MICROFILMED
JAN 25 1988

FHWA REGION	STATE	PROJECT	
5	OHIO		

3/23

HOC-56-0568-0625
HOC-180-0236-0422-0557
BRIDGE REPAIR

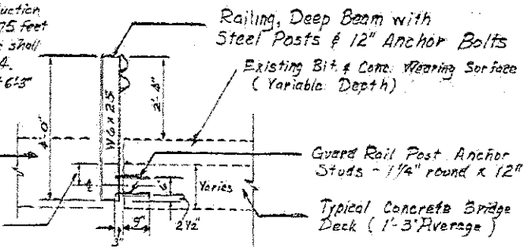
PID NO. BR-36-81

CALCULATIONS

Bridge No.	Item	Pavement	Type D Waterproofing	Porous Backfill	1" Preformed Joint Filler	Drip Strip
HOC-56-0568	301 403 404	(21' x 9 7/12" x 1'6") ÷ 27 = 0.88 CY 26' x 28' x 1 1/4" (Ave)/12" ÷ 27 = 2.81 CY 26' x 28' x 1" (ave)/12" ÷ 27 = 2.25 CY	[26' x 28' + 2(32'-6" x ((12" + 6" + 12")/12"))] ÷ 9 = 102.0 SY	Rear Abut. - (12' + 32'-6") x 1'-6" x 6'-6" ÷ 27 = 16.1 CY End Abut. - (12' + 32'-6") x 1'-6" x 1'-6" ÷ 27 = 3.7 CY	4(1'-6" (Ave) x 1'-6") = 9 SF 2(32'-6" x 6") = 32.5 SF	2 x 8"/12" x (26 + 4(1)) = 40 SF
HOC-56-0625	301 403 404	2(21' x 9 7/12" x 1'6") ÷ 27 = 1.75 CY Same as HOC-56-0568 2.81 CY " " " 2.25 CY	[26' x 28' + 2(28' x ((12" + 6" + 12")/12"))] ÷ 9 = 96.4 SY	2(28' + 12') x 1'-6" x 1'-6" ÷ 27 = 6.7 CY Total 26.5 CY	4(1'-6" x 1'-6") = 9 SF 2(28' x 6") = 28 SF	2 x 8"/12" x (52 + 8(1)) = 80 SF
HOC-180-0236	301 403 404	2(28' x 9 7/12" x 1'6") ÷ 27 = 2.22 CY 22'-0" x 33' x 1 1/4" (Ave)/12" ÷ 27 = 2.52 CY 22'-0" x 33' x 1" /12" ÷ 27 2.24 CY	[22'-0" x 33' + 2(39'-6" x ((12" + 6" + 12")/12"))] ÷ 9 = 102.6 SY		4(1' x 1'-6") = 6 SF 2(39'-6" x 6") = 39.5 SF	2 x 8"/12" x (22 + 4(1)) = 34.7 SF
HOC-180-0422	301 403 404	2(21' x 9 7/12" x 1'6") ÷ 27 = 1.75 CY 22'-6" x 28' x 1 1/4" (Ave)/12 ÷ 27 = 2.24 CY 22'-6" x 28' x 1"/12 ÷ 27 1.94 CY	[22'-6" x 28' + 2(28' x ((12" + 6" + 12")/12))] ÷ 9 = 85.6 SY		4(1' x 1'-6") = 6 SF 2(28' x 6") = 28 SF	2 x 8"/12" x (22'-6" + 4(1)) = 35.3 SF
HOC-180-0557	301 403 404	Same as HOC-180-0422 1.75 CY " " " 2.24 CY " " " 1.94 CY	Same as HOC-180-0422 85.6 SY Total 472.2 SY		4(1' x 1'-6") = 6 SF 2(28' x 6") = 28 SF	2 x 8"/12" x (22'-6" + 4(1)) = 35.3 SF
Adjust to Grade (All 5 Bridges)	404	5 [2(50' x 1/2" (Ave)/12" x 20')] ÷ 27 = 15.43 CY	* (((1/2" + 1 1/2")/2) + (1 1/2" + 1/2")/2) = 1 1/4"		Total 192 SF	Total 225.3 SF
Totals	301 403 404	488 + 3(1.75) + 2.22 = 8.35 CY 2(2.81) + 2.52 + 2(2.24) = 12.62 CY 15.43 + 2(2.25) + 2.24 + 2(1.94) = 26.05 CY	+ 25% added to allow for irregularities in approach profiles and structure grades = 10.4 cy = 15.8 cy = 32.6 cy			

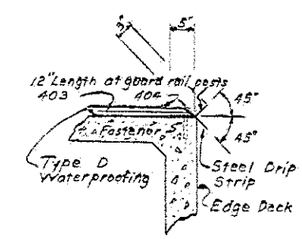
TEMPORARY GUARDRAIL: Quantities shown include two seperate runs of temporary guardrail for two stage construction at each location and lengths of each run are approximately 75 feet in excess of bridge limits. The portion of rail off the bridge shall be supported by temporary drums as per CMS section 606.04. Temporary rail on the bridge shall be attached on posts at 6'-3" centers in the manner shown. For second stage construction the rail posts shall be attached to the interior box beams using anchors cast in the beam. The anchors shall be removed flush with the edge of the beam after the rail posts are removed.

