COUNTY	CONTRACT	F.H.A. DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
NEW CASTLE	1861	2	DEL.			1	13

THE STATE OF DELAWARE

STATE HIGHWAY DEPARTMENT

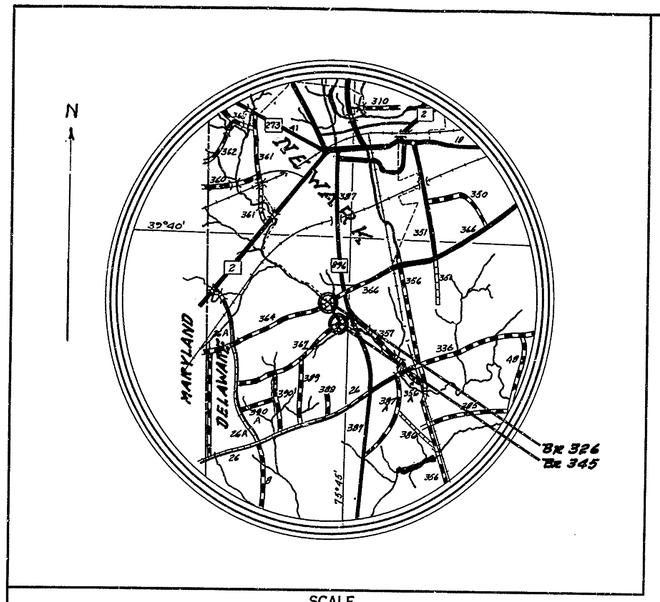
PLAN
FOR
CONSTRUCTION OF CONTRACT Nº 1861

Sta. A 3+00 to Sta. A 10+00; Sta. E 0+10 to E 2+00; Sta B 0+00 to B 7+50

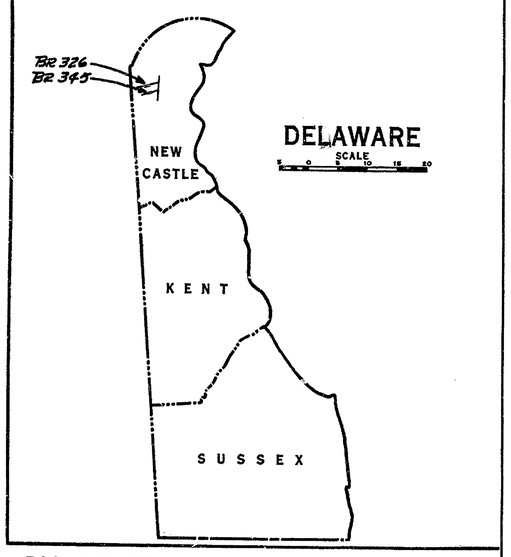
1,640 FEET: 0.311 MILES

SCALE: PLAN: 1 IN. = 50 FT.
PROFILE: HOR. 1 IN. = 50 FT.
VERT. 1 IN. = 10 FT.

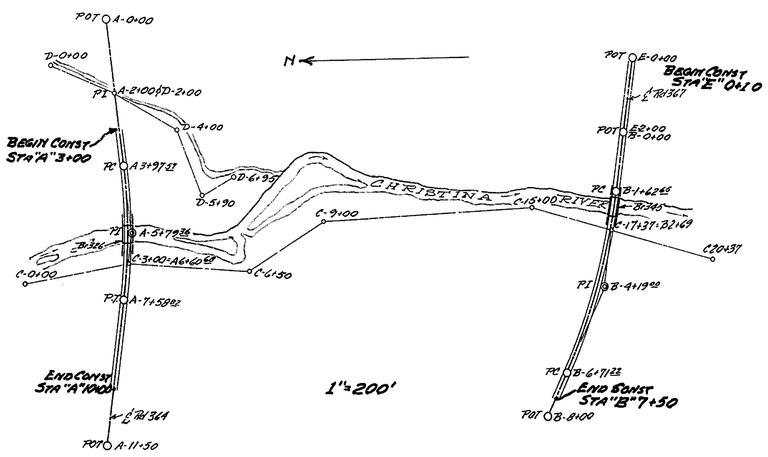
~~FEDERAL AID PROJECT Nº~~



SCALE
1" = 2 mi.



BOOK NUMBER 3969, 3970, 3971



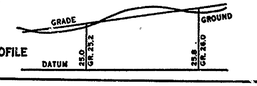
QUANTITIES, PAY ITEMS

	ITEM	DESCRIPTION	AMOUNT	PROPOSAL
	1	CLEARING AND GRUBBING	LUMP SUM	LUMP SUM
	2	EXCAVATION	1030 cu.yd	1150 cu.yd
	2A	REMOVAL of EXISTING MASONRY	20 cu.yd.	20 cu.yd.
	3A	ROCK EXCAVATION, STRUCTURES	40 cu.yd.	40 cu.yd.
	4	EXCAVATION for STRUCTURES	955 cu.yd.	960 cu.yd.
	5	BORROW	4600 cu.yd.	5200 cu.yd.
	7	SELECT BORROW	925 cu.yd.	1000 cu.yd.
	14	BITUMINOUS SURFACE TREATMENT		
		COARSE AGGREGATE	4560 sq.yd.	4600 sq.yd.
		RC-1	2290 gal.	2300 gal.
		RC-3	2280 gal.	2300 gal.
*		SUBFOUNDATION CONCRETE	280 cu.yd.	300 cu.yd.
	18	PORTLAND CEMENT CONCRETE MASONRY	468 cu.yd.	470 cu.yd.
	19	SUPERFICIAL WATERPROOFING	487 sq.yd.	490 sq.yd.
	20	BAR REINFORCEMENT	52,392 lbs.	52,400 lbs.
	22	STRUCTURAL STEEL	LUMP SUM	LUMP SUM
	26	REINFORCED CONCRETE PIPE 15"ϕ	92 Lin.Ft.	100 Lin.Ft.
		24"ϕ	30 Lin.Ft.	35 Lin.Ft.
	29	CORRUGATED METAL PIPE 29"×18"	161 lin.Ft.	170 Lin.Ft.
	39	INTEGRAL PORTLAND CEMENT CONCRETE CURB and GUTTER (Type IX)	120 Lin.Ft.	120 Lin.Ft.
		ALUMINUM BEAM GUARD RAIL (Wood Posts)	395 Lin.Ft.	395 Lin.Ft.
	53	SEEDING	0.92 acres.	1.0 acres.
	54	MULCHING	4,270 Sq.Yd.	4,300 Sq.Yd.
	64	RIP RAP, grouted	36 Sq.Yd.	40 Sq.Yd.
		STEEL "H" TEST PILES	210 Lin.Ft.	210 Lin.Ft.
**		STEEL "H" BEARING PILES	2120 Lin.Ft.	2500 Lin.Ft.
		ALUMINUM BRIDGE RAILING	212 Lin.Ft.	212 Lin.Ft.
		REMOVAL of EXISTING STRUCTURES	LUMP SUM	LUMP SUM
	44	CATCH BASIN PW-B.D.3	1 each	1 each
		JUNCTION BOX	1 each	1 each

*Omitted on one or both bridges if footings are built on piles.
**Omitted on one or both bridges if spread footings are used.

CONVENTIONAL SIGNS

COUNTY LINE
CITY OR TOWN LINE
RIGHT OF WAY LINE
CENTRE LINE, PROPOSED ROAD (240)
MACADAM, TRAVELLED ROAD
TROLLEY OR RAILROAD
WIRE FENCE
PRESENT CULVERT
PROPOSED CULVERT
TELEGRAPH POLE
TREE



INDEX OF SHEETS

SHEET Nº 1 TITLE SHEET
2 TYPICAL SECTION
1,3,4, PLAN AND PROFILE
5-11 BRIDGES
1 QUANTITIES
12,13 STANDARDS "G", "DT", "W"

RECOMMENDED 12-14 1961 — L.W. Moringer, CHIEF, PLANNING & DESIGN

RECOMMENDED 12/15 1961 — Jac S. Robinson, ASSISTANT CHIEF ENGINEER

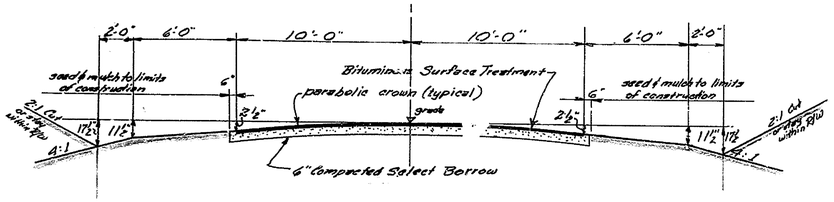
APPROVED 12-15 1961 — Ernest D. Donaldson, CHIEF ENGINEER

APPROVED 12-18 1961 — William J. Miller, Jr., DIRECTOR OF OPERATIONS

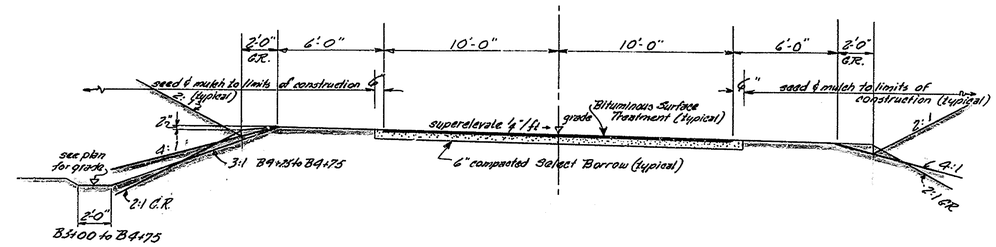
"Imperial" 156 W. B. & E.

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N.C.	1861	2	DEL.			2	13

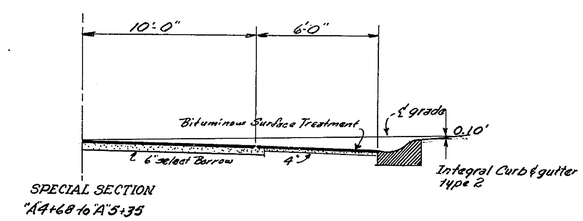
BRIDGE REPLACEMENTS - NEW CASTLE COUNTY



TANGENT SECTION



SUPERELEVATED SECTION



SPECIAL SECTION
"A" 7+68 to "A" 5+35

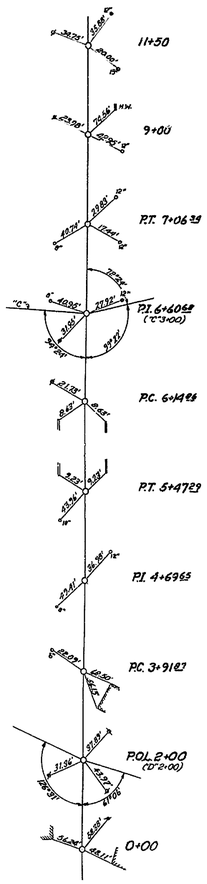
TIE POINTS
BENCH MARKS
EARTHWORK
DRAINAGE

ROADWAY PORTION DESIGNED AND DRAWN UNDER THE SUPERVISION OF: A. B. Culbertson, Jr. 12 Dec. 61
ROAD DESIGN ENGINEER

"Imperial" 158 W. B. & E.

COUNTY	CONTRACT	P.R.S. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N.C.	1861	2	DEL.			3	13

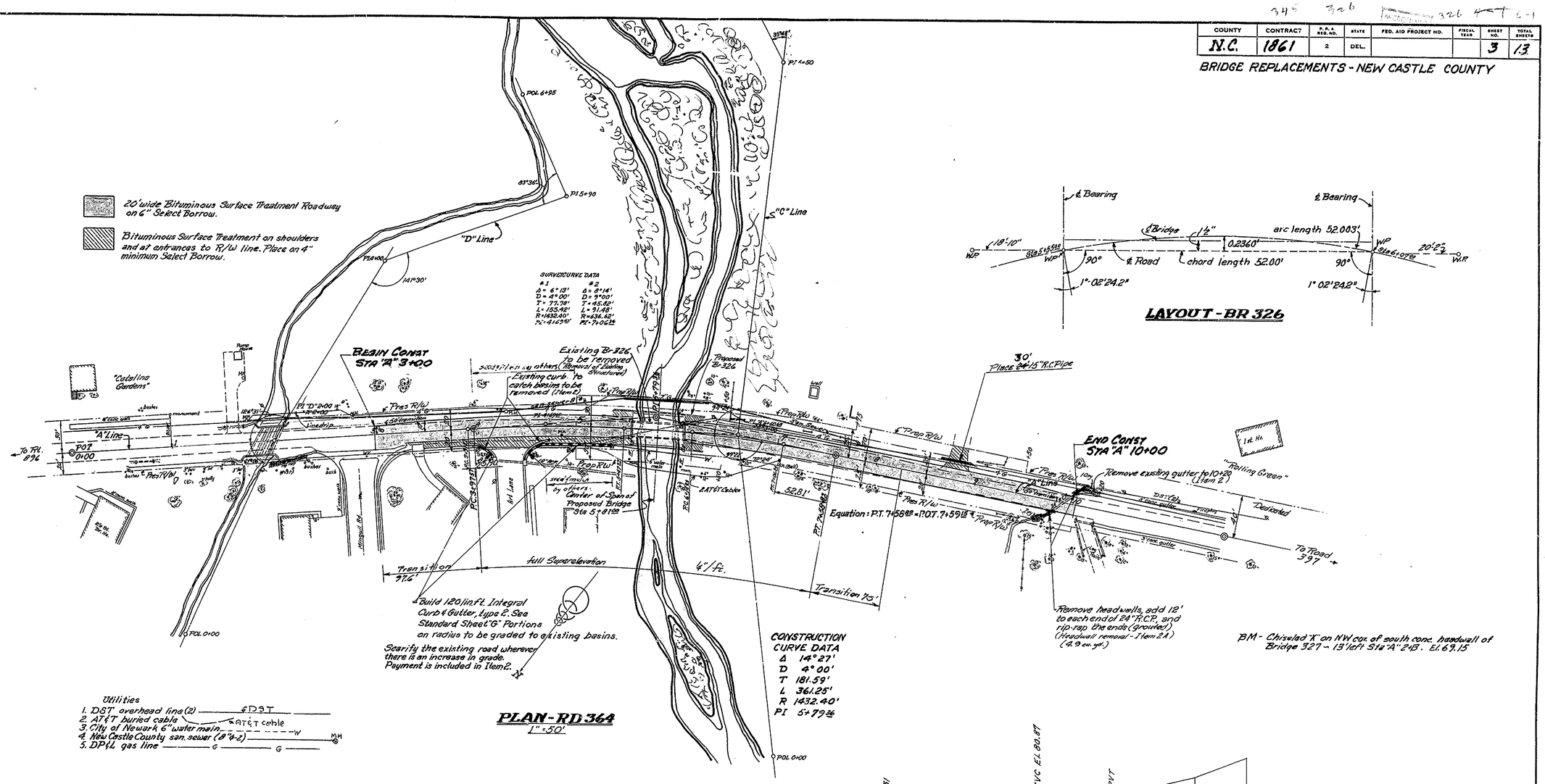
BRIDGE REPLACEMENTS - NEW CASTLE COUNTY



TYE-POINTS
RD 364

20' wide Bituminous Surface Treatment Roadway on 6" Select Borrow.

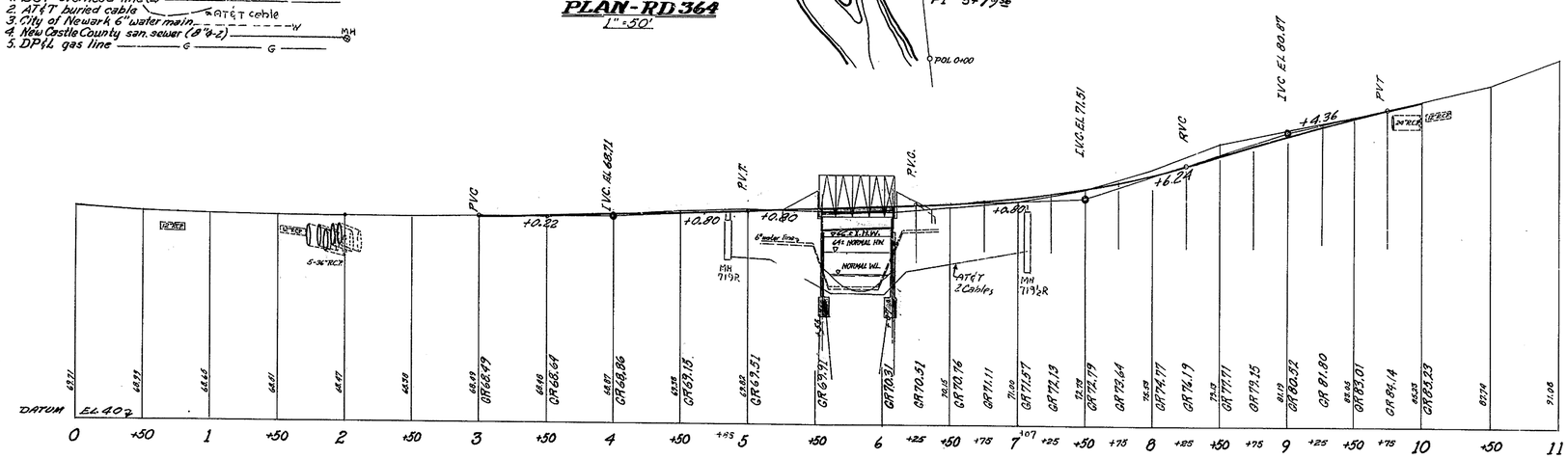
Bituminous Surface Treatment on shoulders and at entrances to R/W line. Place on 4" minimum Select Borrow.



Utilities
1. DST overhead line (2) — DST
2. AT&T buried cable — AT&T cable
3. City of Newark 6" water main — W
4. New Castle County san. sewer (8"&2") — MH
5. DP&L gas line — G

PLAN-RD 364
1" = 50'

LAYOUT - BR 326



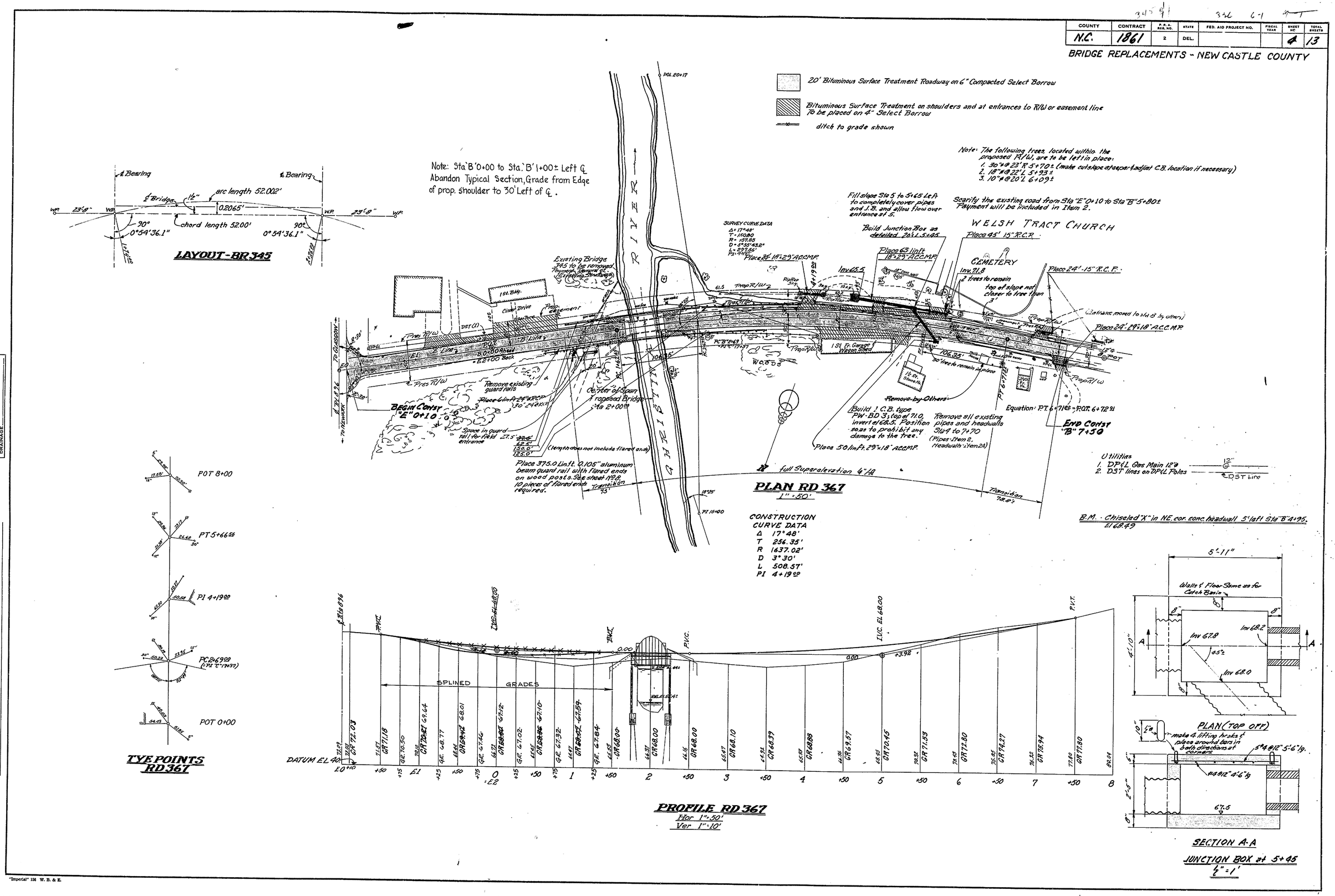
PROFILE - RD 364
Hor. 1" = 50'
Ver. 1" = 10'

TIE POINTS
BENCH MARKS
EARTHWORK
DRAINAGE

"Imperial" 156 W. B. & K.

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N.C.	1861	2	DEL.			4	13

BRIDGE REPLACEMENTS - NEW CASTLE COUNTY

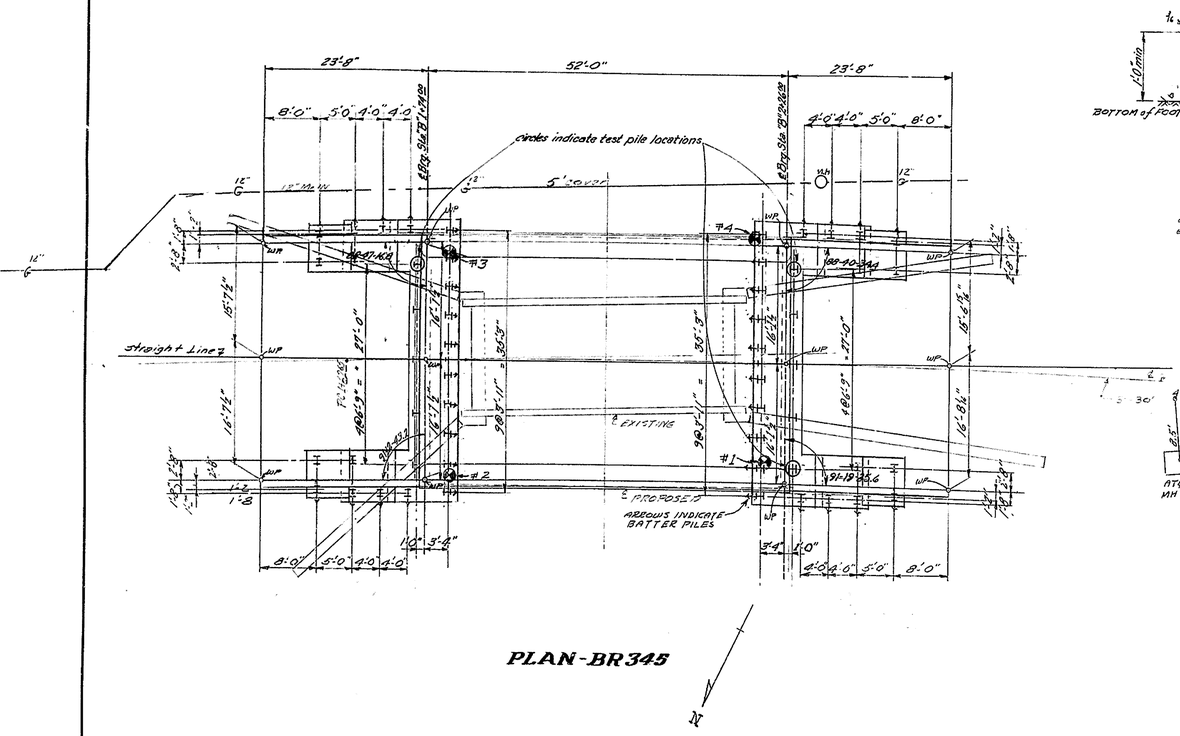


"Imperial" 156 W. B. & E.

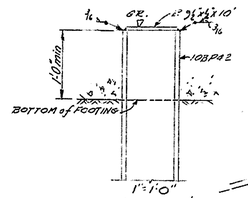
345 - 326 C-1 H-1

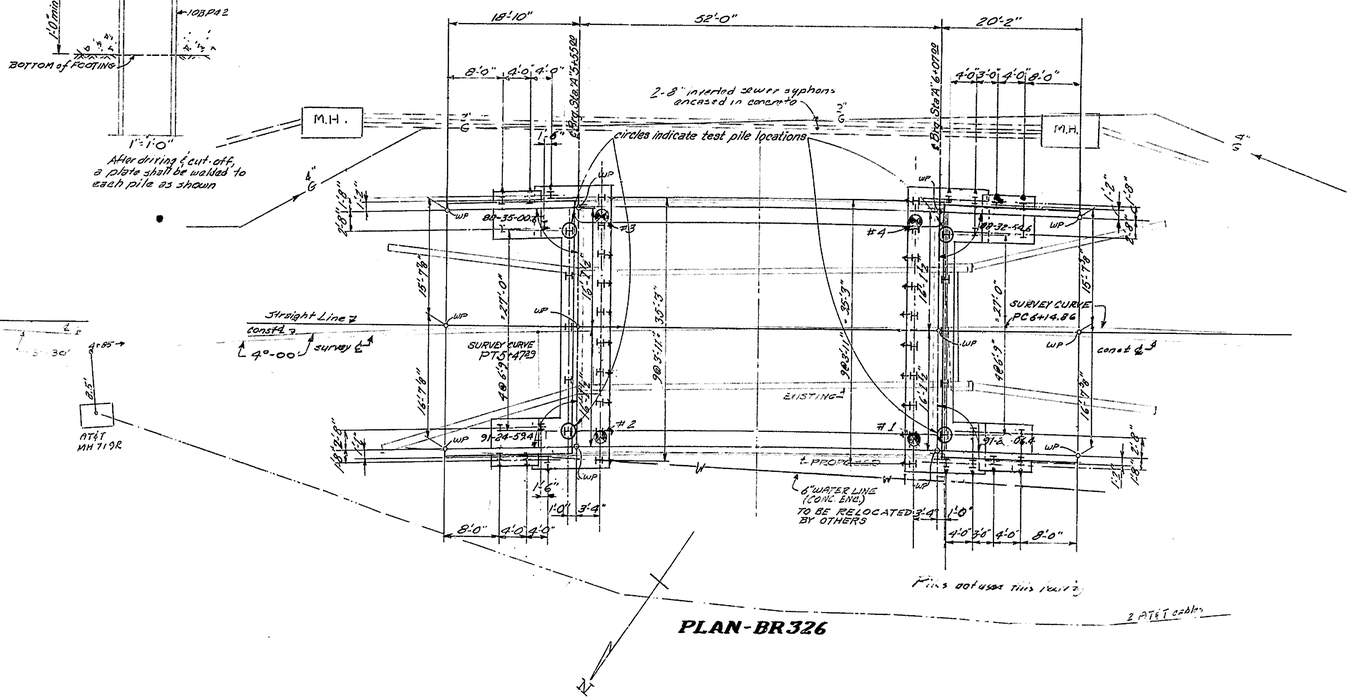
COUNTY	CONTRACT	F.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N.C.	1861	2	DEL.			5	13

BRIDGE REPLACEMENTS - NEW CASTLE COUNTY

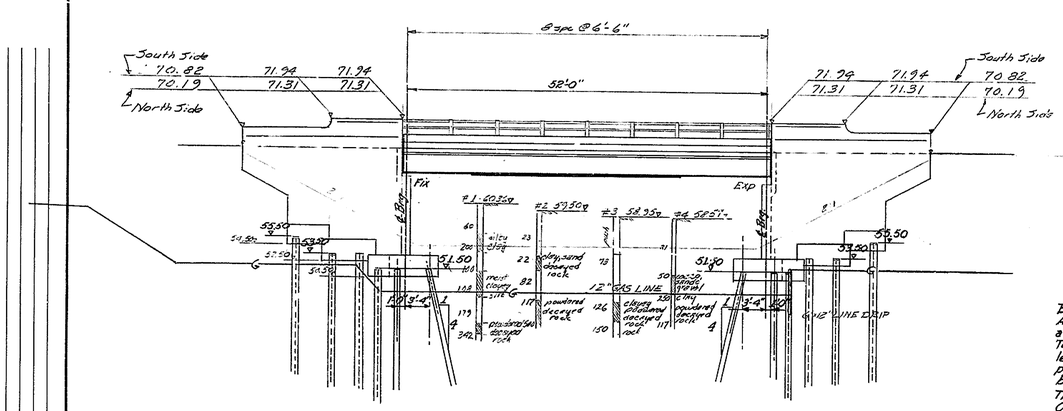


PLAN-BR345

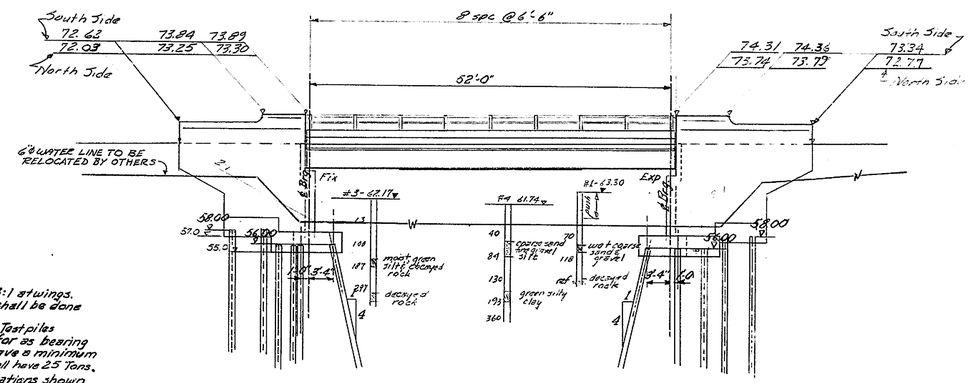




PLAN-BR326



NORTH ELEVATION
&
BORING LOG
BR 345



NORTH ELEVATION
&
BORING LOG
BR 326

Notes:

Batter piles shall be 4:1 at abutments & 3:1 at wings. Any tip strengthening deemed necessary shall be done at the sole expense of the contractor.
Test pile locations shown are suggestions. Test piles left in place as bearing piles shall be paid for as bearing piles and not as test piles. Piles shall have a minimum bearing capacity of 22 Tons, Test Piles shall have 25 Tons.
The wingwalls shall be finished to the elevations shown. On both bridges the south side is on the outside of the superelevated roadway curves, thus higher than the north, or inside, side.
Working points are laid out from a straight line which crosses the ℄ of the road at the bearing ℄'s of the abutments. These are designated by small circles. The abutments are perpendicular to this straight line and parallel to each other.
For alternate footing see special provisions and sheet 11

QUANTITIES

ITEM	DESCRIPTION	Amt Br 326	Amt Br 345
4	Excavation for Structures	360 cu. yd.	593 cu. yd.
	Steel "H" Test Piles	90 Lin. ft.	120 Lin. ft.
	Steel "H" Bearing Piles	1,040 Lin. ft.	1,080 Lin. ft.
	Removal of Existing Structures	L.S.	L.S.

