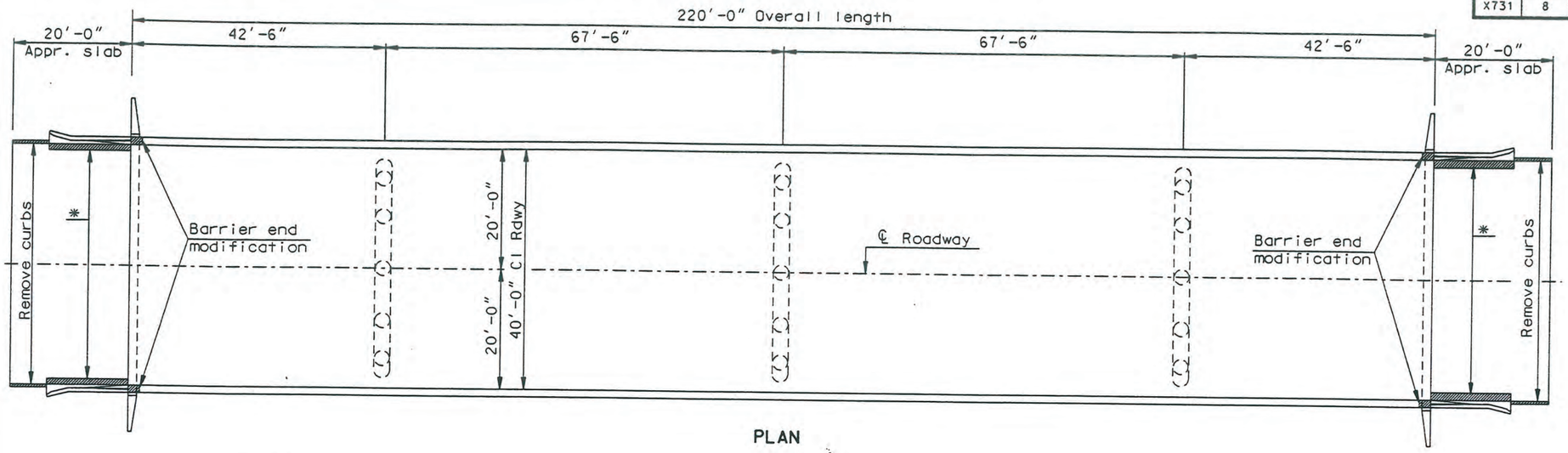
| BRIDGE CODE | FHWA REGION | STATE | FEDERAL AID PROJECT NUMBER | SHEET NO. |
|---|---|---|---|---|
| X731 | 8 | ND | IM-1-094(065)120 | 70 |




PLAN

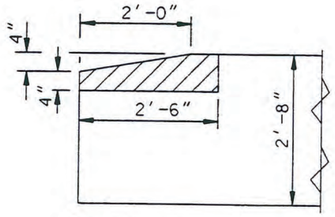
* Remove portion of approach slab for installation of safety shape barrier wall.

## NOTES:

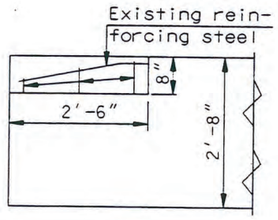
100 SCOPE OF WORK: The work at this site consists of installing safety shape transitiion barriers and making barrier end modifications at all four corners of the bridge.

764 SAFETY SHAPE TRANSISTIONS: A portion of the approach slabs and the curbs shall be removed at both ends of the bridge. New safety shape transition barriers will be built at all four corners of the bridge. All labor, equipment, saw cutting, removal of concrete, rebar, placement of concrete for the safety shape transition barriers and the barrier end modifications shall be included in the bid item "Concrete Cl. AE-3 Safety Shape Transition."

| SPEC CODE | ITEM | ITEM DESCRIPTION | UNIT | QUANTITY |
|---|---|---|---|---|
| 764 | 1001 | CONCRETE CL. AE-3 SAFETY SHAPE TRANSITION | EA | 4.0 |




SHOWING REMOVAL LIMITS
Hatched area designates concrete to be removed. Concrete shall be saw cut to provide for a neat line prior to being removed.
Care shall be taken not to damage existing reinforcing bars.




SHOWING MODIFIED BARRIER END

**BARRIER END MODIFICATION DETAILS**

Typical at all 4 corners of the bridge.

Class AAE-3 Concrete, labor and equipment required to build the barrier end modifications shall be included in the bid item "Concrete Cl. AE-3 Safety Shape Transition".

TERRENCE R. UDLAND REGISTERED PROFESSIONAL 2674 ENGINEER NORTH DAKOTA

NORTH DAKOTA
DEPARTMENT OF TRANSPORTATION

HWY 31 INTERCHANGE

**BRIDGE LAYOUT**

PROJECT: IM-1-094(065)120

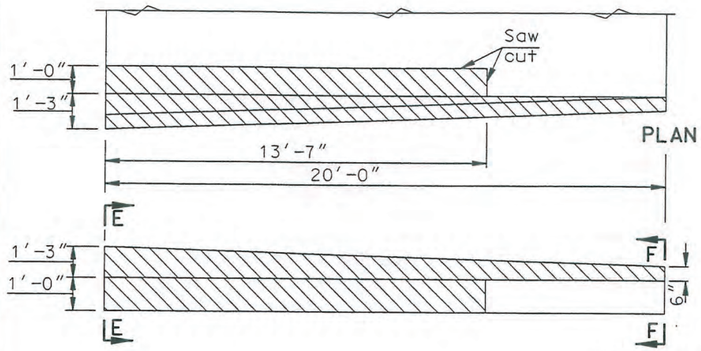
MORTON COUNTY

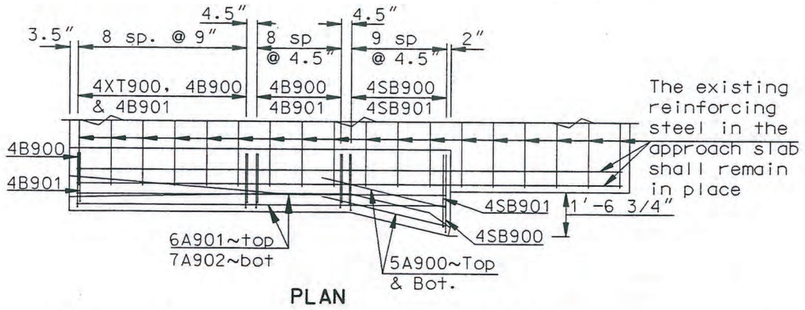
2-3-00 DATE — Terrence R. Udland BRIDGE ENGINEER

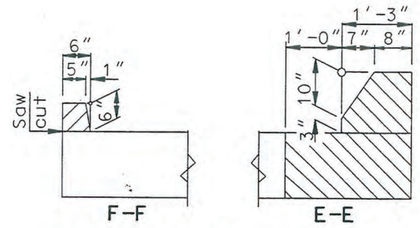
BRLO 00LCS27 LLS

94-127.662

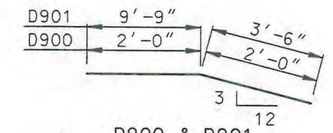
| FHWA REGION | STATE | FEDERAL AID PROJECT NUMBER | SHEET NO. |
|---|---|---|---|
| 8 | ND | IM-1-094(065)120 | 71 |

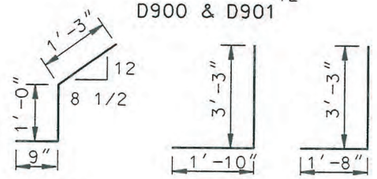


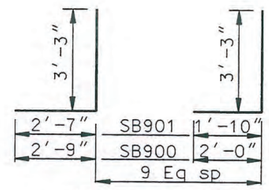




Hatched areas show removal of concrete.




**BENT BAR LIST**
Dimensions shown are out to out

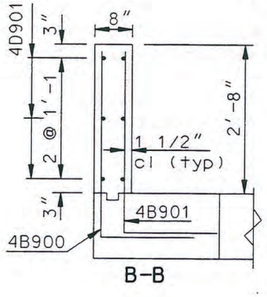
| BAR LIST - 4 TRANSITIONS | | | |
|---|---|---|---|
| SIZE | MARK | NO. | LENGTH |
| 5 | A900 | 16 | 4'-6" |
| 6 | A901 | 8 | 13'-3" |
| 7 | A902 | 8 | 13'-3" |
| 4 | XA903 | 4 | 7'-6" |
| | | | |
| 4 | B900 | 72 | 5'-1" |
| 4 | B901 | 72 | 4'-11" |
| 4 | SB900 | 4 | 56'-3" |
| 4 | SB901 | 4 | 54'-7" |
| | | | |
| 4 | D900 | 8 | 4'-0" |
| 4 | D901 | 24 | 13'-3" |
| | | | |
| 4 | XT900 | 36 | 3'-0" |
| | | | |
| | | | |

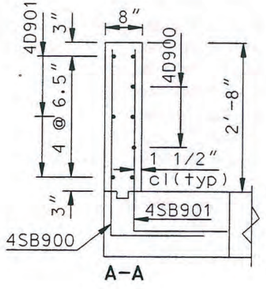
**ESTIMATED MATERIAL QUANTITIES**
(Information only)

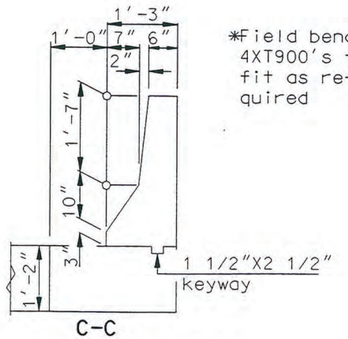
| REINFORCING STEEL LBS | CONCRETE CY |
|---|---|
| 1,554 | 9.2 |

X = Epoxy coated bar
See Bridge Layout sheet for notes.

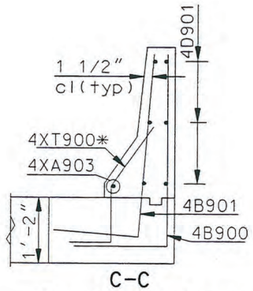
Removal of concrete to be included in the price bid for "Concrete Cl. AE Safety Shape Transistions". There are approximately 6.7 CY of concrete to be removed.

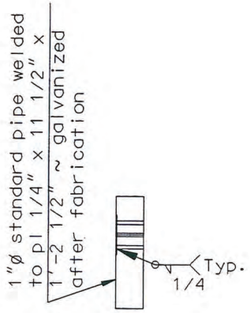


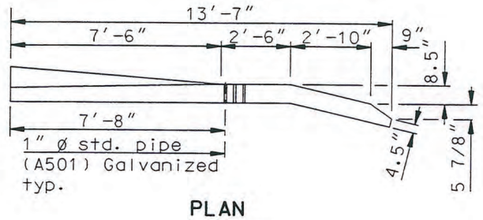



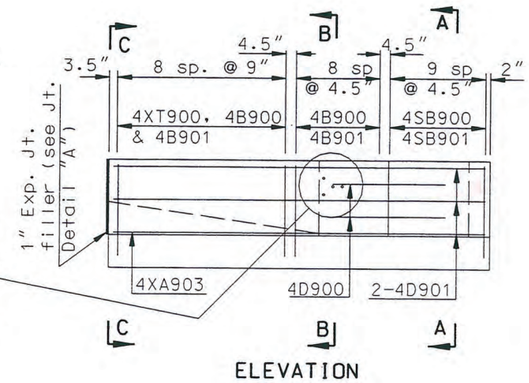




*Field bend 4XT900's to fit as required



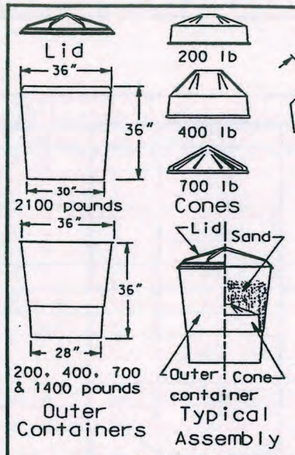

| QUANTITIES | | |
|---|---|---|
| Concrete Cl. AE-3 Safety Shape Transition | 4 | EA. |

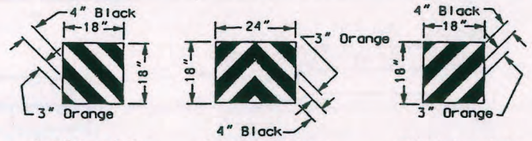
HWY 31 INTERCHANGE

**SAFETY SHAPE TRANSITION BARRIERS**

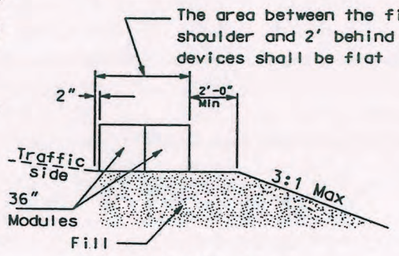
# ATTENUATION DEVICE

D-704-1



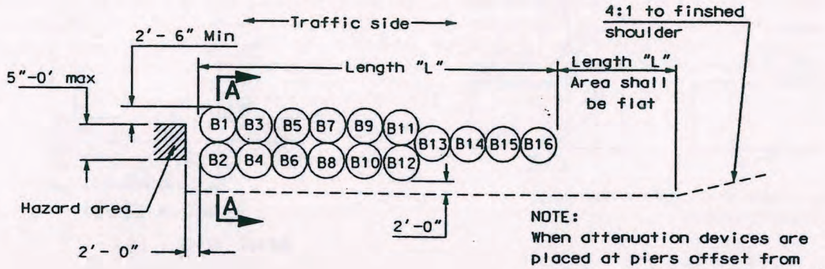

The last attenuation device facing traffic shall have a reflective sheet, following the details above, directly applied to the outer container. The sheet may also be applied to a metallic sheet and attached to the container with approved fasteners. The reflective sheeting shall be Type III C as specified in Section 894 of the Standard Specifications.




SECTION A-A
(Type B Layout)

## TYPICAL MODULE CONSTRUCTION DETAIL

| SAND FILL CHART | | | | | |
|---|---|---|---|---|---|
| | MODULE WEIGHTS (LBS) | | | | |
| | 200 | 400 | 700 | 1400 | 2100 |
| Inches from top edge | 8 | 3 1/2 | 4 1/2 | 3 | 3 1/2 |




NOTE:
When attenuation devices are placed at piers offset from roadway, they shall be angled 10 degrees towards traffic

TYPE B LAYOUT

| MODULE NUMBER | TYPE B ATTENUATION DEVICE DASH NUMBER | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 75 | 70 | 65 | 60 | 55 | 50 | 45 | 40 | 35 | 30 | 25 |
| | MODULE WEIGHTS | | | | | | | | | | |
| B1 | 2100 | | | | | | | | | | |
| B2 | 2100 | | | | | | | | | | |
| B3 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | | |
| B4 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | 2100 | | |
| B5 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 |
| B6 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 |
| B7 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 |
| B8 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 | 1400 |
| B9 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 |
| B10 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 |
| B11 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 |
| B12 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 |
| B13 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 | 700 |
| B14 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| B15 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 | 400 |
| B16 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| LENGTH (L) | 30' | 27' | 27' | 27' | 27' | 27' | 27' | 27' | 27' | 24' | **24'** |
| MODULE WEIGHTS | REPLACEMENT MODULE | | | | | | | | | | |
| 2100 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1400 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 700 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 400 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 200 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

Notes

1. Materials
   A) Modules shall be manufactured from a frangible polyethylene material which will shatter upon impact.
   B) The sand shall meet the requirements for fine aggregate for concrete according to Section 816.01 of the Standard Specifications. Sand unit weight shall be at least 100 pounds per cubic foot. Sand left over the winter shall have a moisture content of 2% or less.
2. Modules
   The modules shall be provided in two sizes to contain volumes of either 2, 4, 7, 14, or 21 cubic feet as a minimum.
   A) The module for the 2, 4 or 7 cubic foot container shall consist of three components:
      1) A 14 C.F., yellow outer container.
      2) A black lid which locks securely over the top lip of the container.
      3) A cone-shaped supporting insert. The insert shall be varied to allow for the three sizes of modules and capable of supporting 200, 400, or 700 pounds of sand mass. The cone inserts shall be placed inside the 14 cubic foot container.
   B) The module for the 21 cubic foot container shall consist of two components:
      1) A 36" height X 36" width yellow outer container.
      2) A black lid which locks securely over the top of the container.
3. The module shall be manufactured by Energy Absorption Systems of Chicago, Illinois, or an approved equal.
4. The contractor shall provide the required modules for Type B layouts as required in the plans. The contractor shall also provide and have available on the project site additional replacement modules (see chart) for each layout location up to a maximum of 20 modules per project. The cost for providing, and having available replacement modules on the project site for the duration of the project shall be included in the price bid for "Type B Attenuation Device".
5. The contractor shall be responsible for maintaining the modules in each layout. Any damaged modules will be replaced by the contractor. The Department will reimburse the contractor for damaged modules (materials only) based on invoice price plus applicable mark-ups for materials and subcontracting according to Section 109.04 of the Standard Specifications. All other costs for labor, equipment and materials required to maintain and replace damaged modules shall be included in the price bid for the item "Type B Attenuation Device".
6. The attenuation devices may be placed on pallets to facilitate maintenance. Pallets shall have a maximum thickness of 3 1/2".
7. The material used for fill may be obtained from an area within the right of way as designated by the Engineer. Upon completion of the work, the devices and fill shall be removed and the area restored to the original condition and reseeded. The fill shall be disposed of as directed by the Engineer.
8. The item "Type B Attenuation Device" will be measured by the number installed. The bid shall include all material, equipment, relocation if required, labor and removal and shall be full compensation to complete the work.

| 10-1-86 | |
|---|---|
| REVISIONS | |
| | CHANGE |
| 9-2-97 | Revised type B layout |
| 12-29-97 | Revised note 1 |
| 07-21-98 | Refl. Type IIIC |

NORTH DAKOTA DEPARTMENT OF TRANSPORTATION

APPROVED: _____
DESIGN ENGINEER

r:\support\desstd\d704-01.dgn Jul. 21, 1998 16:42:26

JOB# 8

| FHWA REGION | STATE | PROJECT | SHEET NO. |
|---|---|---|---|
| 8 | N.D. | IR-94-4(52)127 & IR-94-4(51)147 | 1 |

## DESIGN DATA

IR-94-4(52)127

| Traffic | Average Daily | | | | Est. 30th Max. Hr. |
|---|---|---|---|---|---|
| Current Traffic (1986) | 1100 Pass. | 220 | Trucks | 1320 Total | 165 |
| Traffic Forecast (2006) | 1500 Pass. | 300 | Trucks | 1850 Total | 235 |
| Design Speed | 55 MPH | | | | |
| Minimum Sight Distance (Stopping) | 450' | | | | |
| Bridges | HS 20 | | | | |

IR-94-4(51)147

| Traffic | Average Daily | | | | Est. 30th Max. Hr. |
|---|---|---|---|---|---|
| Current Traffic (1986) | 1300 Pass. | 300 | Trucks | 1600 Total | 240 |
| Traffic Forecast (2006) | 1625 Pass. | 375 | Trucks | 2000 Total | 300 |
| Design Speed | 55 MPH | | | | |
| Minimum Sight Distance (Stopping) | 450 | | | | |
| Bridges | HS 20 | | | | |

# NORTH DAKOTA
# STATE HIGHWAY DEPARTMENT

In Morton County
Federal Aid Project No.
IR-94-4(52)127 & IR-94-4(51)147
Grading, Surfacing & Structural Items

GOVERNING SPECIFICATIONS:

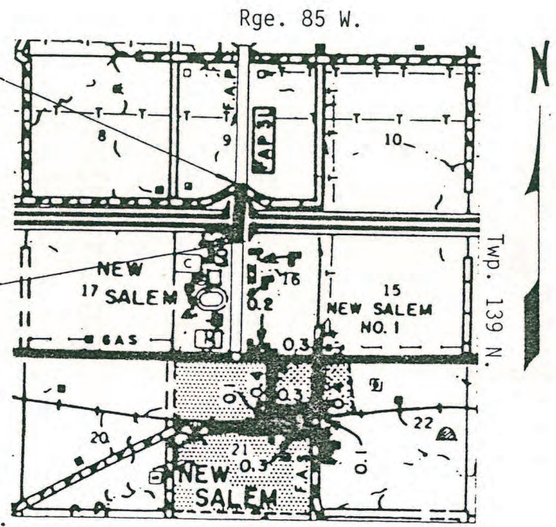
Standard Specifications adopted by the North Dakota State Highway Department Nov. 1986, Standard Drawings currently in effect, and other Contract Provisions submitted herein.

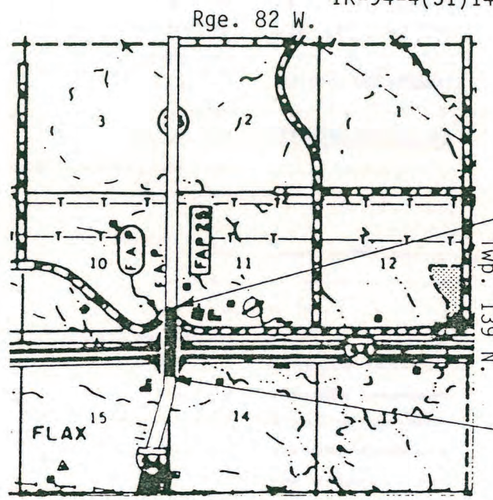
## LENGTH OF PROJECT

| Project | Miles-Gross | Miles-Net |
|---|---|---|
| IR-94-4(52)127 | .289 | .289 |
| IR-94-4(51)147 | .305 | .305 |

Begin Project IR-94-4(52)127 Site 1
Sta. 8+06 A point 2,611.4 ft. east and 461 ft. north of the sw corner of Sec. 9, Twp. 139 N., Rge. 85 W.

End Project IR-94-4(52)127
Sta. 24+17 A point 2611.4 ft. east and 1150 ft. south of the sw corner of Sec. 9, Twp. 139 N., Rge. 85 W.




Begin Project IR-94-4(51)147 Site 2
Sta. 1490+00 A point 432.1 ft. north of the sw corner of Section 11, Twp. 139 N., Rge. 82 W.

End Project IR-94-4(51)147
Sta. 1505+24 A point 1091.9 ft. south of the sw corner of Section 11, Twp. 139 N., Rge. 82 W.

Project IR-94-4(52)127 & IR-94-4(51)147 - Morton Co.
Consists of widening and replacing the existing bridge deck to 40 ft. approach roadways will be widened to match the new structure width. 2" of Hot Bit. Pvmt. will be applied to the widened approach roadway. Traffic will be maintained during construction.

