**ENGINEERING CONSTRUCTION CONTRACTING BUREAU**
**MONTANA DEPARTMENT OF TRANSPORTATION**

# As-Built Drawings

The following are as-built drawings for the structures. MDT provides them for informational purposes only. They do not include drawings for modifications to the structures, such as joint replacements and guardrail revisions and may not completely represent current conditions. Thus, some of the information contained in these documents may be out of date or not applicable with regard to the advertised project. The contractor should not rely solely on the as-built drawings provided for bidding purposes nor does any data in these files supersede the data in the contract documents.

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

# BRIDGE PLANS & QUANTITIES

# FEDERAL AID PROJECT NO. I-90-7(15)318 P.E.
# I-90-7(36)321 UI CONST.

## BOZEMAN PASS — EAST (EAST SECTION)

## PARK COUNTY

### LIST OF DRAWINGS

| SHEET NO. | DWG. NO. | TITLE |
|---|---|---|
| 1 | 11419 | GENERAL LAYOUT AT STA. 181+50.00 |
| 2 | 11420 | FOOTING PLAN |
| 3 | 11421 | BENTS NO.1 & NO.4 E. B. RDWY. |
| 4 | 11422 | BENTS NO.1 & NO.4 W. B. RDWY. |
| 5 | 11423 | BENTS NO.2 & NO.3 E. B. RDWY. |
| 6 | 11424 | BENTS NO.2 & NO.3 W. B. RDWY. |
| 7 | 11425 | ERECTION PLAN E. B. RDWY. |
| 8 | 11426 | ERECTION PLAN W.B. RDWY. |
| * 9 | 11427 | GENERAL LAYOUT AT STA. 325+00.00 |
| * 10 | 11428 | FOOTING PLAN |
| * 11 | 11429 | BENTS NO.1 & NO.4 EB & WB RDWYS. DETAILS |
| * 12 | 11430 | BENTS NO.1 & NO.4 EB & WB RDWYS. ELEVATIONS |
| * 13 | 11431 | BENTS NO.2 & NO.3 EB & WB RDWYS. DETAILS |
| * 14 | 11432 | BENTS NO.2 & NO.3 EB & WB RDWYS. ELEVATIONS |
| * 15 | 11433 | ERECTION PLAN EB & WB RDWYS. |
| * 16 | 11434 | GENERAL LAYOUT AT STA. 505+75.00 |
| * 17 | 11435 | FOOTING PLAN |
| * 18 | 11436 | ABUTMENTS NO.1 & NO.4 & BENTS NO.2 & NO.3 E.B. RDWY. |
| * 19 | 11437 | ABUTMENTS NO.1 & NO.4 & BENTS NO.2 & NO.3 W.B. RDWY. |
| * 20 | B-A Rev.(3-31-72) | STANDARD PRESTRESSED CONCRETE BEAM — TYPE A |
| * 21 | FSA 10 Rev.(12-29-72) | STANDARD ABUTMENT FOR THREE SPAN CONTINUOUS FLAT SLAB — 10-0 FT. WINGWALL |
| * 22 | FSA 15 Rev.(12-29-72) | STANDARD ABUTMENT FOR THREE SPAN CONTINUOUS FLAT SLAB — 15-0 FT. WINGWALL |
| * 23 | FSB 30 Rev.(12-29-72) | STANDARD INTERMEDIATE BENT FOR THREE SPAN CONTINUOUS FLAT SLAB |
| * 24 | SBR-T5 Rev.(12-29-72) | STANDARD STEEL BRIDGE RAIL TYPE NO.5 |
| * 25 | SL-1 Rev(12-29-72). | STANDARD SLAB, CURB, DIAPHRAGM, & END POST DETAILS |
| * 26 | SL-2 Rev.(12-29-72) | STANDARD FLAT SLAB & CURB DETAILS FOR THREE SPAN CONTINUOUS |

FINAL ~~ESTIMATED~~ BRIDGE PLAN QUANTITIES

| | LOCATION | LENGTH IN FEET | REINFORCING STEEL LBS | STRUCTURAL STEEL LUMP SUM | CLASS "AA" CONCRETE CU. YDS. | PRESTRESSED BEAMS TYPE A EACH 30' | 35' | 45' | 50' | 55' | 60' | 70' | STEEL BRIDGE RAIL TYPE 5 LIN. FT. | TREATED TIMBER PILES FURNISHING LIN. FT. | DRIVING LIN. FT. | TREATED TIMBER TEST PILE LUMP SUM | PREBORE HOLES FOR PILES LIN. FT. | STEEL BEARING PILES FURNISHING LIN. FT. | DRIVING LIN. FT. | PROTECTIVE COATING SQ. YDS. | STRUCTURE EXCAVATION TYPE I CU. YDS. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STRUCTURE AT STA. 181+50.00 EASTBOUND ROADWAY | BENT NO.1 | | 2,341 | | 38.0 | | | | | | | | | 650 | 377 | | 20 | | | | ~~30~~ |
| | BENT NO.2 | | 4,889 | | 39.7 | | | | | | | | | 875 | 865 | | | | | | 140 |
| | BENT NO.3 | | 4,649 | .17 | 38.0 | | | | | | | | | 875 | 862 | | | | | | 130 |
| | BENT NO.4 | | 2,341 | | 38.0 | | | | | | | | | 650 | 468 | | 13 | | | | 30 |
| | SUPERSTRUCTURE | 133.00 | 58,883 | | 162.2 | 5 | | 5 | | 5 | | | 256.67 | | | | | | | 688.9 | |
| | SUBTOTAL | 133.00 | 73,003 | .17 | 455.9 | 5 | | 5 | | 5 | | | 256.67 | 3050 | 2569 | | 33 | | | 688.9 | 330 |
| STRUCTURE AT STA. 181+50.00 WESTBOUND ROADWAY | BENT NO.1 | | 2,386 | | 38.0 | | | | | | | | | 845 | 442 | | 30 | | | | 30 |
| | BENT NO.2 | | 6,677 | | 62.9 | | | | | | | | | 1120 | 1106 | | | | | | 110 |
| | BENT NO.3 | | 6,372 | .17 | 60.0 | | | | | | | | | 1120 | 1106 | | | | | | 105 |
| | BENT NO.4 | | 2,333 | | 38.0 | | | | | | | | | 845 | 507 | | 25 | | | | 30 |
| | SUPERSTRUCTURE | 178.00 | 75,727 | | 212.3 | | | 5 | | | 5 | 6 | 346.67 | | | | | | | 919.1 | |
| | SUBTOTAL | 178.00 | 93,495 | .17 | 411.2 | | | 5 | | | 5 | 6 | 346.67 | 3930 | 3161 | | 55 | | | 919.1 | 275 |
| * THIS CONTRACT ONLY STRUCTURE AT STA. 325+00.00 EASTBOUND ROADWAY | BENT NO.1 | | 1,998 | | ~~26.1~~ | | | | | | | | | | | | | 328.7 ~~360~~ | 322.7 ~~354.0~~ | | ~~8.62 20~~ |
| | BENT NO.2 | | 5,311 | | 43.088 ~~43.1~~ | | | | | | | | | | | | | 365.2 ~~480~~ | 357.2 ~~474.0~~ | | 115.19 ~~105~~ |
| | BENT NO.3 | | 5,311 | .249 LS = | 43.088 ~~43.1~~ | | | | | | | | | | | | | 455.6 ~~480~~ | 449.6 ~~474.0~~ | | 24.38 ~~100~~ |
| | BENT NO.4 | | 1,998 | @ $747 | ~~26.1~~ | | | | | | | | | | | | | 320.2 ~~360~~ | 314.2 ~~354.0~~ | | 21.98 ~~20~~ |
| | SUPERSTRUCTURE | 123.00 | 54,446 | = $747 = | 149.5 ~~149.5~~ | | 10 | | 5 | | | | 236.67 | | | | | | | 637.2 ~~637~~ | |
| | SUBTOTAL | 123.00 | 69,064 | .249 LS = | 287.794 ~~287.9~~ | | 10 | | 5 | | | | 236.67 | | | | | 1569.7 ~~1680~~ | 1545.7 ~~1656.0~~ | 637.2 ~~637~~ | 270.17 ~~245~~ |
| STRUCTURE AT STA. 325+00.00 WESTBOUND ROADWAY | BENT NO.1 | | 1,998 | | 26.065 ~~26.1~~ | | | | | | | | | | | | | 339.3 ~~360~~ | 333.3 ~~354.0~~ | | 213 ~~20~~ |
| | BENT NO.2 | | 5,311 | | 43.088 ~~43.1~~ | | | | | | | | | | | | | 356.9 ~~480~~ | 350.9 ~~474.0~~ | | 15.36 ~~105~~ |
| | BENT NO.3 | | 5,311 | .249 LS = | 43.088 ~~43.1~~ | | | | | | | | | | | | | 461.1 ~~480~~ | 455.1 ~~474.0~~ | | 23.52 ~~100~~ |
| | BENT NO.4 | | 1,998 | @ $747 | 26.065 ~~26.1~~ | | | | | | | | | | | | | 333.7 ~~360~~ | 327.7 ~~354.0~~ | | 21.45 ~~20~~ |
| | SUPERSTRUCTURE | 123.00 | 54,446 | = $747 = | 149.5 ~~149.5~~ | | 10 | | 5 | | | | 236.67 | | | | | | | 637.2 ~~637~~ | |
| | SUBTOTAL | 123.00 | 69,064 | .249 LS = | 287.794 ~~287.9~~ | | 10 | | 5 | | | | 236.67 | | | | | 1591.0 ~~1680~~ | 1567.0 ~~1656.0~~ | 637.2 ~~637~~ | 262.66 ~~245~~ |
| STRUCTURE AT STA. 505+75.00 EASTBOUND ROADWAY | ABUTMENT NO.1 | | ~~4,938.8 4,940~~ | @ $747 = | 44.021 ~~44.0~~ | | | | | | | | | | | | | 234.8 ~~255~~ | 227.8 ~~248.0~~ | | 105.74 ~~110~~ |
| | BENT NO.2 | | ~~4,087.64 4,100~~ | | 22.747 ~~22.5~~ | | | | | | | | | | | | | 210.5 ~~180~~ | 206.0 ~~175.5~~ | | 47.76 ~~50~~ |
| | BENT NO.3 | | ~~4,087.64 4,100~~ | .251 LS = | 22.747 ~~22.5~~ | | | | | | | | | | | | | 204.6 ~~135~~ | 200.1 ~~130.5~~ | | 47.76 ~~50~~ |
| | ABUTMENT NO.4 | | ~~4,938.8 4,940~~ | @ $753 = | 44.017 ~~44.0~~ | | | | | | | | | | | | | 169.3 ~~185~~ | 162.3 ~~178.0~~ | | 94.60 ~~110~~ |
| | SUPERSTRUCTURE | 78.00 | ~~36,960 36,982~~ | @ $753 = | 173.262 ~~173.8~~ | | | | | | | | 201.33 ~~201.36~~ | | | | | | | 421 ~~423~~ | |
| | SUBTOTAL | 78.00 | ~~55,013 55,082~~ | .251 LS = | 306.779 ~~306.8~~ | | | | | | | | 201.33 ~~201.36~~ | | | | | 819.2 ~~755~~ | 776.2 ~~732.0~~ | 460.9 ~~423~~ | 295.86 ~~320~~ |
| STRUCTURE AT STA. 505+75.00 WESTBOUND ROADWAY | ABUTMENT NO.1 | | ~~3,296~~ | | 33.437 ~~33.4~~ | | | | | | | | | | | | | 292.0 ~~290~~ | 285.0 ~~283.0~~ | | 80.46 ~~90~~ |
| | BENT NO.2 | | ~~3,882~~ | | 21.772 ~~21.5~~ | | | | | | | | | | | | | 124.7 ~~180~~ | 120.2 ~~175.5~~ | | 14.54 ~~45~~ |
| | BENT NO.3 | | ~~4,164~~ | .251 LS = | 22.763 ~~22.5~~ | | | | | | | | | | | | | | | | 5.31 ~~45~~ |
| | ABUTMENT NO.4 | | ~~4,751~~ | @ $753 = | 45.349 ~~45.4~~ | | | | | | | | | | | | | | | | 109.74 ~~115~~ |
| | SUPERSTRUCTURE | 78.00 | ~~36,960 36,982~~ | @ $753 = | 173.262 ~~173.8~~ | | | | | | | | 191.33 | | | | | | | 418.0 ~~421~~ | |
| | SUBTOTAL | 78.00 | ~~53,047 53,075~~ | .251 LS = | 296.583 ~~296.6~~ | | | | | | | | 191.33 | | | | | 416.7 ~~470~~ | 405.2 ~~458.5~~ | 418.0 ~~421~~ | 286.05 ~~295~~ |
| | TOTAL | 402.00 | ~~246,265~~ | 1.000 LS = | ~~1179.2~~ | | 20 | | 10 | | | | 866.00 ~~866.03~~ | | | | | 4396.6 ~~4585~~ | 4344.1 ~~4502.5~~ | 2113.4 ~~2118~~ | 1174.74 ~~1176~~ |
| | | | 246,188.235 | $3000 = $1178.962 | | | | | | | | | | | | | | | | | |

MOBILIZATION:

STRUCTURES @ STA. 325+00
0.080 L.S. = $28,000.00

STRUCTURES @ STA. 505+75
0.090 L.S. = $31,500.00

DRAWN BY: G.A.P. 11/8/74 CHECKED BY: N.H.R. 5/9/75

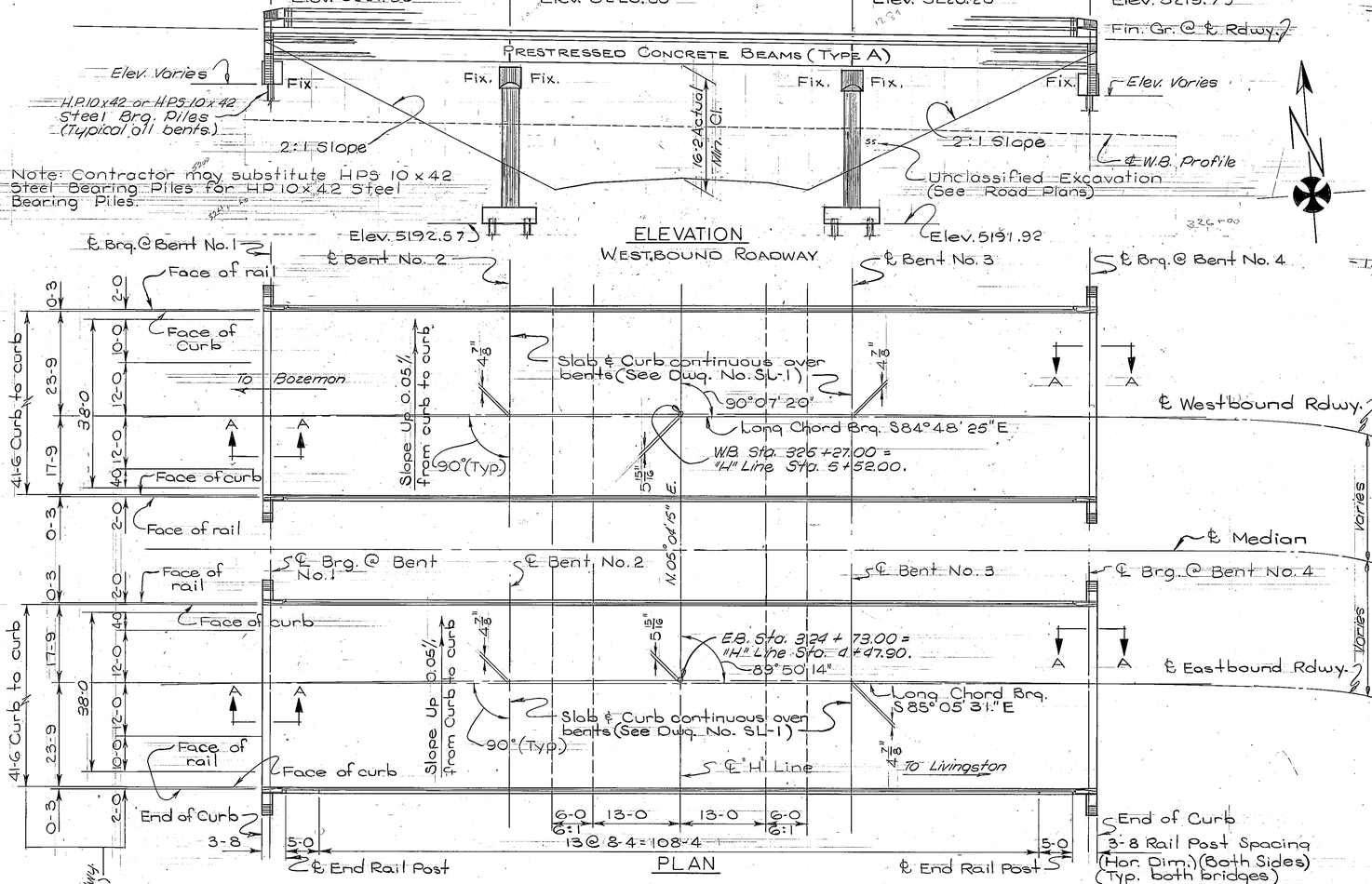
Hes.

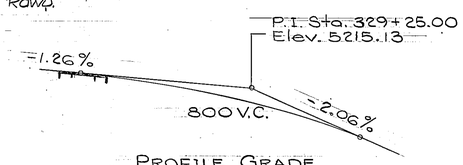
DRAWING NO. 11,427 Q

| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | I-90-7(36)321 | 9 | 26 |

Note: For location of utilities see appropriate road plan sheet

Note: The Contractor may substitute Class "DD" concrete for Class "AD" concrete, however, all concrete shall be bid as Class "AD" concrete unless the State specifies otherwise.




PROFILE GRADE
WESTBOUND RDWY.
NO SCALE

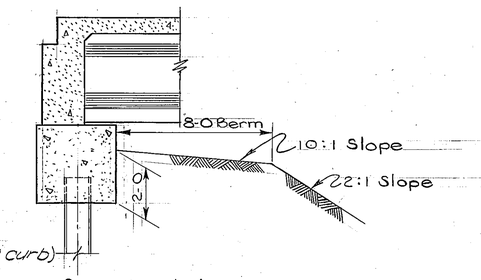



PROFILE GRADE
EASTBOUND RDWY.
NO SCALE

* THIS CONTRACT: IM 0002(753)
EB & WB Roadway slabs replaced and new barrier rail added. See Dwg. No. 19224-19226.




PROFILE GRADE "H" LINE
NO SCALE




SECTION A-A
Scale: 3/8" = 1'-0"

CURVE DATA (EACH RDWY.)

| | |
|---|---|
| Δ | = 38° 35' Rt. |
| $\Delta_c$ | = 35° 35' |
| $D_c$ | = 1° 30' |
| $\Theta_s$ | = 1° 30' |
| $L_s$ | = 200.0' |
| $T_s$ | = 1437.2 |
| $L_c$ | = 2372.2 |
| $T_s$ | = 227.8 |
| R | = 3820.0 |
| S | = 0.05% |

⚠ THIS CONTRACT IM 90-6 (128) 318 HMWM
See Dwg No 20879

## NOTES

**LIVE LOAD:** STANDARD HS20-44 LOADING OR ALTERNATE LOADING. ALTERNATE LOADING FOR BRIDGES AND FLOOR SYSTEMS WITH SPANS UNDER 40 FEET CONSISTS OF TWO AXLES FOUR FEET APART WITH EACH AXLE WEIGHING 24,000 LBS.

**FINISHED GRADE:** Finished plan grade of Bridge at ℄ Roadway as shown on plan is 0.96 Ft. above profile grade shown on Road Plans due to 0.05 ⅛ crown.

**SPECIFICATIONS:** MONTANA STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1970 EDITION, AND ANY AMENDMENTS THERETO, AND SPECIAL PROVISIONS SHALL GOVERN UNLESS OTHERWISE NOTED, DESIGN PREPARED IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATIONS, 1973 EDITION, AND ANY AMENDMENTS THERETO.

**CAST IN PLACE CONCRETE:** UNLESS OTHERWISE APPROVED, ALL CONCRETE SHALL BE CLASS "AD", AN "AIR ENTRAINING AGENT" SHALL BE ADDED TO ALL CONCRETE EXCEPT CLASS"AS".CHAMFER ALL EXPOSED EDGES OF CONCRETE WITH ENCLOSED ANGLE LESS THAN 120°, 3/4" AND FILLET ENTRANT ANGLES 3/4" UNLESS OTHERWISE NOTED. ALL FORMS FOR DECK SLAB SHALL BE REMOVED.

**STRUCTURAL STEEL:** ALL STRUCTURAL STEEL SHALL BE MEASURED AND PAID FOR ON THE LUMP SUM BASIS AS SET FORTH IN THE STANDARD SPECIFICATIONS. ESTIMATED WEIGHT = 1050 POUNDS.

FOR REQUIREMENTS GOVERNING THE FABRICATION OF "STRUCTURAL STEEL" SEE THE STANDARD SPECIFICATIONS. TO AVOID OVERSIGHT THESE REQUIREMENTS SHALL BE CLEARLY NOTED ON THE SHOP DRAWINGS.

STRUCTURAL STEEL SHALL RECEIVE ONE (1) SHOP COAT OF RED LEAD OR BASIC LEAD SILICO CHROMATE PRIMER AND TWO (2) FIELD COATS CONSISTING OF FIRST FIELD OR PRIMER COAT AND ONE(1) COAT OF ALUMINUM PAINT AS SPECIFIED IN THE STANDARD SPECIFICATIONS.

**APPROVAL:** SHOP PLANS SHALL BE APPROVED BY THE STATE OF MONTANA, DEPARTMENT OF HIGHWAYS BEFORE FABRICATION IS BEGUN.

**SETTING OF MASONRY PLATES:** CARE SHALL BE TAKEN IN PLACING REINFORCING STEEL SO AS TO CLEAR ANCHOR BOLTS. MASONRY PLATES SHALL BE PLACED ON THREE LAYERS OF CANVAS THOROUGHLY SWABBED WITH RED LEAD AS CALLED FOR IN THE STANDARD SPECIFICATIONS. THE CONTRACTOR SHALL FINISH CONCRETE UNDER MASONRY PLATES TO THE EXACT ELEVATION SHOWN. BUSH HAMMERING WILL BE PERMITTED AND USED ONLY AS A MEANS OF LEVELING THE CONCRETE SURFACE TO ASSURE FULL AND LEVEL BEARING AND TO REMOVE LAITANCE. LOOSE AND FOREIGN MATERIAL. STEEL SHIMS SHALL BE USED TO BRING THE MASONRY PLATES UP TO GRADE IF NECESSARY. STEEL SHIMS SHALL BE THE SAME SIZE EXCEPT FOR THICKNESS, AS THE MASONRY PLATE. MINIMUM THICKNESS OF ANY SHIMS SHALL BE 1/8". THE COST OF BUSH HAMMERING AND SHIMS, IF ANY, SHALL BE INCLUDED IN THE UNIT PRICES BID FOR CLASS "AD" CONCRETE.

**BACKFILL:** THE BACKFILL AT END BENTS MAY BE COMPLETE UP TO THE BOTTOMS OF THE BACKWALLS BEFORE SUPERSTRUCTURE IS IN PLACE. THE BACKFILL AGAINST THE BACKWALLS SHALL NOT BE PLACED UNTIL AFTER THE CONCRETE ROADWAY SLAB HAS BEEN PLACED.

**FOOTINGS:** ELEVATIONS SHOWN FOR BOTTOM OF FOOTINGS ARE APPROXIMATE ONLY. FINAL ELEVATIONS TO BE DETERMINED BY THE ENGINEER.

**PROTECTIVE COATING:** DECK, CURBS AND CONCRETE END POSTS SHALL BE GIVEN A PROTECTIVE COATING OF BOILED LINSEED OIL. "SEE STANDARD SPECIFICATIONS".

**COVERING:** THE MINIMUM COVERING, MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF ANY REINFORCEMENT BAR, SHALL BE NOT LESS THAN 2 INCHES EXCEPT AS FOLLOWS OR OTHERWISE NOTED:

| | |
|---|---|
| BOTTOM OF SLAB | 1 INCH |
| STIRRUPS AND TIES | 1½ INCHES |

IN ALL FOOTINGS AND PIER SHAFTS, THE MINIMUM COVERING SHALL BE 3 INCHES.

Note: For Sequence of Work see Special Provisions.

MAINTENANCE OF TRAFFIC: For Maintenance of Traffic see Special Provisions.

Note: Slab and curbs to be constructed on concentric curves parallel to the ℄ curves of each roadway.