DELAWARE
STATE HIGHWAY DEPARTMENT

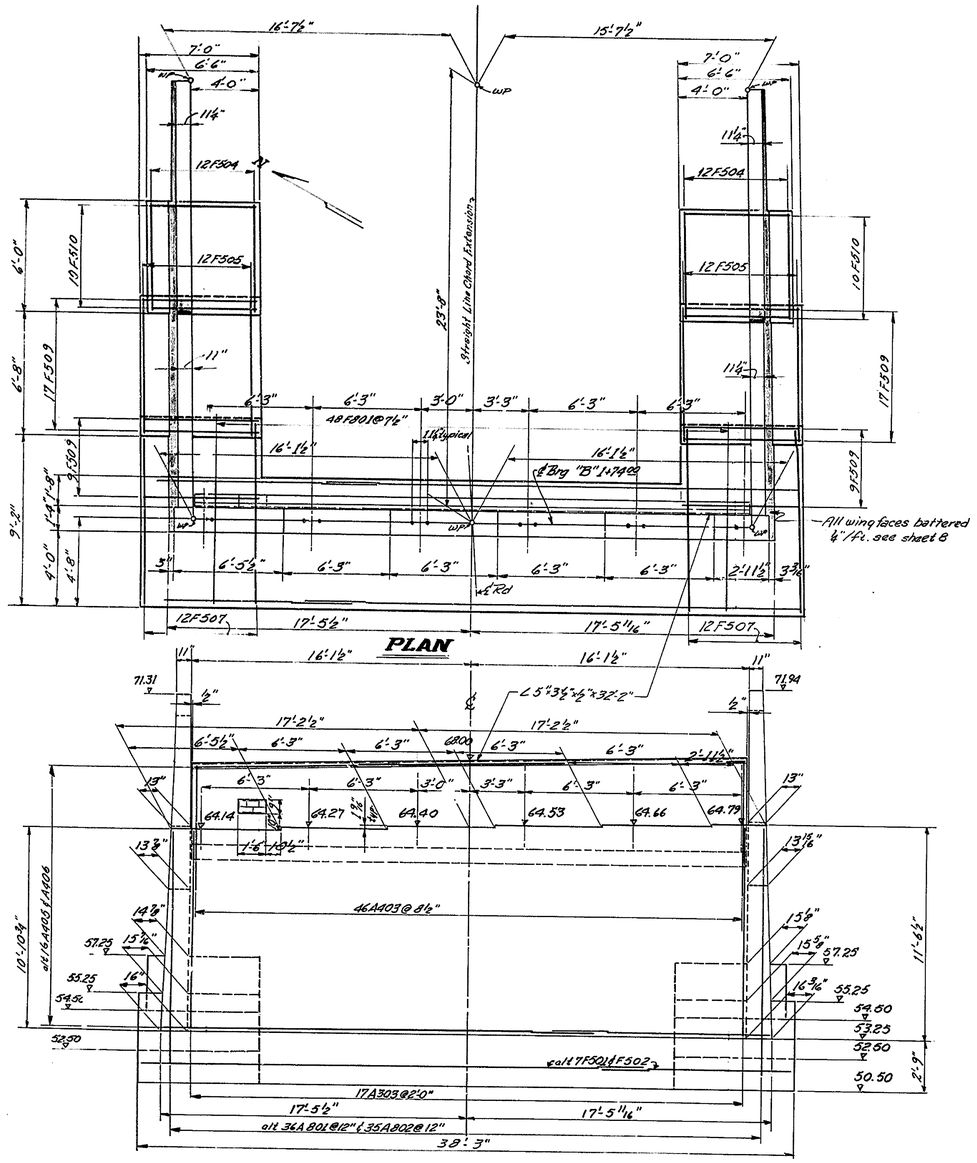
PILE PLANS, ELEVATIONS
BORINGS, & LAYOUTS
BR 326 & BR 345

D. RBS	SCALE	APPROVED BY:
T. RBS	1"=10'-0"	J. M. Fox
C. E. Z. 11/10/61		BRIDGE ENGINEER

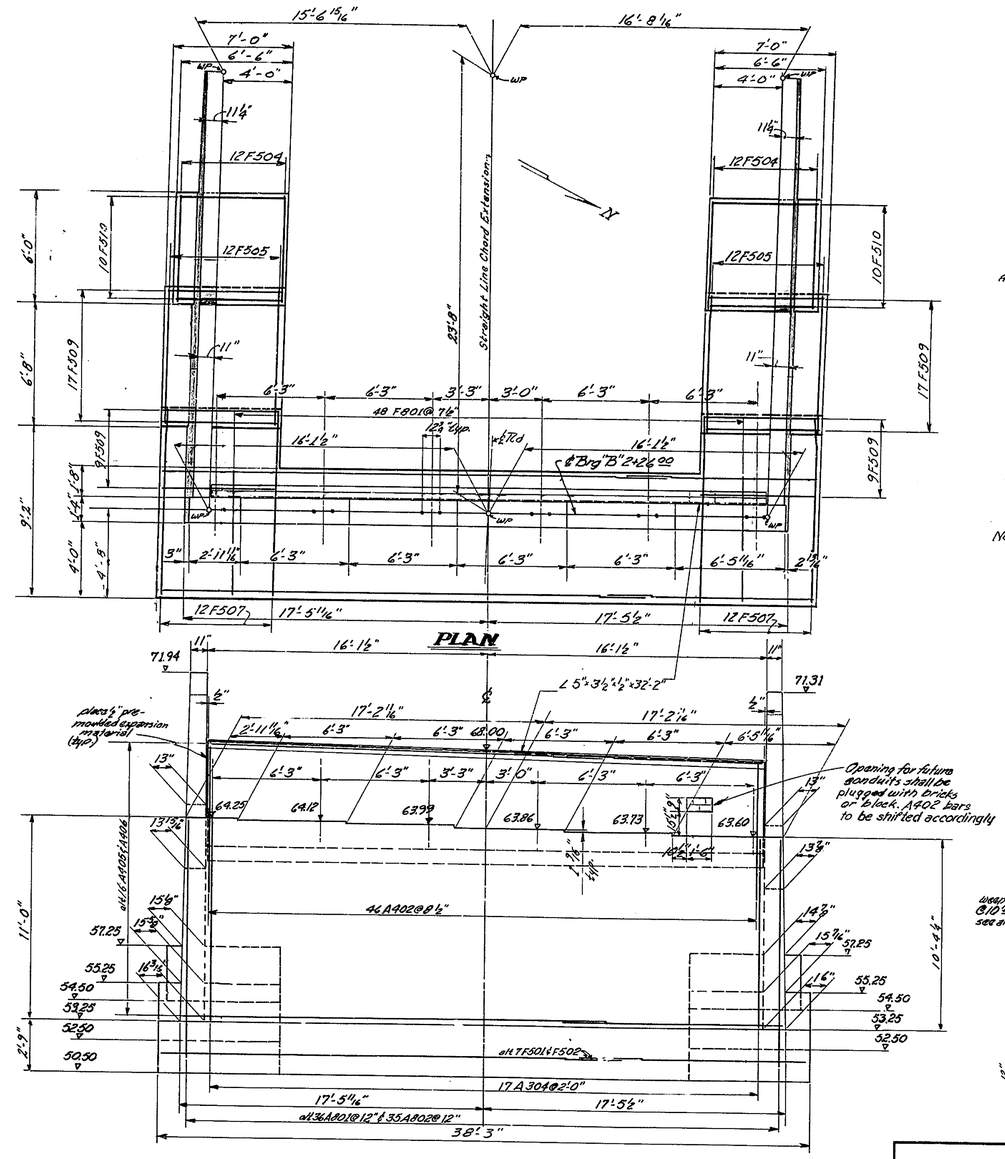
W. B. & E. No. 157

COUNTY	CONTRACT	P. R. A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N.C.	1861	2	DEL.			6	13

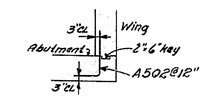
BRIDGE REPLACEMENTS - NEW CASTLE COUNTY



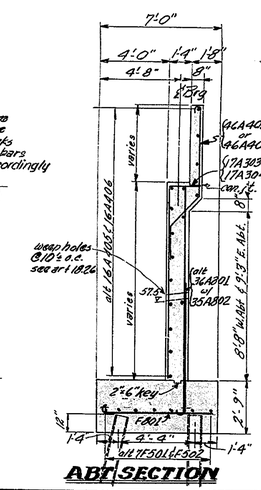
EAST ABUTMENT



WEST ABUTMENT



Note: See Sheet No. 5 for pile plan
Alternate footing is on sheet 11



DELAWARE
STATE HIGHWAY DEPARTMENT

FOOTINGS & ABUTMENTS
BR 345

D. RBS
T. RBS
C. E. Z. 11/10/61

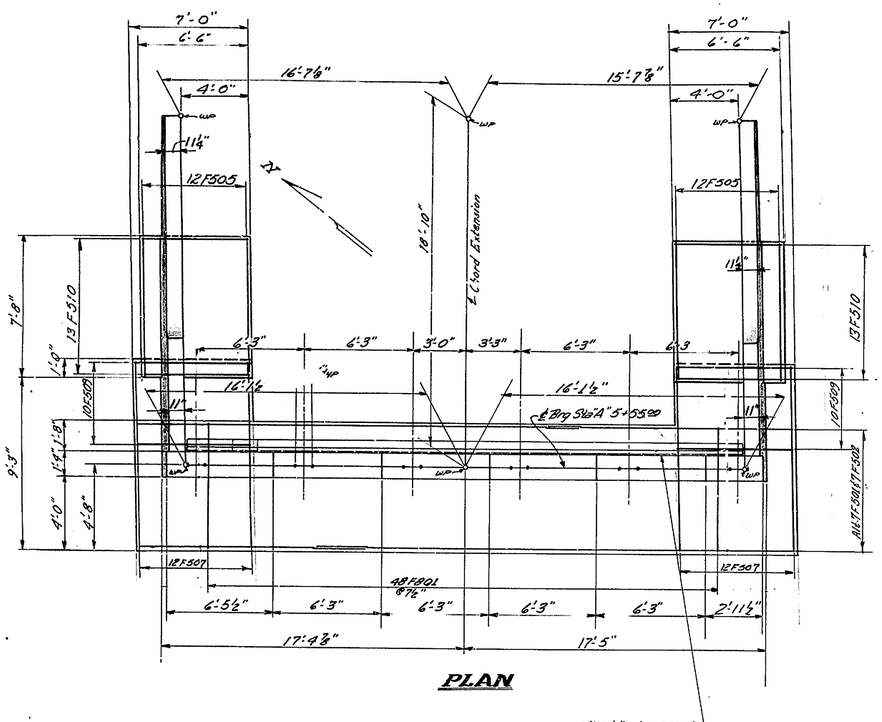
SCALE 1/4" = 1'-0"

APPROVED BY: J. M. Fox
BRIDGE ENGINEER

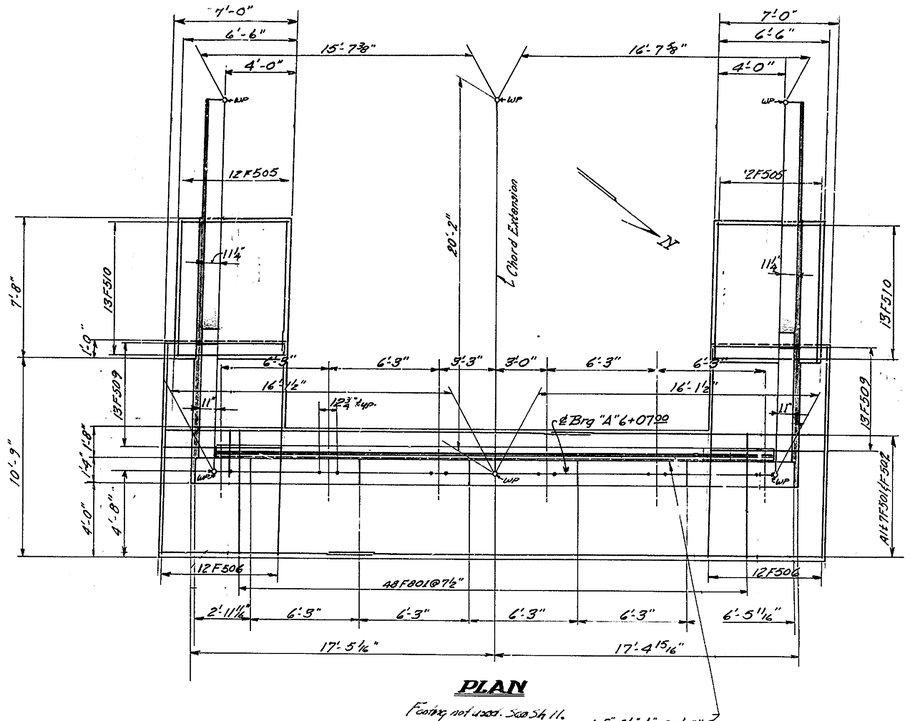
W. & E. No. 156

COUNTY	CONTRACT	F.A.A. RSE. NO.	STATE	FED. AIC PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N.C.	1861	2	DEL.			7	13

BRIDGE REPLACEMENTS - NEW CASTLE COUNTY

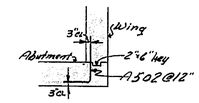


PLAN



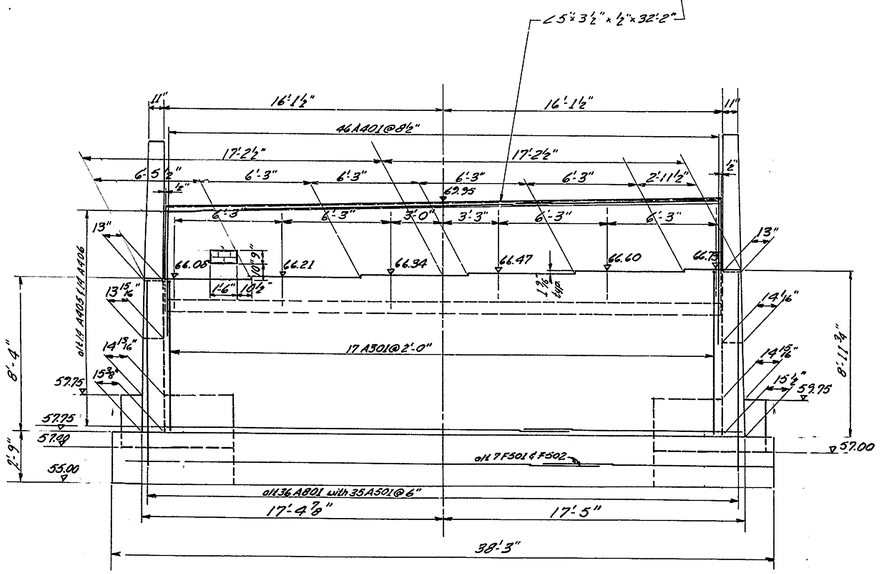
PLAN

Footing not used. See Sh. 11.



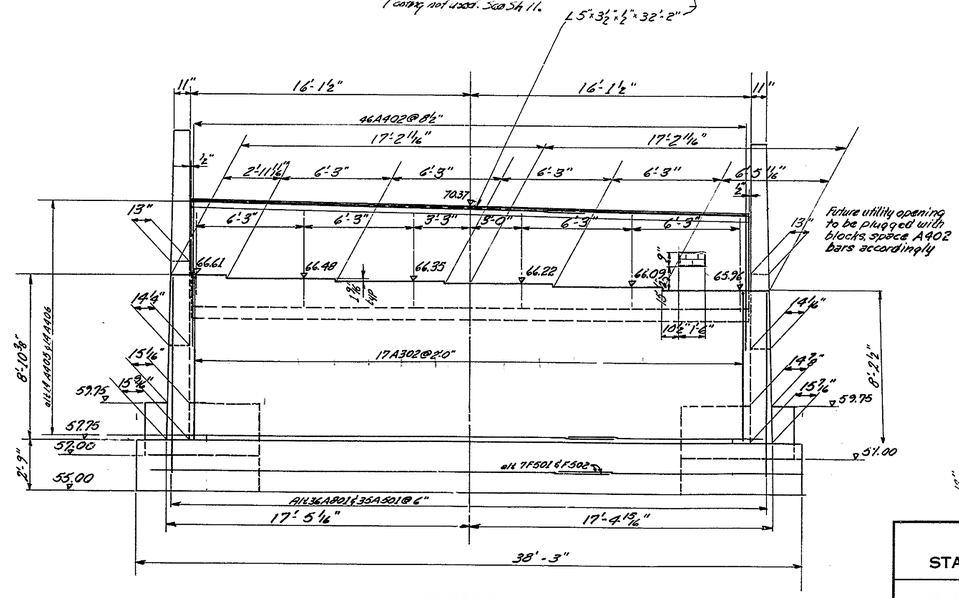
CORNER DETAIL

Note: See Sheet 5 for pile plan
Alternate footing is on Sheet 11



ELEVATION

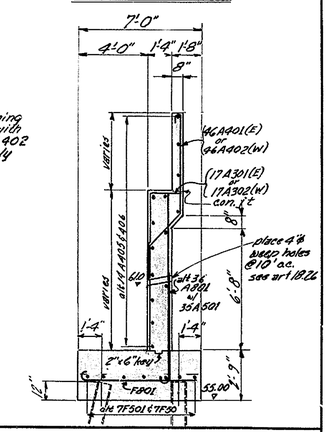
EAST ABUTMENT



ELEVATION

WEST ABUTMENT

ABT SECTION



DELAWARE
STATE HIGHWAY DEPARTMENT

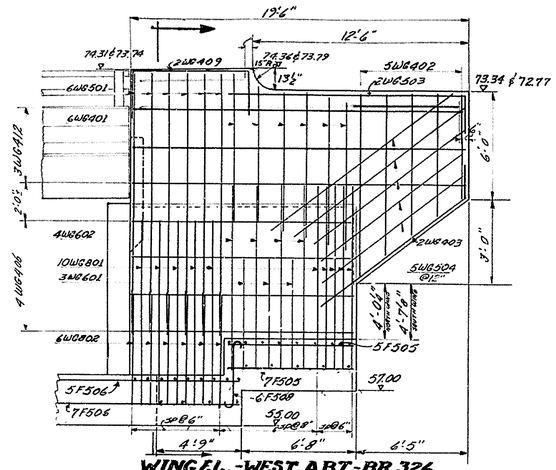
FOOTINGS & ABUTMENTS
BR 326

D. RBS	SCALE	APPROVED BY:
T. RBS	1/4" = 1'-0"	BRIDGE ENGINEER
C. E. Zipfel		

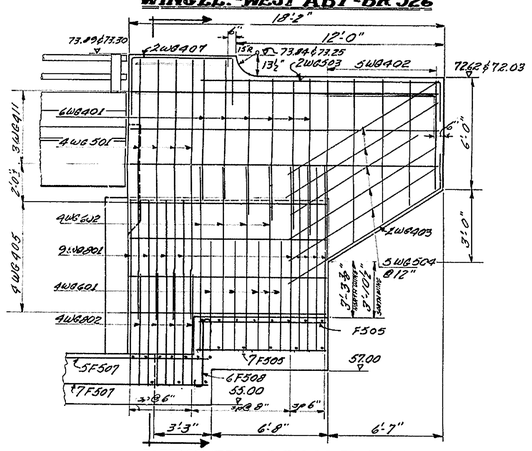
W. R. & E. No. 156

COUNTY	CONTRACT	F.A.P.A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N.C.	1861	2	DEL.			8	13

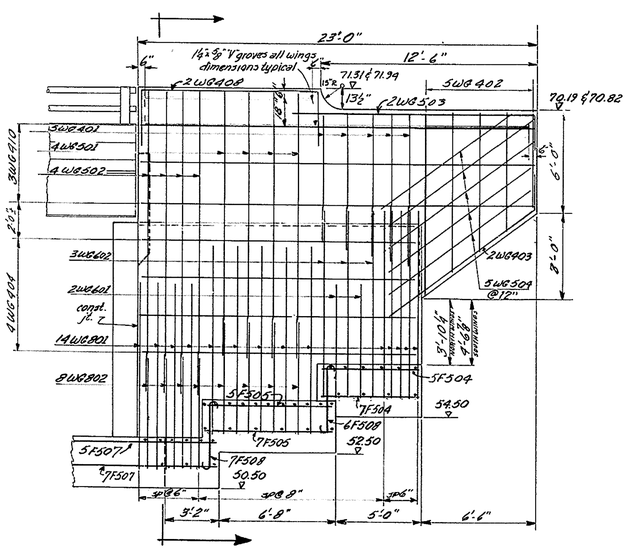
BRIDGE REPLACEMENTS - NEW CASTLE COUNTY



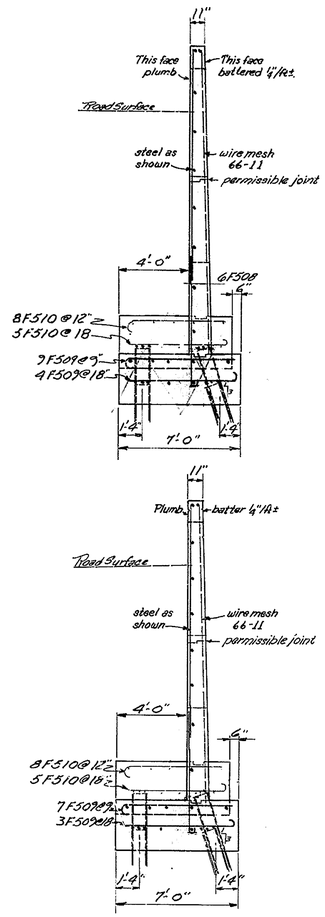
WING EL.-WEST ABT-BR 326

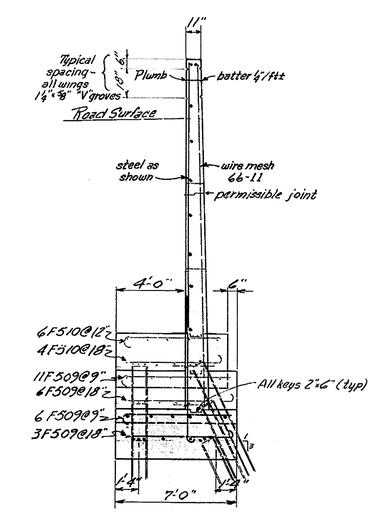


WING EL.-EAST ABT-BR 326



WING EL. ALL WINGS-BR 345

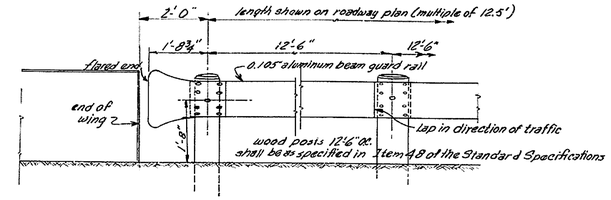




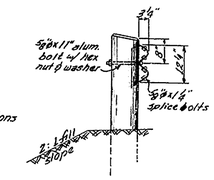
SECTIONS-ALL WGS.

The bridge numbers shall be placed on the right wing at each end of the bridges as shown. The numerals must be 2½" high & depressed ⅛". They shall be painted black. Payment will be included in Item 18. Commercially supplied numerals may be used.

NUMERAL DETAIL



GUARD RAIL DETAIL



G.R. SECTION

ITEM	DESCRIPTION	LOCATION Br 326 East Abt	Br 326 West Abt	Br 345 East Abt	Br 345 West Abt
18	Portland Cement Concrete Masonry				
	Footings*	41.6	43.2	50.0	50.0
	Abutments	19.0	19.4	23.4	23.0
	Wings	16.2	18.3	25.1	26.5
19	Superficial Waterproofing	96.7	101.1	145.2	144.0
20	Bar Reinforcement				
	Footings*	2070	2155	2475	2475
	Abutments	1730	1737	2647	2617
	Wings	1570	1600	2028	2028
	Wire Mesh	550	550	800	800

*Note: Quantities are for pile footings, sheets 5, 6, & 7

LOC	Mark	Size	Length	Bent	Arm't Req'd Br 326 E.Abt	Br 326 W.Abt	Br 345 E.Abt	Br 345 W.Abt
Abutments	A801	8	7-7	1	36	36	36	36
	A802	8	13-1	1	—	—	35	35
	A501	5	10-4	1	35	35	—	—
	A401	4	9-8 to 9-0	1	46	—	—	—
	A402	4	10-0 to 9-4	1	—	46	—	46
	A403	4	9-2 to 8-6	1	—	—	46	—
	A301	3	10-5 to 9-10	1	17	—	—	—
	A302	3	10-4 to 9-8	1	—	17	—	—
	A303	3	13-0 to 12-4	1	—	—	17	—
	A304	3	12-6 to 11-10	1	—	—	—	17
	A405	4	21-0	Str	19	19	16	16
	A406	4	14-0	Str	19	19	16	16
	A502	5	4-0	1	18	18	23	23
Footings	F501	5	16-0	Str.	7	7	7	7
	F502	5	23-0	Str	7	7	7	7
	F504	5	5'-5"	Str	—	—	24	24
	F505	5	7'-2"	Str	24	24	24	24
	F506	5	11-3	Str	—	24	—	—
	F507	5	9-8	Str	24	—	24	24
	F508	5	5-8	1	12	12	26	26
	F801	8	7-7	1	48	48	48	48
	F509	5	7-1	1	20	26	52	52
	F510	5	6-7	1	26	26	20	20
Wings	WG401	4	8-0	Str	12	12	10	10
	WG402	4	9-0 to 5-2	Str	2x5	2x5	2x5	2x5
	WG403	4	12-0	1	4	4	4	4
	WG404	4	16-0	Str	—	—	8	8
	WG405	4	11-0	Str	4	—	—	—
	WG406	4	12-6	Str	—	4	—	—
	WG407	4	11-10	1	4	—	—	—
	WG408	4	16-2	1	—	—	4	4
	WG501	5	14-0	Str	8	12	8	8
	WG502	5	16-0	Str	—	—	8	8
	WG503	5	16-0	1	4	4	4	4
	WG504	5	12-0	Str	10	10	10	10
	WG601	6	6-8	1	8	6	4	4
	WG602	6	10-8	1	8	8	6	6
	WG801	8	11-1	1	18	20	28	28
	WG802	8	7-1	1	8	12	16	16
	WG410	4	22-8	Str	—	—	6	6
	WG411	4	17-10	Str	6	—	—	—
	WG412	4	19-2	Str	—	6	—	—
	WG409	4	12-8	1	—	4	—	—

Hk.		
1-1	6-6	A801
1-1	12-0	A802
1-1	6-6	F801
7	6'-6	F509
1-1	10-0	WG801
1-1	6-0	WG802
8	6-0	WG601
8	10-0	WG602
7	9-9	A501
7	6-0	F510

7 — 4-0 — 7
F508

1-8	8-9 to 8-2	A301
1-8	8-8 to 8-0	A302
1-8	11-4 to 10-8	A303
1-8	10-10 to 10-2	A304
2-0	14-0	WG503
1-6	2-6	A502

Hk. 6"

1-6	1-8	5-4 to 4-8	A401
1-6	1-8	5-8 to 5-0	A402
1-6	1-8	4-10 to 4-2	A403

5-10	WG407
10-2	WG408
6-8	WG409

10-0 — WG403

NOTES.

Location: See sheet #1 of these plans

Specifications: 1) Design-Specifications for Highway Bridges, AASHO, 1957 as amended; 2) Construction - D.S.H.D. Standard Specifications, July 1960; and 3) Special Provisions of this contract.

Materials: 1) Concrete shall have a 28 day strength of 3,000 psi; 2) Bar Reinforcement shall be Structural grade deformed bars, design stress 18,000 psi; 3) Structural Steel shall conform with A.S.T.M. designation A373.

Construction: Wire mesh shall conform to the requirements of Item 21 of the standard Specifications, but shall be paid for as part of Item 20.

The abutments shall be backfilled with Borrow up to the height of the bridge seats before the decks are placed. The decks shall be in place before any further backfilling takes place.

Bituminous surface treatment shall be carried across the decks as shown when placed on the roads.

Loading: H20-S16-44

Elevations: U.S.C. & G.S. Datum

Alternate Footing: In the event that the pile lengths should be extremely short due to test pile results the engineer shall direct that the alternate footing on sheet 11 be used. The amounts of concrete and reinforcement used in the alternate footing shall be paid for at the unit prices bid for Item 18, Portland Cement Concrete Masonry and Item 20, Bar Reinforcement. Subfoundation Concrete shall be paid for at the unit price bid for that item, regardless of the amount actually placed. Excavation for Subfoundation Concrete shall be paid for under the item Subfoundation Concrete. See the Special Provisions

DELAWARE
STATE HIGHWAY DEPARTMENT

WING WALLS, BAR LISTS, QUANTITIES & NOTES; BR 326 & BR 345

D. R.B.S.
T. R.B.S.
C. E.E. Rigatos

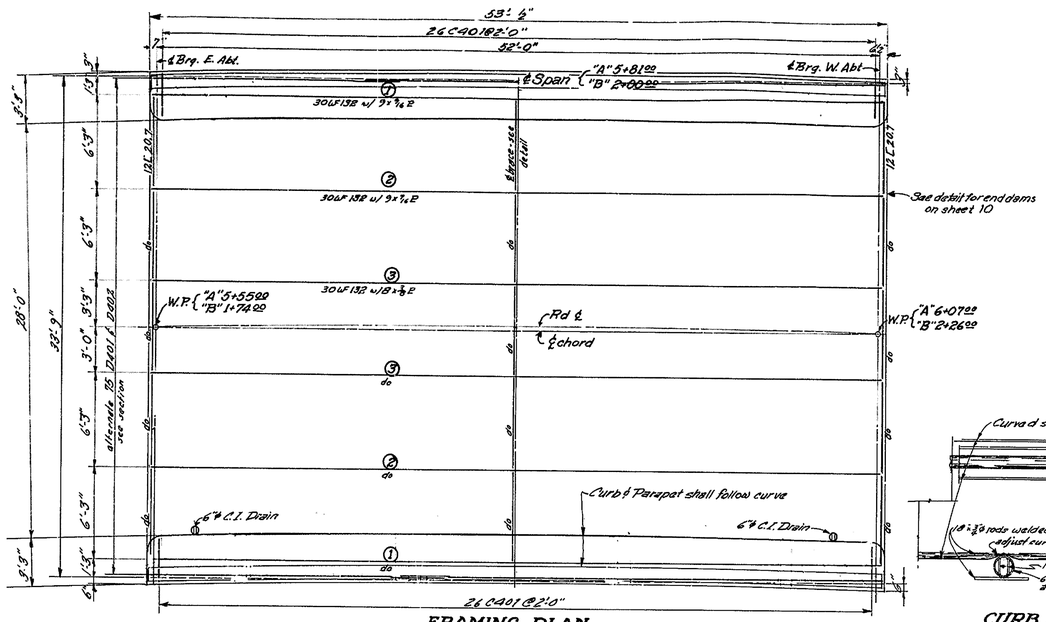
SCALE 4" = 1'-0"

APPROVED BY: J. M. Fox
BRIDGE ENGINEER

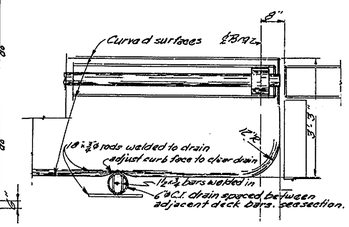
W. B. & E. No. 156

COUNTY	CONTRACT	P.N.A. REG. NO.	STATE	FED AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N.C.	1861	2	DEL.			9	13

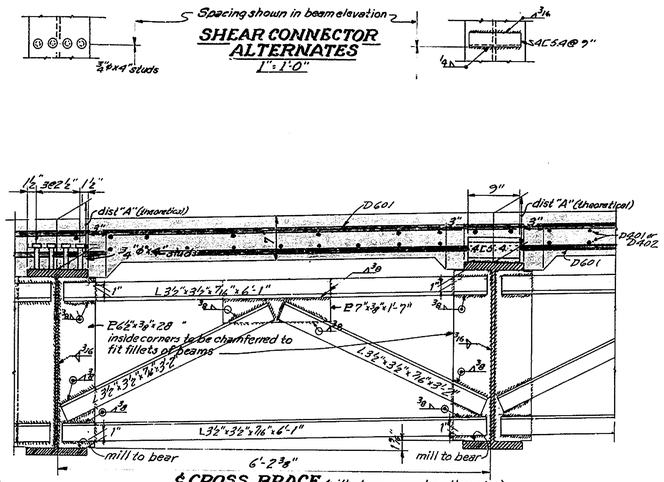
BRIDGE REPLACEMENTS - NEW CASTLE COUNTY



FRAMING PLAN
1" = 5'-0"
(Deck Plan Shown)

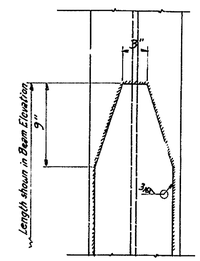


CURB PLAN at the ABUTMENT
1/2" = 1'-0"

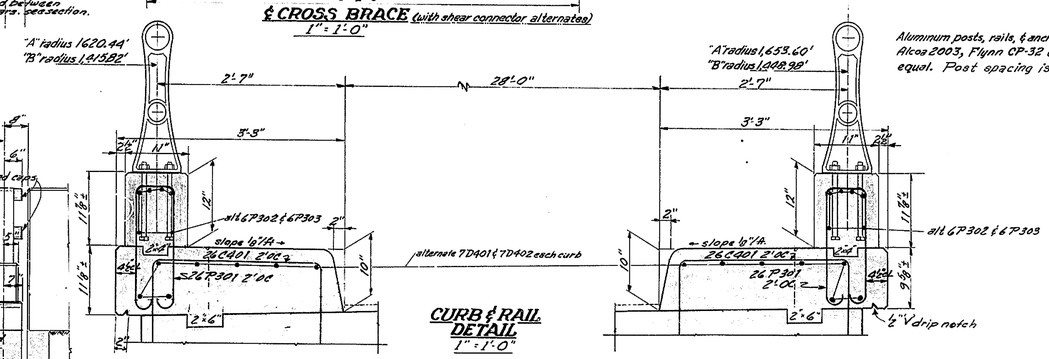


℄ CROSS BRACE (with shear connector alternates)
1" = 1'-0"

SHEAR CONNECTOR ALTERNATES
1" = 1'-0"

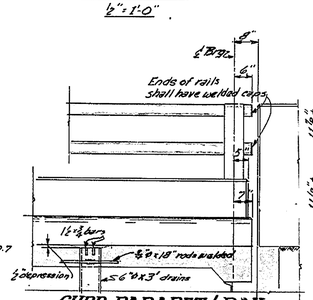


COVER PLATE END DETAIL
1/8" = 1"

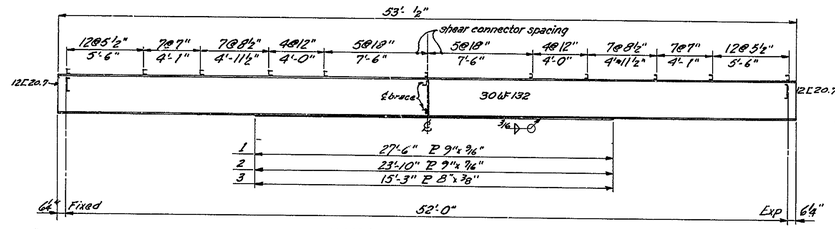


CURB & RAIL DETAIL
1" = 1'-0"

Aluminum posts, rails, & anchor bolts Alcoa 2003, Flynn CP-32 or approved equal. Post spacing is 6'-6".