One of the interior beams shall be fabricated with guardrail anchors at 6'-3" centers on the side toward ℄ to be used for temporary guardrail. All costs associated with this work shall be included for payment in the unit price bid for ~~temporary guardrail~~, ~~metal beam~~.



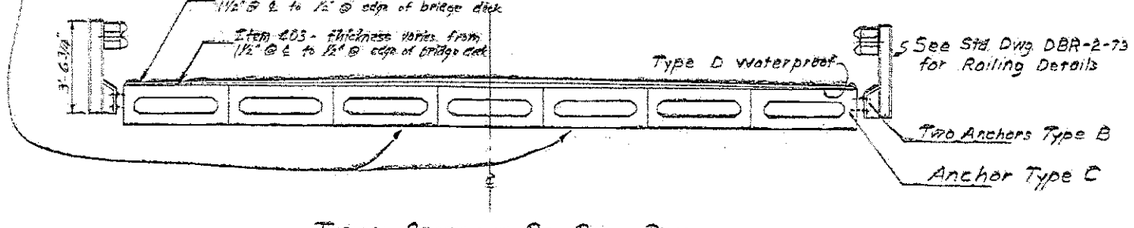
TYPICAL SECTION OF TEMPORARY GUARD RAIL
(To Be Used After Half of the Existing Bridge Deck is Removed)

RAILING ANCHOR STUDS:
Guard rail anchor studs shall be installed in drilled holes using a high strength material such as - Sika SIKA-DUR, HI-MOD, FEL-PRO #132 EPOXY, CELTITE INC. RESIN or approved equal, according to the manufacturer's instructions. Heads are not required and bolts shall be swedged or fully threaded.

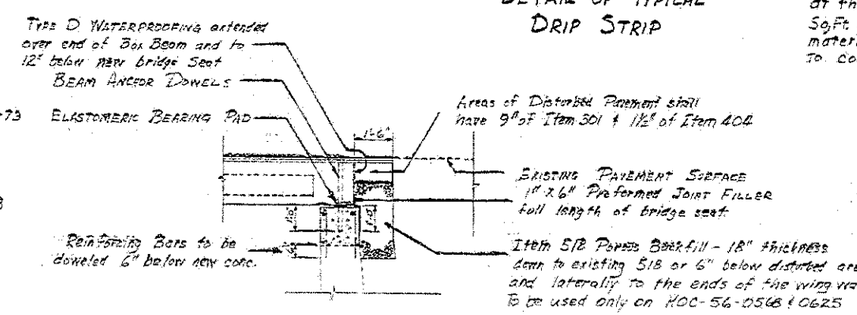


DETAIL OF TYPICAL DRIP STRIP

DRIP STRIP: Prior to applying deck membrane waterproofing a bent drip strip shall be installed along the edges of the deck as shown. The strips shall be fastened at 1'-6" ℄ maximum, with power driven pins or No. 10 galv screws & expansion anchors, subject to the approval of the Engineer. The strips shall be placed the full length of the deck, ending at the face of the abutment or wing walls.
Where splices are required, a 3" (Min) lap shall be used with a fastener thru the lap. Steel for galvanized strips shall be 8" x .105" and shall meet the requirements of ASTM A568. Galv. shall be in accordance with 711.02. Stainless steel shall be 20 gauge ASTM A167 Type 304 mill finish. Payment shall be at the contract price bid for Item Special Sq.Ft. Steel Drip Strip, which shall include all material, labor, tools, & incidentals necessary to complete Item.