Note: Structure Excavation for Bents No. 2 and No. 3 E.B. and W.B. Rdwys. shall be computed from below the limits of the Unclassified Excavation.

| | | |
|---|---|---|
| DESIGNED | | |
| DRAWN | 10-3-69 | K.H.L. |
| CHECKED | 4-8-75 | N.E.R. |
| APPROVED | MAY. 1973 | Hes. |
| REVISED | 9-17-04 | T.J.B. |
| REVISED | 3-19-10 | DGG |

# STATE OF MONTANA
## DEPARTMENT OF HIGHWAYS

HOPPER INTERCHANGE
AT STA. 325+00.00
FEDERAL AID PROJECT NO. I-90-7(36)321
PARK COUNTY
GENERAL LAYOUT

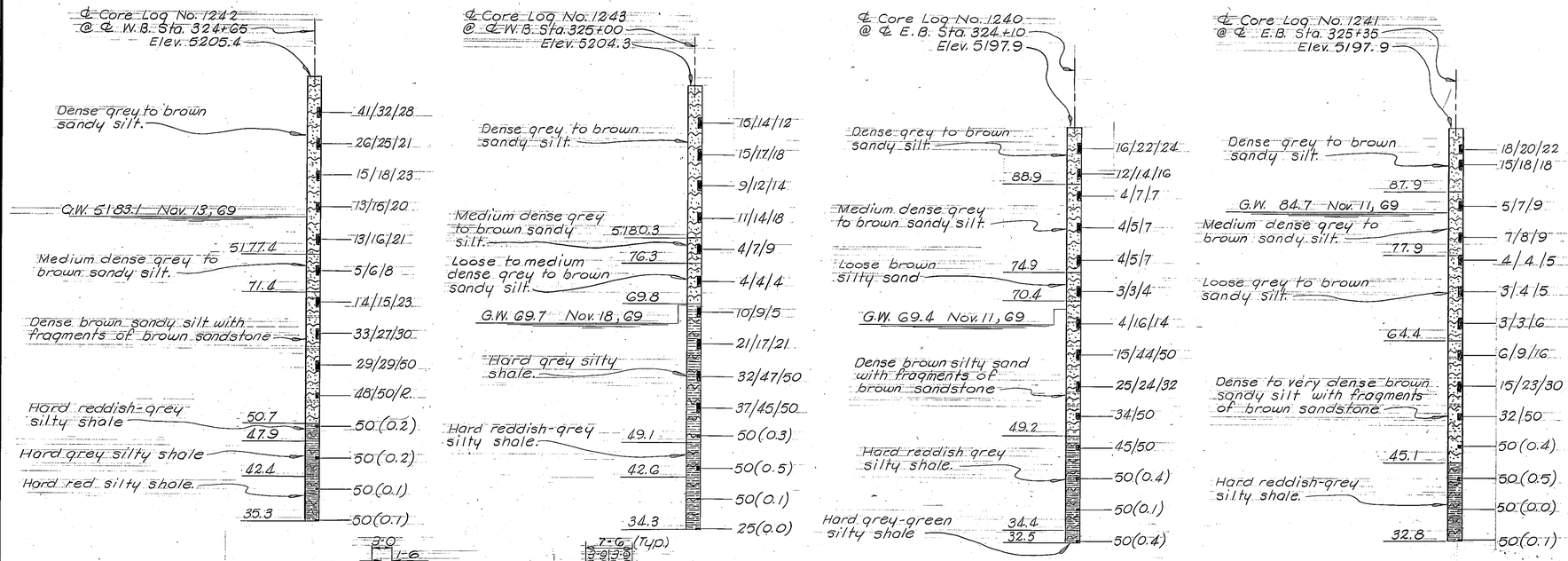
Scale: 1" = 10'-0" (Except as noted)

DRAWING NO. 11427

Hes.

K&E 19 1133 3-69

| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | F-90-7(36)321 | 10 | 26 |




FOOTING PLAN
SCALE 1" = 10'-0"

Note: Dimensions shown on Bent No. 2 W.B. Rdwy. are typical for all intermediate bents.

Note: Dimensions shown on Bent No. 1 W.B. are typical for all other end bents.

Note: Substructure to be constructed parallel to the Long Chord of each Roadway.

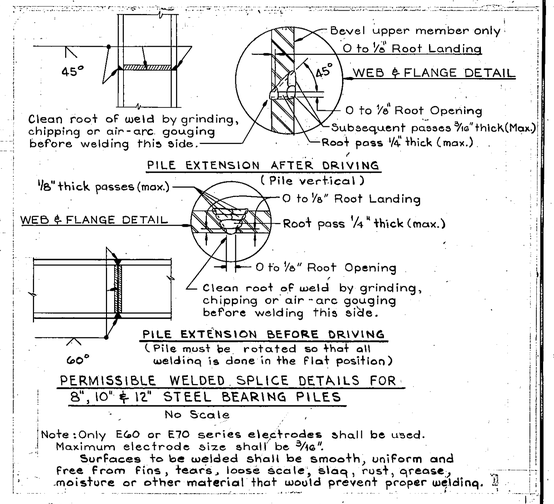
NOTES

SOILS AND FOUNDATION MATERIALS: BORINGS WERE TAKEN BY THE STATE OF MONTANA, DEPARTMENT OF HIGHWAYS AT THE POINTS SHOWN ON THE GENERAL LAYOUT OR FOOTING PLAN.

THE SERIES OF NUMBERS SHOWN ON THE LOG OF BORINGS INDICATES THE NUMBER OF BLOWS PER 6" PENETRATION FOR EACH NUMBER OF THE SERIES OF A 2" SAMPLE TUBE WHICH WAS DRIVEN IN ACCORDANCE WITH THE STANDARD PENETRATION TEST MADE WITH A 2" SPLIT TUBE SAMPLER USING A 140# HAMMER HAVING A 30" DROP. THE TOTAL PENETRATION OF THE SAMPLER TUBE IS INDICATED ON THE CORE LOGS AFTER EACH SERIES IF 6" PENETRATION WAS NOT ACHIEVED IN 50 BLOWS.

THE STATE OF MONTANA, DEPARTMENT OF HIGHWAYS DOES NOT ASSUME ANY RESPONSIBILITY FOR ANY VARIATION OR MISINTERPRETATION OF THE CLASSES OF MATERIALS, AND ADJUSTMENT IN BID PRICES WILL NOT BE MADE IF THE MATERIALS FOUND DO NOT AGREE WITH THOSE SHOWN IN THE LOG OF BORINGS.

FOUNDATION PILES: FOR BIDDING PURPOSES ONLY, PILE LENGTHS HAVE BEEN ESTIMATED AS SHOWN ON DRAWINGS.




PERMISSIBLE WELDED SPLICE DETAILS FOR 8", 10" & 12" STEEL BEARING PILES

No Scale

Note: Only E60 or E70 series electrodes shall be used. Maximum electrode size shall be 5/16". Surfaces to be welded shall be smooth, uniform and free from fins, tears, loose scale, slag, rust, grease, moisture or other material that would prevent proper welding.

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS
HOPPER INTERCHANGE
AT STA. 325+00.00
FEDERAL AID PROJECT NO. I-90-7(36) 321
PARK COUNTY
FOOTING PLAN

SCALE:- AS NOTED

| | | |
|---|---|---|
| DESIGNED | | |
| DRAWN | O.E. M.J.H.F. | 12-18-69 |
| TRACED | | |
| CHECKED | N.H.R. | 4-8-75 |
| REVISED | | |
| REVISED | | |

DRAWING NO. 11428

KAE 19 1153 3-69

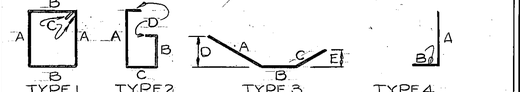
| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | I-90-7(36)321 | 11 | 26 |

# BILL OF REINFORCING STEEL

(One Bent Only)

STRAIGHT BARS

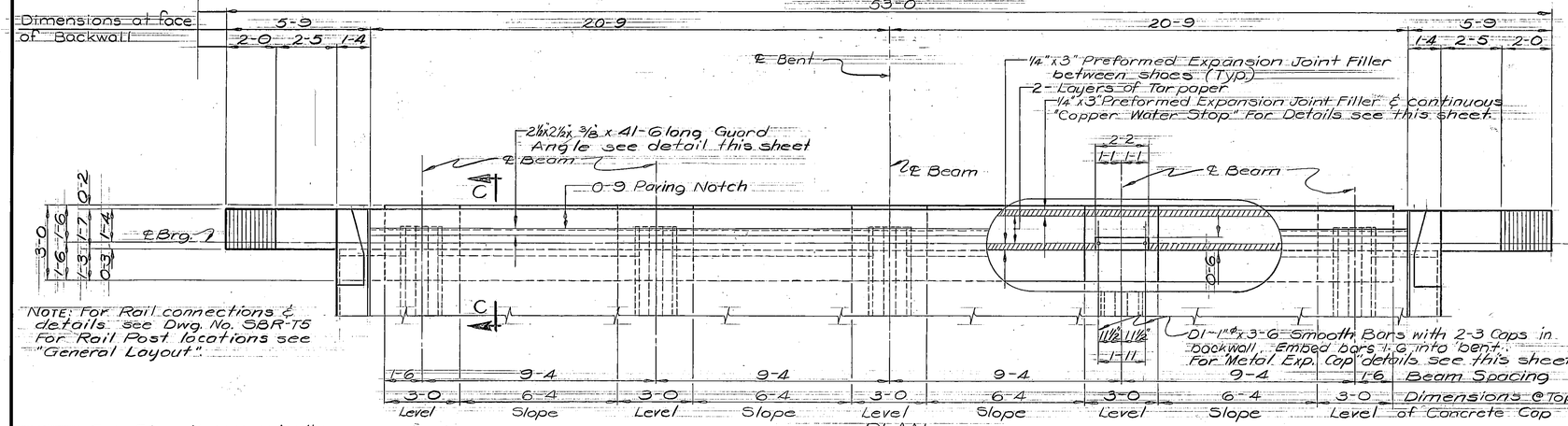
| MARK | SIZE | No. | LENGTH |
|---|---|---|---|
| BW1 | #6 | 2 | 43'-7" |
| BW2 | 6 | 4 | 27'-1 |
| BW3 | 6 | 2 | 26'-11 |
| BW4 | 6 | 2 | 25'-9 |
| BW5 | 4 | 12 | 7'-8 |
| BW6 | 4 | 4 | 7'-4 |
| BW7 | 6 | 5 | 4'-6 |
| BW8 | 4 | 4 | 6'-10 |
| BW9 | 4 | 2 | 6'-8 |
| BW10 | 4 | 2 | 5'-3 |
| BW11 | 4 | 4 | 3'-4 |
| BW12 | 4 | 4 | 2'-0 |
| B1 | 6 | 8 | 40'-0 |
| B2 | #4 | 2 | 40'-0 |




BENT BARS (All dimensions are out to out)

| MARK | SIZE | No. | TYPE | LENGTH | A | B | C | D | E |
|---|---|---|---|---|---|---|---|---|---|
| BW13 | #4 | 2 | 3 | 7'-5" | 3'-7" | 2'-1" | 1'-9" | 1'-7" | 1'-7" |
| BW14 | 4 | 4 | 3 | 8'-1 | 4'-3 | 2'-1 | 1'-9 | 1'-10 | 1'-7 |
| BW15 | 4 | 6 | 3 | 8'-4 | 1'-0 | 6'-7 | 0'-9 | 0'-10 | 0'-5 |
| BW16 | 4 | 2 | 1 | 9'-3 | 3'-0 | 1'-3 | 0'-4½ | | |
| BW17 | 4 | 2 | 1 | 11'-9 | 4'-3 | 1'-3 | 0'-4½ | | |
| BW18 | 4 | 2 | 1 | 13'-3 | 5'-0 | 1'-3 | 0'-4½ | | |
| BW19 | 4 | 2 | 1 | 14'-9 | 5'-9 | 1'-3 | 0'-4½ | | |
| BW20 | 4 | 2 | 1 | 16'-3 | 6'-6 | 1'-3 | 0'-4½ | | |
| BW21 | 4 | 2 | 2 | 14'-2 | 6'-8 | 5'-8 | 1'-3 | 0'-3½ | |
| BW22 | 4 | 34 | 2 | 8'-6 | 3'-10 | 2'-10 | 1'-3 | 0'-3½ | |
| BW23 | 4 | 31 | 4 | 4'-0 | 2'-0 | 2'-0 | | | |
| * D1 | 1"sm | 10 | 3'-6 | | | | | | |
| B3 | #4 | 41 | 1 | 11'-8 | 2'-7 | 2'-8 | 0'-4½ | | |

* D1-1" ϕ Smooth bars shall conform to A.S.T.M. A-36 Steel.




PLAN

NOTE: For Rail connections & details see Dwg. No. SBR-T5 For Rail Post locations see "General Layout."

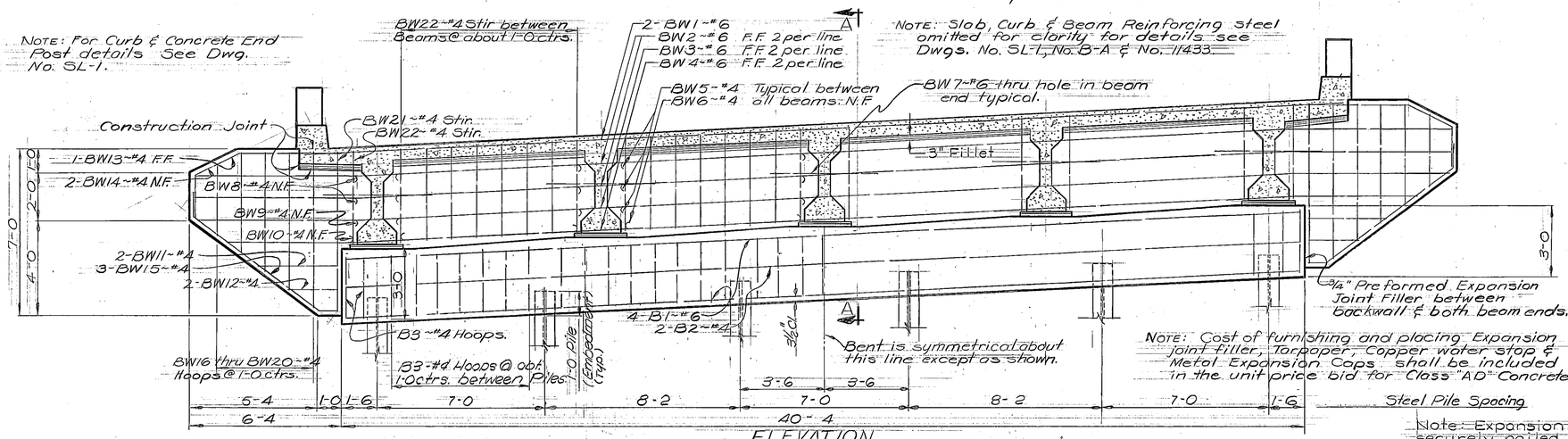
NOTE: For Elevations and other dimensions see Dwg. No. 11430.

NOTE: F.F. Denotes Fill Face
N.F. Denotes Near Face

NOTE: The beam seat areas shall be finished level to the elevations given on Dwg. No. 11430. The areas between beam seats shall be sloped uniformly as required.

NOTE: For Curb & Concrete End Post details See Dwg. No. SL-1.

NOTE: Slab, Curb & Beam Reinforcing steel omitted for clarity for details see Dwgs. No. SL-1, No. B-A & No. 11433.



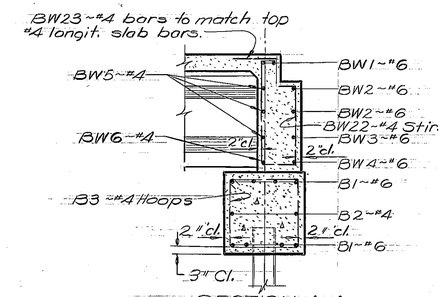

ELEVATION

Bent No.1, W.B. & E.B. (Back on Line) Shown
Bent No.4, W.B. & E.B. (Ahead on Line) Similar

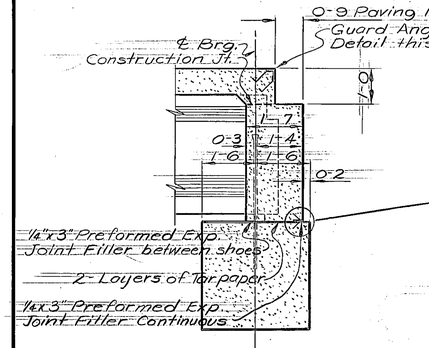
NOTE: Maximum Pile Pressure Under: D.L.+L.L.= 42.0 tons per pile.

NOTE: Expansion Joint Filler to be securely nailed to concrete and held in accurate position while pouring.

NOTE: Cost of furnishing and placing Expansion Joint Filler, Tarpaper, Copper water stop & Metal Expansion Caps shall be included in the unit price bid for Class "AD" Concrete

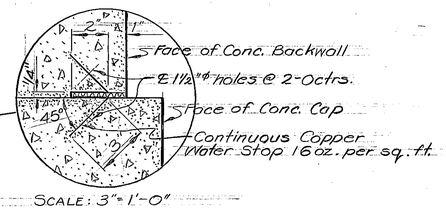



SECTION A-A

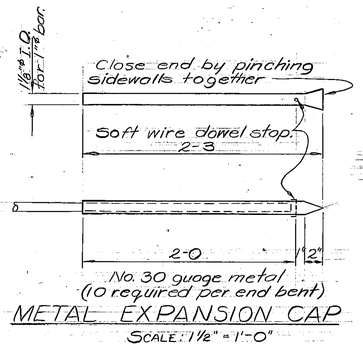



SECTION C-C

SCALE: 1/2"=1'-0"



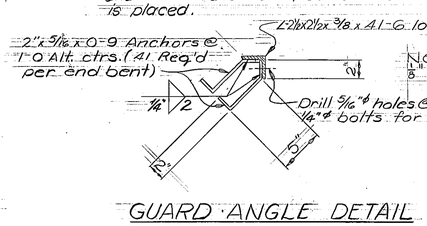

SCALE: 3"=1'-0"




METAL EXPANSION CAP

SCALE: 1½"=1'-0"

NOTE: Guard Angle may be provided in 2 (two) pieces with end Anchor 0'-6 max. from each end in which case they shall be field welded together and held in accurate position while concrete is placed.




GUARD ANGLE DETAIL

SCALE: 1½"=1'-0"

Note: Guard Angles to be set 5" low.

# STATE OF MONTANA
## DEPARTMENT OF HIGHWAYS

HOPPER INTERCHANGE

AT STA. 325+00.00

FEDERAL AID PROJECT NO. I-90-7(36)321

PARK COUNTY

BENTS NO.1 & NO.4 EB & WB RDWYS. DETAILS

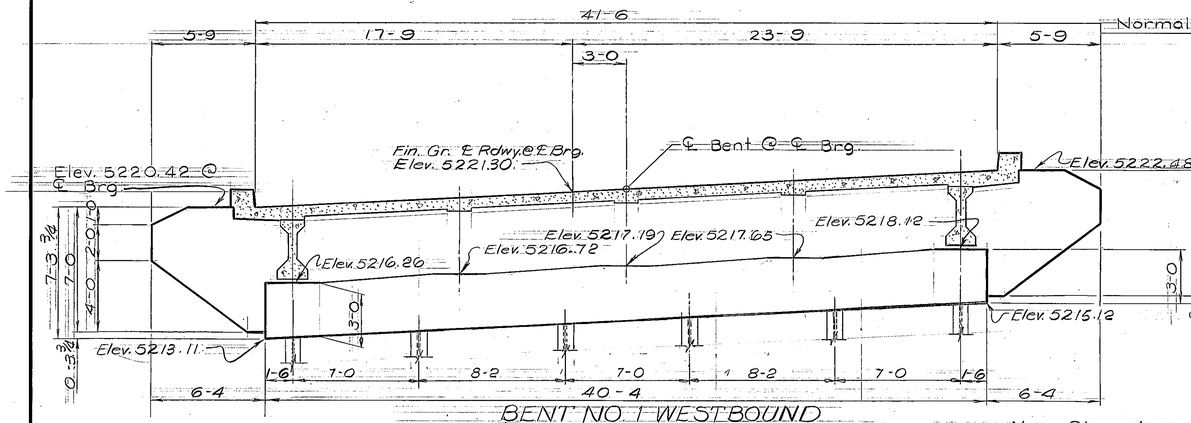
SCALE 3/8"=1'-0" ℄ AS SHOWN

DRAWING NO. 11429

| | | |
|---|---|---|
| DESIGNED | 11-22-72 | J.J.Z. |
| DRAWN | 12-21-72 | G.A.P. |
| CHECKED | | |
| REVISED | | |
| REVISED | | |
| REVISED | | |

HES.

| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | I-90-7(36)321 | 12 | 26 |

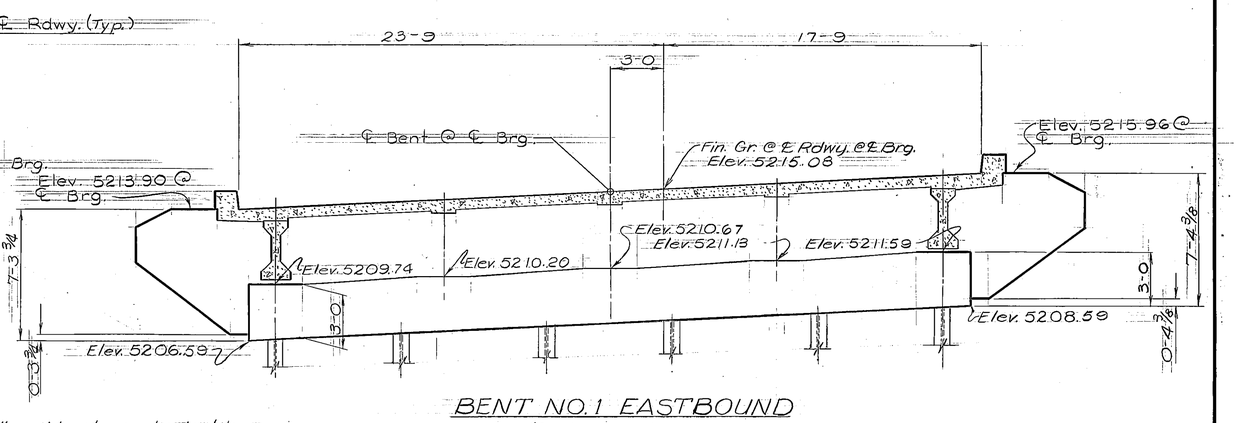



BENT NO. 1 WESTBOUND

Back on Line

Estimated length of pile = 60 ft.

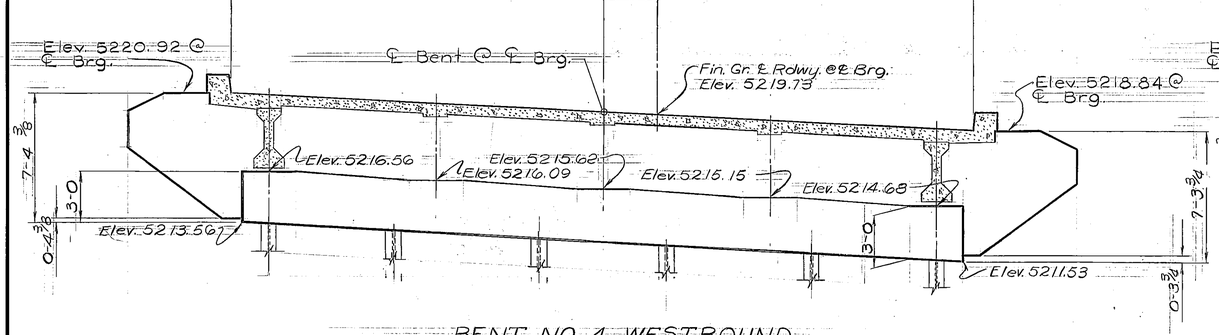
Note: Dimensions for all end bents are typical to those shown on Bent No. 1 Westbound except as shown individually.




BENT NO. 1 EASTBOUND

(Back on Line)

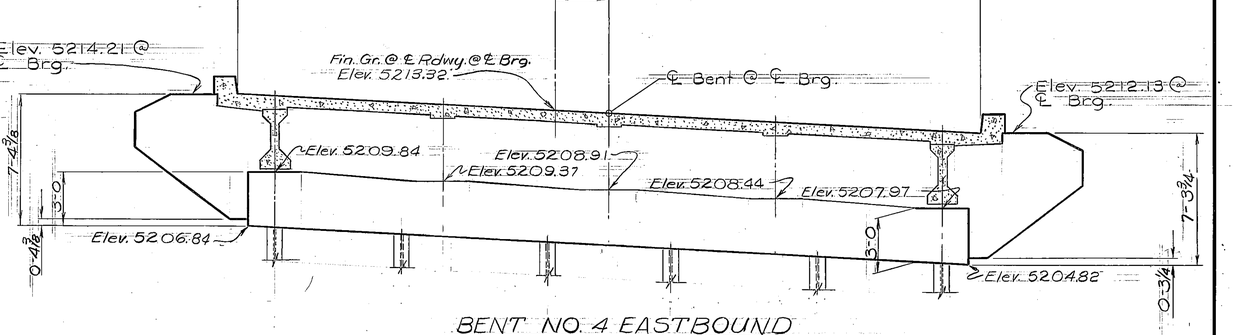
Estimated length of pile = 60 ft.




BENT NO. 4 WESTBOUND

Ahead on Line

Estimated length of pile = 60 ft.




BENT NO. 4 EASTBOUND

(Ahead on Line)

Estimated length of pile = 60 ft.

STATE OF MONTANA

**DEPARTMENT OF HIGHWAYS**

HOPPER INTERCHANGE

AT STA. 325+00.00

FEDERAL AID PROJECT NO. I-90-7(36)321

PARK COUNTY

BENTS NO. 1 & NO. 4 EB & WB RDWYS. ELEVATIONS

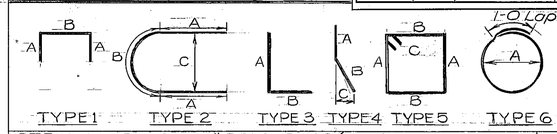
| | | |
|---|---|---|
| DESIGNED | 11-22-72 | J.J.Z. |
| DRAWN | 12-24-72 | G.A.P. |
| CHECKED | 4-8-75 | N.H.R. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

DRAWING NO. 11430

HES.