CURB, PARAPET & RAIL ELEVATION
1/2" = 1'-0"



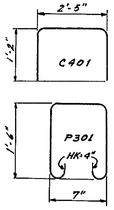
BEAM ELEVATION
1" = 5'-0"

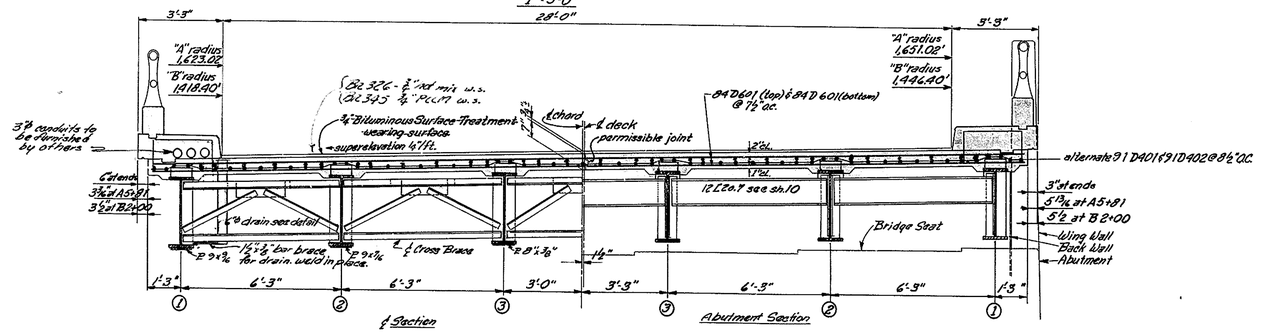
Beam No. & Loc.		1/4 3/4	1/2
1	steel	0.0917	0.1268
	conc.	0.2339	0.3234
	curb	0.1203	0.1663
	Total	0.4459	0.6165
	dist "A"	8.2959	8.4665
2	steel	0.0919	0.1276
	conc.	0.3482	0.4835
	curb	0.0449	0.0622
	Total	0.4850	0.6733
	dist "A"	8.3350	8.5233
3	steel	0.0986	0.1307
	conc.	0.3822	0.5068
	curb		
	Total	0.4808	0.6375
	dist "A"	8.3308	8.5875

Camber (inches)

Straight Bars				Bent Bars			
Mark	Size	Quant.	Length	Mark	Size	Quant.	Length
D401	4	105	20'-0"	C401	4	52	4'-9"
D402	4	105	34'-0"	P301	3	52	4'-3"
D601	6	168	33'-5"				
P302	3	12	20'-0"				
P303	3	12	34'-0"				

Bar List
(1 deck only)





DECK SECTION
3/8" = 1'-0"

	Br 345 (all)	Br 326 "A" 5+55	5+68	5+81	5+94	6+07
℄ Fin Gr	68.00	69.95	70.05	70.16	70.26	70.37
Conc Fin Gr = Fin Gr - 0.06						
1 L	68.27	70.21	70.31	70.42	70.52	70.63
2 L	68.14	70.08	70.18	70.29	70.39	70.50
3 L	68.01	69.95	70.05	70.16	70.26	70.37
℄	67.94	69.89	69.99	70.10	70.20	70.31
3 R	67.88	69.82	69.92	70.03	70.13	70.24
2 R	67.75	69.69	69.79	69.90	70.00	70.11
1 R	67.62	69.56	69.66	69.77	69.87	69.98

Required Elevations

NOTES

1. Superstructures for Br 326 & Br 345 are identical except that the curbs, parapets, & railings shall follow the curves of the roads on the radii shown.
2. Bar Reinforcement shown is for 1 superstructure only. Double is required for contract.
3. Shear connectors may be either 4 ES 4 @ 9" or groups of 3/4" ϕ x 4" studs, 4 per group, spaced as shown.

QUANTITIES (one superstructure only)

Item 18	Portland Cement Concrete Masonry	56 cu. yd.
Item 20	Bar Reinforcement	12,300 lb.
Item 22	Structural Steel	26 Tons
	Aluminum Bridge Railing	106 Lin. ft.

See Title Sheet for a complete tabulation of Quantities and Pay Items.

DELAWARE
STATE HIGHWAY DEPARTMENT

SUPERSTRUCTURE

BR 326 & BR 345

D. R.B.S.
C. R.B.S.
T. E.I. 10/10/61

SCALE as shown

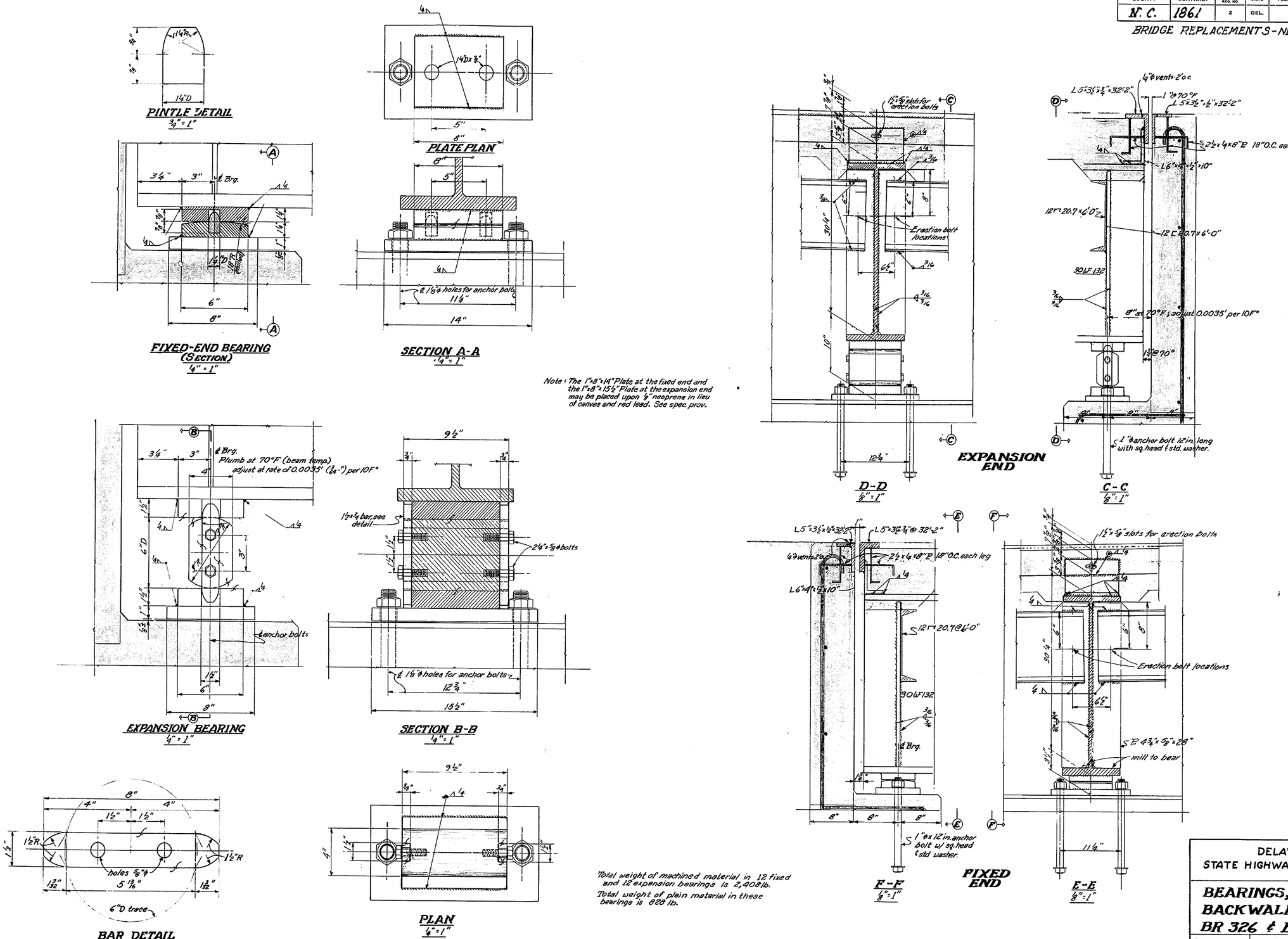
APPROVED: J. M. Fox
BRIDGE ENGINEER

TIE POINTS
BENCH MARKS
EARTHWORK
DRAINAGE

"Imperial" 156 W. B. & E.

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N. C.	1861	2	DEL.			10	12

BRIDGE REPLACEMENTS - NEW CASTLE COUNTY



Note: The 1"x8"x14" Plate at the fixed end and the 1"x8"x15½" Plate at the expansion end may be placed upon ⅛" neoprene in lieu of canvas and red lead. See spec. prov.

Total weight of machined material in 12 fixed and 12 expansion bearings is 2,408 lb.

Total weight of plain material in these bearings is 828 lb.

DELAWARE
STATE HIGHWAY DEPARTMENT

BEARINGS, END DAM & BACKWALL DETAILS BR 326 & BR 345

D. R.B.S.
T. R.B.S.
C. E.Z. 11/10/61

as shown

APPROVED: J. M. Fox
BRIDGE ENGINEER

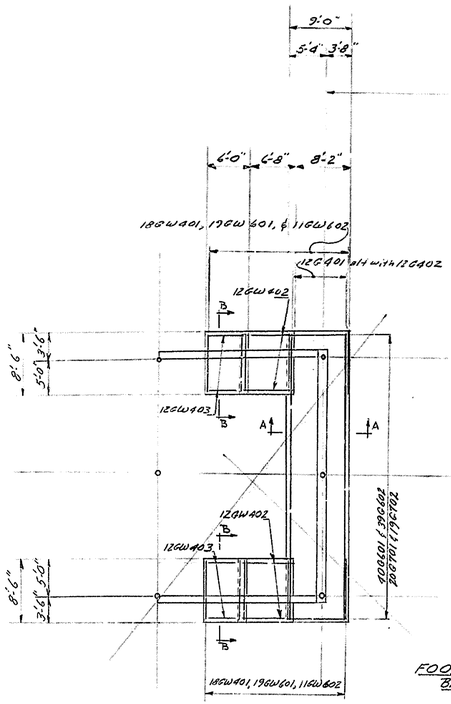
BEARINGS
TIE POINTS
BENCH MARKS
EARTHWORK
DRAINAGE

"Imperial" 156 W. B. & E.

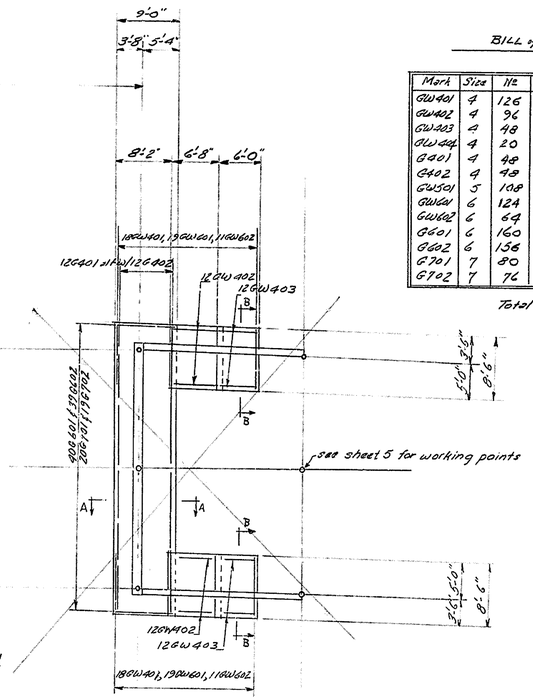
345-326

COUNTY	CONTRACT	F.B.R. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
N.C.	1861	2	DEL.			11	13

BRIDGE REPLACEMENTS, - NEW CASTLE COUNTY



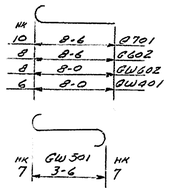
FOOTING PLAN
BRIDGE 345
1"=10'-0"

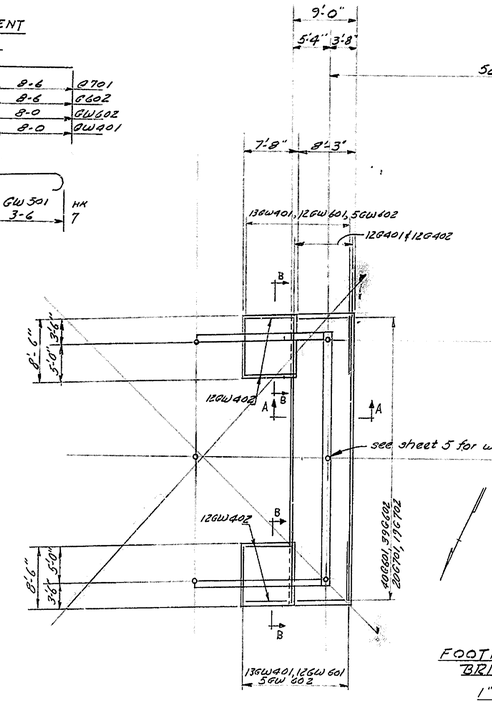


BILL of BAR REINFORCEMENT

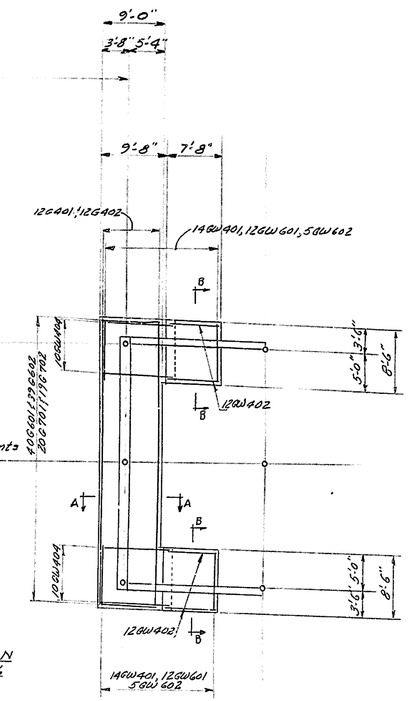
Mark	Size	No	Length
GW401	4	126	8-6
GW402	4	96	7-2
GW403	4	48	5-6
GW404	4	20	10-2
G601	4	48	15-0
G602	4	48	25-0
GW501	5	108	4-8
GW601	6	124	7-0
GW602	6	64	8-8
G601	6	160	7-0
G602	6	156	9-2
G701	7	80	9-4
G702	7	76	6-0

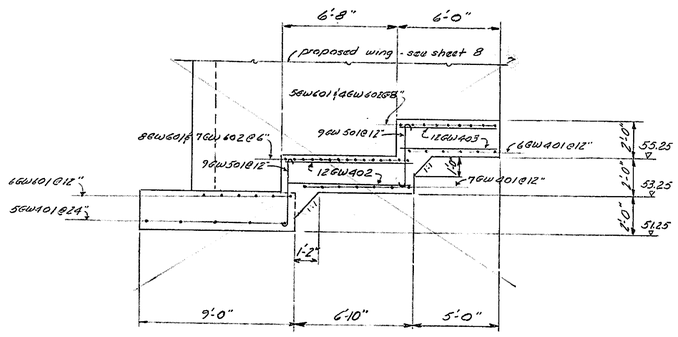
Total Weight = 10,220 lb.



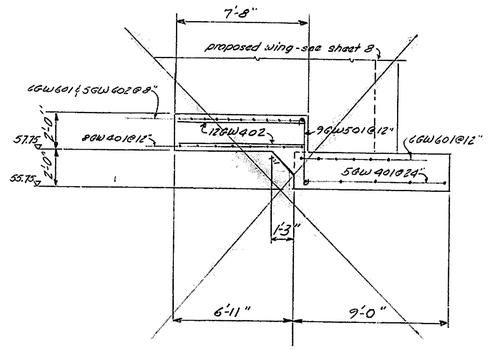


FOOTING PLAN
BRIDGE 326
1"=10'-0"

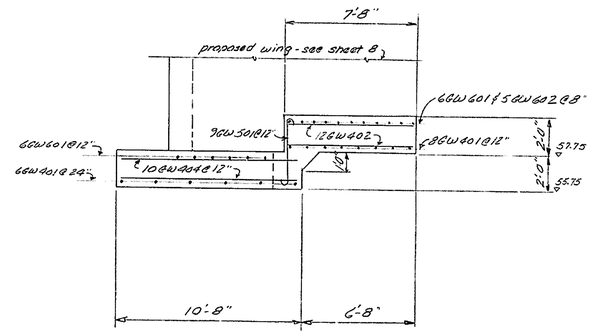




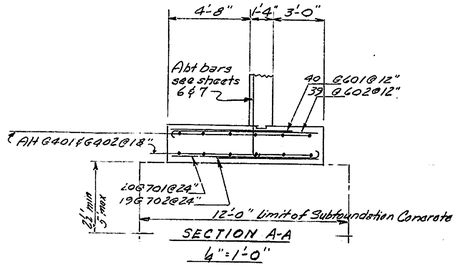
WING FOOTING ELEVATION
BRIDGE 345
4"=1'-0"



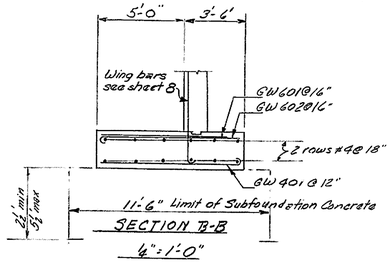
WING FOOTING ELEVATION
EAST ABUTMENT, BR 326
4"=1'-0"



WING FOOTING ELEVATION
WEST ABUTMENT, BR 326
4"=1'-0"



SECTION A-A
4"=1'-0"



SECTION B-B
4"=1'-0"

DELAWARE
STATE HIGHWAY DEPARTMENT

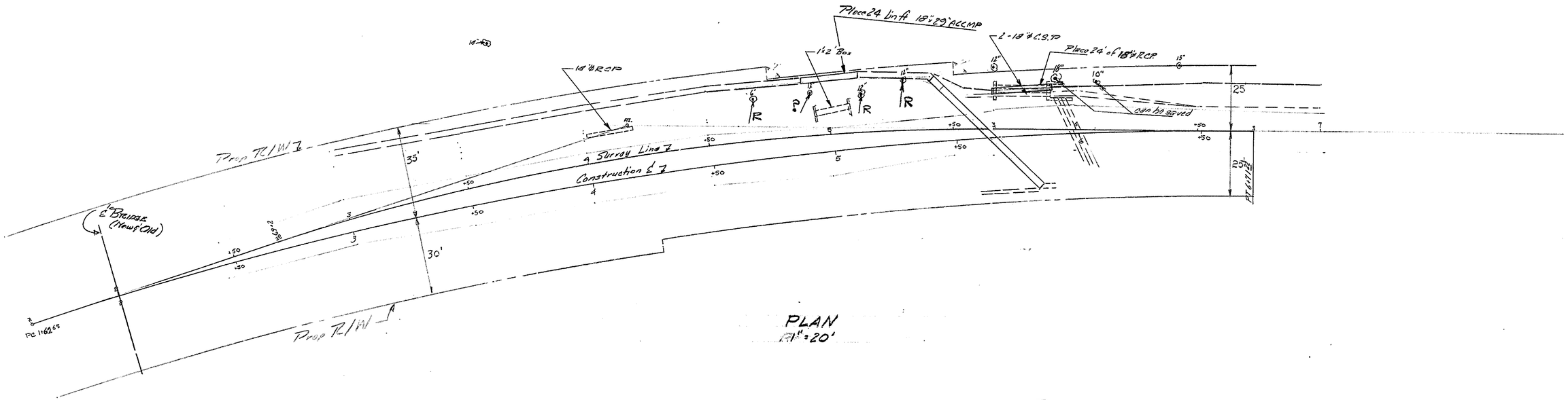
ALTERNATE FOOTINGS

D. T.B.B.	SCALE AS MARKED	APPROVED BY: J. M. Fox
T. T.B.B.		BRIDGE ENGINEER
C. E. Zuppiger		

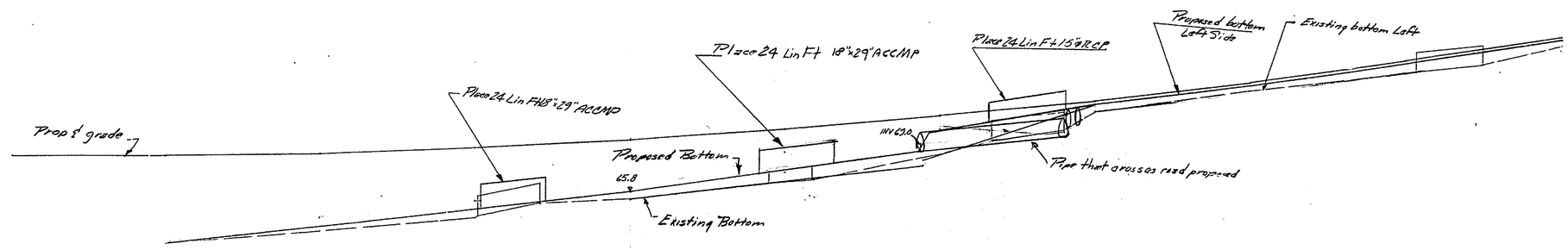
W. B. & K. No. 157

Contract 1861
Study of Portion of Road 367 Design

For remaining details see sheet 14 of the contract drawings.



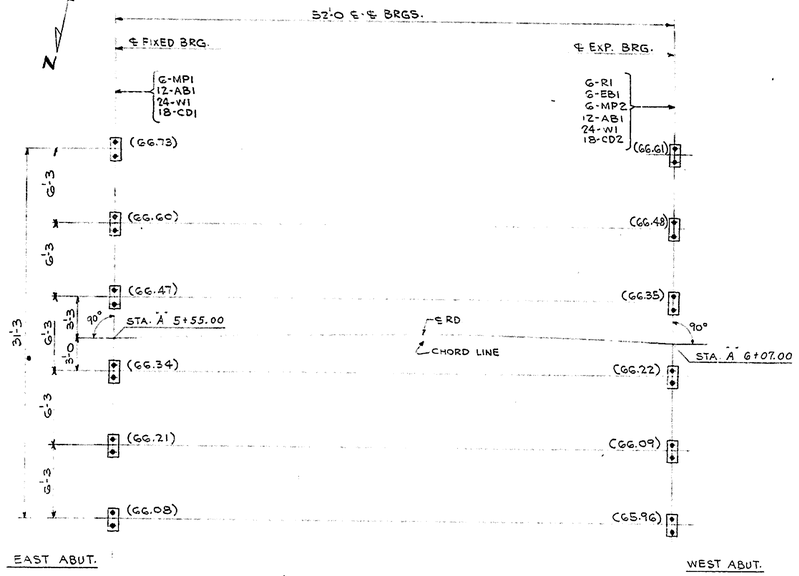
PLAN
1" = 20'



PROFILE
Hor: 1" = 20' ~ Ver 1" = 5'

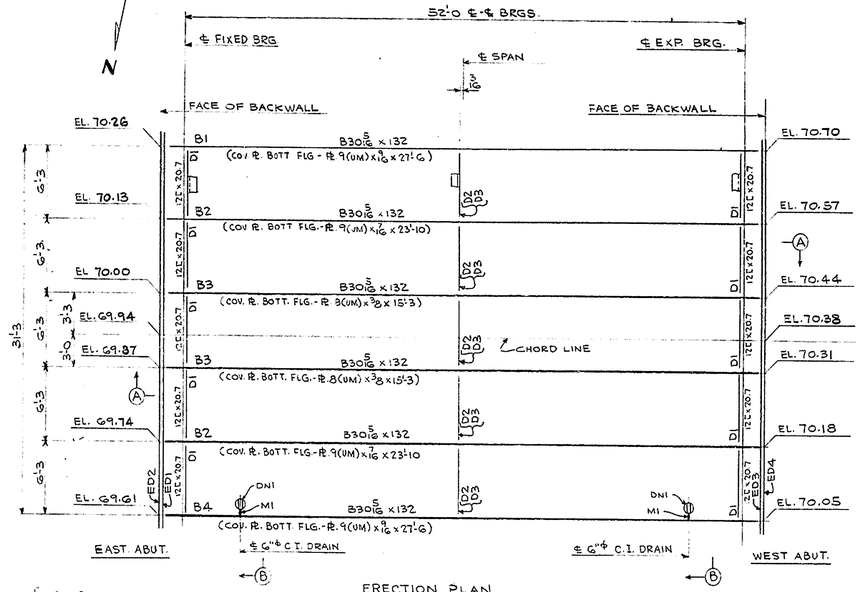
Bu4-1 326-G-1

COUNTY	CONTRACT	PRA REG. NO	STATE	FED. AID PROJECT NO.	FISCAL YEAR
N.C	18G1	2	DEL.		



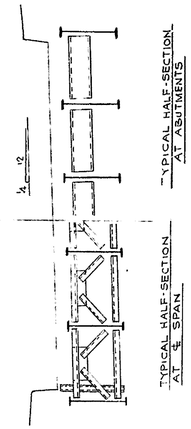
ANCHOR BOLT PLAN

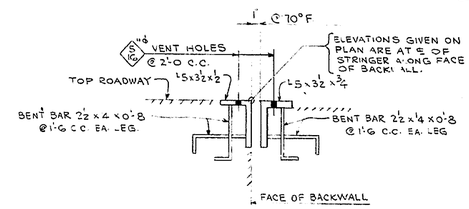
ELEVS. ON PLAN GIVEN THUS( ) ARE AT TOP OF CONCRETE BRIDGE SEAT.
SOLE PLATES WELDED TO STRINGERS IN THE SHOP.
ALL DIMENSIONS ON THIS PLAN ARE HORIZONTAL.



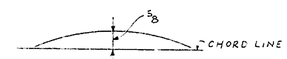
ERECTION PLAN

BRIDGE ON + 0.80% GRADE UP
ALL DIMENSIONS ON THIS PLAN ARE HORIZONTAL.



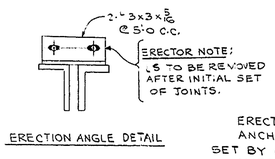


SECTION (A)



CAMBER DIAGRAM

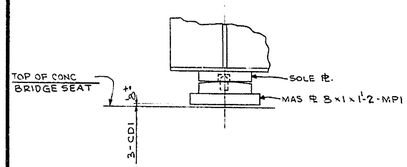
LONGITUDINAL DIMENSIONS IN DETAIL TO BE MEASURED PARALLEL TO CHORD LINE.



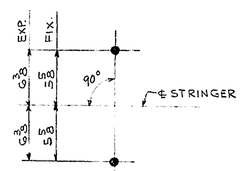
ERECTION ANGLE DETAIL

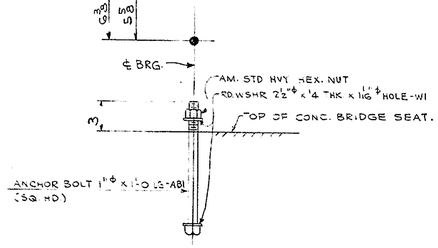
GENERAL NOTES

ERECTION- BY OTHERS
ANCHOR BOLTS- FURNISHED BY BETH. STEEL CO. AND SET BY OTHERS.
MATERIAL SPECS.-ASTM-A7, ASTM-A373 (AS NOTED ON DETAILS)
WORKMANSHIP SPECS.- DELAWARE DEPT. OF HIGHWAYS DATED JULY 1, 1960 AND SPECIAL PROVISIONS.
ALL HOLES, CUTS, BLOCKS, ETC. FOR OTHER TRADES MUST BE SHOWN ON THIS PLAN AT TIME OF APPROVAL, OTHERWISE WORK MUST BE DONE IN THE FIELD AT NO EXPENSE TO THE BETH. STEEL CO.
MEMBERS SHALL BE ERECTED WITH THEIR PIECE MARKS IN THE SAME CORRESPONDING POSITION AS SHOWN ON THIS PLAN.
ALL DIMENSIONS ON THIS PLAN MUST BE STRICTLY ADHERED TO OTHERWISE STEEL WILL NOT FIT, IN CASE OF ERROR NOTIFY THE BETH. STEEL CO. AT ONCE.
ALL WELDING SHALL CONFORM TO THE CURRENT SPECS. FOR WELDED HIGHWAY AND RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY.
SHOP PAINT- ONE COAT AS PER SPECS. EXCEPT WHERE NOTED ON DETAILS.
FIELD PAINT- BY OTHERS.
RAILING, RAILING ANC. BOLTS, ERECTION SHIMS, DRIFT PINS, FITTING UP BOLTS & FIELD WELD WIRE FURNISHED BY OTHERS.

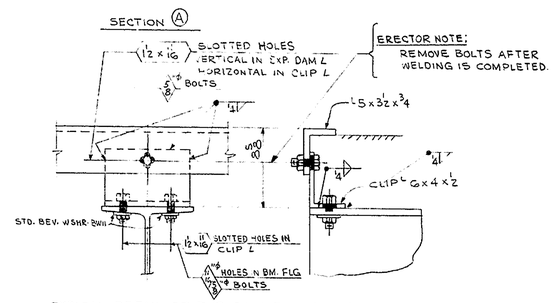


FIXED BEARING DETAIL.



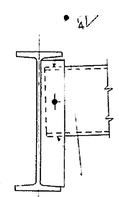


ANCHOR BOLT SETTING AT FIXED AND EXPANSION BEARINGS.

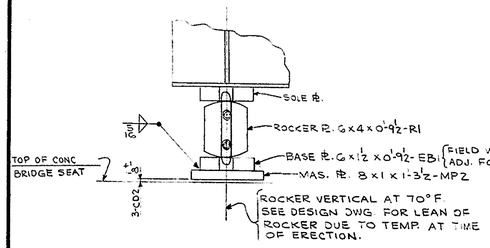


TYPICAL DETAIL OF EXP. DAM TO STRINGER CONN.

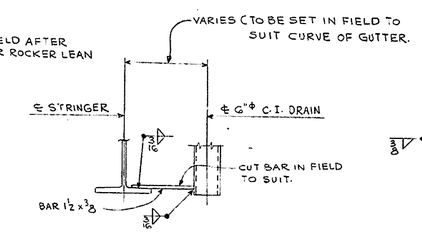
ERECTOR NOTE: WELD TO BE MADE AFTER DAM HAS BEEN SET AND BOLTED INTO FINAL POSITION



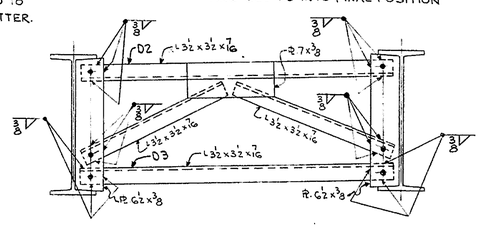
TYPICAL FIELD WELDING (12" TO STRINGERS)



EXPANSION BEARING DETAIL.