TYPICAL SECTION OF BOX BEAM DECK



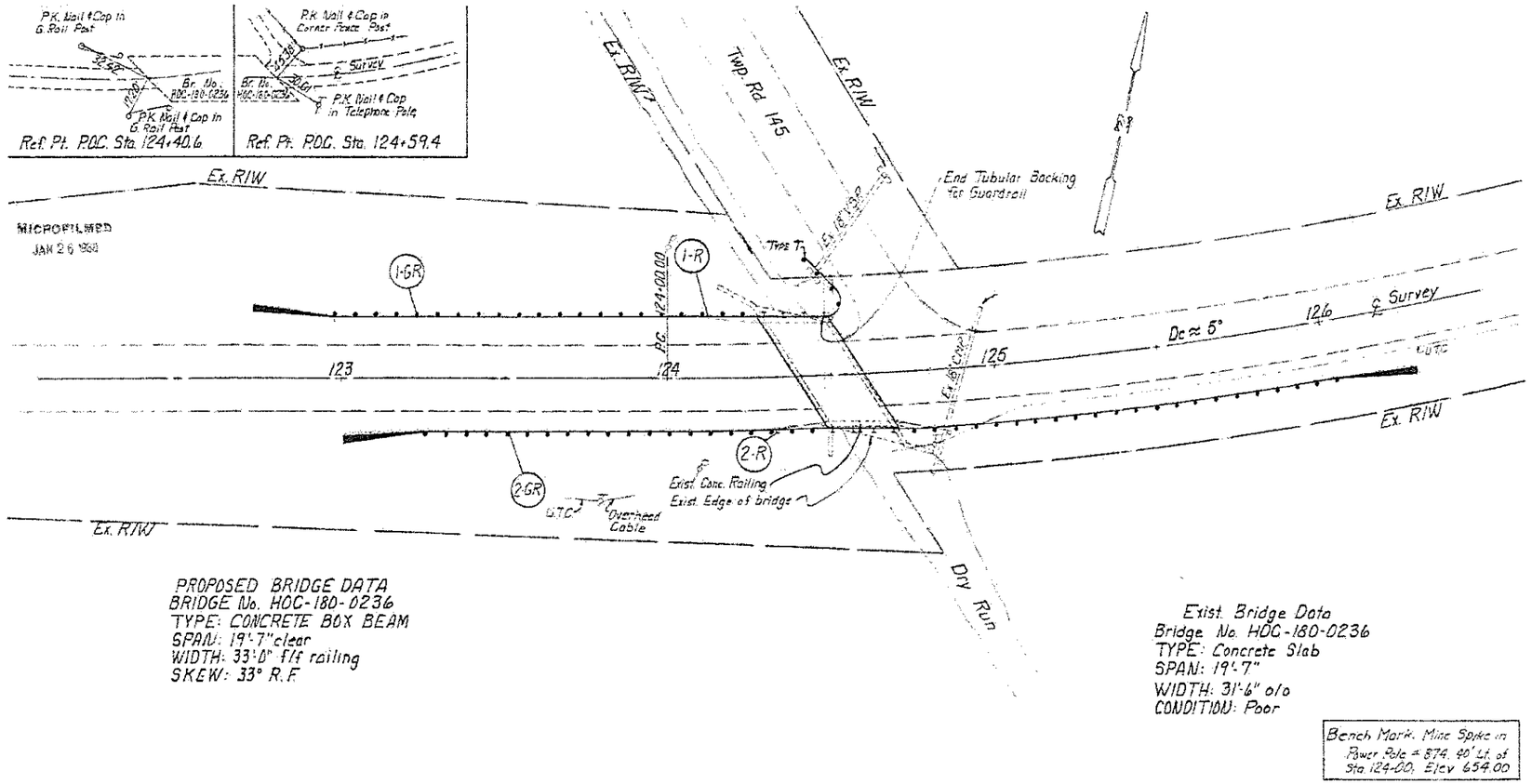
TYPICAL BRIDGE SEAT TREATMENT

BRIDGE SEAT REINFORCING:
Reinforcing steel in the vicinity of the bridge seat shall be accurately placed to avoid interference with the drilling of anchor bar holes.

REINFORCING STEEL SAMPLES:
Refer to CMS Sections 106.03, 700, 709.01 through 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structures by the additional steel, spliced in accordance with 509.08.

DESIGNED BY PEH	CHECKED BY G.R.O.
DATE: 3/11/81	DATE: 4-81

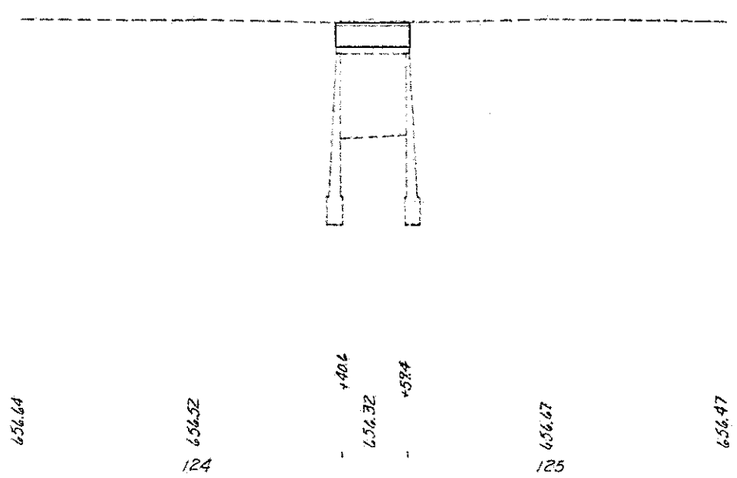
GENERAL NOTES & STRUCTURAL DETAILS



PROPOSED BRIDGE DATA
BRIDGE No. HOC-180-0236
TYPE: CONCRETE BOX BEAM
SPAN: 19'-7" clear
WIDTH: 33'-0" f/f railing
SKEW: 33° R.F.

