MICROFILMED
APR 06 1978
REPRODUCTION

MICROFILMED
APR 06 1978
REPRODUCTION

MICROFILMED
FEB 16 1983

CRA-30N-4.04 LINE DATA

NET LENGTH OF PROJECT 30,997.77 LIN. FT. 5.870 MILES
NET LENGTH OF WORK 51,177.59 LIN. FT. 9.692 MILES

CRA-19-16.09 LINE DATA

NET LENGTH OF PROJECT 3,820.26 LIN. FT. 0.723 MILES
NET LENGTH OF WORK 4,170.50 LIN. FT. 0.789 MILES

TOTAL NET LENGTH OF PROJECTS 34,818.03 LIN. FT. 6.594 MILES
TOTAL NET LENGTH OF WORK 55,348.09 LIN. FT. 10.482 MILES

FOR LINE DATA DETAILS SEE SHEET 2

CONVENTIONAL SIGNS

COUNTY LINE
TOWNSHIP LINE
LOT LINE
CORPORATION LINE
CENTER LINE
FENCE LINE
POLE LINE — TELEPHONE — POWER
RAILROAD
GUARD RAIL
DRAIN PIPE
RIGHT OF WAY LINE — R/W
LIMITED ACCESS LINE — LA
LIMITED ACCESS AND RIGHT OF WAY LINE — LA R/W

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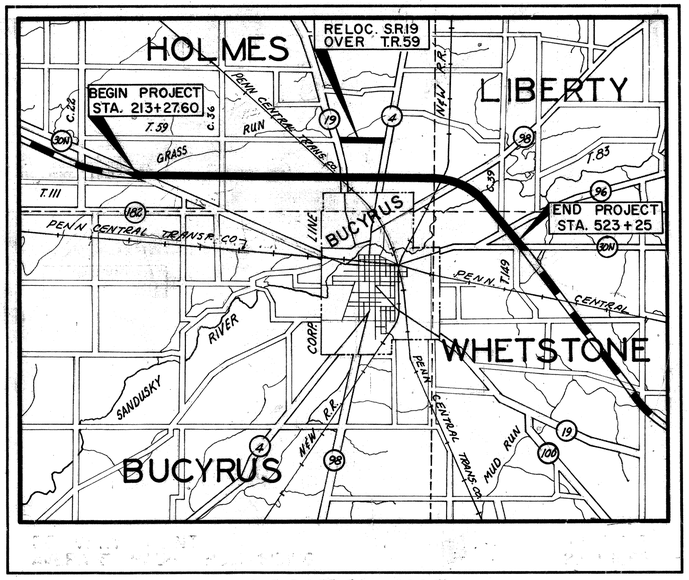
FILE NO	
219-C	CRAWFORD COUNTY CRA-30-4.04
	DATE OF LETTING _____ 19
	CONTRACT NO. _____

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

CRA-30N-4.04
CRA-19-16.09
CITY OF BUCYRUS
HOLMES, LIBERTY & WHETSTONE TWPS.
CRAWFORD COUNTY

GRADE SEPARATION WITH THE PENN CENTRAL TRANS. CO.
GRADE SEPARATION WITH THE N&W R.W.Y. CO.



LOCATION MAP

0 1 2 3 4
SCALE IN MILES

PORTION TO BE IMPROVED
STATE HIGHWAYS
OTHER ROADS

SCALES

PLAN
PROFILE - HORIZONTAL
PROFILE - VERTICAL
CROSS SECTION

STANDARD DRGS.											
BR-1-65 Sh.1 RB-1-55	11-24-65 2-2-59					SD-1-65 Sh1,2,3 CSB-1-63 Sh.4	11-8-65 12-8-65	GR-2B MC-8	2-15-68 12-1-67		
BP-5	6-1-65	CB-6	6-1-65	FAC1-1	9-15-67	HW-E	6-1-65	MC-7	3-1-66		
BP-6	6-1-65	CB-8	6-1-65	FAC1-2	6-1-65	SP-53	6-30-61	L-1	6-1-65		
BP-7	1-1-66	HL-1	11-1-65	HL-3	11-1-65	I-1	6-1-65	MH-1	6-1-65		
BP-3	1-10-67	HL-2	11-1-65	MC-1	10-1-67	I-2	6-1-65	MH-1A	8-1-66		
CB-2-2A&B	6-1-65	F-2	6-1-65	GR-1	1-1-67	MC-3	5-1-66	A-1-54	11-8-65		
CB-2-3&2-4	6-1-65	F-3	2-20-68	GR-2A	1-1-67	MC-4	6-1-65	P-1-54	11-8-65		
CB-4	6-1-65	F-5	2-20-68	GR-5	1-15-68	MC-5	6-1-65	CS-1-65	6-1-65		
CB-5	6-1-65	F-6	10-1-66	GR-6	2-15-68	MC-6	6-1-65	AS-1-67	1-11-68		

SUPPLEMENTAL SPECIFICATIONS			
808	1-13-67	832	5-25-67
811	1-1-67	931	5-25-67
815	1-1-67		
816	8-6-65		
825	12-19-67		
828	1-1-67		
1001	3-21-66		
801	1-1-67		

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	F-406 (11)	

1 / 541

F-406(11)

THE PROJECT DESIGNATION CRA-30N-4.04 APPEARING THROUGHOUT THIS PLAN SHALL BE CONSIDERED TO READ CRA-30N-4.04, CRA-19-16.09

CRAWFORD COUNTY
CRA-30N-4.04
CRA-19-16.09

1967 SPECIFICATIONS

LIMITED ACCESS

THIS IMPROVEMENT IS ESPECIALLY DESIGNED FOR THROUGH TRAFFIC AND HAS BEEN DECLARED A LIMITED ACCESS HIGHWAY OR FREEWAY BY ACTION OF THE DIRECTOR OF HIGHWAYS IN ACCORDANCE WITH THE PROVISIONS OF SECTION 5511.02 OF THE REVISED CODE OF OHIO.

THE STANDARD SPECIFICATIONS OF THE STATE OF OHIO DEPARTMENT OF HIGHWAYS, INCLUDING CHANGES AND SUPPLEMENTAL SPECIFICATIONS LISTED IN THE PROPOSAL SHALL GOVERN THIS IMPROVEMENT.

THE RIGHT-OF-WAY FOR THIS IMPROVEMENT WILL BE PROVIDED BY THE STATE OF OHIO.

I HEREBY APPROVE THESE PLANS AND DECLARE THAT THE MAKING OF THIS IMPROVEMENT WILL NOT REQUIRE THE CLOSING OF THE HIGHWAY TO TRAFFIC AND THAT PROVISIONS FOR THE MAINTENANCE AND SAFETY OF TRAFFIC WILL BE AS SET FORTH ON THESE PLANS AND ESTIMATES.

APPROVED: D.H. Commer
DATE: 10-1-67 DIVISION DEPUTY DIRECTOR

APPROVED: C.H. Gloster
DATE: 3-5-68 ENGINEER OF BRIDGES

APPROVED: R.E. Catlin (WCB)
DATE: 4-9-68 ENGINEER OF LOCATION & DESIGN

APPROVED: R.E. Schultz
DATE: 4-9-68 DEPUTY DIRECTOR OF DESIGN & CONSTRUCTION

APPROVED: _____
DATE: _____ DEPUTY DIRECTOR OF RIGHT OF WAY

APPROVED: Thomas Major
DATE: 4-12-68 DEPUTY DIRECTOR OF PLANNING & PROGRAMMING

APPROVED: E.W. Wilson
DATE: 4-12-68 FIRST ASSISTANT DIRECTOR

APPROVED: P.E. Masters
DATE: 4-12-68 DIRECTOR OF HIGHWAY

Sheet No. 372 & 373 revised 11-6-68 EBL
Sheet No. 461, 462 & 439 revised 11-22-68 EBL
Sheet No. 392 revised 4-10-69

PREPARED BY
ENGINEERING ASSOCIATES
CONSULTING ENGINEERS
WOOSTER, OHIO

DEPARTMENT OF TRANSPORTATION,
FEDERAL HIGHWAY ADMINISTRATION,
BUREAU OF PUBLIC ROADS
APPROVED

_____ DIVISION ENGINEER _____ DATE

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

424
541

CRAWFORD COUNTY CRA-30N-4.04

BENCH MARKS

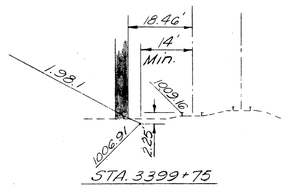
℄ U.S. 30 Sta. 449+50 187' Rt.
Spike in Tele pole
Elev. 1009.161

℄ U.S. 30 Sta. 457+09 189' Lt.
Spike in 30" W Cherry
Elev. 1011.383

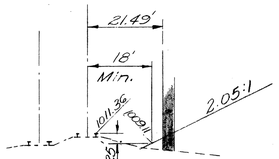
CURVE DATA

P.I. Sta. 462+18.61
Δ = 44°53'41.5" Rt.
D = 1°28'
T = 1613.94'
L = 3061.01'
E = 320.26'
R = 3906.53'