# BILL OF REINFORCING STEEL (One Bent only)

| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | I-90-7(36)321 | 73 | 26 |

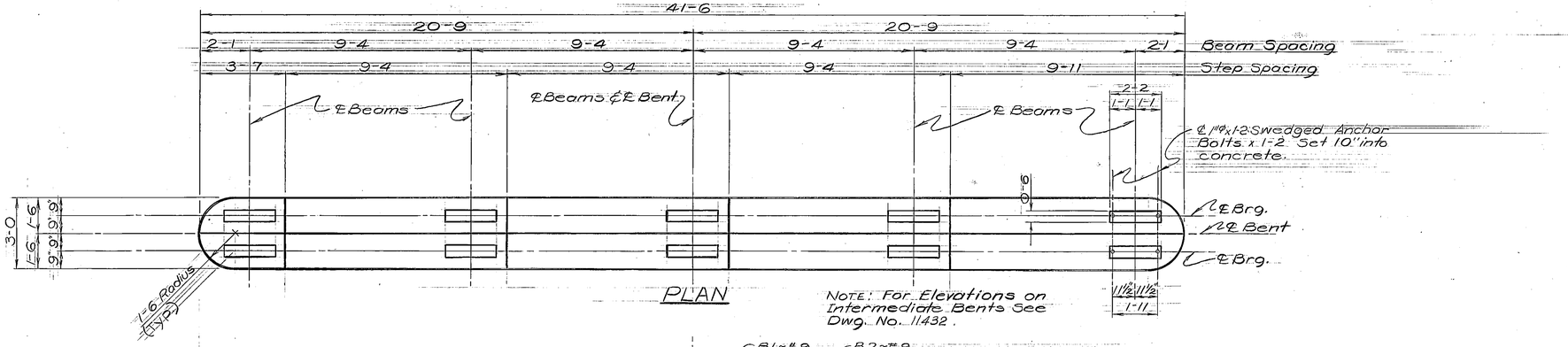



## STRAIGHT BARS

| MARK | SIZE | No. | LENGTH |
|---|---|---|---|
| B 1 | #9 | 2 | 38'-6" |
| B 2 | 9 | 2 | 40'-10" |
| B 3 | 9 | 8 | 12'-3 |
| B 4 | 4 | 2 | 38'-6 |
| B 5 | 9 | 7 | 33 6 |
| B 6 | 4 | 9 | 3'-0 |
| | | | |
| C 1 | 8 | 9 | 21'-0 |
| C 2 | 8 | 9 | 20'-3 |
| C 3 | 8 | 9 | 19'-6 |
| | | | |
| D 1 | 8 | 27 | 4'-0 |
| | | | |
| F 1 | #6 | 90 | 7'-0 |

## BENT BARS (All dimensions are out to out)

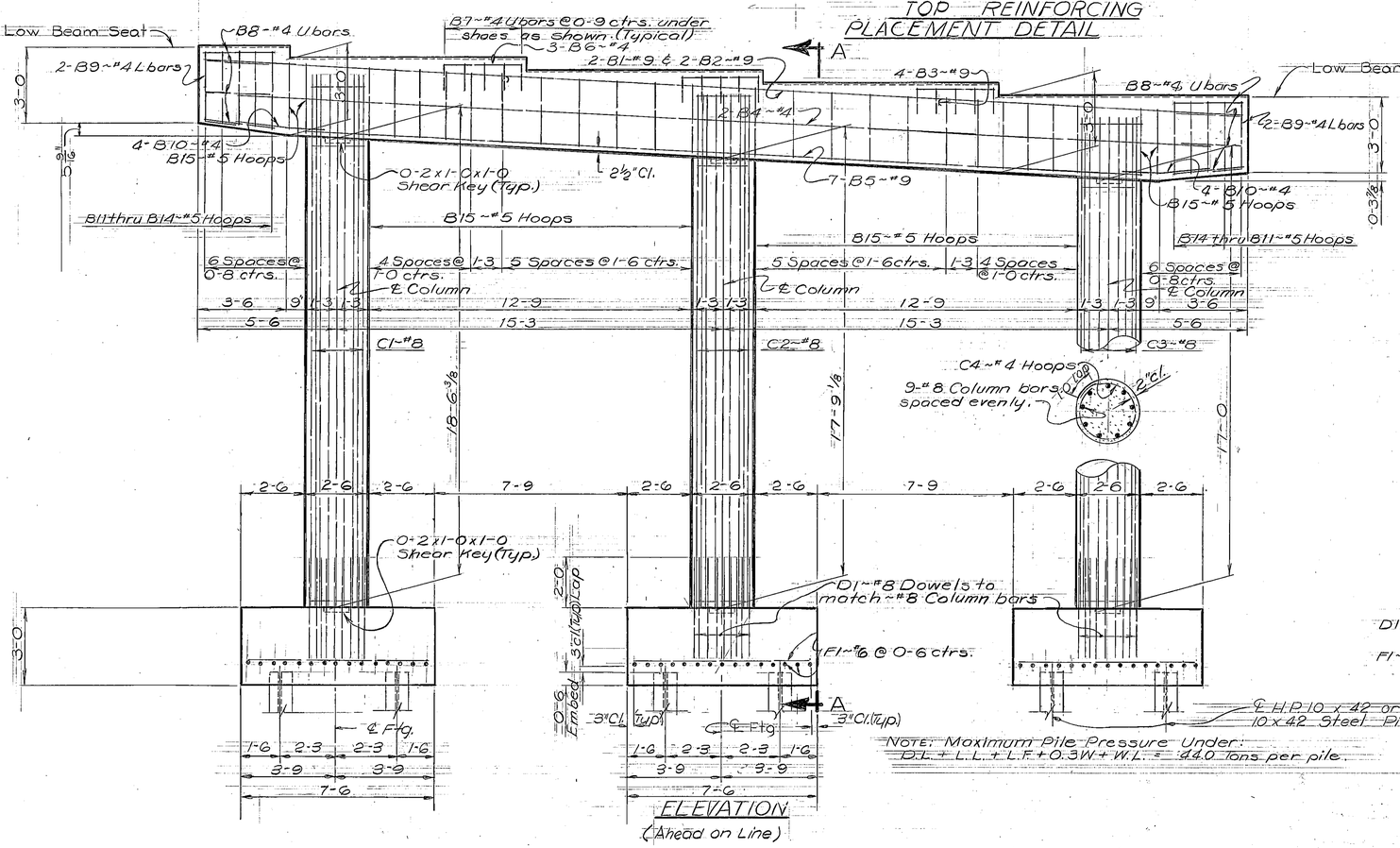
| MARK | SIZE | No. | TYPE | LENGTH | A | B | C |
|---|---|---|---|---|---|---|---|
| B 7 | #4 | 15 | 1 | 6'-8" | 1'-6" | 2'-8" | |
| B 8 | 4 | 8 | 2 | 7'-1 | 1'-6 | 4'-1 | 2'-7" |
| B 9 | 4 | 4 | 3 | 5'-4 | 2'-8 | 2'-6 | |
| B 10 | 4 | 8 | 4 | 3'-0 | 1'-6 | 1'-6 | 0'-3 |
| B 11 | 5 | 2 | 5 | 11'-3 | 2'-9 | 2'-6 | 0'-4½ |
| B 12 | 5 | 2 | 5 | 11'-8 | 2'-9½ | 2'-8 | 0'-4½ |
| B 13 | 5 | 2 | 5 | 11'-9 | 2'-10 | 2'-8 | 0'-4½ |
| B 14 | 5 | 2 | 5 | 11'-10 | 2'-10½ | 2'-8 | 0'-4½ |
| B 15 | 5 | 26 | 5 | 11'-5 | 2'-8 | 2'-8 | 0'-4½ |
| | | | | | | | |
| C 4 | #4 | 62 | 6 | 8'-4 | 2'-2 | | |







## TOP REINFORCING PLACEMENT DETAIL




Note: For Estimated length of piles see Dwg. No. 11432.

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

HOPPER INTERCHANGE
AT STA. 325+00.00

FEDERAL AID PROJECT NO. I-90-7(36)321

PARK COUNTY

BENTS NO.2 & NO.3
E.B. & W.B. RDWYS. DETAILS

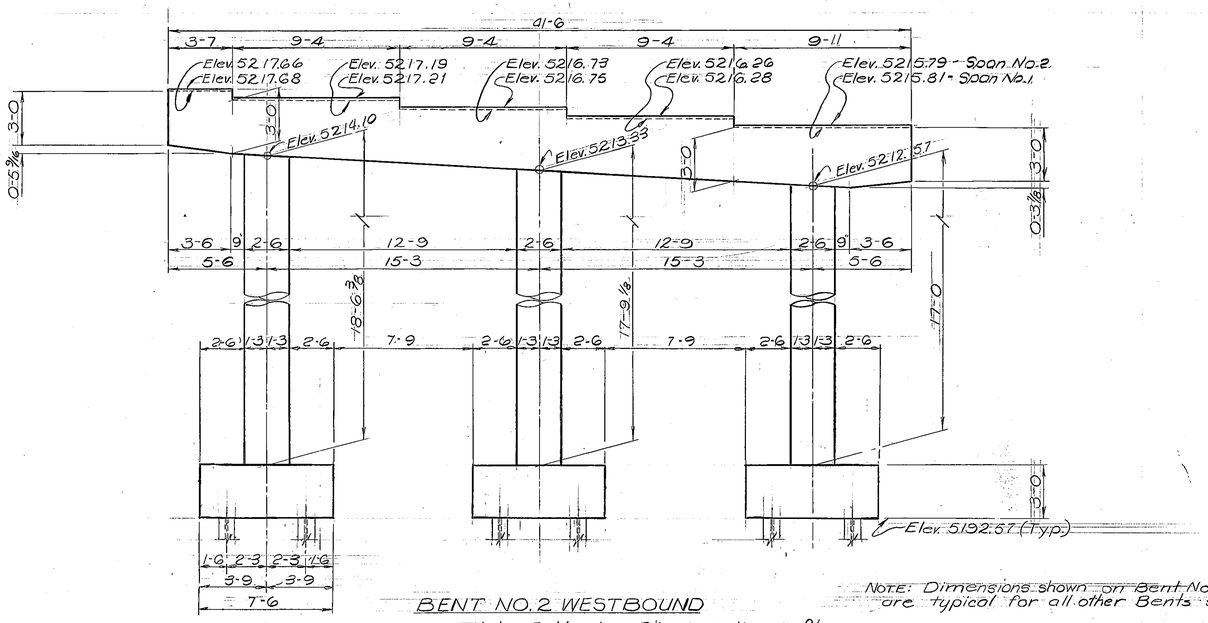
SCALE: ⅜" = 1'-0"

DRAWING NO. 11431

| | | |
|---|---|---|
| DESIGNED | 12-1-72 | J.J.Z. |
| DRAWN | 3-23-73 | G.A.P. |
| CHECKED | 4-8-75 | N.H.R. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

Hes.

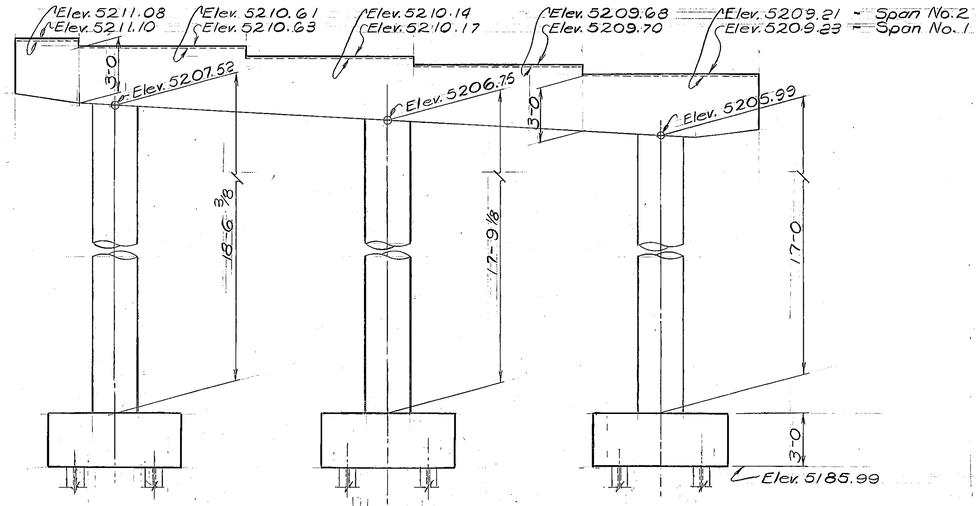
| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | I-90-7(36)321 | 14 | 26 |




BENT NO. 2 WESTBOUND

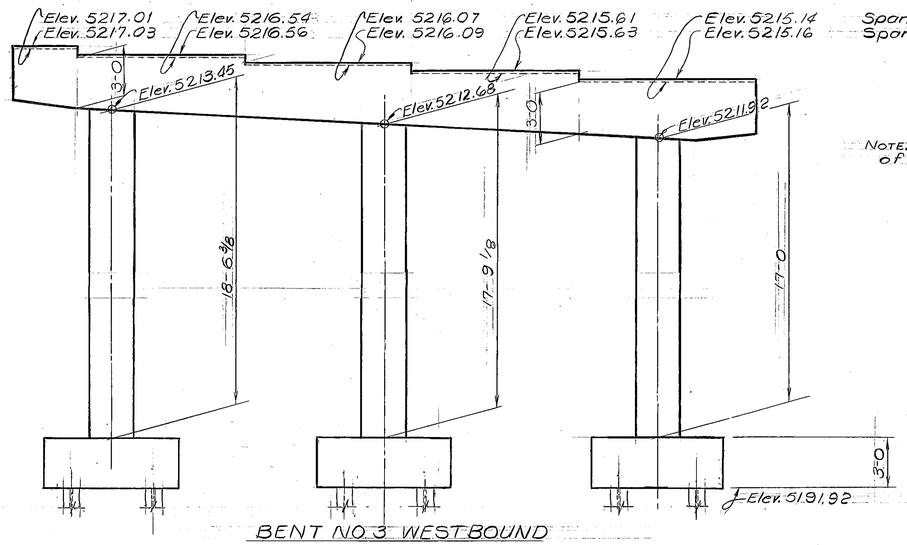
Note: Estimated Pile Length = 40 Ft.

NOTE: Dimensions shown on Bent No 2 W.B. are typical for all other Bents shown




BENT NO. 2 EASTBOUND

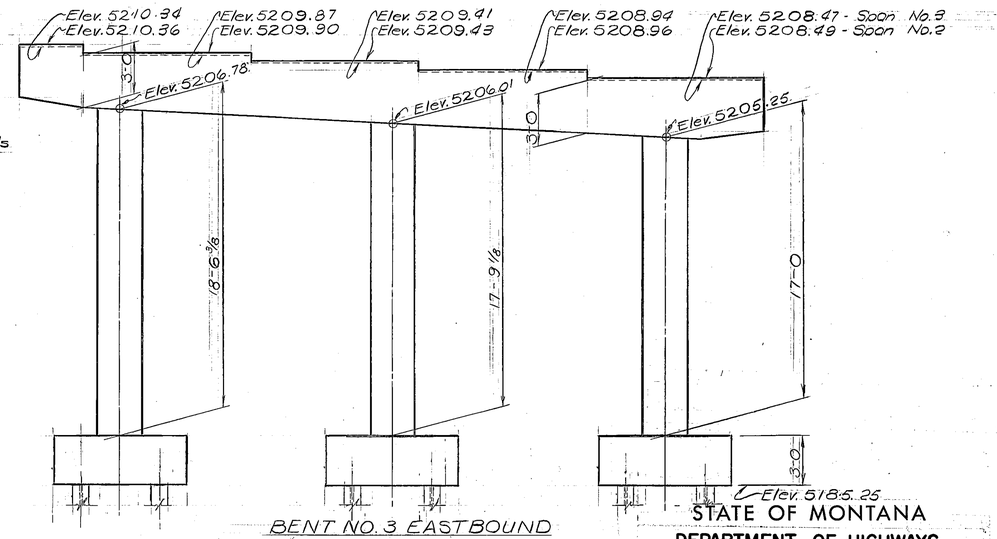
Note: Estimated Pile Length = 40 Ft.




BENT NO. 3 WESTBOUND

Note: Estimated Pile Length = 40 ft.

NOTE: For other Dimensions & Details of Bents See Dwg. No. 11431.




BENT NO. 3 EASTBOUND

Note: Estimated Pile Length = 40 ft.

STATE OF MONTANA

**DEPARTMENT OF HIGHWAYS**

HOPPER INTERCHANGE

AT STA. 325+00.00

FEDERAL AID PROJECT NO I-90-7(36)321

PARK COUNTY

BENTS NO. 2 & NO. 3, EB & WB RDWYS. ELEVATIONS

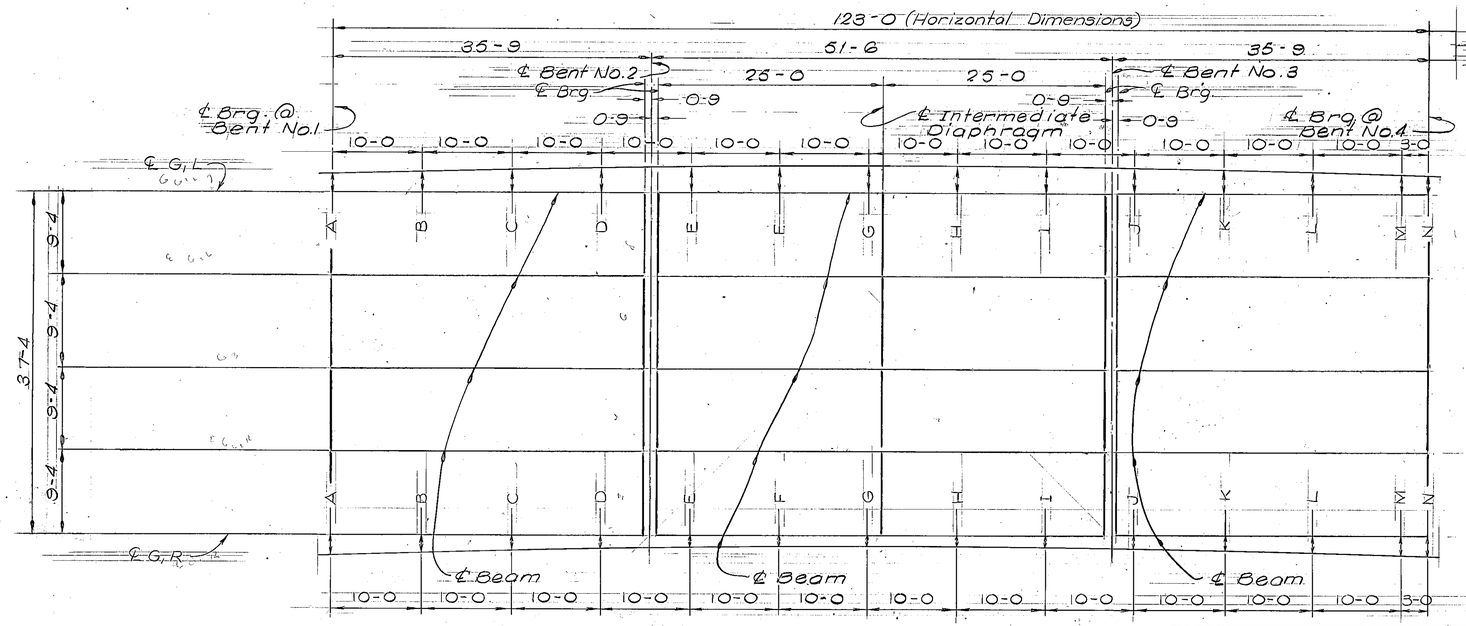
SCALE : ¼" = 1'-0"

DRAWING NO. 11432

| | | |
|---|---|---|
| DESIGNED | 12/11/72 | J.J.Z. |
| DRAWN | 1/4/73 | G.A.P. |
| CHECKED | 4-8-75 | N.H.R. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

HEB.

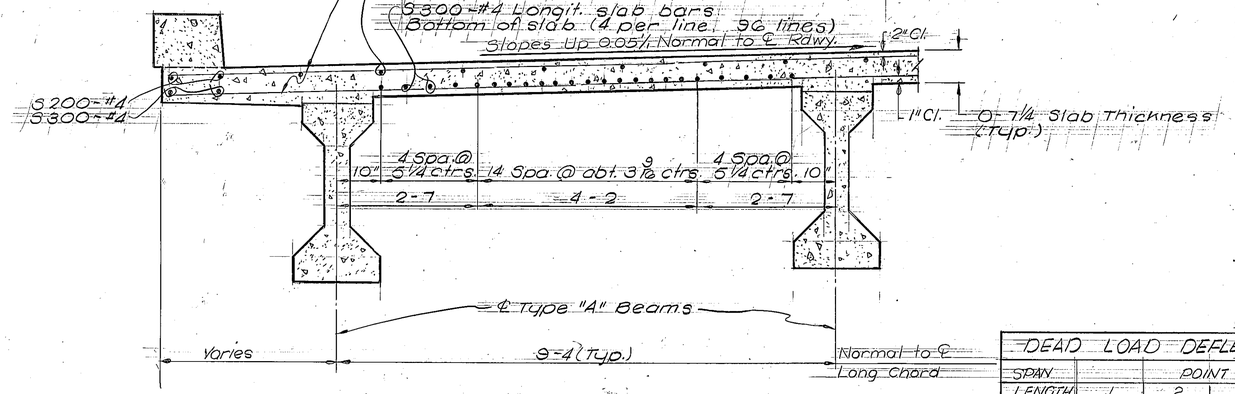
| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | I-90-7(36)321 | 15 | 26 |




Note: For additional slab, curb, end post, & diaphragm details see Dwg. No. SL-1.

## ERECTION PLAN

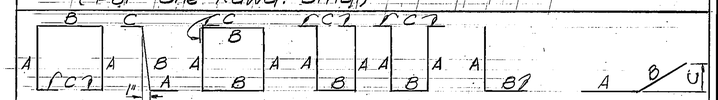
SCALE: 1/8"=1'-0"




## TRANSVERSE SECTION

SCALE: 3/4"=1'-0"

## BILL OF REINFORCING STEEL
(For One Rdwy. Only)




| STRAIGHT BARS | | | | BENT BARS (All dimensions out to out.) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mark | Size | No. | Length | Mark | Size | No | Type | Length | A | B | C |
| S5 | #6 | 44 | 15'-0" | C1 | #4 | 336 | 1 | 3'-4" | 0'-3" | 1'-0" | 0'-5" |
| S6 | 5 | 50 | 10'-0 | C2 | 4 | 320 | 2 | 2'-6 | 1'-0 | 1'-0 | 0'-6 |
| | | | | C3 | 4 | 64 | 3 | 3'-7 | 0'-10 | 0'-8 | 0'-3½ |
| S100 | 6 | 588 | 43'-7 | C4 | 5 | 80 | 2 | 4'-9 | 3'-3 | 1'-0 | 0'-6 |
| S200 | 4 | 124 | 31'-10 | C5 | 4 | 4 | 6 | 2'-0 | 1'-0 | 1'-0 | |
| S300 | 4 | 384 | 31'-10 | | | | | | | | |
| | | | | | | | | | | | |
| C300 | 4 | 32 | 32'-1" | D4 | 4 | 128 | 4 | 4'-10 | 1'-10 | 0'-7 | 0'-3½ |
| | | | | D7 | 4 | 32 | 5 | 6'-4 | 2'-7 | 0'-7 | 0'-3½ |
| | | | | | | | | | | | |
| D3 | 6 | 32 | 7'-10 | | | | | | | | |
| D5 | 4 | 8 | 7'-10 | D2 | 5 | 16 | 7 | 2'-9 | 1'-1½ | 1'-7½ | 0'-6 |
| D6 | 6 | 8 | 7'-10 | 3 | 4 | 12 | 3 | 6'-3 | 2'-0 | 0'-10 | 0'-3½ |
| D8 | 6 | 15 | 4'-6 | 4 | | 4 | | 6'-7 | | 9 | |
| | | | | 5 | | 4 | | 6'-11 | | 8 | |
| | | | | 6 | | 4 | | 5'-9 | | 7 | |
| | | | | 7 | | 4 | | 5'-7 | | 6 | |
| | | | | 8 | | 4 | | 6'-5 | | 5 | |
| P1 | #5 | 24 | 2'-9 | P9 | #4 | 4 | 8 | 6'-3 | 2'-0 | 4 | 0'-3½ |

## ROADWAY OFFSETS (Shown @ top of slab)

| Location | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| G,L @ W.B. Rdwy. | 2'-1 1/16 | 2'-2 13/16 | 2'-4 1/4 | 2'-5 3/8 | 2'-6 1/4 | 2'-6 3/4 | 2'-6 15/16 | 2'-6 13/16 | 2'-6 7/16 | 2'-5 1/16 | 2'-4 5/8 | 2'-3 1/4 | 2'-1 5/8 | 2'-1 1/16 |
| G,R @ W.B. Rdwy. | 2'-1" | 1'-11 1/4 | 1'-9 3/4 | 1'-8 5/8 | 1'-7 13/16 | 1'-7 1/4 | 1'-7 1/16 | 1'-7 3/16 | 1'-7 5/8 | 1'-8 5/16 | 1'-9 3/8 | 1'-10 3/4 | 2'-0 7/16 | 2'-1" |
| G,L @ E.B. Rdwy. | 2'-1" | 2'-2 13/16 | 2'-4 1/4 | 2'-5 3/8 | 2'-6 1/4 | 2'-6 3/4 | 2'-6 15/16 | 2'-6 13/16 | 2'-6 7/16 | 2'-5 1/16 | 2'-4 5/8 | 2'-3 1/4 | 2'-1 5/8 | 2'-1" |
| G,R @ E.B. Rdwy. | 2'-1 1/16 | 1'-11 1/4 | 1'-9 13/16 | 1'-8 5/8 | 1'-7 13/16 | 1'-7 1/4 | 1'-7 1/16 | 1'-7 3/16 | 1'-7 5/8 | 1'-8 5/16 | 1'-9 3/8 | 1'-10 3/4 | 2'-0 7/16 | 2'-1 1/16 |

PRESTRESSED CONCRETE BEAMS: Prestressed concrete beams shall be fabricated in accordance with Dwg. No. B-A. Maximum f'c (compressive strength of concrete at 28 days) shall be 6,000 p.s.i. Design stresses without prestress are as follows:

| SPAN LENGTH | | 35' | 50' |
|---|---|---|---|
| Beam D.L Stresses (p.s.i.) | Fb | 18 | -370 |
| | Ft | 224 | 456 |
| Total D.L+L.L Design Stresses (p.s.i.) | Fb | -1257 | -2442 |
| | Ft | 947 | 1963 |
| Required Ultimate Moment Capacity (Kip Ft.) | Mu | 1340 | 2464 |

## DEAD LOAD DEFLECTION TABLE

| SPAN LENGTH | POINT .1 | .2 | .3 | .4 | .5 |
|---|---|---|---|---|---|
| 35' | 0" | 1/16" | 1/16" | 1/16" | 1/16" |
| 50' | -1/8" | 1/4" | 3/8" | 7/16" | 7/16" |

Note: Deflections are symmetrical about ℄ Span.

