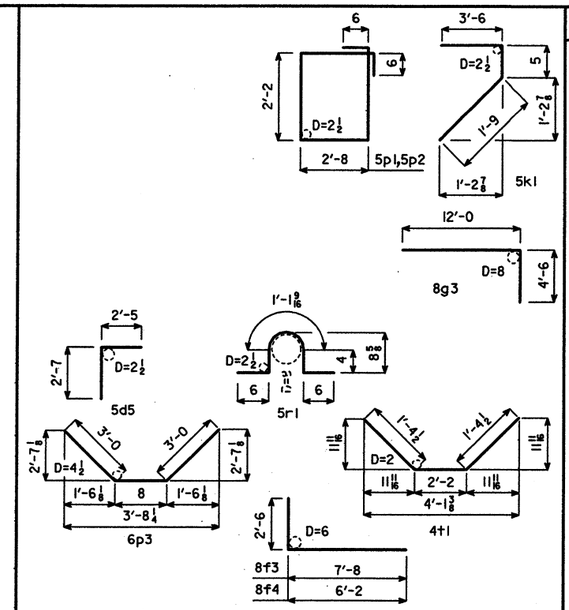
DESIGN SHEET NO. 9 OF 14 FILE NO. 28216 DESIGN NO. 299

DESIGNED BY J. NELSON CHECKED BY G. HAIG
DETAILED BY C. F. RIECKEN CADD FILE

WASHINGTON COUNTY | PROJECT NUMBER

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		10	16

20-JUL-1999 10:17 criecke s:\projects\92092040a86\brfinal\h920299.s09



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

BENT BAR DETAILS

CONC. PLACEMENT QUANTITIES — ONE SUPER. & TWO ABUTS.

LOCATION		QUANTITY
SLAB & ABUT. DIAPH.		186.0
ABUTMENT FOOTINGS		46.6
ABUTMENT WINGS	4 AT 1.7	6.8
PAVING BLOCKS	2 AT 0.85	1.7
TOTAL (CU. YDS.)		241.1

ESTIMATED QUANTITIES — ONE SUPER. & TWO ABUTS.

ITEM		UNIT	QUANTITY
STRUCTURAL CONCRETE, CLASS "C"		CU. YD.	241.1
STRUCTURAL STEEL		LBS.	1,992
REINFORCING STEEL EPOXY COATED		LBS.	41,371
REINFORCING STEEL		LBS.	6,054
PRETENSIONED PRESTRESSED CONCRETE BEAMS	LXD100	NO.	7
CLASS 20 EXCAVATION		CU. YD.	137.4
HP10X42 STEEL BEARING PILING	FURNISH 30@57'	L.F.	1710
	DRIVE 30@57'	L.F.	1710

REINF.BAR LIST-ONE SUPER.&TWO ABUTS.

EPOXY COATED REINFORCING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
6a1	SLAB TRANSV. TOP & BOTT.	——	235	46'-10	16,531
5b1	SLAB LONGIT. TOP & BOTT.	——	306	36'-0	11,490
5d6	ABUT. DIAPH. LONGIT. B.F.	——	16	24'-6	409
5d7	PAVING NOTCH LONGIT.	——	4	24'-2	101
8f1	ABUT. FOOTING LONGIT. B.F.	——	16	25'-10	1104
8g1	ABUT. VERT. B.F.	——	82	8'-8	1897
8g3	ABUT. DIAPH. VERT. B.F.	⌐	74	16'-6	3260
5k1	PAVING NOTCH TRANSV.	⌐	78	5'-8	461
5p1	ABUT. HOOPS	□	124	10'-8	1380
6p3	ABUT. BOTT. AT PILES	﹀	52	6'-8	521
BARRIER RAIL - SEE DESIGN SHT. NO. 14					4217
REINFORCING STEEL EPOXY COATED - TOTAL (LBS.)					41,371

NON-COATED REINFORCING

BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
5d2	ABUT. DIAPH. LONGIT.	——	36	5'-11	222
5d3	ABUT. DIAPH. LONGIT.	——	12	4'-8	58
5d5	ABUT. DIAPH. ENDS	⌐	12	5'-0	63
5d8	ABUT. DIAPH. WING EXT. LONGIT.	——	40	10'-6	438
8f2	ABUT. FOOTING LONGIT. F.F.	——	20	25'-5	1357
8f3	ABUT. EXTENSION LONGIT.	⌐	16	10'-2	434
8f4	ABUT. EXTENSION LONGIT.	⌐	16	8'-8	370
8g2	ABUT. VERT. F.F.	——	72	7'-7	1458
6g4	ABUT. DIAPH. WING EXT. VERT.	——	40	6'-9	406
5h1	ABUT. WING HORIZ.	——	48	6'-8	334
5h2	ABUT. TO WING ANCHOR	——	8	4'-0	33
5p2	ABUT. EXTENSION HOOPS	□	24	10'-8	267
5r1	PAVING BLOCK LIFTING LOOPS	∩	12	2'-10	35
5s1	WING VERT.	——	56	VARIES	263
4t1	UNDER BEAMS AT ABUTMENTS	﹀	14	4'-11	46
#2	PILE SPIRAL	⌀	30	38'-6	193
	SPIRAL SPACERS, L⅛ x ⅜ x ⅛ x 0.70	——	60	1'-10	77
REINFORCING STEEL - TOTAL (LBS.)					6054