RECOMMENDED
FEB 18 1963

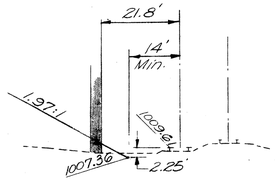


STA. 3399+75



STA. 3400+25

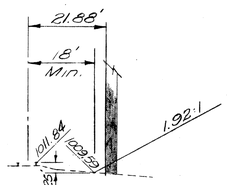
RIGHT BRIDGE



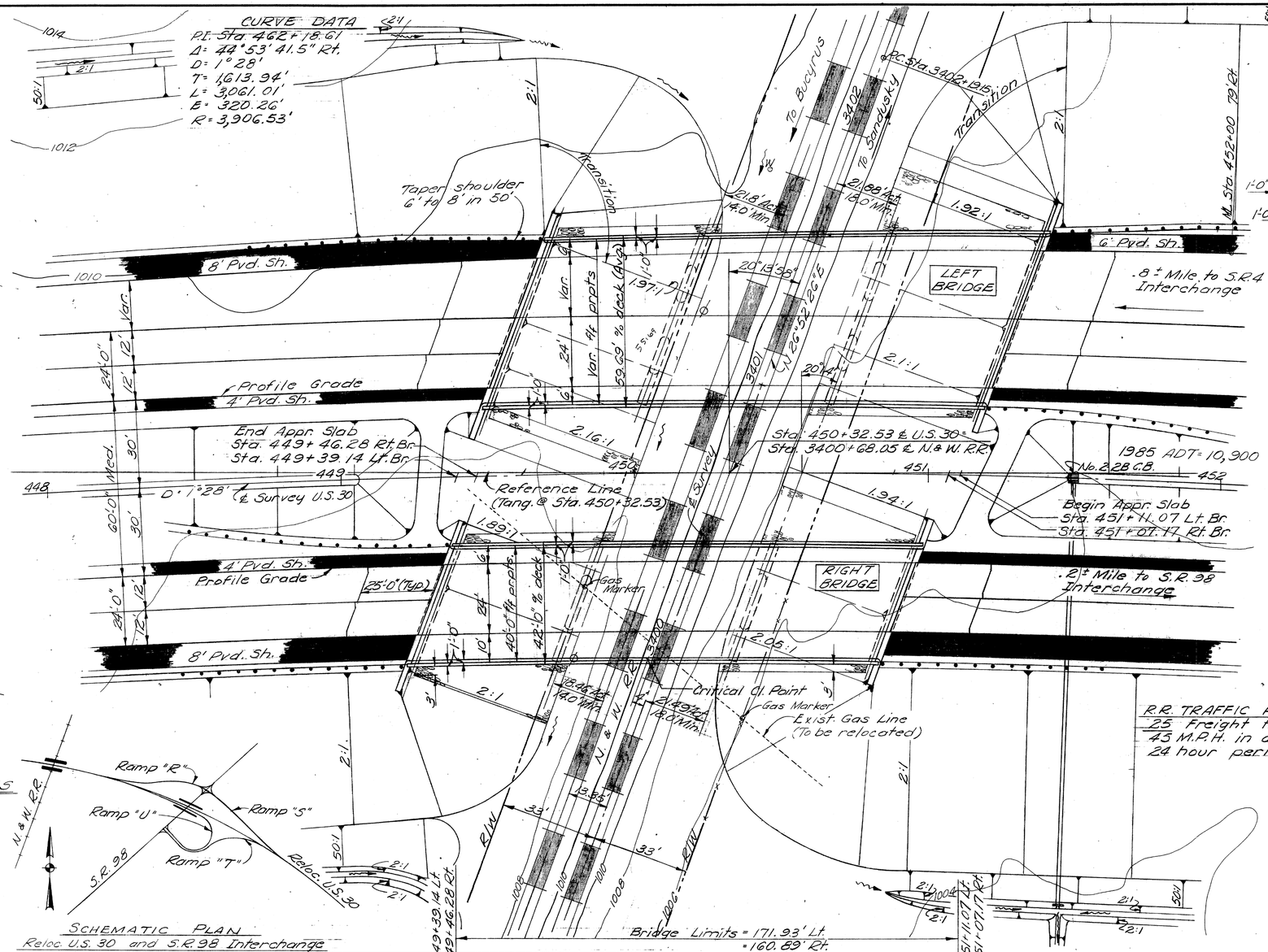
STA. 3401+25

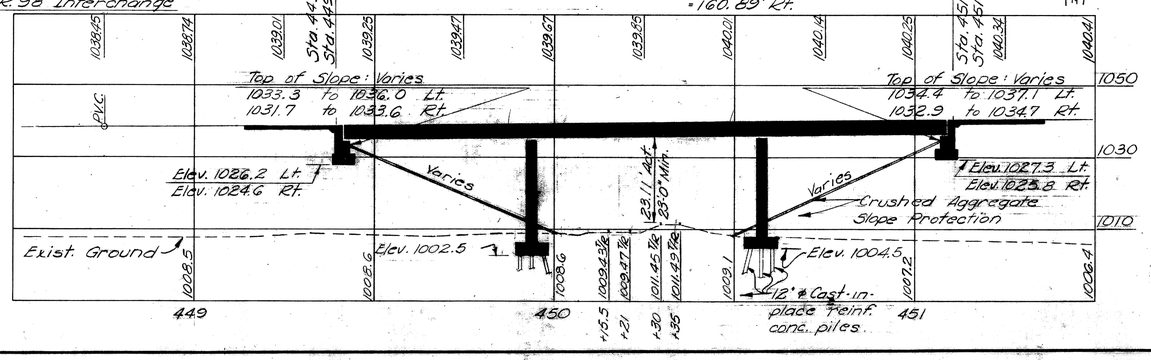
LEFT BRIDGE

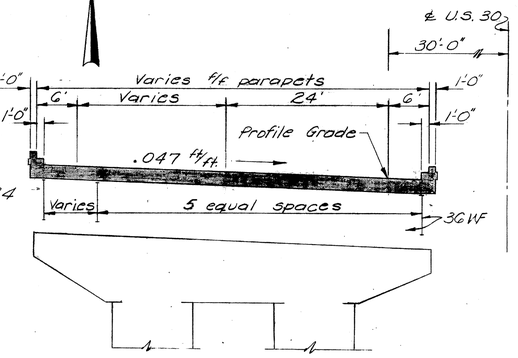
CLEARANCE DIAGRAMS



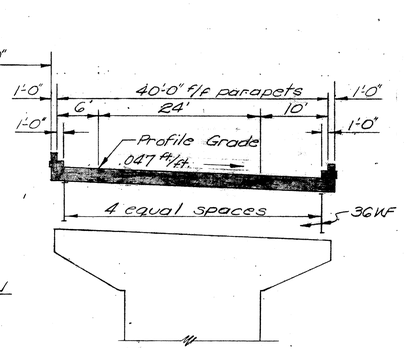
STA. 3401+75







LEFT BRIDGE



RIGHT BRIDGE

R.R. TRAFFIC PATTERN

25 Freight trains @ 45 M.P.H. in a typical 24 hour period.

PROPOSED STRUCTURE

Type: Continuous steel beam with reinforced concrete deck and substructure.
Spans: Lt.- 51.5', 64.0', 51.5' ℄ brgs.
Rt.- 48.0', 60.0', 48.0' ℄ brgs.
Roadway: Lt.- Varies (57.69' Avg.) ft/f prpts.
Rt.- 40'-0" ft/f parapets
Load Frequency: CF-2000 (57)
Skew: 20°14'00" (Lt. Fwd.) to Ref. Line
Wearing Surface: 7" mono. concrete
Approach Slab: AS-1-67 (25' long)
Alignment: 1°28' Rt. Curve, including speed change lane on Lt. Bridge
Superelevation: .047 ft/ft.

+1.20% △ -2.00%

P.V.I. Sta. 453+25
Elev. 1043.85
V.C. = 900'

Estimated Average Pay Length of 12" ϕ C.I.P. Reinf. Conc. Piles = 30 feet.

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

SITE PLAN

BRIDGE No. CRA-30N-0851 L/R
OVER N. & W. R.R.
CRAWFORD COUNTY
STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
B.G.J.		V.N.	M.M.	J.M.H.	10-21-65	

