LETTING DATE 10-8-91

LONGITUDINAL SUBDRAINS
FN-34-4(28)--21-88

UNION COUNTY

**CONSTRUCTION PLANS SHOWING PROJECT AS BUILT**

Plan Preparation Supervised By: Timothy A. Brady
Resident Construction Engineer

Date MAY 14, 1993 Iowa Reg. No. 11002

**REVIEWED AND FORWARDED TO AMES**

Glenn E. Miller
District Construction Engineer

Date MAY 18 1993

One 50% Reduced and ~~Two~~ ONE Full-Size Prints To Be Made and Returned To

ALAN SAMSON
District Engineer

AFTER MICROFILMING RETURN ORIGINAL TO DISTRICT NO. _____

# IOWA
# DEPARTMENT OF TRANSPORTATION
*Highway Division*

PLANS OF PROPOSED IMPROVEMENTS ON THE

# PRIMARY ROAD SYSTEM
# UNION COUNTY
## LONGITUDINAL SUBDRAINS

ON U.S. 34 FROM THE ECL OF CRESTON TO EAST JCT. U.S. 169

SCALES: As Noted

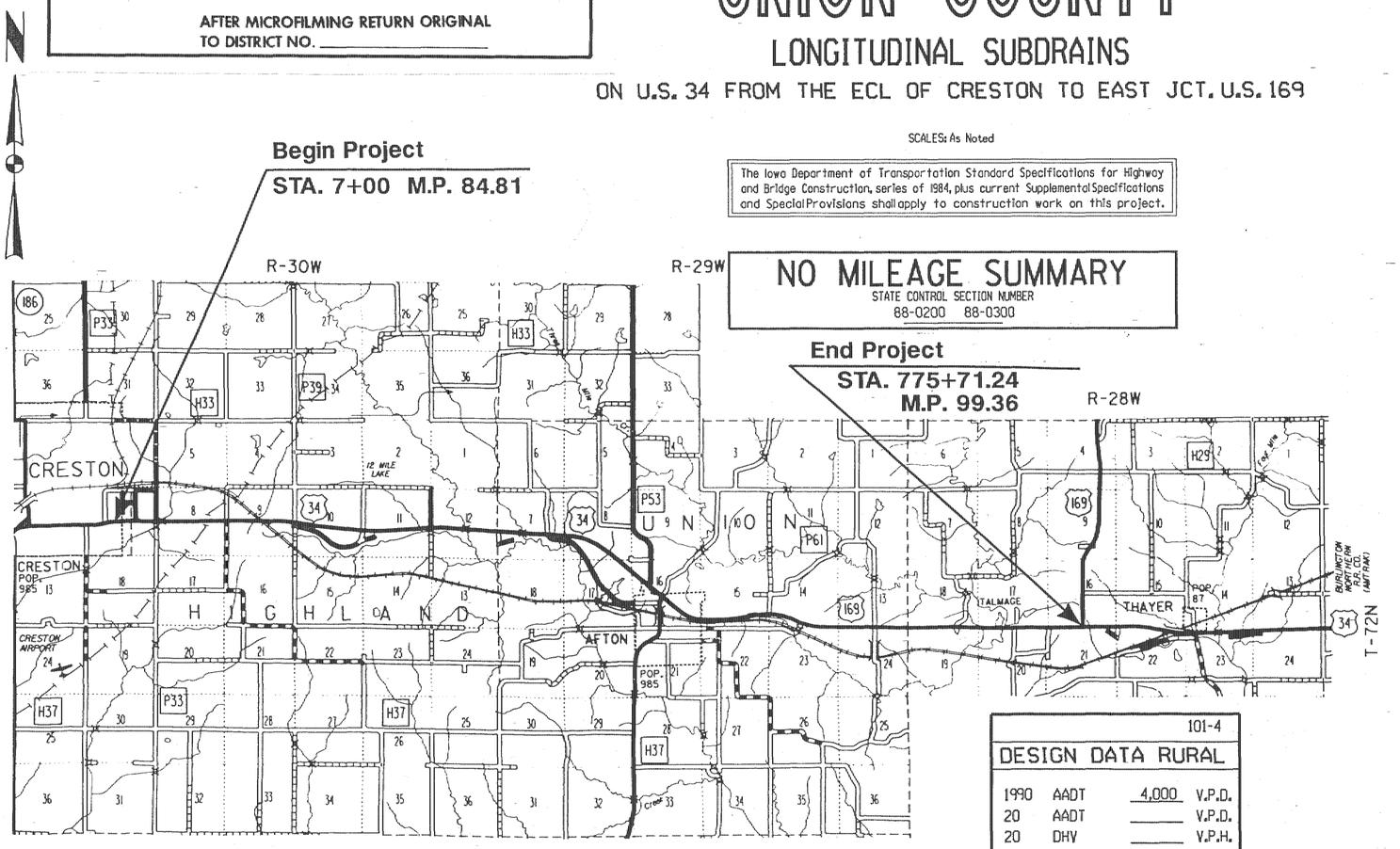
The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, series of 1984, plus current Supplemental Specifications and Special Provisions shall apply to construction work on this project.