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

SUPERSTRUCTURE DETAILS

STATION: 596+27.13 — MARCH, 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 10 OF 14 — FILE NO. 28216 — DESIGN NO. 299

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		11	16

BR3 DESIGNED BY J. NELSON — CHECKED BY G. HAIG
DETAILED BY C. F. RIECKEN — CADD FILE

INTEGRAL ABUT. "D" BEAMS - BAR LIST & SUPER. DETAILS - 0° SKEW | STANDARD SHEET 4518 | WASHINGTON COUNTY | PROJECT NUMBER

20-MAY-1999 14:56 — criecke — s:\projects\92092040a86\brfinal\h920299.s10

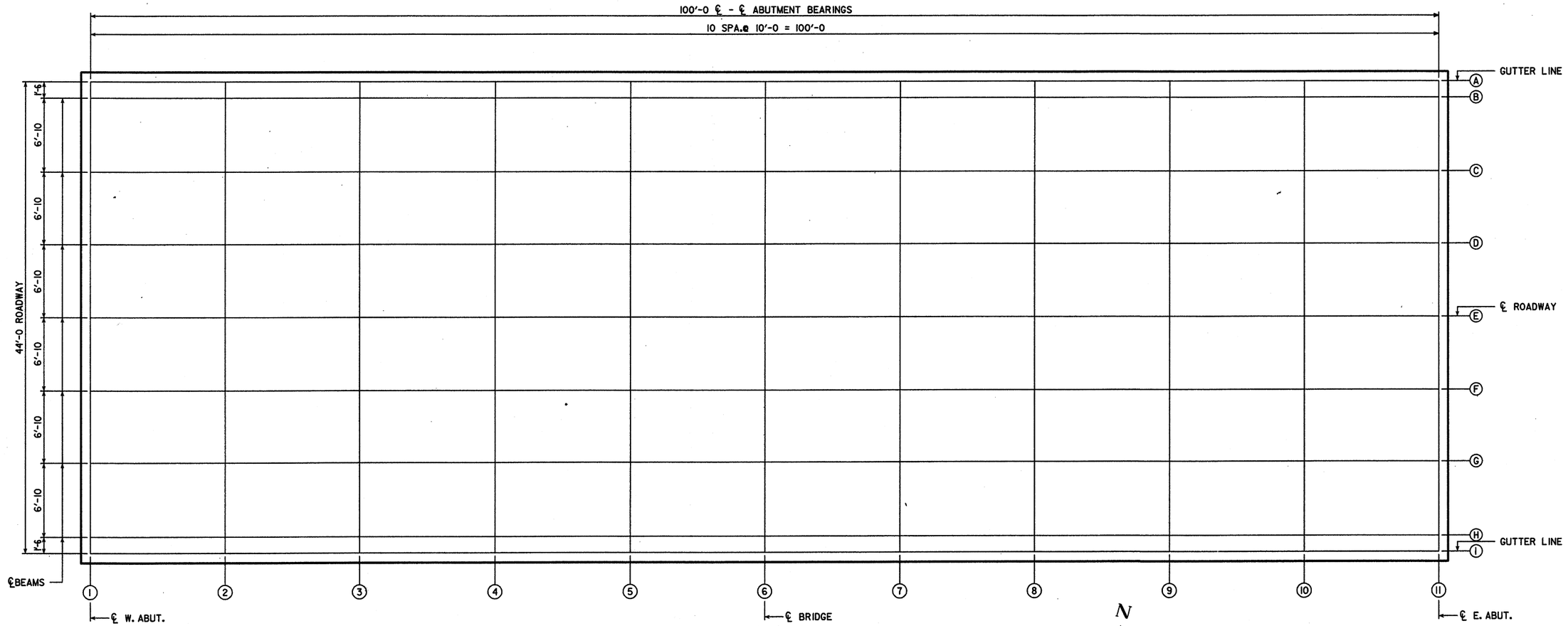
REVISED: 6-21-93 - "IN. FT." COLUMN DELETED FROM REINFORCING BAR LIST.
HE4518.SOI (HSTD04518.SOI--LEP: THIS SHEET REDRAWN, DEVICE:ZHAO4(200,004) ARCH.TAPE NO. 15 DATE 9-8-88)

TOP OF SLAB ELEVATIONS

NOTE: ADD 600 TO THE ELEVATIONS SHOWN

	1	2	3	4	5	6	7	8	9	10	11
A	83.26	83.28	83.31	83.35	83.39	83.44	83.49	83.56	83.63	83.71	83.80
B	83.29	83.31	83.34	83.38	83.42	83.47	83.53	83.59	83.66	83.74	83.83
C	83.43	83.45	83.48	83.51	83.56	83.61	83.66	83.73	83.80	83.88	83.97
D	83.57	83.59	83.61	83.65	83.69	83.74	83.80	83.86	83.94	84.02	84.10
E	83.67	83.70	83.72	83.76	83.80	83.85	83.91	83.97	84.04	84.12	84.21
F	83.57	83.59	83.61	83.65	83.69	83.74	83.80	83.86	83.94	84.02	84.10
G	83.43	83.45	83.48	83.51	83.56	83.61	83.66	83.73	83.80	83.88	83.97
H	83.29	83.31	83.34	83.38	83.42	83.47	83.53	83.59	83.66	83.74	83.83
I	83.26	83.28	83.31	83.34	83.39	83.44	83.50	83.56	83.63	83.71	83.80