9053-00-7301

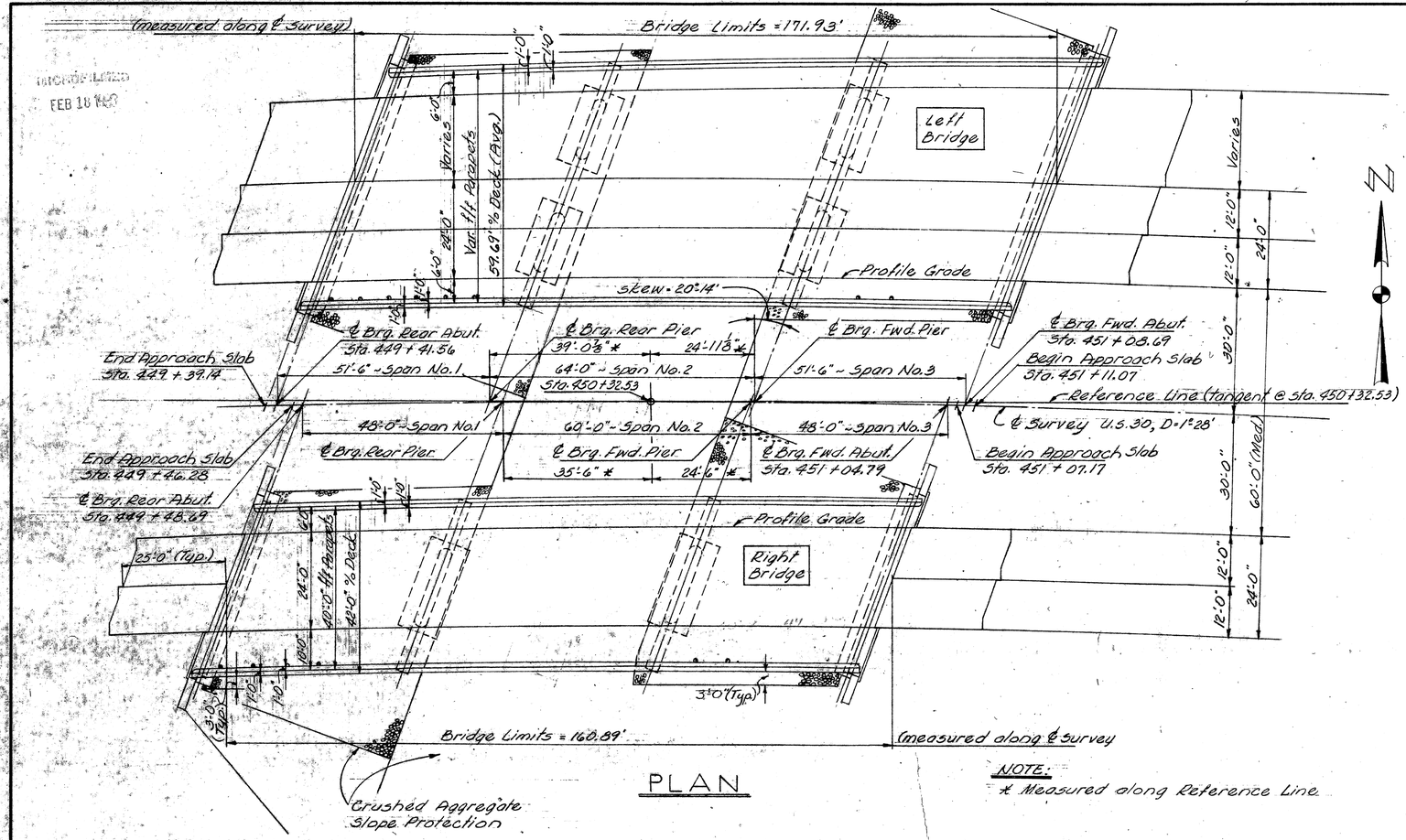
HILLS CO.—17-0253—100—8-63

RECEIVED
FEB 18 1966

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

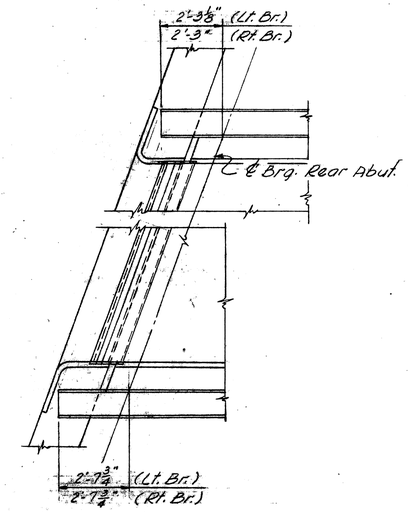
425/541

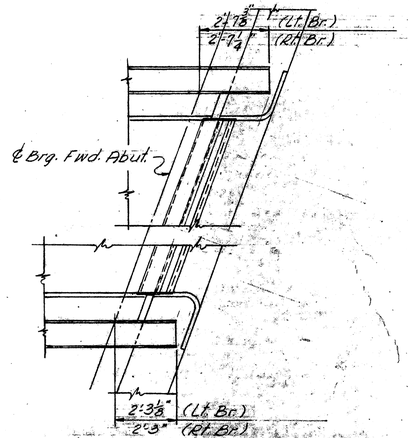
CRAWFORD COUNTY CRA-30N-4.04



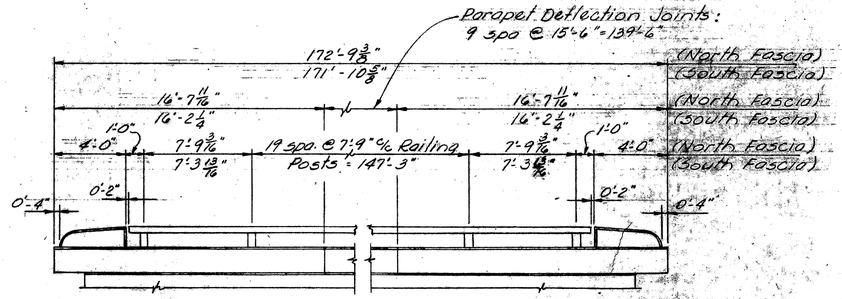
PLAN

NOTE:
* Measured along Reference Line

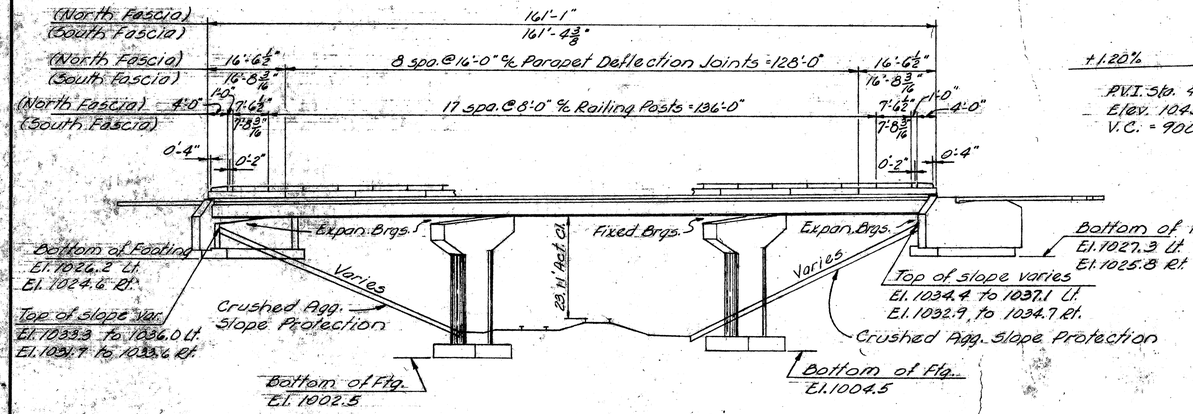




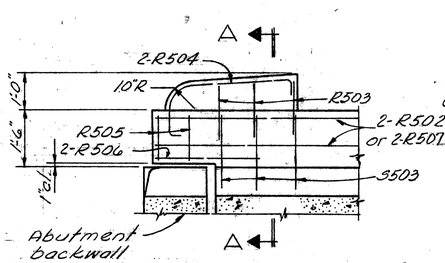
PART PLAN AT ABUTMENTS



RAILING and PARAPET DETAILS
(Left Bridge)
Right Bridge Railing & Parapet Details shown on ELEVATION

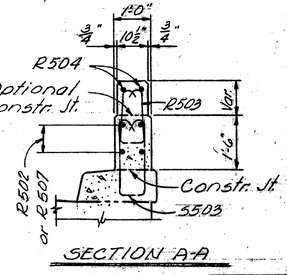


ELEVATION
(Piles not shown)
(Right Bridge Shown)



END POST DETAIL

See Std. Dwg. BR-1-65 for additional railing details.



SECTION A-A

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

GENERAL PLAN & ELEVATION
BRIDGE NO. CRA-30N-0851 Lt/Rt.
OVER N.&W. R.R.
CRAWFORD COUNTY STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
VLA			JKS	ACH	10-4-66	

7302

BRILL CO.—1958—30—648

RECEIVED BRIDGES
FEB 18 1966

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

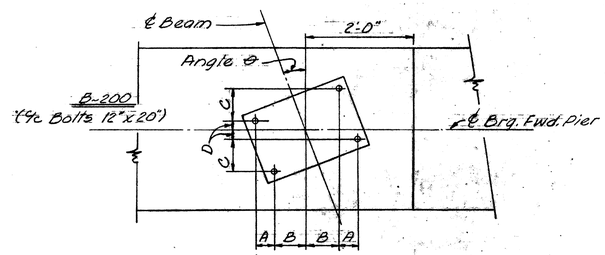
426
541

CRAWFORD COUNTY CRA-30N-4.04

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION	Bridge No. CRA-30N-0851 Left						Bridge No. CRA-30N-0851 Right					
				ABUTS.	PIERS	SUPERS	GEN'L.			ABUTS.	PIERS	SUPERS	GEN'L.		
503	Lump	Sum	Cofferdams, cribs and sheeting				Lump						Lump		
503	1016	Cu.Yds.	Unclassified excavation	425	186					294	111				
505	Lump	Sum.	First test pile				Lump								
507	2760	Lin.Ft.	Piles, 12" cast-in-place reinforced concrete.		1680						1080				
509	218,599	Lbs.	Reinforcing steel	11,583	25,822	92,798				8114	18,110	62,132			
511	521	Cu.Yds.	Class "C" concrete, superstructure			311						210			
511	383	Cu.Yds.	Class "C" concrete, piers above footing		235						148				
511	442	Cu.Yds.	Class "E" concrete, abutments	258						184					
511	131	Cu.Yds.	Class "E" concrete, pier footings		82						49				
512	22	Lin.Ft.	Waterproofing, premolded sealing strip	22											
513	422,600	Lbs.	Structural steel			258,200						164,400			
832	422,600	Lbs.	Field painting of structural steel			258,200						164,400			
517	667.12	Lin.Ft.	Bridge railing Type 1			344.67						322.45			
518	201	Lin.Ft.	6" Perforated helical C.M.P. Sec. 707.06 incl. specials	119						82					
518	302	Lin.Ft.	6" Non-perforated helical C.M.P. Sec. 707.06	185						117					
518	14	Each	Scuppers (including supports)			8						6			
518	202	Cu.Yds.	Porous Backfill	113						89					
601	1779	Sq.Yds.	Crushed aggregate slope protection	1072						707					
808	521	Units	Water-reducing, set retarding admixture			311						210			
825	2063	Sq.Yds.	Concrete surface treatment				1230						833		
828	200	Lin.Ft.	Joint sealer (end dam)			119						81			

160
-30
130
NOT 100 DEDUCT



ANCHOR BOLT LAYOUT

Location	Angle ℄	Dim. A	Dim. B	Dim. C	Dim. D
Right Bridge.					
All Beams	20°-39'-49"	4 1/4"	7 1/4"	7 1/16"	2 7/16"
Left Bridge.					
South Fascia & Interior Beams	20°-12'-12"	4 1/8"	7 5/16"	6 15/16"	2 3/16"
North Fascia Beam.	21°-04'-50"	4 5/16"	7 3/16"	7 3/16"	2"

GENERAL NOTES

For additional General Notes see Sheet No. 365.

FIRST TEST PILE: Payment will be made for only one first test pile, Item 505. This first test pile may be driven on either the Left or the Right Bridge.

EXCAVATION QUANTITIES includes the removal of fill material required for the construction of the abutments.

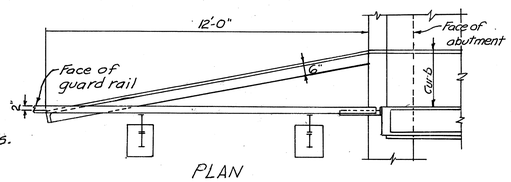
RAILROAD AERIAL LINES will be relocated by the railroad. The Contractor shall use the precautions necessary to see that the lines are not disturbed during the construction stage and cooperate with the railroad in the relocation of these lines. The cost of the relocation shall be included in the railroad force account work.

CONSTRUCTION CLEARANCE of 20' vertically above the top of the railroad rails and 8' horizontally from the center of tracks shall be maintained at all times.