APPROVED DATE 12-5-86

Ray Zink

CHIEF ENGINEER
NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

RAY ZINK REGISTERED PROFESSIONAL P.E. 572 ENGINEER NORTH DAKOTA

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR DATE

# SYMBOLS

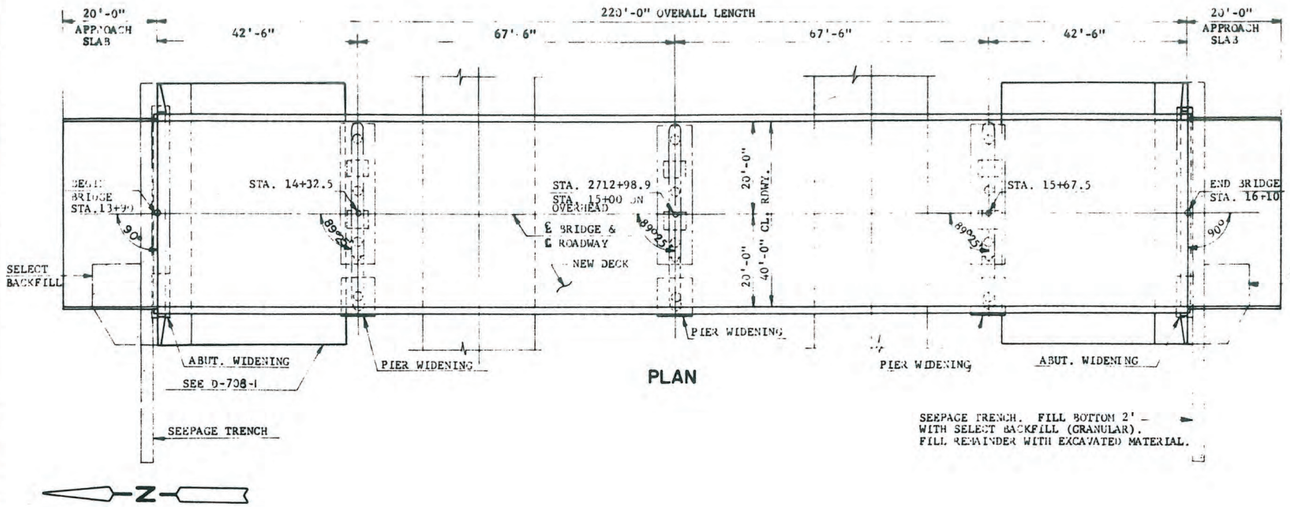
STATE & NATIONAL LINES
COUNTY LINE
TOWNSHIP & RANGE LINES
SECTION LINE
QUARTER SECTION LINE
SECTION CORNER
QUARTER SECTION CORNER
OLD RIGHT OF WAY LINE
NEW RIGHT OF WAY LINE
GRADE LINE
CENTERLINE OF CONSTRUCTION — 500
RAILROAD RIGHT OF WAY LINE
CITY OR VILLAGE CORPORATE LIMITS
PROPERTY LINE
EASEMENT LINE
FENCES
SNOW FENCE
DRAINAGE
WATERS EDGE
MARSH OR SWAMP
RIPRAP
DRAINAGE DITCH
APPROACH — 502 + 00
TRAVELED WAY
RAILROADS
GUARD RAIL
GUIDE POSTS
DELINEATORS
HEDGES AND TREES
INTERCHANGE
HIGHWAY GRADE SEPARATION - NO CONNECTION
OTHER BRIDGE
SERVICE ROAD
TERMINATED CROSS-ROAD

BUILDINGS
TELEGRAPH LINES
TELEPHONE LINES
POWER LINES
CULVERTS (In Place)
CULVERTS (Install)
CONCRETE BOX CULVERTS (Install)
BRIDGES (Install)
CONCRETE CURB
CONCRETE CURB AND GUTTER
CONCRETE WALK
CATCH BASIN (Existing)
CATCH BASIN (New)
MANHOLE (Existing)
MANHOLE (New)
CURB INLET (Existing)
CURB INLET (New)
GROUND MOUNTED SIGNS
OVERHEAD SIGNS
HYDRANT
LIGHT STANDARDS
TRAFFIC SIGNALS (Plan & Profile Sheets)
HIGH MAST LIGHTING ASSEMBLY
GROUND ELEVATION — 1419 / 1418
GRADE — 245
CENTERLINE
SECTION LINE
DEFLECTION ANGLE (Delta)
SOD OR JUTE MESH
POLES TO BE MOVED
POLES TO BE LOWERED
CONCRETE FOUNDATION
CONDUIT
CONDUCTOR
CONCRETE PULL BOX
FEED POINT
250 WATT LIGHT STANDARDS
400 WATT LIGHT STANDARDS
700 WATT LIGHT STANDARDS
1000 WATT LIGHT STANDARDS
FLASHING BEACON
TRAFFIC SIGNAL - MAST ARM MOUNTED
TRAFFIC SIGNAL - POST MOUNTED
SIGNAL HEAD — 3
PEDESTRIAN PUSHBUTTON POST
TRAFFIC SIGNAL CONTROLLER
FEED POINT - PAD MOUNTED

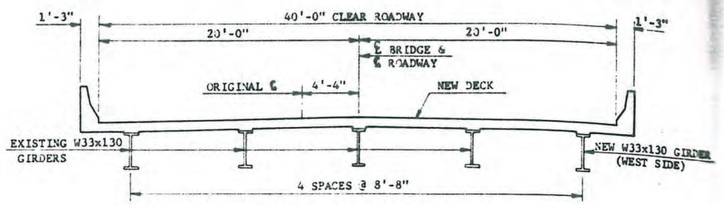
# ABBREVIATIONS

| | | | |
|---|---|---|---|
| Aggr | Aggregate | M L | Main Line |
| Ahd | Ahead | N R | North Roadway |
| Alt | Alternate | Off Loc | Office Location |
| Approx | Approximate or Approximately | O to O | Out to Out |
| Appr | Approach | P & P | Plan and Profile |
| Asph Cem or A C | Asphalt Cement | P C | Point of Curvature |
| Asph Conc | Asphaltic Concrete | P C C | Point of Compound Curve |
| Bit | Bituminous or Bitumen | P C C Pvmt | Portland Cement Concrete Pavement |
| Bk | Back | P D | Private Drive |
| B M | Bench Mark | Pen | Penetration |
| Bldg | Building | Perf | Perforated |
| Br | Bridge | P I | Point of Intersection |
| C A E S | Corrugated Aluminum End Section | P O C | Point on Curve |
| C A P | Corrugated Aluminum Pipe | P O T | Point on Tangent |
| C B | Catch Basin | P P | Power Pole |
| C B G | Curb and Gutter | P R C | Point of Reverse Curvature |
| Ch Blk | Channel Block | Pref | Prefarmed |
| Ch Ch | Channel Change | P S D | Passing Sight Distance |
| C I | Curb Inlet | P T | Point of Tangency |
| C I P | Cast Iron Pipe | P v C | Polyvinyl Chloride Sewer Pipe |
| Cl | Class | Quant | Quantity or Quantities |
| C S E S | Corrugated Steel End Section | R | Radius |
| C S P | Corrugated Steel Pipe | R or Rge | Range |
| CMS | Cationic Medium Setting | RC | Rapid Curing |
| Comp | Compression | R C E S | Reinforced Concrete End Section |
| Const | Construction | R C P | Reinforced Concrete Pipe |
| Conc | Concrete | R C P S | Reinforced Concrete Pipe Sewer |
| Cont Reinf Conc Pvmt | Continuously Reinforced Concrete Pavement | Rd | Road |
| | | Rdbd | Roadbed |
| Contn | Contraction | Rdwy | Roadway |
| Crn | Crown | Refl | Reflectorized |
| CRS | Cationic Rapid Setting | R R | Railroad |
| Crse | Course | Rt | Right |
| C S | Curve to Spiral | R/W | Right of Way |
| C to C | Center to Center | Salv | Salvage |
| C Y | Cubic Yard | San | Sanitary |
| D | Degree of Curvature | S C | Spiral to Curve |
| D-Load | Dead Load | SC | Slow Curing |
| D B | Ditch Block | Sc | Spiral Deflection Angle |
| Def | Deformed | S D | Sight Distance |
| Del | Deliver | S E | Superelevation |
| D G | Ditch Grade | Sec | Section |
| El or Elev | Elevation | Sec Line Appr | Section Line Approach |
| Ellipt | Elliptical | Sep | Separation |
| Emb | Embankment | Serv | Service |
| Emul | Emulsified | Sgr Prep | Subgrade Preparation |
| Engr | Engineer | Shldr | Shoulder |
| Eq | Equation | SP | Special Provision |
| E R | East Roadway | S P P | Structural Plate Pipe |
| E S | End Section | S P P A | Structural Plate Pipe Arch |
| Esmt | Easement | S R | South Roadway |
| Exc | Excavation | SS | Slow Setting or Supplement Specification |
| Exp | Expansion | S S D | Stopping Sight Distance |
| F D | Field Drive | S T | Spiral to Tangent |
| Found | Foundation | Sta | Station |
| F P | Fence Post | Std | Standard |
| Furn | Furnish | Std Specs | Standard Specifications |
| Ga | Gage or Gauge | Struct | Structure |
| Gr | Gravel | Surf | Surface or Surfacing |
| Grd | Graded | Surv | Survey |
| G V | Gate Valve | S W | Sidewalk |
| Hel | Helical | S Y | Square Yard |
| Hyd | Hydrant | T | Tangent Length (circular curve) |
| Ident | Identification | T or Twp | Township |
| Inchg | Interchange | Tel | Telephone |
| I M | Iron Monument | Temp | Temporary |
| Inst | Install | T P | Telephone Pole |
| Inter | Intersection | Tr | Traffic |
| Inv | Invert | Trans | Transverse or Transition |
| Jt | Joint | Trtd | Treated |
| L | Length of Curve | Ts | Tangent Length (curve with spirals) |
| Lc | Length of Spiral | T S | Tangent to Spiral |
| Levg | Leveling | U S C & G S | United States Coast and Geodetic Survey |
| L F | Linear or Lineal Foot | V C | Vertical Curve |
| Liq | Liquid | V C P | Vitrified Clay Pipe |
| Long | Longitudinal | W M | Water Main |
| L P | Light Pole | W M V | Water Main Valve |
| Lt | Left | W R | West Roadway |
| M | One Thousand | Wrng | Wearing |
| Matl | Material | W S V | Water Service Valve |
| Max | Maximum | X-Sec | Cross Section |
| MC | Medium Curing | Xc | Spiral Coordinate |
| M H | Manhole | Yc | Spiral Coordinate |
| Min | Minimum | | |

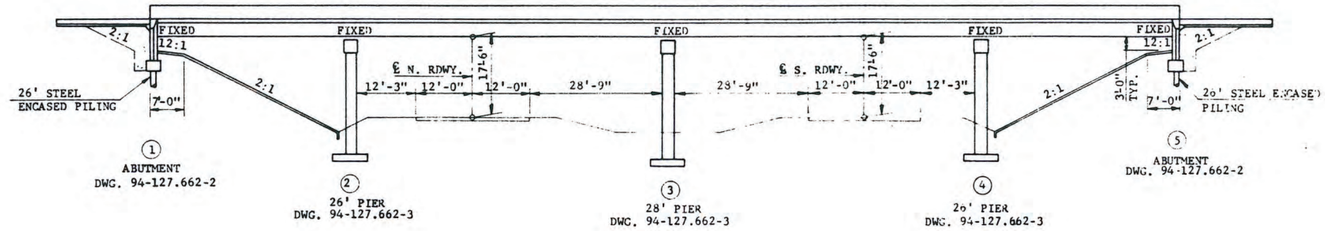
| BRIDGE CODE NO. | FHWA REGION | STATE | FED AID PROJ. NO. |
|---|---|---|---|
| X-731 | 8 | N.D. | IR-094-4(052)127 |



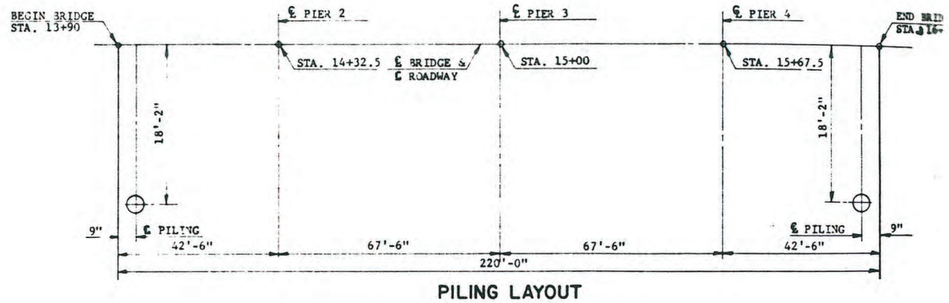

PLAN




DECK SECTION

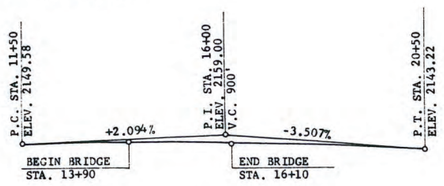



ELEVATION



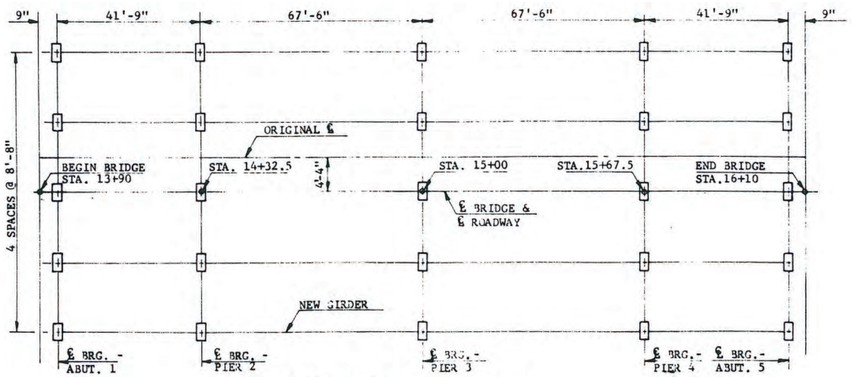

PILING LAYOUT
(NOT TO SCALE)

DESIGN STRENGTHS:
FY 60,000 PSI - REINFORCING STEEL
FY 36,000 PSI - AASHTO M-183 STRUCTURAL STEEL
F'C = 3,000 PSI - CLASS AE-3 CONCRETE
F'C = 4,000 PSI - CLASS AAE-3 CONCRETE
LOAD FACTOR DESIGN

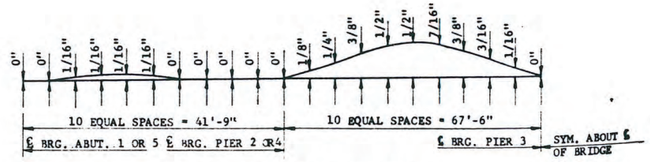



ORIGINAL VERTICAL CURVE

THE ENGINEER SHALL ESTABLISH A NEW VERTICAL CURVE IN THE FIELD




BEARING PLATE LAYOUT
(NOT TO SCALE)




DEAD LOAD DEFLECTIONS *
SHOWING DIMENSIONS "A"

*THE DEAD LOAD DEFLECTIONS SHOWN ARE FOR THE CONCRETE DEAD LOAD ONLY. THE SCREED ELEVATIONS SHALL BE ADJUSTED BY THE AMOUNT OF DEAD LOAD DEFLECTION.

## PILE LOADING

| LOCATION | DEAD LOAD | EARTH LOAD | LIVE LOAD | * MIN. PENETR. | DESIGN LOAD |
|---|---|---|---|---|---|
| ABUTMENT 1 | 25.8 T. | | 23.4 T. | | 49.2 T. |
| | | | | | |
| PIER 3 | 3065 #/ ' | 657 #/ ' | 1140 #/ ' | | 4862 #/ ' |
| | | | | | |
| ABUTMENT 5 | 25.8 T. | | 23.4 T. | | 49.2 T. |

LOCATION
NEW SALEM INTERCHANGE HWY. 31

| SPEC | CODE | ITEM DESCRIPTION | UNIT | QUANTITY |
|---|---|---|---|---|
| 202 | 115 | REMOVAL OF CONCRETE - SITE 1 | L SUM | 1.0 |
| 210 | 100 | CLASS 1 EXCAVATION | CU YD | 190.0 |
| 210 | 200 | SELECT BACKFILL | CU YD | 95.0 |
| 210 | 202 | FOUNDATION PREPARATION - SITE 1 | L SUM | 1.0 |
| 550 | 215 | CONCRETE BRIDGE APPROACH SLAB | SQ YD | 185.0 |
| 602 | 130 | CLASS AAE-3 CONCRETE | CU YD | 29.0 |
| 602 | 1130 | CLASS AE-3 CONCRETE | CU YD | 362.0 |
| 602 | 1250 | PENETRATING WATER REFELLENT TR. | SQ YD | 228.0 |
| 612 | 115 | REINFORCING STEEL GRADE 60 | LBS | 40100.0 |
| 612 | 116 | REINFORCING STEEL GRADE 60 EC | LBS | 5870.0 |
| 616 | 5890 | STRUCTURAL STEEL | L SUM | 1.0 |
| 616 | 8000 | STUD SHEAR CONNECTOR | EA | 1350.0 |
| 622 | 2038 | SEC PILING 12.75 x .25 | LIN FT | 90.0 |
| 630 | 100 | SANDBLASTING AND PAINTING | L SUM | 1.0 |
| 709 | 1100 | SLOPE PROTECTION, CONC. | SQ YD | 170.0 |
| 950 | 7013 | ROADWAY CANOPY (SITE 1) | L SUM | 1.0 |

## STRUCTURAL DRAWINGS

GENERAL DRAWINGS: THIS SHEET
94-127.662-1 THRU 94-127.662-9
STANDARD DRAWINGS: D-708-1 & D-900-1

| DESIGN LOADING | SCALE |
|---|---|
| HS 20 | 1 INCH = 15 FEET |

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

HIGHWAY 31 INTERCHANGE WIDENING

BRIDGE LAYOUT

PROJECT IR-094-4(052)127 STA. 2712+98.9

MORTON COUNTY

APPROVED

26 OCT 76
DATE

BRIDGE DESIGN ENGINEER

94-127.662

100 SCOPE OF WORK: The widening rehabilitation of this bridge consists of removing the existing concrete deck, adding to the substructures, adding a girder line, cleaning and painting the structural steel and placing a new concrete deck. The rehabilitation will be done in stages so that one lane of traffic can cross the bridge at all times. The bridge has an existing clear roadway of 30 feet. The rehabilitated bridge will have a clear roadway of 40 feet.

100 GENERAL: The cost of furnishing and placing preformed expansion joint filler, concrete inserts, tie wire, bar spacers, bar supports, deck drains, and other miscellaneous items shall be included in the price bid for Class AE-3 and AAE-3 concrete.

202 REMOVAL OF CONCRETE: In removing the deck concrete, care shall be taken to ensure no damage is done to the girders. All work to remove and properly dispose of the concrete shall be included in the lump sum bid item "Removal of Concrete."

210 BACKFILL: Select backfill shall be compacted in accordance with Section 203.02F.

550 BRIDGE APPROACH SLABS: Mechanical finishing of the approach slabs shall be required. Transverse metal tine finish and the surface tolerance of 3/16" in 10 feet are also required.

602 SURFACE FINISH "D": Surface Finish "D" shall be required for all surfaces of the barrier and the edge of the slab.

602 PENETRATING WATER REPELLENT TREATMENT: Penetrating water repellent shall be applied to the driving surface of the concrete deck.

612 REINFORCING STEEL: Dimensions for bent bars are given out to out and to tangent intersections unless otherwise noted.

612 All reinforcing steel shall be Grade 60.

612 REBAR COUPLERS: The rebar couplers shall be an approved mechanical connector meeting the requirements of AASHTO Bridge Specification, Section 8.32.2.3. These couplers shall be incidental to the bid item "Reinforcing Steel, Grade 60 Epoxy Coated."

The couplers shall be epoxy coated the same as the reinforcing steel according to AASHTO M284. Damaged epoxy coating and uncoated ares of the coupler joint shall be repaired according to Section 612.03 E of the Standard Specifications.

616 STRUCTURAL STEEL: Structural steel shall be AASHTO M 183. Requirements for Charpy V-Notch tests are designated on the girder detail sheets.

616 Shear connector on splice plates shall be moved to clear bolt holes. All stud shear connectors shall be installed in the field.

616 Field connections shall be made with 7/8 inch diameter, AASHTO M 164 high-strength bolts unless otherwise shown.

616 Temporary or permanent attachments or devices that are not shown on the plans as part of the structure shall not be welded to the structural steel members during the fabrication and construction process.

616 The cost of swedge bolts and bearing plates shall be included in the lump sum bid item "Structural Steel."

616 The estimated weight of Structural Steel is 34,500 lbs.

630 PAINT AND PAINTING: Paint shall conform to the Standard Specifications, Section 852.01 A and 852.01 Q. The finish coats shall be orange color no. 32169 and shall meet Federal Standard No. 595 colors. The dry thickness of each finish and spot coat shall not be less than 1.5 mil for any reading. The dry thickness of the shop coat shall not be less than 1.5 mil for any reading.

630 OLD STEEL: Surfaces of old steel shall be cleaned to Steel Structures Painting Council Surface Preparation Specification SSPC-SP6, Commercial Blast Cleaning, and shall meet requirements of Section 630.03 A.

630 NEW STEEL: Painting shall conform to Sections 630.03B and 630.03C. Splice plate contact surfaces shall have an AASHTO Class A preparation.

630 Cleaning and painting of the old steel shall be included in the lump sum price bid for "Sandblasting and Painting." Cleaning and painting of new steel shall be included in lump sum price bid for "Structural Steel."

704 TRAFFIC CONTROL: One lane of traffic shall be maintained on the bridge at all times during the project.

708 SLOPE PROTECTION: The concrete slope protection will be limited to the cast-in-place type shown on Standard D-708-1.

ELEVATION CHECK POINTS: Ten bolts need to be placed on top of the barrier to serve as elevation check points. The cost for this item shall be included in the unit price bid for Class AAE-3 concrete.

SHOP DRAWINGS: The contractor shall submit the following shop drawings to the Construction office for approval;

1. Structural Steel.

DESIGN STRENGTH:

| | | |
|---|---|---|
| F'C | 3,000 PSI | Cl. AE-3 or AE-4 Concrete |
| F'C | 4,000 PSI | Cl. AAE-3 or AAE-4 Concrete |
| FY | 60,000 PSI | GR. 60 Reinforced Steel |
| FY | 36,000 PSI | Structural Steel |

ROADWAY CANOPY: The structural contractor shall construct a canopy above the existing roadway under the structure to protect traffic from falling material. The canopy is an added safeguard and does not relive the contractor of any responsibility for the safety of the public.

The canopy may be erected prior to the placing of the girders, supporting it from the ground, or it may be suspended from the girders immediately following their erection. The erection of the canopy and the girders shall be completed in a minimum amount of time and with the least inconvenience to the public.