BM #51 STA 595+77.5--16.7 LT FOUND IHC BM ON TOP OF NW WING POST OF BR--ELEV=678.30



TOP OF SLAB ELEVATIONS

N

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

TOP OF SLAB ELEVATIONS

STATION: 596+27.13 MARCH 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 11 OF 14 FILE NO. 28216 DESIGN NO. 299

DESIGNED BY J. NELSON CHECKED BY G. HAIG

DETAILED BY C. F. RIECKEN CADD FILE

WASHINGTON COUNTY

PROJECT NUMBER

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		12	16

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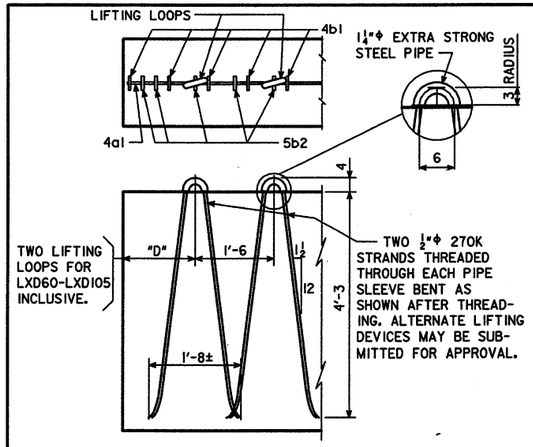


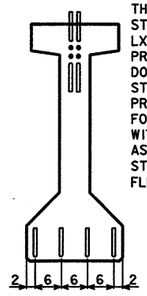
LIFTING LOOP DETAIL

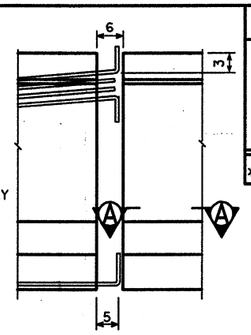
"D" = 3'-9 FOR LXD100

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

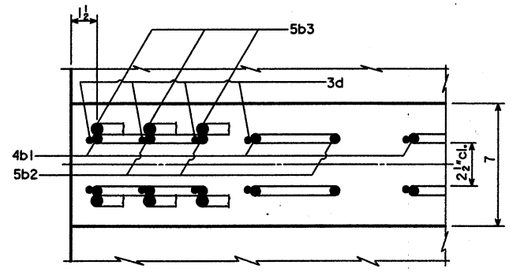
COIL TIE DETAIL

THE TOP AND BOTTOM DEFLECTED STRANDS OF BEAMS LXD65 THROUGH LXD105 ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT UP OR DOWN AS SHOWN. THE REMAINING TOP STRANDS ARE TO BE CUT WITH 0'-5 PROJECTIONS.
FOUR BOTTOM STRANDS ARE TO BE CUT WITH 1'-0 PROJECTIONS AND SHOP BENT AS SHOWN. THE REMAINING BOTTOM STRANDS SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.





STRAND PROJECTION AT BEAM ENDS WHEN EMBEDDED IN CONCRETE END DIAPHRAGMS



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

LXD BEAM DATA

BEAM	SPAN LENGTH ℄-℄ BEARING	OVERALL BEAM LENGTH (L)	# STRAND SIZE	NO. OF STRANDS: STRAIGHT	NO. OF STRANDS: DEFLECTED	TOTAL INITIAL PRESTRESS KIPS ③	HOLD DOWN FORCE-KIPS	CAMBER (In.): AT RELEASE		CAMBER (In.): AFTER LOSSES		DEFLECTION (In.) Δ_D: IMMEDIATE (ELASTIC) Δ_I ① CONC. DIAPH.	IMMEDIATE (ELASTIC) Δ_I ① STEEL DIAPH.	TIME (PLASTIC) Δ_T ② CONC. DIAPH.	TIME (PLASTIC) Δ_T ② STEEL DIAPH.	PERMISSIBLE SPACING		HS20 LOADING: CONC. DIAPH.	HS20 LOADING: STEEL DIAPH.	WEIGHT (TONS)		CONCRETE (C.Y.)	REINFORCING STEEL - (lbs.)
*LXD100	100'-0	101'-0	½"ϕ	28	8	1115	24.9	1.89		3.33		1.68	1.58	0.42	0.40			7'-6	7'-6	33.6		16.6	1439

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

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

TOTAL BEAM DEFLECTIONS AT ℄ 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 LXD35 THRU LXD85 INCLUSIVE IS BASED ON 72.664% Fsu, AND FOR LXD90 THRU LXD105 ON 75% Fsu. Fsu = 270 ksi AND As = 0.153 sq. in.