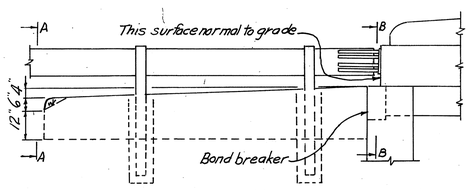
SHEETING AND BRACING: Before construction is started, eight sets of prints showing details of the sheeting and bracing to be used for excavation adjacent to the railroad tracks shall be submitted to the Director for approval by the Department of Highways and by the Railroad Company.

ALIGNING RAILROAD TRACKS: After the Contractor has completed all excavation and backfill adjacent to the railroad tracks in compliance with Sec. 503.04 and 503.09 of the Construction and Materials Specifications, subject to the supervision of the Railroad Company, nothing in Sec. 503.04, 503.09 or 108.04 of the specifications shall be construed to hold the Contractor liable for aligning and resurfacing the railroad tracks.

MACHINE FINISH of the Bridge decks shall be at the option of the Contractor.



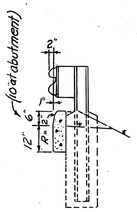
PLAN



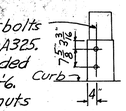
ELEVATION

APPROACH TRANSITION CURB

Use on both sides of roadway at entrance end of bridge.
Include with abutments for payment.



Section A-A



Section B-B

1 1/4"x1'-8" Anchor bolts and nuts, ASTM A325. Bolts are threaded 3" and imbeded 1'-6". Galvanize the nuts and a minimum of 6" of threaded end of the bolts. Use at all corners where guard rail occurs. Include with bridge railing for payment.

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

GENERAL NOTES & ESTIMATED QUANTITIES
BRIDGE NO. CRA-30N-0851 Lt./Rt.
OVER N.E.W. R.R.
CRAWFORD COUNTY STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
V.L.A.	BBB		J.K.S.	ACH 10-4-66		

73/4

21
25

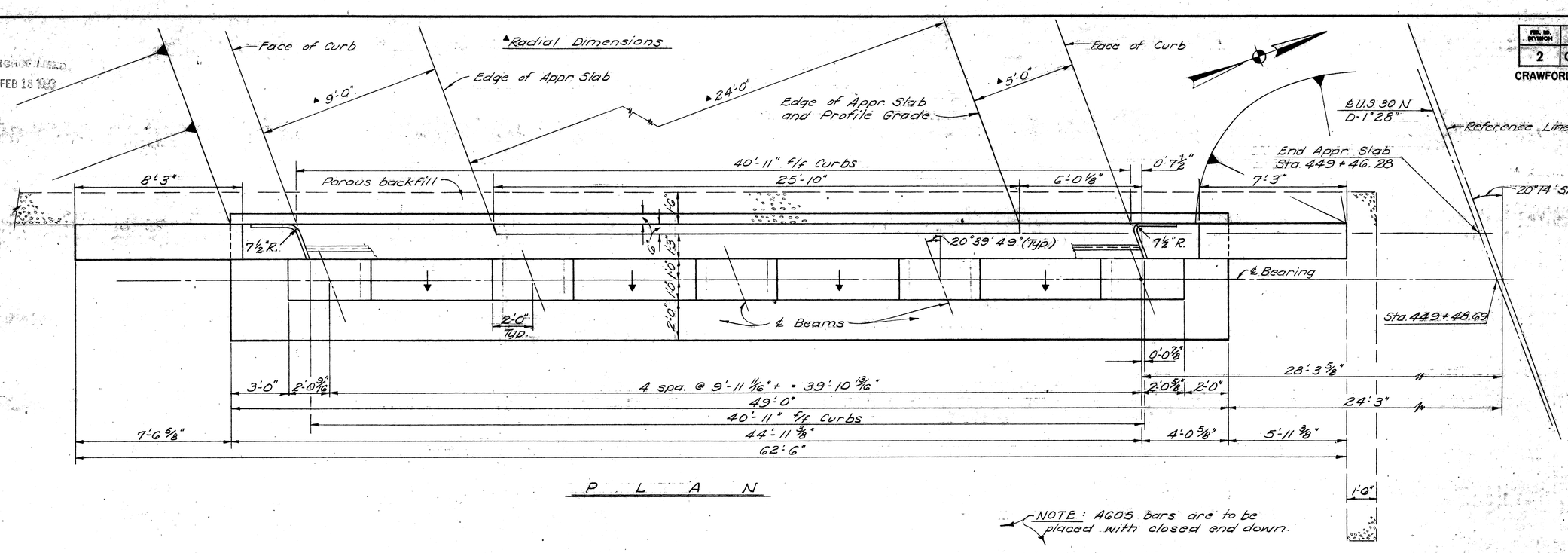
HILLS CO.—1954—50—4

MICROFILMED
FEB 18 1972

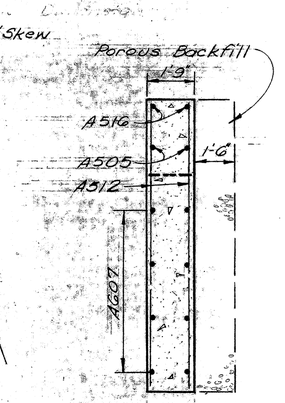
FED. RD. SYSTEM	STATE	PROJECT	
2	OHIO		

427
541

CRAWFORD COUNTY CRA-30N-4.04

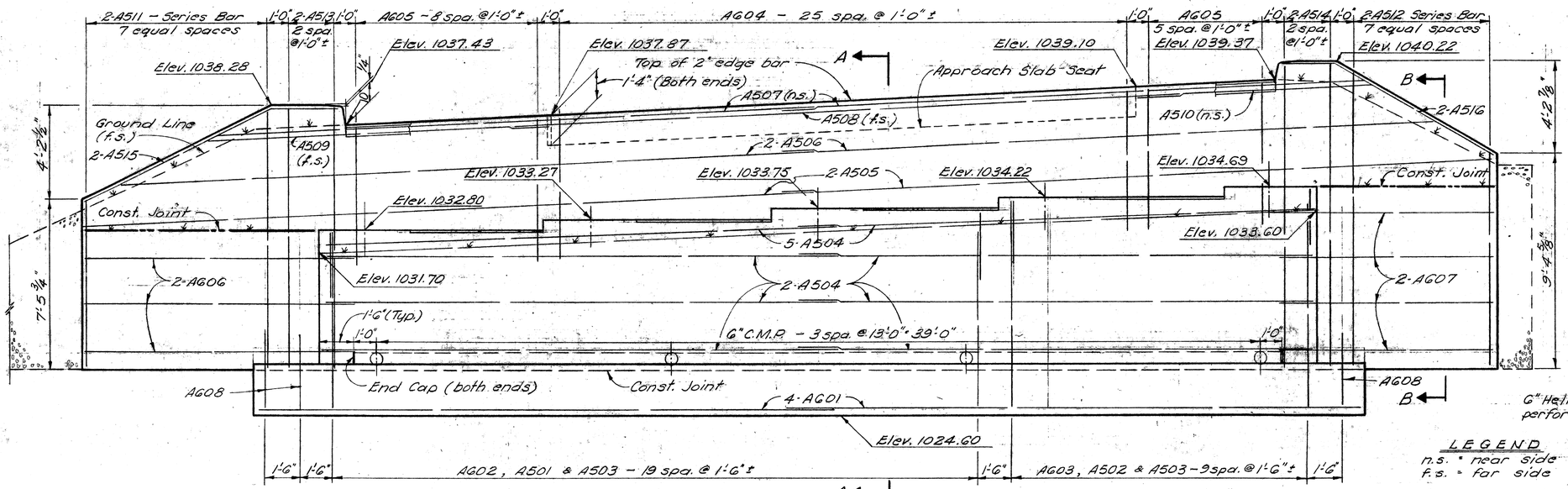


P L A N

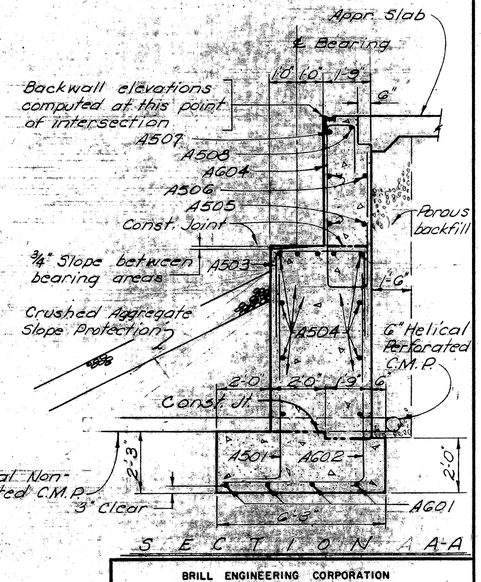


S E C T I O N B-B

NOTE: A605 bars are to be placed with closed end down.



E L E V A T I O N



S E C T I O N A-A

LEGEND
n.s. = near side
f.s. = far side

NOTE: Use the A503 bars to adjust for the changes in elevations of the bridge seats.

N O T E S

FOUNDATION BEARING PRESSURE: Abutment footings are designed for a maximum bearing pressure of 2 tons per sq. ft.

POROUS BACKFILL shall extend upward to the approach slab and to the surface of the earth shoulders, and outward to the surface of the embankment slopes as per plan. Excavation, therefore, in excess of that required for construction of the abutment, shall be considered as paid for in the bid price per cu. yd. paid for porous backfill.

PROCEDURE: The embankment shall be placed and compacted up to the finished spill-thru slope and to the level of the subgrade for a distance of 200 feet back of the abutments. After a waiting period of 90 days, abutment excavation may be made. This waiting period may be shortened if settlement hubs indicate that settlement has ceased.

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

REAR ABUTMENT DETAILS

BRIDGE No. CRA-30N-0851 RT.
OVER N & W. R.R.

CRAWFORD COUNTY STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVISED	DATE	REVISED
V.L.A.	Y.N.		J.K.S.	R.G.W.		