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

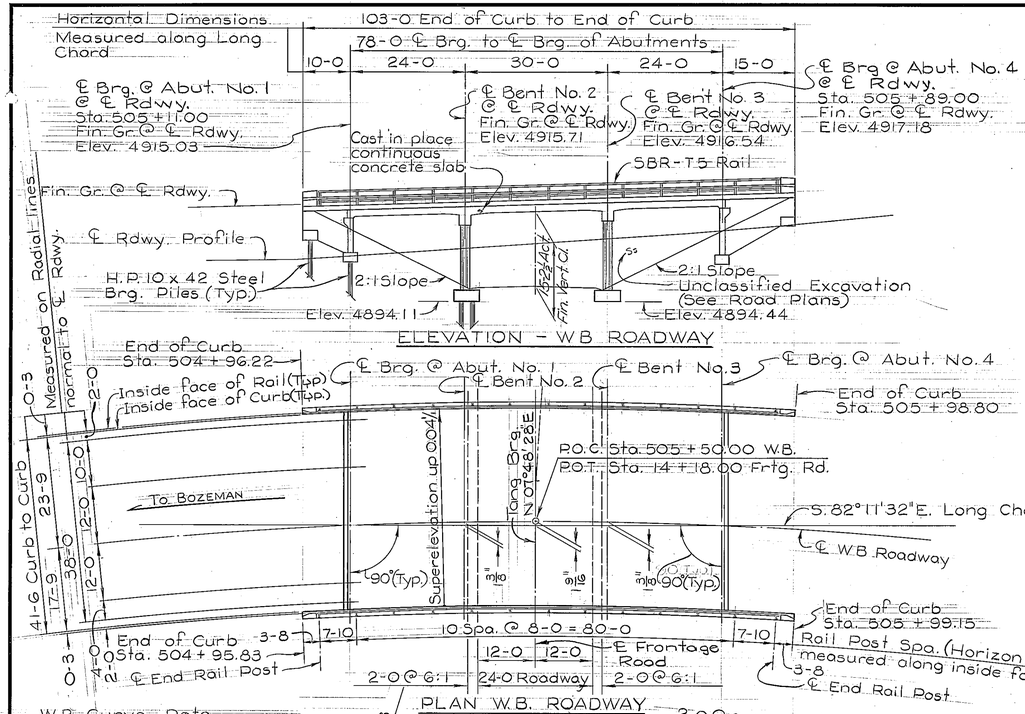
HOPPER INTERCHANGE
AT STA. 325 + 00.00
FEDERAL AID PROJECT NO. I-90-7(36)321
PARK COUNTY
ERECTION PLAN
EB & WB RDWYS.

SCALE: As Shown.
DRAWING NO. 11433

| | | |
|---|---|---|
| DESIGNED | L.D.D. | 9-20-72 |
| DRAWN | J.H.E. | 8/18/72 |
| CHECKED | N.H.R. | 4-8-73 |
| REVISED | | |
| REVISED | | |
| REVISED | | |

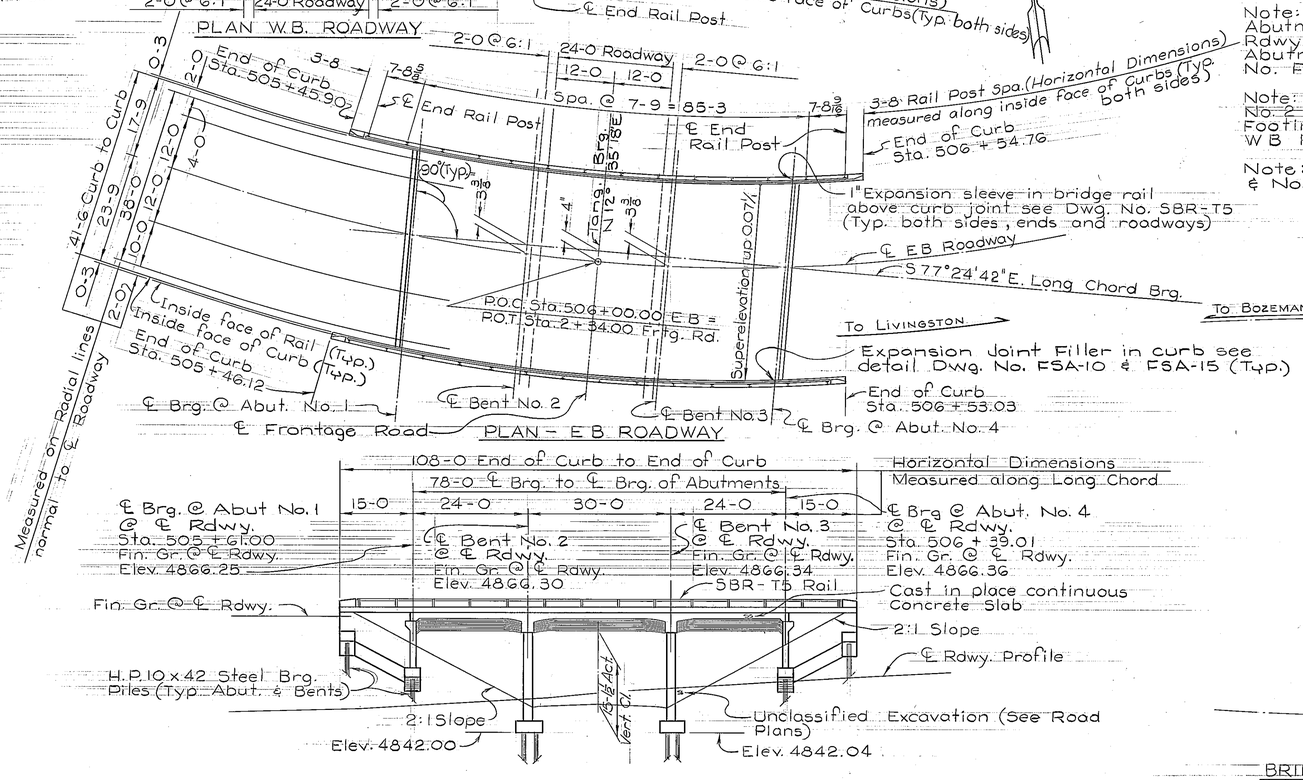
Hec.

| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | I-90-7(36)321 | 16 | 26 |



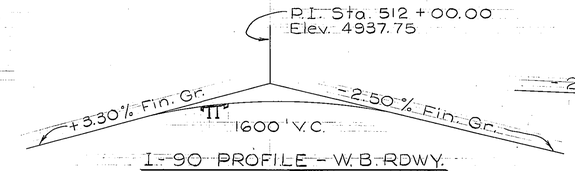

W B Curve Data
Δ = 19°27'30" Rt.
D = 1°00'
T = 982.5'
L = 1945.8'
R = 5730.0'
S = 0.04%

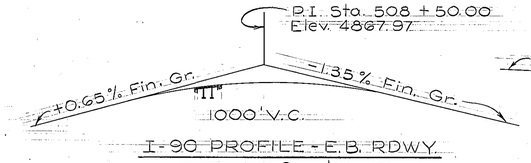
E B Curve Data
Δ = 37°06' Lt.
Δc = 30°51'
Dc = 2°30'
Lc = 1234.0'
Rc = 2292.0'
S = 0.07%
θs = 3°07'30"
Ls = 250.0'
Ts = 894.4'

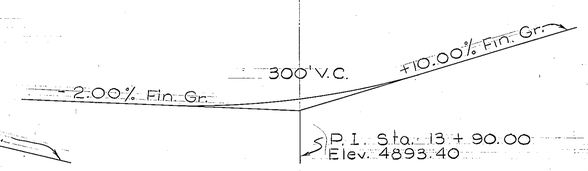


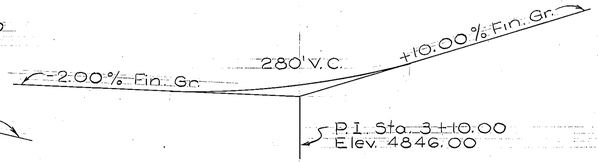







Note: The Contractor may substitute H.P.S. 10 x 42 Steel Bearing Piles in lieu of the H.P. 10 x 42 Steel Brg. Piles shown hereon.

Note: The Contractor may substitute Class "DD" concrete for Class "AD" concrete, however, all concrete shall be bid as Class "AD" concrete unless the State specifies otherwise.

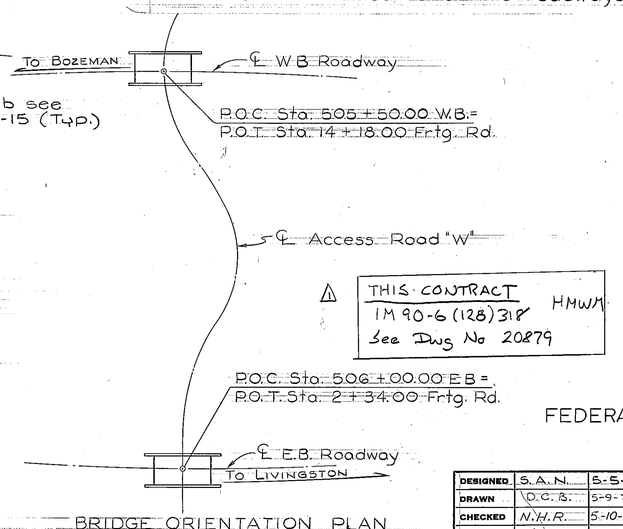
Note: Structure excavation for all Abutments shall be calculated from the sub-grade elevations and 2:1 slopes of the approach roadway embankments. Structure excavation for intermediate bents shall be calculated from below the limits of the unclassified excavation.

Note: Footing Alternate No. 2 shall be used for Abutment No. 1 and No. 4 E B Rdwy. and No. 1 W B Rdwy. See Dwg. No. 11,437 for footing details on Abutment No. 4 W B Rdwy. see Dwg. No. FSA 15 and No. FSA 10 for other details of Abutments.

Note: Footing Alternate No. 2 shall be used for Bents No. 2 and No. 3 E B Rdwy. and Bent No. 2 W B Rdwy. Footing Alternate No. 3 shall be used for Bent No. 3 W B Rdwy. see Dwg. No. FSB 30.

Note: Column height "H" varies see Dwg. No. 11436 & No. 11437 (Typ. both Rdwys.)

Note: Slab, curbs and wingwalls shall be constructed on concentric curves parallel to the centerline curve of the roadways.




1 THIS CONTRACT
IM 90-6 (128) 318 HMWM
See Dwg No 20879

## NOTES

FINISHED GRADE: Finished grade @ ℄ Roadway is 0.24' above Profile Grade ~ Westbound, and 0.60' above Profile Grade ~ Eastbound; shown on Road Plans.

LIVE LOAD: STANDARD HS20-44 LOADING OR ALTERNATE LOADING. ALTERNATE LOADING FOR BRIDGES AND FLOOR SYSTEMS WITH SPANS UNDER 40 FEET CONSISTS OF TWO AXLES FOUR FEET APART WITH EACH AXLE WEIGHING 24,000 LBS.

SPECIFICATIONS: MONTANA STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1970 EDITION, AND ANY AMENDMENTS THERETO, AND SPECIAL PROVISIONS SHALL GOVERN UNLESS OTHERWISE NOTED. DESIGN PREPARED IN ACCORDANCE WITH A.A.S.H.O. SPECIFICATIONS, 1973 EDITION, AND ANY AMENDMENTS THERETO.

APPROVAL: SHOP PLANS SHALL BE APPROVED BY THE STATE OF MONTANA, DEPARTMENT OF HIGHWAYS BEFORE FABRICATION IS BEGUN.

CAST IN PLACE CONCRETE: UNLESS OTHERWISE APPROVED, ALL CONCRETE SHALL BE CLASS "AD", AN "AIR ENTRAINING AGENT" SHALL BE ADDED TO ALL CONCRETE EXCEPT CLASS "AS". CHAMFER ALL EXPOSED EDGES OF CONCRETE WITH ENCLOSED ANGLE LESS THAN 120°, 3/4" AND FILLET ENTRANT ANGLES 3/4" UNLESS OTHERWISE NOTED. ALL FORMS FOR DECK SLAB SHALL BE REMOVED

STRUCTURAL STEEL: ALL STRUCTURAL STEEL SHALL BE MEASURED AND PAID FOR ON THE LUMP SUM BASIS AS SET FORTH IN THE STANDARD SPECIFICATIONS.
ESTIMATED WEIGHT = 1256 POUNDS.

FOR REQUIREMENTS GOVERNING THE FABRICATION OF "STRUCTURAL STEEL" SEE THE STANDARD SPECIFICATIONS. TO AVOID OVERSIGHT THESE REQUIREMENTS SHALL BE CLEARLY NOTED ON THE SHOP DRAWINGS.

ALL STRUCTURAL STEEL AND BRIDGE RAIL SHALL RECEIVE ONE (1) SHOP COAT OF RED LEAD OR BASIC LEAD SILICO CHROMATE PRIMER AND TWO (2) FIELD COATS CONSISTING OF FIRST FIELD OR PRIMER COAT AND ONE (1) COAT OF ALUMINUM PAINT AS SPECIFIED IN THE STANDARD SPECIFICATIONS OR AS OTHERWISE SPECIFIED IN THE "SPECIAL PROVISIONS".

FOOTINGS: ELEVATIONS SHOWN FOR BOTTOM OF FOOTINGS ARE APPROXIMATE ONLY. FINAL ELEVATIONS TO BE DETERMINED BY THE ENGINEER.

PROTECTIVE COATING: DECK, CURBS AND CONCRETE END POSTS SHALL BE GIVEN A PROTECTIVE COATING OF BOILED LINSEED OIL. "SEE STANDARD SPECIFICATIONS".

UTILITIES: FOR LOCATION OF UTILITIES, SEE APPROPRIATE ROAD PLANS SHEET.

COVERING: THE MINIMUM COVERING, MEASURED FROM THE SURFACE OF THE CONCRETE TO THE FACE OF ANY REINFORCEMENT BAR, SHALL BE NOT LESS THAN 2 INCHES EXCEPT AS FOLLOWS OR OTHERWISE NOTED:

| | |
|---|---|
| BOTTOM OF SLAB | 1 INCH |
| STIRRUPS AND TIES | 1½ INCHES |

IN ALL FOOTINGS AND PIER SHAFTS, THE MINIMUM COVERING SHALL BE 3 INCHES.

BACKFILL: Superstructure shall be in place before any backfill is placed against the abutments. Fill at the two ends of the Structure shall be kept at about the same elevations during the process of backfilling. See Art. 11.04 (B) of the Standard Specifications.

Note: For Sequence of Work see "Special Provisions."

* THIS CONTRACT: IM 0002 (753)
EB & WB Roadway Slabs Replaced.
See Dwg. No. 19227 - 19230.

**STATE OF MONTANA**
**DEPARTMENT OF HIGHWAYS**

SEPARATION
AT STA. 505+75.00

FEDERAL AID PROJECT NO. I-90-7(36) 321
PARK COUNTY
GENERAL LAYOUT

Scale: 1" = 15'-0" Except as noted

| | | |
|---|---|---|
| DESIGNED | S. A. N. | 5-5-75 |
| DRAWN | D. C. B. | 5-9-75 |
| CHECKED | N. H. R. | 5-10-75 |
| APPROVED | H.E.B. | 6-17-75 |
| * REVISED | T. T. S. K. | 9-17-04 |
| 1 REVISED | D.G.G. | 3-9-10 |

DRAWING NO. 11,434

H.E.B.

| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | I-90-7(36)321 | 17 | 26 |

℄ Core Log No. 1253
℄ W.B. Rdwy. Sta. 505+10.00

Elev. 4903.7

| | |
|---|---|
| Medium dense brown sandy silt with rock fragments | 16/12/11 |
| | 15/12/11 |
| 4890.5 | |
| Brown sandy silt | 12/14/17 |
| | 9/11/14 |
| G.W. 76.6 Dec. 9, '69 | 3/4/5 |
| | 5/10/15 |
| 70.6 Hard brown silty shale | 47/50(0.8) |
| 67.5 | |
| Hard brown shale | 50(0.3) |
| | 50(0.2) |
| 53.6 | 50(0.1) |

℄ Core Log No. 1250 ℄ E.B. Rdwy. Sta. 505+60.00

Elev. 4847.7

| | |
|---|---|
| Medium dense to loose grey to brown sandy silt | 10/9/9 |
| | 3/3/4 |
| G.W. 32.6 Dec. 3,69 | 4/5/6 |
| 31.0 Hard brown sandstone (Highly fractured) | 48/50(0.8) |
| 25.4 Medium dense greyish white bentonite | 7/10/17 |
| 20.0 Hard red shale | 50(0.3) |
| | 50(0.3) |
| | 25(0.0) |
| 02.1 | |

℄ Core Log No. 1252 ℄ W.B. Rdwy. Sta. 505+90.00

Elev. 4909.5

| | |
|---|---|
| Very dense brown sandy silt with rock fragments | 50(0.4) |
| 01.5 | 25(0.0) |
| Hard grey sandstone | |
| 4885.4 | |
| 82.8 Hard grey sandy shale | |
| Hard grey sandstone 78.3 | |

No groundwater encountered

℄ Core Log No. 1251 ℄ E.B. Rdwy. Sta. 506+40.00

Elev. 4853.6

| | |
|---|---|
| Med. dense grey-brown sandy silt | 5/6/5 |
| G.W. 46.4 Dec. 4, 69 | 9/9/10 |
| 43.4 Medium dense to dense red weathered shale with rock fragments | 18/21/16 |
| 35.2 Hard red shale | 39/50(0.9) |
| 30.6 Hard red sandstone | 50(0.2) |
| 26.1 Hard red shale | 50(0.2) |
| 17.0 Hard dense greyish-white bentonite | 50(0.2) |
| 15.2 | |
| 13.6 | 25(0.0) Hard red sandstone |

## NOTES

**SOILS AND FOUNDATION MATERIALS:** BORINGS WERE TAKEN BY THE MONTANA STATE HIGHWAY DEPARTMENT AT THE POINTS SHOWN ON THE GENERAL LAYOUT OR FOOTING PLAN.

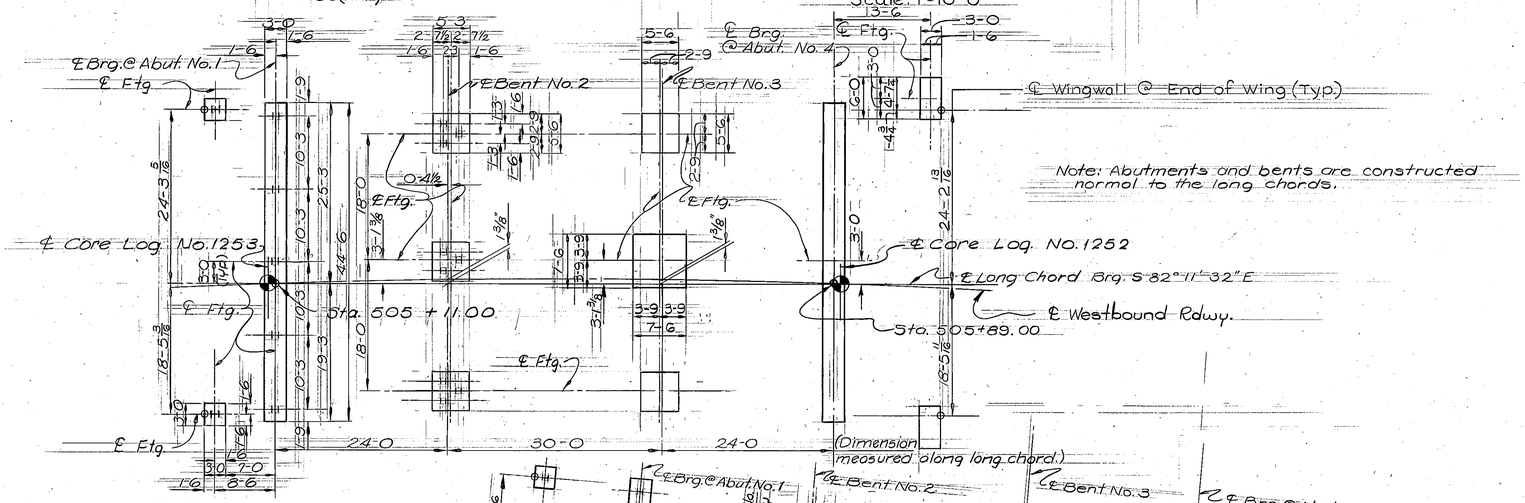
THE SERIES OF NUMBERS SHOWN ON THE LOG OF BORINGS INDICATES THE NUMBER OF BLOWS PER 6" PENETRATION FOR EACH NUMBER OF THE SERIES OF A 2" SAMPLE TUBE WHICH WAS DRIVEN IN ACCORDANCE WITH THE STANDARD PENETRATION TEST MADE WITH A 2" SPLIT TUBE SAMPLER USING A 140# HAMMER HAVING A 30" DROP. THE TOTAL PENETRATION OF THE SAMPLER TUBE IS INDICATED ON THE CORE LOGS AFTER EACH SERIES IF 6" PENETRATION WAS NOT ACHIEVED IN 50 BLOWS.

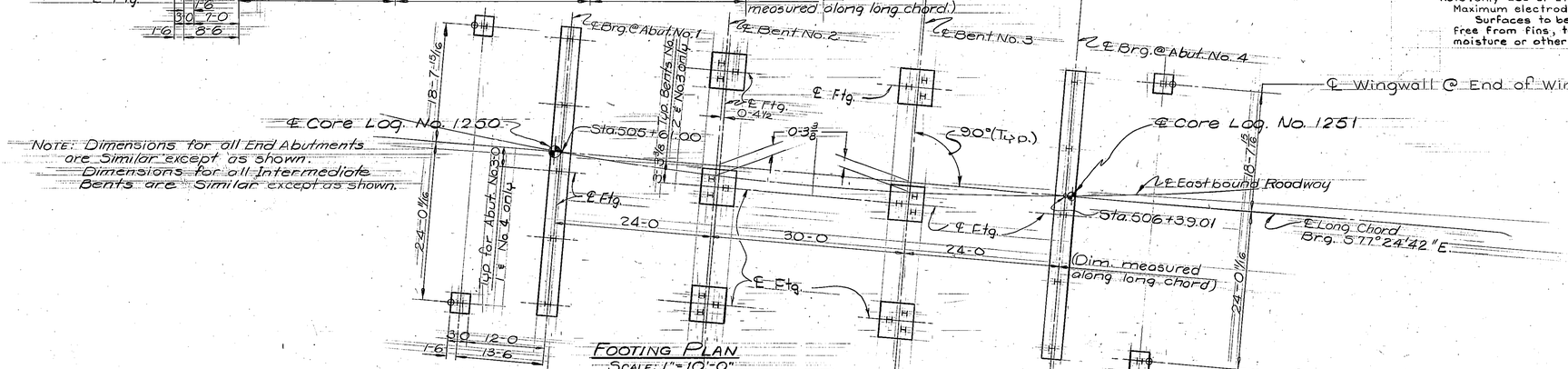
THE STATE HIGHWAY DEPARTMENT DOES NOT ASSUME ANY RESPONSIBILITY FOR ANY VARIATION OR MISINTERPRETATION OF THE CLASSES OF MATERIALS AND ADJUSTMENT IN BID PRICES WILL NOT BE MADE IF THE MATERIALS FOUND DO NOT AGREE WITH THOSE SHOWN IN THE LOG OF BORINGS.

**FOUNDATION PILES:** FOR BIDDING PURPOSES ONLY, PILE LENGTHS HAVE BEEN ESTIMATED AS SHOWN ON DRAWINGS.

## LOG OF BORINGS

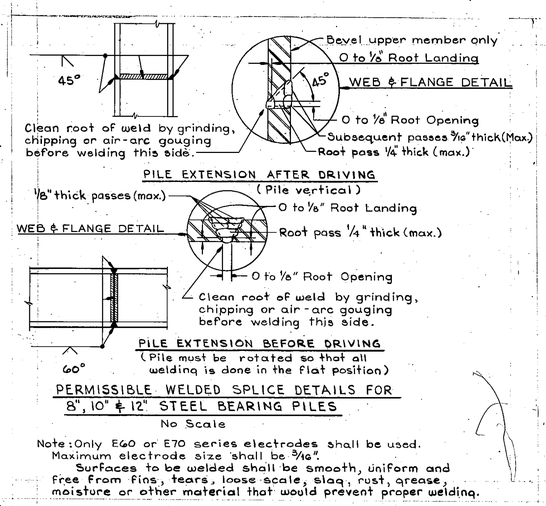
Scale: 1"=10'-0"




## FOOTING PLAN

SCALE: 1"=10'-0"




PILE EXTENSION BEFORE DRIVING
(Pile must be rotated so that all welding is done in the flat position)

PERMISSIBLE WELDED SPLICE DETAILS FOR 8", 10" & 12" STEEL BEARING PILES

No Scale

Note: Only E60 or E70 series electrodes shall be used. Maximum electrode size shall be 5/16". Surfaces to be welded shall be smooth, uniform and free from fins, tears, loose scale, slag, rust, grease, moisture or other material that would prevent proper welding.