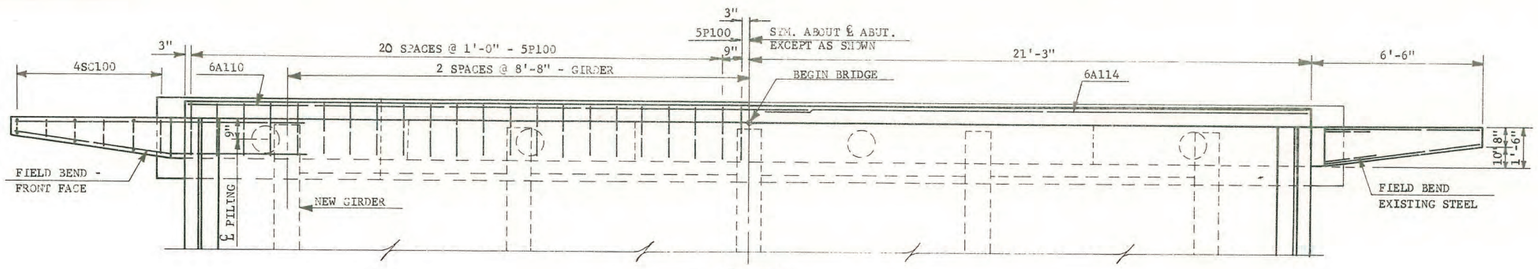
The canopy shall be of a design and material selected by the contractor and approved by the engineer. The minimum vertical clearance from the graveled roadway to the bottom of the canopy shall be 13'-6". The canopy shall project a minimum distance of 5'-0" beyond the outside edge of curb of the proposed structure.

After completion of the structure, the canopy shall be removed and shall remain the property of the contractor.

The roadway canopy shall be paid for at the contract lump sum unit price for "Roadway Canopy (Site 1)." The roadway canopy shall be measured as a lump sum item and shall include construction, maintenance, and removal.

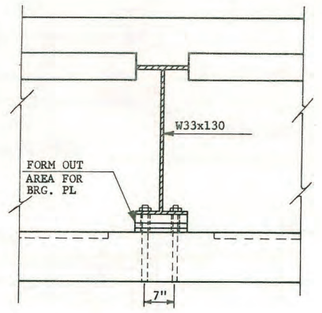
MATHISON 5M 5-77 E5677»

| FHWA REGION | STATE | FED. AID PROJ. NO. | SHEET NO. |
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| 8 | N.D. | IR-094-4(052)127 | 3/ |

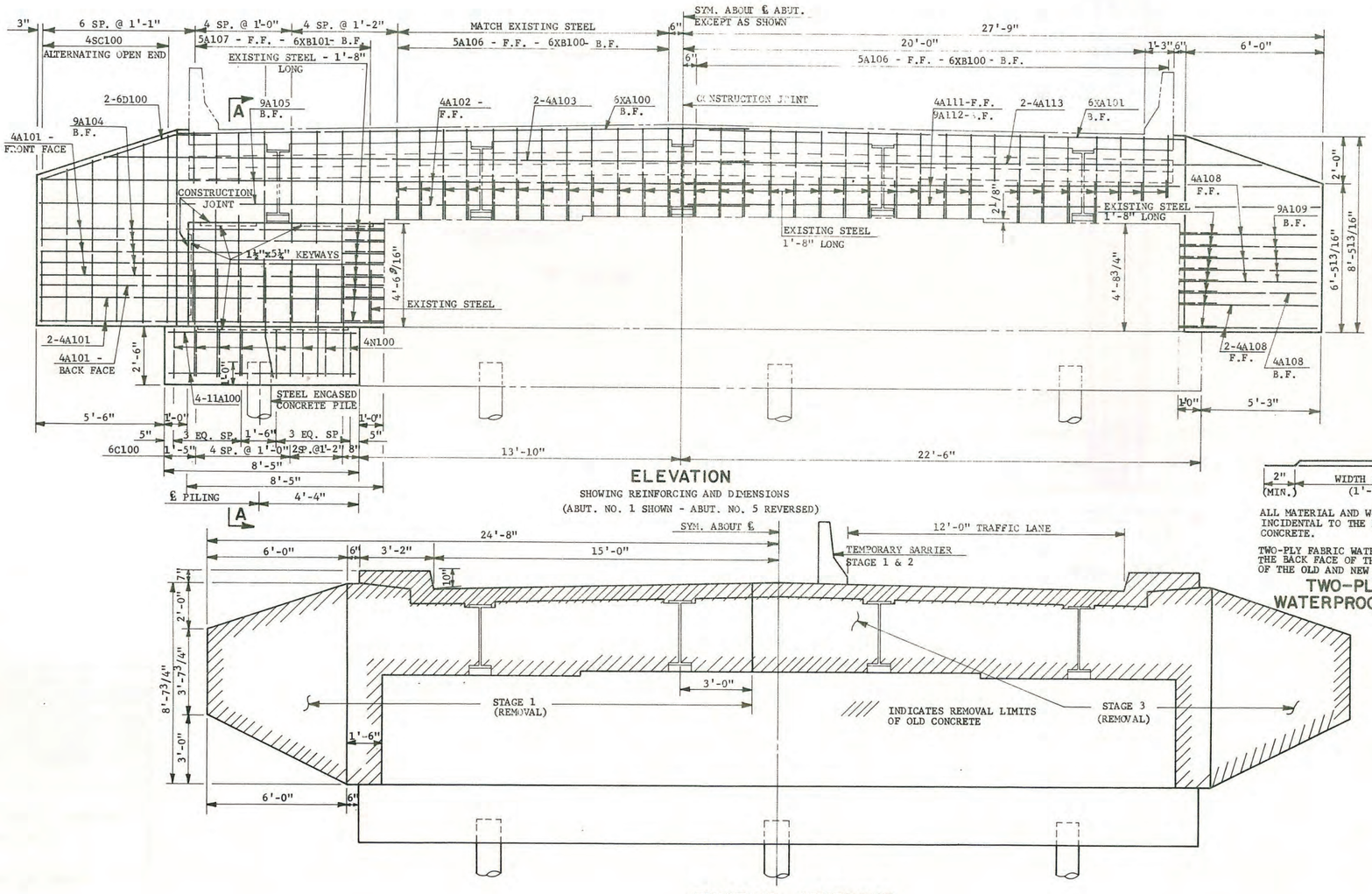



## PLAN

SHOWING REINFORCING AND DIMENSIONS



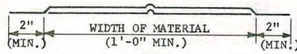

B–B




## ELEVATION

SHOWING REINFORCING AND DIMENSIONS
(ABUT. NO. 1 SHOWN - ABUT. NO. 5 REVERSED)

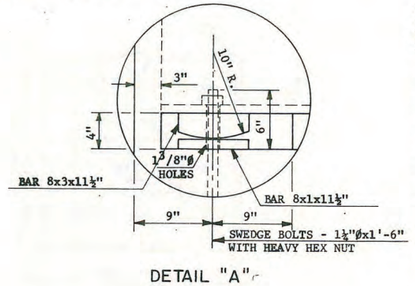
## EXISTING ABUTMENT



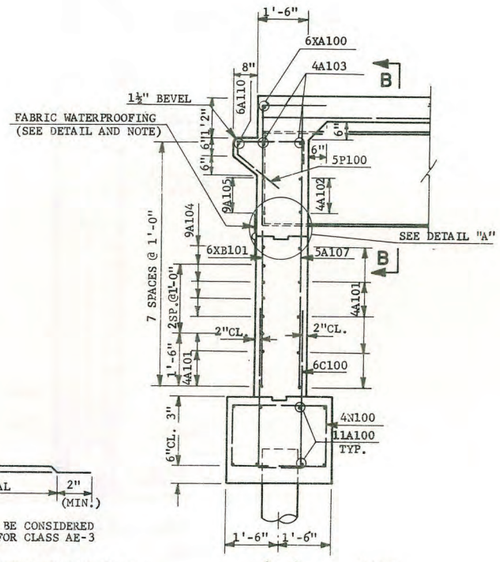

ALL MATERIAL AND WORK SHALL BE CONSIDERED INCIDENTAL TO THE PAY ITEM FOR CLASS AE-3 CONCRETE.

TWO-PLY FABRIC WATERPROOFING SHALL BE APPLIED TO THE BACK FACE OF THE ABUTMENT ALONG THE JUNCTION OF THE OLD AND NEW CONCRETE.

## TWO-PLY FABRIC WATERPROOFING DETAIL




DETAIL "A"




A–A

NOTES:

THE PIPE FOR THE STEEL-ENCASED PILES SHALL BE 12-3/4" OUTSIDE DIAMETER WITH A WALL THICKNESS OF 0.230 INCHES, AND END CLOSURE PLATE 3/4" THICK.

*FOOTING AND BREAST WALL ONLY. CONCRETE QUANTITIES FOR THE WINGS AND BACKWALL ARE INCLUDED WITH THE SLAB QUANTITIES ON DWG. 94-127.662-7.

| QUANTITIES (ONE ABUT.) | |
|---|---|
| CLASS AE-3 CONCRETE | 4.5 C.Y.* |
| REINFORCING STEEL | 2118 LBS. |
| REINFORCING STEEL (EPOXY) | 460 LBS. |
| PILING (SEE LAYOUT) | |
| EXCAVATION (SEE LAYOUT) | |

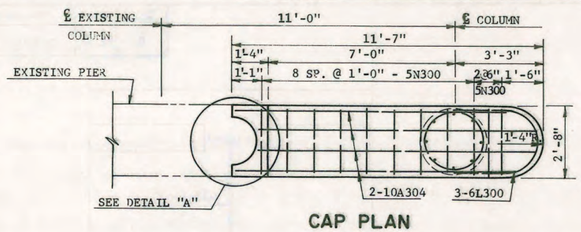
HIGHWAY 31 INTERCHANGE
WIDENING

**ABUTMENT DETAILS**

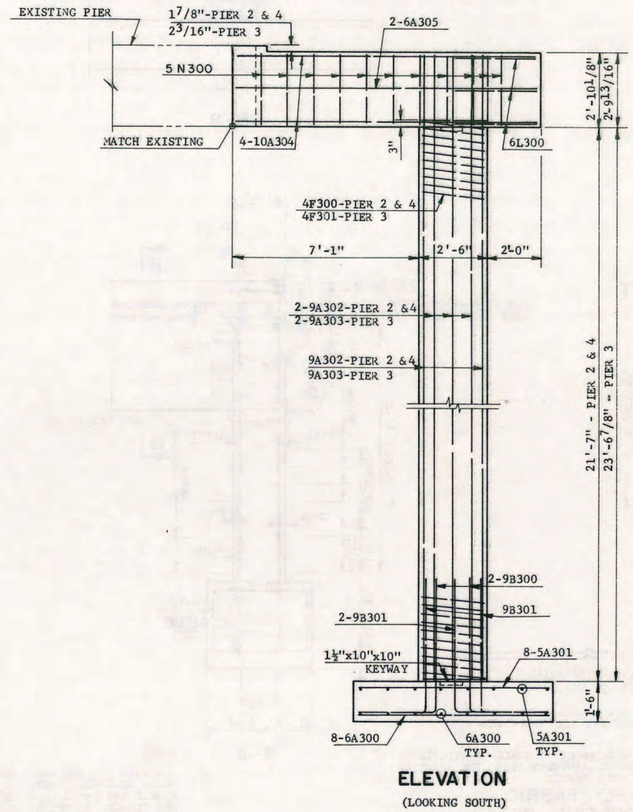
94-127.662-2

MATHISON 5M 8-77 686774

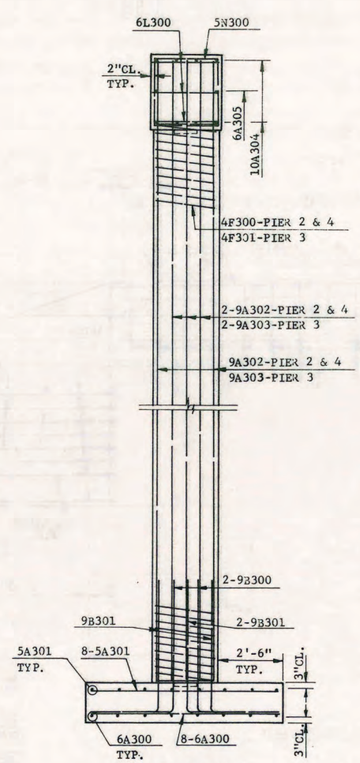
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| 8 | N.D. | IR-094-4(052)127 | 32 |



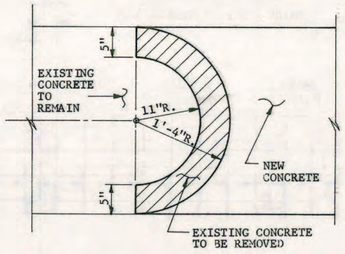

CAP PLAN



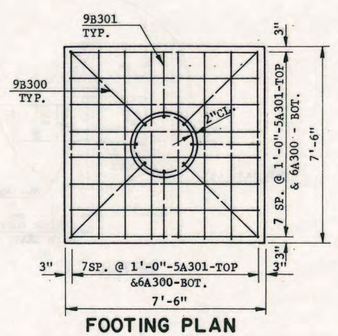

ELEVATION
(LOOKING SOUTH)




END VIEW




DETAIL "A"




FOOTING PLAN

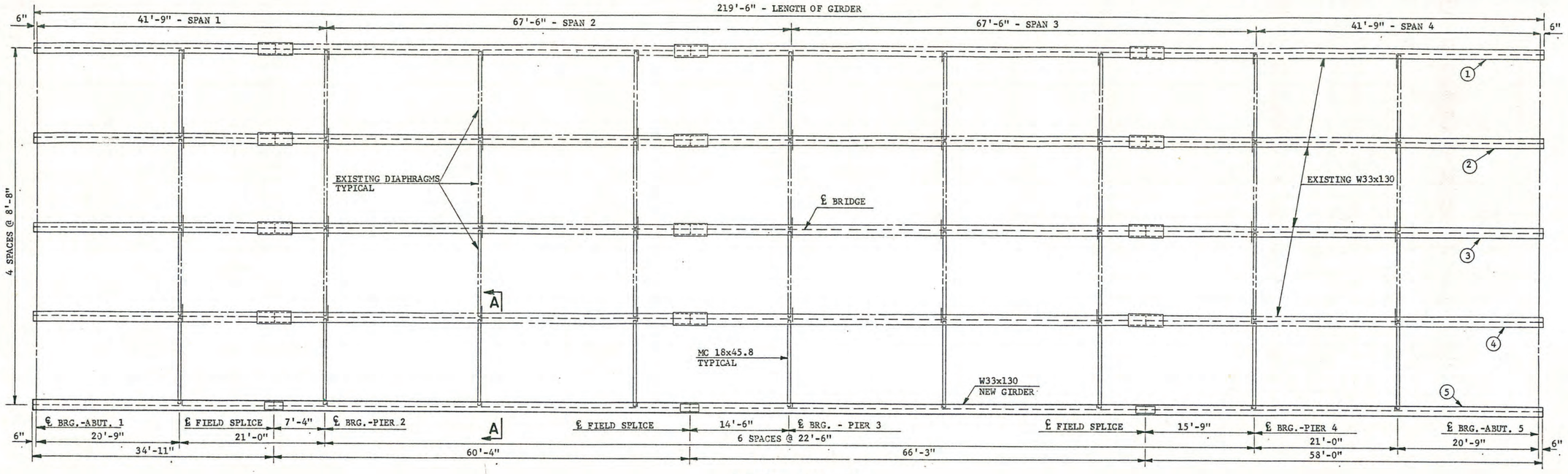
| QUANTITIES | | |
|---|---|---|
| PIER 2 - CLASS AE-3 CONCRETE | 10.1 | C.Y. |
| REINFORCING STEEL | 2051 | LBS. |
| PIER 3 - CLASS AE-3 CONCRETE | 10.4 | C.Y. |
| REINFORCING STEEL | 2133 | LBS. |
| PIER 4 - CLASS AE-3 CONCRETE | 10.1 | C.Y. |
| REINFORCING STEEL | 2051 | LBS. |

HIGHWAY 31 INTERCHANGE WIDENING

PIER DETAILS

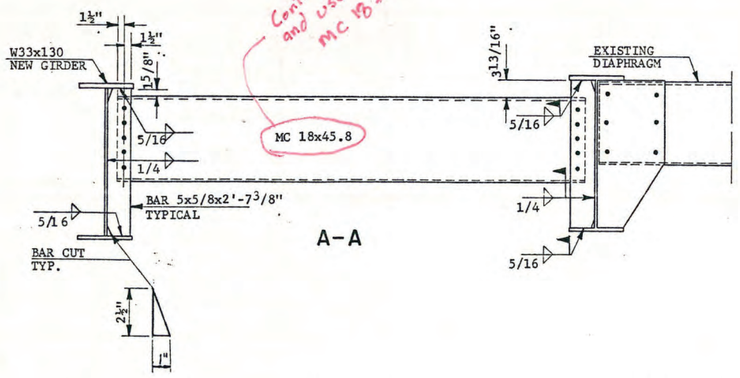
94-127.662-3

| FHWA REGION | STATE | FED. AID PROJ. NO. | SHEET NO. |
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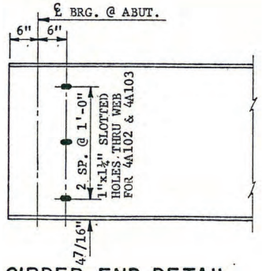



GIRDER LAYOUT

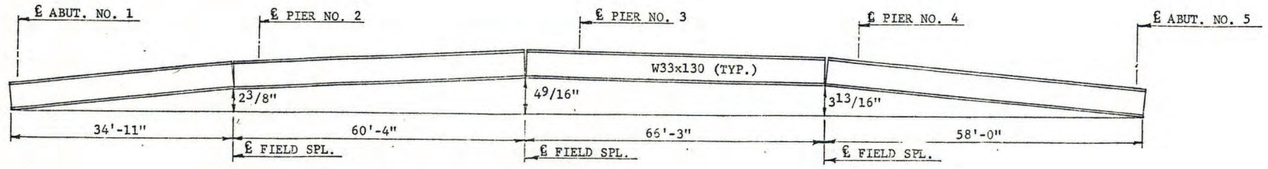
Contractor requested and used MC 18 x 42.7 OK fsl 12 MAR 87



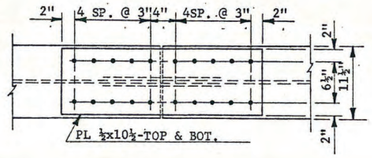

A-A



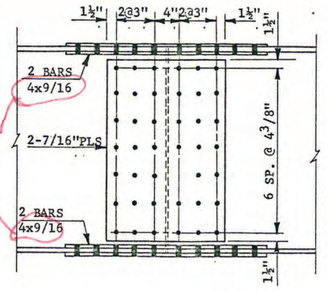

GIRDER END DETAIL




SHOP BLOCKING DIAGRAM ⚠




Contractor requested ⅝" plates OK fsl




FIELD SPLICE DETAILS

REVISIONS:

⚠ SHOP BLOCKING DIAGRAM ADDED. 4/6/87

**QUANTITIES**

SEE DWG. 94-127.662-5

HIGHWAY 31 INTERCHANGE

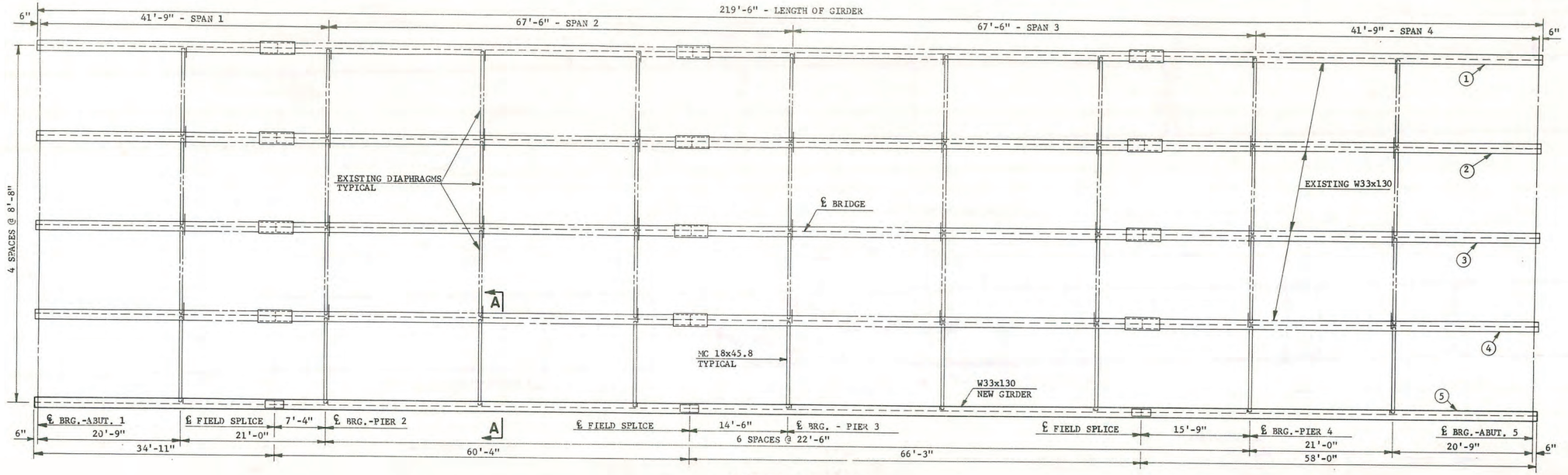
WIDENING

GIRDER LAYOUT

94-127.662-4

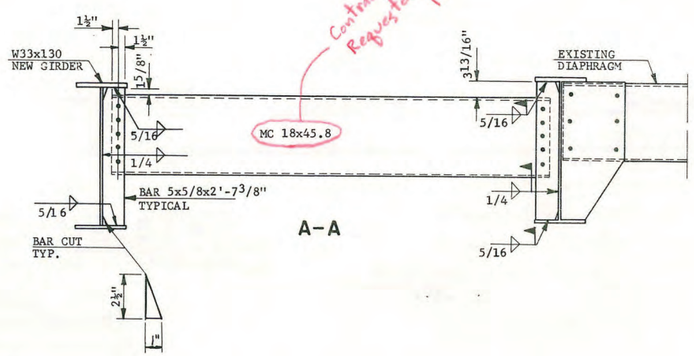
MATHISON 516 9-77 686774

| FHWA REGION | STATE | FED. AID PROJ. NO. | SHEET NO. |
|---|---|---|---|
| 8 | N.D. | IR-094-4(052)127 | 5 |

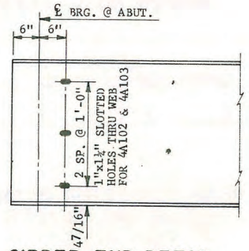



GIRDER LAYOUT

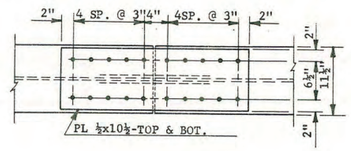
Contractor Requested to use MC 18x42.7 OK pzf 12 MAR 87