7303

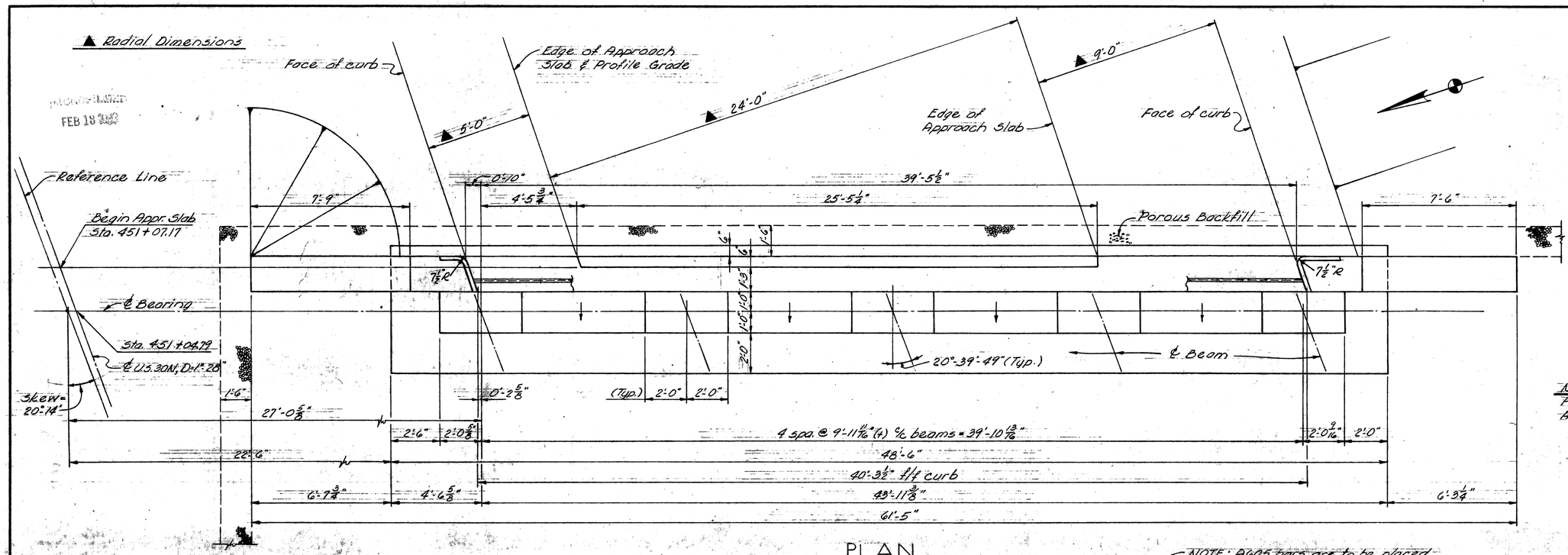
HILLS CO.—19734—80—4-65

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	-	

CRAWFORD COUNTY CRA-30N-4.04

428
541

▲ Radial Dimensions

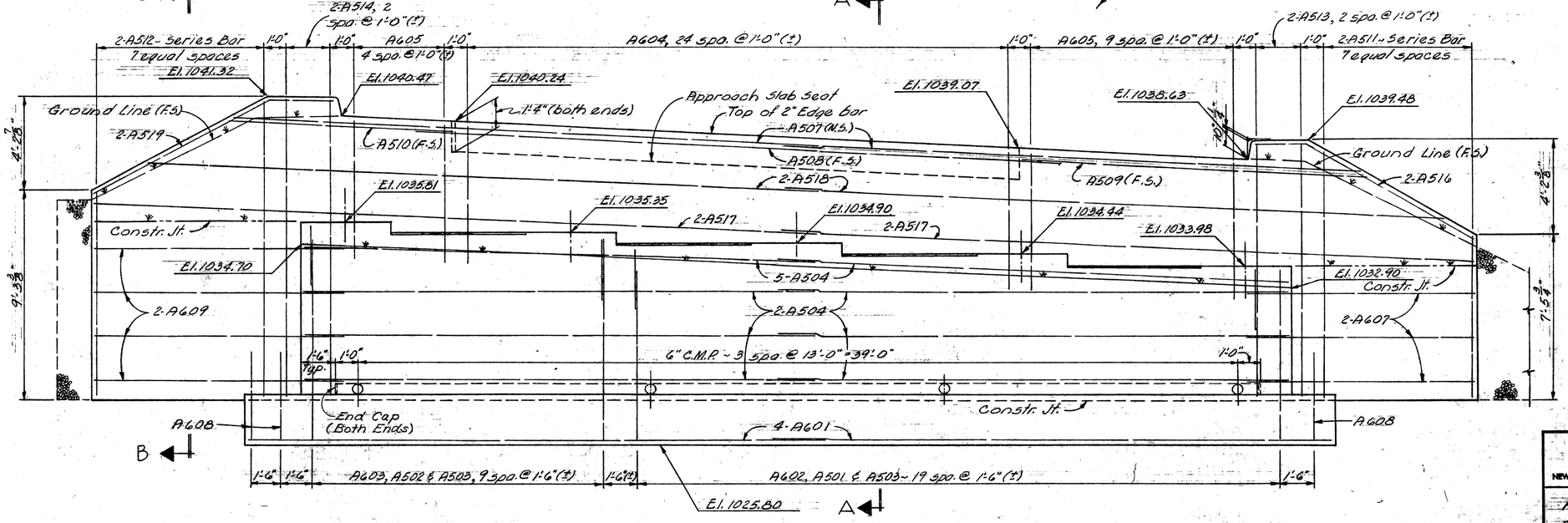


PLAN

NOTE
For additional notes, and sections A-A and B-B see Sheet No 427

B ◀ ▶ A

NOTE: A605 bars are to be placed with the closed end down.



ELEVATION

LEGEND
N.S. indicates near side
F.S. indicates far side

NOTE: Use A503 bars to adjust for the changes in elevations of the bridge seats.

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

FORWARD ABUTMENT DETAILS

BRIDGE NO. CRA-30N-0851 Right
OVER N.Y.W. R.R.
CRAWFORD COUNTY STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
V.L.A.	B.A.S.		J.K.S.	B.G.		