SECTION (B)



TYPICAL DETAIL OF CROSS BRACE AT ℄ SPAN

LIST OF DRAWINGS	
SHEET NO.	DESCRIPTION
E1	ANCHOR BOLT AND ERECTION PLAN
1	DETAILS
2	DETAILS
M1	ANCHOR BOLTS
M2	WASHERS
M3	CANVAS DUCK
M4	FIELD PAINT
M5	WASHERS
SB1	FIELD BOLTS

BRIDGE No. 326
ON ROAD 304

ITEM 22

ANCHOR BOLT AND ERECTION PLAN

TEMP. / SUPT. / LAYOUT / FITTER / SHOP INSP. / PC. WK. / B. SMITH / MCH. / ERECT. / O. INSP. / WEIGHTS

STRUCT.: BRIDGE REPLACEMENTS
NEW CASTLE COUNTY, DELAWARE
CUST.: EASTERN STATES CONST. CO.

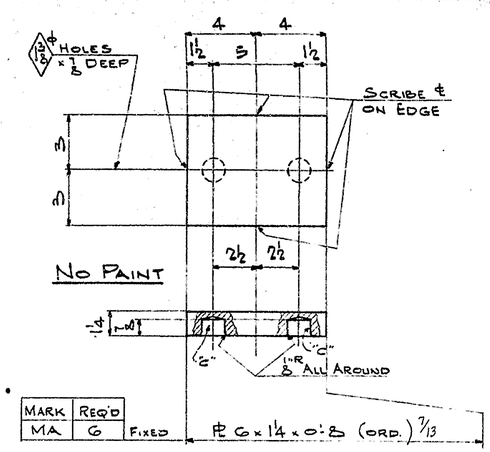
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION

BETHLEHEM DRAFTING ROOM BETH. WORKS
IN CHARGE HOOVER MADE BY FWV
CHECKED BY JHB 5/18/66 TRACED BY
REVISED LAST ASSEM. MK.

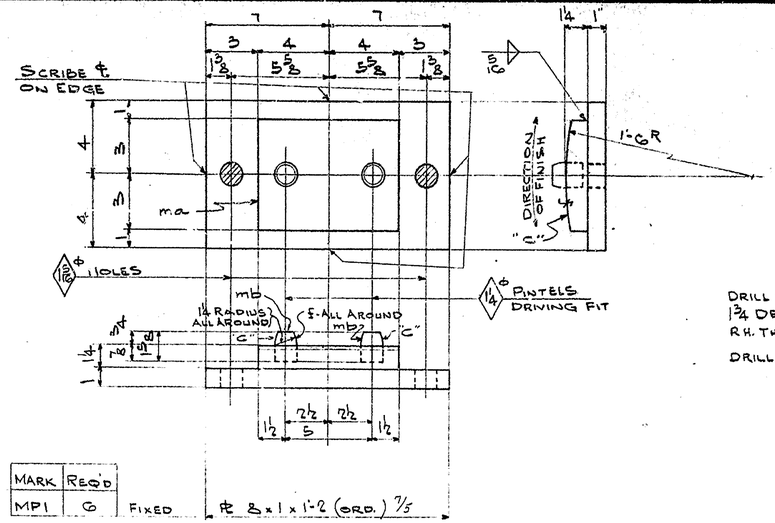
SHOP NO. CONTRACT HP523-B SHEET E1

3200-500-8,68

COUNTY	CONTRACT	P.R.A. REG. NO	STATE	FED. AID PROJECT NO	FISCAL YR.
N.C.	1861	2	DEL.		

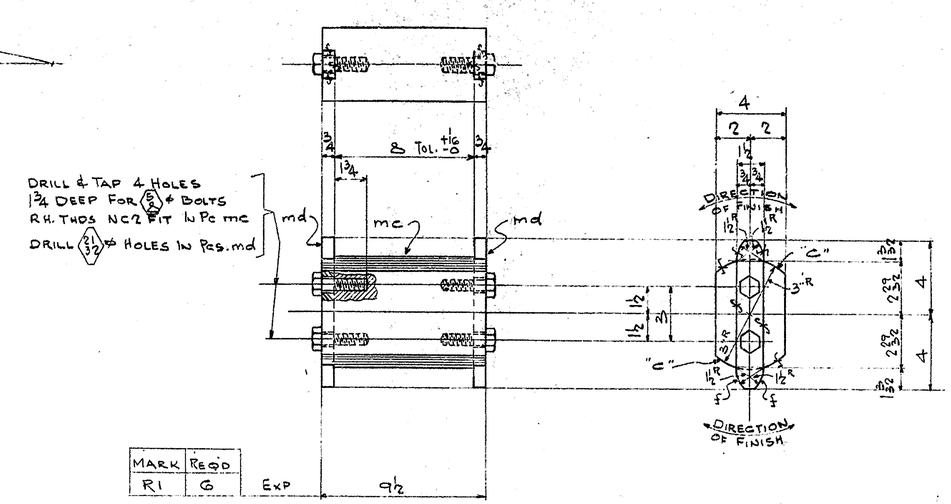


MARK	REQ'D		
MA	6	FIXED	PL 6 × 1¼ × 0'-8 (ORD.) 7/13



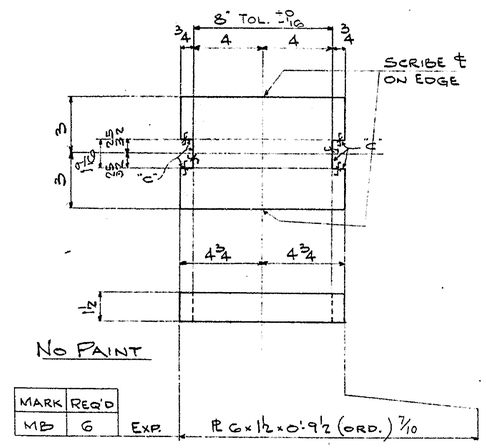
MARK	REQ'D		
MP1	6	FIXED	PL 8 × 1 × 1'-2 (ORD.) 7/5

6 PL 6 × 1¼ (M1S) × 0'-8 ma (ORD.) 7/12
12 PINTELS 1¼ ⌀ (FIN. ALL AROUND) × 1 5/8 LG. mb (ORD.) 7/17
5/16 FILLET WELD × 8'-0

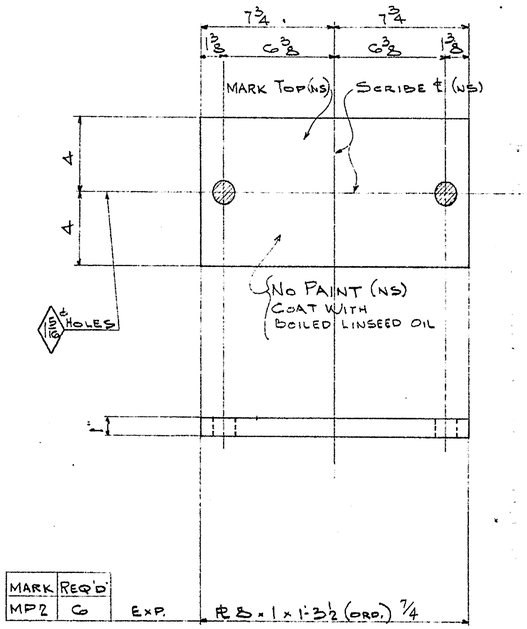


MARK	REQ'D		
R1	6	EXP	9½

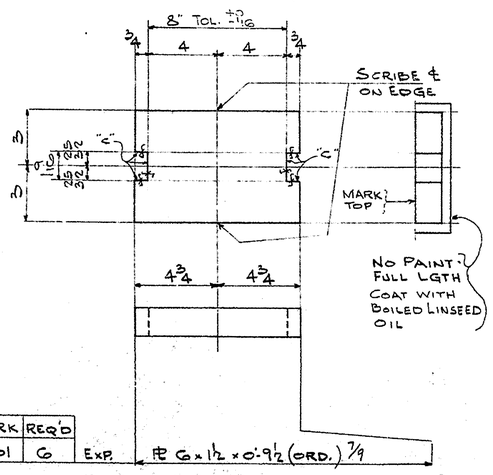
6-BAR 6 (M2S) × 4 × 0'-9½ (MB2E) mc (ORD.) 7/7
12-BAR 1½ (M2W) × ¾ × 0'-8 - md (ORD.) 7/15 ASTM-A7
24 PB 5/8 ⌀ × 2¼ LG HEX HD. (1 5/8 THD. LGTH) ASTM-A307 (ORD. ON AM1 DO NOT DUPLICATE)



MARK	REQ'D		
MB	6	EXP.	PL 6 × 1½ × 0'-9½ (ORD.) 7/10



MARK	REQ'D		
MP2	6	EXP.	PL 8 × 1 × 1'-3½ (ORD.) 7/4



MARK	REQ'D		
EB1	6	EXP.	PL 6 × 1½ × 0'-9½ (ORD.) 7/9

NOTES:

SURFACES MARKED "C" TO BE COATED WITH A MIXTURE OF HOT WHITE LEAD & TALLOW
ALL PLS. TO BE PRESS STRAIGHTENED TO INSURE FLATNESS.
SOLE PLS MA & MB TO BE PAINTED IN THE SHOP AFTER ASSEMBLY TO STRINGERS.
ALL WELDING SHALL CONFORM TO THE CURRENT SPECS FOR WELDED HWY. & RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY
MAT'L SPECS. ASTM-A373 UNLESS NOTED

BRIDGE NO 326
ON ROAD 364

ITEM 22

RIVETS ✓
OPEN HOLES AS NOTED
REAM ✓
MILLING AS NOTED
PAINT (ONE COAT AS PER SPECS. UNLESS NOTED & SURFACES MARKED "C")
WELDING AS NOTED
SHOP CONTACT SURFACES NO PAINT

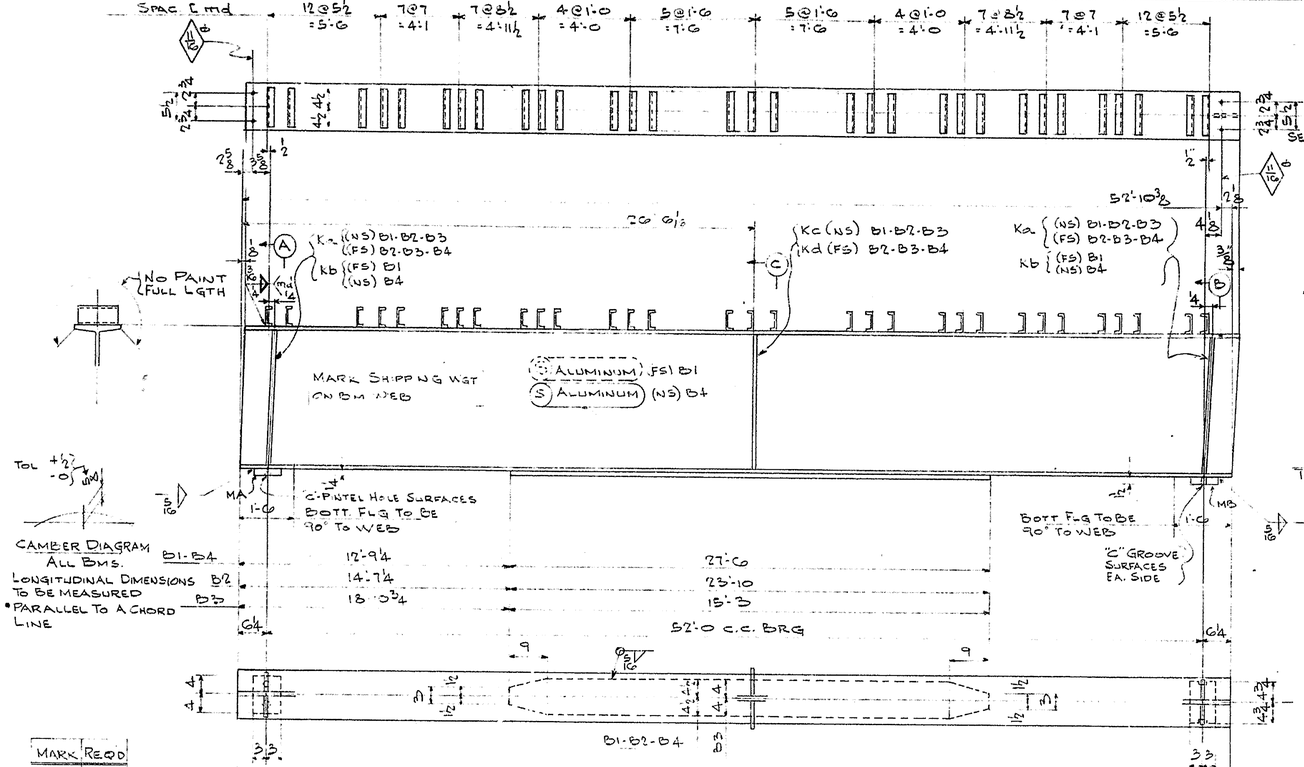
TEMP. / SUPT. / LAYOUT / FITTER / SHOP INSP. / PC. WK. / B. SMITH / MCH. / ERECT. / O. INSP. / WEIGHTS

BEARING DETAILS

BRIDGE REPLACEMENTS
NEW CASTLE COUNTY, DELAWARE
CUSTOMER: EASTERN STATES CONST. CO.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
BETHLEHEM DRAFTING ROOM BETH WORKS
IN CHARGE HOOVER MADE BY HJR
CHECKED BY JHB 5/18/62 TRACED BY
REVISED LAST ASSEM. MK.
SHOP NO.
CONTRACT HP523-B SHEET 1

COUNTY	CONTRACT	PR A. REG NO	STATE	FED AID PROJ. NO	FISCAL YR
N.C.	18G1	2	DEL.		

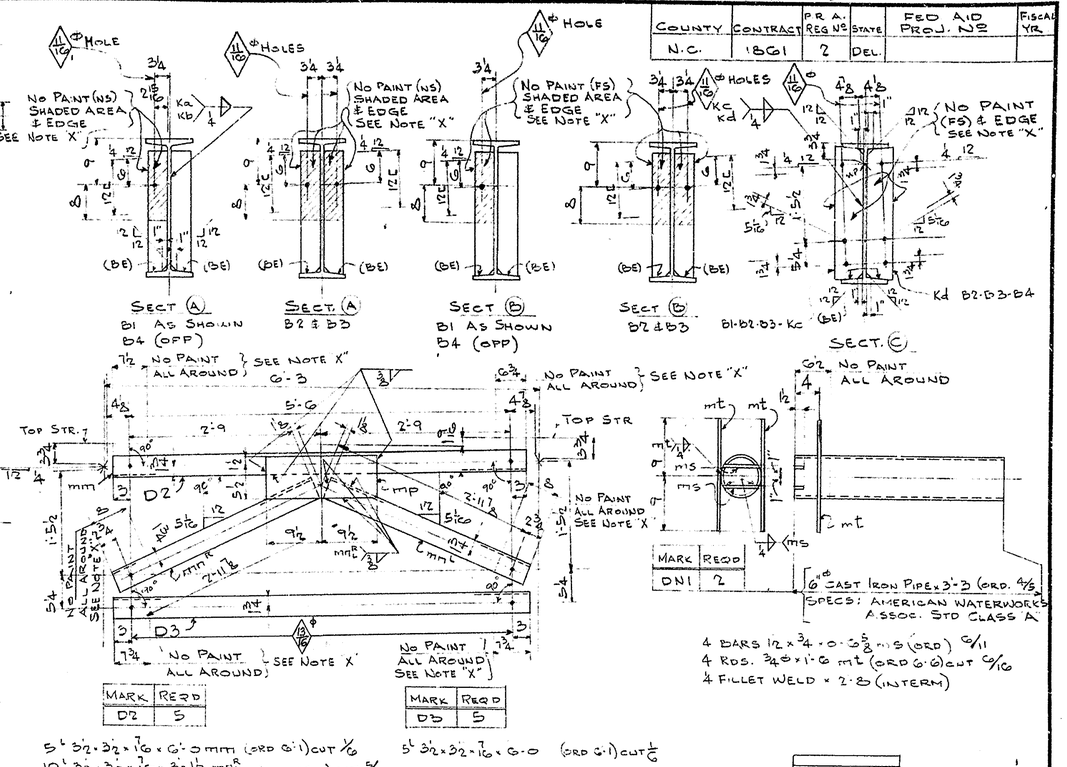


MARK	REQ'D
B1	ONE
B2	2
B3	2
B4	ONE

2 Cov. Pl 9 (UM) × 9/16 × 27'-6 ma B1-B4 (ORD 2/3)
2 Cov. Pl 9 (UM) × 7/16 × 23'-10 mb B2 (ORD 2/3)
2 Cov. Pl 8 (UM) × 3/8 × 15'-3 mc B3 (ORD 2/7)
42 Pcs [4 × 5.4 × 0'-9 md (ORD 35/40) - JT 5/9
6 Sole Pl 6 × 1¼ × 0'-5 MA } Detailed & Ord. on Sht. 1
6 Sole Pl 6 × ½ × 0'-7½ MB } Do Not Duplicate

B3 0 5/16 × 132 × 53'-0½ (ORD 53'-1½) ½ cut to 53'-0⅜
B3 0 5/16 × 132 - 53'-0½ (ORD 53'-1½) ½ cut to 53'-0⅜
B3 0 5/16 × 132 - 53'-0½ (ORD 53'-1½) ½ cut to 53'-0⅜
B3 0 5/16 × 132 - 53'-0½ (ORD 53'-1½) ½ cut to 53'-0⅜

20 bars 4¾ × ⅝ × 2'-3¾ Ka { 12 ea. B1-B4, 4 ea. B2-B3 } (ORD 20/22-0) cut 6/7
4 bars 4¾ × ⅝ × 2'-3¾ Kb 2 ea. B1 & B4
5 Bars 6½ × ⅜ × 2'-4 7/16 Kc - B1-B2-B3 } (ORD 26'-0) cut 6/8
5 Bars 6½ × ⅜ × 2'-4 7/16 Kd B2-B3-B4 }
5/16 Fillet Weld × 319'-6
¼ Fillet Weld × 470'-8 { 78'-6 ea. B1-B4, 79'-11 ea. B2-B3 }
5/16 Fillet Weld × 287'-4 { 88'-6 ea. B1-B4, 51'-2 - B2, 34'-0 - B3 }
42 @ 9 Stg = 31'-6
15 @ 2'-0 = 30'-0



MARK	REQ'D
D2	5

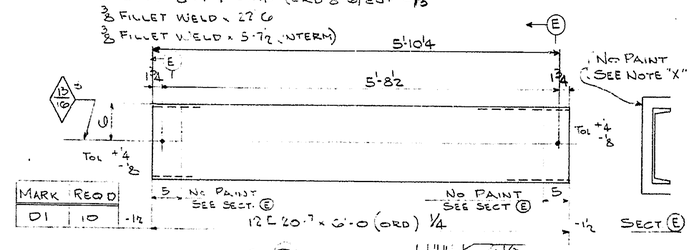
MARK	REQ'D
D3	5

5 L 3½ × 3½ × 7/16 × 6'-0 mm (ORD 6'-1) cut 1/6
10 L 3½ × 3½ × 7/16 × 3'-1½ mnR (ORD 33'-0) cut 5/6
5 Pl 7 × 3/8 × 1'-7 - mp (ORD 8'-6) cut 6/3
3/8 Fillet Weld × 27'-6
3/8 Fillet Weld × 5'-7½ (Interm)

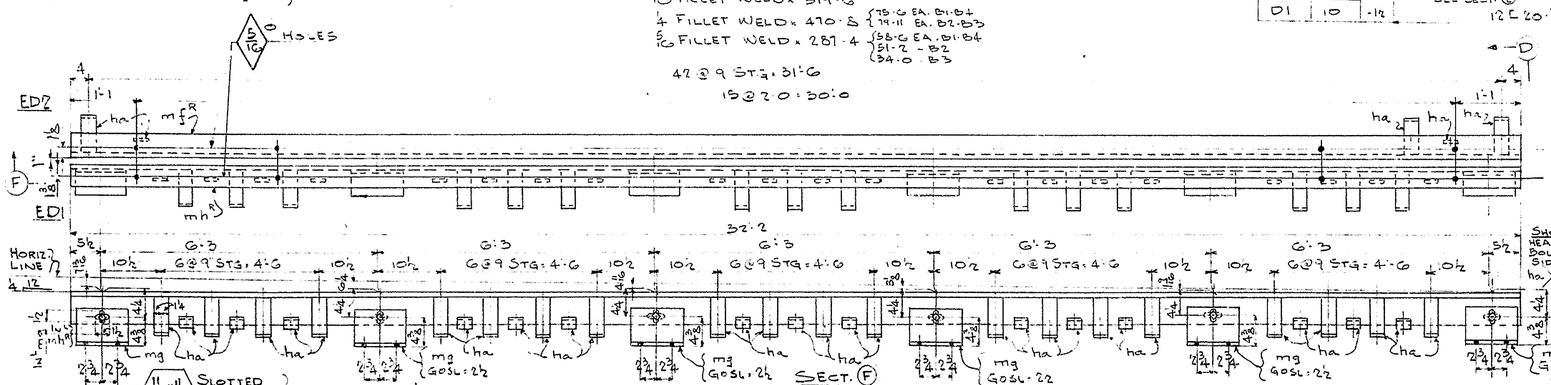
5 L 3½ × 3½ × 7/16 × 6'-0 (ORD 6'-1) cut 1/6

MARK	REQ'D
M1	2

(Plain) No Paint
Bar 1/2 × 3/8 × 1'-6 (ORD 3'-0) cut 1/2



MARK	REQ'D
D1	10



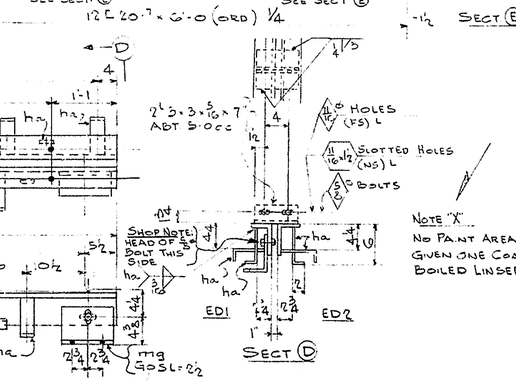
MARK	REQ'D
ED1	ONE
(Opp.) ED3	ONE

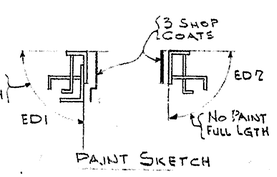
2 L 5 × 3½ × ¾ × 32'-2 mh R (ORD 32'-3) cut 3/5
12 L 6 × 4 × ½ × 0'-10 mg (ORD 11'-0) cut 5/3
70 bars 2½ × ¼ × 0'-8 ha (ORD 20/22) cut 6/7
3/16 Fillet Weld × 29'-2 (Interm)
12 TB 5/8 Φ × 2 Sq Hd & Nut

MARK	REQ'D
ED2	ONE
(Opp) ED4	ONE

2 L 5 × 3½ × ½ × 32'-2 mf R (ORD 32'-3) cut 3/5
86 bars - ha (ORD 20/22) cut 6/9
3/16 Fillet Weld × 35'-10 (Interm)

Temporary Mat'l
28 L 3 × 3 × 5/16 × 0'-7
28 TB 5/8 Φ × 1½ Sq Hd & Nut
¼ Fillet Weld × 7'-0 (Int) No Paint Full Lgth





Notes:

For General Notes & Welding Specs See E1
Mat'l Specs ASTM-A373 Unless Noted
Surfaces Marked "C" To Be Coated With A Mixture of Hot White Lead & Tallow.

Bridge No 326 on Road 364

Item 22

Rivets	✓
Open Holes	As Noted
Ream	✓
Milling	As Noted
Paint	One Coat As Per Specs Unless Noted & Surfaces Marked "C"
Welding	As Noted
Shop Contact Surfaces	No Paint

Temp.	
Supt.	
Layout	
Fitter	
Shop Insp.	
Pc. Wk.	
B. Smith	
Mch.	
Erect.	
O. Insp.	
Weights	

Details

Bridge Replacement
New Castle County, Del.
Customer: Eastern States Const. Co.

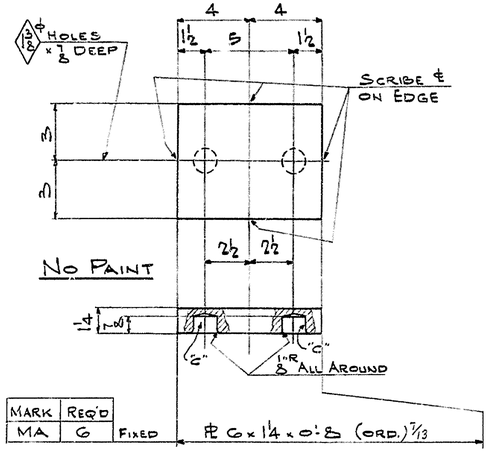
Bethlehem Steel Company
Fabricated Steel Construction
Bethlehem Drafting Room Beth Works

In Charge Hoover — Made By KWC
Checked By J.H.B. — Traced By
Revised R1-JBT 6/9/62 — Last Assem. Mk.

Shop No. — Contract HP523-B — Sheet 2

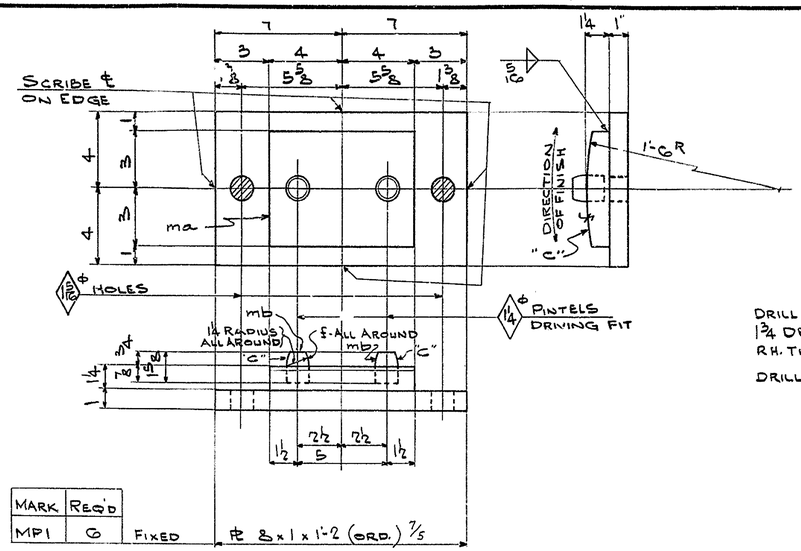
3200-26-11,68-TSCo

COUNTY	CONTRACT	P.R.A. REQ. Nº	STATE	FED. AID PROJECT Nº	FISCAL YR.
N.C	18G1	2	DEL.		



MARK	REQ'D	
MA	6	FIXED

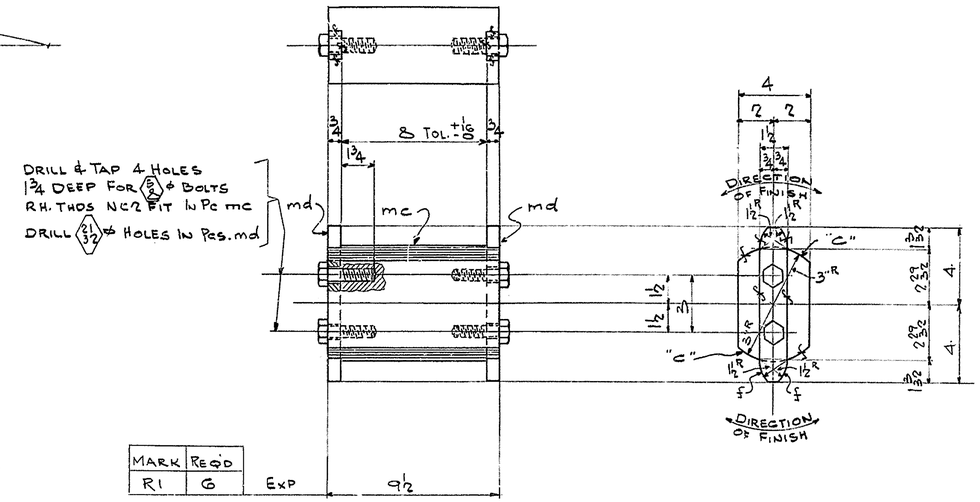
PL 6 x 1¼ x 0'-8 (ORD.) 7/13



MARK	REQ'D	
MP1	6	FIXED

PL 8 x 1 x 1'-2 (ORD.) 7/5

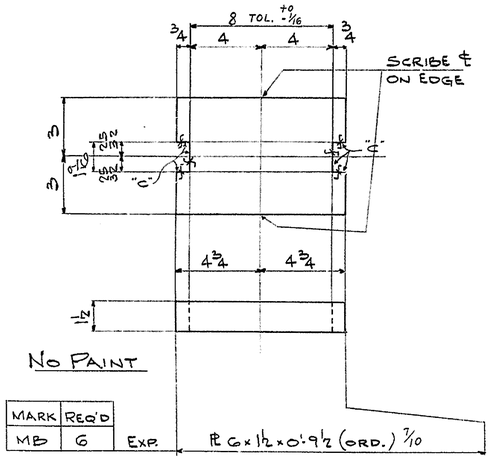
6 PL 6 x 1¼ (M15) x 0'-8 ma (ORD.) 7/12
12 PINTELS 1¼ ϕ (FIN. ALL AROUND) x 1⅝ LG. mb (ORD.) 7/17
5/16 FILLET WELD x 8'-0



MARK	REQ'D	
R1	6	EXP

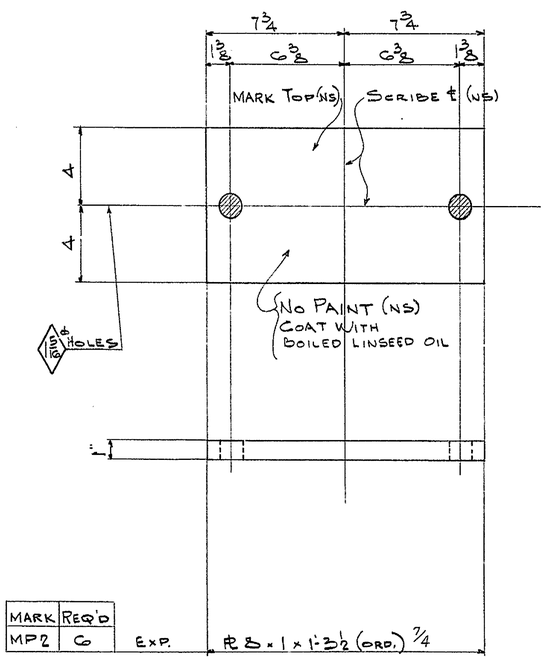
PL 9½

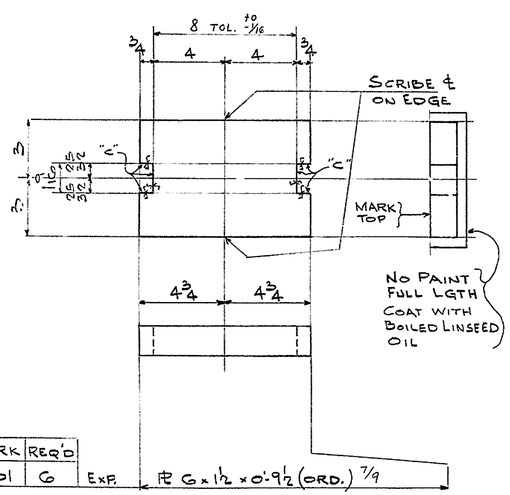
6 - BAR 6 (M25) x 4 x 0'-9½ (MB2E) mc (ORD.) 7/7
12 - BAR 1½ (M2W) x ¾ x 0'-8 - md (ORD.) 7/15 ASTM-A7
24 PB ⅝ ϕ x 2¼ LG. HEX HD. (1⅝ THD. LGTH) ASTM-A307 (ORD. ON AMI DO NOT DUPLICATE)



MARK	REQ'D	
MB	6	EXP.

PL 6 x 1½ x 0'-9½ (ORD.) 7/10





MARK	REQ'D	
MP2	6	EXP.

PL 8 x 1 x 1'-3½ (ORD.) 7/4

MARK	REQ'D	
EB1	6	EXP.