* MINIMUM CONCRETE f'c (AT 28 DAYS) SHALL BE 6000 psi. MINIMUM f'ci AT RELEASE SHALL BE 5000 psi.

Δ 6'-10 LXD100

NOTES:

IF THE STEEL DIAPHRAGM OPTION IS ALLOWED AND USED, HOLES MUST BE CAST IN THE WEB TO ACCOMMODATE THE STEEL DIAPHRAGM ATTACHMENTS AS DETAILED ON THE STEEL DIAPHRAGM DETAIL SHEET.

IF SOLE PLATE IS REQUIRED FOR BEARING, SOLE PLATE IS TO BE SET IN FORMS WHEN BEAM IS CAST AND FORMED OUT BELOW TO EXCLUDE CONCRETE AS DETAILED ON THE BEARING SHEET.

IF STUB ABUTMENTS ARE USED, ALL STRANDS AT THE ENDS OF BEAMS AT STUB ABUTMENTS SHALL BE CUT OFF REASONABLY FLUSH WITH THE CONCRETE.

NOTES:

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

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

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

TOPS OF BEAMS ARE TO BE STRUCK OFF LEVEL AND INTENTIONALLY ROUGHENED TO A FULL AMPLITUDE OF APPROXIMATELY ¼ INCH.

BEARINGS SHALL BE AS DETAILED ON OTHER DESIGN SHEETS.

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

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

FOR TRANSPORTING, THE OVERHANG SHALL BE IN ACCORDANCE WITH ART. 2407.13 OF STD. SPEC., EXCEPT THE OVERHANG MAY BE INCREASED TO A MAXIMUM OF 12 FEET FOR THE LXD100 BEAM.

THE CONTRACTOR SHALL ASSURE THE LATERAL STABILITY OF THE LXD100 AND LXD105 BEAMS DURING HANDLING, TRANSPORTING AND ERECTION BY PROVIDING TEMPORARY BRACING AS NEEDED.

IF THE PRECAST PANEL OPTION IS ALLOWED AND USED FOR BRIDGE DECK FORMATION, TOP FLANGE FINISH SHALL BE MODIFIED AS PER DETAILS ON THE PRECAST PANEL SHEET.

½" DIAMETER STRANDS STRESSED TO NOT MORE THAN 3,000 LBS. EACH MAY BE USED IN LIEU OF THE a BARS WHICH RUN THE FULL LENGTH OF THE BEAM IN THE TOP FLANGE.

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.

CONCRETE IN ACCORDANCE WITH SECTION 9, f'_c =5000 psi. (EXCEPT AS NOTED).

PRESTRESSING STEEL IN ACCORDANCE WITH SECTION 9, f_s= 270,000 psi.

SPECIFICATIONS:

CONSTRUCTION: STANDARD SPECIFICATIONS OF THE IOWA DEPARTMENT OF TRANSPORTATION, CURRENT SERIES, WITH CURRENT APPLICABLE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS.

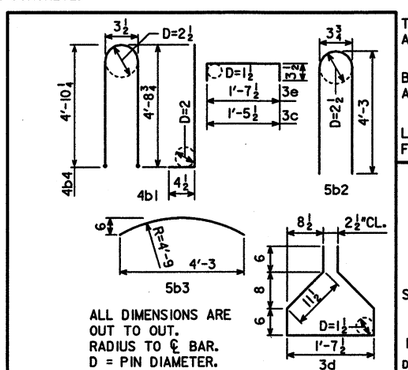
DESIGN: A.A.S.H.T.O., SERIES OF 1989, WITH MINOR MODIFICATIONS.

A/B A=SIZE B=NO.

REINFORCING BAR LIST

BEAM / SPAN		LXD100 / 100'-0	
BAR	SHAPE	NO.	LENGTH
4a1	—	2	22'-0
a2	—	6/4	35'-4
a3	—	8/2	36'-0
4b1	⊂	53	10'-4
5b2	⊂	12	8'-8
5b3	⌒	20	4'-4
4b4	⊂	28	10'-7
3c	⊓	81	2'-1
3d	△	81	5'-7
3e	⊓	16	2'-3

NOTE :
FOR MODIFIED STIRRUP EXTENSIONS, SEE "BENT BAR DETAILS" AND BEAM DETAIL SHEET FOR DIMENSIONS AND LOCATIONS.



ALL DIMENSIONS ARE OUT TO OUT.
RADIUS TO ℄ BAR.
D = PIN DIAMETER.

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

LXD BEAM DETAILS

STATION: 596+27.13 MARCH, 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 12 OF 14 FILE NO. 28216 DESIGN NO. 299