428

HILLS CO. - 69M - 10-4-65

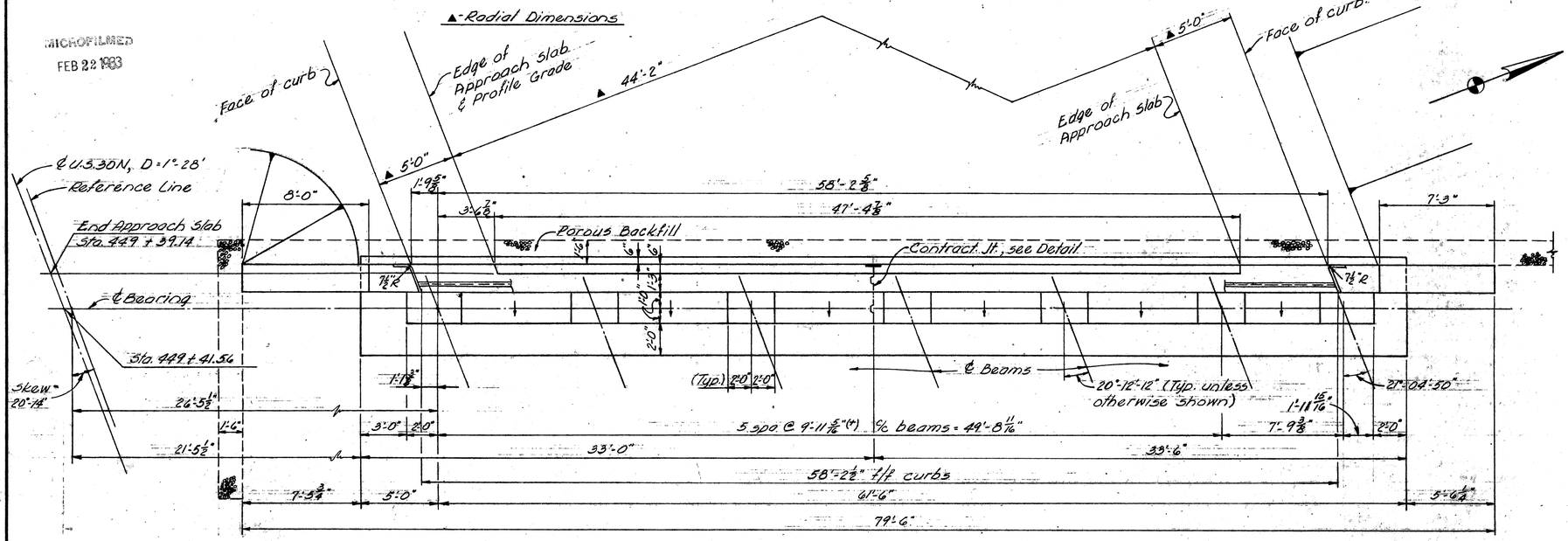
MICROFILMED
FEB 22 1983

FED. HI. DIVISION	STATE	PROJECT	
2	OHIO		

429
541

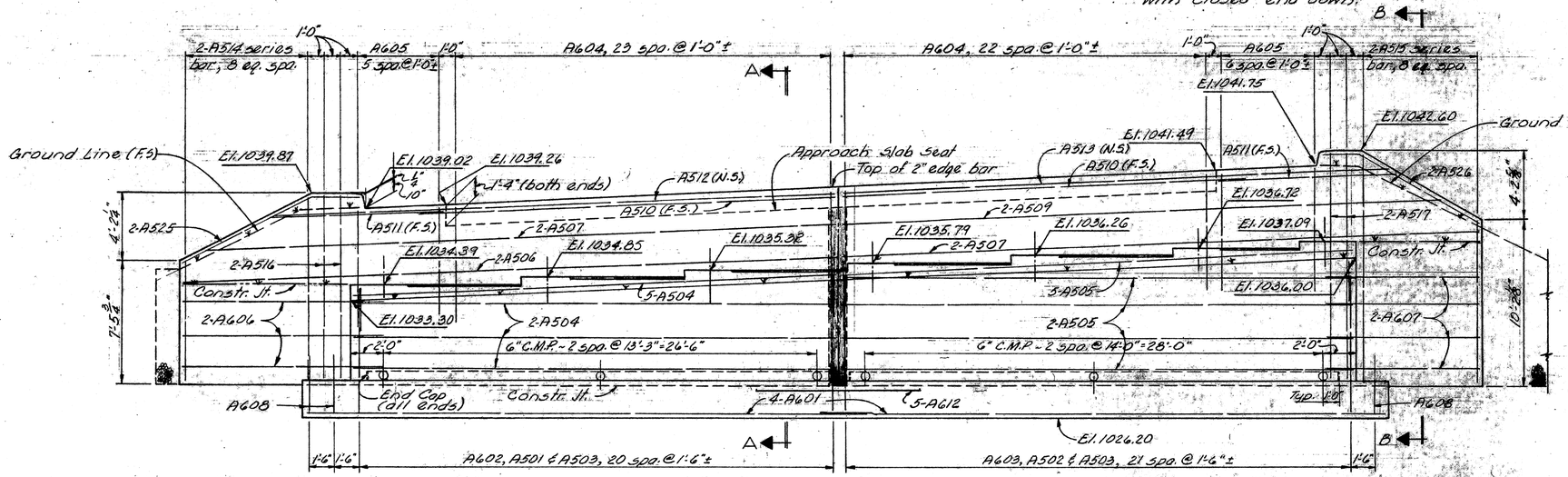
CRAWFORD COUNTY CRA-30N-4.04

▲-Radial Dimensions



PLAN

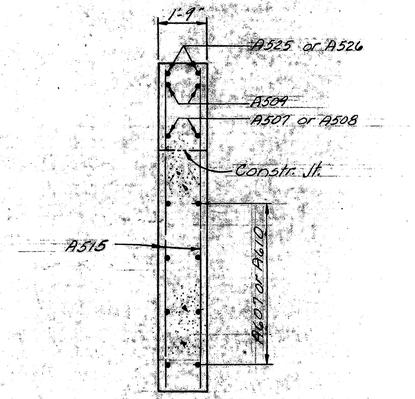
NOTE: A605 bars are to be placed with closed end down.



ELEVATION

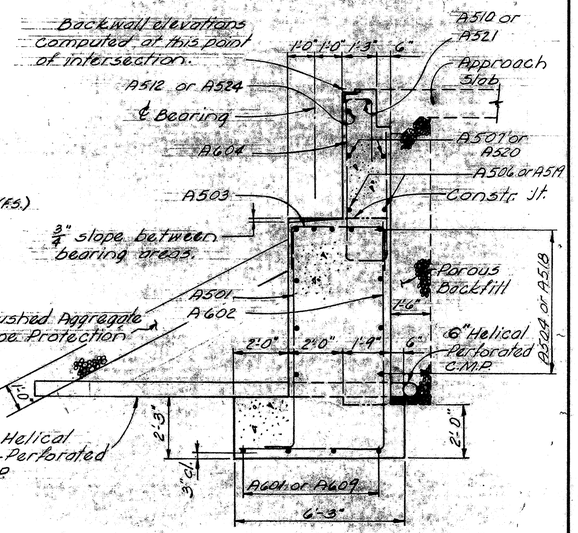
NOTE
The backwall angle of the end dam shall have an unwelded butt joint at the contraction joints of the rear and forward abutments (Ft. Br.)

NOTES
N.S. indicates near side.
F.S. indicates far side.
Use the A503 bars to adjust for the changes in elevations of the bridge seats.



SECTION B-B

For additional notes see Sheet No. 427, and for Contraction Joint detail see Sheet No. 430



SECTION A-A

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

REAR ABUTMENT DETAILS
BRIDGE NO. CRA-30N-0051 LEFT
OVER N.Y.C. R.R.
CRAWFORD COUNTY STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
VLA	BAB		JAS	AGW		

7303

428
541

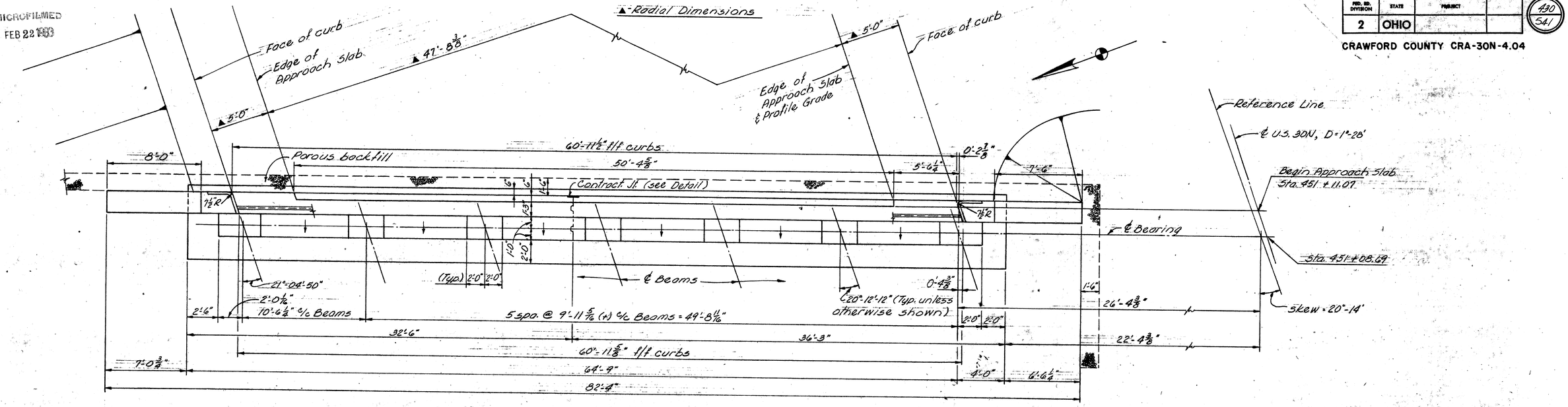
HILLS CO.—19934—30—4-82

MICROFILMED
FEB 22 1983

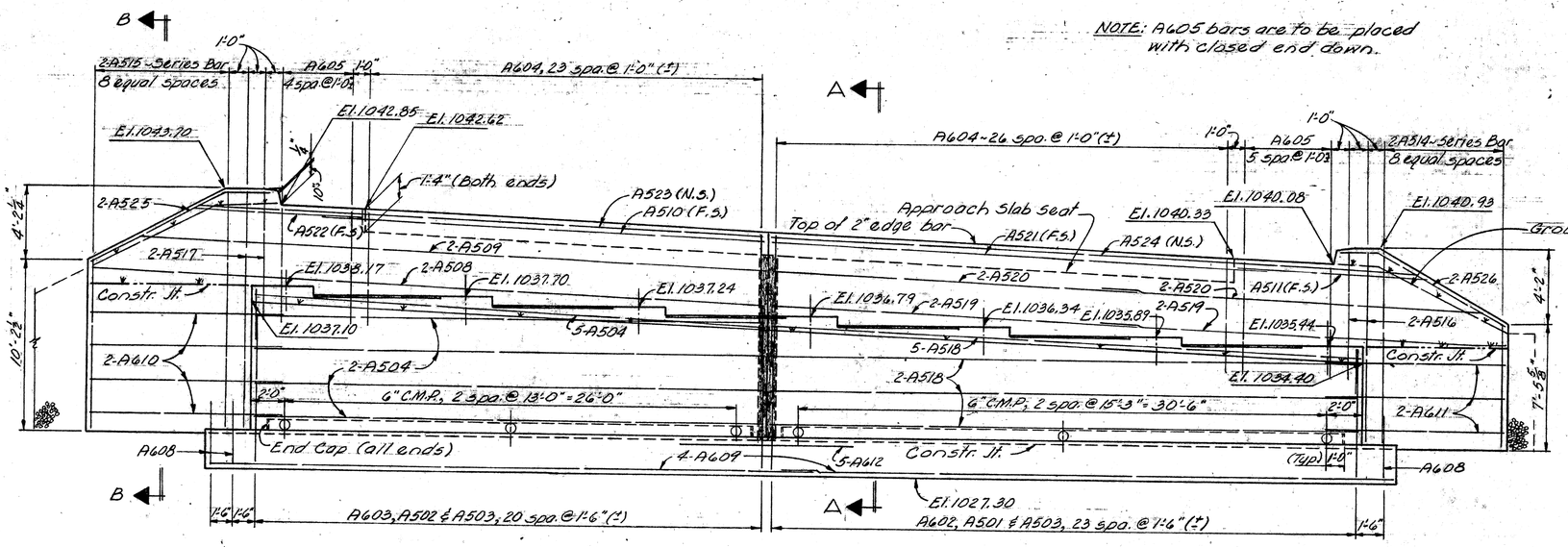
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CRAWFORD COUNTY CRA-30N-4.04

490
541



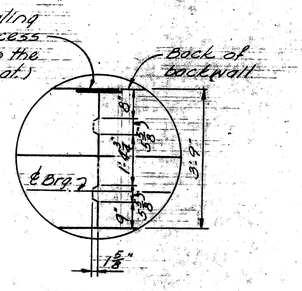
PLAN



ELEVATION

NOTE: A605 bars are to be placed with closed end down.

NOTE: Use A503 bars to adjust for the changes in elevations of the bridge seats.



CONTRACTION JOINT DETAIL

NOTE

N.S. indicates near side
F.S. indicates far side

For Sections A-A & B-B see Sheet No. 429, and for additional notes see Sheet No. 427

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

FORWARD ABUTMENT DETAILS
BRIDGE NO. CRA-30N-0851 LEFT
OVER N.E.W. R.R.
CRAWFORD COUNTY STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
V.L.A	BDP		JKS	DGV		

7306

BILLS CO.—1958—50—465

MICROFILMED
FEB 22 1963

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CRAWFORD COUNTY CRA-30N-4.04

431
541

NOTES

BRIDGE SEAT REINFORCING: Special care shall be taken in placing the reinforcing steel in the vicinity of the bridge seat, so as to avoid interference with the drilling of anchor bolt holes. This applies to the Forward Pier only.