**THIS AS BUILT PLAN INCLUDES**

| YEAR | WORK | CONTRACTOR | PROJ. INSPECTOR |
|---|---|---|---|
| 1993 | LONG. SUBDRAINS | MANATT'S INC. | RICHARD SIDDENS |
| | | | |
| | | | |

| STATE | FHWA REGION | F.Y. | SHEET | TOTAL |
|---|---|---|---|---|
| IOWA | 7 | | 1 | 1 |

PROJECT NUMBER
FN-34-4(28)--21-88
R.O.W. PROJECT NUMBER
ROW
PIN NUMBER
91-88010-1




## NO MILEAGE SUMMARY
STATE CONTROL SECTION NUMBER
88-0200 88-0300

## INDEX OF SHEETS
105-3
07-21-87

| NO. | DESCRIPTION |
|---|---|
| 1. | TITLE SHEET |
| 2. | Typicals |
| 3A.-E. | Estimated Project Quantities and General Information |
| 4A.-D. | Bridge Retrofit Designs |
| 5A.-D. | Detail Sheets |

## STANDARD ROAD PLANS
105-4
06-17-77

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

| NUMBER | DATE | NUMBER | DATE | NUMBER | DATE |
|---|---|---|---|---|---|
| RE-2A | 02-17-87 | RE-69 | 08-08-89 | RF-30A | 01-09-90 |
| RE-2B | 10-02-90 | RF-1 | 09-03-76 | RF-30B | 07-21-87 |
| RE-47 | 11-10-87 | RF-2 | 10-02-90 | RF-31 | 12-03-71 |
| RE-48A | 08-20-85 | RF-3 | 12-09-77 | RS-2 | 07-16-91 |
| RE-52 | 08-08-89 | RF-14 | 07-16-91 | RS-3 | 11-15-88 |
| RE-65 | 01-09-90 | RF-19C | 05-10-88 | RS-4 | 11-15-88 |
| RE-68 | 08-08-89 | RF-19E | 07-16-91 | | |

*1254

## DESIGN DATA RURAL
101-4

| | | | |
|---|---|---|---|
| 1990 | AADT | 4,000 | V.P.D. |
| 20 | AADT | | V.P.D. |
| 20 | DHV | | V.P.H. |
| TRUCKS | | 12 | % |

REVISIONS

Iowa Department of Transportation
*Highway Division*
AUTHORIZED FOR LETTING
George T. Jansen 7-25-91
DEPUTY CHIEF ENGINEER DATE

ROAD DESIGN PRODUCED CADD
91145
008367
107
FRB

LOCATION MAP SCALE
0 1 2 3
Miles

MICROFILMED

Donald L East
ROAD DESIGN ENGINEER DATE JUL 24 1991

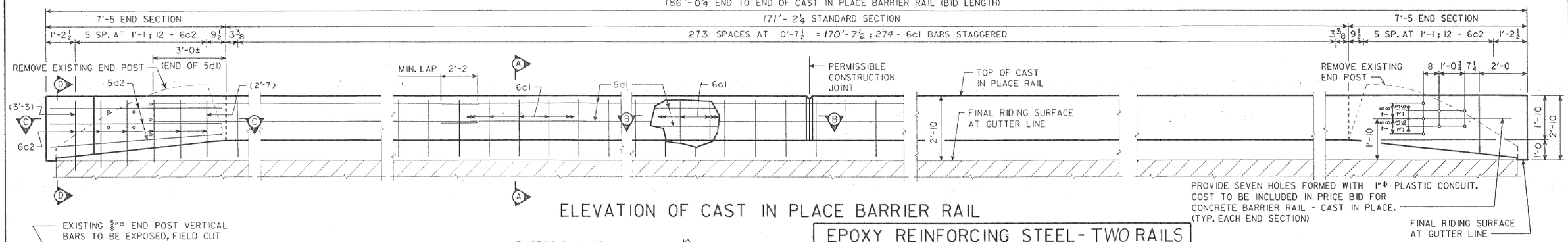
REGISTERED PROFESSIONAL ENGINEER JOHN R. ABRAMS 7229 IOWA

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 Registered Professional Engineers under the laws of the State of Iowa.
Name
Iowa Registration No. 7229 Date 7/24/91