STATE OF MONTANA
**DEPARTMENT OF HIGHWAYS**

SEPARATION
AT STA. 505+75.00
FEDERAL AID PROJECT NO. I-90-7(36)321
PARK COUNTY

FOOTING PLAN

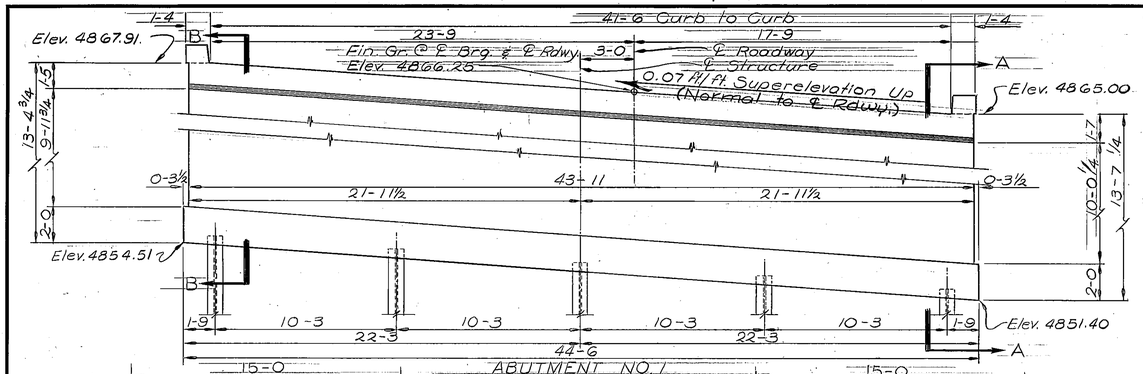
Scale: As noted

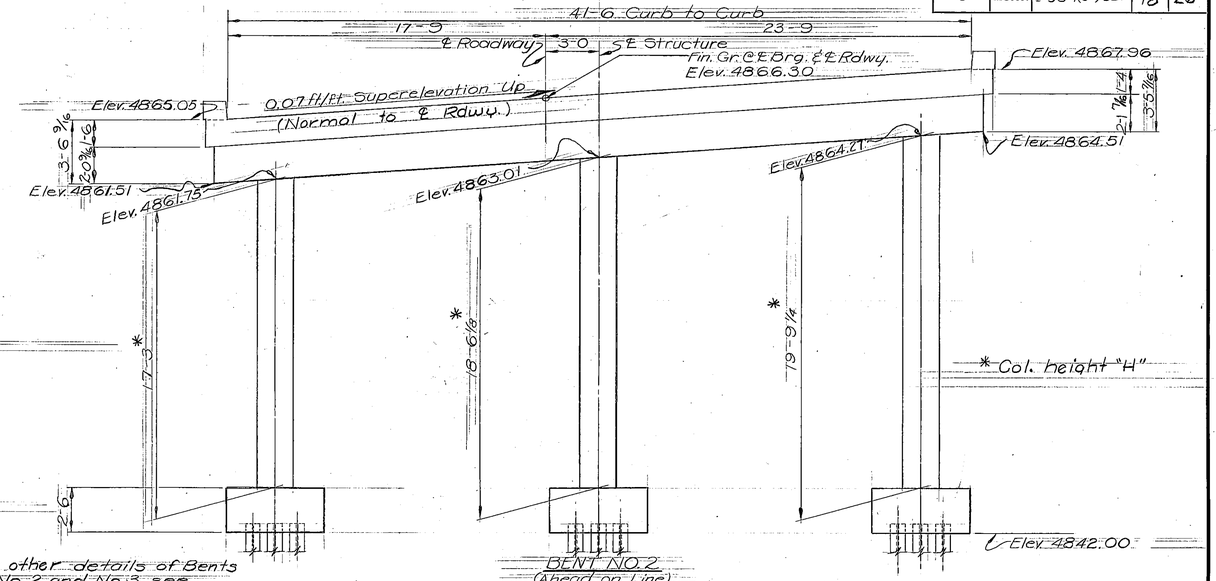
| | | |
|---|---|---|
| DESIGNED | | |
| DRAWN | 1-29-70 | K.H.L. |
| TRACED | | |
| CHECKED | 4-9-75 | N.H.R. |
| REVISED | | |
| REVISED | | |

DRAWING NO. 11435

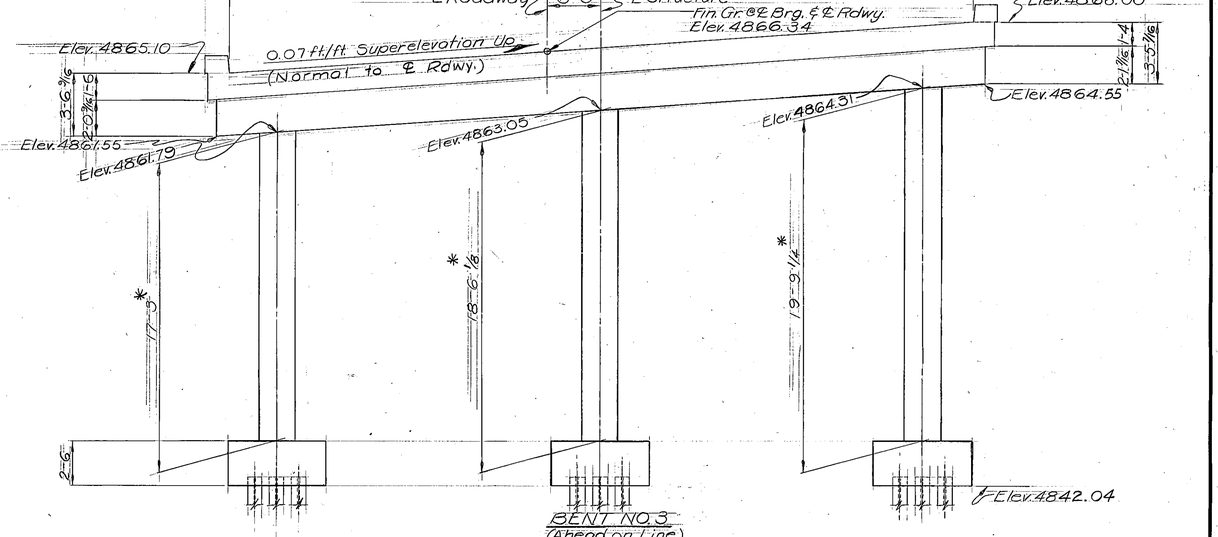
K&E 19 1153 3-69

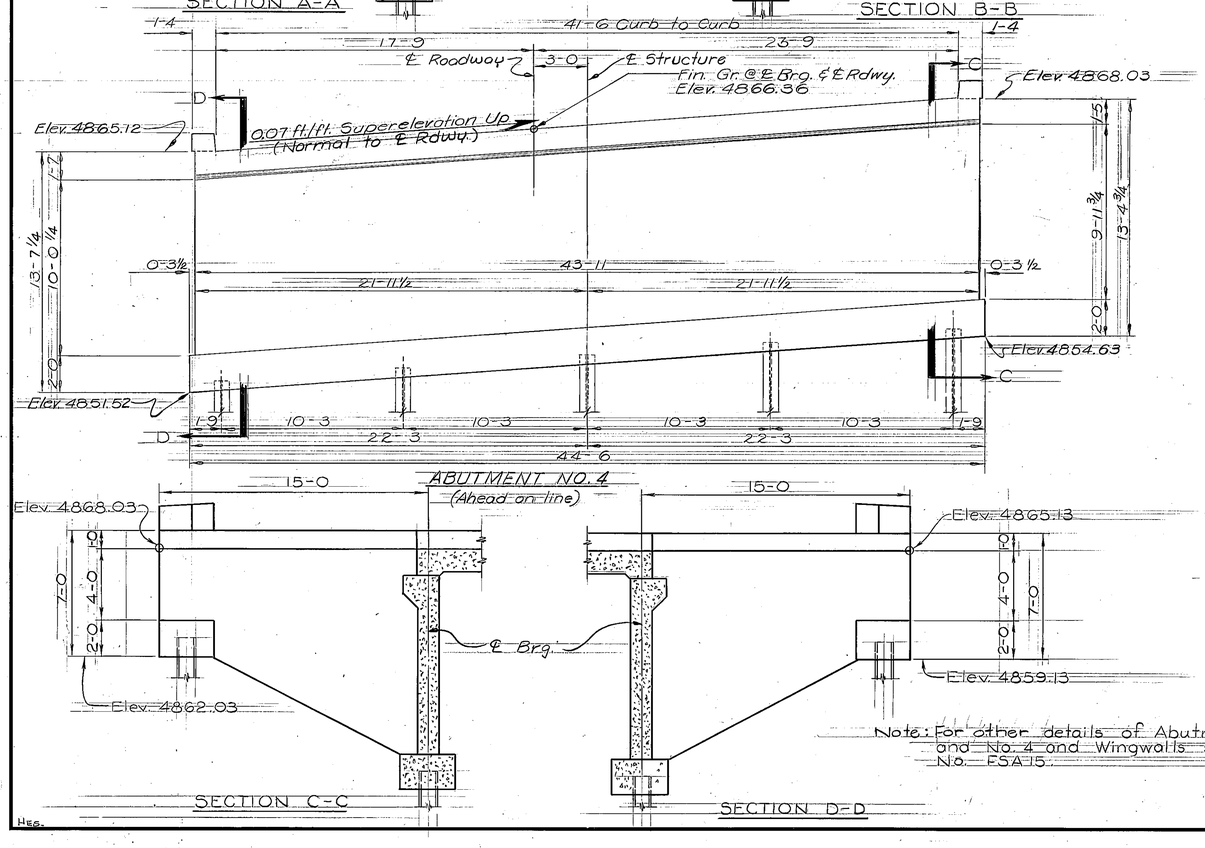
| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | I-90-7(36)321 | 18 | 26 |




Note: For other details of Bents No. 2 and No. 3 see Dwg. No. FSB30




Note: For other details of Abutments No. 1 and No. 4 and Wingwalls see Dwg. No. FSA15.

ESTIMATED PILE LENGTHS:

Abut. No. 1 Abut. Pile = 35'-0
Abut. No. 1 Wing Pile = 40'-0
Bent No. 2 Ftg. Pile = 20'-0
Bent No. 3 Ftg. Pile = 15'-0
Abut. No. 4 Abut. Pile = 25'-0
Abut. No. 4 Wing Pile = 30'-0

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

SEPARATION
AT STA. 505+75.00
FEDERAL AID PROJECT NO. I-90-7(36)321
PARK COUNTY

ABUTMENTS NO. 1 & NO. 4 & BENTS NO. 2 & NO. 3 E. B. RDWY.

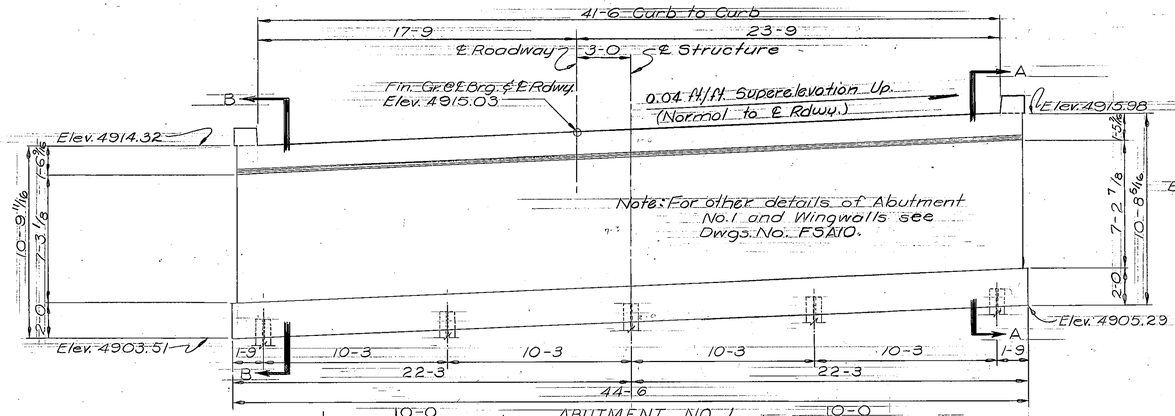
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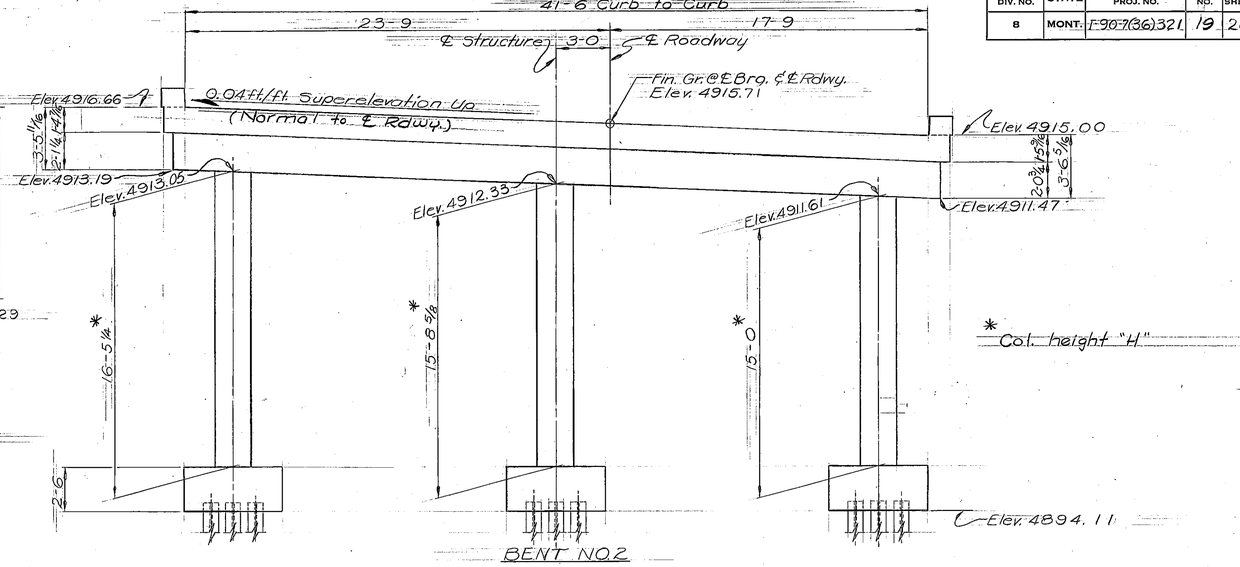
DRAWING NO. 11436

| | | |
|---|---|---|
| DESIGNED | 5/6/75 | S.A.N. |
| DRAWN | 5/7/75 | D.C.B. |
| CHECKED | 5/9/75 | N.H.R. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

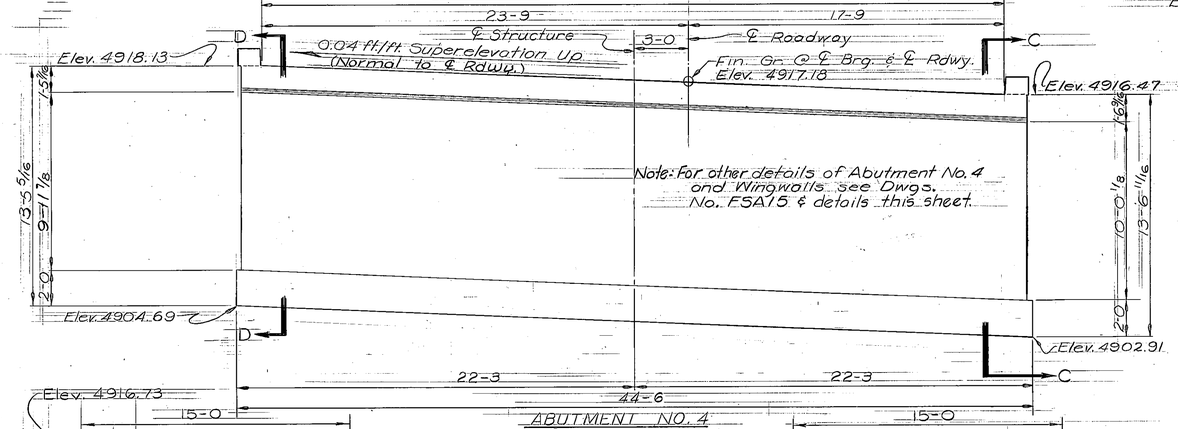
HEG.

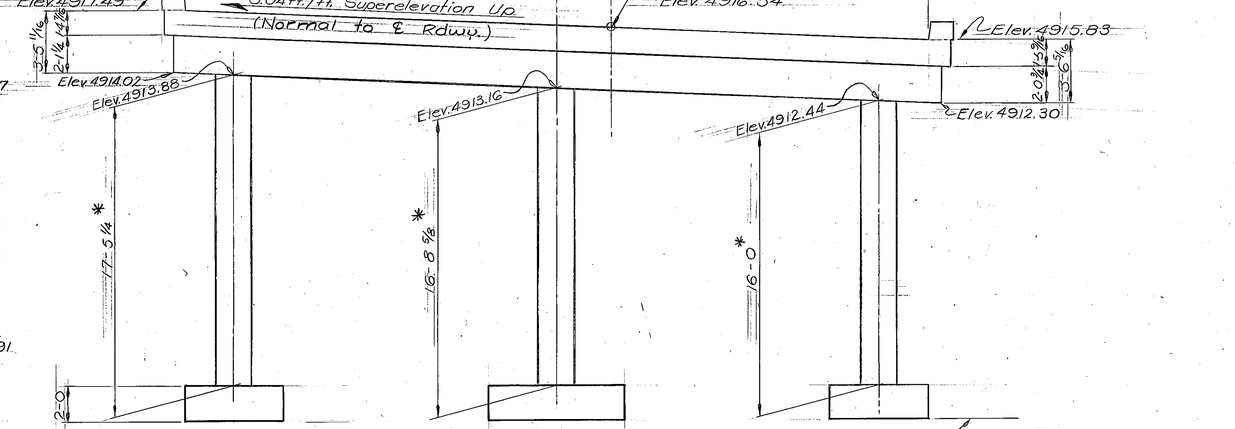
| FED. ROAD DIV. NO. | STATE | FED. AID PROJ. NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|
| 8 | MONT. | F 90-7(36)321 | 19 | 26 |




ESTIMATED PILE LENGTH:
Abut. No. 1 Abut. Pile = 40'-0
Abut No. 1 Wing Pile = 45'-0
Bent No. 2 Ftg. Pile = 20'-0




*Note: For Abutment No. 4 delete ftg. bars from Std. Dwg. FSA 15 & use new callouts with Bill of Reinforcing Steel on this Dwg.

*BILL OF REINFORCING STEEL (ABUT. No. 4 ONLY)

| STRAIGHT BARS | | | | | | | |
|---|---|---|---|---|---|---|---|
| Mark | Size | No. | Length | Mark | Size | No. | Length |
| F1 | #4 | 12 | 2'-6" | F3 | #4 | 8 | 22'-6" |
| F2 | #7 | 8 | 5-6 | F4 | #4 | 45 | 2-6 |

FOOTING PRESSURES (Abut No. 4 only)
Note: Max. Footing Pressure under: D.L. + L.L. + V.E. = 2.0 T/sq.ft. (Abut. Ftg. only)
Note: Max. Footing Pressure under: D.L. + L.L. + V.E. = 1.8 T/sq.ft. (Wing Ftg. only)

STATE OF MONTANA
DEPARTMENT OF HIGHWAYS

SEPARATION
AT STA. 505+75.00
FEDERAL AID PROJECT NO. I 90 7(36)321

PARK COUNTY

ABUTMENTS NO. 1 & NO. 4 & BENTS NO. 2 & NO. 3 W.B. RDWY.

SCALE: 1/4" = 1'-0"

| | | |
|---|---|---|
| DESIGNED | 5/6/75 | S.A.N. |
| DRAWN | 5/7/75 | D.C.B. |
| CHECKED | 5-9-75 | N.H.R. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

DRAWING NO. 11437

| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 0002(753) | B1 |

MONTANA
DEPARTMENT OF TRANSPORTATION

BRIDGE PLANS AND QUANTITIES

# FEDERAL AID PROJECT NO. IM 0002(694) P.E.
# IM 0002(753) CONSTRUCTION

## D-2 BRIDGE DECK REPAIR

## GALLATIN & PARK COUNTIES

LIST OF DRAWINGS

| SHEET NO. | DWG. NO. | TITLE |
|---|---|---|
| B2 | 19224 | DECK REMOVAL DETAILS |
| B3 | 19225 | SLAB DETAILS @ STA. 19 + 65.96 |
| B4 | 19226 | SLAB DETAILS @ STA. 99 + 06.00 |
| B5 | 19227 | SLAB REMOVAL DETAILS @ STA. 154 + 15.26 |
| B6 | 19228 | EB RDWY SLAB REINFORCING @ STA. 154 + 15.26 |
| B7 | 19229 | WB RDWY SLAB REINFORCING @ STA. 154 + 15.26 |
| B8 | 19230 | SLAB DETAILS @ STA. 154+15.26 |
| B9 | MSL-5 (Revised 5-1-03) | STANDARD SLAB, BARRIER & DIAPHRAGM DETAILS |
| B10 | 11412 | EXISTING GENERAL LAYOUT @ STA. 19 + 65.96 |
| B11 | 11427 | EXISTING GENERAL LAYOUT @ STA. 99 + 06.00 |
| B12 | 11434 | EXISTING GENERAL LAYOUT @ STA. 154 + 15.26 |

## ESTIMATED BRIDGE PLAN QUANTITIES

| LOCATION | STRUCTURE NUMBER | CLASS SD CONCRETE ($m^3$) | REINFORCING STEEL - EPOXY (kg) | TRANSVERSE DECK GROOVING ($m^2$) | REMOVE DECK ($m^2$) |
|---|---|---|---|---|---|
| 19 + 65.96 EB | I00090319+06691 | 143.9 | 15286 | 468.0 | 533.1 |
| 19 + 65.96 WB | I00090319+06692 | 143.9 | 15286 | 468.0 | 533.1 |
| SUBTOTAL | | 287.8 | 30572 | 936.0 | 1066.2 |
| 99 + 06.00 EB | I00090324+06051 | 138.4 | 14728 | 449.8 | 512.7 |
| 99 + 06.00 WB | I00090324+06052 | 138.4 | 14728 | 449.8 | 512.7 |
| SUBTOTAL | | 276.8 | 29456 | 899.6 | 1025.4 |
| 154 + 15.26 EB | I00090328+00291 | 152.2 | 13846 | 285.9 | 323.0 |
| 154 + 15.26 WB | I00090328+00292 | 151.2 | 13768 | 285.9 | 323.0 |
| SUBTOTAL | | 303.4 | 27614 | 571.8 | 646.0 |
| TOTAL | | 868.0 | 87642 | 2407.4 | 2737.6 |

BRIDGE BUREAU

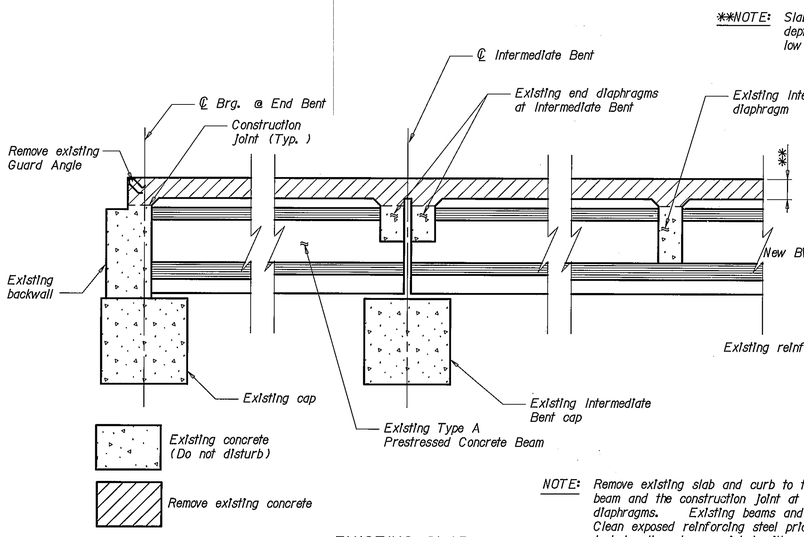
PREPARED BY: TJB 4-13-04 CHECKED BY: MLR 3-29-05

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7/10/2008
12:49:00 PMCPS - U1426

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BRIDGE BUREAU

| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 0002(753) | B2 |




## DECK REMOVAL AND REPLACEMENT DETAILS

Scale ~ 1:40

## GENERAL NOTES

GENERAL: Plans were prepared from original drawings and as-built drawings. No additional survey information was procured for this project. Existing structure dimensions may vary from those shown on the drawings. Verify all dimensions necessary to complete the work.

SPECIFICATIONS: Montana Department of Transportation and the Montana Transportation Commission Standard Specifications for Road and Bridge Construction, 2006 edition, and any amendments thereto, and special provisions govern unless otherwise noted. Design was prepared in accordance with AASHTO Standard Specifications for Highway Bridges, 17th edition - 2002, and any amendments thereto.

REINFORCING STEEL: Use new deformed type reinforcing steel meeting the requirements of AASHTO M 31M Grade 60 (420). Include all costs associated with furnishing and placing new reinforcing steel in the unit price bid for Reinforcing Steel or Reinforcing Steel - Epoxy Coated.

Replace existing reinforcing steel damaged during construction that is called out to remain in place at no additional cost to the State.

Include cleaning exposed existing reinforcing steel in other items of work.

EPOXY RESIN BONDING AGENT: Thoroughly coat all existing concrete in contact with new concrete with an epoxy bonding agent (AASHTO M 235-91 Type V) immediately prior to placing new concrete. Include all costs associated with providing and applying the epoxy bonding agent in the unit price bid for Concrete - Class SD.

TRAFFIC CONTROL PLAN AND SEQUENCE OF OPERATION: See Special Provisions.

DIMENSIONS: All dimensions are in millimeters except as noted. Verify all necessary dimensions of the existing structures in the field before ordering materials. Obtain approval of shop plans from the State of Montana, Department of Transportation before beginning fabrication. If the dimensions and details of the existing structure are not as shown on the plans, vary construction as necessary to best suit existing conditions and the nature of the intended work.

CONCRETE STRENGTH: Use f'c = 31 MPa for Class SD concrete.