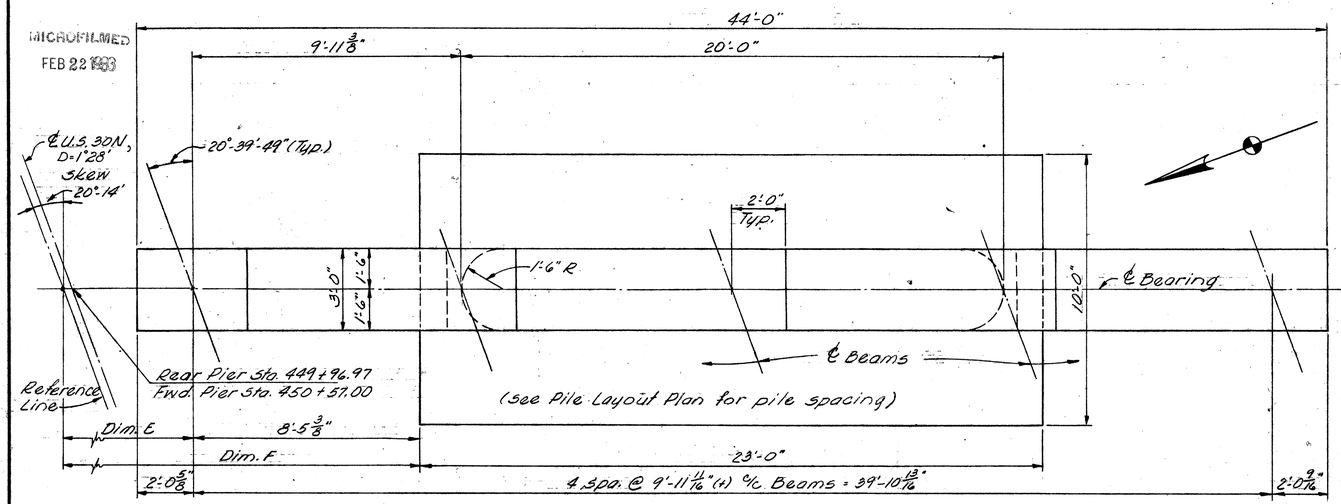
PROCEDURE: The embankment shall be placed and compacted up to the finished spill-thru slope and to the level of the subgrade for a distance of 200 feet back of the abutments. After a waiting period of 90 days the piers may be constructed. This waiting period may be shortened if settlement bubs indicate that settlement has ceased.

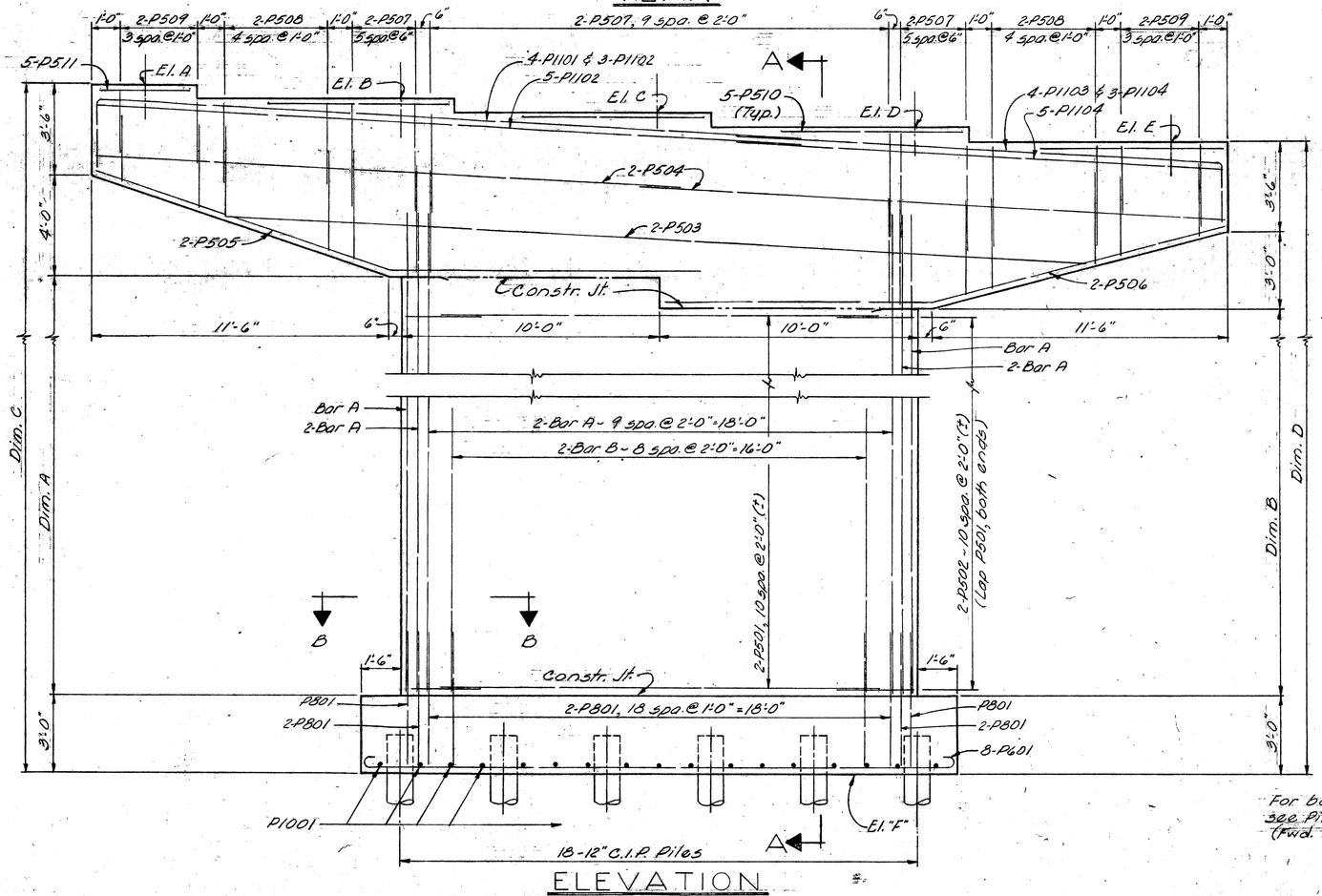
PILES shall be driven to a minimum bearing capacity of 35 tons per pile.

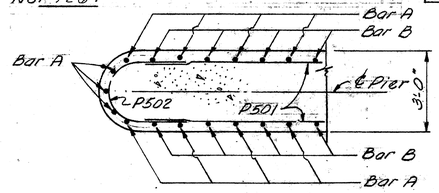
For Anchor Bolt Layout see Sheet No. 426.

ELEVATIONS						
Location	A	B	C	D	E	F
Rear Pier	1034.58	1034.11	1033.64	1033.17	1032.71	1002.50
Forward Pier	1035.01	1034.55	1034.08	1033.62	1033.16	1004.50

	DIMENSIONS						BARS	
Location	Dim. A	Dim. B	Dim. C	Dim. D	Dim. E	Dim. F	Bar A	Bar B
Rear Pier	21'-6 7/8"	20'-8 3/8"	32'-0 9/8"	30'-2 3/8"	27'-11"	36'-4 3/8"	P802	P804
Forward Pier	20'-0 1/8"	19'-2"	30'-6"	28'-8"	27'-5 1/8"	35'-10 5/8"	P803	P805



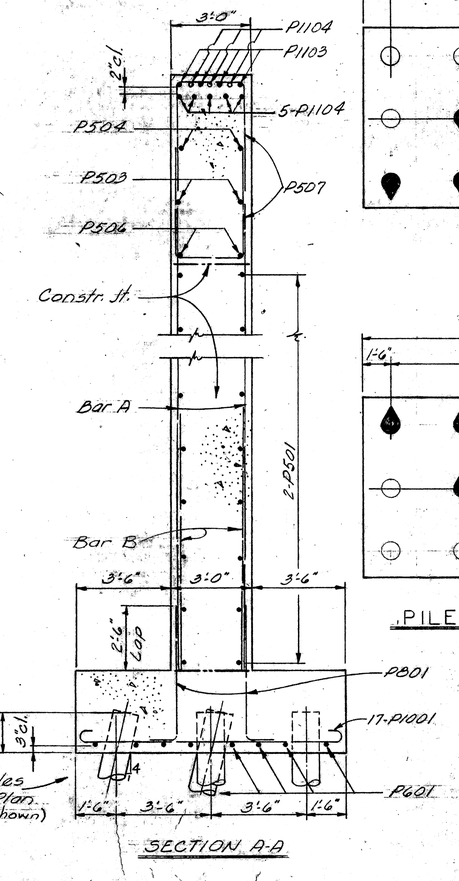


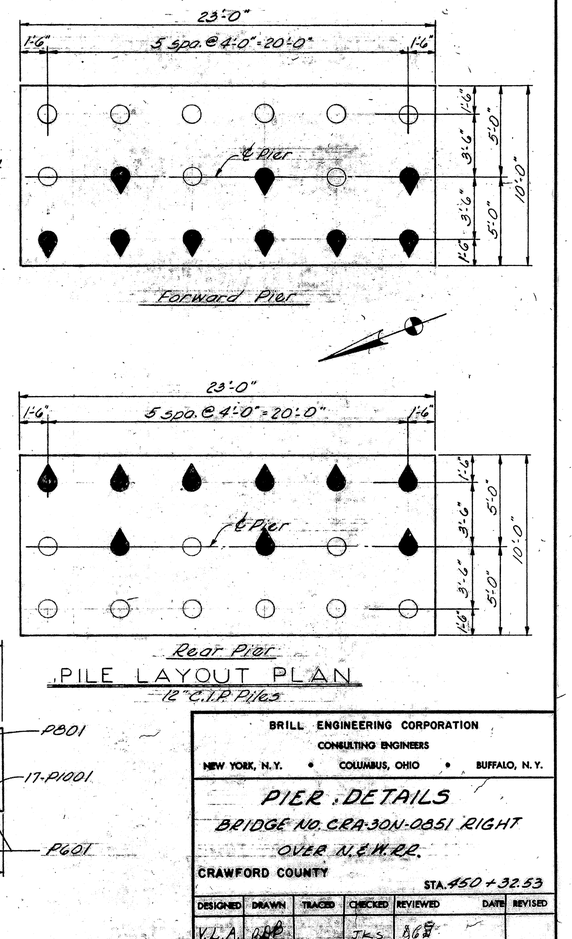


LEGEND

○ indicates vertical pile.

● indicates battered pile, 1:4.





BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

PIER DETAILS

BRIDGE NO. CRA-30N-0851 RIGHT
OVER N.E.W.R.R.
CRAWFORD COUNTY
STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
V.L.A.			J.K.S.			