BRG DESIGNED BY J. NELSON CHECKED BY G. HAIG
DETAILED BY C. F. RIECKEN CADD FILE

LXD BEAMS

MODIFIED STANDARD SHEET 4630
ISSUE DATE 06-01-90

WASHINGTON COUNTY

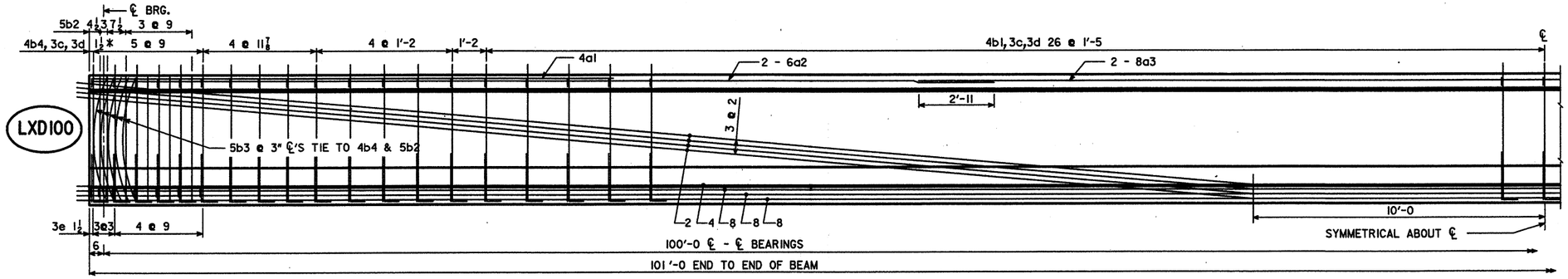
PROJECT NUMBER

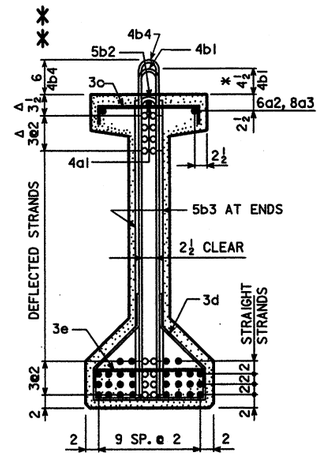
STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		13	16

09-AUG-1999 09:41 criecke s:\projects\9209204Oa86\brfinal\h920299.s12

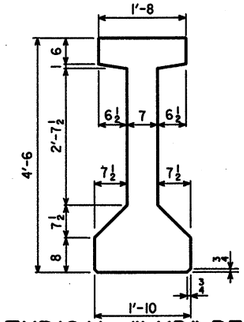
REVISED: 10-94, SPECIFICATION ARTICLE NO. CHANGED, DEVICE ZHA1(200,005) ARCH. TAPE NO. 20
REVISED: 4-21-95, SHOP BEND OF STRAND PROJECTION AT BEAM ENDS CHANGED.
REVISED: 10-97, NOTE ADDED FOR STRAND SUBSTITUTION.
REVISED: 11-98, BENDING OF STRAND PROJECTION AND NOTE CHANGED.
HLXD4630.S01 (HLXD4630.S01--GJP: THIS SHEET REISSUED, DEVICE: ZHA1(200,005) ARCH. TAPE 9 DATE 05-24-90)

NOTE: DIMENSIONS FOR THE LOCATION OF THE DEFLECTED STRANDS ARE AT ℄ BEAM AND END OF BEAM.





BEAM LXD100



TYPICAL "LXD" BEAM CROSS SECTION

AREA = 638.75 In.²
Y_b = 24.37 In.
I = 214,974 In.⁴

** NOTE STIRRUP EXTENSION

o DEFLECTED STRANDS
* KEEP
Δ DIMENSIONS AT END OF BEAM

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

LXD100 BEAM DETAILS

STATION: 596+27.13 MARCH, 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 13 OF 14 FILE NO. 28216 DESIGN NO. 299

DESIGNED BY	CHECKED BY									
J. NELSON	G. HAIG	LXD BEAM		MODIFIED STANDARD SHEET 4635 ISSUE DATE 06-01-90	WASHINGTON COUNTY	PROJECT NUMBER	STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
DETAILED BY C. F. RIECKEN	CADD FILE						IOWA	7		14	16