MONTANA DEPARTMENT OF TRANSPORTATION

D-2 BRIDGE DECK REPAIR
AT STA. 19+65.96 & 99+06.00
FEDERAL AID PROJECT NO. IM 0002(753)
GALLATIN & PARK COUNTIES
DECK REMOVAL DETAILS

Scale ~ As Noted

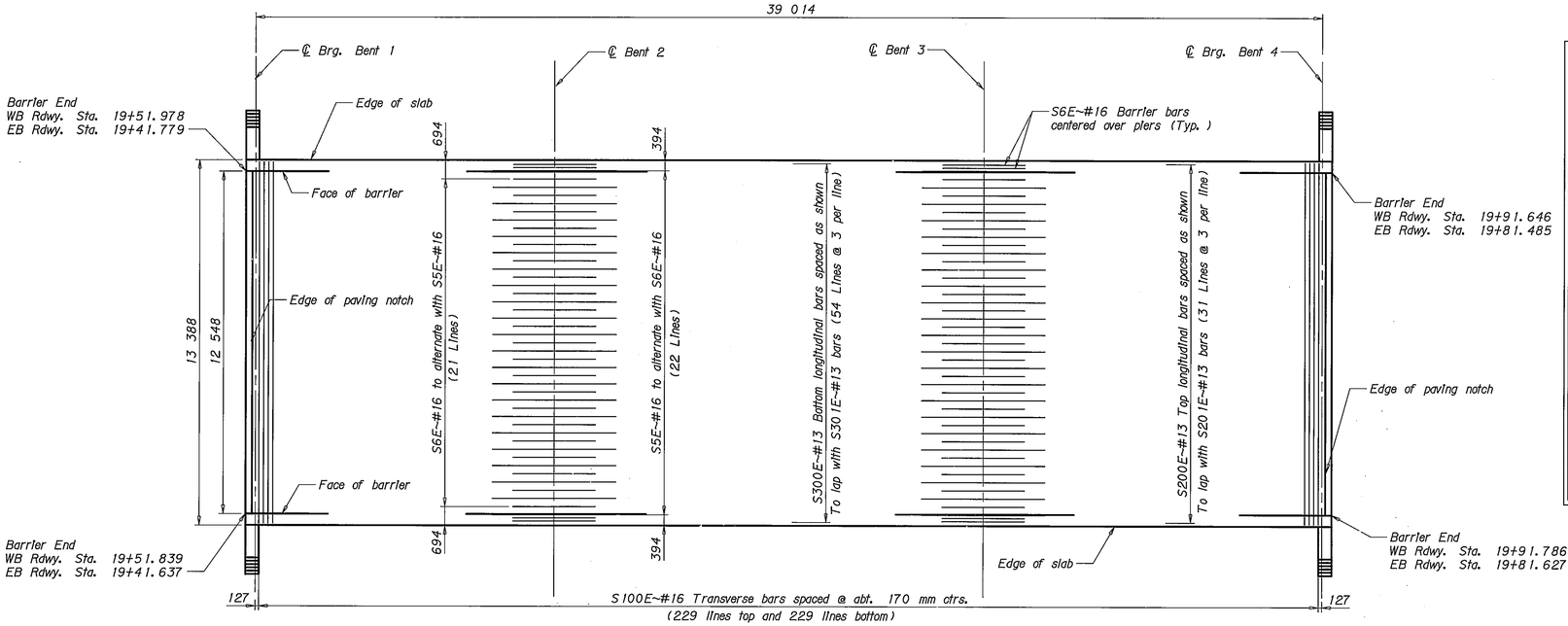
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| | | |
|---|---|---|
| DESIGNED | 10-31-03 | T. J. B. |
| DRAWN | 10-31-03 | T. J. B. |
| CHECKED | 4-9-04 | M. S. K. |
| APPROVED | 4-25-05 | K. M. B. |
| REVISED | | |
| REVISED | | |

c:\dgn\5298brmde001.dgn
7/10/2006 12:49:05 PMCPS - U1426

| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 0002(753) | B3 |

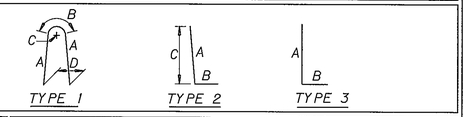
BRIDGE BUREAU




## REINFORCING STEEL PLACEMENT DIAGRAM

Scale ~ 1:100
EB Roadway Shown - WB Roadway Similar

## BILL OF REINFORCING STEEL (One Structure Only)




| STRAIGHT BARS | | | | BENT BARS (All dimensions are out to out) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mark | Size | No. | Length | Mark | Size | No. | Type | Length | A | B | C | D |
| S100E | 16 | 458 | 13 240 | B1E | 13 | 234 | 1 | 1 550 | 710 | 130 | 40 | 230 |
| S200E | 13 | 93 | 12 190 | B2E | 16 | 230 | 2 | 1 300 | 760 | 540 | 630 | |
| S201E | 13 | 31 | 4 550 | B3E | 13 | 230 | 3 | 920 | 560 | 360 | | |
| S300E | 13 | 162 | 12 190 | | | | | | | | | |
| S301E | 13 | 54 | 4 550 | | | | | | | | | |
| S5E | 16 | 44 | 4 500 | | | | | | | | | |
| S6E | 16 | 50 | 3 000 | | | | | | | | | |
| B100E | 13 | 48 | 12 190 | | | | | | | | | |
| B101E | 13 | 16 | 5 010 | | | | | | | | | |
| BW1E | 16 | 8 | 13 240 | | | | | | | | | |

NOTE: The suffix E denotes epoxy coated reinforcing.

NOTE: Lap #13 bars 510 mm minimum.

NOTE: See Std. Dwg. No. MSL-5 for additional slab and barrier details.

NOTE: For deck removal details and for additional notes see Dwg. No. 19224.

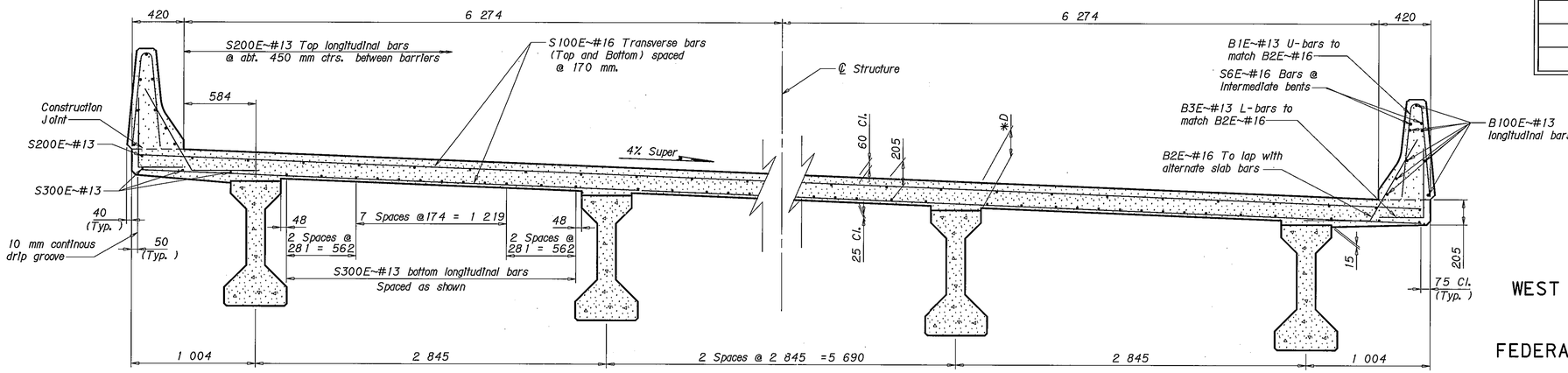
NOTE: Omit the 100 mm Ø Schedule 40 PVC conduit pipe in barriers.

## DEAD LOAD DEFLECTION TABLE

TYPE A PRESTRESSED CONCRETE BEAM

| Span Length | Tenth Point | | | | |
|---|---|---|---|---|---|
| | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 |
| 10 668 Span | 1 | 2 | 2 | 3 | 3 |
| 15 240 Span | 4 | 7 | 10 | 12 | 12 |
| 12 192 Span | 1 | 3 | 4 | 4 | 5 |

NOTE: Deflections symmetrical about 0.5 point and do not include beam dead load.




*NOTE: Dimension D = 225 @ ℄ Brg. unless otherwise noted. (Varies @ tenth points) See dead load deflection table and camber diagram

## PARTIAL TRANSVERSE SECTION

Scale ~ 1:20
(Looking ahead on line)
EB Roadway Shown - WB Roadway Similar

MONTANA DEPARTMENT OF TRANSPORTATION

# WEST END - JACKSON CREEK INTERCHANGE

AT STA. 19+65.96

FEDERAL AID PROJECT NO. IM 0002(753)

GALLATIN & PARK COUNTIES

## SLAB DETAILS

Scale ~ As Noted

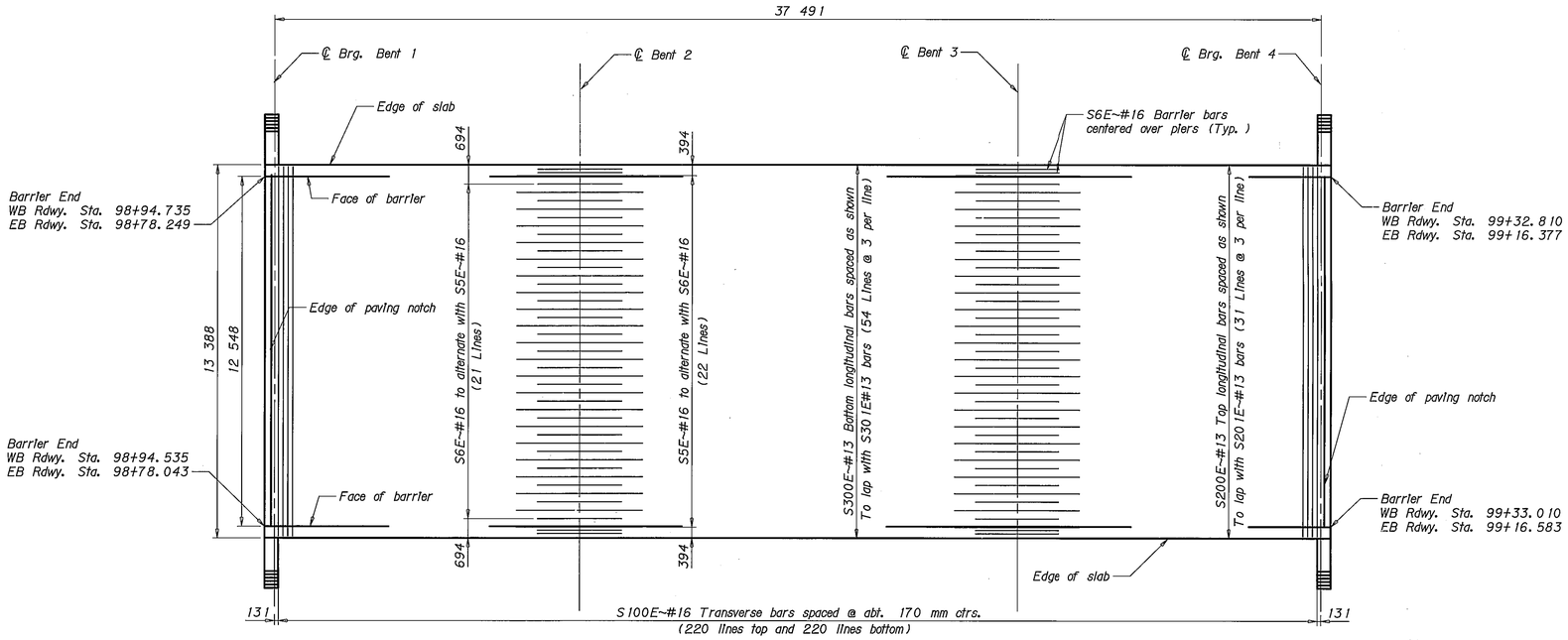
| | | |
|---|---|---|
| DESIGNED | 10-22-03 | T. J. B |
| DRAWN | 10-22-03 | T. J. B |
| CHECKED | 4-9-04 | M. S. K. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

FILENAME: 5298BRSLD002.DGN DRAWING NO. 19225

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7/10/2008
12:49:11 PWCPS - U1426

| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 0002(753) | B4 |

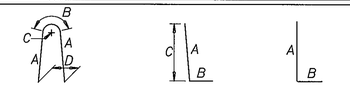
BRIDGE BUREAU




## REINFORCING STEEL PLACEMENT DIAGRAM

Scale ~ 1: 100
EB Roadway Shown - WB Roadway Similar

## BILL OF REINFORCING STEEL (One Structure Only)




| STRAIGHT BARS | | | | BENT BARS (All dimensions are out to out) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mark | Size | No. | Length | Mark | Size | No. | Type | Length | A | B | C | D |
| S100E | 16 | 440 | 13 240 | B1E | 13 | 226 | 1 | 1 550 | 710 | 130 | 40 | 230 |
| S200E | 13 | 93 | 12 190 | B2E | 16 | 222 | 2 | 1 300 | 760 | 540 | 630 | |
| S201E | 13 | 31 | 3 030 | | | | | | | | | |
| | | | | B3E | 13 | 222 | 3 | 920 | 560 | 360 | | |
| S300E | 13 | 162 | 12 190 | | | | | | | | | |
| S301E | 13 | 54 | 3 030 | | | | | | | | | |
| S5E | 16 | 44 | 4 500 | | | | | | | | | |
| S6E | 16 | 50 | 3 000 | | | | | | | | | |
| B100E | 13 | 48 | 12 190 | | | | | | | | | |
| B101E | 13 | 16 | 3 490 | | | | | | | | | |
| BW1E | 16 | 8 | 13 240 | | | | | | | | | |

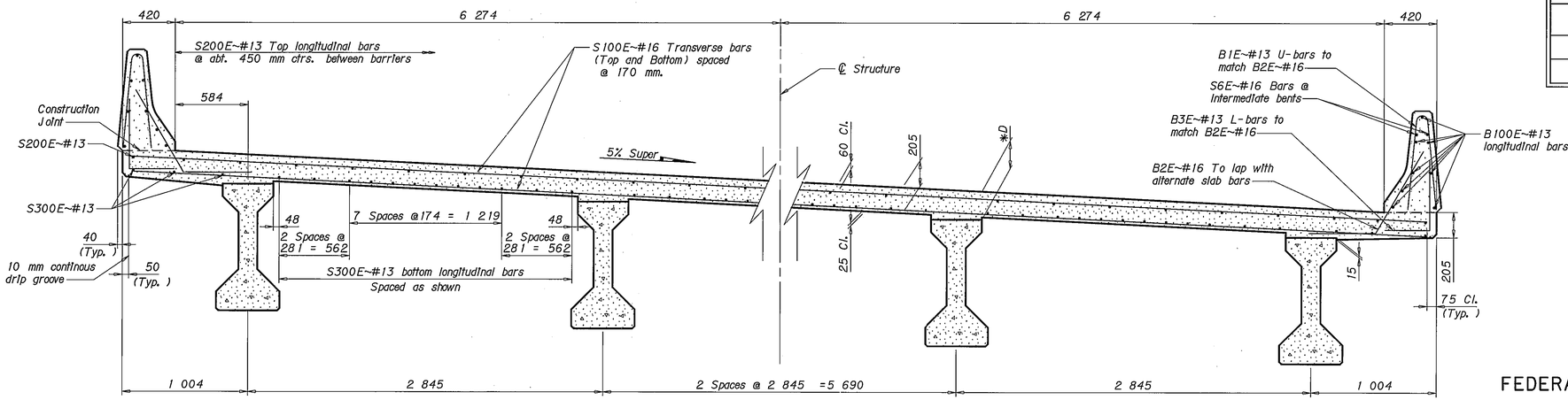
NOTE: The suffix E denotes epoxy coated reinforcing.

NOTE: Lap #13 bars 510 mm minimum.

NOTE: See Std. Dwg. No. MSL-5 for additional slab and barrier details.

NOTE: For deck removal details and for additional notes see Dwg. No. 19224.

NOTE: Omit the 100 mm Ø Schedule 40 PVC conduit pipe in barriers.




*NOTE: Dimmension D = 225 @ ℄ Brg. unless otherwise noted. (Varies @ tenth points) See dead load deflection table and camber diagram.

## PARTIAL TRANSVERSE SECTION

Scale ~ 1: 20
(Looking ahead on line)
EB Roadway Shown - WB Roadway Similar

## DEAD LOAD DEFLECTION TABLE

TYPE A PRESTRESSED CONCRETE BEAM

| Span Length | Tenth Point | | | | |
|---|---|---|---|---|---|
| | 0. 1 | 0. 2 | 0. 3 | 0. 4 | 0. 5 |
| 10 668 Span | 1 | 2 | 2 | 3 | 3 |
| 15 240 Span | 4 | 7 | 10 | 12 | 12 |

NOTE: Deflections symmetrical about 0. 5 point and do not include beam dead load.

| | | |
|---|---|---|
| DESIGNED | 10-24-03 | T. J. B |
| DRAWN | 10-24-03 | T. J. B |
| CHECKED | 4-9-04 | M. S. K. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

MONTANA DEPARTMENT OF TRANSPORTATION

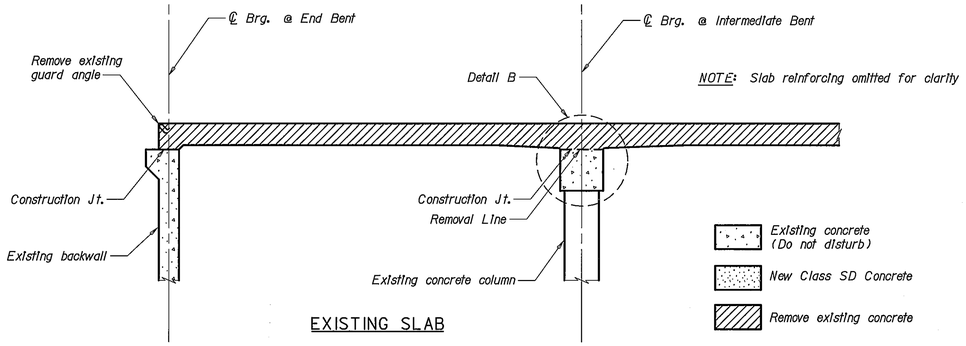
HOPPER INTERCHANGE
AT STA. 99+06.00
FEDERAL AID PROJECT NO. IM 0002(753)
GALLATIN & PARK COUNTIES
SLAB DETAILS

Scale ~ As Noted

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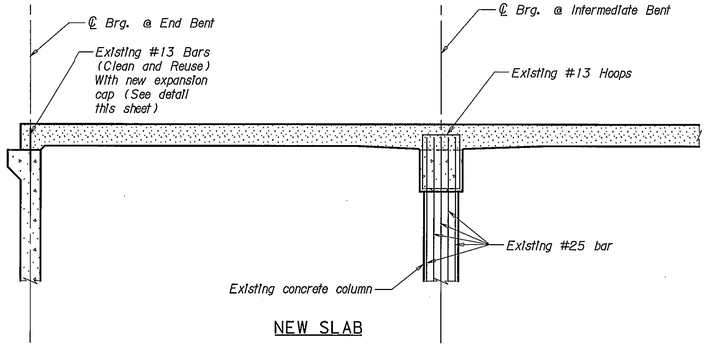
c:\dgn\5298brsld001.dgn
7/10/2008
12:49:16 PMCPS - U1426

| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 0002(753) | B5 |




NOTE: Slab reinforcing omitted for clarity

EXISTING SLAB




NEW SLAB

NOTE: See Dwg. No. 19228 for Bill of Reinforcing Steel for EB Roadway. See Dwg. No. 19229 for Bill of Reinforcing Steel for WB Roadway.

NOTE: See Dwg. No. 19224, 19228, and 19229 for additional notes and details.

NOTE: Remove existing slab and curbs to the top of the backwall @ end bents and to 10mm below the construction joint @ intermediate bents. Clean exposed reinforcing steel prior the placing new concrete.

NOTE: See Std. Dwg. No. MSL-5 for additional barrier details.

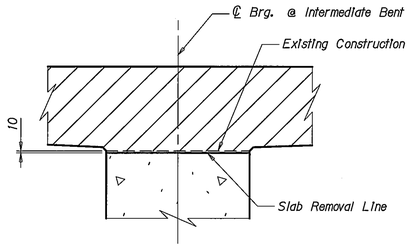
NOTE: Use Class SD Concrete in all barriers.

NOTE: Barrier End Stations remain unchanged. Table of Barrier Stations represents the equivalent metric stations.

| TABLE OF BARRIER STATIONS | | |
|---|---|---|
| LOCATION | EB Roadway | WB Roadway |
| B1 Rt. | 154+06.457 | 153+91.129 |
| B1 Lt. | 154+06.390 | 153+91.248 |
| B4 Rt. | 154+39.044 | 154+22.621 |
| B4 Lt. | 154+39.571 | 154+22.514 |

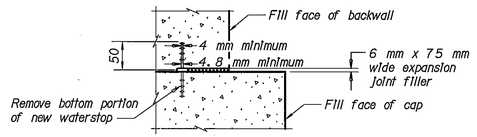
# SLAB REMOVAL AND REPLACEMENT DETAILS

Scale ~ 1: 50




DETAIL B

Scale ~ 1: 15



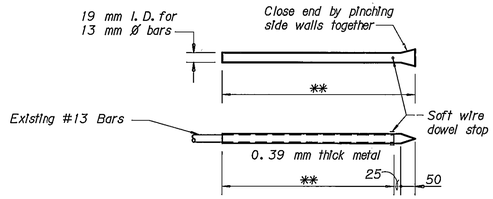

WATERSTOP DETAIL

No Scale

NOTE: Hold waterstop in accurate position while placing concrete.

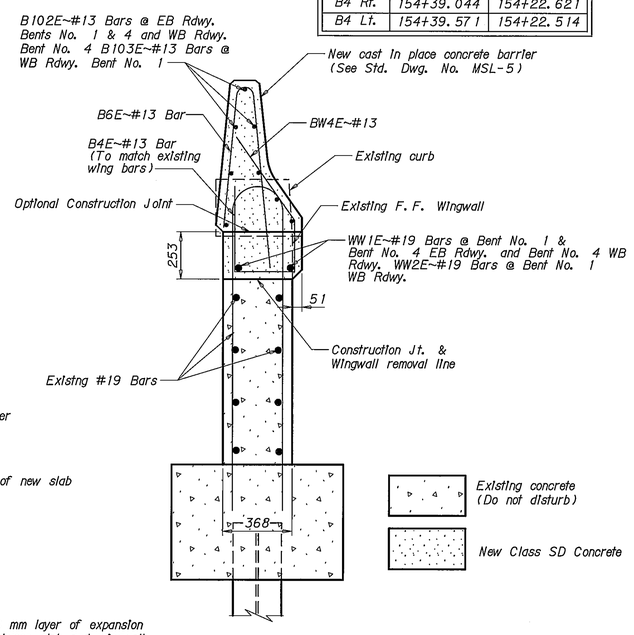
NOTE: Remove exposed portion of existing copper waterstop.

**NOTE: Field cut expansion caps to the required length



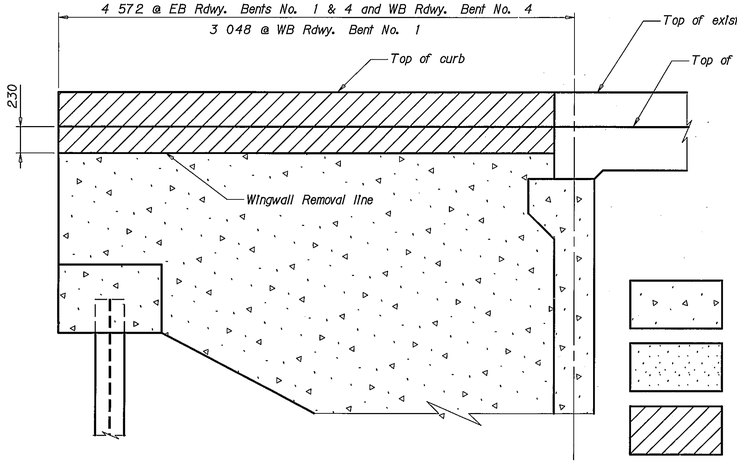

METAL EXPANSION CAP DETAIL

No Scale

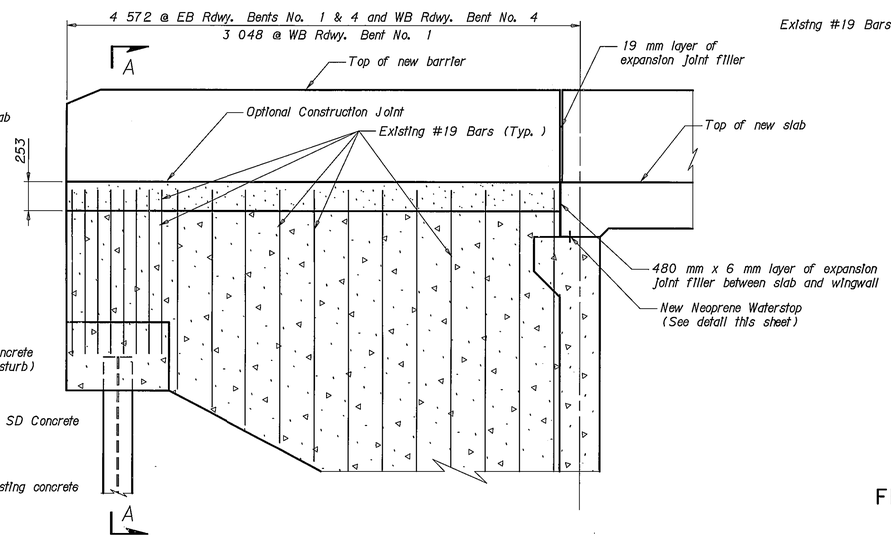



SECTION A-A

Scale ~ 1: 15




EXISTING WINGWALL




NEW WINGWALL

# WINGWALL REMOVAL & REPLACEMENT DETAIL

Scale ~ 1: 25

MONTANA DEPARTMENT OF TRANSPORTATION

COUNTY ROAD SEPARATION

AT STA. 154+15.26

FEDERAL AID PROJECT NO. IM 0002(753)