Exist. Bridge Data
Bridge No. HOC-180-0236
TYPE: Concrete Slab
SPAN: 19'-7"
WIDTH: 31'-6" o/o
CONDITION: Poor

Bench Mark. Mine Spike in Power Pole ≈ 874.40' Lt. of Sta. 124+00. Elev 654.00



			202 Guardrail Removed Lin. Ft.	606 Temporary Guardrail Lin. Ft.	606 Guardrail Type G Lin. Ft.	606 Guardrail Type S 6' Radius Lin. Ft.	606 Bridge Terminal Assy. Type B Each	606 Anchor Assy. Type A Each	606 Anchor Assy. Type T Each
ROADWAY									
1-R 124+13 ↳	124+50	Lt.	25						
2-R 124+33 ↳	124+85	Rt.	25						
1-GR 122+73.75 ↳	124+54	Lt.			128	12.5	2	1	1
2-GR 123+01.3 ↳	126+22.3	Rt.			253		2	2	
		Lt.		100					
		Rt.		100					
			50	200	381	12.5	4	3	1

PLAN PROFILE HOC-180-0236

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JAN 26 1998

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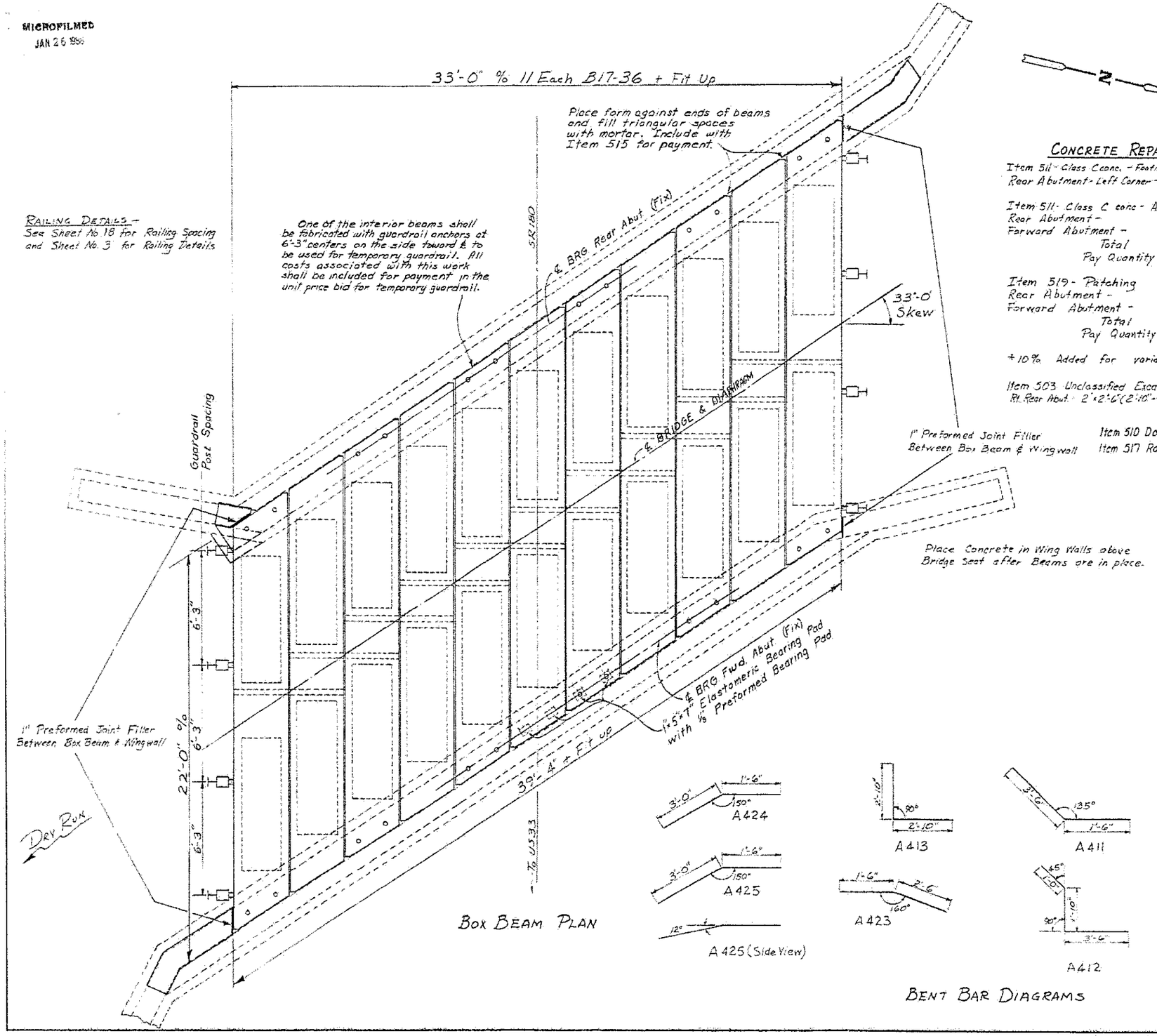
HOC - 180 - 0236
BRIDGE REPAIR

PLAN NO. BR-36-81



RAILING DETAILS -
See Sheet No. 18 for Railing Spacing and Sheet No. 3 for Railing Details

1" Preformed Joint Filler Between Box Beam & Wingwall

Place Concrete in Wing Walls above Bridge Seat after Beams are in place.