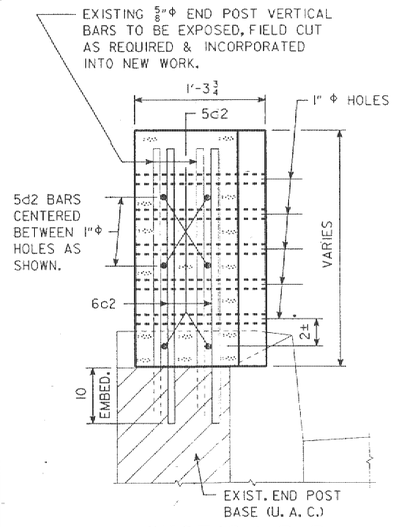
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED

FOR THE DIVISION ADMINISTRATOR DATE

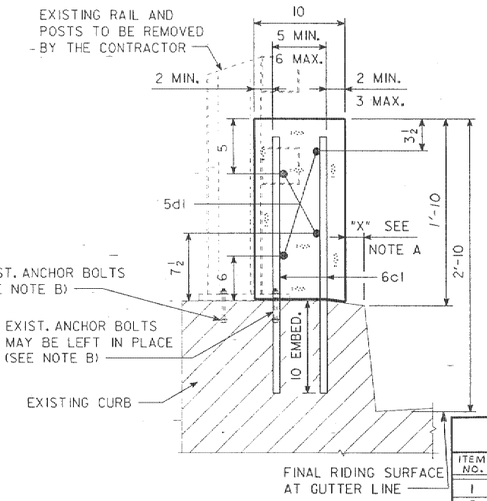
DMH (ECHER)




## ELEVATION OF CAST IN PLACE BARRIER RAIL




## SECTION D-D




## SECTION A-A

### EPOXY REINFORCING STEEL - TWO RAILS

| BAR | LOCATION | SHAPE | NO. | LENGTH | LIN. FT. | WEIGHT |
|---|---|---|---|---|---|---|
| 6c1 | STANDARD RAIL, VERT. | —— | 548 | 2'-6 | 1370 | 2058 |
| 6c2 | END SECTION, VERTICAL | —— | 48 | SHOWN | 140 | 210 |
| 5d1 | STANDARD RAIL, LONGIT. | —— | 40 | 37'-3 | 1490 | 1554 |
| 5d2 | END SECTION, LONGIT. | —— | 24 | 7'-1 | 170 | 177 |
| | | | | | TOTAL (LBS.) | 3999 |

### CONCRETE PLACEMENT SUMMARY

| SECTION | TOTAL |
|---|---|
| STANDARD SECTION 342.4'@ .057 CU. YDS. PER LIN. FT. | 19.5 |
| END SECTIONS 4 @ 0.78 CU. YDS. PER SECTION | 3.1 |
| TOTAL (CU. YDS.) | 22.6 |

### ESTIMATED QUANTITIES - TWO RAILS

| ITEM NO. | ITEM | UNITS | QUANTITY |
|---|---|---|---|
| 1 | CONCRETE BARRIER RAIL, (CAST-IN-PLACE) | LIN. FT. | 372.0 |
| 2 | REMOVAL OF EXISTING HANDRAIL | L.S. | LUMP SUM |

ITEM NO. 1 — ESTIMATE REFERENCE INFORMATION

INCLUDES 22.6 CU. YDS. CLASS D STRUCTURAL CONCRETE AND 3999 LBS. OF REINFORCING STEEL. REINFORCING STEEL COMPRISED OF 1660 L.F. OF #5 BAR AND 1510 L.F. OF #6 BAR.