GALLATIN & PARK COUNTIES

SLAB REMOVAL DETAILS

Scale ~ As Noted

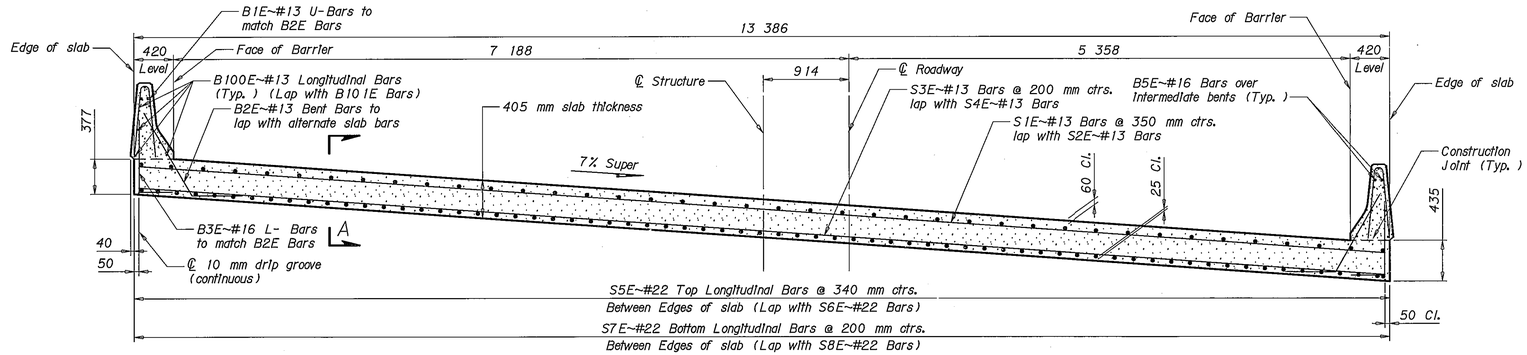
| | | |
|---|---|---|
| DESIGNED | 5-11-04 | M.S.K. |
| DRAWN | 5-13-04 | T.J.B. |
| CHECKED | 3-10-05 | M.L.R. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

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7/10/2008
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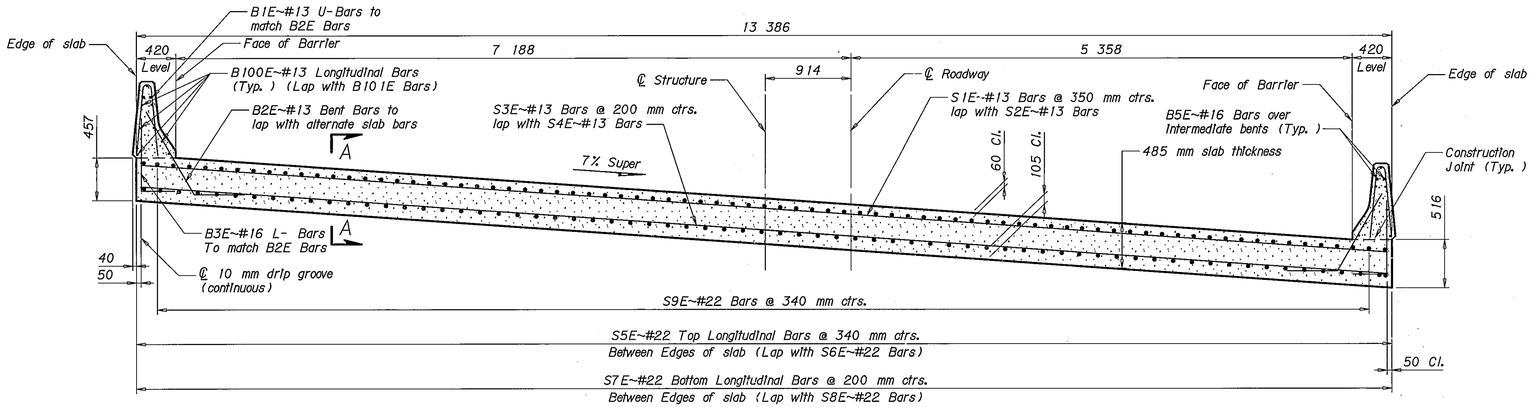
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|---|---|---|
| MONTANA | IM 0002(753) | B6 |

BRIDGE BUREAU



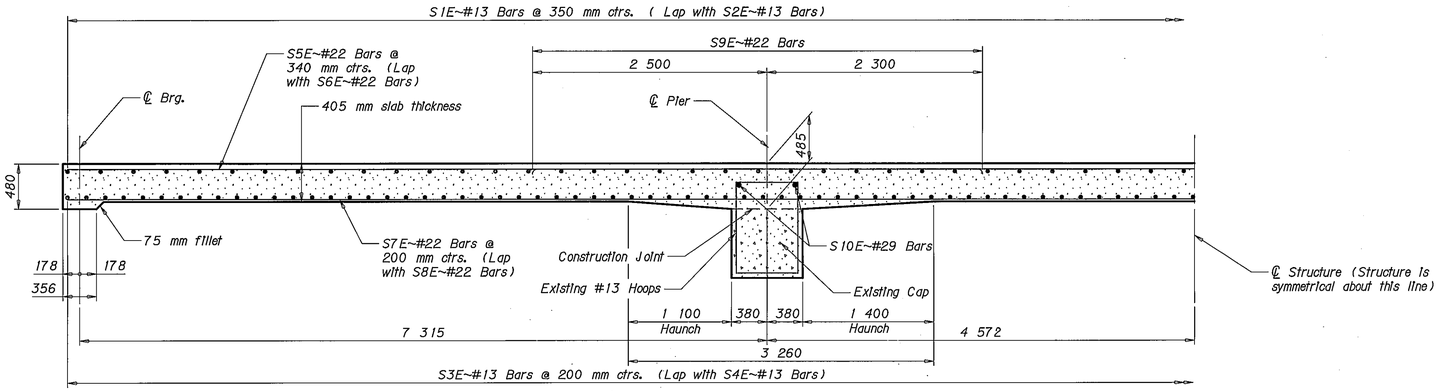

## TRANSVERSE SLAB SECTION NEAR ℄ SPAN

(Looking Back On Line)
Scale ~ 1:30




## TRANSVERSE SLAB SECTION @ ℄ PIER

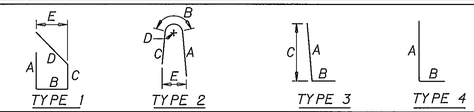
(Looking Back On Line)
Scale ~ 1:30




## HALF LONGITUDINAL SECTION - SECTION A-A

Scale ~ 1:30

## BILL OF REINFORCING STEEL




| STRAIGHT BARS | | | | BENT BARS (All dimensions are out to out) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mark | Size | No. | Length | Mark | Size | No. | Type | Length | A | B | C | D | E |
| S1E | 13 | 70 | 12 190 | B1E | 13 | 126 | 2 | 1 560 | 710 | 140 | 710 | 45 | 220 |
| S2E | 13 | 70 | 1 710 | B2E | 16 | 122 | 3 | 1 550 | 1 020 | 530 | 880 | | |
| S3E | 13 | 122 | 12 190 | B3E | 13 | 122 | 4 | 1 130 | 770 | 360 | | | |
| S4E | 13 | 122 | 1 710 | B4E | 13 | 64 | 1 | 1 600 | 460 | 320 | 280 | 540 | 450 |
| S5E | 22 | 40 | 18 290 | B6E | 13 | 64 | 2 | 1 780 | 930 | 140 | 710 | 45 | 250 |
| S6E | 22 | 40 | 6 950 | | | | | | | | | | |
| S7E | 22 | 68 | 18 290 | | | | | | | | | | |
| S8E | 22 | 68 | 6 950 | | | | | | | | | | |
| S9E | 22 | 78 | 4 800 | | | | | | | | | | |
| S10E | 29 | 4 | 13 280 | | | | | | | | | | |
| B100E | 13 | 32 | 12 190 | | | | | | | | | | |
| B101E | 13 | 16 | 890 | | | | | | | | | | |
| B102E | 13 | 32 | 4 290 | | | | | | | | | | |
| B5E | 16 | 8 | 3 000 | | | | | | | | | | |
| WW1E | 19 | 8 | 4 290 | | | | | | | | | | |

NOTE: The suffix E denotes epoxy coated reinforcing.

NOTE: Lap #13 bars 510 mm minimum.
Lap #22 bars 1 090 mm minimum.

NOTE: See Std. Dwg. No. MSL-5 for additional barrier details.

NOTE: See Dwg. No. 19227 for barrier end stations.

NOTE: Omit the 100 mm Ø Schedule 40 PVC conduit pipe in barriers.

NOTE: See Dwg. No. 19227 for additional notes and details.

MONTANA DEPARTMENT OF TRANSPORTATION

# COUNTY ROAD SEPARATION
# AT STA. 154+15.26
# FEDERAL AID PROJECT NO. IM 0002(753)
# GALLATIN & PARK COUNTIES
# EB RDWY SLAB REINFORCING

Scale ~ As Noted

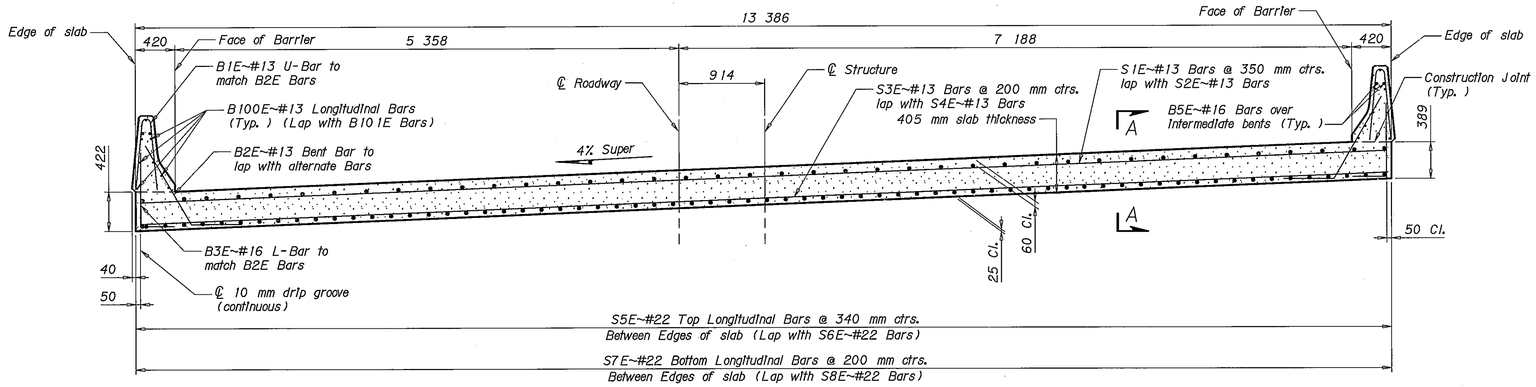
| | | |
|---|---|---|
| DESIGNED | 5-11-04 | M. S. K. |
| DRAWN | 1-19-05 | T. J. B. |
| CHECKED | 3-10-05 | M. L. R. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

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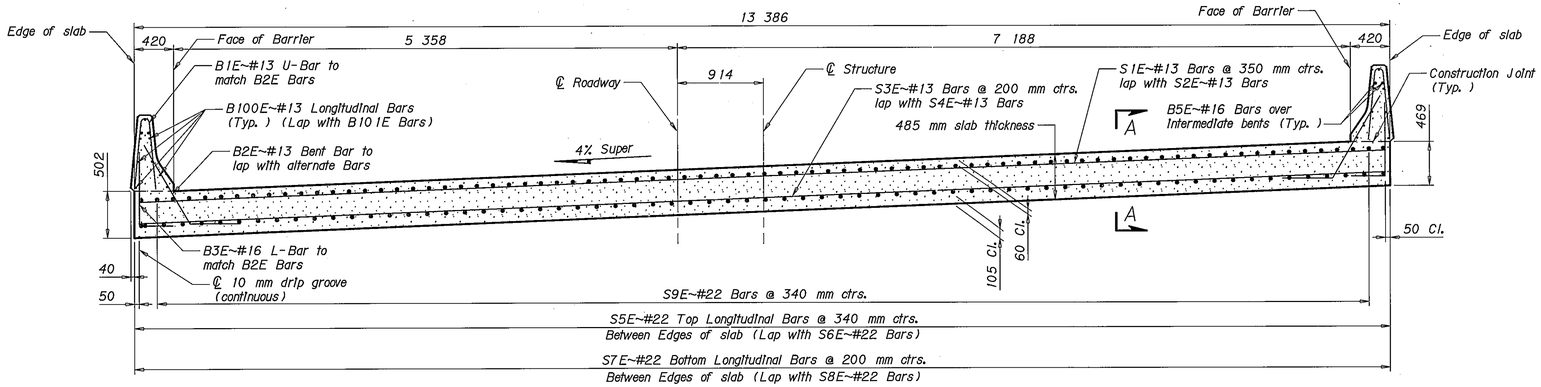
| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 0002(753) | B7 |

BRIDGE BUREAU



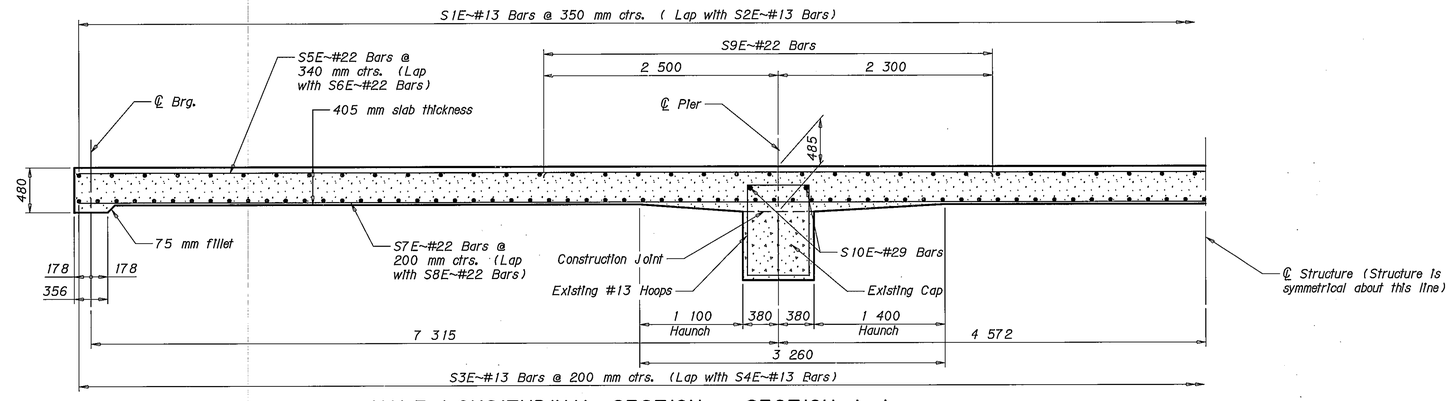

## TRANSVERSE SLAB SECTION NEAR ℄ SPAN

(Looking Back On Line)
Scale ~ 1:30




## TRANSVERSE SLAB SECTION @ ℄ PIER

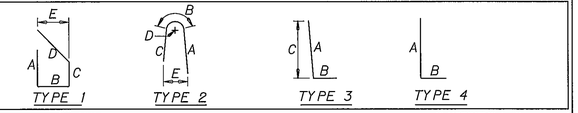
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Scale ~ 1:30




## HALF LONGITUDINAL SECTION - SECTION A-A

Scale ~ 1:30

## BILL OF REINFORCING STEEL




| STRAIGHT BARS | | | | BENT BARS (All dimensions are out to out) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mark | Size | No. | Length | Mark | Size | No. | Type | Length | A | B | C | D | E |
| S1E | 13 | 70 | 12 190 | B1E | 13 | 126 | 2 | 1 560 | 710 | 140 | 710 | 45 | 220 |
| S2E | 13 | 70 | 1 710 | B2E | 16 | 122 | 3 | 1 500 | 970 | 530 | 840 | | |
| S3E | 13 | 122 | 12 190 | B3E | 13 | 122 | 4 | 1 150 | 790 | 360 | | | |
| S4E | 13 | 122 | 1 710 | B4E | 13 | 54 | 1 | 1 600 | 460 | 320 | 280 | 540 | 450 |
| S5E | 22 | 40 | 18 290 | B6E | 13 | 54 | 2 | 1 780 | 930 | 140 | 710 | 45 | 250 |
| S6E | 22 | 40 | 6 950 | | | | | | | | | | |
| S7E | 22 | 68 | 18 290 | | | | | | | | | | |
| S8E | 22 | 68 | 6 950 | | | | | | | | | | |
| S9E | 22 | 78 | 4 800 | | | | | | | | | | |
| S10E | 29 | 4 | 13 280 | | | | | | | | | | |
| | | | | | | | | | | | | | |
| B100E | 13 | 32 | 12 190 | | | | | | | | | | |
| B101E | 13 | 16 | 890 | | | | | | | | | | |
| B102E | 13 | 16 | 4 290 | | | | | | | | | | |
| B103E | 13 | 16 | 2 770 | | | | | | | | | | |
| B5E | 16 | 8 | 3 000 | | | | | | | | | | |
| | | | | | | | | | | | | | |
| WW1E | 19 | 4 | 4 290 | | | | | | | | | | |
| WW2E | 19 | 4 | 2 770 | | | | | | | | | | |

NOTE: The suffix E denotes epoxy coated reinforcing.

NOTE: Lap #13 bars 510 mm minimum.
Lap #22 bars 1 090 mm minimum.

NOTE: See Std. Dwg. No. MSL-5 for additional barrier details.

NOTE: See Dwg. No. 19227 for barrier end stations.

NOTE: Omit the 100 mm Ø Schedule 40 PVC conduit pipe in barriers.

NOTE: See Dwg. No. 19227 for additional notes and details.

MONTANA DEPARTMENT OF TRANSPORTATION

COUNTY ROAD SEPARATION
AT STA. 154+15.26
FEDERAL AID PROJECT NO. IM 0002(753)
GALLATIN & PARK COUNTY
WB RDWY SLAB REINFORCING

Scale ~ As Noted

| | | |
|---|---|---|
| DESIGNED | 5-11-04 | M. S. K. |
| DRAWN | 1-19-05 | T. J. B. |
| CHECKED | 3-10-05 | M. L. R. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

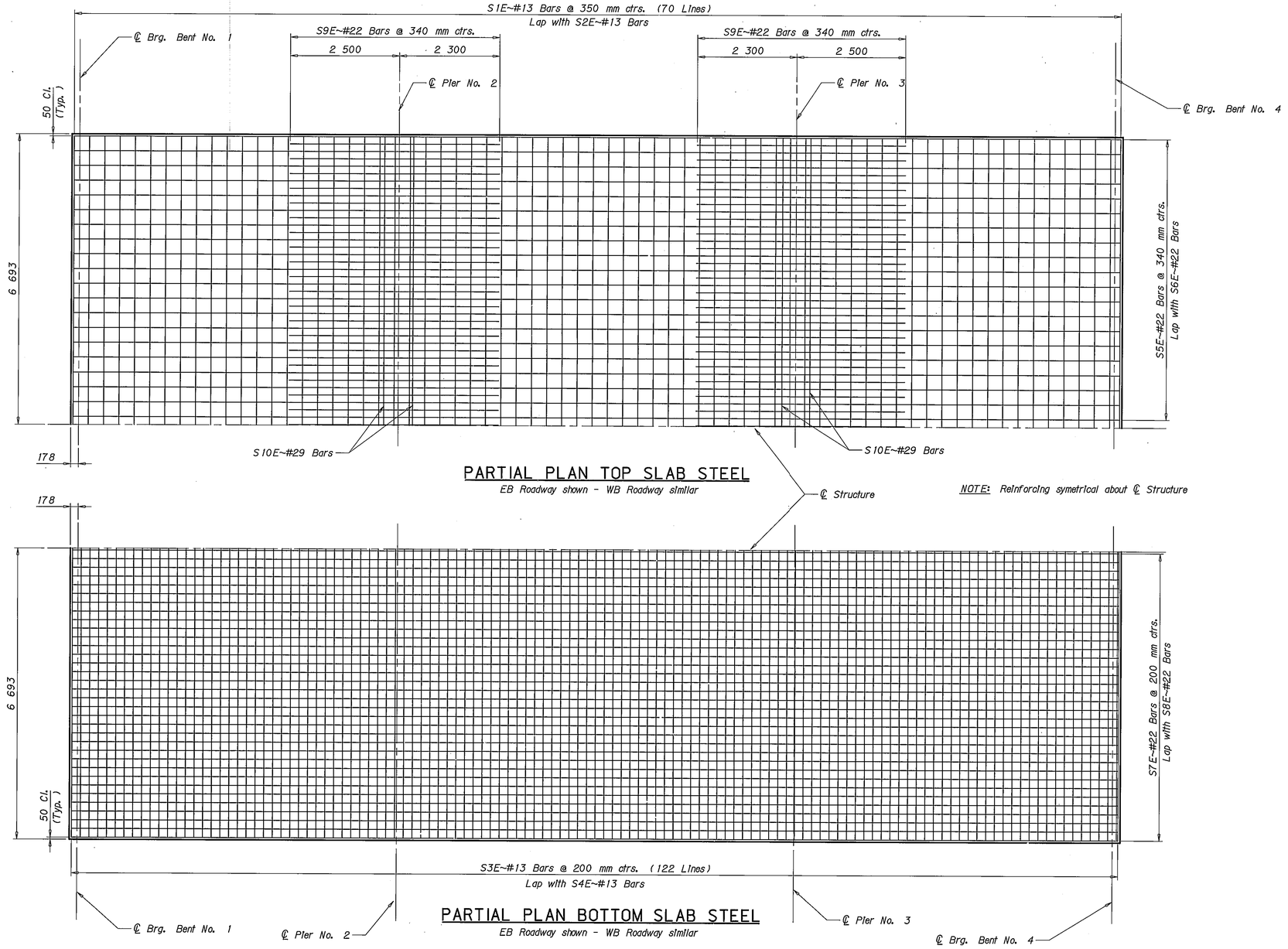
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7/10/2008
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| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 0002(753) | 88 |

NOTE: See Dwg. No. 19228 for Bill of Reinforcing steel for EB Roadway. See Dwg. No. 19229 for Bill of Reinforcing Steel for WB Roadway.

NOTE: See Dwg. No. 19228 and 19229 for additional notes and details.




## PARTIAL PLAN TOP SLAB STEEL

EB Roadway shown - WB Roadway similar

NOTE: Reinforcing symetrical about ℄ Structure

## PARTIAL PLAN BOTTOM SLAB STEEL

EB Roadway shown - WB Roadway similar

MONTANA DEPARTMENT OF TRANSPORTATION

# COUNTY ROAD SEPARATION
# AT STA. 154+15.26
# FEDERAL AID PROJECT NO. IM 0002(753)
# GALLATIN & PARK COUNTIES
# SLAB DETAILS

Scale ~ 1:50

| | | |
|---|---|---|
| DESIGNED | 8-25-04 | M. S. K. |
| DRAWN | 1-19-05 | T. J. B. |
| CHECKED | 3-10-05 | M. L. R. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

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SECTION II

7 of 34

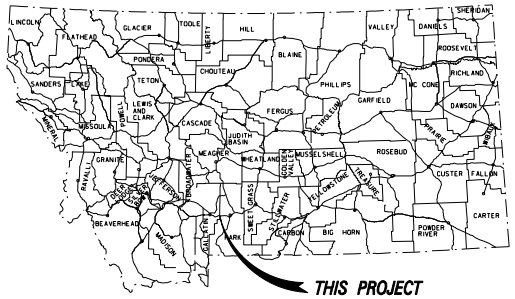
# MONTANA DEPARTMENT OF TRANSPORTATION

## FEDERAL AID PROJECT NO. IM 90-6(128)318

## COLD MILL, PLANT MIX SURF. OVERLAY, SEAL & COVER

## BOZEMAN HILL – E. & W.

## GALLATIN & PARK COUNTIES



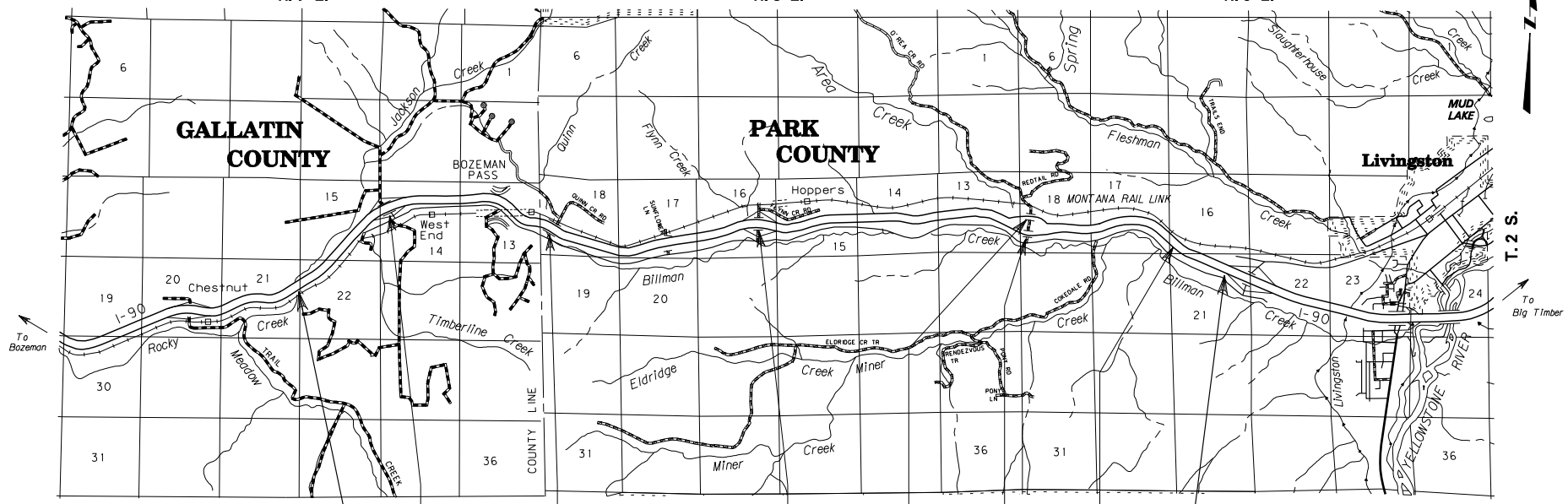

| DESIGN DATA | | | |
|---|---|---|---|
| PRESENT | 2009 | A.A.D.T. = | 12,200 |
| LETTING | 2010 | A.A.D.T. = | 12,630 |
| DESIGN | 2030 | A.A.D.T. = | 21,940 |
| | | D.H.V. = | 2,520 |
| | | T. = | 17.3 % |
| | | V. = | 50 |
| | | 18 KIP ESAL'S = | 1,584 |
| | | GROWTH RATE = | 2.8 % |