BOX BEAM PLAN

CONCRETE REPAIR QUANTITIES

Item 511 - Class C conc. - Footings
Rear Abutment - Left Corner - 0.23 CY

Item 511 - Class C conc - Abutment above footing
Rear Abutment - 4.46 CY
Forward Abutment - 2.26 CY
Total 6.74 CY
Pay Quantity +10% 0.67 * 7.41 CY

Item 519 - Patching
Rear Abutment - 72.5 SF
Forward Abutment - 123.2 SF
Total 195.7 SF
Pay Quantity +10% 19.6 SF * 215.3 SF

* 10% Added for variable dimensions

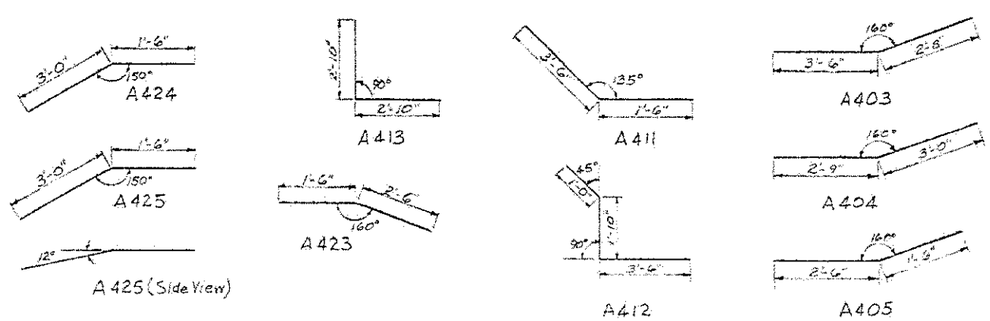
Item 503 Unclassified Excavation
Rt. Rear Abut. 2'×2'-6'(2'-10"-4'-10") ÷ 27 = 142 C.Y.
Use 2 C.Y.

Item 510 Dowel Holes = 188 Each
Item 517 Railing = 44 Lin. Ft.

STEEL LIST

MARK	No.	LENGTH	WEIGHT	Shp.	LOCATION
A401	2	37'-3"	52 *	S	Rear Abut.
A402	50	1'-2"	39	S	" "
A403	3	6'-2"	13	B	" "
A404	3	5'-9"	12	B	" "
A405	8	4'-0"	22	B	" "
A406	8	3'-0"	16	S	" "
A407	4	3'-3"	7	S	" "
A408	4	10'-2"	27	S	" "
A409	1	2'-2"	2	S	" "
A410	1	10'-6"	7	S	" "
A411	5	5'-0"	17	B	" "
A412	5	6'-4"	21	B	" "
A413	2	5'-8"	8	B	" "
A414	1	3'-0"	2	S	" "
A415	4	8'-2"	22	S	" "
A416	3	10'-6"	21	S	" "
A420	52	1'-2"	41	S	Fwd Abut.
A421	1	42'-3"	29 *	S	" "
A422	1	41'-6"	29 *	S	" "
A423	2	4'-0"	6	B	" "
A424	2	4'-6"	6	B	" "
A425	2	4'-6"	6	B	" "
A426	6	2'-9"	11	S	" "
		Total	416 #		

* Includes an additional 1'-8" length to cut and splice for half width construction.



BENT BAR DIAGRAMS

REINFORCING STEEL SAMPLES

Refer to CMS Sections 106.03, 700, 709.01 through 709.05 and 709.08. Sufficient additional reinforcing steel shall be provided for sampling. Random samples shall be replaced in the structures by the additional steel, spliced in accordance with 509.08.