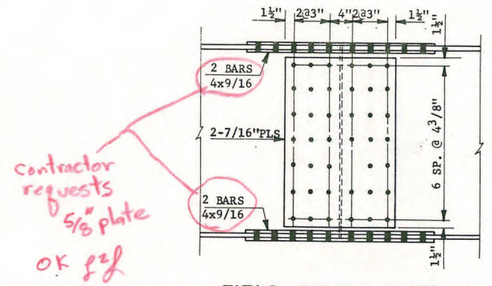



A-A




GIRDER END DETAIL




FIELD SPLICE DETAILS

| QUANTITIES |
|---|
| SEE DWG. 94-127.662-5 |

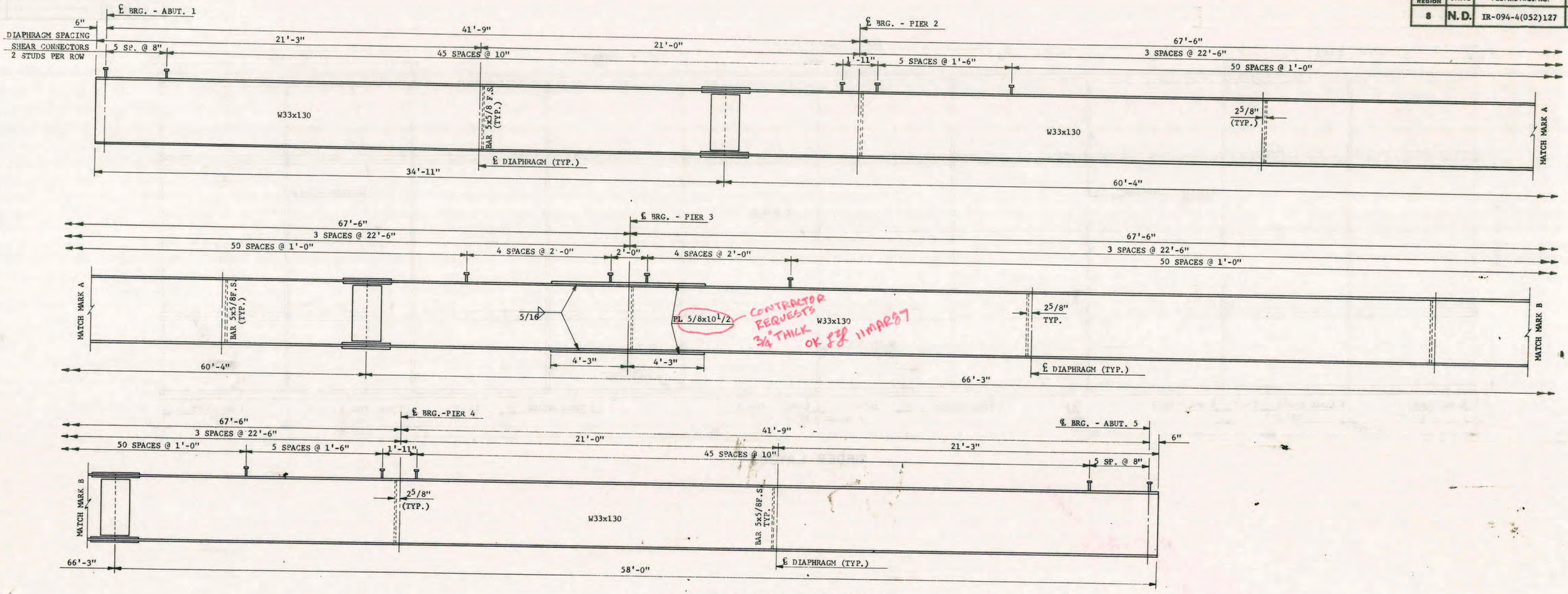
HIGHWAY 31 INTERCHANGE
WIDENING

GIRDER LAYOUT

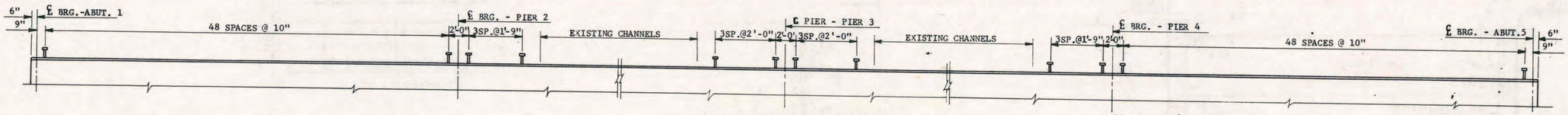
94-127.662-4

MATHISON 516 8-77 65677a

| FHWA REGION | STATE | FED. AID PROJ. NO. | SHEET NO. |
|---|---|---|---|
| 8 | N.D. | IR-094-4(052)127 | 54 |

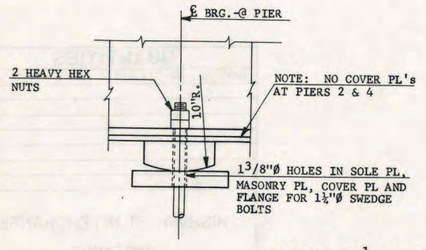



## GIRDER NO. 5 ELEVATION

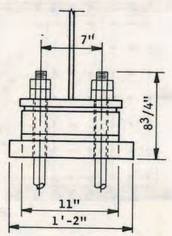


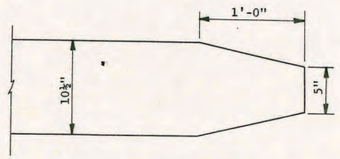

## SHEAR CONNECTOR DETAIL FOR EXISTING GIRDERS

(2 STUDS PER ROW)



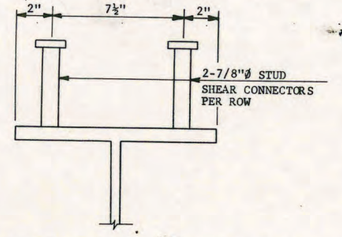

## PIER BEARING DETAILS




## COVER PLATE DETAIL

(TAPER TOP AND BOTTOM PLATES)




## SHEAR CONNECTOR DETAIL

USE 5" STUDS ON GIRDERS 1 & 2 (456 REQUIRED)
USE 6" STUDS ON GIRDERS 3,4 & 5 (900 REQUIRED)

THE GIRDER MATERIAL SUPPLIED SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH TEST FOR 15 FT. LB. AT 40°F. SAMPLING AND TESTING PROCEDURES SHALL BE IN ACCORDANCE WITH AASHTO T-243. THE (H) FREQUENCY OF HEAT TESTING SHALL BE USED.

| QUANTITIES | |
|---|---|
| STUD SHEAR CONNECTORS | - 1356 EA. |

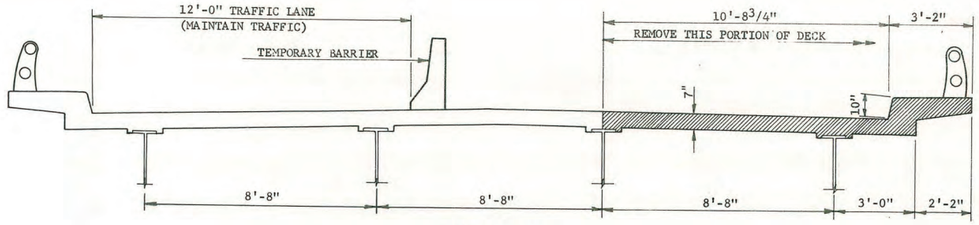
HIGHWAY 31 INTERCHANGE WIDENING

GIRDER DETAILS

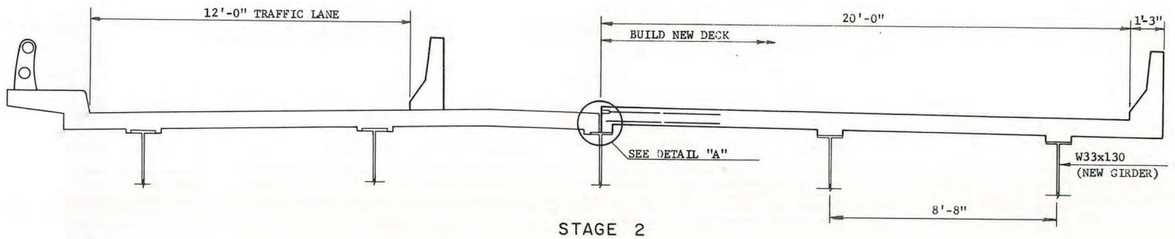
94-127.662-5

MATHISON SM 9-77 69677a

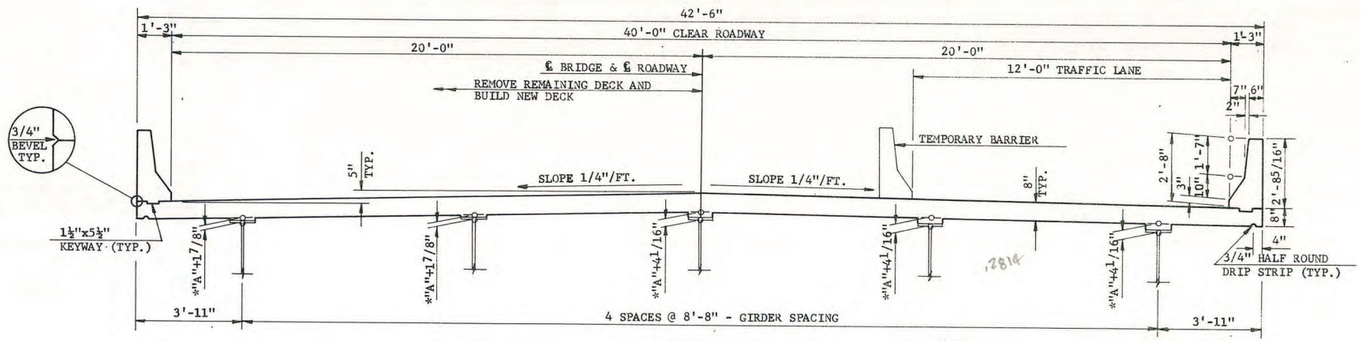
| FHWA REGION | STATE | FED. AID PROJ. NO. | SHEET NO. |
|---|---|---|---|
| 8 | N.D. | IR-094-4(032)127 | 35 |




STAGE 1




STAGE 2




STAGE 3
SHOWING DIMENSIONS

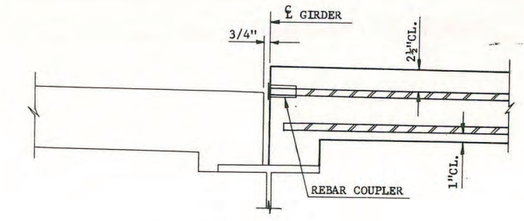
*THE "A" DIMENSION IS SHOWN IN THE "DEAD LOAD DEFLECTIONS." SLIGHT ADJUSTMENTS MAY BE REQUIRED TO ACCOMMODATE GIRDER CAMBER.

## DECK STAGE DETAILS

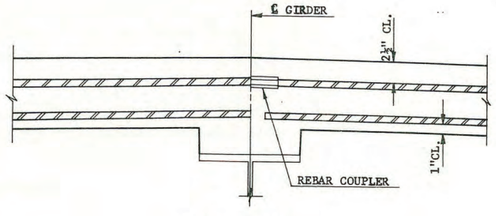



HALF SLAB SECTION
SHOWING REINFORCING BETWEEN SUPPORTS

HALF SLAB SECTION
SHOWING REINFORCING OVER SUPPORTS




DETAIL "A"




DETAIL "B"

## QUANTITIES

SEE DWG. 94-127.662-7

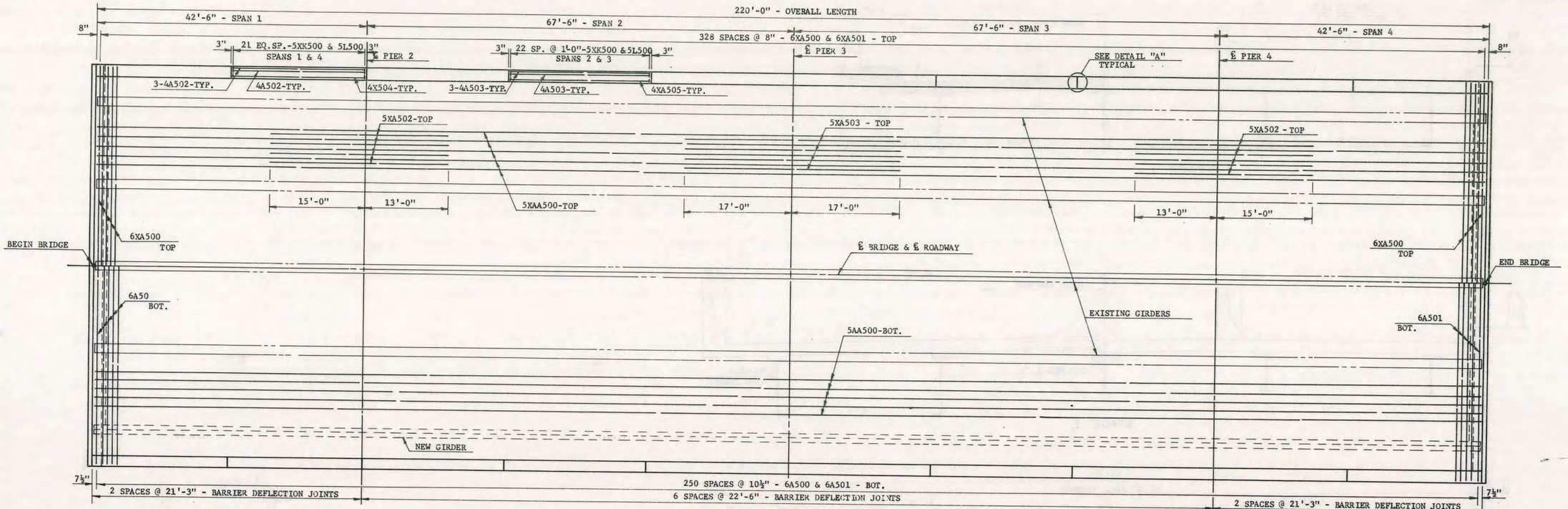
HIGHWAY 31 INTERCHANGE
WIDENING

SLAB SECTIONS

94-127.662-6

MATHISON 514 9-77 65872a

| FHWA REGION | STATE | FED. AID PROJ. NO. | SHEET NO. |
|---|---|---|---|
| 8 | N.D. | IR-094-4(052)127 | 36 |



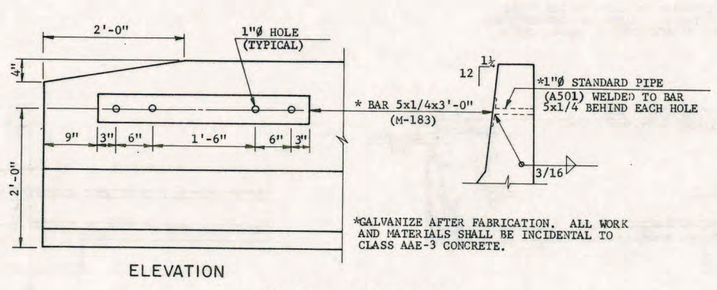

PLAN

NOTE:

FORM A 3/4" TRIANGULAR GROOVE AT THE CENTER OF EACH BARRIER SECTION. GROOVE BOTH VERTICAL FACES AND ACROSS THE TOP.

THE BARRIER QUANTITIES ARE INCLUDED IN THE SLAB QUANTITIES.

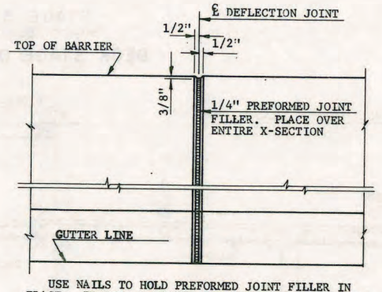
FIELD BEND 4A502's & 5L500's TO CONFORM TO THE SHAPE OF THE BARRIER END DETAIL.




*GALVANIZE AFTER FABRICATION. ALL WORK AND MATERIALS SHALL BE INCIDENTAL TO CLASS AAE-3 CONCRETE.

ELEVATION

BARRIER END DETAILS




USE NAILS TO HOLD PREFORMED JOINT FILLER IN PLACE. PROVIDE ADEQUATE TIE WIRES ON THE BARRIER FORMS TO AVOID ANY SHIFTING DURING PLACEMENT.

BARRIER DEFLECTION JOINT

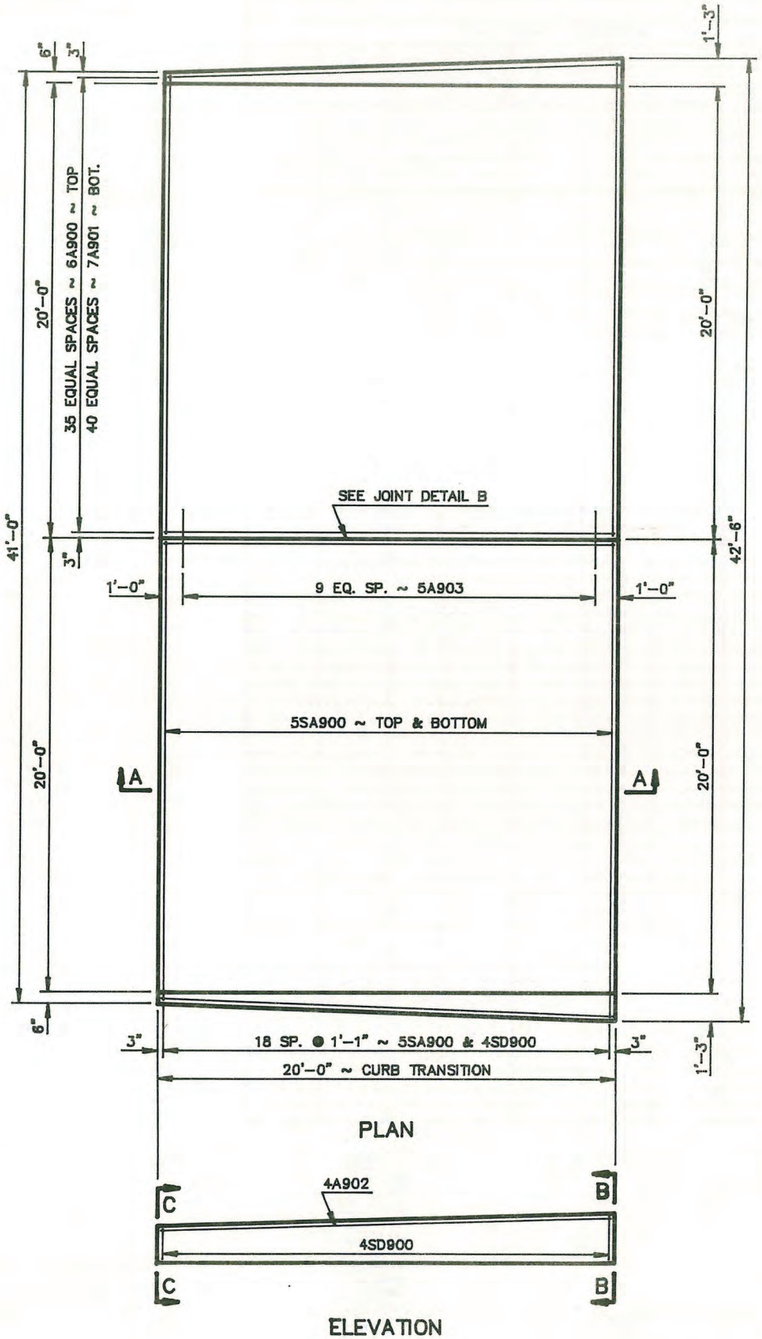
DETAIL "A"

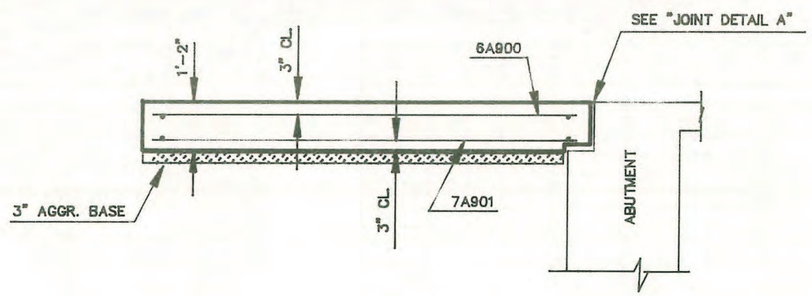
| QUANTITIES | |
|---|---|
| CLASS AAE-3 CONCRETE | 297.5 C.Y. |
| REINFORCING STEEL | 29,635 LBS. |
| ℄REINFORCING STEEL (EPOXY) | 37,343 LBS. |

HIGHWAY 31 INTERCHANGE WIDENING

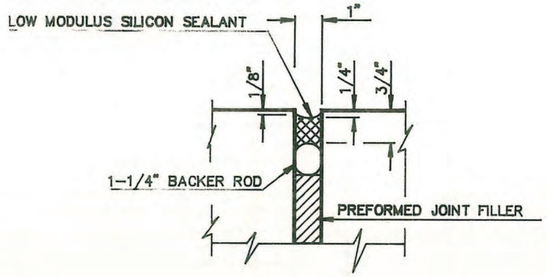
SLAB LAYOUT

94-127.662-7

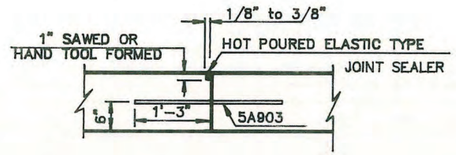


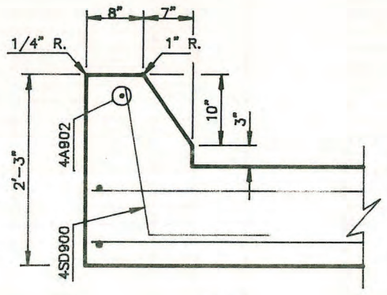

A–A



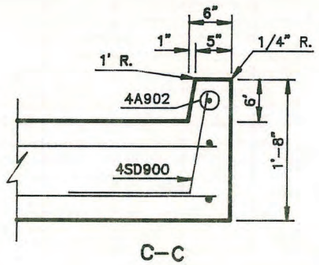

JOINT DETAIL A



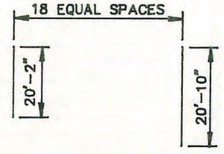

JOINT DETAIL B



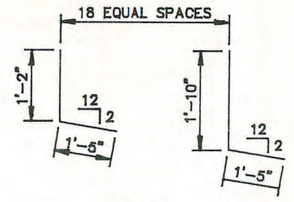

B–B




C–C




SA900




SD900

| FHWA REGION | STATE | FED. AID PROJ. NO. | SHEET NO. |
|---|---|---|---|
| 8 | N.D. | IR-094-4(052)127 | 37 |

## ONE SLAB

### REINFORCING STEEL

| SIZE | MARK | NUMBER EACH OR SET | NOMINAL LENGTH |
|---|---|---|---|
| 6 | A900 | 72 | 19'-9" |
| 7 | A901 | 82 | 19'-9" |
| 4 | A902 | 2 | 19'-9" |
| 5 | A903 | 10 | 2'-6" |
| | | | |
| 5 | SA900 | 4 | 389'-6" |
| 4 | SD900 | 2 | 55'-5" |

### QUANTITIES FOR ESTIMATING PURPOSES ONLY

| | |
|---|---|
| CONCRETE (C.Y.) | 37.0 |
| REINFORCING STEEL (LBS.) | 7,198 |

### QUANTITIES (ONE SLAB)

| | |
|---|---|
| APPROACH SLAB | 92.8 S.Y. |

**NOTE:**

THE ABOVE ESTIMATED MATERIAL QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. ALL MATERIALS INCLUDING SUB-BASE AGGREGATE, BACKER ROD, SILICON SEALANT, PREFORMED JOINT FILLER AND LABOR REQUIRED TO BUILD THE APPROACH SLABS SHALL BE INCIDENTAL TO THE PAY ITEM, "CONCRETE BRIDGE APPROACH SLAB".