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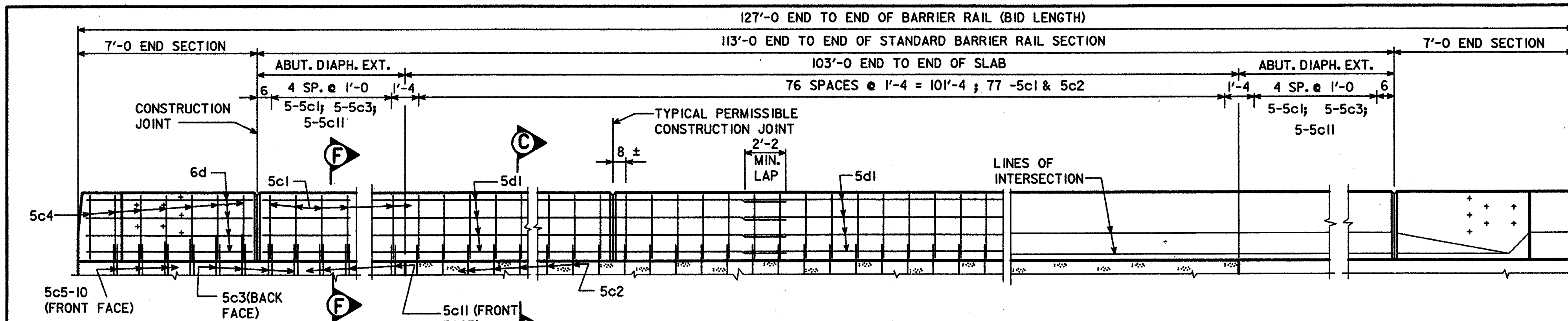
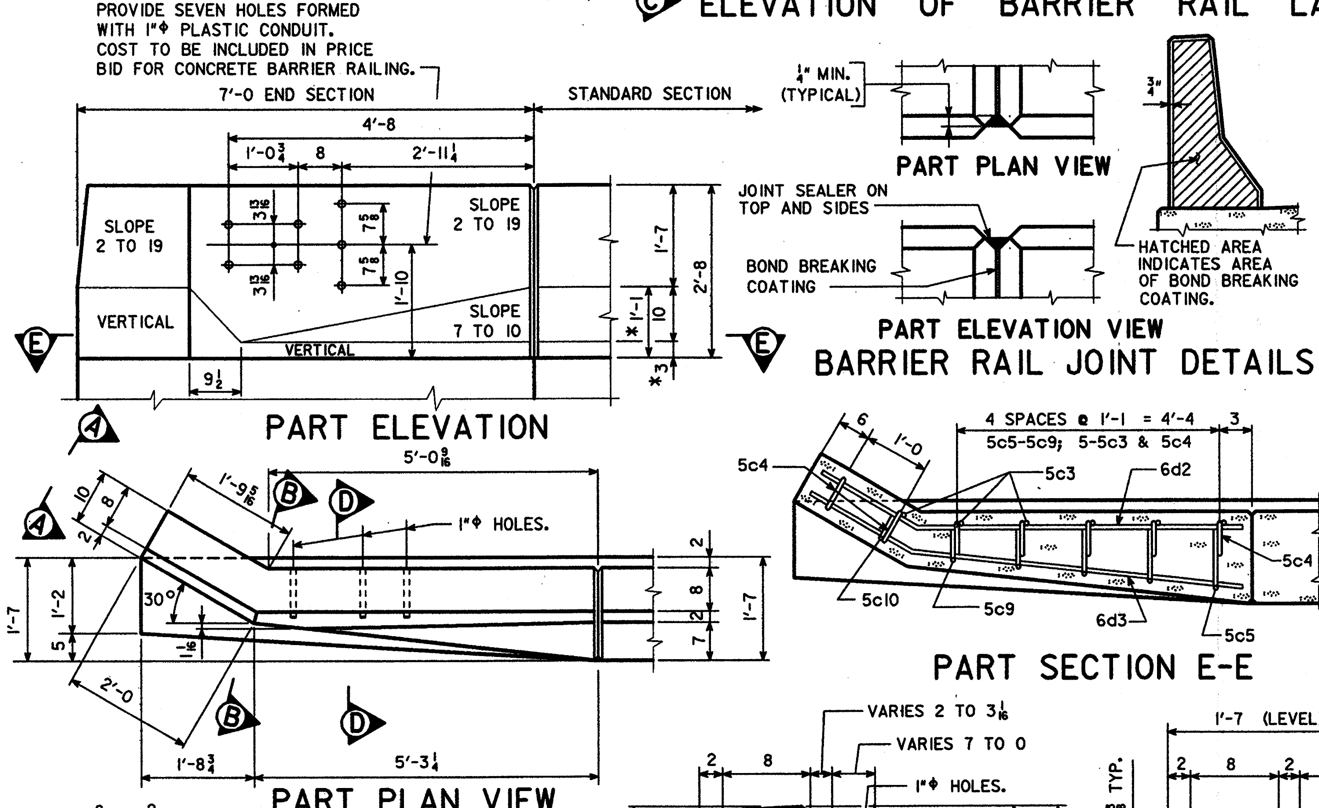
HLXD4635.SOI (HLXD04635.SOI--G.JP: THIS SHEET REISSUED, DEVICE: ZHAI:(200,005) ARCH. TAPE _9_ DATE 05-24-90)



ELEVATION OF BARRIER RAIL LAYOUT



BARRIER RAIL NOTES:

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

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

THE PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE PLACED BETWEEN VERTICAL BARS AT A MINIMUM SPACING OF 20 FEET. CONSTRUCTION JOINT CONTACT SURFACES ARE TO BE COATED WITH AN APPROVED BOND BREAKER.

COST OF THE JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

ALL BARRIER RAIL CONCRETE IS TO BE CLASS D.