DESIGNED	CHECKED
BY. PEH	BY. SPK
DATE: 3/11/81	DATE: 4-9

PRECAST BOX BEAM LAYOUT HOC-180-0236

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JAN 26 1988

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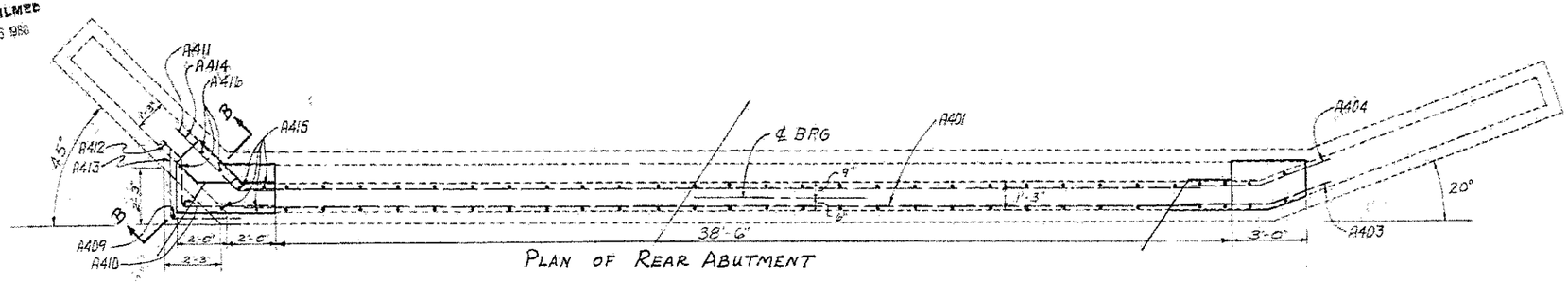
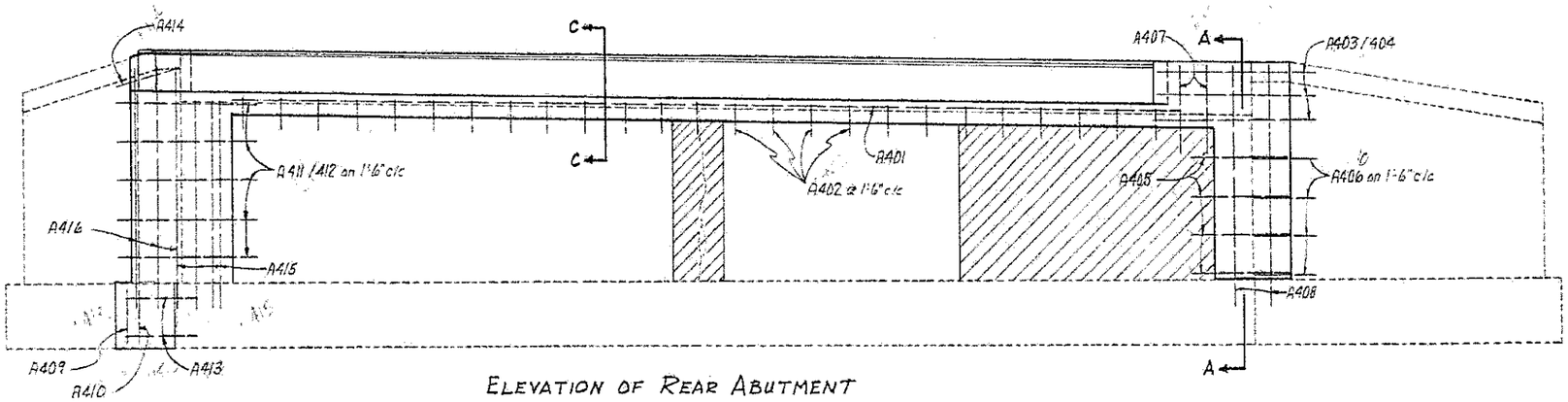
HDC-180-0236
BRIDGE REPAIR