THE CONCRETE SHALL BE CLASS AE-3 AND THE REINFORCING STEEL SHALL BE GRADE 60.

HIGHWAY 31 INTERCHANGE

WIDENING

APPROACH SLAB

# BILL OF REINFORCING STEEL, GRADE 60

LETTER PREFIX OF BAR MARK DENOTES SHAPE - SEE BAR BENDING & CUTTING DIAGRAMS

| FHWA REGION | STATE | FED. AID PROJ. NO. | SHEET NO. |
|---|---|---|---|
| 8 | N.D. | IR-094-4(052)127 | 38 |

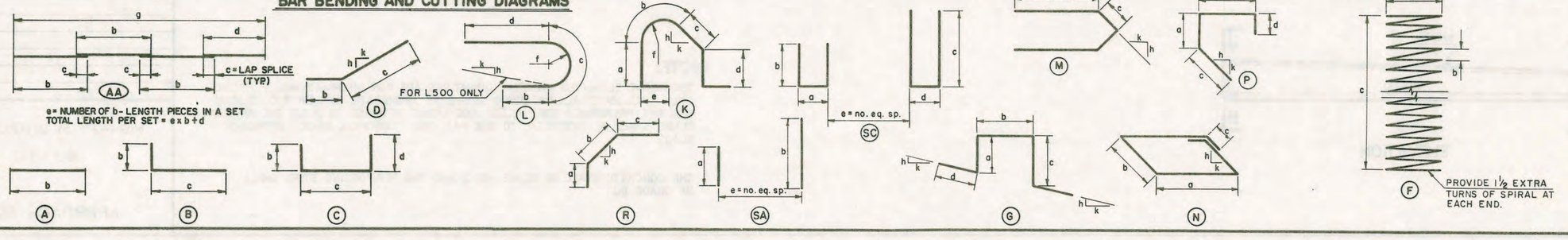
| LOCATION | | SIZE | MARK | NUMBER EACH OR SETS | NOMINAL LENGTH | DETAILING DIMENSIONS a | b | c | d | e | f | g | h | k |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABUTMENTS | REGULAR | 11 | A100 | 16 | 8'-1" | | 8'-1" | | | | | | | |
| | | 4 | A101 | 16 | 14'-9" | | 14'-9" | | | | | | | |
| | | 4 | A102 | 4 | 30'-5" | | 30'-5" | | | | | | | |
| | | 4 | A103 | 4 | 27'-9" | | 27'-9" | | | | | | | |
| | | 9 | A104 | 10 | 14'-9" | | 14'-9" | | | | | | | |
| | | 9 | A105 | 4 | 30'-5" | | 30'-5" | | | | | | | |
| | | 5 | A106 | 64 | 3'-7" | | 3'-7" | | | | | | | |
| | | 5 | A107 | 16 | 8'-4" | | 8'-4" | | | | | | | |
| | | 4 | A108 | 16 | 6'-1" | | 6'-1" | | | | | | | |
| | | 9 | A109 | 10 | 6'-1" | | 6'-1" | | | | | | | |
| | | 6 | A110 | 2 | 23'-11" | | 23'-11" | | | | | | | |
| | | 4 | A111 | 4 | 26'-0" | | 26'-0" | | | | | | | |
| | | 9 | A112 | 4 | 27'-6" | | 27'-6" | | | | | | | |
| | | 4 | A113 | 4 | 23'-5" | | 23'-5" | | | | | | | |
| | | 6 | A114 | 2 | 20'-0" | | 20'-0" | | | | | | | |
| | | 6 | C100 | 14 | 10'-2" | | 4'-6" | 1'-2" | 4'-6" | | | | | |
| | | 6 | D100 | 8 | 7'-8" | | 1'-6" | 6'-2" | | | | | 4 | 12 |
| | | 4 | N100 | 16 | 9'-10" | 2'-8" | 1'-9" | 6" | | | | | 12 | 0 |
| | | 5 | P100 | 88 | 4'-2" | 4" | 1'-10" | 1'-7" | 5" | | | | 12 | 9 |
| | | 4 | SC100 | 4 | 89'-6" | 4" | 6'-2" | 8'-0" | 1'-2" | 5 | | | | |
| | EPOXY | 6 | XA100 | 2 | 24'-7" | | 24'-7" | | | | | | | |
| | | 6 | XA101 | 2 | 20'-8" | | 20'-8" | | | | | | | |
| | | 6 | XB100 | 64 | 5'-7" | | 2'-0" | 3'-7" | | | | | | |
| | | 6 | XB101 | 16 | 10'-4" | | 2'-0" | 8'-4" | | | | | | |
| PIER 2&4 | | 6 | A300 | 32 | 7'-2" | | 7'-2" | | | | | | | |
| | | 5 | A301 | 32 | 7'-2" | | 7'-2" | | | | | | | |
| | | 9 | A302 | 16 | 24'-3" | | 24'-3" | | | | | | | |
| | | 10 | A304 | 16 | 10'-3" | | 10'-3" | | | | | | | |
| | | 6 | A305 | 4 | 10'-3" | | 10'-3" | | | | | | | |
| | | 9 | B300 | 8 | 8'-7" | | 4'-0" | 4'-7" | | | | | | |
| | | 9 | B301 | 8 | 7'-1" | | 2'-6" | 4'-7" | | | | | | |
| | | 4 | F300 | 2 | 520'-0" | 2'-2" | 3.5" | 21'-10" | | | | | | |
| | | 6 | L300 | 6 | 7'-5" | | 2'-0" | 3'-5" | 2'-0" | | 1'-1" | | 0 | 12 |
| | | 5 | N300 | 22 | 10'-8" | 2'-4" | 2'-6" | 6" | | | | | 12 | 0 |
| PIER 3 | | 6 | A300 | 16 | 7'-2" | | 7'-2" | | | | | | | |
| | | 5 | A301 | 16 | 7'-2" | | 7'-2" | | | | | | | |
| | | 9 | A303 | 8 | 26'-2" | | 26'-2" | | | | | | | |
| | | 10 | A304 | 8 | 10'-3" | | 10'-3" | | | | | | | |
| | | 6 | A305 | 2 | 10'-3" | | 10'-3" | | | | | | | |
| | | 9 | B300 | 4 | 8'-7" | | 4'-0" | 4'-7" | | | | | | |
| | | 9 | B301 | 4 | 7'-1" | | 2'-6" | 4'-7" | | | | | | |
| | | 4 | F301 | 1 | 565'-0" | 2'-2" | 3.5" | 23'-10" | | | | | | |
| | | 6 | L300 | 3 | 7'-5" | | 2'-0" | 3'-5" | 2'-0" | | 1'-1" | | 0 | 12 |
| | | 5 | N300 | 11 | 10'-8" | 2'-4" | 2'-6" | 6" | | | | | 12 | 0 |

| LOCATION | | SIZE | MARK | NUMBER EACH OR SETS | NOMINAL LENGTH | DETAILING DIMENSIONS a | b | c | d | e | f | g | h | k |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUPERSTRUCTURE | REGULAR | 6 | A500 | 251 | 21'-2" | | 21'-2" | | | | | | | |
| | | 6 | A501 | 251 | 20'-11" | | 20'-11" | | | | | | | |
| | | 4 | A502 | 32 | 20'-11" | | 20'-11" | | | | | | | |
| | | 4 | A503 | 48 | 22'-2" | | 22'-2" | | | | | | | |
| | | 5 | AA500 | 44 | 223'-5" | | 60'-0" | 1'-3" | 43'-5" | 3 | | 219-8" | | |
| | | 5 | L500 | 452 | 5'-0" | | 2'-2" | 8" | 2'-2" | | 2.5" | | 1 | 12 |
| | EPOXY | 6 | XA500 | 329 | 21'-2" | | 21'-2" | | | | | | | |
| | | 6 | XA501 | 329 | 20'-11" | | 20'-11" | | | | | | | |
| | | 5 | XA502 | 76 | 28'-0" | | 28'-0" | | | | | | | |
| | | 5 | XA503 | 38 | 34'-0" | | 34'-0" | | | | | | | |
| | | 4 | XA504 | 8 | 20'-11" | | 20'-11" | | | | | | | |
| | | 4 | XA505 | 12 | 22'-2" | | 22'-2" | | | | | | | |
| | | 5 | XAA500 | 44 | 223'-5" | | 60'-0" | 1'-3" | 43'-5" | 3 | | 219-8" | | |
| | | 5 | XK500 | 452 | 5'-2" | 1'-6" | 6" | 1'-0" | 10" | 8" | 2.5 | | 12 | 8.5 |

## NOTES

1. FABRICATION AND TOLERANCES SHALL BE IN ACCORDANCE WITH THE CRSI MANUAL OF STANDARD PRACTICE.
2. ALL DIMENSIONS ARE OUT TO OUT OF BARS.
3. NOMINAL LENGTH OF EACH BENT BAR OR CUT BAR IS THE SUM TOTAL OF THE DETAILING DIMENSIONS FOR THAT BAR, UNLESS OTHERWISE NOTED.
4. ADJACENT AA BARS SHALL BE TURNED END FOR END SO THAT THE SPLICE LOCATIONS ARE STAGGERED.
5. BAR MARKS THAT BEGIN WITH THE LETTER X INDICATES THAT BAR SHALL BE EPOXY COATED.

## BAR BENDING AND CUTTING DIAGRAMS




HIGHWAY 31 INTERCHANGE WIDENING

REINFORCING BAR LIST

94-127.662-9

| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 5 | N. D. | I-94-3 (11) 119 | 1 | 42 |

# NORTH DAKOTA
# STATE HIGHWAY DEPARTMENT

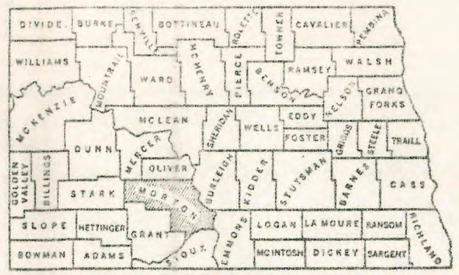
## PLANS

FOR THE PROPOSED IMPROVEMENT OF A

## STATE HIGHWAY

IN MORTON COUNTY

FEDERAL AID PROJECT NO. I-94-3(11)119




SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES

SCALES
- LAYOUT SHEET: 1 IN. = 5280'
- PLAN AND PROFILE DRAWINGS (HOR. 1 IN. = 100 FT. / VERT. 1 IN. = 10 FT.
- STRUCTURAL DRAWINGS:- AS SHOWN
- CROSS SECTION SHEETS:- 1 IN. = 10 FT.

### INDEX OF DRAWINGS


| | | |
|---|---|---|
| SHEET NO. 1 | TITLE PAGE | |
| SHEET NO. 1 | SUMMARY OF QUANTITIES | |
| SHEETS NO. 2 | TO 9 | INCL. PLAN AND PROFILE DRAWINGS |
| SHEETS NO. 10 | TO 28 | INCL. STRUCTURAL DRAWINGS |
| SHEETS NO. 29 | TO 31 | INCL. INTER. LAYOUTS |
| SHEETS NO. 32 | TO 45 | INCL. CROSS SECTIONS |


### LENGTH OF PROJECT

| PROJECT | MILES-GROSS | MILES-NET |
|---|---|---|
| I-94-3(11) | 7.457 | 0.000 |
| | | |
| | | |
| | | |
| TOTALS | 7.457 | 0.000 |

GOVERNING SPECIFICATIONS:

Standard Specifications adopted by the North Dakota State Highway department Jan. 1956 and approved as standard by the Bureau of Public Roads May 7, 1956 Required Special Provisions dated Oct 9, 1957 and approved by the Bureau of Public Roads Nov. 25, 1957 and others submitted herewith.

### KEY TO CONVENTIONAL SIGNS

- STATE & NATIONAL LINES
- COUNTY LINE
- TOWNSHIP & RANGE LINES
- GRADE LINE (500)
- CENTERLINE OF CONSTRUCTION
- OLD RIGHT OF WAY LINE
- NEW RIGHT OF WAY LINE
- ABANDONED RIGHT OF WAY LINE
- PROPERTY LINE
- STONE WALL
- OTHER FENCES (KIND)
- POLE LINES (KIND)
- POWER LINES (KIND)
- BRIDGE
- GROUND ELEVATION / GRADE (DESIGN 2345)
- TRAVELED WAY
- RAILROADS (KIND & NAME)
- HEDGES AND TREES (KIND)
- TRAILS
- CITY OR VILLAGE CORPORATE LIMITS
- SECTION CORNER

2713+03.2 BRIDGE 0.0 LENGTH

### DESIGN DATA

| TRAFFIC | AVERAGE DAILY | EST. 30TH MAX. HR. |
|---|---|---|
| CURRENT TRAFFIC (1956) | 1550 PASS. 580 TRUCKS 2120 | TOTAL 275 |
| TRAFFIC FORECAST (1976) | 4160 PASS. 1300 TRUCKS 5550 | TOTAL 720 |

DESIGN SPEED 70 MPH
TRAFFIC CLASSIFICATION "M"
MINIMUM SIGHT DISTANCE (NON PASSING) 600'
DESIGN LOADING H20-S16 (1957)
CLEAR ROADWAY WIDTH STA 2318+48.9 24'
STA 2477+46.0 24'
STA 2713+03.2 30'

LIST OF STRUCTURAL DRAWINGS

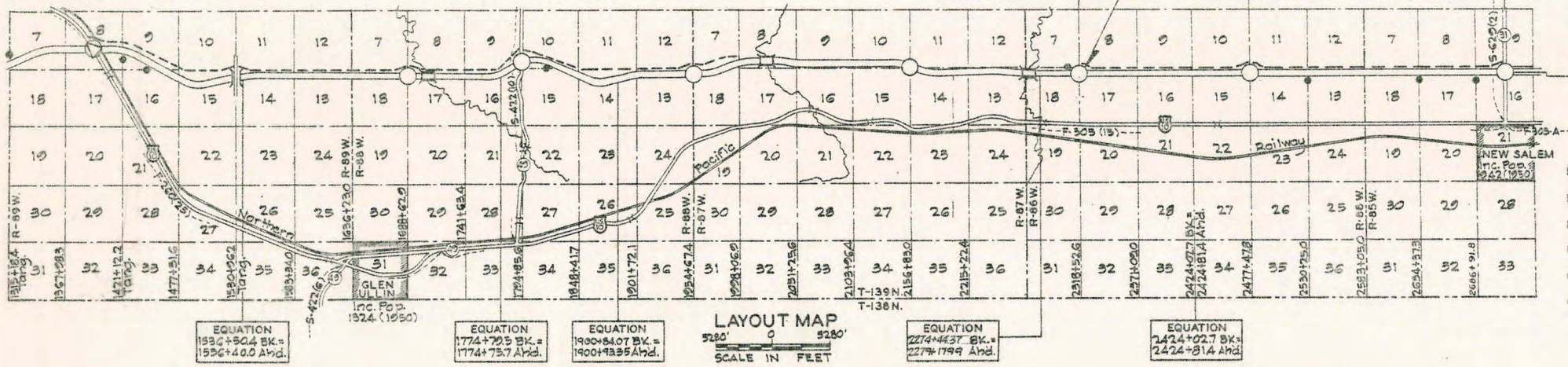
| | | |
|---|---|---|
| 94-49 | H-1152-2 | 94-51 |
| 94-49-1 | H-1158-1 | 94-51-1 |
| 94-50 | H-1158-2 | H-1272 |
| 94-50-1 | H-1271 | H-1344 |
| H-0110 | H-1348 | H-1163-1 |
| H-0311 | STD 7.6 | H-1163-2 |
| H-0401 | STD 14.9 | |
| H-0501 | | |

BEG. I-94-3 (11) 119
Sta. 2318+48.9
I-94-3 (5)
Sta. 2318+52.6
A Point 231.4' South of the N.W. Cor. Sec. 17 T-139 N., R-86 W.

2318+48.9 BRIDGE 0.0 LENGTH

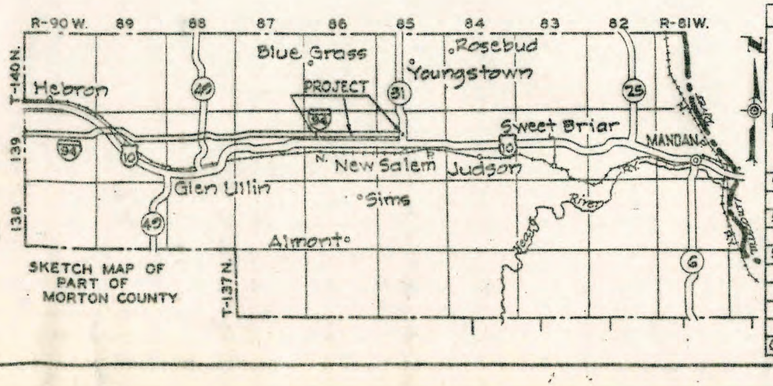
2477+46.0 BRIDGE 0.0 LENGTH

END I-94-3 (11) 119
Sta. 2713+03.2
I-94-3 (5)
Sta. 2713+03.2
A Point 233' South and 2,611.4' East of the N.W. Cor. Sec. 16, T-139 N., R-85 W.




LAYOUT MAP
5280' 0 5280'
SCALE IN FEET

LEGEND
- INTERCHANGE
- HIGHWAY GRADE SEPARATION-NO CONNECTION
- COMBINATION HIGHWAY-RAILROAD INTERCHANGE
- OTHER BRIDGE
- SERVICE ROAD
- TERMINATED CROSS-ROAD




SKETCH MAP OF PART OF MORTON COUNTY

① See Special Provision

### QUANTITIES

| LOCATION | 15B EXCAVATION CLASS 'Z' | 13X ROADWAY EXCAVATION "CLASS A" | 22B SELECT BACKFILL | 60A CONCRETE CLASS A-1½ | WATER | 62A REINFORC'G STEEL | 63A STRUCTURAL STEEL | 65G STEEL ENCASED PILING | 84 TEMPORARY CROSSING & DETOUR LUMP SUM FOR EACH | BRIDGE BENCH MARKS | ORNAMENTAL METAL RAILING |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Cu. Yd. | Cu. Yd. | Cu. Yd. | Cu. Yd. | M Gal. | Lb. | Lb. | L.F. | STA. | SET | L.F. |
| STA. 2318+48.9 | 243 | 28,200 | 60 | 269.5 | 282 | 55,824 | 112,300 | 765 | 2318+48.9 | 1 | 424 |
| STA. 2477+46.0 | 243 | 40,800 | 60 | 269.5 | 408 | 55,824 | 112,300 | 1,042 (1020) | 2477+46.0 | 1 | 424 |
| STA. 2713+03.2 | 424 | 30,000 | 70 | 382.4 | 300 | 76,333 | 143,100 | 150 | 2713+03.2 | 1 | 424 |
| GRAND TOTAL | 910 | 99,000 | 190 | 921.4 | 990 | 187,981 | 367,700 | 1957 | 3 Lump Sum | 3 | 1272 |
| | ① | | | | ① | | | ① | ① | | |

APPROVED DATE June 1, 1959
R. H. Bradley
CHIEF ENGINEER
NORTH DAKOTA STATE HIGHWAY DEPARTMENT

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS

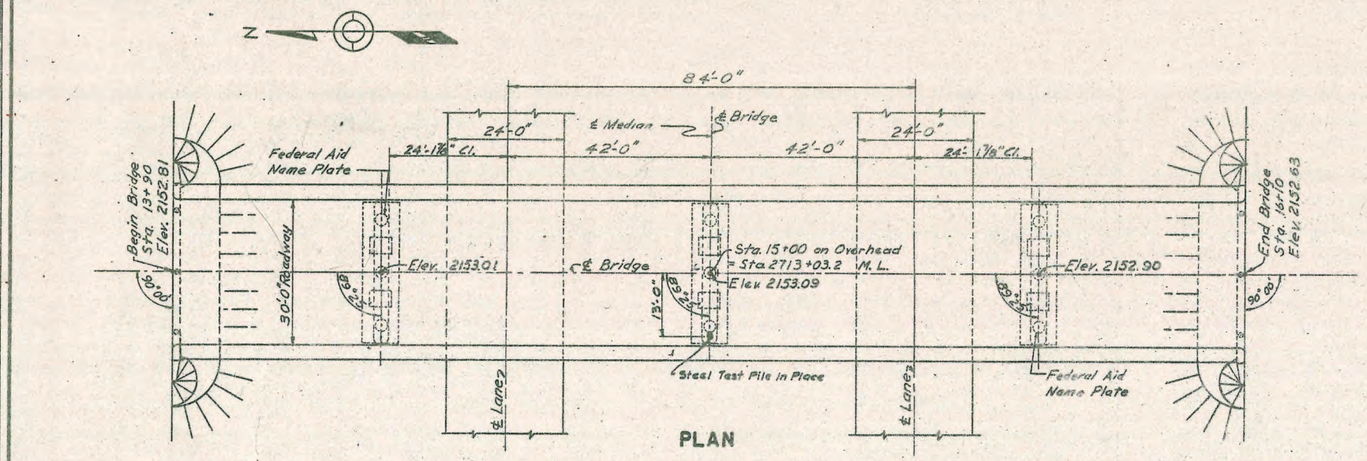
APPROVED:

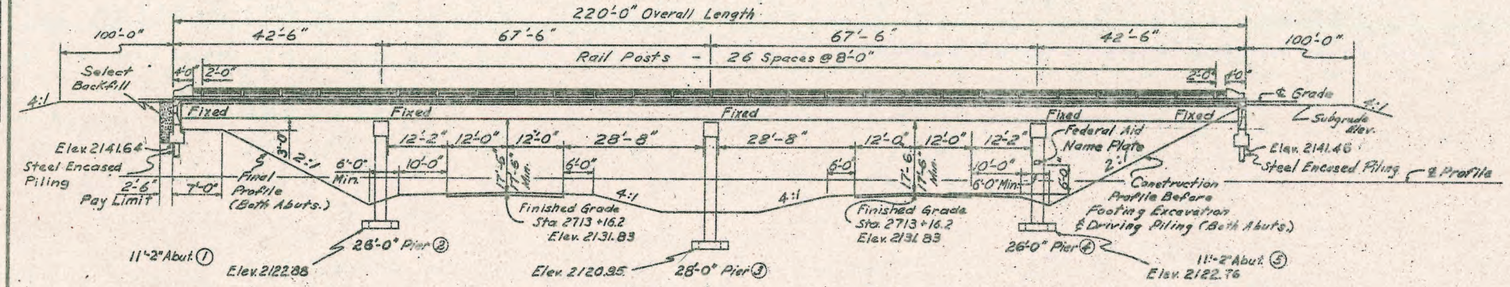
DIVISION ENGINEER DATE

I-94-3 (11) 119

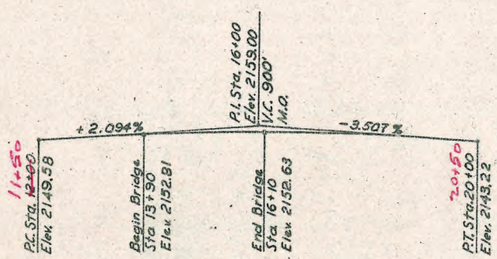
| | MADE BY | CHECKED BY |
|---|---|---|
| DETAILS | R.W.C. | G.F.E. |
| CING | R.W.C. | G.F.E. |
| QUANTITIES | G.F.E. | T.H.O. |

Quantity Class A-1/2 Concrete from 382.4 C.Y. to 336.0 C.Y. — G.F.E. 7-22-59



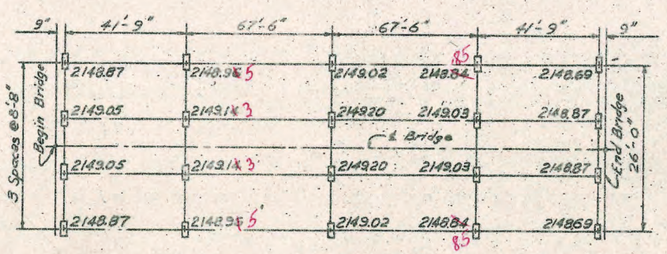




ELEVATION



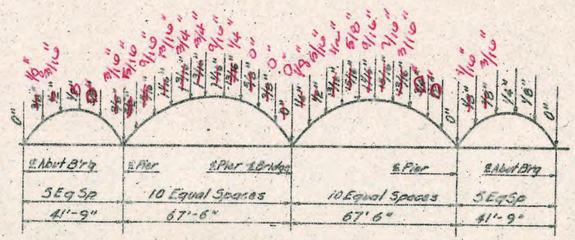

VERTICAL CURVE DATA

*Elevations Are To Top Of Finished Roadway*




BEARING PLATE LAYOUT

*Elevations Shown Are To Top Of Concrete*




CAMBER DIAGRAM

*(Showing Dimension "a" See H-1163-2)*

## BENCH MARKS

| NO. | DESCRIPTION | LOCATION | ELEV. |
|---|---|---|---|
| 27X | Iron Pin | Sta. 2700+00~200' Lt. | 2127.45 |
| 28X | Iron Pin | Sta. 2707+50~200' Lt. | 2122.03 |
| 29X | Iron Pin | Sta. 2716+00~200' Lt. | 2130.62 |

## PILE LOADING

| LOCATION | DEAD LOAD | LIVE LOAD | EARTH | WIND 50 LB. | WIND 15 LB. | WIND 100 LB. L.L. | LONG. FORCE | DESIGN LOAD | MINIMUM REQUIRED BEARING | * MINIMUM PENETRATION |
|---|---|---|---|---|---|---|---|---|---|---|
| Abutment | 30.4 T. | 17.8T | 5.8 T. | | | | | 54.0 T. | 63.0 T | 25' |
| Pier ③ | 2634 ¾" | 1250 ¾" | 640 ¾" | | | | | 4544 ½" | 4544 ½" | |

* Below Bottom of Footing in ft

FEDERAL AID PROJECT I-94-3(11) NORTH DAKOTA 1959

FEDERAL AID NAME PLATE 2 REQUIRED

NOTES:

Dimensions for reinforcing steel bent bars are given center to center unless noted.

The fabricator shall add a prefix to each bar designation to differentiate between structures and/or units of a structure on the project.

All exposed corners of concrete shall be beveled with 3/4" triangular moldings unless otherwise noted.

Each section of slab or curb shall be poured in one continuous run from end to end.

The surface of railings, end posts, curbs, the outside face of slab and the exposed wing surfaces shall be given the "Rubbed Surface Finish". All other concrete surfaces shall be given the "Ordinary Surface Finish".

Dead load deflections and vertical curve corrections have been accounted for in camber diagram.

The cost of incidental items shown on the plans but not listed in the "Estimate of Quantities" shall be included in the unit price bid for the various pay items.

A vibrating strike-off template shall be used when finishing the deck slab concrete. Care shall be taken that the vibrator is shut off when the forward movement of the template is stopped. The final strike-off shall be made on a fairly long surface without continual starting and stopping.

The end closure plate on the steel-encased piles shall be no larger than the O.D. of the piles and shall be welded to the pile with a 1/4" continuous single bevel fee weld.

| BRIDGE CODE No. | FED. ROAD DIST. NO. | STATE | PROJ. No. | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|---|
| X 731 | 5 | N.D. | I-94-3(11) | | | |

Air-entrained portland cement shall be used in the bridge slab and curb concrete. Concrete made from both regular and air-entrained cement shall be considered Class A-½ as a pay item.

Earth consolidation shall be in accordance with Sec. 17.3(a) of the Standard Specifications using "Extra Compaction".

Embankment material shall be obtained from the Highway Right-of-Way as staked by the Engineer within 1000 feet of the bridge site.

The Structural Contractor will be required to drill pilot holes completely through compacted fills and when necessary sufficiently into the original ground to permit driving of piling to the required penetration and bearing.

The pipe for the steel-encased piles shall be 12-3/4" outside diameter with a wall thickness of 0.230 inches, and end closure plate 3/4" thick.

All pilot holes drilled for piling, but not completely filled by the piles, shall be backfilled with sand or fine gravel.

Steel-encased test pile in place shall be cut off 1'-0" below footing elevation and filled with pit run gravel.

## ESTIMATE OF QUANTITIES

| SP'L PRO. | SPEC. NO. | BID ITEM | | |
|---|---|---|---|---|
| | 12 | REMOVING EXISTING STRUCTURE AT STA. | | |
| | 18A | EXCAVATION CLASS 1 | | CU. YD. |
| | 18B | " CLAS 2 | 424 | CU. YD. |
| | 18C | " CLASS 3 | | CU. YD. |
| | 22B | SELECT BACKFILL | 70 | CU. YD. |
| 33A | 33K | ROADWAY EXCAVATION "CLASS A" | [illegible] | CU. YD. |
| | 60A | CONCRETE CLASS A-1/2 | 352.3 [illegible] | CU. YD. |
| 42 | | WATER FOR COMPACTION (10 GAL./CU. YD.) | 300 | M GAL. |
| | 62A | REINFORCING STEL | 81,952 [illegible] | LB. |
| | 63A | STRUCTURAL STEEL | 143,100 | LB. |
| | 64A | UNTREATED TIMBER | | M.B.M. |
| | 64B | TREATED TIMBER | | M.B.M. |
| | 65A | UNTREATED TIMBER PILING — @ — FT. | | LIN. FT. |
| | 65B | TREATED TIMBER PILING — @ — FT. | | LIN. FT. |
| 150 | 66C | STEEL-ENCASED PILING | 6 @ 25 FT. 150 | LIN. FT. |
| | 66K | UNTREATED TIMBER TEST PILES | | EACH |
| | 66L | TREATED TIMBER TEST PILES | | EACH |
| | | | | |
| 52A | 54 | TEMPORARY CROSSING AND DETOUR (STA. 2713+03.2) | | LUMP SUM |
| | | BRIDGE BENCH MARK | 1 | SET |
| | | ORNAMENTAL METAL RAILING | 424 | LIN. FT. |

## STRUCTURAL DRAWINGS

GENERAL DRAWING (THIS SHEET) & H-031

SUBSTRUCTURE ST'D 14.9, H-0401, H-1272, H-1344, 94-51-1

SUPERSTRUCTURE ST'D 7.6, H-0110, H-0501, H-1152-2, H-1163-1, H-1163-2

DESIGN LOADING H20-S16 (1957) | SCALE 1 INCH = 16 FEET

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

# HIGHWAY NO. 31 INTERCHANGE
## BRIDGE LAYOUT

PROJECT I-94-3(11) STA. 2713+03.2

MORTON COUNTY

C.O. #1 ~ Nov. 2, 1959
Dwgs. C.O: H-1272-A
C.O. H-1344-A

APPROVED

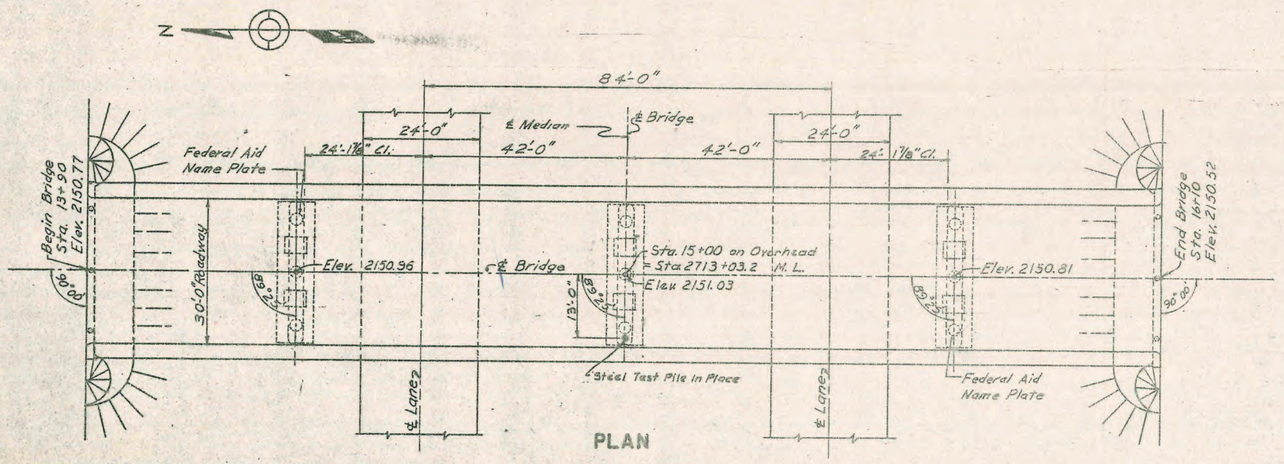
5-20-59 DATE

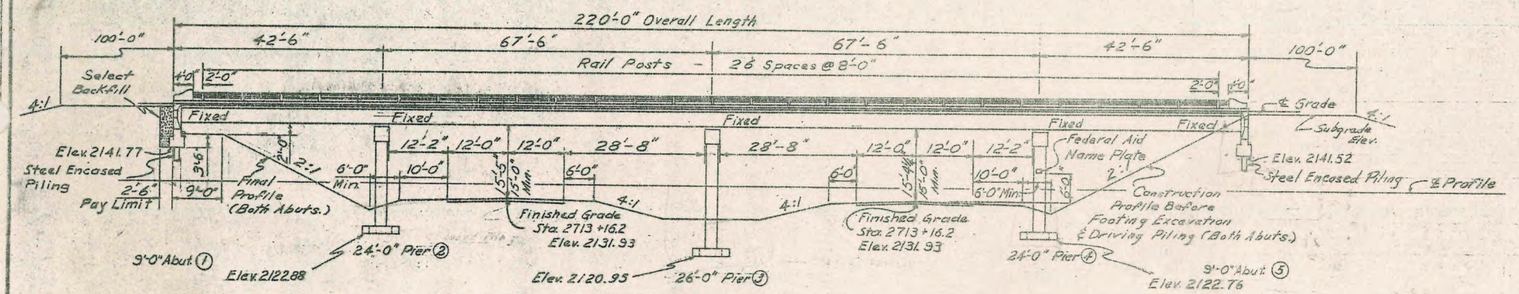
Joseph R. Kirby BRIDGE ENGINEER

JOSEPH R. KIRBY REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA 1129

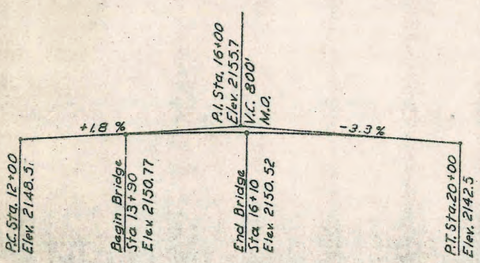
C094-51-A

CO 94-51-A



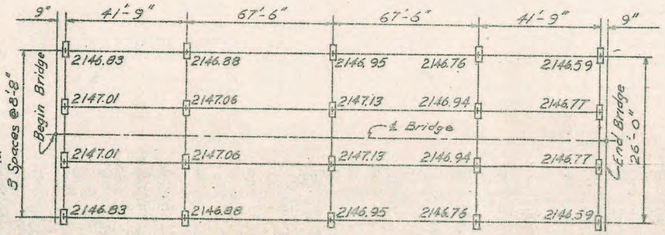




ELEVATION



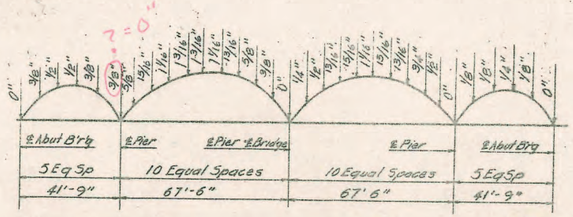

VERTICAL CURVE DATA

*Elevations Are To Top Of Finished Roadway*




BEARING PLATE LAYOUT

*Elevations Shown Are To Top Of Concrete*




CAMBER DIAGRAM (Showing Dimension "a" See H-1163-2)

NOTES:

Dimensions for reinforcing steel bent bars are given center to center unless noted.

The fabricator shall add a prefix to each bar designation to differentiate between structures and/or units of a structure on the project.

All exposed corners of concrete shall be beveled with 3/4" triangular moldings unless otherwise noted.

Each section of slab or curb shall be poured in one continuous run from end to end.

The surface of railings, end posts, curbs, the outside face of slab and the exposed wing surfaces shall be given the "Rubbed Surface Finish". All other concrete surfaces shall be given the "Ordinary Surface Finish".

Dead load deflections and vertical curve corrections have been accounted for in camber diagram.

The cost of incidental items shown on the plans but not listed in the "Estimate of Quantities" shall be included in the unit price bid for the various pay items.

A vibrating strike-off template shall be used when finishing the deck slab concrete. Care shall be taken that the vibrator is shut off when the forward movement of the template is stopped. The final strike-off shall be made on a fairly long surface without continual starting and stopping.

The end closure plate on the steel-encased piles shall be no larger than the O.D. of the piles and shall be welded to the pile with a 1/4" continuous single bevel tee weld.

| BRIDGE CODE NO. | FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|---|
| X 731 | 5 | N.D. | I-94-3(11) | | | |

Air-entrained portland cement shall be used in the bridge slab and curb concrete. Concrete made from both regular and air-entrained cement shall be considered Class A-1½ as a pay item.

Earth consolidation shall be in accordance with Sec. 17.3(a) of the Standard Specifications using "Extra Compaction".

Embankment material shall be obtained from the Highway Right-of-Way as staked by the Engineer within 1000 feet of the bridge site.

All piling shall be driven a minimum of fifteen (15) feet into the original ground for abutment piling and fifteen (15) feet below bottom of pier footings. The Structural Contractor will be required to drill pilot holes completely through compacted fills and when necessary sufficiently into the original ground to permit driving of piling to the required penetration and bearing.

The pipe for the steel-encased piles shall be 12-3/4" outside diameter with a wall thickness of 0.230 inches, and end closure plate 3/4" thick.

All pilot holes drilled for piling, but not completely filled by the piles, shall be backfilled with sand or fine gravel.

Steel-encased test pile in place shall be cut off 1'-0" below footing elevation and filled with pit run gravel.

## ESTIMATE OF QUANTITIES

| SP'L PRO. | SPEC. NO. | BID ITEM | | |
|---|---|---|---|---|
| | 12 | REMOVING EXISTING STRUCTURE AT STA. | | |
| | 15A | EXCAVATION CLASS 1 | | CU. YD. |
| | 15B | " CLASS 2 | 424 | CU. YD. |
| | 15C | " CLASS 3 | | CU. YD. |
| | 22B | SELECT BACKFILL | 70 | CU. YD. |
| 33A | 33X | ROADWAY EXCAVATION "CLASS A" | 30,000 | CU. YD. |
| | 60A | CONCRETE CLASS A-1½ | 336.0 382.4 | CU. YD. |
| 42 | | WATER FOR COMPACTION (10 GAL/CU. YD.) | 300 | M. GAL. |
| | 62A | REINFORCING STEEL | 76,333 | LB. |
| | 63A | STRUCTURAL STEEL | 143,100 | LB. |
| | 64A | UNTREATED TIMBER | | M.B.M. |
| | 64B | TREATED TIMBER | | M.B.M. |
| | 65A | UNTREATED TIMBER PILING — @ — FT. | | LIN. FT. |
| | 65B | TREATED TIMBER PILING — @ — FT. | | LIN. FT. |
| 15G | 65G | STEEL-ENCASED PILING | 6 @ 25 FT. 150 | LIN. FT. |
| | 65K | UNTREATED TIMBER TEST PILES | | EACH |
| | 65L | TREATED TIMBER TEST PILES | | EACH |
| | | | | |
| 32A | 84 | TEMPORARY CROSSING AND DETOUR (STA. 2713+03.2) | 1 | LUMP SUM |
| | | BRIDGE BENCH MARK | 1 | SET |
| | | ORNAMENTAL METAL RAILING | 424 | LIN. FT. |

See Tracing

## STRUCTURAL DRAWINGS

GENERAL DRAWING (THIS SHEET) & H-0311

SUBSTRUCTURE ST'D 14.9, H-0401, H-1272, H-1344, 94-51-1

SUPERSTRUCTURE ST'D 7.6, H-0110, H-0501, H-1152-2, H-1163-1, H-1163-2

| DESIGN LOADING | SCALE |
|---|---|
| H20-S16 (1957) | 1 INCH = 15 FEET |

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

# HIGHWAY NO. 31 INTERCHANGE
## BRIDGE LAYOUT

PROJECT I-94-3(11) STA. 2713+03.2

MORTON COUNTY

APPROVED

5-20-59
DATE

Joseph R. Kirby
BRIDGE ENGINEER

JOSEPH R. KIRBY REGISTERED PROFESSIONAL ENGINEER NORTH DAKOTA NO.

## BENCH MARKS

| NO. | DESCRIPTION | LOCATION | ELEV. |
|---|---|---|---|
| 27X | Iron Pin | Sta. 2700+00 ~ 200' Lt. | 2127.45 |
| 28X | Iron Pin | Sta. 2707+50 ~ 200' Lt. | 2122.03 |
| 29X | Iron Pin | Sta. 2716+00 ~ 200' Lt. | 2130.62 |

## PILE LOADING

| LOCATION | DEAD LOAD | LIVE LOAD | EARTH | WIND 50 LB. | WIND 15 LB. | WIND 100 LB. L.L. | LONG. FORCE | DESIGN LOAD | MINIMUM REQUIRED BEARING | * MINIMUM PENETRATION |
|---|---|---|---|---|---|---|---|---|---|---|
| Abutment | 26.0 T. | 17.8 T. | 4.0 T. | | | | | 47.8 T. | 65.0 T. | 25' |
| Pier ③ | 2630 #/ft | 1250 #/ft | 640 #/ft | | | | | 4520 #/ft | 4520 #/ft | |

* Below Bottom of Footing in Ft.