**DOWEL SETTING NOTE :**

THE 6c BARS SHALL BE SET AS DOWELS IN DRILLED HOLES. HOLES ARE TO BE 10" DEEP. THE DOWELS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. ONE OF THE FOLLOWING SYSTEMS SHALL BE USED AS A BONDING AGENT FOR THE DOWELS :

A. EPOXY GROUT SYSTEM IN ACCORDANCE WITH STANDARD SPECIFICATIONS ARTICLE 2301.15 AND CURRENT SUPPLEMENTAL SPECIFICATIONS OF THE IOWA D.O.T. HIGHWAY DIVISION.

B. HYDRAULIC CEMENT GROUT SYSTEMS. DRILLED HOLES ARE TO BE 2½ TIMES THE DOWEL DIAMETER AND ARE TO BE BLOWN CLEAN WITH COMPRESSED AIR IMMEDIATELY PRIOR TO PLACING GROUT. THE HYDRAULIC CEMENT GROUT SHALL BE ONE OF THOSE APPROVED IN MATERIALS I.M. 491.13 AND SHALL BE USED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

NOTE A:

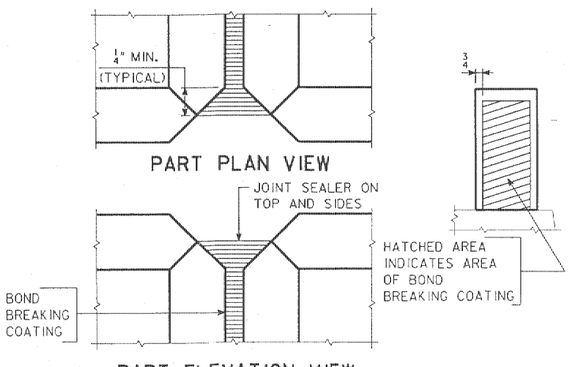
ON EACH SIDE OF BRIDGE, DIMENSION "X" SHALL BE A MINIMUM OF 1" AND A MAXIMUM OF 3", BUT MUST BE CONSTANT FOR FULL LENGTH OF BRIDGE, HOWEVER APPROXIMATELY 10 LINEAR FEET AT EITHER END OF STD. RAIL SECTION SHALL BE TRANSITIONED TO 2" AT THE END SECTION AS SHOWN IN SECTION C-C.

NOTE B:

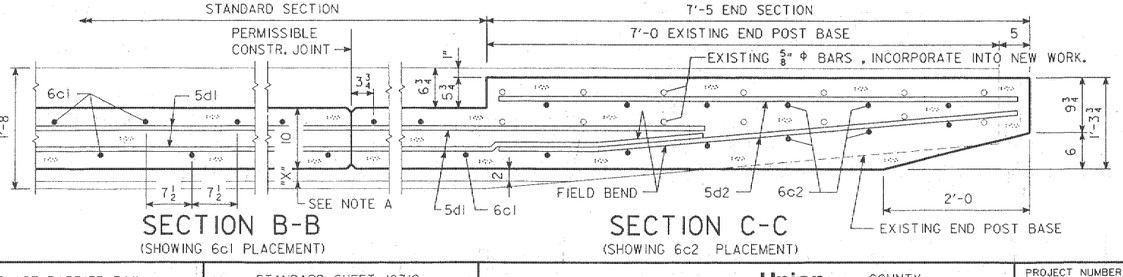
EXISTING RAIL IS TO BE REMOVED. ANY ANCHOR BOLTS THAT WILL HAVE AT LEAST 2" OF CONCRETE COVER WHEN ENCOMPASSED BY THE NEW BARRIER RAIL MAY BE LEFT IN PLACE AT THE CONTRACTORS OPTION SUBJECT TO THE APPROVAL OF THE ENGINEER. ANY ANCHOR BOLTS NOT HAVING THE 2" MIN. COVER SHALL BE CUT OFF FLUSH WITH OR SLIGHTLY BELOW THE TOP OF CURB AND ENDS OF NON STAINLESS STEEL BOLTS PAINTED WITH TWO COATS OF ZINC RICH PAINT.

STAINLESS STEEL ANCHOR BOLTS OUTSIDE THE AREA OF NEW BARRIER RAIL MAY BE LEFT IN PLACE AT CONTRACTORS OPTION SUBJECT TO APPROVAL OF THE ENGINEER. STAINLESS STEEL BOLTS NEED NOT BE PAINTED.

NON STAINLESS STEEL ANCHOR BOLTS OUTSIDE THE AREA OF NEW BARRIER RAIL SHALL BE CUT OFF FLUSH WITH OR SLIGHTLY BELOW TOP OF CURB SURFACE AND THE REMAINING EXPOSED ENDS PAINTED WITH TWO COATS OF ZINC RICH PAINT.