PL 6 x 1½ x 0'-9½ (ORD.) 7/9

NOTES:

SURFACES MARKED "C" TO BE COATED WITH A MIXTURE OF HOT WHITE LEAD & TALLOW
ALL PLS. TO BE PRESS STRAIGHTENED TO INSURE FLATNESS.
SOLE PLS MA & MB TO BE PAINTED IN THE SHOP AFTER ASSEMBLY TO STRINGERS.
ALL WELDING SHALL CONFORM TO THE CURRENT SPECS FOR WELDED HWY. & RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY
MAT'L SPECS. ASTM-A373 UNLESS NOTED

BRIDGE Nº 345
ON ROAD 367

ITEM 22

RIVETS ✓
OPEN HOLES AS NOTED
REAM ✓
MILLING AS NOTED
PAINT (ONE COAT AS PER SPECS. UNLESS NOTED & SURFACES MARKED "C")
WELDING AS NOTED
SHOP CONTACT SURFACES NO PAINT

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.
WEIGHTS

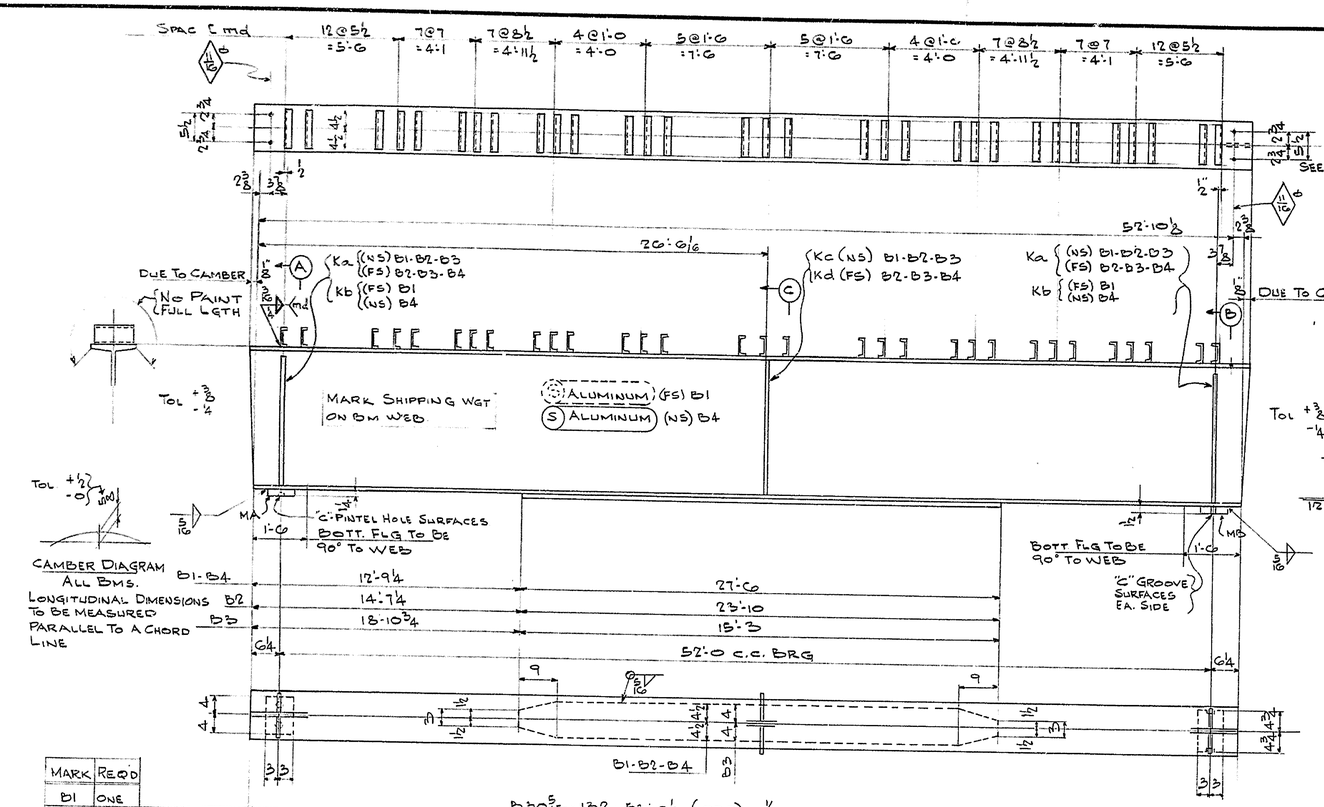
BEARING DETAILS

BRIDGE REPLACEMENTS
NEW CASTLE COUNTY, DELAWARE
CUSTOMER: EASTERN STATES CONST. CO.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
BETHLEHEM DRAFTING ROOM BETH WORKS
IN CHARGE Hoover MADE BY HTR
CHECKED BY JHB 5/18/62 TRACED BY
REVISED LAST ASSEM. MK.
SHOP NO. CONTRACT HD523-A SHEET 1

3200-2m-11,56-BSCo

COUNTY	CONTRACT	P.R.A. REG Nº	STATE	FED AID PROJ. Nº	FISCAL YR.
N.C.	18G1	2	DEL.		

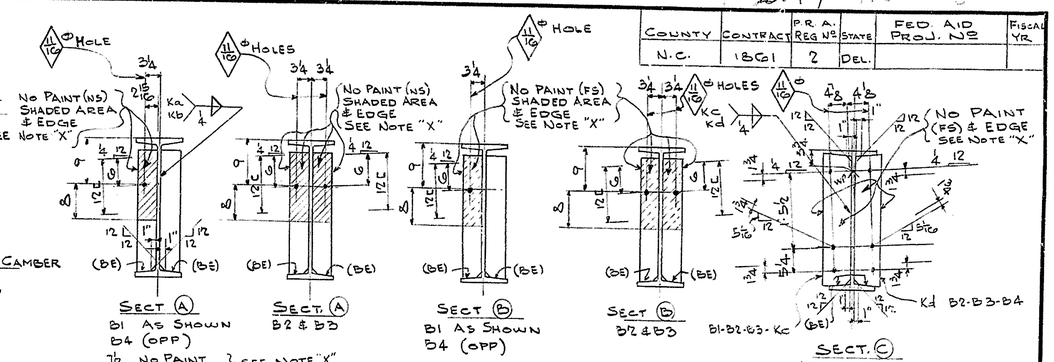


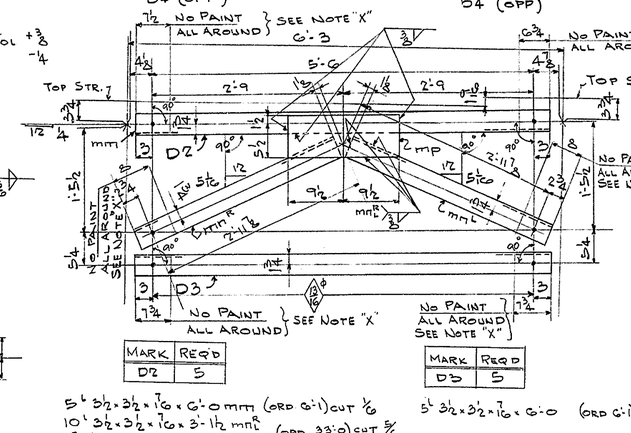
MARK	REQ'D
B1	ONE
B2	2
B3	2
B4	ONE

B30 5/16 × 132 × 53'-0½ (ORD) ½
B30 5/16 × 132 × 53'-0½ (ORD) ½
B30 5/16 × 132 × 53'-0½ (ORD) ½
B30 5/16 × 132 × 53'-0½ (ORD) ½

2 Cov. Pl 9 (UM) × 9/16 × 27'-6 ma B1-B4 (ORD) 2/3
2 Cov. Pl 9 (UM) × 7/16 × 23'-10 mb B2 (ORD) 2/5
2 Cov. Pl 8 (UM) × 3/8 × 15'-3 mc B3 (ORD) 2/7
4-26 Pc [4 × 5'-4 × 0'-9 md (ORD 35/40) CUT 5/9
(Sole Pl 6 × 1¼ × 0'-8 MA } DETAILED & ORD. ON SHT. 1
6 Sole Pl 6 × 1½ × 0'-9½ MB } DO NOT DUPLICATE

20 BARS 4¾ × 5/8 × 2'-3¾ Ka { 2 EA. B1-B4, 4 EA. B2-B3 } (ORD 20/22'-0) CUT 6/7
4 BARS 4¾ × 5/8 × 2'-3¾ Kb 2 EA B1 & B4
5 BARS 6½ × 3/8 × 2'-4 9/16 Kc - B1-B2-B3 } (ORD 26'-0) CUT 6/5
5 BARS 6½ × 3/8 × 2'-4 9/16 Kd B2-B3-B4 }
3/16 FILLET WELD × 319'-6
¼ FILLET WELD × 470'-8 { 75'-6 EA. B1-B4, 79'-11 EA. B2-B3 }
5/16 FILLET WELD × 287'-4 { 38'-6 EA. B1-B4, 51'-2 - B2, 34'-0 - B3 }



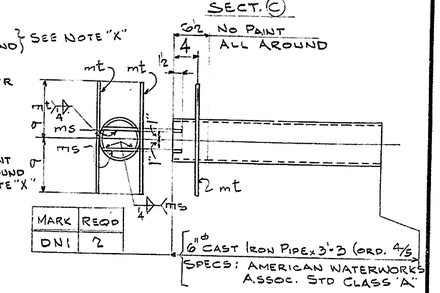


MARK	REQ'D
D2	5

5 L 3½ × 3½ × 7/16 × 6'-0 mm (ORD 6'-1) CUT 1/6
10 L 3½ × 3½ × 7/16 × 3'-1½ mmR (ORD. 33'-0) CUT 5/6
5 Pl 7 × 3/8 × 1'-7 - mp (ORD 8'-6) CUT 6/3
3/8 FILLET WELD × 22'-6
3/8 FILLET WELD × 5'-7½ (INTERM)

MARK	REQ'D
D3	5

5 L 3½ × 3½ × 7/16 × 6'-0 (ORD 6'-1) CUT 1/6

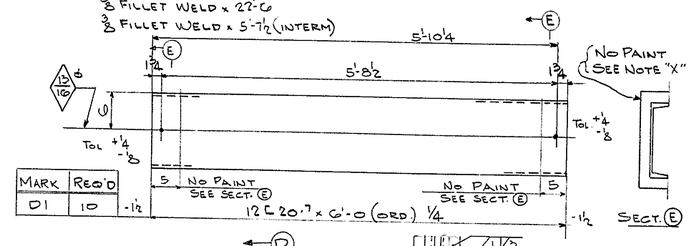


MARK	REQ'D
DN1	2

4 BARS 1½ × ¾ × 0'-6 5/8 ms (ORD) 6/11
4 RODS. ¾ ϕ × 1'-6 mt (ORD 6'-6) CUT 6/6
4 FILLET WELD × 2'-8 (INTERM)

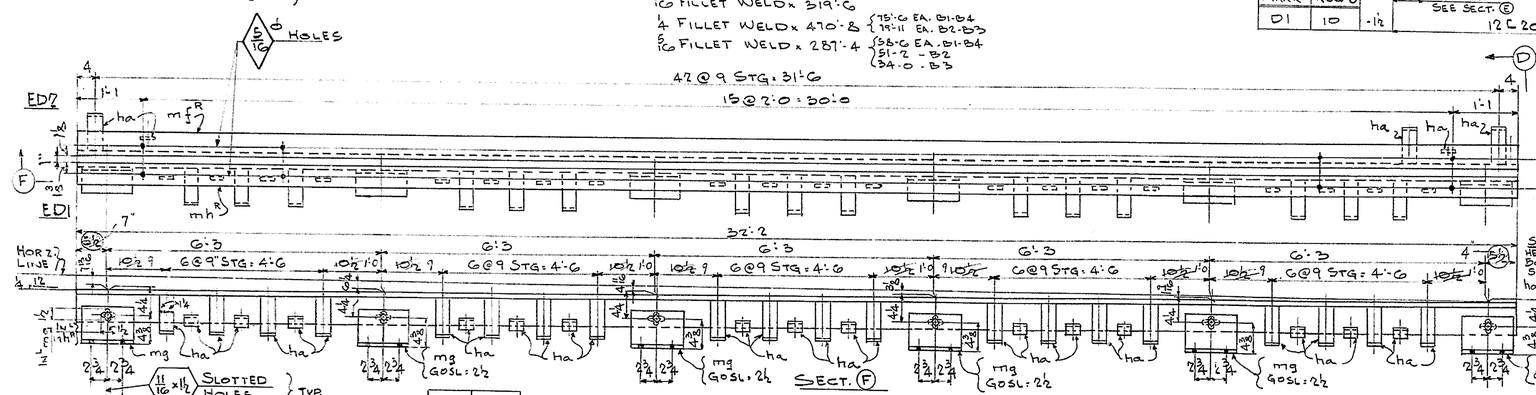
MARK	REQ'D
M1	2

(PLAIN) No Paint
BAR 1½ × 3/8 × 1'-6 (ORD 3'-0) CUT 13/16



MARK	REQ'D
D1	10

12 [20.7 × 6'-0 (ORD) ¼



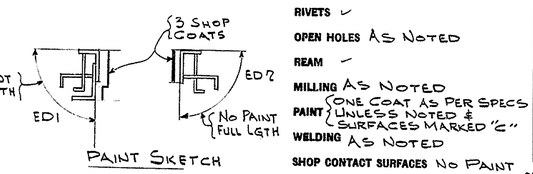
MARK	REQ'D
ED1	ONE
(OPP.) ED3	ONE

2 L 5 × 3½ × ¾ × 32'-2 mhR (ORD 32'-3) CUT 3/5
12 L 6 × 4 × ½ × 0'-10 mg (ORD. 11'-0) CUT 5/3
70 BARS 2½ × ¼ × 0'-8 ha (ORD 20/22) CUT 6/9
3/16 FILLET WELD × 29'-2 (INTERM)
12 TB 5/8 ϕ × 2 Sq Hd & Nut

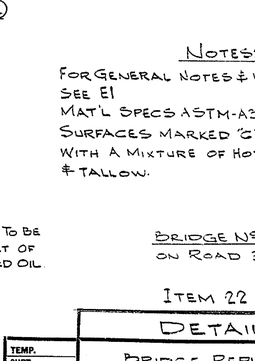
MARK	REQ'D
ED2	ONE
(OPP) ED4	ONE

2 L 5 × 3½ × ½ × 32'-2 mfR (ORD. 32'-3) CUT 3/5
86 BARS - ha (ORD. 20/22) CUT 6/9
3/16 FILLET WELD × 35'-10 (INTERM)

Temporary Mat'l
28 L 3 × 3 × 5/16 × 0'-7
28 TB 5/8 ϕ × 1½ Sq Hd & Nut
¼ Fillet Weld × 7'-0 (INT)



Paint Sketch



Note "X"
No Paint Area To Be Given One Coat Of Boiled Linseed Oil.

Notes:
For General Notes & Welding Specs See E1
Mat'l Specs ASTM-A373 Unless Noted
Surfaces Marked "C" To Be Coated With A Mixture Of Hot White Lead & Tallow.

Bridge Nº 345
on Road 367

Item 22

Temp.	
Suft.	
Layout	
Fitter	
Shop Insp.	
Pc. Wk.	
B. Smith	
Mch.	
Erect.	
O. Insp.	
Weights	

Rivets ✓
Open Holes As Noted
Ream —
Milling As Noted
Paint { One Coat As Per Specs Unless Noted & Surfaces Marked "C"
Welding As Noted
Shop Contact Surfaces No Paint

Details

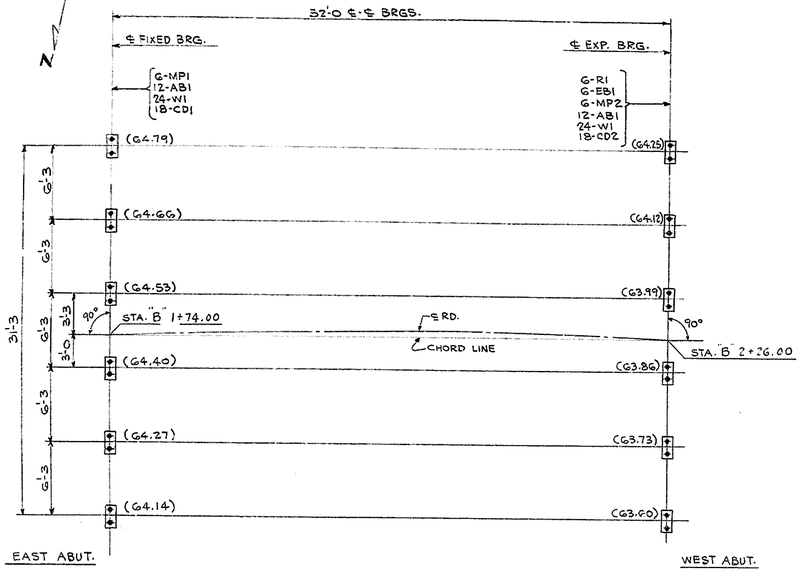
Bridge Replacement
New Castle County, Del.
Customer: Eastern States Const. Co.

BETHLEHEM STEEL COMPANY
Fabricated Steel Construction
Bethlehem Drafting Room DETH Works
In Charge Hoover Made By HKR
Checked By J.H.B. 5/23/62 Traced By
Revised R1-2&4 8/14/62 Last Assem. Mk.
Shop No. Contract HP523-A Sheet 2

3200-2m-11,56-BSCo

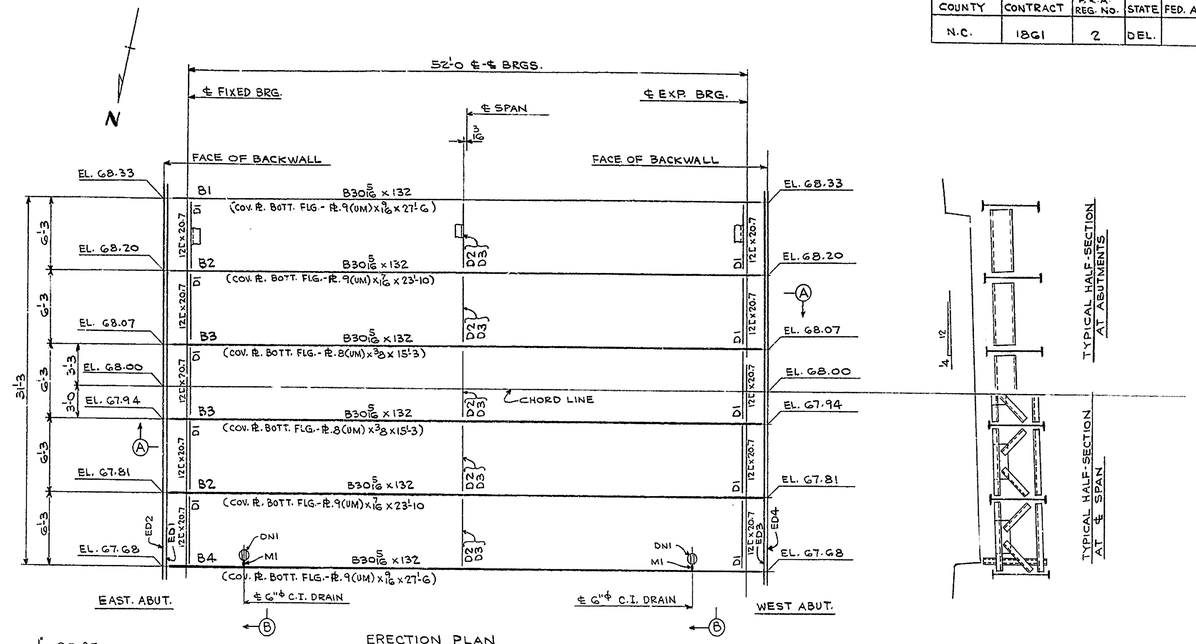
345-386 6-1 ~~DRAFT~~

COUNTY	CONTRACT	P.R.A. REG. No.	STATE	FED. AID PROJECT NO.	FISCAL YEAR
N.C.	18G1	2	DEL.		



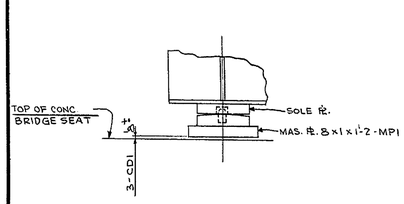
ANCHOR BOLT PLAN

ELEVS. ON PLAN GIVEN THUS( ) ARE AT TOP OF CONCRETE BRIDGE SEAT.
SOLE PLATES WELDED TO STRINGERS IN THE SHOP.
ALL DIMENSIONS ON THIS PLAN ARE HORIZONTAL.

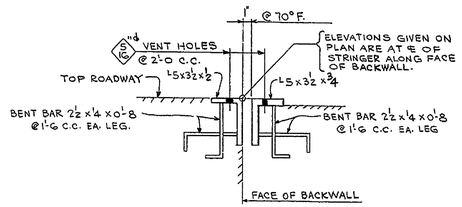


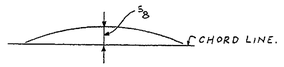
ERECTION PLAN

BRIDGE ON STRAIGHT GRADE
ALL DIMENSIONS ON THIS PLAN ARE HORIZONTAL



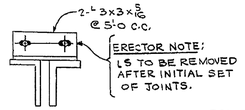
FIXED BEARING DETAIL





CAMBER DIAGRAM

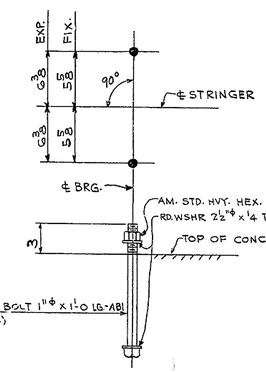
LONGITUDINAL DIMENSIONS IN DETAIL TO BE MEASURED PARALLEL TO CHORD LINE.



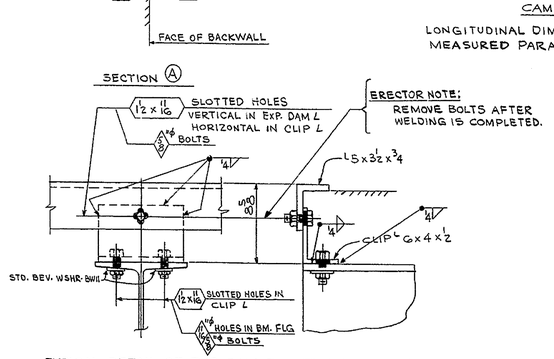
ERECTION ANGLE DETAIL

GENERAL NOTES

ERECTION- BY OTHERS
ANCHOR BOLTS- FURNISHED BY BETH. STEEL CO. AND SET BY OTHERS.
MATERIAL SPECS.-ASTM-A7, ASTM-A373 (AS NOTED ON DETAILS
WORKMANSHIP SPECS.- DELAWARE DEPT. OF HIGHWAYS DATED JULY 1, 1960 AND SPECIAL PROVISIONS.
ALL HOLES, CUTS, BLOCKS, ETC. FOR OTHER TRADES MUST BE SHOWN ON THIS PLAN AT TIME OF APPROVAL, OTHERWISE WORK MUST BE DONE IN THE FIELD AT NO EXPENSE TO THE BETH. STEEL CO.
MEMBERS SHALL BE ERECTED WITH THEIR PIECE MARKS IN THE SAME CORRESPONDING POSITION AS SHOWN ON THIS PLAN.
ALL DIMENSIONS ON THIS PLAN MUST BE STRICTLY ADHERED TO OTHERWISE STEEL WILL NOT FIT. IN CASE OF ERROR NOTIFY THE BETH. STEEL CO. AT ONCE.
ALL WELDING SHALL CONFORM TO THE CURRENT SPECS. FOR WELDED HIGHWAY AND RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY.
SHOP PAINT- ONE COAT AS PER SPECS. EXCEPT WHERE NOTED ON DETAILS.
FIELD PAINT- BY OTHERS.
RAILING, RAILING ANC. BOLTS, ERECTION SHIMS, DRIFT PINS, FITTING UP BOLTS & FIELD WELD WIRE FURNISHED BY OTHERS.



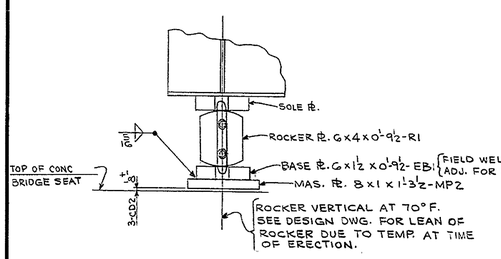
ANCHOR BOLT SETTING AT FIXED AND EXPANSION BEARINGS



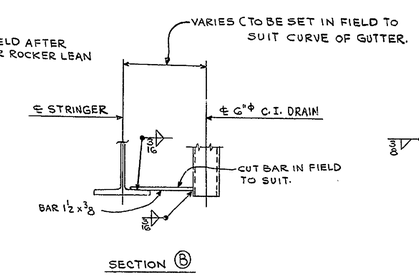
TYPICAL DETAIL OF EXP. DAM TO STRINGER CONN.

ERECTOR NOTE: WELD TO BE MADE AFTER DAM HAS BEEN SET AND BOLTED INTO FINAL POSITION

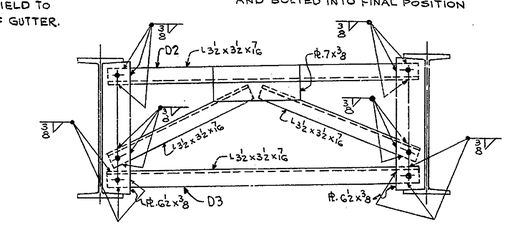
TYPICAL FIELD WELDING (12 L TO STRINGERS)



EXPANSION BEARING DETAIL



SECTION Ⓑ



TYPICAL DETAIL OF CROSS BRACE AT ℄ SPAN

LIST OF DRAWINGS

SHEET NO.	DESCRIPTION
E1	ANCHOR BOLT AND ERECTION PLAN
1	BEARING DETAILS
2	DETAILS
M1	ANCHOR BOLTS
M2	WASHERS
M3	CANVAS DUCK
M4	FIELD PAINT
M5	WASHERS
SB1	FIELD BOLTS

BRIDGE No. 345
ON ROAD 367

ITEM 22

ANCHOR BOLT AND ERECTION PLAN

TEMP.
SUPT.
LAYOUT
FITTER
SHOP INSP.
PC. WK.
B. SMITH
MCH.
ERECT.
O. INSP.
WEIGHTS

STRUCT.: BRIDGE REPLACEMENTS
NEW CASTLE COUNTY, DELAWARE
CUST.: EASTERN STATES CONST. CO.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
BETHLEHEM DRAFTING ROOM BETH. WORKS
IN CHARGE HOOVER MADE BY FWV
CHECKED BY JWB 5/16/61 TRACED BY
REVISED LAST ASSEM. MK.

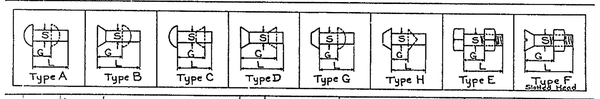
SHOP NO.
CONTRACT HP523-A
SHEET E1

3200-500-8,58

9

FABRICATED STEEL CONSTRUCTION
SUMMARY OF FIELD BOLTS
3210 Rev.A 2-55

BETH. DRAFTING ROOM BETH. WORKS



Line	Number of Same or Bolts	Actual No. Req'd	Connecting	Diam. S	Rivets Type	Rivets Grip G	Rivets Length L	Bolts Type	Bolts Head Hex. Sq.	Bolts Grip G	Bolts Length L	Bolts Length of Thd.	Nuts No.	Nuts Hex. or Sq.	Item	Weight
1																
2	55	50	DIAP. TO STRGS	5/8 φ				E	SQ	13/16	1 3/4	STD	55	SQ	RES.	
3																
4	30	24	EXP DIAM TO STRGS	5/8 φ				E	SQ	13/16	2 3/4	STD	30	SQ		
5																
6																
7			AM STD. REG. NUTS													
8																
9																
10			TOTAL Nº FURNISHED	= 85												
11			TOTAL Nº REQ'D	= 74												
12			EXCESS	= 11	ABT 15%											
13																
14																
15																
16																
17																
18																
19																
20																
21																

COUNTY	CONTRACT	PRA REG. Nº	STATE	FED. AID PROJ. Nº	FISCAL YR.
N.C.	1861	2	DEL.		

NUTS ON BOLTS
ASTM-A307

BRIDGE Nº 326 ON RD. 364
ITEM 22

Summary of Sheet Nos. R ..... Total Weight this Page .....

ALL BOLTS OVER 1½"Ø AND 7½" IN LENGTH TO BE BILLED AS RODS OFF FORM NO. 3205.
FOR ROLTS OR RIVETS OF SPECIAL DESIGN, DRAW SKETCH ON THIS SHEET.

Gen'l Supt. ☐ Layout ☐ Temp. Shop ☐ Smith Shop ☐ Loader ☐ Scale ☐ Purch. Dept. ☐ Erection ☐ O. Insp. ☐
Shop Supt. ☐ Fitter ☐ Mach. Shop ☐ Rod Shop ☐ Shipper ☐ Bill ☐ Owners ☐ S. Insp. ☐ App'l. ☐

IN CHARGE OF HOOVER — Made by HWR Date ..... Checked by JHB Date 5/23/62 — Rev. No. ..... Date ..... Shop No. ..... — CONTRACT HP523-B — Page No. SB1 of ..... — USE AS B.F.P.

Customer EASTERN STATES CONST CO. Structure BRIDGE REPLACEMENT NEW CASTLE COUNTY, DEL.

FABRICATED STEEL CONSTRUCTION
BILL OF MISCELLANEOUS MATERIAL
3211 Rev.A 4-55

BETH. DRAFTING ROOM BETH. WORKS

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1		(48 NET)				
2	50	ROUND FLAT WASHERS 2½"φ x 1/4" THK. (1 1/16"φ HOLES)	W1			RES.
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20		ITEM 22				
21						
22		BRIDGE Nº 345				
23		ON ROAD 367				
24						
25		COUNTY / CONTRACT / P.R.A. REG. NO. / STATE / FED. AID PROJ. NO. / FISCAL YEAR				
26		N.C / 1861 / 2 / DEL.				
27						
28						

Material: STEEL
Specifications: ASTM-A7
Machining:
Paint: NONE
Shipment: ADVANCE
Inspection:
Remarks: USED UNDER HEAD AND NUT OF ANCHOR BOLTS-AB1

Gen'l Supt. ☐ Layout ☐ Temp. Shop ☐ Smith Shop ☐ Loader ☐ Scale ☐ Purch. Dept. ☐ Erection ☐ O. Insp. ☐
Shop Supt. ☐ Fitter ☐ Mach. Shop ☐ Rod Shop ☐ Shipper ☐ Bill ☐ Owners ☐ S. Insp. ☐ App'l. ☐

IN CHARGE OF HOOVER — MADE BY FWV DATE ..... CHECKED BY ..... DATE ..... — REV. NO. ..... DATE ..... SHOP NO. ..... — CONTRACT HP523-A — BILL PAGE NO. M 2 OF ..... — USE AS B.F.P.

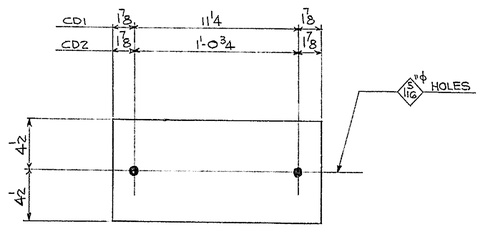
CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

3233 (9-55) BSCo.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

CUSTOMER EASTERN STATES CONST. CO.
STRUCTURE BRIDGE REPLACEMENTS - NEW CASTLE COUNTY, DELAWARE



18-PIECES 12 TO 14 OZ. DUCK - 9 x 1'-3 - CD1
18-PIECES 12 TO 14 OZ. DUCK - 9 x 1'-4½ - CD2

MATERIAL SPECS: COMMERCIAL GRADE
SHIPMENT: WITH FIRST CARLOAD OF STEEL
REMARKS: CANVAS DUCK { CD1 - AT FIXED BEARINGS / CD2 - AT EXPANSION BEARINGS }

ITEM 22

BRIDGE Nº 345
ON ROAD 367

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR
N.C.	1861	2	DEL.		