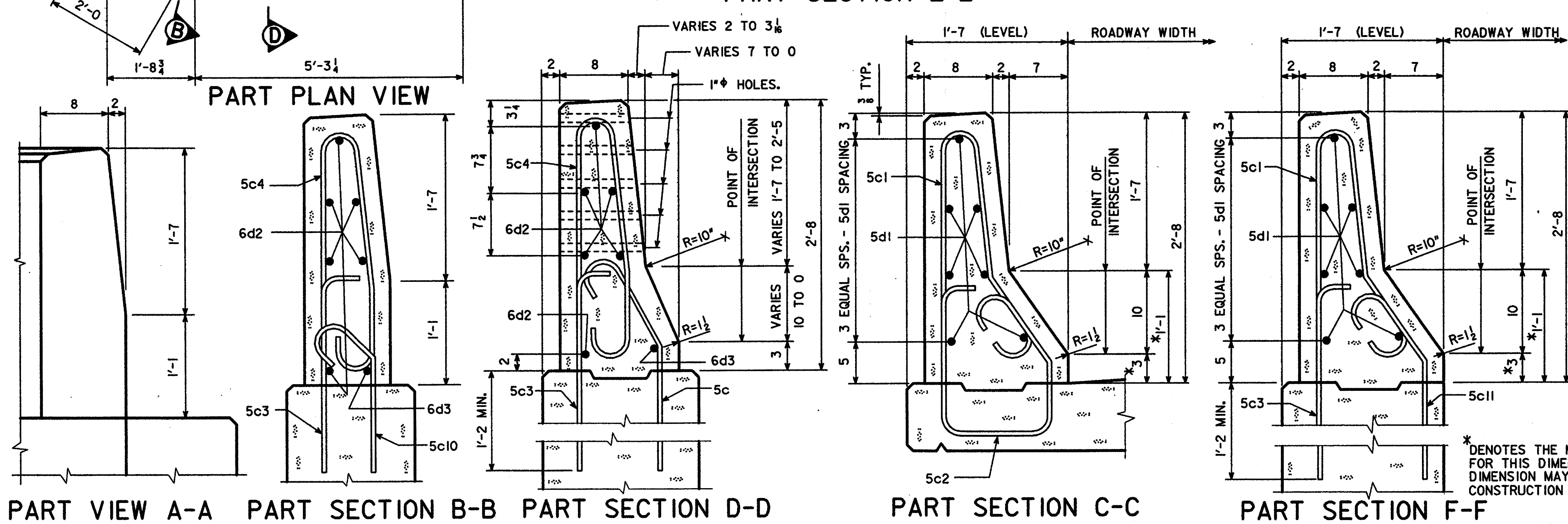
ALL BARRIER RAIL REINFORCING STEEL IS TO BE EPOXY COATED.

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

THE JOINT SEALER SHALL BE LIGHT GRAY NONSAG LATEX CAULKING SEALER MARKETED FOR OUTDOOR USE. NO TESTING OR CERTIFICATION IS REQUIRED.

TOP OF THE BARRIER RAIL IS TO BE PARALLEL TO THE THEORETICAL ℄ GRADE.

CROSS SECTIONAL AREA OF THE STANDARD SECTION OF THE BARRIER RAIL = 2.47 SQUARE FEET.

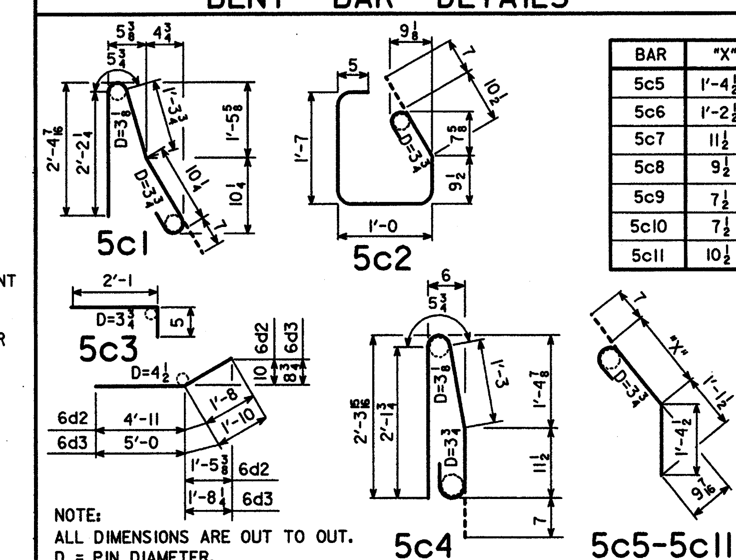


*DENOTES THE MAXIMUM VALUE FOR THIS DIMENSION. THIS DIMENSION MAY VARY DUE TO CONSTRUCTION INACCURACIES.

EPOXY REINF. STEEL-TWO BARRIER RAILS

SECTION	BAR	LOCATION	SHAPE	NO.	LENGTH	WEIGHT
STANDARD SECTION	5c1	VERTICAL		174	5'-5	983
	5c2	VERTICAL		154	5'-3	843
	5c3	VERTICAL		20	2'-6	53
	5c11	VERTICAL		20	2'-10	59
	5d1	LONGITUDINAL		42	39'-0	1708
4 - 7'-0 END SECTIONS	5c3	VERTICAL		24	2'-6	63
	5c4	VERTICAL		28	5'-5	158
	5c5-10	VERTICAL		24	VARIES	72
	6d2	LONGITUDINAL		24	6'-7	237
	6d3	LONGITUDINAL		4	6'-10	41
(INCLUDE WITH SUPERSTRUCTURE REINFORCING)				TOTAL (LB.)		4217

BENT BAR DETAILS



BAR	"X"
5c5	1'-4 1/2
5c6	1'-2 1/2
5c7	11 1/2
5c8	9 1/2
5c9	7 1/2
5c10	7 1/2
5c11	10 1/2