## CAST IN PLACE BARRIER RAIL JOINT DETAILS




## SECTION B-B (SHOWING 6c1 PLACEMENT)

## SECTION C-C (SHOWING 6c2 PLACEMENT)

**CAST IN PLACE 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 ¾" 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 JOINT SEALER AND BOND BREAKER SHALL BE CONSIDERED INCIDENTAL TO OTHER CONSTRUCTION.

THE CAST IN PLACE BARRIER RAIL IS TO BE BID ON A LINEAL FOOT BASIS MEASURED FROM END TO END OF RAIL. THE NUMBER OF LINEAL FEET OF CAST IN PLACE BARRIER RAIL INSTALLED WILL BE PAID FOR AT THE CONTRACT PRICE PER LINEAL FOOT BASED ON PLAN QUANTITIES. PRICE BID FOR CAST IN PLACE BARRIER RAIL SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIAL (INCLUDING REINF. STEEL & 1" Φ PLASTIC CONDUIT) PLUS ALL OF THE EQUIPMENT AND LABOR REQUIRED TO ERECT THE RAIL IN ACCORDANCE WITH THESE PLANS AND CURRENT SPECIFICATIONS.

ALL CAST IN PLACE BARRIER RAIL CONCRETE IS TO BE CLASS D.

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

THE JOINT SEALER SHALL CONFORM TO FED. SPEC. TT-S00230 OR TT-S00227 FOR TYPE II, CLASS A OR B.

THE PRICE BID FOR "REMOVAL OF EXISTING HANDRAIL" SHALL INCLUDE ALL COSTS ASSOCIATED WITH DISMANTLING THE EXISTING ALUMINUM HANDRAIL (APPROX. 344 L.F. AND 42 POSTS). THE RAILS AND POSTS ARE TO BECOME THE PROPERTY OF THE CONTRACTOR AND REMOVED FROM THE SITE BY HIM. THE BID ITEM SHALL ALSO INCLUDE ALL COSTS ASSOCIATED WITH THE REMOVAL OF THE EXISTING CONCRETE END POSTS AND THE CUTTING OFF AND PAINTING OF THE EXISTING RAIL POST ANCHOR BOLTS IF REQUIRED.

ANY REMOVALS AND DISPOSALS REQUIRED SHALL BE IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS. ANY DAMAGE TO OTHER PORTIONS OF THE EXISTING STRUCTURE NOT NOTED FOR REMOVAL SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE REPAIRED BY HIM AT NO COST TO THE STATE.

EXISTING BRIDGE RAIL IS NOT TO BE REMOVED UNTIL AUTHORIZED BY THE ENGINEER.

**LOCATION:**

U.S. # 34 OVER
TWELVE MILE CREEK
T-72N, R-30W
SECTION 12
HIGHLAND TWP.
UNION COUNTY
BR. MAINT. # 8890.05034

### DESIGN HISTORY AT THIS SITE

| DES. NO. | TYPE OF WORK |
|---|---|
| 770 | ORIGINAL DESIGN |
| 491 | RETROFIT RAIL |

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

6-25-91 (DATE) — LeRoy Phillips (LEROY PHILLIPS) — REG. NO. 4138

DESIGN FOR REPAIRS TO

168'-0 × 44' PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE

43'-3 & 55'-9 END SPANS — 69'-0 INTERIOR SPAN

# CAST IN PLACE BARRIER RAIL DETAILS

STA. 282 + 62.00 — APRIL 1991

UNION COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION

DESIGN SHEET NO. 1 OF 1 — FILE NO. 28371 — DESIGN NO. 491

REVISED: BARRIER RAIL DETAILS CHANGED. TAPE NO. 9 DATE 2-26-90
HSTD103IC.SOI --LEP: THIS SHEET REDRAWN. DEVICE:ZHAO:(200,004) ARCH. TAPE NO. 000016. DATE 11-3-88

| DESIGNED BY | DETAILED BY | TRACED BY | CHECKED BY | STANDARD SHEET | COUNTY | PROJECT NUMBER | STATE | FHWA REGION | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| R. Gustafson | R. Gustafson | | Kahler | 103IC | Union | FN-34-4(28)--21-88 | IOWA | 7 | | 4B | 15 |

CAST IN PLACE BARRIER RAIL