REQ. No. 896-7794

RIVETS ✓ — DWG. MADE BY FWV DATE ..... — IN CHARGE OF HOOVER
HOLES AS NOTED — DWG. CHKD. BY JHB DATE 5/18/62 — CONTRACT HP523-A
PAINT NONE — SHOP No. ..... TIER ..... — SHEET-PAGE No. M3

FABRICATED STEEL CONSTRUCTION
BILL OF MISCELLANEOUS MATERIAL
3211 Rev.A 4-55

BETH. DRAFTING ROOM BETH. WORKS

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1						
2		ORDER FOR FIELD PAINT				RES.
3		ONE COAT OF RED LEAD PAINT				
4		FOR COATING THE TOP SURFACE OF				
5		3 LAYERS OF DUCK AND THE CONCRETE			•	
6		BEAM SEAT AT EACH BEAM BEARING.				
7						
8		TOTAL BEARING AREA = 11.8 SQ. FT.				
9		RED LEAD PAINT REQUIRED = ONE GALLON				
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20		ITEM 22				
21						
22		BRIDGE Nº 345				
23		ON ROAD 367				
24						
25		COUNTY / CONTRACT / P.R.A. REG. NO. / STATE / FED. AID PROJ. NO. / FISCAL YEAR				
26		N.C. / 1861 / 2 / DEL.				
27						
28						

Material:
Specifications: ALL INGREDIENTS TO MEET DELAWARE HIGHWAY SPECS.
Machining:
Paint:
Shipment: WITH FIRST CARLOAD OF STEEL
Inspection:
Remarks:

Gen'l Supt. ☐ Layout ☐ Temp. Shop ☐ Smith Shop ☐ Loader ☐ Scale ☐ Purch. Dept. ☐ Erection ☐ O. Insp. ☐
Shop Supt. ☐ Fitter ☐ Mach. Shop ☐ Rod Shop ☐ Shipper ☐ Bill ☐ Owners ☐ S. Insp. ☐ App'l. ☐

IN CHARGE OF HOOVER — MADE BY FWV DATE ..... CHECKED BY JHB DATE 5/11/62 — REV. NO. ..... DATE ..... SHOP NO. ..... — CONTRACT HP523-A — BILL PAGE NO. M 4 OF ..... — USE AS B.F.P.

CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

D C B A A B C D

3211-12m-3.54-18Co

BETHLEHEM STEEL COMPANY

FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

BILL OF MISCELLANEOUS MATERIAL

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1		(24 NET)				
2	25	STD. DEV. WASHER 2" x 2" x 5/16 AV THK x 11/16 ϕ HOLE	DW11			RES.

COUNTY	CONTRACT	P.R.A. REG. No.	STATE	FED. AID PROJ. No.	FISCAL YR.
N.C.	18G1	2	DEL.		

BRIDGE No. 345 ON RD 367

ITEM 22

Material: STEEL

Specifications: MFG STD.

Machining: ✓

Paint: ONE COAT

Shipment: SHIP WITH FIRST CARLOAD OF STEEL

Inspection:

Remarks: TO BE USED WITH EXP DAM BOLTS

Gen'l. Supt. ☐ Shop Supt. ☐ Layout ☐ Fitter ☐ Temp. Shop ☐ Mach. Shop ☐ Smith Shop ☐ Rod Shop ☐ Loader ☐ Shipper ☐ Scale ☐ Bill ☐ Purch. Dept. ☐ Owners ☐ Erection ☐ S. Insp. ☐ O. Insp. ☐ App'l. ☐ Stores ☐

In Charge of HOOVER

Made by K.R. Date

Checked by J.N.B. Date 5/23/62

Rev. by Date

Shop No.

Contract HP523-A

Bill Page No. M. 5 of

Use as B.F.P.

Customer EASTERN STATES CONST. CO. Structure BRIDGE REPLACEMENT NEW CASTLE COUNTY, DEL.

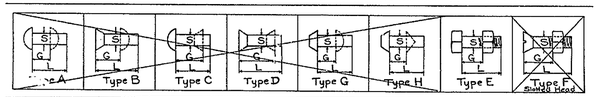
FABRICATED STEEL CONSTRUCTION

SUMMARY OF FIELD ~~RIVETS AND~~ BOLTS

3210 Rev.A 3-59

BETH. DRAFTING ROOM BETH. WORKS

MICROFILMED



Line	Number of Rivets or Bolts	ACTUAL No. REQ'D	Connecting	Diam. S	Rivets Type	Rivets Grip G	Rivets Length L	Bolts Type	Bolts Head Hex. Sq.	Bolts Grip G	Bolts Length L	Bolts Length of Thd.	Nuts No.	Nuts Hex. or Sq.	Item	Weight
1																
2	55	50	DIAPH. TO STRGS.	5/8ϕ				E	SQ	13/16	1¾	STD	55	SQ	RES.	
3																
4	30	24	EXP DAM TO STRGS	5/8ϕ				E	SQ	13/16	2¾	STD	30	SQ	✓	
5																
6																
7			AM. STD. REG NUTS													
8																
9																
10			TOTAL No FURNISHED	= 55												
11			TOTAL No REQ'D	= 74												
12			EXCESS	11	ABT 15%											
13																
14																
15																
16																
17																
18																
19																
20																
21																
22																
23																
24																
25																
26			NUTS ON BOLTS													
27			ASTM-A307													
28																
29			BRIDGE No 345 ON RD 367													
30			ITEM 22													

COUNTY	CONTRACT	P.R.A. REG. No.	STATE	FED. AID PROJ. No.	FISCAL YR.
N.C.	18G1	2	DEL.		

Summary of Sheet Nos. R. Total Weight this Page

ALL BOLTS OVER 1½" AND 7'-0" IN LENGTH TO BE BILLED AS RODS ON FORM NO. 3208.
NOT BOLTS OR RIVETS OF SPECIAL DESIGN, DRAW SKETCH ON THIS SHEET.

Gen'l Supt. ☐ Shop Supt. ☐ Layout ☐ Fitter ☐ Temp. Shop ☐ Mach. Shop ☐ Smith Shop ☐ Rod Shop ☐ Loader ☐ Shipper ☐ Scale ☐ Bill ☐ Purch. Dept. ☐ Owners ☐ Erection ☐ S. Insp. ☐ O. Insp. ☐ App'l. ☐

In Charge of HOOVER

Made by K.R. Date

Checked by J.N.B. Date 5/28/62

Rev. by Date

Shop No.

Contract HP523-A

Page No. M. SB1 of

Use as B.F.P.

Customer EASTERN STATES CONST. CO. Structure BRIDGE REPLACEMENT NEW CASTLE COUNTY, DEL.

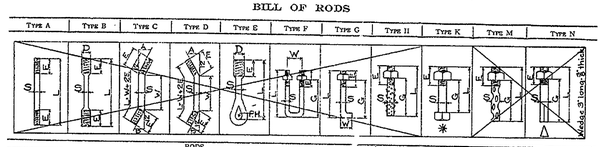
3208-2m-10.54-h.5Co

BETHLEHEM STEEL COMPANY

FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

BILL OF RODS



Line	No. of rods	Mark	Type	Section S	Length L Ft.	Length L In.	Bevel A	Bevel B	Screw E	Screw D	Screw Direct	Pin-hole P.H.	Stripped Thrd.	Total Sq.	Nuts No.	Nuts Sq. or hex.	Weight each with nuts	Mill Order No. of pcs.	Mill Order Section	Mill Order Length Ft.	Mill Order Length In.	Mill Order Item
1																						
2	24	ABI	K	1 11/16ϕ	1	0			22¾		R.H.				24	SQ.						896-7793
3																						
4			NUT TO BE AMERICAN STD. HEAVY																			
5																						
6																						
7																						
8																						
9																						
10			MAT'L. SPECS: ASTM-A307																			
11																						
12																						
13																						
14			ADVANCE SHIPMENT																			
15																						
16																						
17																						
18																						
19																						
20																						
21																						
22																						
23																						
24			ITEM No 22																			
25																						
26			BRIDGE No. 326																			
27			ON ROAD 364																			
28																						

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR
N.C.	18G1	2	DEL.		

Total weight of material on this page

Paint — NONE - THREADS TO BE OILED

*Bill all Type K bolts ½" ϕ to 1½" ϕ incl. up to 2'-0" incl. in length on bolt list, form 3210.

Gen'l Supt. ☐ Shop Supt. ☐ Layout ☐ Fitter ☐ Temp. Shop ☐ Mach. Shop ☐ Smith Shop ☐ Rod Shop ☐ Loader ☐ Shipper ☐ Scale ☐ Bill ☐ Purch. Dept. ☐ Owners ☐ Erection ☐ S. Insp. ☐ O. Insp. ☐ App'l ☐

In Charge of HOOVER

Made by FWV Date

Checked by J.N.B. Date 5/18/62

Rev. by Date

Shop No.

Contract HP523-B

Bill Page No. M. 1 of

Use as B. F. P.

Customer EASTERN STATES CONST. CO. Structure BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

FABRICATED STEEL CONSTRUCTION

BILL OF MISCELLANEOUS MATERIAL

3211 Rev.A 4-59

BETH. DRAFTING ROOM BETH. WORKS

LINE	NO.	DESCRIPTION	MARK OR ITEM NO.	WEIGHT	REQUISITION NO.	ORDER NO.
1		(48 NET)				
2	50	ROUND FLAT WASHERS 2 1/2"ϕ x 1/4" THK. (1 1/16"ϕ HOLES)	W1			RES.

ITEM 22

BRIDGE No. 326

ON ROAD 364

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. No.	FISCAL YEAR
N.C.	18G1	2	DEL.		

Material: STEEL

Specifications: ASTM-A7

Machining:

Paint: NONE

Shipment: ADVANCE

Inspection:

Remarks: USED UNDER HEAD AND NUT OF ANCHOR BOLTS - ABI

Gen'l Supt. ☐ Shop Supt. ☐ Layout ☐ Fitter ☐ Temp. Shop ☐ Mach. Shop ☐ Smith Shop ☐ Rod Shop ☐ Loader ☐ Shipper ☐ Scale ☐ Bill ☐ Purch. Dept. ☐ Owners ☐ Erection ☐ S. Insp. ☐ O. Insp. ☐ App'l ☐

In Charge of HOOVER

Made by FWV Date

Checked by J.N.B. Date 5/18/62

Rev. by Date

Shop No.

Contract HP523-B

Bill Page No. M. 2 of

Use as B.F.P.

Customer EASTERN STATES CONST. CO. Structure BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

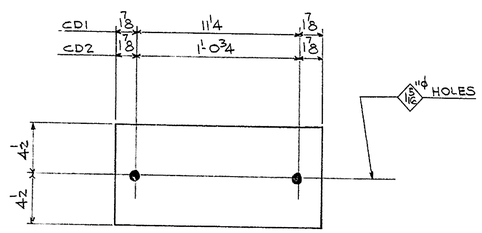
3233 (9-55) BSCo.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

CUSTOMER EASTERN STATES CONST. CO.

STRUCTURE BRIDGE REPLACEMENTS-NEW CASTLE COUNTY, DELAWARE



18-PIECES 12 TO 14 OZ. DUCK - 9 x 1'-3 - CD1
18-PIECES 12 TO 14 OZ. DUCK - 9 x 1'-4½ - CD2

MATERIAL SPECS: COMMERCIAL GRADE
SHIPMENT: WITH FIRST CARLOAD OF STEEL
REMARKS: CANVAS DUCK { CD1 - AT FIXED BEARINGS; CD2 - AT EXPANSION BEARINGS }

ITEM 22

BRIDGE No. 326
ON ROAD 364

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR
N.C.	1861	2	DEL.		

REQ. No. 896-7794

RIVETS ✓ DWG. MADE BY FWV DATE IN CHARGE OF HOOVER
HOLES AS NOTED DWG. CHKD. BY JNB DATE 5/18/62 CONTRACT HP523-B
PAINT NONE SHOP No. TIER SHEET-PAGE No. M3

FABRICATED STEEL CONSTRUCTION
BILL OF MISCELLANEOUS MATERIAL
3211 Rev.A 4-58

BETH. DRAFTING ROOM BETH. WORKS

LINE	NO.	DESCRIPTION	MARK OR ITEM NO.	WEIGHT	REQUISITION NO.	ORDER NO.
1						
2		ORDER FOR FIELD PAINT				RES.
3		ONE COAT OF RED LEAD PAINT				
4		FOR COATING THE TOP SURFACE OF				
5		3 LAYERS OF DUCK AND THE CONCRETE				
6		BEAM SEAT AT EACH BEAM BEARING.				
7						
8		TOTAL BEARING AREA = 11.8 SQ. FT.				
9		RED LEAD PAINT REQUIRED = ONE GALLON				
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20		ITEM 22				
21						
22		BRIDGE No. 326				
23		ON ROAD 364				
24						
25		COUNTY / CONTRACT / P.R.A. REG. NO / STATE / FED. AID PROJ. NO. / FISCAL YEAR				
26		N.C. / 1861 / 2 / DEL.				
27						
28						

Material:
Specifications: ALL INGREDIENTS TO MEET DELAWARE HIGHWAY SPECS.
Machining:
Paint:
Shipment: WITH FIRST CARLOAD OF STEEL
Inspection:
Remarks:

Gen'l Supt. ☐ Shop Supt. ☐ Layout ☐ Fitter ☐ Temp. Shop ☐ Mach. Shop ☐ Smith Shop ☐ Rod Shop ☐ Leader ☐ Shipper ☐ Scale ☐ Bill ☐ Purch. Dept. ☐ Owners ☐ Erection ☐ S. Insp. ☐ O. Insp. ☐ App'l ☐

IN CHARGE OF HOOVER MADE BY FWV DATE CHECKED BY JNB DATE 5/18/62 REV. DATE SHOP NO. CONTRACT HP523-B BILL PAGE NO. M 4 OF USE AS R.F.P.

CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

3211-12m-3.54-BSCo

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

BILL OF MISCELLANEOUS MATERIAL

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1		(24 NET)				
2	25	STD. BEV. WASHER 2 x 2 x 5/16 AV THK x 11/16 HOLE	BW11			RES.
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20		COUNTY / CONTRACT / P.R.A. REG. No / STATE / FED. AID PROJ. No / FISCAL YR				
21		N.C. / 1861 / 2 / DEL				
22						
23						
24						
25						
26		BRIDGE No 326 ON RD. 364				
27						
28		ITEM 22				

Material:- STEEL
Specifications:- MFG. STD.
Machining:- ✓
Paint:- ONE COAT
Shipment:- SHIP WITH FIRST CARLOAD OF STEEL
Inspection:-
Remarks:- TO BE USED WITH EXP DAM BOLTS

Gen'l Supt. ☐ Shop Supt. ☐ Layout ☐ Fitter ☐ Temp Shop ☐ Mach. Shop ☐ Smith Shop ☐ Rod Shop ☐ Leader ☐ Shipper ☐ Scale ☐ Bill ☐ Purch. Dept. ☐ Owners ☐ Erection ☐ S. Insp. ☐ O. Insp. ☐ App'l ☐ Stores ☐

IN CHARGE OF HOOVER MADE BY KHR DATE CHECKED BY JNB DATE 5/23/62 Rev. by Date SHOP No. CONTRACT HP523-B BILL PAGE No. M 5 OF USE AS R.F.P.

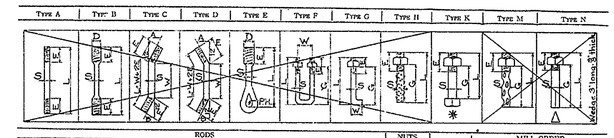
CUSTOMER EASTERN STATES CONST CO. STRUCTURE BRIDGE REPLACEMENT NEW CASTLE COUNTY, DEL.

3328-2m-10.54-BSCo

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

BILL OF RODS



Line	No. of rods	Mark	Type	Section S	Length L Ft.	Length L In.	Detail Information: Bevel A	Bevel B	Screw E	Screw D	Direct	Pin-hole P.H.	Surface Treat.	Tread Ext.	Nuts No.	Nuts Sq. or Hex.	Weight each with nuts	Mill Order No. of pcs.	Section	Length Ft.	Length In.	Item
1																						
2	24	AB1	K	1 1/8 ϕ	1	0			2¾		R.H				24	SQ.						896-7793
3																						
4		NUT TO BE AMERICAN STD. HEAVY																				
5																						
6																						
7																						
8																						
9																						
10	MAT'L. SPECS: ASTM-A307.																					
11																						
12																						
13																						
14		ADVANCE SHIPMENT																				
15																						
16																						
17																						
18																						
19		COUNTY / CONTRACT / P.R.A. REG. No. / STATE / FED. AID PROJ. No. / FISCAL YEAR																				
20																						
21		N.C. / 1861 / 2 / DEL.																				
22																						
23																						
24		ITEM No. 22																				
25																						
26		BRIDGE No. 345																				
27		ON ROAD 367																				
28																						

TOTAL WEIGHT OF MATERIAL ON THIS PAGE

PAINT - NONE - THREADS TO BE OILED.

*Bill all Type K bolts 14" to 11½" ℓ incl. up to 2'-6" incl. in length on bolt list, form 3210.

Gen'l Supt. ☐ Shop Supt. ☐ Layout ☐ Fitter ☐ Temp. Shop ☐ Mach. Shop ☐ Smith Shop ☐ Rod Shop ☐ Leader ☐ Shipper ☐ Scale ☐ Bill ☐ Purch. Dept. ☐ Owners ☐ Erection ☐ S. Insp. ☐ O. Insp. ☐ App'l ☐

IN CHARGE OF HOOVER MADE BY FWV DATE CHECKED BY JNB DATE 5/18/62 Rev. by Date SHOP No. CONTRACT HP523-A BILL PAGE No. M 1 OF USE AS R. F. P.

CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

D C B A A B C

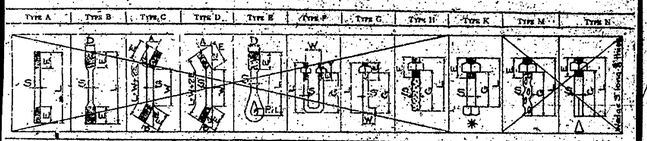
3285-2m-10,54-BSCo

BETHLEHEM STEEL COMPANY

FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

BILL OF RODS



Line	No. of rods	Mark	Type	Specification	Rods Length Ft.	Rods Length In.	Detail Information Bevel A	Bevel B	Screw E	Screw D	Direct	Motion Pitch	Square Thread	Left Hand	Nuts No.	Nuts Sq. or Hex.	Weight each with nuts	Mill Order No. of pcs.	Standard	Length Ft.	Length In.	Item
1																						
2	24	AB1	K	1"φ	1	0			28		R.H.				24	SQ.						896-7793
3																						
4				NUT TO BE AMERICAN STD. HEAVY																		
5																						
6																						
7																						
8																						
9																						
10	MATL. SPECS: ASTM-A307																					
11																						
12																						
13																						
14	ADVANCE SHIPMENT																					
15																						
16																						
17																						
18																						
19	COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR																
20																						
21	N.C.	1861	2	DEL.																		
22																						
23																						
24				ITEM No. 22																		
25																						
26				BRIDGE No. 345																		
27				ON ROAD 367																		
28																						

TOTAL WEIGHT OF MATERIAL ON THIS PAGE

PAINT — NONE - THREADS TO BE OILED.

*Drill all Type K holes 13/16" φ to 1 1/16" φ incl. up to 2'-0" incl. in length on bolt list, form 2810.

Gen'l Supt. Shop Supt. | Layout Fitter | Temp. Shop Mach. Shop | Smith Shop Rod Shop | Loader Skipper | Scale Bill | Purch. Dept. Owners | Erection S. Insp. | O. Insp. App'l

IN CHARGE OF HOOVER — MADE BY FWV — DATE — CHECKED BY JKB — DATE 5/18/62 — Rev. by — Date — SHOP No. — CONTRACT HP523-A — BILL PAGE No. M — OF — USE AS B. P. P.

CUSTOMER EASTERN STATES CONST. CO. — STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

FABRICATED STEEL CONSTRUCTION

BILL OF MISCELLANEOUS MATERIAL

3211 (Rev.) 4-59

BETH. DRAFTING ROOM BETH. WORKS

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1		(48 NET)				
2	50	ROUND FLAT WASHERS 2½" x 4" THK. (1 1/16" HOLES) W1				RES.
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20		ITEM 22				
21						
22		BRIDGE No. 345				
23		ON ROAD 367				
24						
25		COUNTY / CONTRACT / P.R.A. REG. NO. / STATE / FED. AID PROJ. NO. / FISCAL YEAR				
26						
27		N.C. / 1861 / 2 / DEL.				
28						

Material: STEEL

Specifications: ASTM-A7

Machining:

Paint: NONE

Shipment: ADVANCE

Inspection:

Remarks: USED UNDER HEAD AND NUT OF ANCHOR BOLTS-AB1

Gen'l Supt. Shop Supt. | Layout Fitter | Temp. Shop Mach. Shop | Smith Shop Rod Shop | Loader Skipper | Scale Bill | Purch. Dept. Owners | Erection S. Insp. | O. Insp. App'l

IN CHARGE OF HOOVER — MADE BY FWV — DATE — CHECKED BY — DATE — SHOP NO. — CONTRACT HP523-A — BILL PAGE NO. M 2 OF — USE AS B.F.P.

CUSTOMER EASTERN STATES CONST. CO. — STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

3233 (9-61) BSCo.

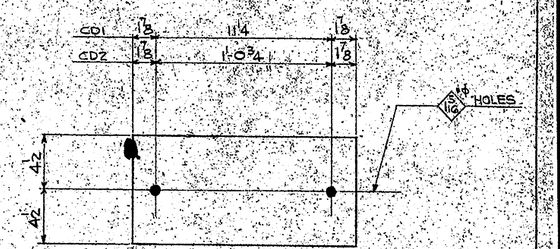
BETHLEHEM STEEL COMPANY

FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

CUSTOMER EASTERN STATES CONST. CO.

STRUCTURE BRIDGE REPLACEMENTS-NEW CASTLE COUNTY, DELAWARE



18-PIECES 12 TO 14 OZ. DUCK - 9 x 1'-3 - CD1
18-PIECES 12 TO 14 OZ. DUCK - 9 x 1'-4½ - CD2

MATERIAL SPECS: COMMERCIAL GRADE
SHIPMENT: WITH FIRST CARLOAD OF STEEL
REMARKS: CANVAS DUCK {CD1 - AT FIXED BEARINGS / CD2 - AT EXPANSION BEARINGS}

ITEM 22

BRIDGE No. 345
ON ROAD 367

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR
N.C.	1861	2	DEL.		

RIVETS ✓ — HOLES AS NOTED — PAINT NONE

DWG. MADE BY FWV — DATE — DWG. CHKD. BY JKB — DATE 5/18/62 — SHOP No. — TIER — REQ. No. 896-7794 — IN CHARGE OF HOOVER — CONTRACT HP523-A — SHEET-PAGE No. M3

FABRICATED STEEL CONSTRUCTION

BILL OF MISCELLANEOUS MATERIAL

3211 (Rev.) 4-59

BETH. DRAFTING ROOM BETH. WORKS

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1						
2		ORDER FOR FIELD PAINT				RES.
3		ONE COAT OF RED LEAD PAINT				
4		FOR COATING THE TOP SURFACE OF				
5		3 LAYERS OF DUCK AND THE CONCRETE				
6		BEAM SEAT AT EACH BEAM BEARING.				
7						
8		TOTAL BEARING AREA = 11.8 SQ. FT.				
9		RED LEAD PAINT REQUIRED = ONE GALLON		1		
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20		ITEM 22				
21						
22		BRIDGE No. 345				
23		ON ROAD 367				
24						
25		COUNTY / CONTRACT / P.R.A. REG. NO. / STATE / FED. AID PROJ. NO. / FISCAL YEAR				
26						
27		N.C. / 1861 / 2 / DEL.				
28						

Material:

Specifications: ALL INGREDIENTS TO MEET DELAWARE HIGHWAY SPECS.

Machining:

Paint:

Shipment: WITH FIRST CARLOAD OF STEEL

Inspection:

Remarks:

Gen'l Supt. Shop Supt. | Layout Fitter | Temp. Shop Mach. Shop | Smith Shop Rod Shop | Loader Skipper | Scale Bill | Purch. Dept. Owners | Erection S. Insp. | O. Insp. App'l

IN CHARGE OF HOOVER — MADE BY FWV — DATE — CHECKED BY JKB — DATE 5/18/62 — SHOP NO. — CONTRACT HP523-A — BILL PAGE NO. 4 OF — USE AS B.F.P.

CUSTOMER EASTERN STATES CONST. CO. — STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

3211-12m-3.54-BSCo

BETHLEHEM STEEL COMPANY

FABRICATED STEEL CONSTRUCTION

BETH DRAFTING ROOM BETH WORKS

BILL OF MISCELLANEOUS MATERIAL

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1		(24 NET)				
2	25	STD. BEV. WASHER 2" x 2" x 5/16 AV THK x 11/16 ϕ HOLE	BW11			RES.
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20		COUNTY / CONTRACT / P.R.A. REG. No. / STATE / FED. AID PROJ. No. / FISCAL YR.				
21		N.C. / 18061 / 2 / DEL.				
22						
23						
24						
25						
26		BRIDGE No. 345 ON RD 367				
27						
28		ITEM 22				

Material:- STEEL

Specifications:- MFG. STD.

Machining:-

Paint:- ONE COAT

Shipment:- SHIP WITH FIRST CARLOAD OF STEEL

Inspection:-

Remarks:- TO BE USED WITH EXP DAM BOLTS.

Gen'l Supt. / Shop Supt. / Layout / Fitter / Temp Shop / Mach. Shop / Smith Shop / Rod Shop / Loader / Shipper / Scale / Bill / Punch. Dept. / Owners / Erection / S. Insp. / Fl. Insp. / Appr'l / Stores

IN CHARGE OF HOOVER

MADE BY H.R. DATE

CHECKED BY J.H.B. DATE 5/23/62

SHOP No.

CONTRACT H.P523-A

BILL PAGE No. M 5 OF

USE AS B.F.P.

CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENT NEW CASTLE COUNTY, DEL.

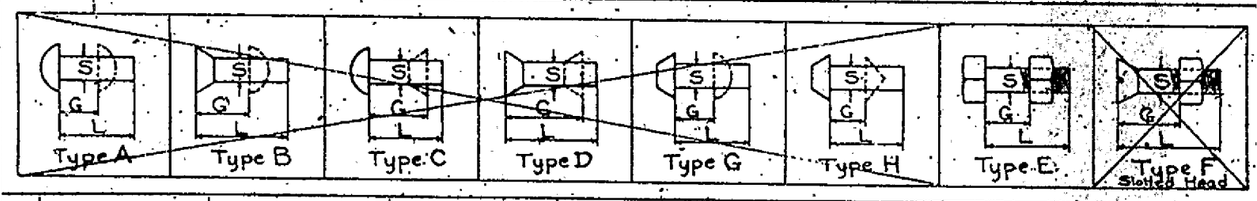
BETHLEHEM STEEL

FABRICATED STEEL CONSTRUCTION

SUMMARY OF FIELD ~~RIVETS AND~~ BOLTS

3210 (Rev. A 1-62)

BETH DRAFTING ROOM BETH WORKS



Line	Number of Rivets or Bolts	ACTUAL No. REQ'D	Connecting	Diam. S	RIVETS Type	RIVETS Grip G	RIVETS Length L	BOLTS Type	BOLTS Head Hex. Sq.	BOLTS Grip G	BOLTS Length L	BOLTS Length of Thd.	NUTS No.	NUTS Hex. or Sq.	Item	Weight
1																
2	55	50	DIAPH. TO STRGS	5/8 ϕ				E	Sq.	13/8	1 3/4	STD	55	Sq.	RES.	
3																
4	30	24	EXP. DAM TO STRGS	5/8 ϕ				E	Sq.	1 3/16	2 1/4	STD	30	Sq.		
5																
6																
7			AM. STD. REG NUTS --													
8																
9																
10			TOTAL No. FURNISHED	= 85												
11			TOTAL No. REQ'D	= 74												
12			EXCESS	11	ABT 15%											
13																
14																
15																
16																
17																
18																
19																
20																
21																
22			COUNTY / CONTRACT / PRA REG No. / STATE / FED. AID PROJ. No. / FISCAL YR.													
23			N.C. / 18061 / 2 / DEL.													
24																
25																
26								NUTS ON BOLTS								
27								ASTM. A307								
28																
29					BRIDGE			No. 345	IN RD		367					
30																

ITEM 22

Summary of Sheet Nos. R

Total Weight This Page

ALL BOLTS OVER 1 1/16 AND 2 1/16 IN LENGTH TO BE BILLED AS RODS ON FORM NO. 3208.
FOR BOLTS OR RIVETS OF SPECIAL DESIGN, DRAW SKETCH ON THIS SHEET.

Gen'l Supt. / Shop Supt. / Layout / Fitter / Temp Shop / Mach. Shop / Smith Shop / Rod Shop / Loader / Shipper / Scale / Bill / Punch. Dept. / Owners / Erection / Insp. / Appr'l

IN CHARGE OF HOOVER

Made by H.R. Date

Checked by J.H.B. Date 5/23/62

Shop No.

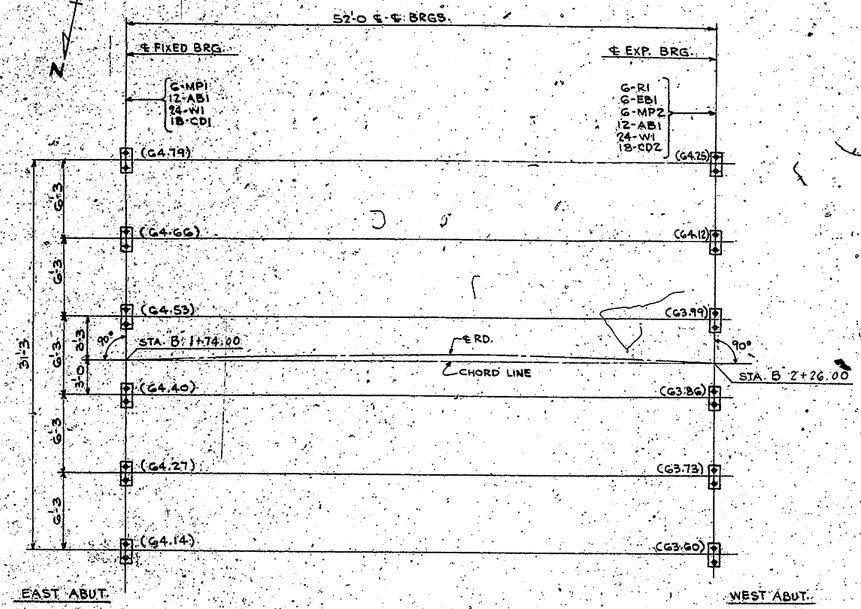
CONTRACT HP523-A

Page No. SB1 of

Use as B.F.P.

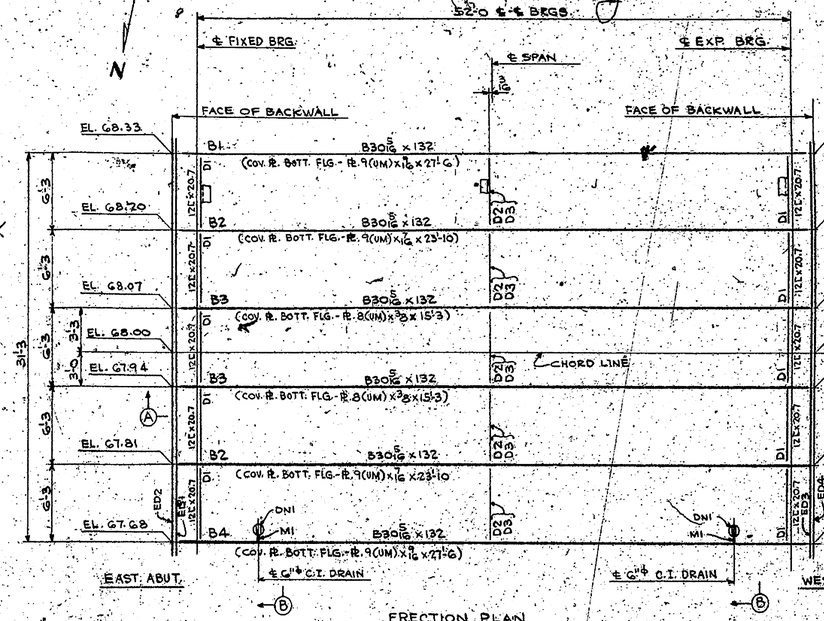
Customer EASTERN STATES CONST CO. Structure BRIDGE REPLACEMENT NEW CASTLE COUNTY, DEL.

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR
N.C.	1BG1	2	DEL.		



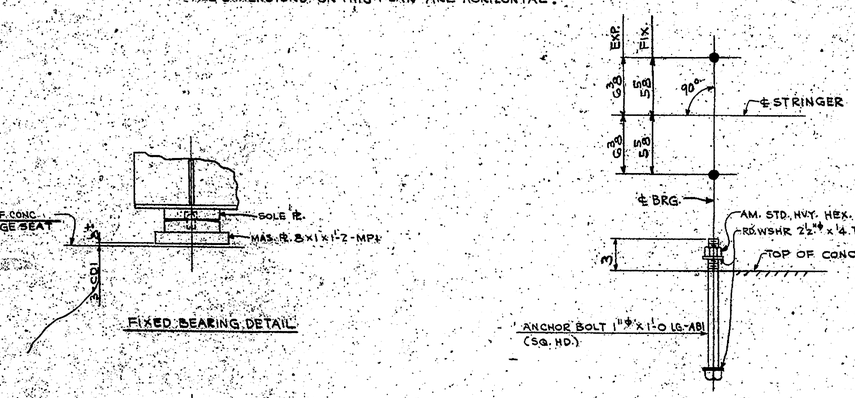
ANCHOR BOLT PLAN

ELEVS. ON PLAN GIVEN THUS( ) ARE AT TOP OF CONCRETE BRIDGE SEAT.
SOLE PLATES WELDED TO STRINGERS IN THE SHOP.
ALL DIMENSIONS ON THIS PLAN ARE HORIZONTAL.