LETTING DATE –

*SURFACING SOURCE – CONTRACTOR FURNISHED*

**LENGTH 12.3 miles**

**NO SCALE**




**STA. 0+00.0 (ENGLISH) ON I 90-6(36)315 U-2**

**STA. 0+00.0 (ENGLISH) BEGIN IM 90-6(128)318**

**STA. 84+50.0 ℄ MED. RP 319.7**
**DUAL 41.5' x 128.0' BRIDGES IN PLACE (JACKSON CREEK INTERCHANGE)**

**STA. 181+50.0 ℄ MED. RP 321.9**
**41.5' x 133.0' EAST BOUND & 41.5' x 178.0' WEST BOUND BRIDGES IN PLACE (MUIR GRADE SEPARATION)**

**STA. 325+00.0 ℄ MED. RP 324.6**
**DUAL 41.5' x 123.0' BRIDGES IN PLACE (HOPPER INTERCHANGE)**

**STA. 505+50.0 WEST BOUND RP 328.0**
**41.5' x 78.0' BRIDGE IN PLACE (GRADE SEPARATION)**

**STA. 506+00.0 EAST BOUND RP 328.0**
**41.5' x 78.0' BRIDGE IN PLACE (GRADE SEPARATION)**

**STA. 613+48.0 EAST BOUND BK. =**
**STA. 614+07.2 WEST BOUND BK. =**
**STA. 2+65.2 ℄ MED. AH.**

**STA. 36+00.0 (ENGLISH) END IM 90-6(128)318 =**
**STA. 36+00.0 (ENGLISH) ON I-IG 90-7(9)327**

***THIS CONTRACT***

**RP 318.4 TO RP 330.7**

| RELATED PROJECTS |
|---|
| |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| MDT MONTANA DEPARTMENT OF TRANSPORTATION | C:\dgn\6922\6922000RDPVP001.DGN | DESIGNED BY | BERT BOUMA | | BOZEMAN HILL - E. & W. | | IM 90-6(128)318 |
| | 7/8/2010 | REVIEWED BY | | | | | |
| | 2:43:31 PM u0796 | CHECKED BY | | | CSF = N. A. | UPN NUMBER 6922000 | SHEET 1 OF 22 |

| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 90-6(128)318 | B1 |

# MONTANA
# DEPARTMENT OF TRANSPORTATION

## BRIDGE PLANS AND QUANTITIES
## FEDERAL AID PROJECT NO. IM 90-6(127)318 P.E.
## IM 90-6(128)318 CONST.
## BOZEMAN HILL E & W
## GALLATIN COUNTY
## PARK COUNTY

### LIST OF DRAWINGS


| SHEET NO. | DWG. NO. | TITLE |
|---|---|---|
| B1 | 20879A | TITLE SHEET |
| B2 | 20879B | REVISE BRIDGE RAIL-CONCRETE BARRIER |
| B3 | 20879C | BARRIER DETAILS |
| B4 | 20880A | EXPANSION JOINT LOCATION AND LONGITUDINAL STEEL REINFORCEMENT PLACEMENT DIAGRAM AND BARRIER END DETAIL |
| B5 | 20880B | BARRIER REINFORCING STEEL PLACEMENT DIAGRAMS, BRIDGE DECK REPAIR & BILL OF REINFORCING STEEL |


### BRIDGE PLAN QUANTITIES

| FEATURE CROSSED | GENERAL LAYOUT DWG. NO. | BRIDGE IDENTIFICATION NO. | HMWM DECK SEAL TREATMENT QUANTITIES | | * CLASS A BRIDGE DECK REPAIR (SQ. YD) | REVISE BRIDGE RAIL CONCRETE BARRIER (LN. FT) |
|---|---|---|---|---|---|---|
| | | | BRIDGE DECK TREATMENT (SQ. YD) | FURNISH HMWM TREATMENT MATERIAL (GAL) | | |
| JACKSON CREEK INTERCHANGE | 11412 | 100090319+06691 | 590 | 54 | | |
| | 11412 | 100090319+06692 | 590 | 54 | | |
| COUNTY ROAD SEPARATION | 11419 | 100090321+08951 | | | 1 | 361.3 |
| | 11419 | 100090321+08952 | | | 1 | 271.3 |
| HOPPER INTERCHANGE | 11427 | 100090324+06051 | 567 | 52 | | |
| | 11427 | 100090324+06052 | 567 | 52 | | |
| COUNTY ROAD SEPARATION | 11434 | 100090328+00291 | 362 | 33 | | |
| | 11434 | 100090328+00292 | 362 | 33 | | |
| | | | 3038 | 278 | 2 | 632.6 |

* NOTE: See Dwg. No. 20880B for Bridge Deck Repair.

MONTANA DEPARTMENT OF TRANSPORTATION

BOZEMAN HILL E & W

FEDERAL AID PROJECT NO. IM 90-6(128)318

GALLATIN COUNTY

PARK COUNTY

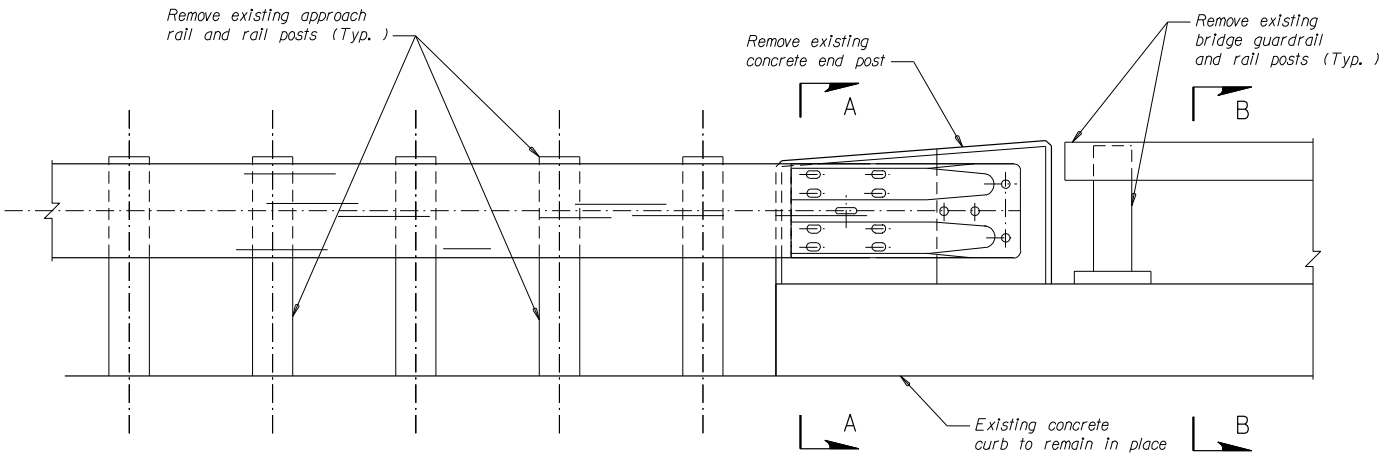
TITLE SHEET

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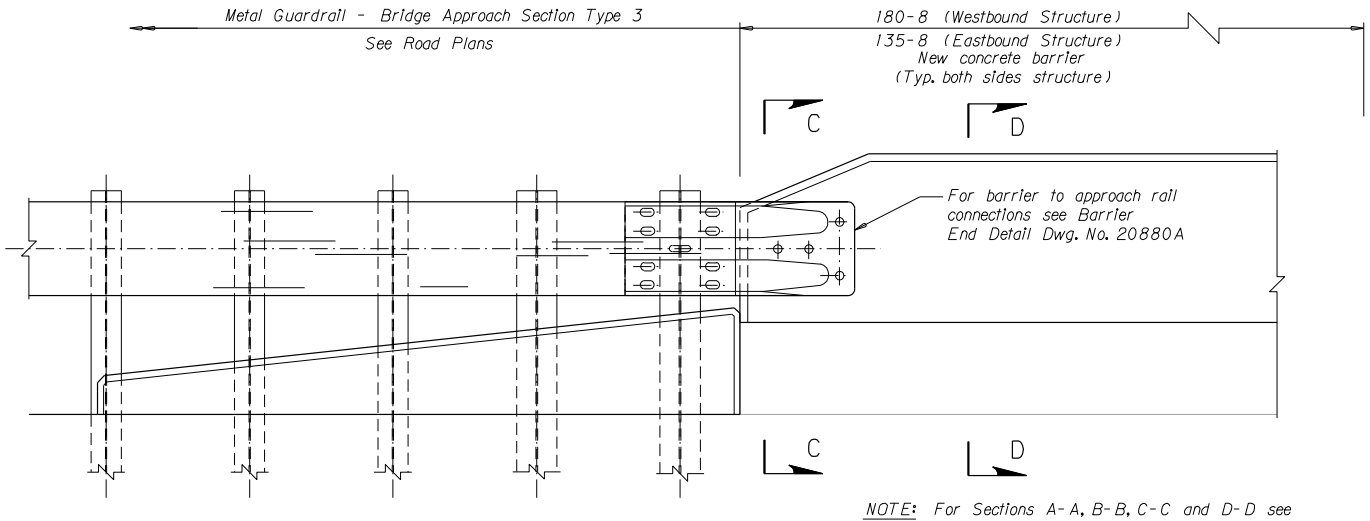
| | | |
|---|---|---|
| DESIGNED | 1-28-10 | C. W. |
| DRAWN | 3-3-10 | D. G. G. |
| CHECKED | 3-19-10 | L. M. M. |
| APPROVED | 3-19-10 | D. F. J. |
| REVISED | | |
| REVISED | | |

FILENAME: 6922000BRRRV001.DGN DRAWING NO. 20879A

| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 90-6(128)318 | B2 |




PARTIAL EXISTING ELEVATION VIEW




NOTE: For Sections A-A, B-B, C-C and D-D see Dwg. No. 20879C.

PARTIAL NEW ELEVATION VIEW

NOTE: f'c = 4000 psi for Class DD-Bridge Concrete.

MONTANA DEPARTMENT OF TRANSPORTATION

BOZEMAN HILL E & W

FEDERAL AID PROJECT NO. IM 90-6(128)318

PARK COUNTY

REVISE BRIDGE RAIL

-

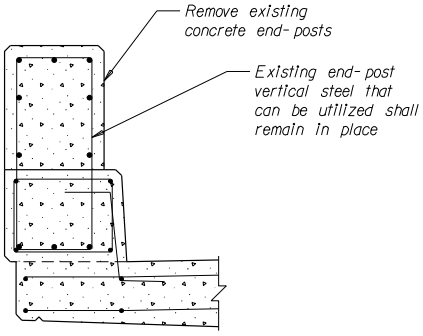
CONCRETE BARRIER

Scale ~ No Scale

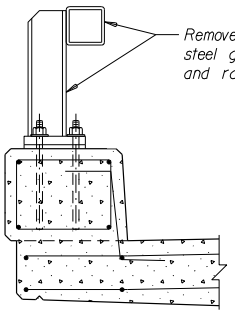
| | | |
|---|---|---|
| DESIGNED | 1-28-10 | C. W. |
| DRAWN | 3-3-10 | D. G. G. |
| CHECKED | 3-19-10 | L. M. M. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

FILENAME: 6922000BRRRV001.DGN DRAWING NO. 20879B

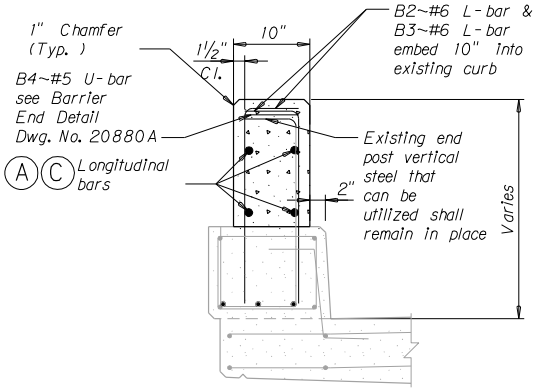
| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 90-6(128)318 | B3 |



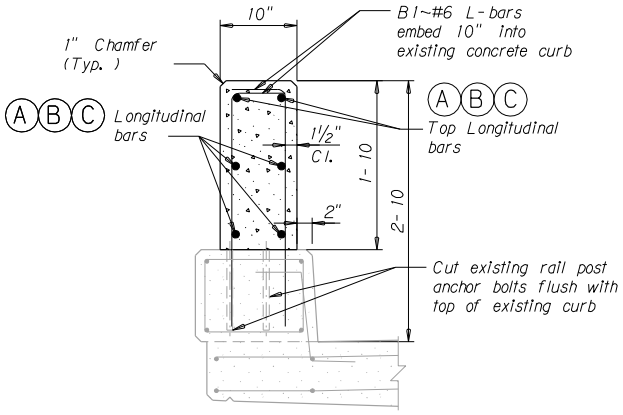

SECTION A-A




SECTION B-B




SECTION C-C




SECTION D-D

NOTE: For Bill of Reinforcing Steel see Dwg. No. 20880B.

NOTE: For L-bar placement locations see Barrier Reinforcing Steel Placement Diagram Dwg. No. 20880B.

NOTE: For (A) (B) (C) longitudinal barrier steel reinforcing mark numbers see table this sheet.

NOTE: For (A) (B) (C) longitudinal barrier steel placement locations see Longitudinal Steel Placement Diagrams Dwg. No. 20880A.

TABLE OF
LONGITUDINAL STEEL REINFORCING
MARK NUMBERS

| LOCATION | WESTBOUND | EASTBOUND |
|---|---|---|
| (A) Top Longitudinal Bars | B100~#5 to lap B102~#5 | B100~#5 to lap B106~#5 |
| (B) Top Longitudinal Bars | B100~#5 to lap B101~#5 | B100~#5 to lap B108~#5 |
| (C) Top Longitudinal Bars | B100~#5 to lap B104~#5 | B109~#5 |
| (A) Longitudinal Bars | B100~#5 to lap B103~#5 | B100~#5 to lap B107~#5 |
| (B) Longitudinal Bars | B100~#5 to lap B101~#5 | B100~#5 to lap B108~#5 |
| (C) Longitudinal Bars | B100~#5 to lap B105~#5 | B110~#5 |

MONTANA DEPARTMENT OF TRANSPORTATION

BOZEMAN HILL E & W

FEDERAL AID PROJECT NO. IM 90-6(128)318

PARK COUNTY

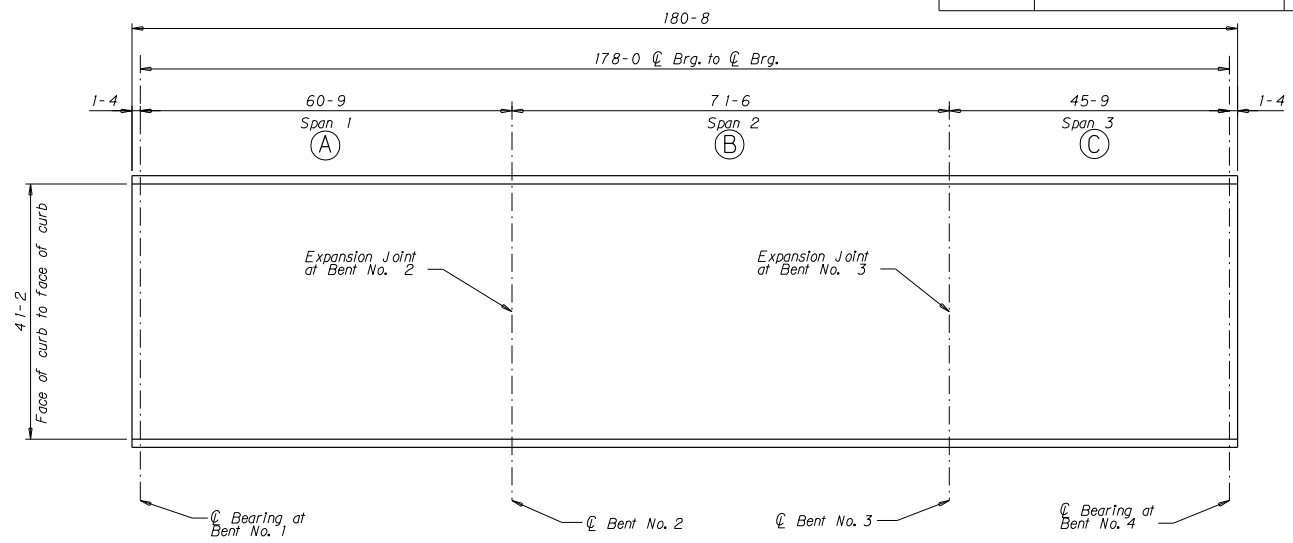
BARRIER DETAILS

Scale ~ No Scale

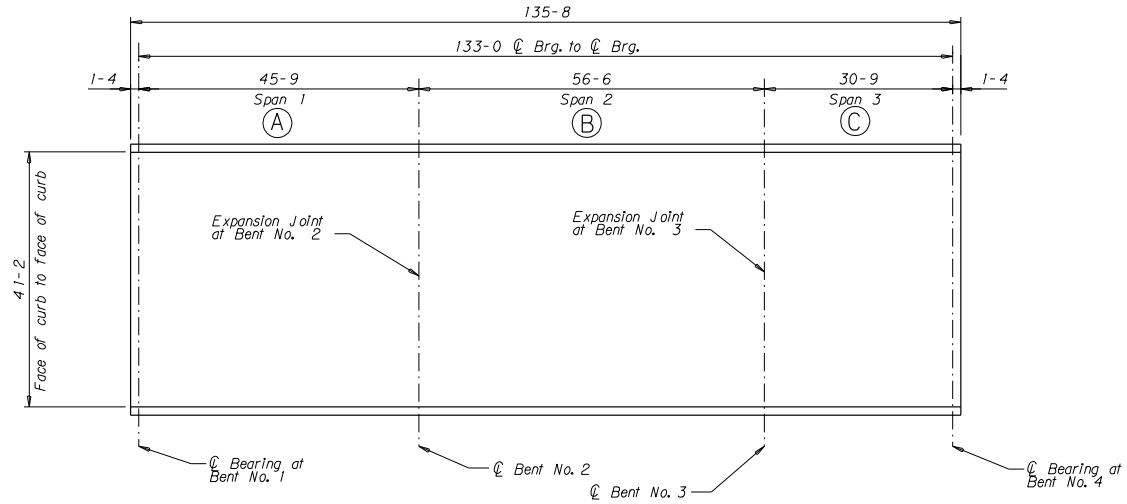
| | | |
|---|---|---|
| DESIGNED | 1-28-10 | C.W. |
| DRAWN | 3-3-10 | D.G.G. |
| CHECKED | 3-19-10 | L.M.M. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

FILENAME: 6922000BRRRV001.DGN DRAWING NO. 20879C

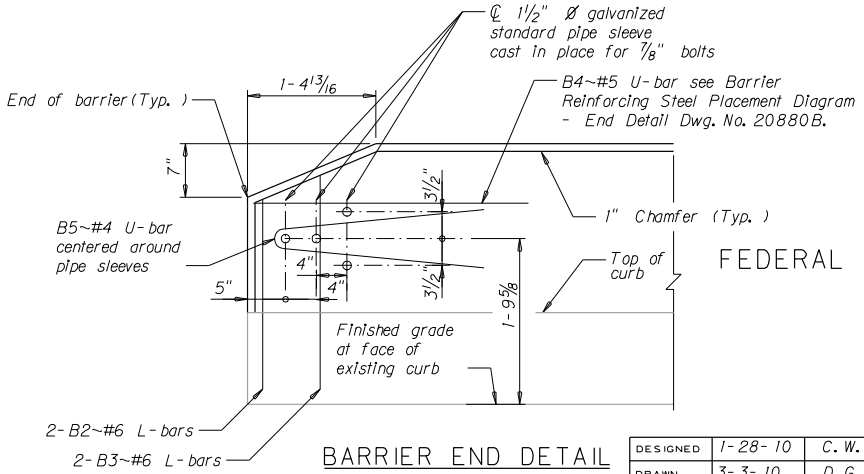
| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 90-6(128)318 | B4 |




EXPANSION JOINT LOCATION AND
LONGITUDINAL REINFORCING STEEL PLACEMENT DIAGRAM
WESTBOUND PLAN VIEW




EXPANSION JOINT LOCATION AND
LONGITUDINAL REINFORCING STEEL PLACEMENT DIAGRAM
EASTBOUND PLAN VIEW




BARRIER END DETAIL

| | | |
|---|---|---|
| DESIGNED | 1-28-10 | C. W. |
| DRAWN | 3-3-10 | D. G. G. |
| CHECKED | 3-18-10 | L. M. M. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

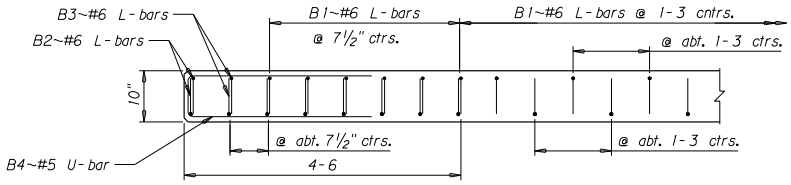
MONTANA DEPARTMENT OF TRANSPORTATION

BOZEMAN HILL E & W
FEDERAL AID PROJECT NO. IM 90-6(128)318
PARK COUNTY
EXPANSION JOINT LOCATION AND
LONGITUDINAL STEEL
REINFORCEMENT PLACEMENT
DIAGRAM
AND
BARRIER END DETAIL

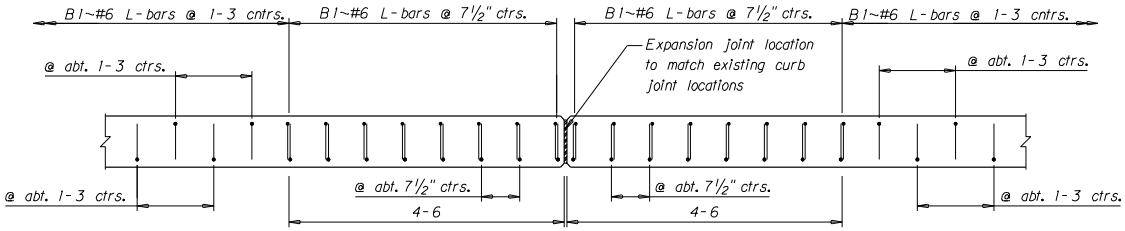
Scale ~ No Scale

FILENAME: 6922000BRRRV002.DGN DRAWING NO. 20880A

| STATE | PROJECT NUMBER | SHEET NO. |
|---|---|---|
| MONTANA | IM 90-6(128)318 | B5 |

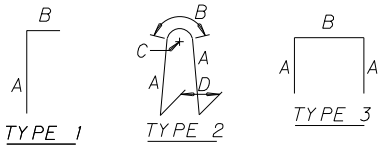



BARRIER REINFORCING STEEL PLACEMENT DIAGRAM - END DETAIL




BARRIER REINFORCING STEEL PLACEMENT DIAGRAM - EXPANSION JOINT DETAIL

## BILL OF REINFORCING STEEL




*For information purposes only.*

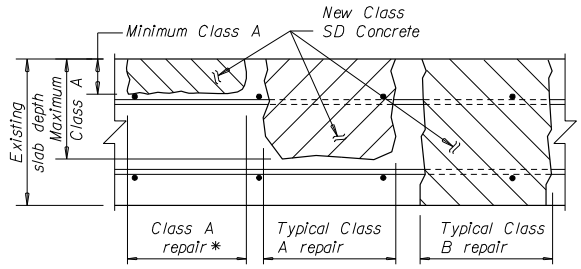
WESTBOUND

| STRAIGHT BARS | | | | BENT BARS (All dimensions are out to out) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mark | Size | No. | Length | Mark | Size | No. | Type | Length | A | B | C | D | E |
| B100 | 5 | 36 | 40-0 | B1 | 6 | 662 | 1 | 3-1 | 2-6 | 0-7 | | | |
| B101 | 5 | 12 | 34-2 | B2 | 6 | 8 | 1 | 2-6 | 1-11 | 0-7 | | | |
| B102 | 5 | 4 | 23-4 | B3 | 6 | 8 | 1 | 2-9 | 2-2 | 0-7 | | | |
| B103 | 5 | 8 | 24-9 | B4 | 5 | 4 | 3 | 6-7 | 3-0 | 0-7 | | | |
| B104 | 5 | 4 | 8-4 | B5 | 4 | 4 | 2 | 4-10 | 2-2 | 0-6 | 0-2 | 0-9 | |
| B105 | 5 | 8 | 9-9 | | | | | | | | | | |
| | | | | | | | | | | | | | |

EASTBOUND

| STRAIGHT BARS | | | | BENT BARS (All dimensions are out to out) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mark | Size | No. | Length | Mark | Size | No. | Type | Length | A | B | C | D | E |
| B100 | 5 | 24 | 40-0 | B1 | 6 | 518 | 1 | 3-1 | 2-6 | 0-7 | | | |
| B106 | 5 | 4 | 8-4 | B2 | 6 | 8 | 1 | 2-6 | 1-11 | 0-7 | | | |
| B107 | 5 | 8 | 9-9 | B3 | 6 | 8 | 1 | 2-9 | 2-2 | 0-7 | | | |
| B108 | 5 | 12 | 19-2 | B4 | 5 | 4 | 3 | 6-7 | 3-0 | 0-7 | | | |
| B109 | 5 | 4 | 30-4 | B5 | 4 | 4 | 2 | 4-10 | 2-2 | 0-6 | 0-2 | 0-9 | |
| B110 | 5 | 8 | 31-9 | | | | | | | | | | |
| | | | | | | | | | | | | | |

NOTE: Lap #5 bars 36" minimun.




* See Dwg. No. 20879A for quantities of Class A Repair.

BRIDGE DECK REPAIR
No scale

NOTE: See Special Provisions for definitions of Class A deck repair.

MONTANA DEPARTMENT OF TRANSPORTATION

BOZEMAN HILL E & W
FEDERAL AID PROJECT NO. IM 90-6(128)318
PARK COUNTY

BARRIER REINFORCING STEEL PLACEMENT DIAGRAMS,

BRIDGE DECK REPAIR
&
BILL OF REINFORCING STEEL

Scale ~ No Scale

| | | |
|---|---|---|
| DESIGNED | 1-28-10 | C.W. |
| DRAWN | 3-3-10 | D.G.G. |
| CHECKED | 3-18-10 | L.M.M. |
| REVISED | | |
| REVISED | | |
| REVISED | | |

FILENAME: 6922000BRRRV002.DGN DRAWING NO. 20880B