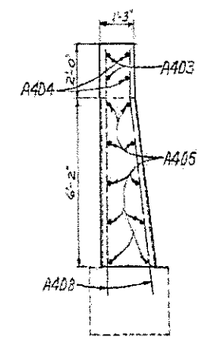
PLAN NO. BR-36-81



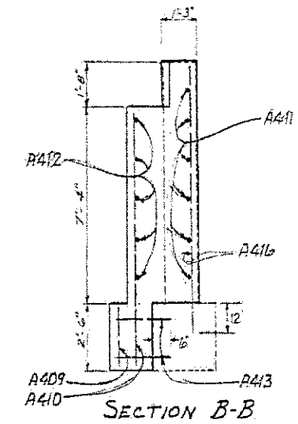
PLAN OF REAR ABUTMENT



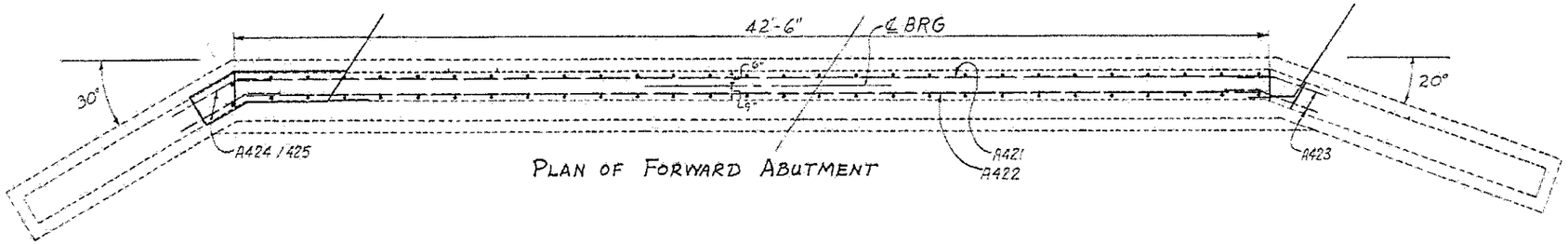
ELEVATION OF REAR ABUTMENT



SECTION A-A



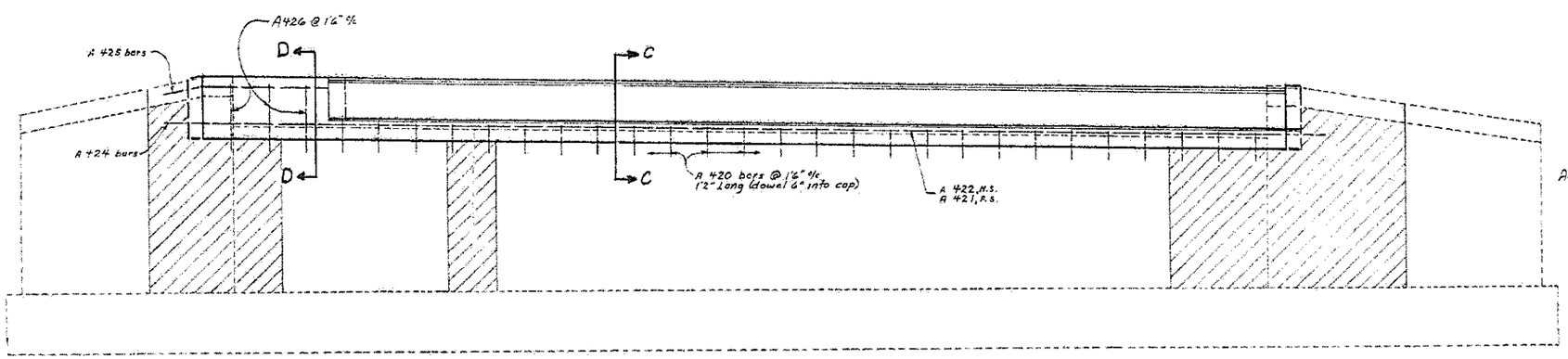
SECTION B-B



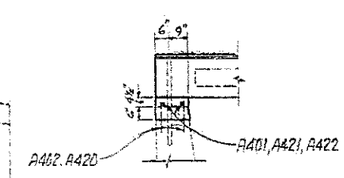
PLAN OF FORWARD ABUTMENT

NOTE:
Portions of existing reinforcing steel that is firmly embedded in sound concrete shall be salvaged and tied to the new steel as directed by the Engineer. All existing reinforcing steel that is loose, rusted, or grossly misshapen shall be removed. In areas where adequate horizontal steel is salvaged, dowelled portions of new horizontal steel may be omitted and new bars field cut to fit as directed by the Engineer.

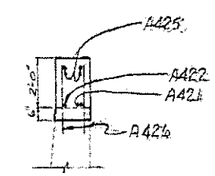
NOTE:
Cross-hatched areas indicate areas of concrete patching. (Item 519). Bold lines indicate approximate limits of complete concrete removal and replacement with 511 concrete.



ELEVATION OF FORWARD ABUTMENT



SECTION C-C



SECTION D-D

DESIGNED BY PEH	CHECKED BY [illegible]
DATE 3/11/81	DATE 4-8

STRUCTURAL DETAILS HDC-180-0236

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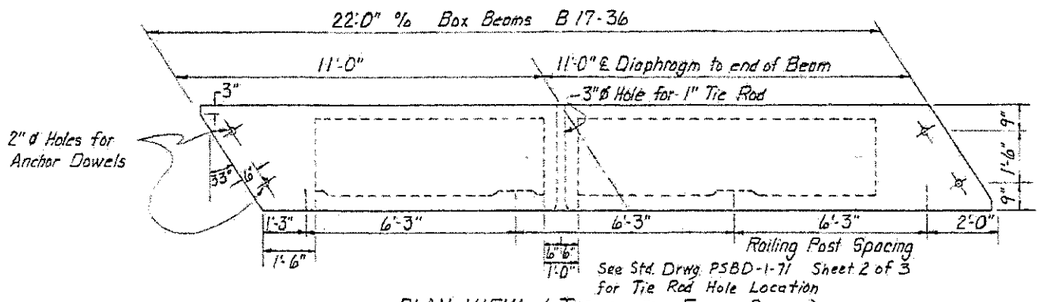
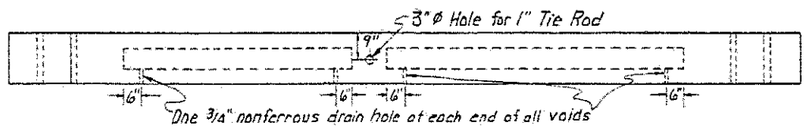
HOC-180-0236
BRIDGE REPAIR