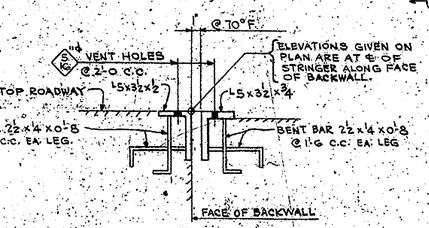


ERECTION PLAN

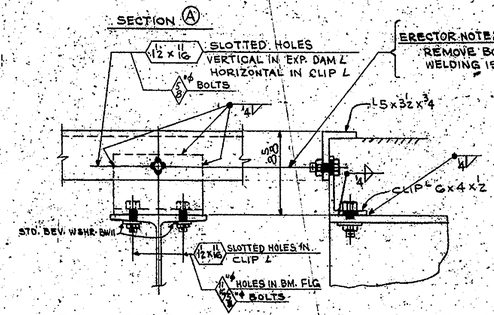
BRIDGE ON STRAIGHT GRADE
ALL DIMENSIONS ON THIS PLAN ARE HORIZONTAL.



ANCHOR BOLT SETTING AT FIXED AND EXPANSION BEARINGS

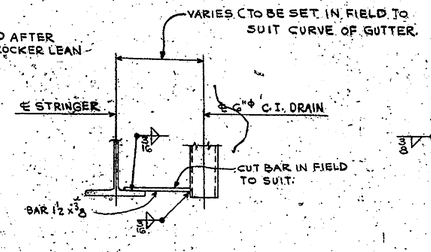


SECTION (A)

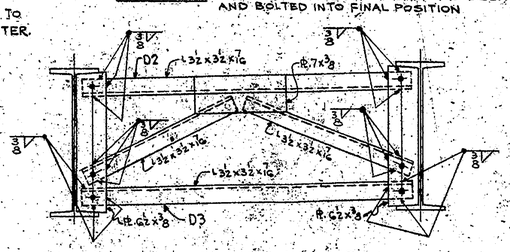


TYPICAL DETAIL OF EXP. DAM TO STRINGER CONN.

ERECTOR NOTE: WELD TO BE MADE AFTER DAM HAS BEEN SET AND BOLTED INTO FINAL POSITION



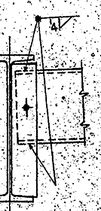
SECTION (B)



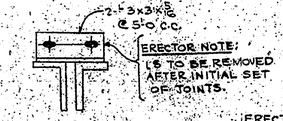
TYPICAL DETAIL OF CROSS BRACE AT ℄ SPAN

CAMBER DIAGRAM

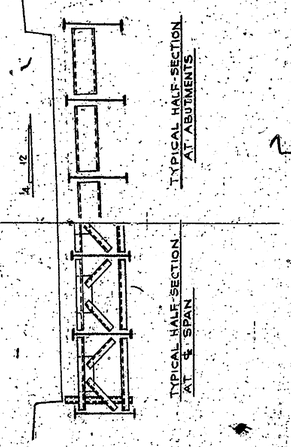
LONGITUDINAL DIMENSIONS IN DETAIL TO BE MEASURED PARALLEL TO CHORD LINE.



TYPICAL FIELD WELDING (12 E TO STRINGERS)



ERECTION ANGLE DETAIL



GENERAL NOTES

ERECTION - BY OTHERS
ANCHOR BOLTS - FURNISHED BY BETH. STEEL CO. AND SET BY OTHERS.
MATERIAL SPECS. - ASTM-A7, ASTM-A373 (AS NOTED ON DETAILS
WORKMANSHIP SPECS. - DELAWARE DEPT. OF HIGHWAYS DATED JULY 1, 1960. AND SPECIAL PROVISIONS.
ALL HOLES, CUTS, BLOCKS, ETC. FOR OTHER TRADES MUST BE SHOWN ON THIS PLAN AT TIME OF APPROVAL, OTHERWISE WORK MUST BE DONE IN THE FIELD AT NO EXPENSE TO THE BETH. STEEL CO.
MEMBERS SHALL BE ERECTED WITH THEIR PIECE MARKS IN THE SAME CORRESPONDING POSITION AS SHOWN ON THIS PLAN.
ALL DIMENSIONS ON THIS PLAN MUST BE STRICTLY ADHERED TO OTHERWISE STEEL WILL NOT FIT. IN CASE OF ERROR NOTIFY THE BETH. STEEL CO. AT ONCE.
ALL WELDING SHALL CONFORM TO THE CURRENT SPECS. FOR WELDED HIGHWAY AND RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY.
SHOP PAINT - ONE COAT AS PER SPECS. EXCEPT WHERE NOTED ON DETAILS.
FIELD PAINT - BY OTHERS.
RAILING, RAILING ANC. BOLTS, ERECTION SHIMS, DRIFT PINS, FITTING UP BOLTS & FIELD WELD WIRE FURNISHED BY OTHERS.

BRIDGE No. 345
ON ROAD 367

ITEM 22

LIST OF DRAWINGS

SHEET NO.	DESCRIPTION
E1	ANCHOR BOLT AND ERECTION PLAN
1	BEARING DETAILS
2	DETAILS
M1	ANCHOR BOLTS
M2	WASHERS
M3	CANVAS DUCK
M4	FIELD PAINT
M5	WASHERS
SB1	FIELD BOLTS

ANCHOR BOLT AND ERECTION PLAN

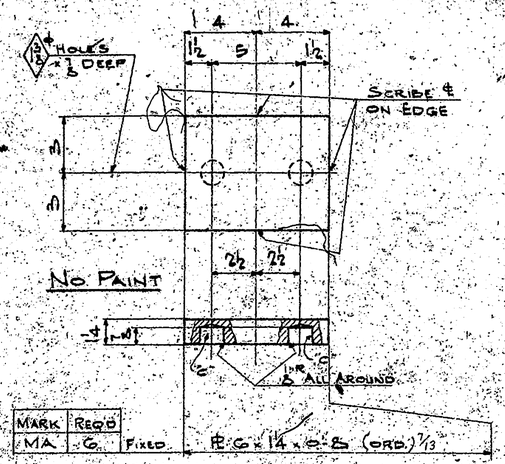
TEMP. / SUPT. / LAYOUT / FITTER / SHOP SUP. / PC. WK. / A. SMITH / MCH. / ERECT. / O. WSP. / WEIGHTS

STRUCT. BRIDGE REPLACEMENTS
NEW CASTLE COUNTY, DELAWARE
CUST. EASTERN STATES CONST. CO.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
BETHLEHEM DRAFTING ROOM BETH. WORKS
IN CHARGE HOOVER MADE BY FWV
CHECKED BY 9/28/61 TRACED BY
REVISED LAST ASSEM. MK.

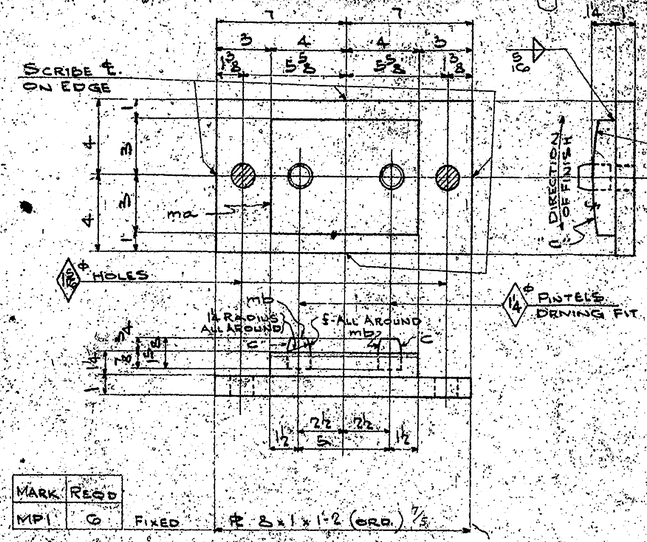
SHOP NO. CONTRACT HP523-A SHEET E1

COUNTY	CONTRACT	F.P.A. REG. NO	STATE	FED. AID PROJECT NO	FISCAL YR.
N.C.	18001	2	DEL.		



MARK	REQ'D	
MA	6	FIXED

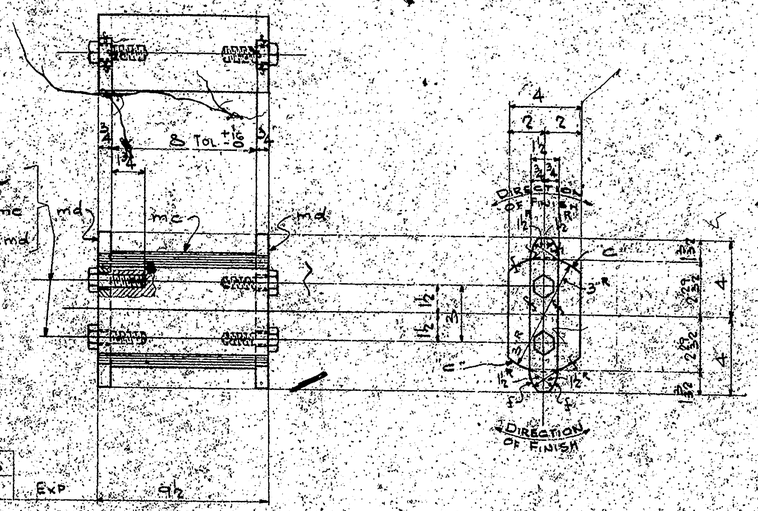
PL 6 × 1¼ × 0'-8 (ORD.) 7/13



MARK	REQ'D	
MP1	6	FIXED

PL 8 × 1 × 1'-2 (ORD.) 7/3

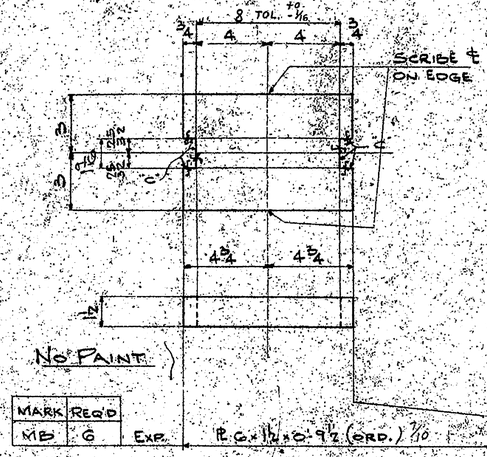
6 PL 6 × 1¼ (M15S) × 0'-8 mc (ORD.) 7/12
12 PINTELS 1¼ ϕ (FIN. ALL AROUND) × 1⅝ LG. mb (ORD.) 7/11
5/16 FILLET WELD × 8'-0



MARK	REQ'D	
R1	6	EXP

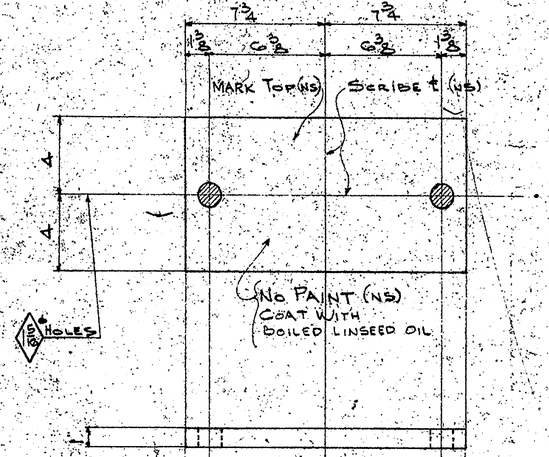
PL 8½

6 BAR 6 (M12S) × 4 × 0'-9½ (MD2E) mc (ORD.) 7/7
12 BAR 12 (M12W) × ¾ × 0'-8 md (ORD.) 7/15
ASTM-A7
24 PB ⅝ ϕ × 24 LG. HEX HD (1⅝ THD. LGTH.) ASTM-A307 (ORD. ON AMI DO NOT DUPLICATE)



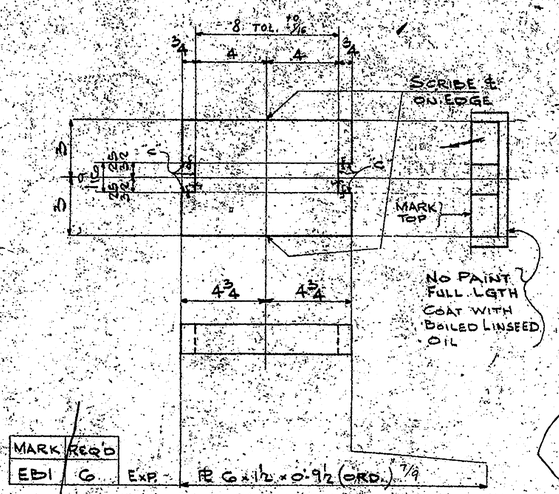
MARK	REQ'D	
MB	6	EXP.

PL 6 × 1½ × 0'-9½ (ORD.) 7/10



MARK	REQ'D	
MP2	6	EXP.

PL 8 × 1 × 1'-3½ (ORD.) 7/4



MARK	REQ'D	
EB1	6	EXP.

PL 6 × 1½ × 0'-9½ (ORD.) 7/9

NOTES:

SURFACES MARKED "C" TO BE COATED WITH A MIXTURE OF HOT WHITE LEAD & TALLOW.
ALL PS. TO BE PRESS STRAIGHTENED TO INSURE FLATNESS.
SOLE PL MA & MB TO BE PAINTED IN THE SHOP AFTER ASSEMBLY TO STRINGERS.
ALL WELDING SHALL CONFORM TO THE CURRENT SPECS FOR WELDED HWY. & RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY.
MAT'L SPECS. ASTM-A283 UNLESS NOTED.

BRIDGE No. 345
ON ROAD 367

ITEM 22

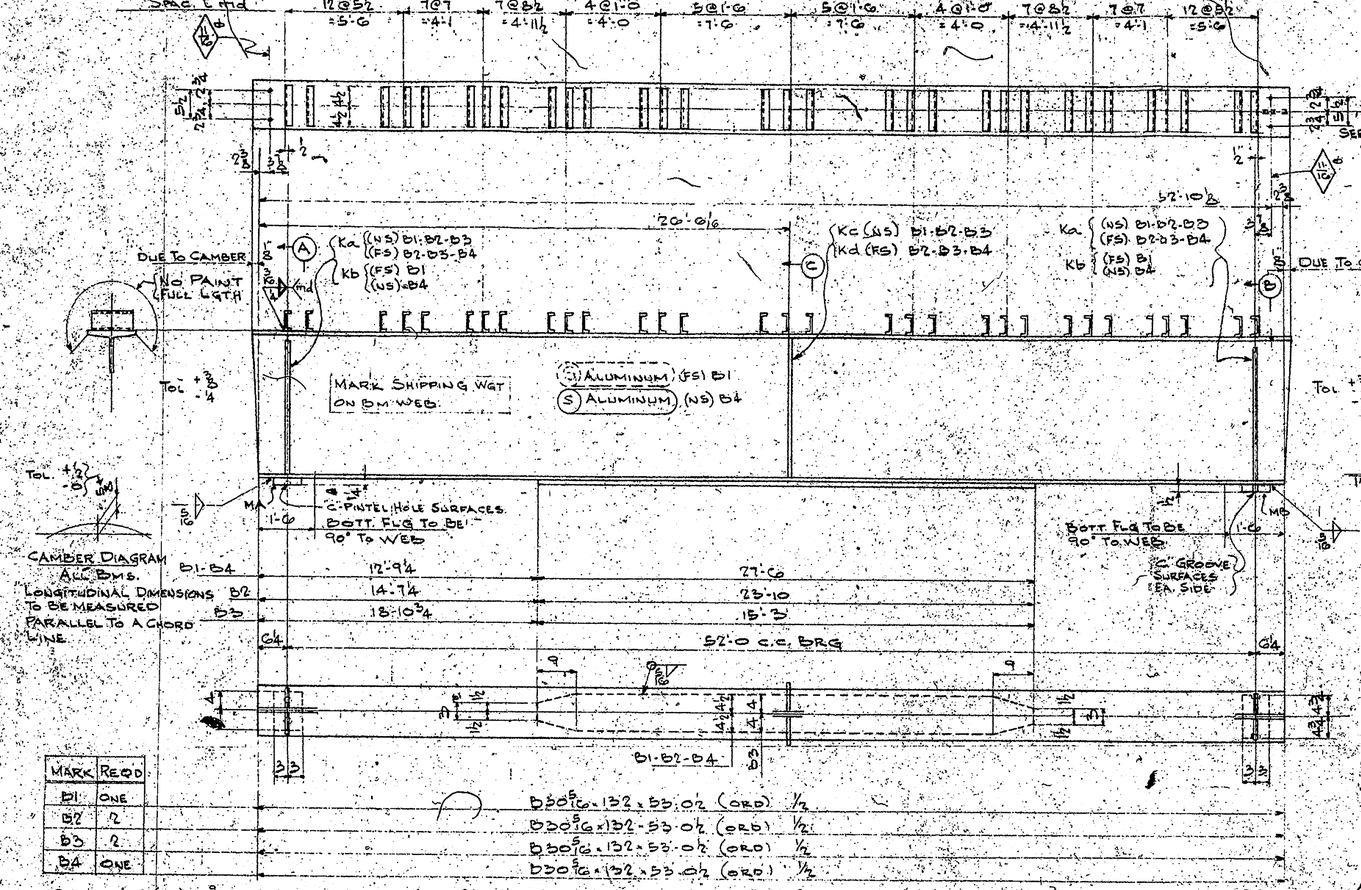
RIVETS
OPEN HOLES AS NOTED
REAM
MILLING AS NOTED
PAINT ONE COAT AS PER SPECS. UNLESS NOTED & SURFACES MARKED "C"
WELDING AS NOTED
SHOP CONTACT SURFACES NO PAINT

BEARING DETAILS

TEMP.	BRIDGE REPLACEMENTS
SUPT.	NEW CASTLE COUNTY DELAWARE
LAYOUT	
FITTER	CUSTOMER EASTERN STATES CONST. CO.
SHOP INSP.	BETHLEHEM STEEL COMPANY
FL. WK.	FABRICATED STEEL CONSTRUCTION
B. SMITH	BETHLEHEM DRAFTING ROOM 26TH WORKS
MCH.	IN CHARGE HOOVER MADE BY [illegible]
ERECT.	CHECKED BY [illegible] TRACED BY
O. INSP.	REVISED LAST ASSEM. MK.
WEIGHTS	

SHOP NO. CONTRACT HP 523-A SHEET 1.

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YR.
N.C.	18G1	2	DEL.		



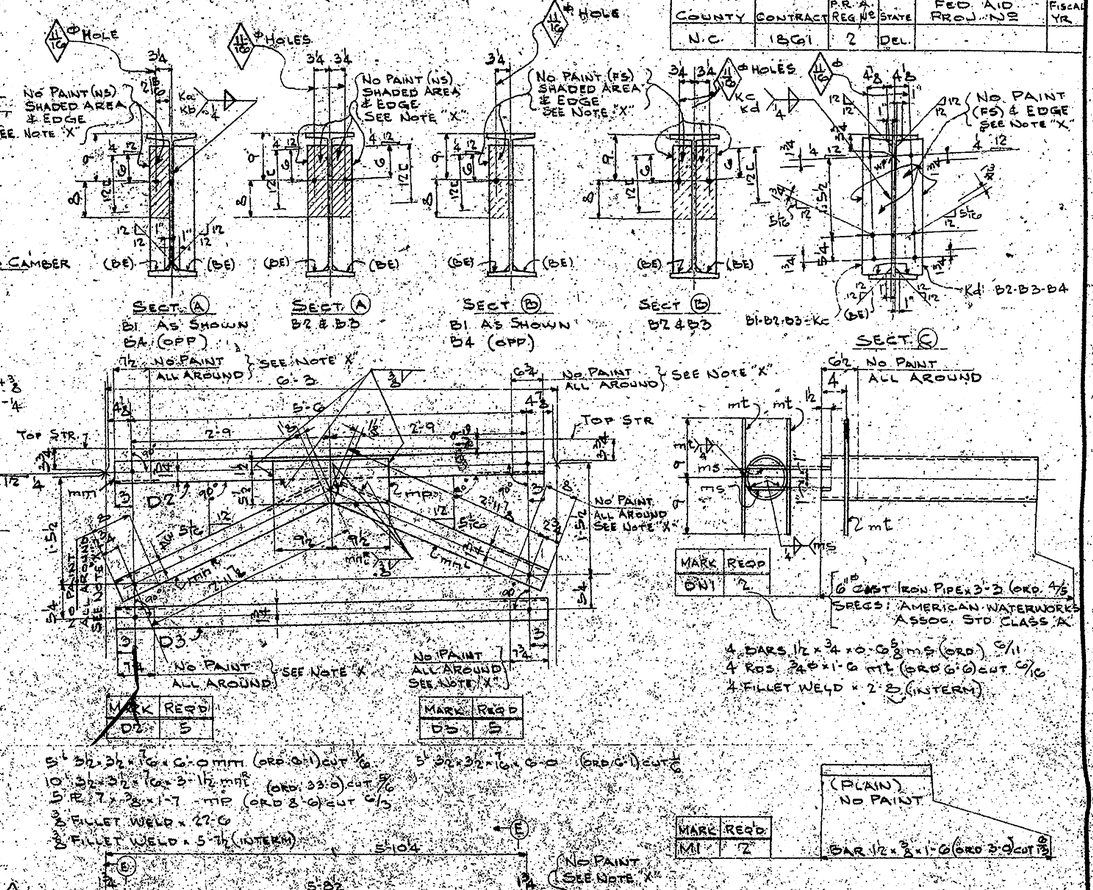
MARK	REQ'D
B1	ONE
B2	2
B3	2
B4	ONE

2 Cov. PL 9 (UM) × 9/16 × 27'-6 ma B1-B4 (ORD) 2/3
2 Cov. PL 9 (UM) × 9/16 × 23'-10 mb B2 (ORD) 2/5
2 Cov. PL 8 (UM) × 3/8 × 15'-3 mc B3 (ORD) 2/7
420 Pc. L 4 × 5 × 4 × 0'-9 md (ORD 35/40) CUT 5/9
6 Sole PL 6 × 1¼ × 0'-8 MA } DETAILED & ORD. ON SHT. 1 DO NOT DUPLICATE
6 Sole PL 6 × 1½ × 0'-9½ MB }

B30 5/16 × 132 × 53'-0½ (ORD) 1/2
B30 5/16 × 132 × 53'-0½ (ORD) 1/2
B30 5/16 × 132 × 53'-0½ (ORD) 1/2
B30 5/16 × 132 × 53'-0½ (ORD) 1/2

20 BARS 4¾ × 5/8 × 2'-3¾ Ka { 2 EA. B1-B4, 4 EA. B2-B3 } (ORD 20/22'-6) CUT 6/7
4 BARS 4¾ × 5/8 × 2'-3¾ Kb 2 EA B1 & B4
5 BARS 6½ × 3/8 × 2'-4 9/16 Kc B1-B2-B3 } (ORD 26'-0) CUT 6/5
5 BARS 6½ × 3/8 × 2'-4 9/16 Kd B2-B3-B4 }
5/16 FILLET WELD × 319'-6
¼ FILLET WELD × 470'-8 { 75'-6 EA. B1-B4, 19'-11 EA. B2-B3 }
5/16 FILLET WELD × 281'-4 { 56'-6 EA. B1-B4, 51'-2 B2, 54'-8 B3 }

42 @ 9 STG. 31'-6
15 @ 2'-0 = 30'-0



MARK	REQ'D
D2	5

MARK	REQ'D
D3	5

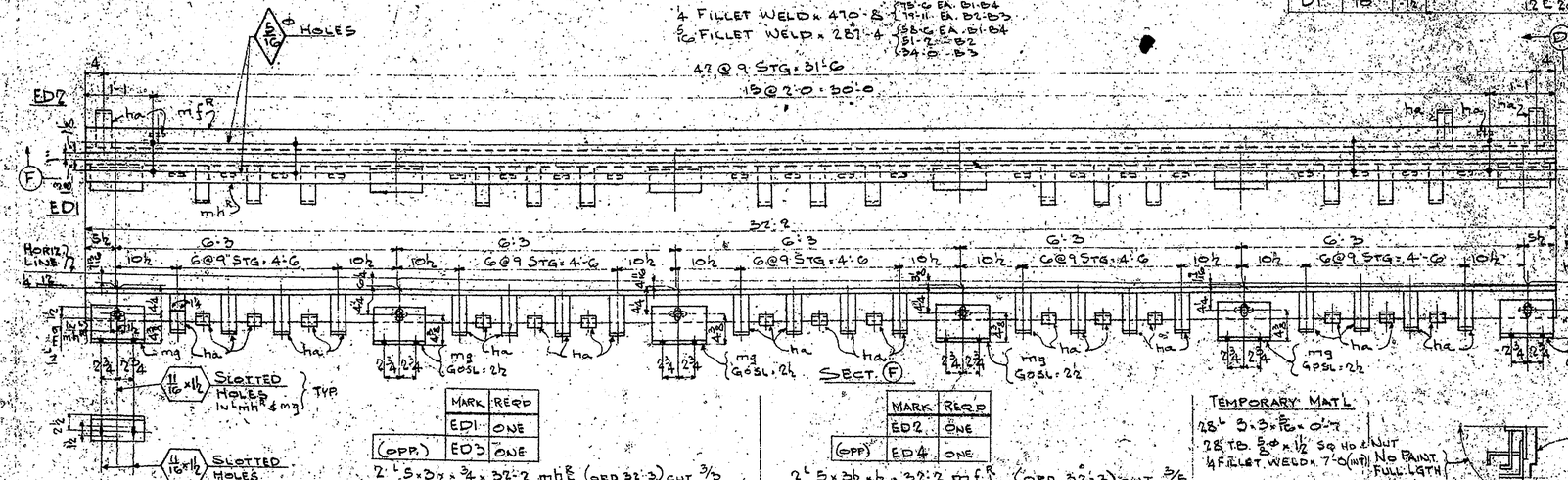
MARK	REQ'D
DW1	2

5' 3½ × 3½ × 7/16 × 6'-0 mm (ORD 9'-1) CUT 6/6
10' 3½ × 3½ × 7/16 × 3'-1½ mn (ORD 33'-0) CUT 8/6
5 PL 7 × 3/8 × 1'-7 mp (ORD 8'-6) CUT 6/5
3/8 FILLET WELD × 27'-6
3/8 FILLET WELD × 5'-7½ (INTERM)

(PLAIN) NO PAINT

MARK	REQ'D
M1	2

BAR 1½ × 3/8 × 1'-6 (ORD 3'-6) CUT 8/13

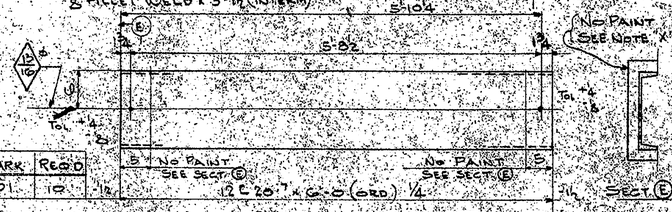


MARK	REQ'D
ED1	ONE
(OPP.) ED3	ONE

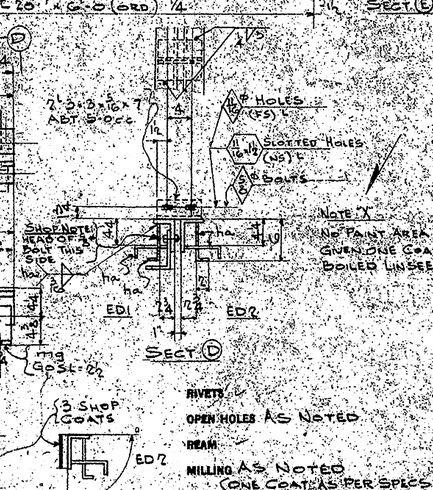
2 PL 5 × 3½ × ¾ × 32'-2 mh (ORD 32'-3) CUT 3/5
12 L 6 × 4 × ½ × 0'-10 mg (ORD. 11'-0) CUT 5/5
70 BARS 2½ × 4 × 0'-8 ha (ORD 20/22) CUT 6/9
3/16 FILLET WELD × 29'-2 (INTERM)
12 TB 5/8 Φ × 2 SQ. HD & NUT

MARK	REQ'D
ED2	ONE
(OPP) ED4	ONE

2 PL 5 × 3½ × ½ × 32'-2 mf (ORD 32'-3) CUT 3/5
86 BARS - ha (ORD 20/22) CUT 6/9
3/16 FILLET WELD × 35'-10 (INTERM)



MARK	REQ'D
D1	10



NOTES:

FOR GENERAL NOTES & WELDING SPECS SEE E1
MAT'L SPECS ASTM A373 UNLESS NOTED
SURFACES MARKED "C" TO BE COATED WITH A MIXTURE OF HOT WHITE LEAD & TALLOW.

BRIDGE NO. 345 ON ROAD 327

ITEM 22

TEMPORARY MAT'L
28 L 3 × 3 × 3/16 × 0'-7
28 TB 5/8 Φ × 1½ SQ HD & NUT
4 FILLET WELD × 7'-0 (INT)

PAINT SKETCH

RIVETS
OPEN HOLES AS NOTED
REAM
MILLING AS NOTED
PAINT (ONE COAT AS PER SPECS UNLESS NOTED & SURFACES MARKED "C")
WELDING AS NOTED
SHOP CONTACT SURFACES NO PAINT

TEMP.	
SUPT.	
LAYOUT.	
FITTER.	
SHOP INSP.	
PC. WK.	
R. SMITH	
MCH.	
ERECT.	
O. INSP.	
WEIGHTS	

DETAIL

BRIDGE REPLACEMENT
NEW CASTLE COUNTY, DEL.
CUSTOMER: EASTERN STATES CONST. CO.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
BETHLEHEM DRAFTING ROOM BETH WORKS

IN CHARGE HOOVER MADE BY KR
CHECKED BY J.N.B. TRACED BY
REVISED LAST ASSEM. MK.
SHOP NO. CONTRACT HD523-A SHEET 2

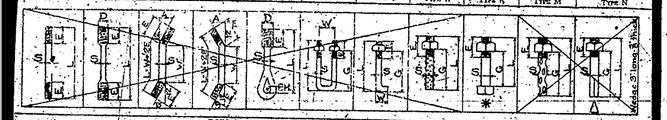
3003-206-11-55-DSCO

BETHLEHEM STEEL COMPANY

FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

BILL OF RODS



Line	No. of rods	Mark	Type	Size of rod	Length L Ft.	Length L In.	Detail Information Bevel A	B	C	Screw D	Direct	Pin-hole P.H.	Sq.	Hexd.	Nuts No.	Size	Weight each when bent	No. of pcs.	Mill Order Section	Length Ft.	Length In.	Item
2	24	ABI	K	1 1/4"	1	0				22 3/4	R.H.				24	SQ.						896-7793

NUT TO BE AMERICAN STD. HEAVY

MAT'L. SPECS: ASTM-A307

ADVANCE SHIPMENT

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR
N.C.	1861	2	DEL.		

ITEM No 22

BRIDGE No 326 ON ROAD 364

TOTAL WEIGHT OF MATERIAL ON THIS PAGE

PAINT - NONE - THREADS TO BE OILED

*Bill all Type K bolts 1/4" ϕ to 1 1/2" ϕ incl. up to 2'-0" incl. in length on bolt list, form-3210.

Gen'l Supt. Shop Supt. | Layout Fitter | Trimp. Shop Mach. Shop | Smith Shop Rod Shop | Loader Shipper | Scale Bill | Purch. Dept. Owners | Erection S. Insp. | O. Insp. App'l

IN CHARGE OF HOOVER — MADE BY FWV DATE — CHECKED BY JNB DATE 5/18/62 — Rev. by — Date — CONTRACT HP523-B — BILL PAGE NO. M 1 OF — USE AS B.F.P. — SHOP NO.

CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

FABRICATED STEEL CONSTRUCTION

BILL OF MISCELLANEOUS MATERIAL

3211 Rev.A 4-55

BETH. DRAFTING ROOM BETH. WORKS

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1		(4¢ NET)				
2	50	ROUND FLAT WASHERS 2 1/2" x 1/4" THK. (1 1/16" HOLES)	W1			REQ.

ITEM 22

BRIDGE No 326 ON ROAD 364

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR
N.C.	1861	2	DEL.		