FEDERAL AID PROJECT I-94-3(11) NORTH DAKOTA 1959

FEDERAL AID NAME PLATE 2 REQUIRED

See C094-51-A

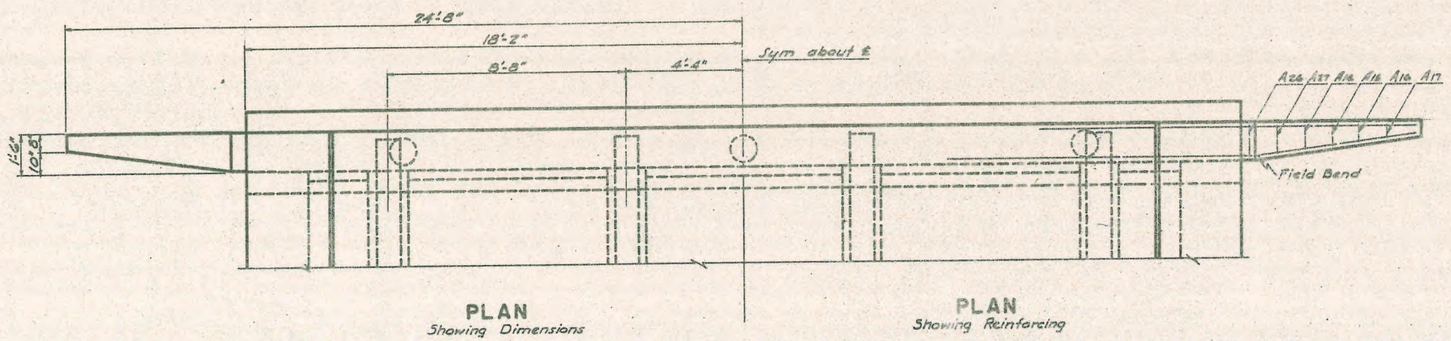
94-51

94-51

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 5 | N.D. | | | | |

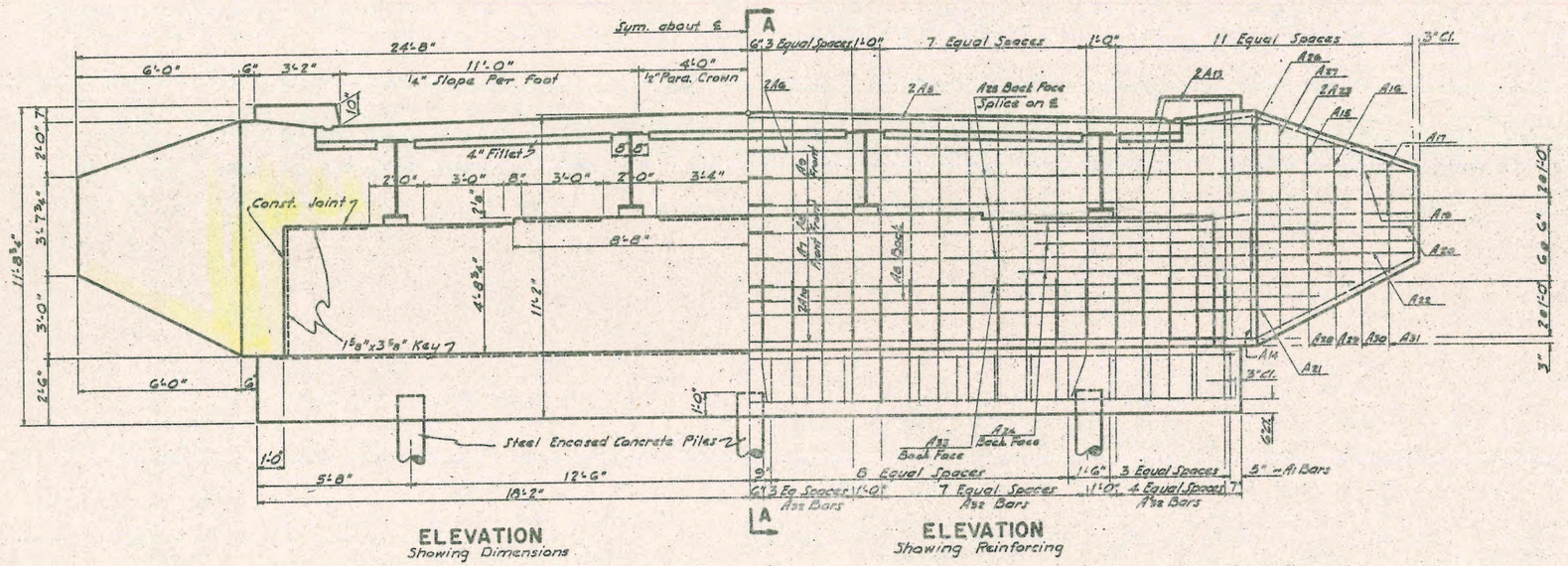
## ADDITIONAL BAR LIST

| MARK | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| *A19 | 2 | 6 | 12'-0" | Str. |
| *A20 | 1 | 6 | 8'-0" | " |
| *A21 | 2 | 6 | 7'-4" | " |
| *A22 | 1 | 6 | 6'-0" | " |
| A23 | 4 | 6 | 21'-0" | Bent |
| A24 | 6 | 5 | 14'-0" | Str. |
| A25 | 8 | 5 | 26'-6" | " |
| A26 | 2 | 4 | 11'-2" | Bent |
| A27 | 2 | 4 | 18'-0" | " |
| A28 | 2 | 4 | 9'-6" | " |
| A29 | 2 | 4 | 9'-3" | " |
| A30 | 2 | 4 | 12'-0" | " |
| A31 | 2 | 4 | 7'-6" | " |
| A32 | 34 | 6 | 10'-2" | " |
| A33 | 2 | 5 | 24'-0" | Str. |



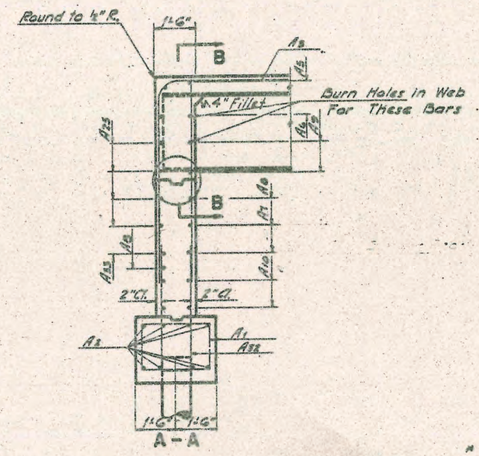

**PLAN**
*Showing Dimensions*

**PLAN**
*Showing Reinforcing*

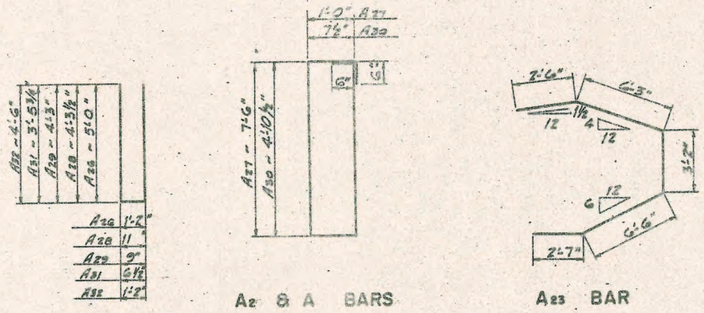



**ELEVATION**
*Showing Dimensions*

**ELEVATION**
*Showing Reinforcing*




A-A




**BENT BAR DETAILS**

* Cut A19, A20, A21 & A22 Bars from A18 Bars.

Additional bar list and quantities are for one abutment. Backfill behind abutments shall not be placed until after slab has been poured and set for 48 hours.

For details not shown see drawing H-1272.

## ADDITIONAL QUANTITIES

| | |
|---|---|
| Concrete Class 4-1/2 | 6.5 C.Y. |
| Reinforcing Steel | 1903 Lbs. |

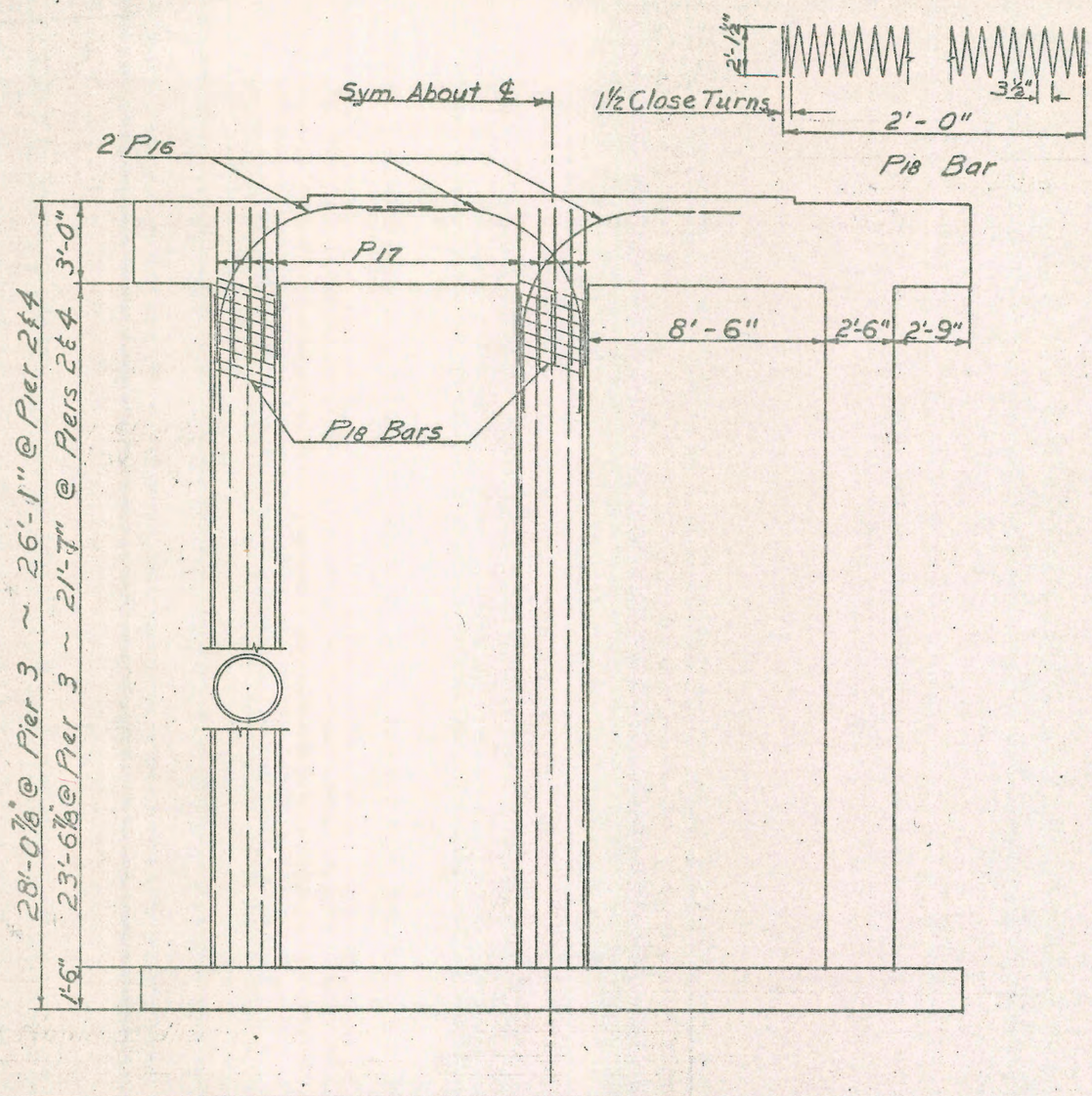
SKETCH TO ACCOMPANY
CHANGE ORDER NO. 1
ABUTMENT REVISIONS
BRIDGE NO. 94-51
PROJECT I-94-3(11)

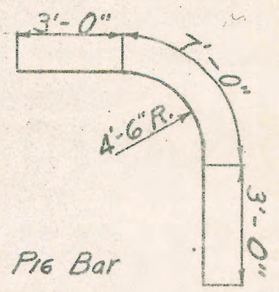
OCT. 30, 1953

COH-1272-A

COH-1272-A

DETAILS MADE BY / CHECKED BY
CING CHECKED BY
QUANTITIES MADE BY / CHECKED BY




P16 Bar

* ADDITIONAL BAR LIST

| MARK | NO. | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| P16 | 8 | 7 | 13'-0" | Bent |
| P17 | 24 | 7 | 5'-6" | Str. |
| P18 | 3 | 4 | 60'-0" | Spiral |

* For one pier.

This change order shows revisions to Dwg. H-1344.

Nov. 3, 1959

* ADDITIONAL QUANTITIES

| | |
|---|---|
| Concrete Class A-1½ | 1.1 C.Y. |
| Reinforcing Steel | 603 lbs. |

SKETCH TO ACCOMPANY
CHANGE ORDER #1

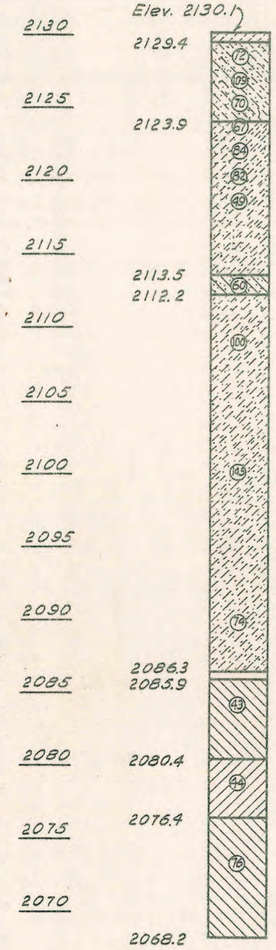
# PIER REVISIONS

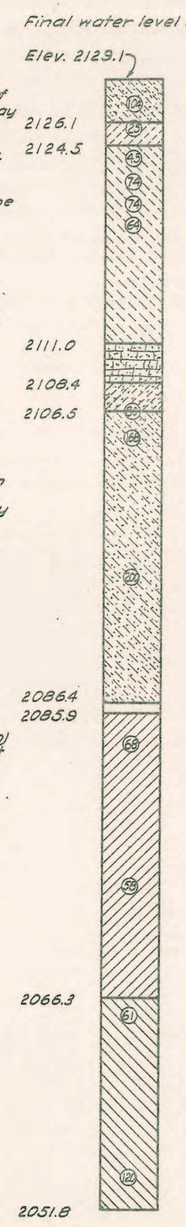
Bridge No. 94-51
Project I-94-3(11)

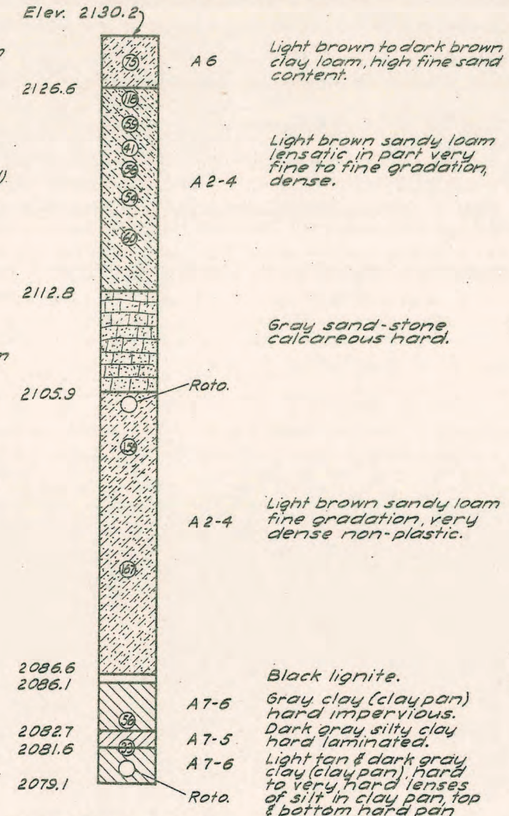
CO H-1344-A

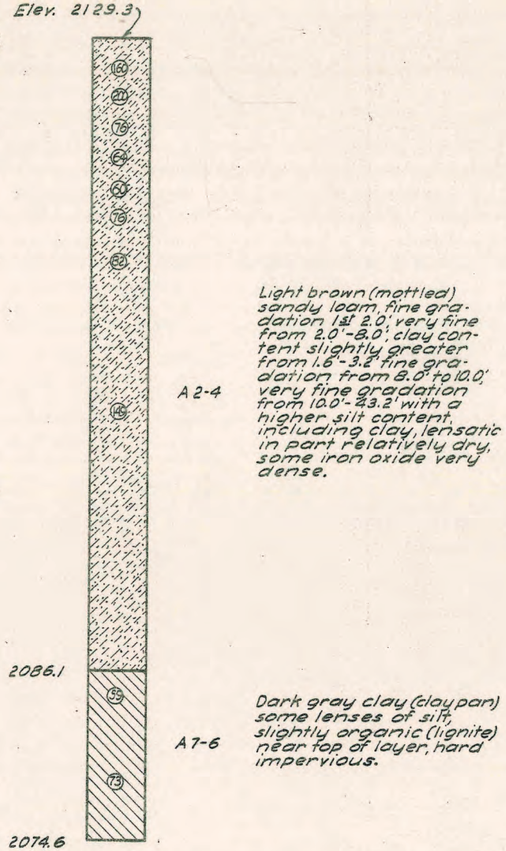
| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 5 | N.D. | | | | |

Made by: R.M.S.




Notes:

Encircled numbers indicate the number of blows, delivered by a 140 lb. hammer from a height of 30" to drive core tube 1.0'.

The boring log data shown is for design purposes only. The State assumes no responsibility if soil conditions encountered during construction differ from these shown.

BRIDGE NO. 94-51

**BORING LOG**

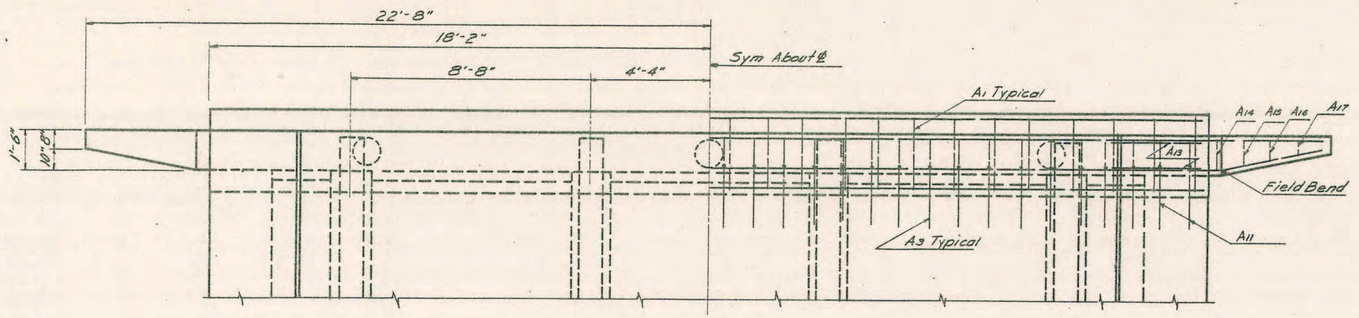
I-94-3(11) 119

MORTON COUNTY

94-51-1

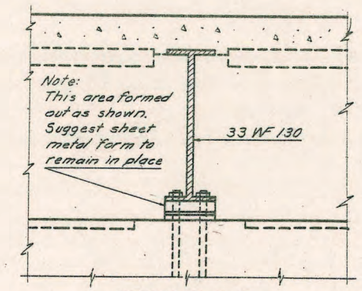
94-51-1

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 5 | N. D. | | | | |

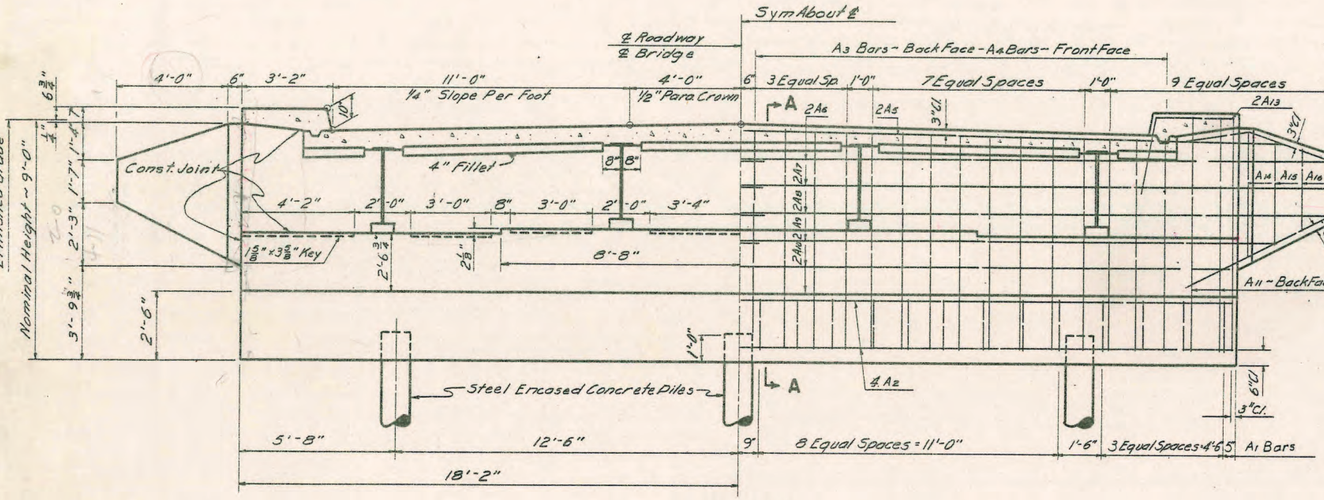



PLAN

Half Showing Dimensions Half Showing Reinforcement

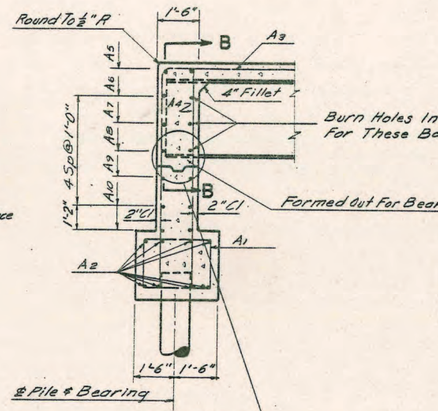



SECTION B-B

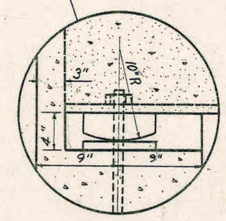


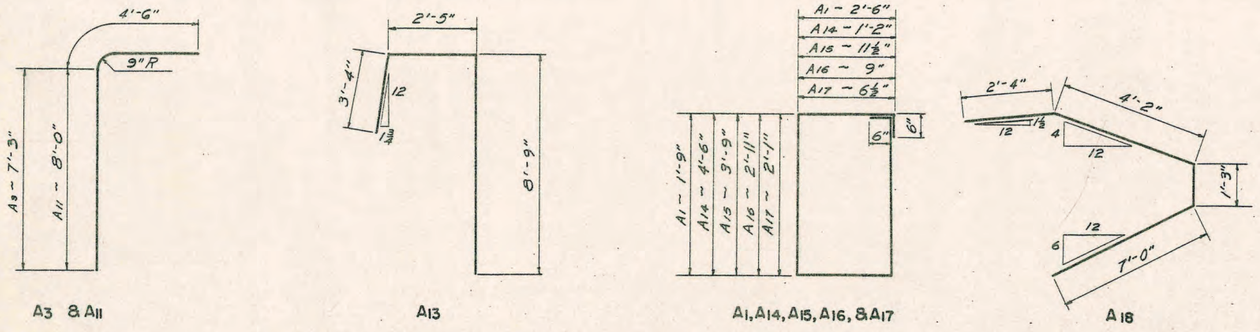

ELEVATION

Half Showing Dimensions Half Showing Reinforcement




SECTION A-A




A3 & A11 A13 A1, A14, A15, A16, & A17 A18

BENT BAR DETAILS

## BAR LIST

| MARK | NO | SIZE | LENGTH | SHAPE |
|---|---|---|---|---|
| A1 | 26 | 4 | 9'-6" | Bent |
| A2 | 8 | 11 | 36'-0" | Str |
| A3 | 30 | 6 | 11'-9" | Bent |
| A4 | 30 | 5 | 8'-0" | Str. |
| A5 | 4 | 6 | 22'-3" | " |
| A6 | 4 | 4 | 23'-0" | " |
| A7 | 4 | 4 | 23'-3" | " |
| A8 | 4 | 4 | 22'-3" | " |
| A9 | 4 | 4 | 20'-3" | " |
| A10 | 4 | 4 | 36'-0" | " |
| A11 | 4 | 5 | 12'-6" | Bent |
| A12 | 4 | 5 | 8'-9" | Str |
| A13 | 4 | 5 | 14'-6" | Bent |
| A14 | 2 | 4 | 12'-4 | " |
| A15 | 2 | 4 | 10'-5" | " |
| A16 | 2 | 4 | 8'-4" | " |
| A17 | 2 | 4 | 6'-3" | " |
| A18 | 4 | 6 | 14'-9" | " |

NOTES:

Pile shells shall be filled to within 6" of top of pile. The last 6" shall be filled when pouring abutment footing.