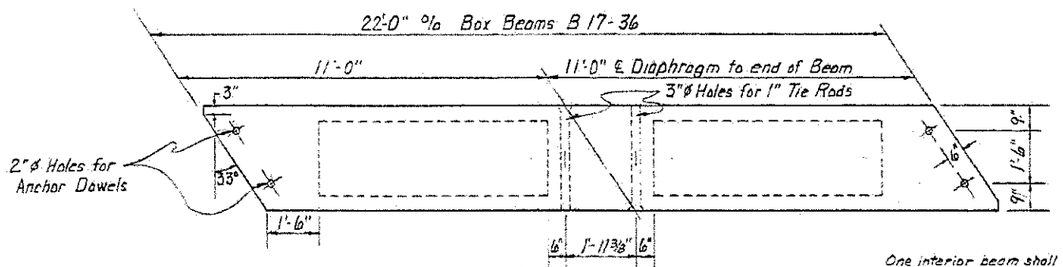
BR-36-61



PLAN VIEW (TYPICAL FOR FASCIA BEAMS)
Not Drawn to Scale

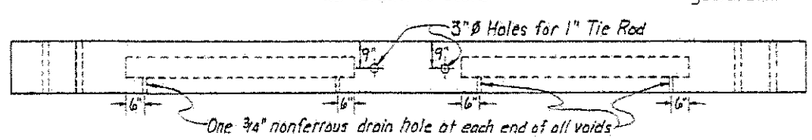


ELEVATION VIEW
Not Drawn to Scale



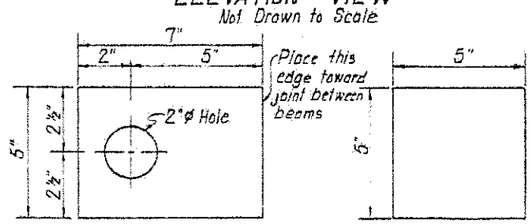
PLAN VIEW (TYPICAL FOR INTERIOR BEAMS)
Not Drawn to Scale

One interior beam shall be fabricated with guardrail anchors at 6'-3" centers on one side to be used for temporary guardrail.



ELEVATION VIEW
Not Drawn to Scale

Provide 24-1/8"x5"x7", 20-1/8"x5"x5" preformed bearing pads, as detailed, for shims.
Payment for these shims to be included in the bid price paid for Item 516 Elastomeric Bearing Pads.



ELASTOMERIC BEARING PADS
1" Thick

CONCRETE STRESSES:
Minimum concrete strength at 28 days $f'_c = 5500$ psi
Minimum concrete strength at time of initial prestress $f'_{ci} = 4000$ psi

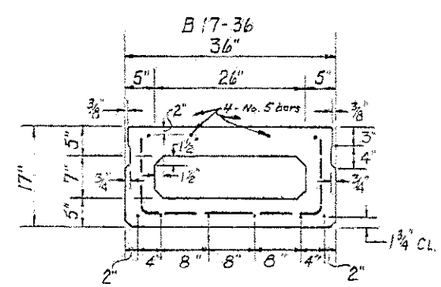
PRESTRESSING STRANDS:
1/2" dia. 270K seven-wire, uncoated, stress-relieved strand.
$A_s = .154$ Sq. in., Initial Tension = 28,900 lbs. per strand.

DESIGN LOADING:
B 17-36 HS 20-44 with Interstate Alternates Superimposed Dead Load 175 lbs. per Lin. Ft.

BEAM FABRICATION:
Beams shall be so fabricated as to include provisions for lifting into place. Outside beams shall be fabricated with keys, holes, drains, bolts, studs and sleeves located and spaced as per Plan drawing. Unit price bid for prestressed concrete beams shall include transverse tie rods, anchor dowels, bolts, studs and nuts for guardrail and mortaring of shear keys. Diaphragms shall be located as detailed. Omit shear keys on guardrail side of fascia beams.

VERIFICATION:
The Contractor shall verify all dimensions at the site.

NOTE:
Reinforcing steel to be 2" clear from top of box.



6 Strands 1/2"ø each beam

Anchor dowels should clear the P.S. strands.

CONCRETE BOX BEAM DETAILS

The surface of beams shall be textured to provide a uniform surface with a gritty texture.
Net final camber of spans is .33". The Asphalt wearing surface course shall compensate for the camber by thickening the 403 levelling course from 1 1/2" at center of span (℄) to 1 3/4" at ends of spans.
For additional reinforcing and other details see Std. Drwg. PSBD-1-71 & DBP-2-73

DESIGNED	CHECKED
BY PEA	BY [illegible]
DATE 3/11/81	DATE 4-9