Material: STEEL

Specifications: ASTM-A7

Machining:

Paint: NONE

Shipment: ADVANCE

Inspection:

Remarks: USED UNDER HEAD AND NUT OF ANCHOR BOLTS - ABI

Gen'l Supt. Shop Supt. | Layout Fitter | Trimp. Shop Mach. Shop | Smith Shop Rod Shop | Loader Shipper | Scale Bill | Purch. Dept. Owners | Erection S. Insp. | O. Insp. App'l

IN CHARGE OF HOOVER — MADE BY FWV DATE — CHECKED BY JNB DATE 5/18/62 — Rev. by — Date — CONTRACT HP523-B — BILL PAGE NO. M 2 OF — USE AS B.F.P. — SHOP NO.

CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

3233 (9-55) BSCo.

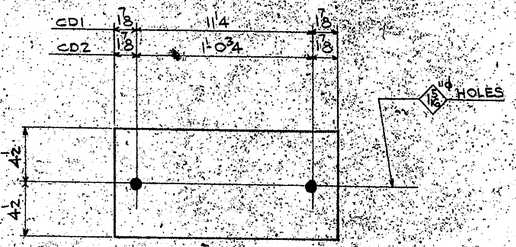
BETHLEHEM STEEL COMPANY

FABRICATED STEEL CONSTRUCTION

BETH. DRAFTING ROOM BETH. WORKS

CUSTOMER EASTERN STATES CONST. CO.

STRUCTURE BRIDGE REPLACEMENTS - NEW CASTLE COUNTY, DELAWARE



18-PIECES 12 TO 14 OZ. DUCK - 9 x 1'-3 - CD1
18-PIECES 12 TO 14 OZ. DUCK - 9 x 1'-4 1/2 - CD2

MATERIAL SPECS: COMMERCIAL GRADE
SHIPMENT: WITH FIRST CARLOAD OF STEEL
REMARKS: CANVAS DUCK CD1 - AT FIXED BEARINGS
CD2 - AT EXPANSION BEARINGS

ITEM 22

BRIDGE No 326 ON ROAD 364

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR
N.C.	1861	2	DEL.		

REQ. No. 896-7794

RIVETS: ✓ — DWG. MADE BY FWV DATE — IN CHARGE OF HOOVER

HOLES AS NOTED — DWG. CHKD. BY JNB DATE 5/18/62 — CONTRACT HP523-B

PAINT NONE — SHOP No. — TIER — SHEET-PAGE No. M3

FABRICATED STEEL CONSTRUCTION

BILL OF MISCELLANEOUS MATERIAL

3211 Rev.A 4-55

BETH. DRAFTING ROOM BETH. WORKS

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1						
2		ORDER FOR FIELD PAINT				
3		ONE COAT OF RED LEAD PAINT				RES.
4		FOR COATING THE TOP SURFACE OF				
5		3 LAYERS OF DUCK AND THE CONCRETE				
6		BEAM SEAT AT EACH BEAM BEARING.				
7						
8		TOTAL BEARING AREA = 11.8 SQ. FT.				
9		RED LEAD PAINT REQUIRED = ONE GALLON				

ITEM 22

BRIDGE No 326 ON ROAD 364

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR
N.C.	1861	2	DEL.		

Materials:

Specifications: ALL INGREDIENTS TO MEET DELAWARE HIGHWAY SPECS.

Machining:

Paint:

Shipment: WITH FIRST CARLOAD OF STEEL

Inspection:

Remarks:

Gen'l Supt. Shop Supt. | Layout Fitter | Trimp. Shop Mach. Shop | Smith Shop Rod Shop | Loader Shipper | Scale Bill | Purch. Dept. Owners | Erection S. Insp. | O. Insp. App'l

IN CHARGE OF HOOVER — MADE BY FWV DATE — CHECKED BY JNB DATE 5/18/62 — Rev. by — Date — CONTRACT HP523-B — BILL PAGE NO. M 4 OF — USE AS B.F.P. — SHOP NO.

CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENTS NEW CASTLE COUNTY, DELAWARE

3211 12m-3,61-BSCo

BETHLEHEM STEEL COMPANY

FABRICATED STEEL CONSTRUCTION

BETH DRAFTING ROOM BETH WORKS

BILL OF MISCELLANEOUS MATERIAL

Line	No.	Description	Mark or Item No.	Weight	Requisition No.	Order No.
1		(24 NET)				
2	25	STD. DEV. WASHER 2 × 2 × 5/16 AV. THK × 11/16 ϕ HOLE	BW11			RES.
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20		COUNTY / CONTRACT / P.R.A. REG. No / STATE / FED. AID PROJ. No	FISCAL YR			
21		N.C. / 1861 / 2 / DEL				
22						
23						
24						
25						
26		BRIDGE No 326 ON RD 364				
27						
28		ITEM 22				

Material:- STEEL

Specifications:- MFG STD.

Machining:-

Paint:- ONE COAT

Shipment:- SHIP WITH FIRST CARLOAD OF STEEL

Inspection:-

Remarks:- TO BE USED WITH EXP DAM BOLTS

Gen'l. Supt. / Shop Supt. / Layout / Fitter / Temp. Shop / Mach. Shop / Smith Shop / Rod Shop / Loader / Shipper / Scale / Bill / Purch. Dept. / Owners / Erection / S. Insp. / App'l.

IN CHARGE OF HOOVER

MADE BY HJR DATE

CHECKED BY JHB DATE 5/23/62

Rev. by Date

SHOP No.

CONTRACT HP523-B

BILL PAGE No. M 5 OF

USE AS B.F.P.

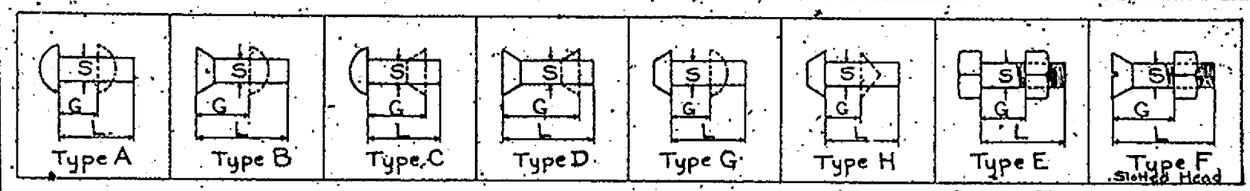
CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENT NEW CASTLE COUNTY, DEL.

FABRICATED STEEL CONSTRUCTION

SUMMARY OF FIELD [redacted] BOLTS

3210 (Rev. 4 3-55)

BETH DRAFTING ROOM BETH WORKS



Line	Number of [redacted] Bolts	Actual No Reqd	Connecting	Diam. S	Rivets Type	Rivets Grip G	Rivets Length L	Bolts Type	Bolts Head Hex Sq	Bolts Grip G	Bolts Length L	Bolts Length of Thd.	Nuts No.	Nuts Hex. or Sq.	Item	Weight
1																
2	55	50	DIAP TO STRGS	5/8 ϕ				E	SQ	13/16	1 3/4	STD	55	SQ	RES.	
3																
4	30	24	EXP DAM TO STRGS	5/8 ϕ				E	SQ	13/16	2 3/4	STD	30	SQ		
5																
6																
7			AM STD REG. NUTS													
8																
9																
10			TOTAL No FURNISHED		= 85											
11			TOTAL No REQ'D		= 74											
12			EXCESS		= 11											
13																
14																
15																
16																
17																
18																
19																
20																
21																
22			COUNTY / CONTRACT		P.R.A. REG. No		STATE		FED. AID PROJ. No				FISCAL YR			
23			N.C. / 1861		2		DEL.									
24																
25																
26			NUTS ON BOLTS.													
27			ASTM-A307													
28																
29			BRIDGE No 326 ON RD. 364													
30			ITEM 22													

Summary of Sheet Nos. 8 Total Weight This Page

ALL BOLTS OVER 1 1/2" DIA AND 2'-6" IN LENGTH TO BE BILLED AS RODS ON FORM NO. 3208.
FOR BOLTS OR RIVETS OF SPECIAL DESIGN, DRAW SKETCH ON THIS SHEET.

Gen'l. Supt. / Shop Supt. / Layout / Fitter / Temp. Shop / Mach. Shop / Smith Shop / Rod Shop / Loader / Shipper / Scale / Bill / Purch. Dept. / Owners / Erection / S. Insp. / App'l.

IN CHARGE OF HOOVER

Made by HJR Date

Checked by JHB Date 5/23/62

Rev. by Date

Shop No.

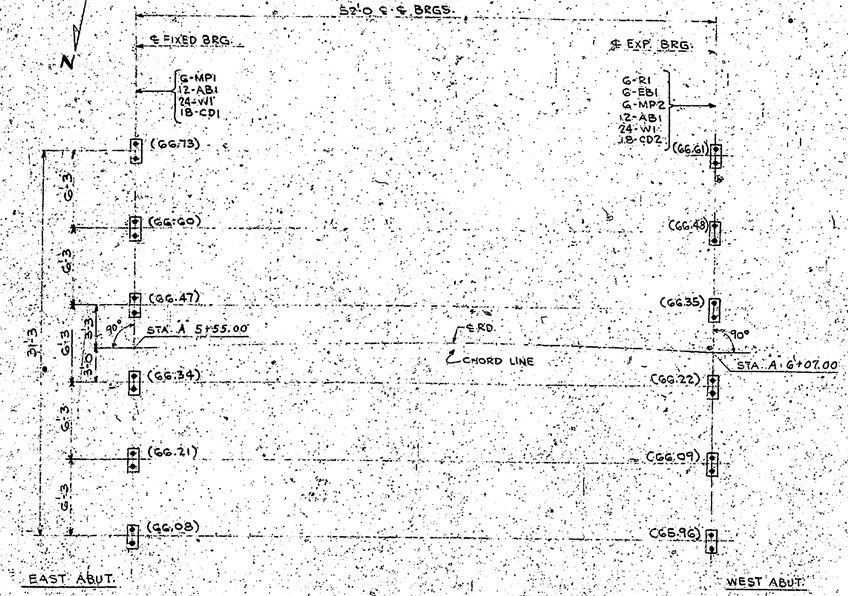
CONTRACT HP523-B

Page No. SB1 of

Use as B.F.P.

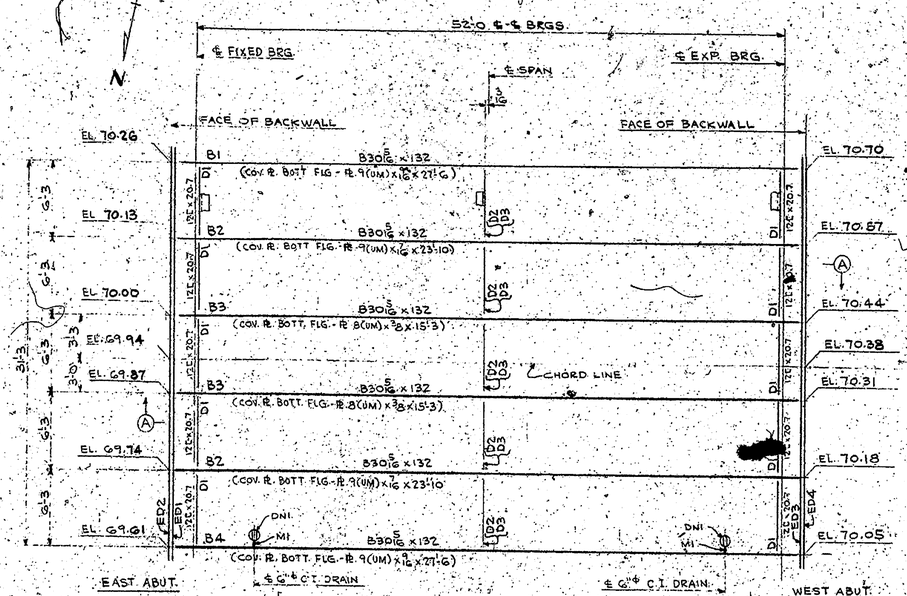
CUSTOMER EASTERN STATES CONST. CO. STRUCTURE BRIDGE REPLACEMENT NEW CASTLE COUNTY, DEL.

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR
N.C.	1861	2	DEL.		



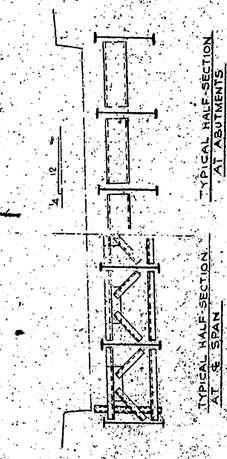
ANCHOR BOLT PLAN

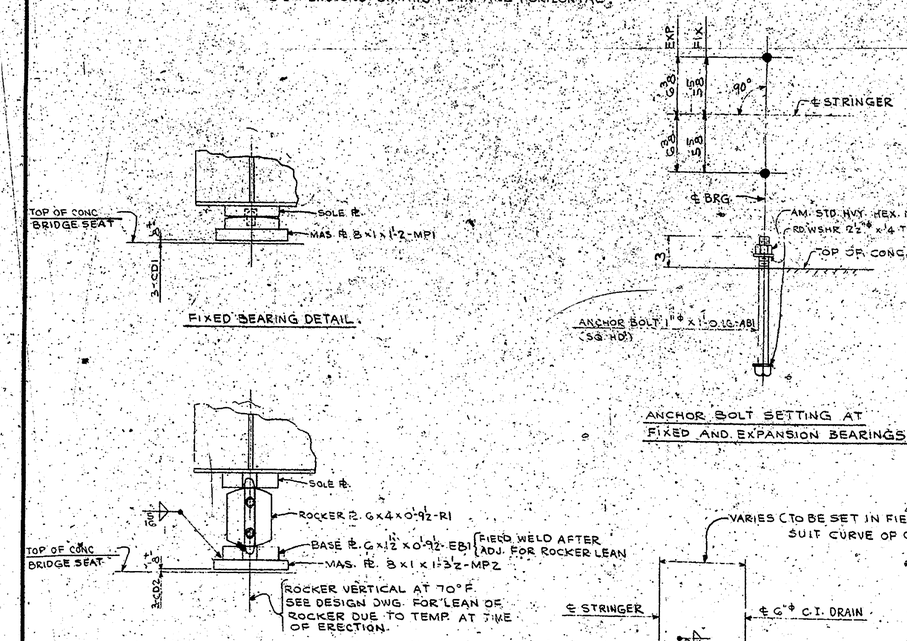
ELEVS. ON PLAN GIVEN THUS( ) ARE AT TOP OF CONCRETE BRIDGE SEAT.
SOLE PLATES WELDED TO STRINGERS IN THE SHOP.
ALL DIMENSIONS ON THIS PLAN ARE HORIZONTAL.

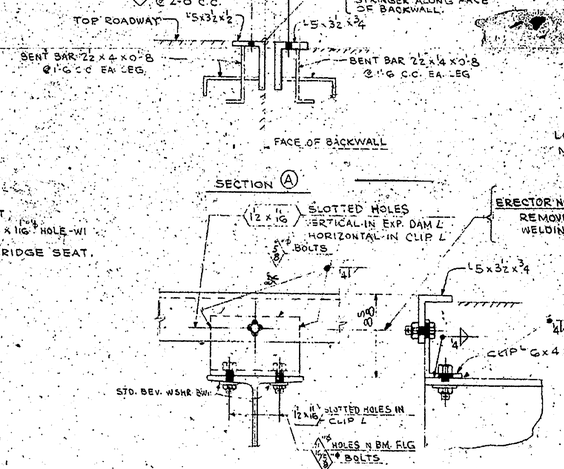


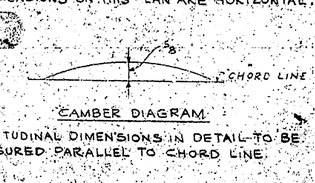
ERECTION PLAN

BRIDGE ON + 0.80% GRADE UP
ALL DIMENSIONS ON THIS PLAN ARE HORIZONTAL.



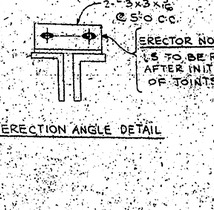




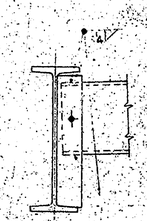


CAMBER DIAGRAM

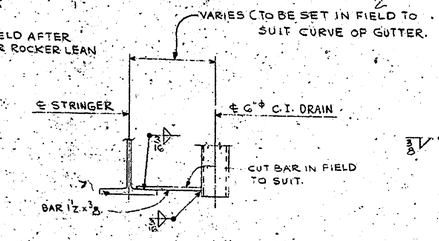
LONGITUDINAL DIMENSIONS IN DETAIL TO BE MEASURED PARALLEL TO CHORD LINE.

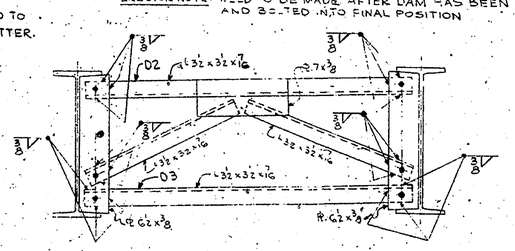


ERECTION ANGLE DETAIL



TYPICAL FIELD WELDING (12" C TO STRINGERS)





GENERAL NOTES

ERECTION - BY OTHERS.
ANCHOR BOLTS - FURNISHED BY BETH. STEEL CO. AND SET BY OTHERS.
MATERIAL SPECS. - ASTM-A7, ASTM-A373 (AS NOTED ON DETAILS)
WORKMANSHIP SPECS. - DELAWARE DEPT. OF HIGHWAYS DATED JULY 1, 1960 AND SPECIAL PROVISIONS.
ALL HOLES, CUTS, BLOCKS, ETC. FOR OTHER TRADES MUST BE SHOWN ON THIS PLAN AT TIME OF APPROVAL, OTHERWISE WORK MUST BE DONE IN THE FIELD AT NO EXPENSE TO THE BETH. STEEL CO.
MEMBERS SHALL BE ERECTED WITH THEIR PIECE MARKS IN THE SAME CORRESPONDING POSITION AS SHOWN ON THIS PLAN.
ALL DIMENSIONS ON THIS PLAN MUST BE STRICTLY ADHERED TO OTHERWISE STEEL WILL NOT FIT. IN CASE OF ERROR NOTIFY THE BETH. STEEL CO. AT ONCE.
ALL WELDING SHALL CONFORM TO THE CURRENT SPECS. FOR WELDED HIGHWAY AND RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY.
SHOP PAINT - ONE COAT AS PER SPECS. EXCEPT WHERE NOTED ON DETAILS.
FIELD PAINT - BY OTHERS.
RAILING, RAILING ANC. BOLTS, ERECTION SHIMS, DRIFT PINS, FITTING UP BOLTS & FIELD WELD WIRE FURNISHED BY OTHERS.

LIST OF DRAWINGS

SHEET NO.	DESCRIPTION
E1	ANCHOR BOLT AND ERECTION PLAN
1	DETAILS
2	DETAILS
M1	ANCHOR BOLTS
M2	WASHERS
M3	CANVAS DUCK
M4	FIELD PAINT
M5	WASHERS
SB1	FIELD BOLTS

BRIDGE No. 326
ON ROAD 304

ITEM 22

ANCHOR BOLT AND ERECTION PLAN

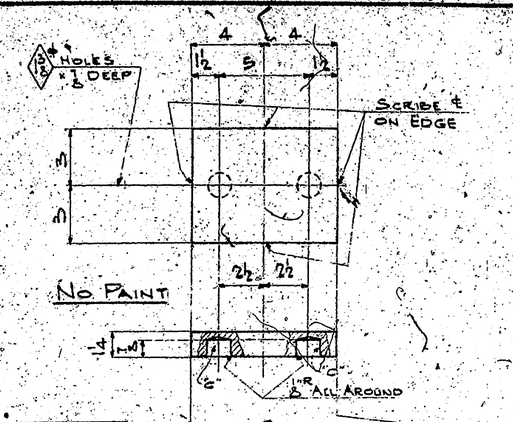
TEMP.	
SUPT.	
LAYOUT	
FITTER	
SHOP INSP.	
PG. WK.	
E. SMITH	
MCH.	
ERECT.	
O. INSP.	
WEIGHTS	

STRUCT. BRIDGE REPL. CEMENTS
NEW CASTLE COUNTY, DELAWARE
CUST. EASTERN STATES CONST. CO.

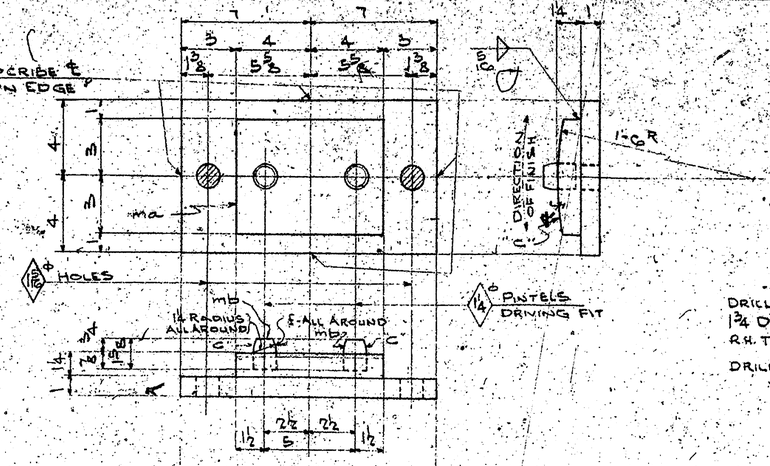
BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
BETHLEHEM DRAFTING ROOM BETH. WORKS
IN CHARGE HOOVER MADE BY FWV
CHECKED BY JNB TRACED BY
REVISED LAST ASSEM. MK.

SHOP NO. CONTRACT HP523-B SHEET E1

COUNTY	CONTRACT	F.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YR.
N.C.	1861	2	DEL.		

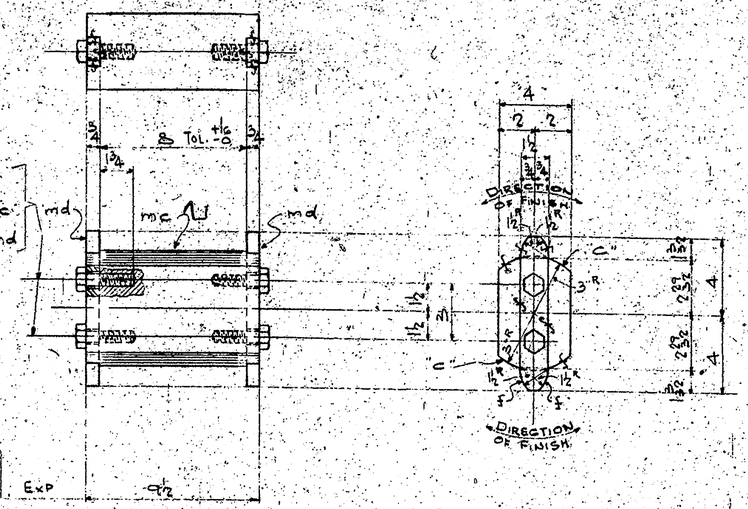


MARK	REQ'D		
MA	6	FIXED	PL 6 × 1 1/4 × 0'-8 (ORD.) 7/13



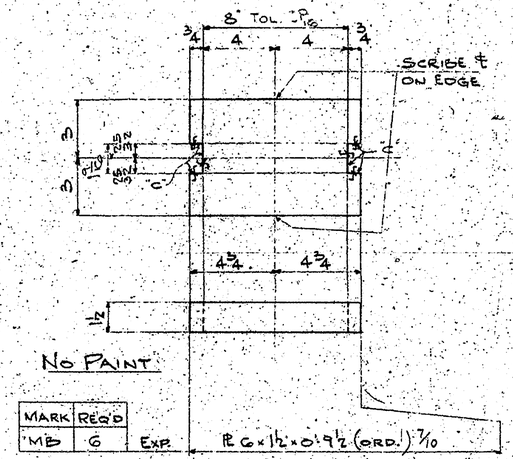
MARK	REQ'D		
MP1	6	FIXED	PL 8 × 1 × 1'-2 (ORD.) 7/5

6 PL 6 × 1 1/4 (MIS) × 0'-8 ma (ORD.) 7/12
12 PINTELS 1 1/4 ⌀ (FIN. ALL AROUND) × 1 5/8 LG. mb (ORD.) 7/17
5/16 FILLET WELD × 8'-0

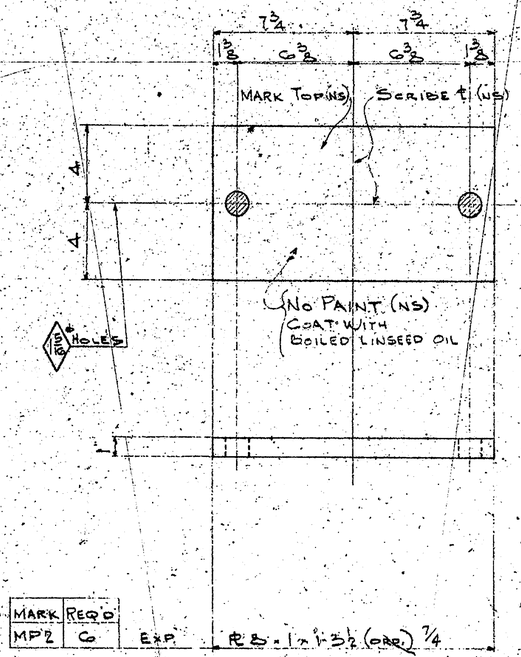


MARK	REQ'D		
R1	6	EXP	9 1/2

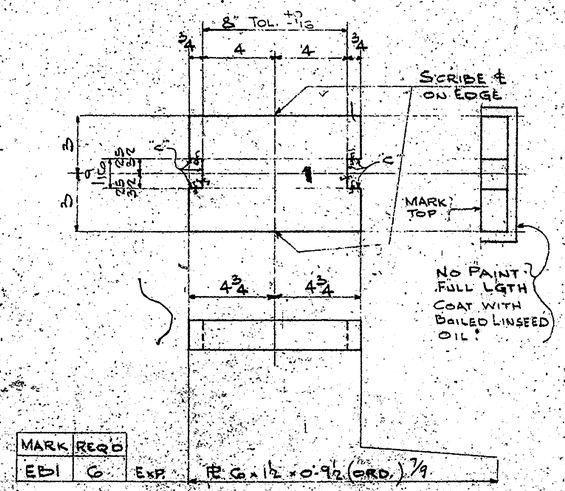
6-BAR 6 (M25) × 4 × 0'-9 1/2 (MB2E) mc (ORD.) 7/7
12-BAR 1 1/2 (1.12W) × 3/4 × 0'-8 - md (ORD.) 7/15 ASTM-A7
24 PB 5/8 ⌀ × 2 1/4 LG HEX HD. (1 5/8 THD. LGTH) ASTM-A307 (ORD ON AMT. DO NOT DUPLICATE)



MARK	REQ'D		
MB	6	EXP	PL 6 × 1 1/2 × 0'-9 1/2 (ORD.) 7/10



MARK	REQ'D		
MP2	6	EXP	PL 8 × 1 × 1'-3 1/2 (ORD.) 7/4



MARK	REQ'D		
EB1	6	EXP	PL 6 × 1 1/2 × 0'-9 1/2 (ORD.) 7/9

NOTES:

SURFACES MARKED "C" TO BE COATED WITH A MIXTURE OF HOT WHITE LEAD & TALLOW
ALL PLS. TO BE PRESS STRAIGHTENED TO INSURE FLATNESS.
SOLE PLS MA & MB TO BE PAINTED IN THE SHOP AFTER ASSEMBLY TO STRINGERS.
ALL WELDING SHALL CONFORM TO THE CURRENT SPECS FOR WELDED HWY. & RAILWAY BRIDGES OF THE AMERICAN WELDING SOCIETY.
MAT'L SPECS. ASTM-A373 UNLESS NOTED

BRIDGE NO. 326
ON ROAD 364

ITEM 22

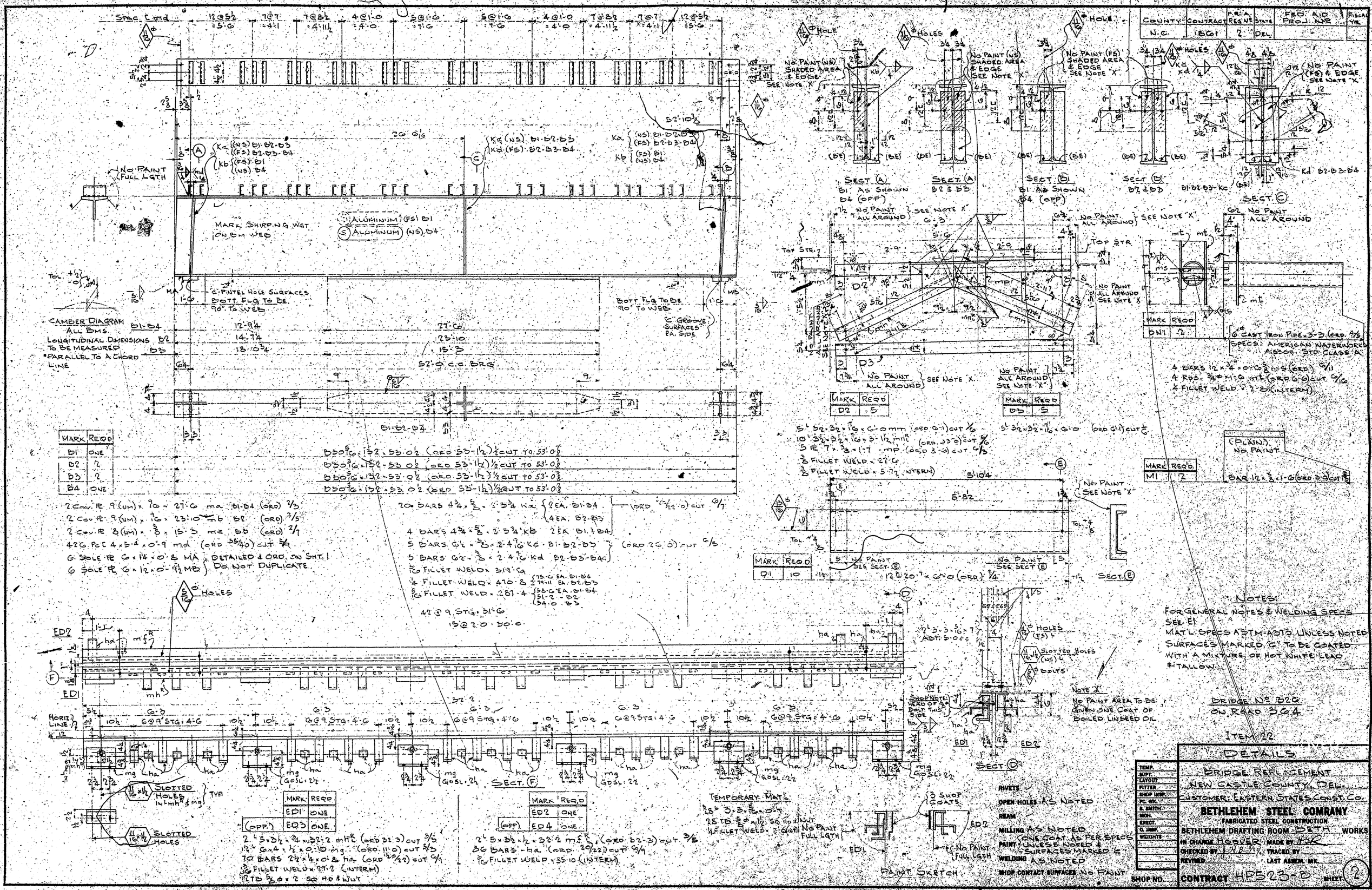
RIVETS ✓
OPEN HOLES AS NOTED
REAM ✓
MILLING AS NOTED
PAINT (ONE COAT AS PER SPECS UNLESS NOTED & SURFACES MARKED "C")
WELDING AS NOTED
SHOP CONTACT SURFACES NO PAINT

TEMP. / SUPT. / LAYOUT / FITTER / SHOP INSP. / PC. WK. / B. SMITH / MCH. / ERECT. / O. INSP. / WEIGHTS

SHOP NO.

BEARING DETAILS

BRIDGE REPLACEMENTS
NEW CASTLE COUNTY, DELAWARE
CUSTOMER: EASTERN STATES CONST. CO.

BETHLEHEM STEEL COMPANY
FABRICATED STEEL CONSTRUCTION
BETHLEHEM DRAFTING ROOM BETH WORKS
IN CHARGE HOOVER MADE BY [illegible]
CHECKED BY [illegible] TRACED BY
REVISED LAST ASSEM. MK.
CONTRACT HP 523-B SHEET 1

COUNTY	CONTRACT	P.R.A. RES. No.	STATE	FED. AID PROJ. No.	FISCAL YR.
N.C.	8601	2	DEL.