## QUANTITIES

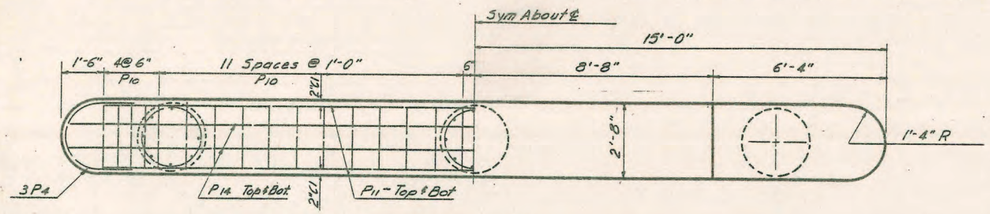
| | |
|---|---|
| Concrete Class A-1/2 | 15.3 C.Y. |
| Reinforcing Steel | 2,863 Lb. |
| Piling (See Layout) | |

# 9'-0" ABUTMENT DETAIL FOR I BEAM SPAN 30' ROADWAY

| DETAILS | |
|---|---|
| MADE BY | J.H.C. |
| CHECKED BY | G.F.C. |
| MADE BY | J.H.D. |
| CHECKED BY | D.D.B. |
| MADE BY | G.F.E.F. T.H.D. |
| CHECKED BY | L.P.H. |

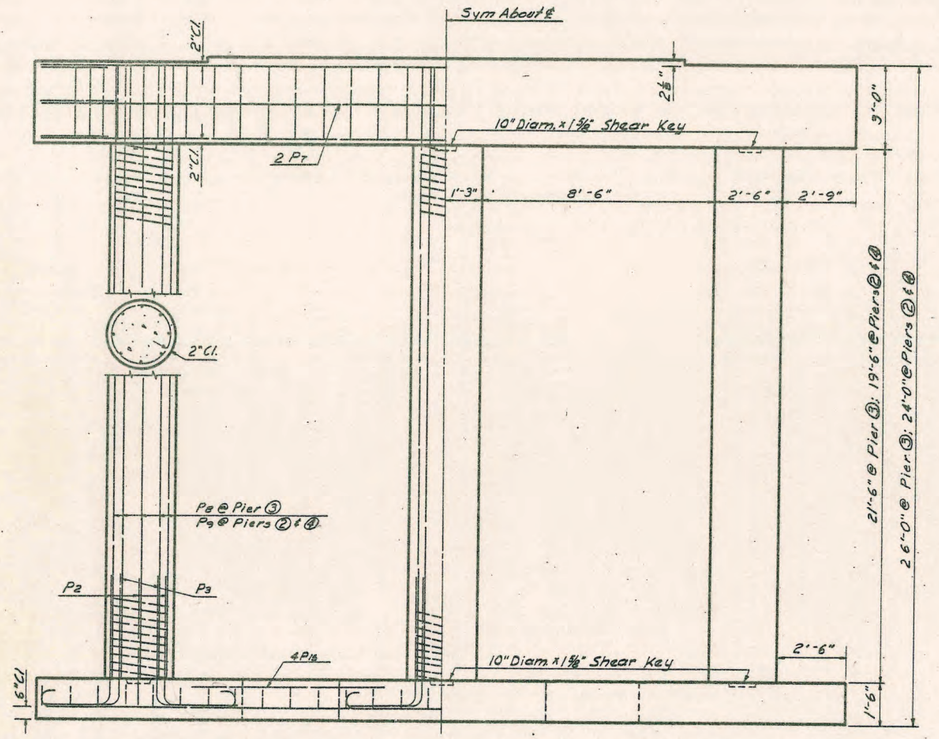
H-1272

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 5 | N.D. | | | | |



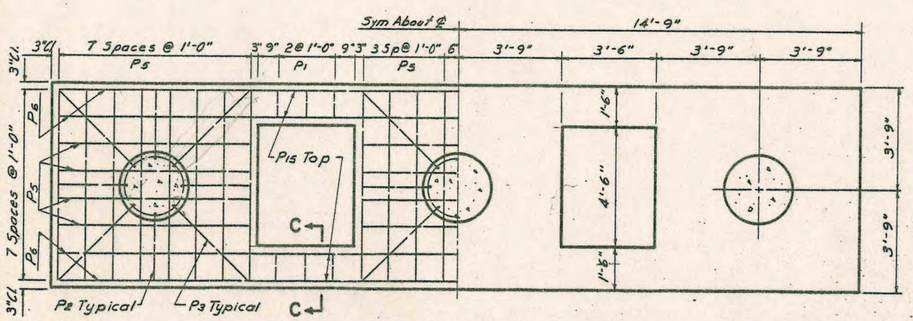

**TOP PLAN**

*Half Showing Reinforcement Half Showing Dimensions*



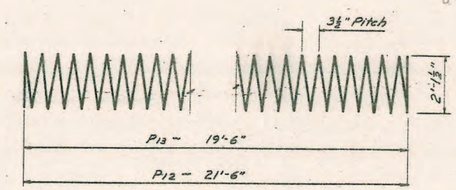

**ELEVATION**

*Half Showing Reinforcement Half Showing Dimensions*

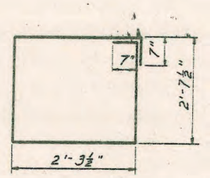



**FOOTING PLAN**

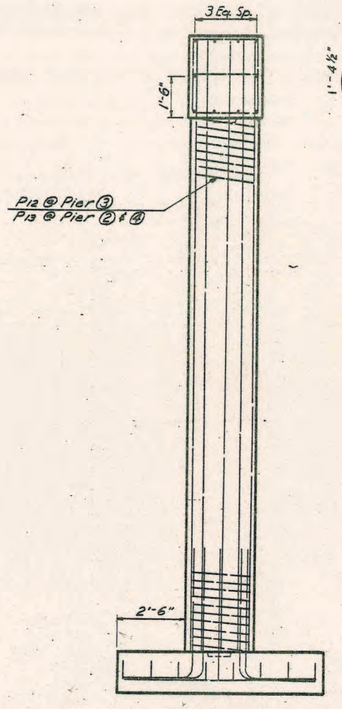
*Half Showing Reinforcement Half Showing Dimensions*



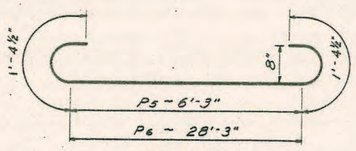

P12 & P13



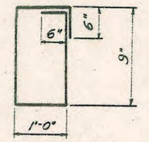

P10



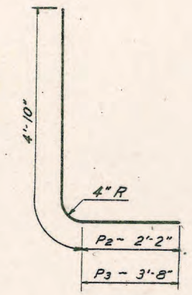

END VIEW



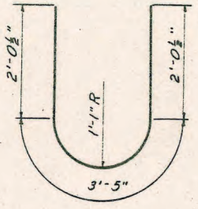

P5 & P6




P1




P2 & P3




P4

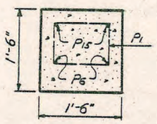
**BENT BAR DETAILS**

| BAR LIST ~ THREE PIERS | | | | |
|---|---|---|---|---|
| MARK | NO | SIZE | LENGTH | SHAPE |
| P1 | 36 | 4 | 4'6" | Bent |
| P2 | 36 | 9 | 7'-0" | " |
| P3 | 36 | 9 | 8'-6" | " |
| P4 | 18 | 6 | 7'-8" | " |
| P5 | 108 | 8 | 9'-0" | " |
| P6 | 12 | 8 | 31'-0" | " |
| P7 | 6 | 6 | 27'-3" | Str. |
| P8 | 24 | 3 | 24'-3" | " |
| P9 | 48 | 9 | 22'-3" | " |
| P10 | 96 | 5 | 11'-0" | Bent |
| P11 | 12 | 10 | 27'-3" | Str. |
| P12 | 3 | 4 | 506'-9" | Spiral |
| P13 | 6 | 4 | 460'-9" | " |
| P14 | 12 | 10 | 29'-6" | Str. |
| P15 | 24 | 8 | 7'-6" | " |

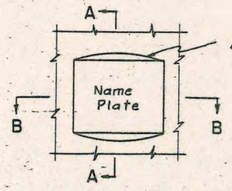
Notes:

Pier cap reinforcement shall be placed after column concrete has been placed.

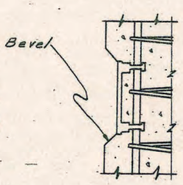
Column concrete shall be placed to the elevation of the bottom of the pier cap; then allowed to set a minimum of two hours before pier cap concrete is placed.



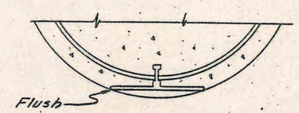

C-C




PART ELEV. OF COLUMN




A-A




B-B

**FEDERAL AID NAME PLATE DETAIL**

*See Layout & Standard 14.9*

| QUANTITIES - 3 PIERS | |
|---|---|
| Concrete Class A-1℄ | 317 CY |
| Reinforcing Steel | 19025 Lb |

**PIER DETAIL FOR I-BEAM SPANS**

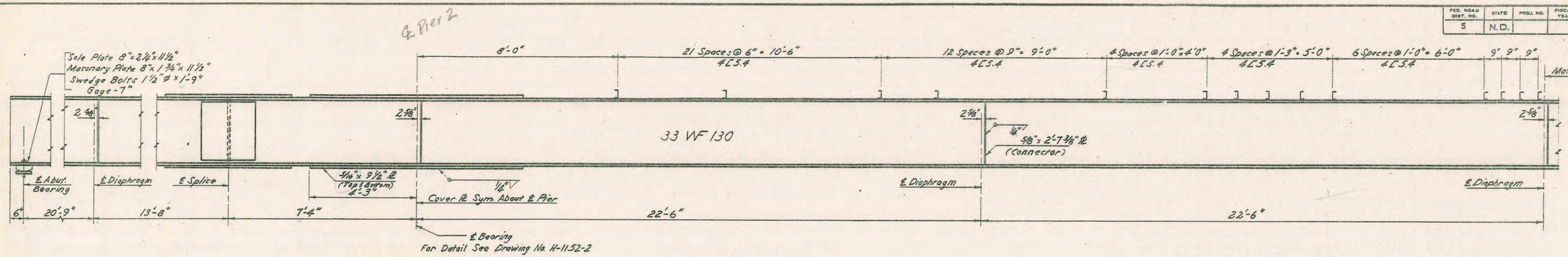
30' ROADWAY

H-1344

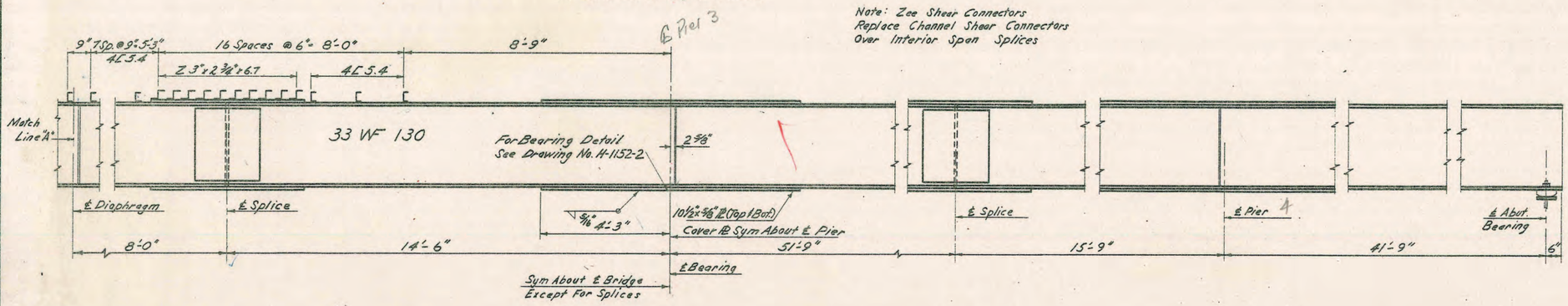
H-1344

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET No. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 5 | N.D. | | | | |

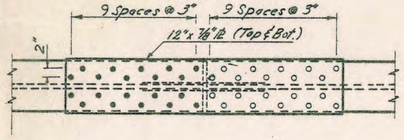
DETAILS — MADE BY P.W.C. — CHECKED BY G.F.E.
TRACING — MADE BY L.P.H. — CHECKED BY D.D.B.
QUANTITIES — MADE BY G.F.E. — CHECKED BY E.P.H.

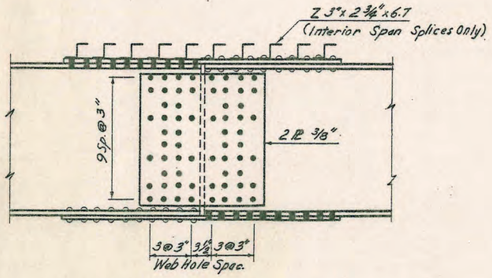



Note: Zee Shear Connectors Replace Channel Shear Connectors Over Interior Span Splices

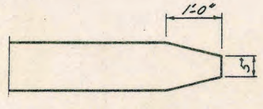



## BEAM ELEVATION

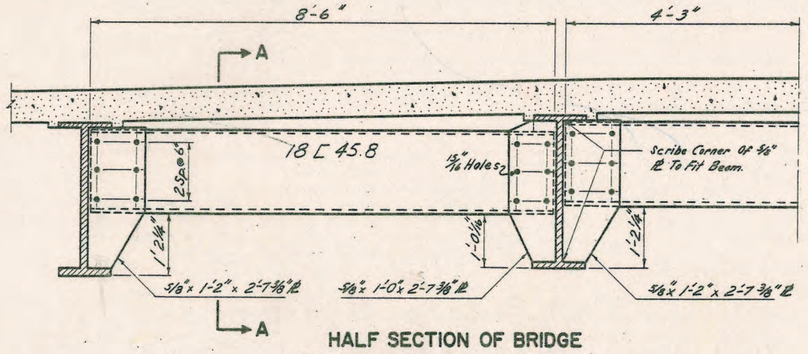


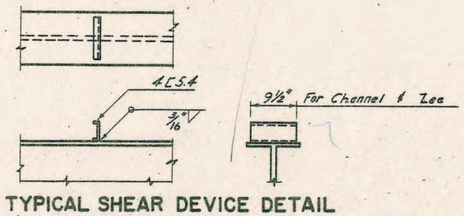

**TYPICAL SPLICE DETAIL**
*Also See Drawing No. H-1152-2 For Camber*



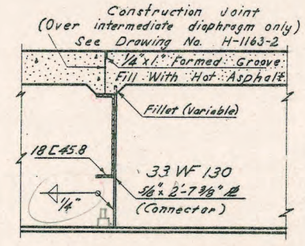

**DETAIL SHOWING COVER PLATE TAPER**
*Top & Bottom Plates*




**HALF SECTION OF BRIDGE**
*Showing Steel Diaphragm & Connectors*




**TYPICAL SHEAR DEVICE DETAIL**
*Except Over Beam Splice*




**SECTION A-A**

Notes:
Open holes are to be 13/16" except as noted.
Field connections shall be made with ⅞ high tensile strength bolts or field rivets.
All exposed steel shall be given one shop coat of Red Lead paint & two field coats of Aluminum paint preceded by a spot coat of Red Lead paint in accordance with Section 80 & 132.17 of the Standard Specifications.
The first field coat of Aluminum paint shall be tinted with Prussian Blue.
No paint to be applied to sheer connectors or top of beam.
For small angle skews (0° to 4°) the abutments shall remain normal to the ℄ Roadway & the piers shall be skewed. The shop drawings shall show adjusted location of pier bearings to conform to the angle of skew. (See layout sheet for skew angle.) Diaphrams shall remain normal to the ℄ Roadway.
The placement of pier swedge bolts shall be in accordance with the approved shop drawings.

146,697

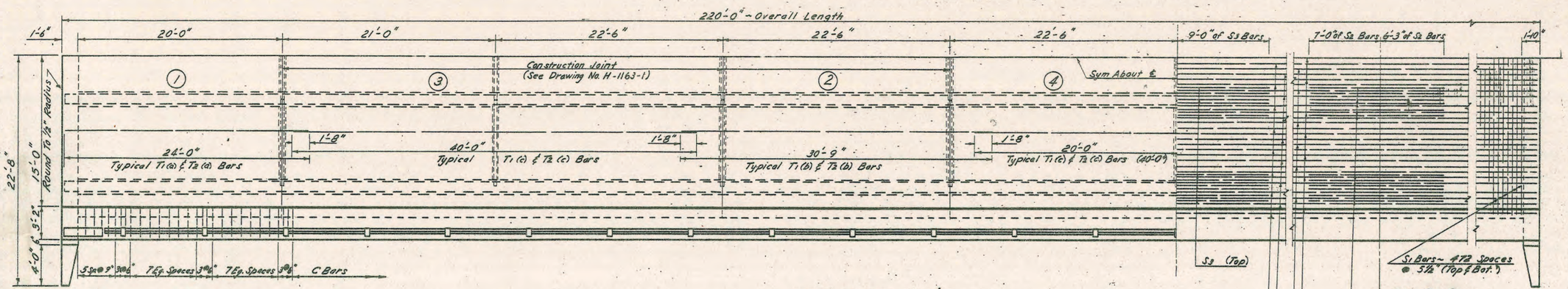
| QUANTITIES | |
|---|---|
| Structural Steel | 143,100 lb. |

**SUPERSTRUCTURE**
**FOUR SPAN CONTINUOUS COMPOSITE I-BEAM**
220' OVERALL LENGTH
30' ROADWAY

H-1163-1

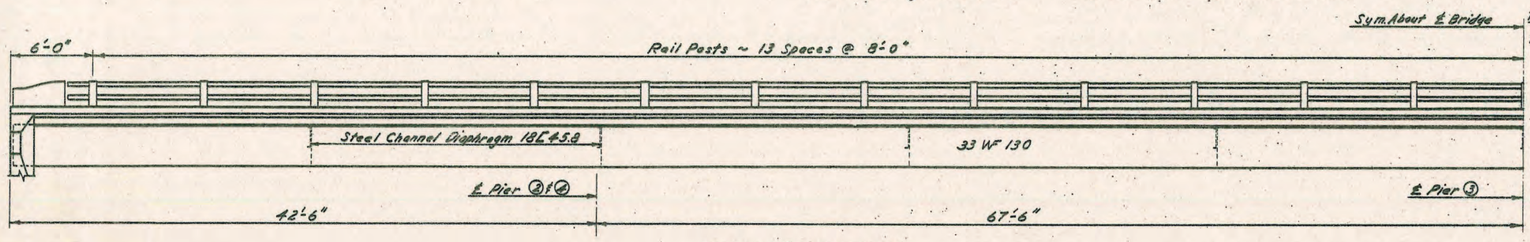
H-1163-1

| FED. ROAD DIST. NO. | STATE | PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| 5 | N. D. | | | | |



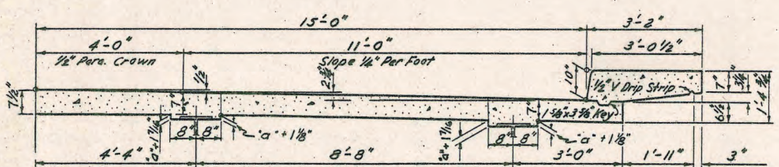

## HALF PLAN

Quarter Showing Dimensions  Quarter Showing Reinforcement



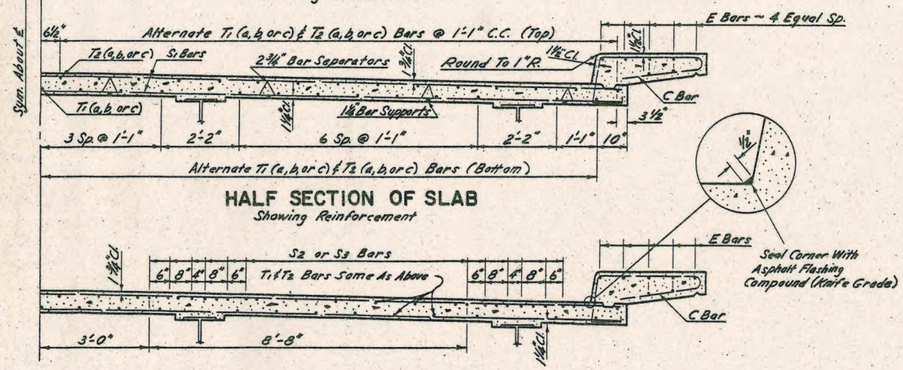

## HALF ELEVATION

| BAR LIST | | | | |
|---|---|---|---|---|
| MARK | NO | SIZE | LENGTH | SHAPE |
| C | 548 | 5 | 7'-3" | Bent |
| E | 84 | 5 | 37'-6" | Str. |
| S1 | 946 | 5 | 31'-8" | " |
| S2 | 48 | 5 | 13'-3" | " |
| S3 | 24 | 5 | 18'-0" | " |
| | | | | |
| T1 (a) | 54 | 4 | 24'-0" | " |
| T1 (b) | 54 | 4 | 30'-9" | " |
| T1 (c) | 81 | 4 | 40'-0" | " |
| | | | | |
| T2 (a) | 56 | 5 | 24'-0" | " |
| T2 (b) | 56 | 5 | 30'-9" | " |
| T2 (c) | 84 | 5 | 40'-0" | " |



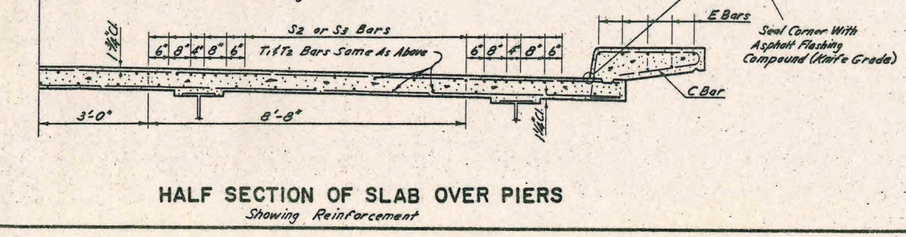

## HALF SECTION OF SLAB

Showing Dimensions



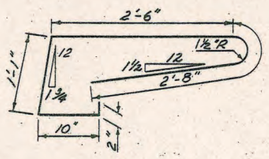

## HALF SECTION OF SLAB

Showing Reinforcement




## HALF SECTION OF SLAB OVER PIERS

Showing Reinforcement




C

## BENT BAR DETAILS

NOTES:

After the slab concrete has been placed, the bridge shall be subjected to no loads other than its own dead load & the necessary formwork until the slab concrete has attained 75% of its required 28-day strength. The curbs shall not be placed until said time.

The slab shall be poured in the following sequence:

1. Slab sections 1
2. Slab sections 2
3. Slab sections 3 & 4

The curb shall be placed in one continuous operation.

The Camber Diagram (on Layout Sheet) shows dimension "a" from an assumed chord drawn between supports. Additions or subtractions must be made to 'a' to compensate for the tolerances in the beam & deflection due to the weight of the beam.

213.7
SEE TRACING

| QUANTITIES | |
|---|---|
| Concrete Class A1½ | 260 C.Y. |
| Reinforcing Steel | 51,582 lb. |
| Ornamental Metal Railing | 424 Lin. Ft. |

**SUPERSTRUCTURE**
**FOUR SPAN CONTINUOUS**
**COMPOSITE I-BEAM**
220' OVERALL LENGTH
30' ROADWAY

| DETAILS | |
|---|---|
| MADE BY | P.W.E. |
| CHECKED BY | C.F.E. |
| MADE BY | F.P.H. |
| CHECKED BY | D.D.R. |
| MADE BY | T.H.D. |
| CHECKED BY | C.F.E. |

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