CONCRETE PLACEMENT SUMMARY

SECTION		TOTAL
STANDARD SECTION	226 L.F. @ .0915 CU. YD. PER FT.	20.7
END SECTION	4 @ 0.58 CU. YD.	2.3
	TOTAL (CU. YD.)	23.0

CONCRETE BARRIER RAIL QUANTITIES

ITEM	UNIT	QUANTITY
CONCRETE BARRIER RAILING	L.F.	254.0

DESIGN FOR 0° SKEW

100'-0 X 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

100'-0 CENTER SPAN

BARRIER RAIL DETAILS

STATION: 596+27.13 MARCH, 1999

WASHINGTON COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION

DESIGN SHEET NO. 14 OF 14 FILE NO. 28216 DESIGN NO. 299

STATE	FHWA REGION	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
IOWA	7		15	16

REVISED: 5c5-5c11 BENT BAR DETAIL CORRECTED. TAPE # 15 DATED 9-5-91.
REVISED: 5c1 & 5c2 BAR DETAILS CHANGED. * NOTE ADDED. TAPE NO. 00017 DATED 1-9-92.
REVISED: * DELETED FROM "PART SECTION D-D" AND * DIMENSIONS ADDED TO "PART ELEVATION". TAPE NO. 19. DATED 11-9-92.
REVISED: 6-21-93 - "LIN. FT." COLUMN DELETED FROM REINFORCING BAR LIST.
REVISED: 8-4-97 ; JOINT SEALER NOTE CHANGED.
HE1020C.S01 (HSTD1020C.S02--LEP: THIS SHEET REDRAWN, DEVICE:ZHAO:(200,004) ARCH.TAPE NO. 000016 DATE 11-3-88)

BR3 DESIGNED BY J. NELSON CHECKED BY G. HAIG
DETAILED BY C. F. RIECKEN CADD FILE

BARRIER RAIL--INTEGRAL ABUTMENTS WITH WING EXTENSIONS

STANDARD SHEET 1020C

WASHINGTON COUNTY

PROJECT NUMBER

21-MAY-1999 07:51 criecke s:\projects\92092040a86\brfinal\h920299.s14

ESTIMATED ROADWAY QUANTITIES

100-0A
10-28-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
	2525--2638030	SILT FENCE	FT	200	919

POLLUTION PREVENTION PLAN

110-12A
02-23-93

All contractors/subcontractors shall conduct their operations in a manner that minimizes erosion and prevents sediments from leaving the highway 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 a two lane roadway on IA 92 in Washington County from the east city limits of Washington to east of Ainsworth.

This PPP covers approximately 180 acres with an estimated 120 acres being disturbed.

The PPP is located in an area of one soil association (Otley-Mahaska-Taintor). The estimated average SCS runoff curve number for this PPP after completion will be 68.

Refer to the P.C.C. Pavement Grade and Replace plan (Washington County STP-92-9(56)-2C-92) 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 project engineer's office. Runoff from this work will flow into various unnamed ditches which flow into the North Fork Long Creek, the South Fork Long Creek, the Iowa River, and the Mississippi River. North Fork Long Creek and South Fork Long Creek are tributaries of the Iowa River. The Iowa River is a tributary of the Mississippi River.

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

2. CONTROLS

Prior to beginning grading, excavation or clearing and grubbing operations, silt fence shall be placed along the perimeter of the areas to be disturbed at locations where runoff can move offsite. 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, & earth dikes shall be installed as specified in the plans and/or as required

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by the project 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. No more than 750,000 square feet of exposed erodible area is allowed in any one grading spread without permission of the project engineer. Other stabilizing methods shall be used outside the seeding period.

This work shall be done in accordance with Section 2525 of the Standard Specification.
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 such as rock or sod flumes, rock ditch checks, letdown structures, soil stabilization mats and other appropriate measures shall be installed by the paving or erosion control contractor as determined by the engineer after field investigation. The construction will be completed with the establishment of permanent perennial vegetation of all disturbed areas by the erosion control contractor.

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 are encountered, 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 ½" 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 (i.e. longitudinal and standard subdrains), 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.

ESTIMATE REFERENCE INFORMATION

100-4
07-15-97

Data listed below is for informational purpose only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
	2525--2638030	SILT FENCE Item is for temporary erosion control, to be placed as directed by the engineer.

STANDARD ROAD PLANS

105-4
12-03-96

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

NUMBER	DATE	NUMBER	DATE	NUMBER	DATE
RC-16A	10-27-98	RC-16B	09-21-99		

Design No. 299
No. 28216
Design Sheet No. C.01

ROADWAY DESIGN

LICENSED PROFESSIONAL ENGINEER
Keith Allen Cadwell
12095
IOWA

I hereby certify that this plan 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.

Keith A. Cadwell 7/29/99
Signature Date

Keith Allen Cadwell
Printed or Typed Name

My license renewal date is December 31, 2000

Pages or sheets covered by this seal: C.01

OFFICE OF DESIGN • CADD • PRODUCED	STATE OF IOWA	FHWA REGION 7	FISCAL YEAR	WASHINGTON COUNTY	PROJECT NUMBER	BRF-92-9(78)--38-92	SHEET NUMBER	16 OF 16

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