7307

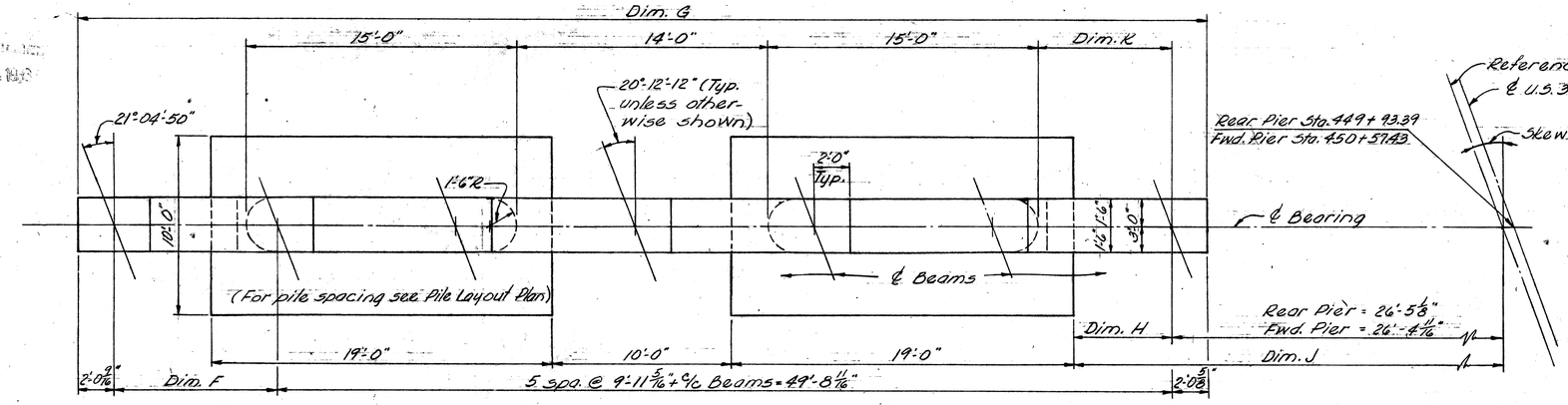
HILLS CO.—1958M—50—4-63

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

432
541

CRAWFORD COUNTY CRA-30N-4.04

FEB 24 1960

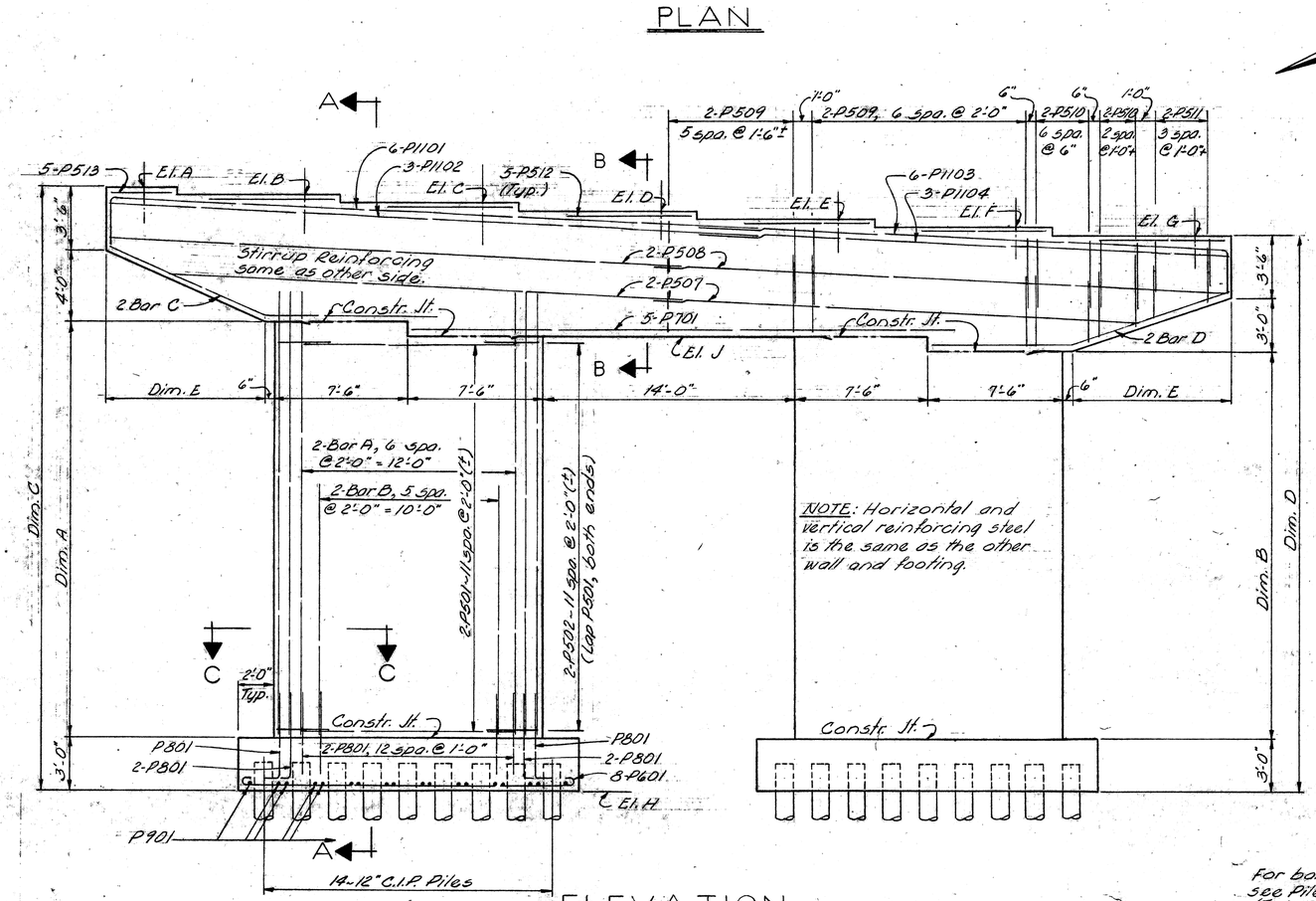


PLAN

NOTE

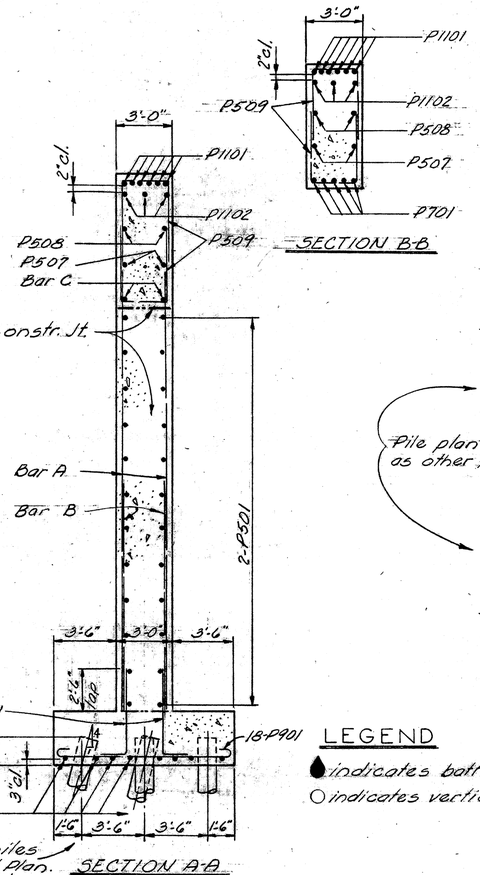
For additional notes see "Pier Details" for CRA-30N-0851: Right, Sheet No. 431

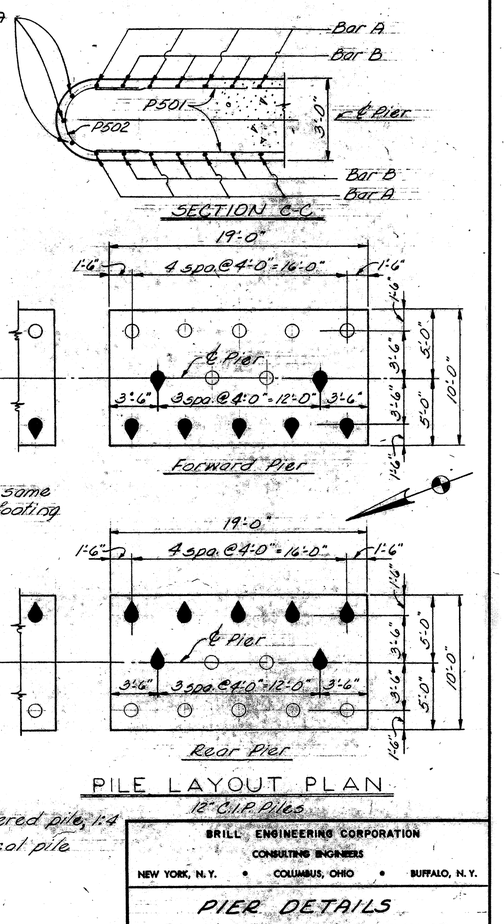
For Anchor Bolt Layout see sheet No. 426



NOTE: Horizontal and vertical reinforcing steel is the same as the other wall and footing.

ELEVATION





LEGEND

● indicates battered pile, 1:4

○ indicates vertical pile

PILE LAYOUT PLAN

12" C.I.P. Piles

Location	ELEVATIONS A	B	C	D	E	F	G	H	J	DIMENSIONS A	B	C	D	E	F	G	H	J	K	BAR A	B	C	D
Rear Pier	1036.97	1036.57	1036.11	1035.65	1035.18	1034.72	1034.26	1002.50	1028.57	23'-11 5/8"	22'-3"	34'-5 3/8"	31'-9"	8'-8 11/16"	8'-7 1/2"	62'-5 3/8"	5'-2 7/16"	31'-7 3/16"	7'-2 7/16"	P802	P804	P503	P505
Forward Pier	1037.39	1036.94	1036.49	1036.03	1035.57	1035.12	1034.66	1004.50	1028.98	22'-4 3/8"	20'-8"	32'-10 3/8"	30'-2"	9'-3"	9'-8 1/2"	63'-6"	5'-8 3/8"	32'-1 1/16"	7'-8 3/8"	P803	P805	P504	P506

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

PIER DETAILS

BRIDGE NO. CRA-30N-0851 LT.
OVER N.Y.N. RR.
CRAWFORD COUNTY STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
V.L.A.	BDB		J.F.S.	A.G.J.		

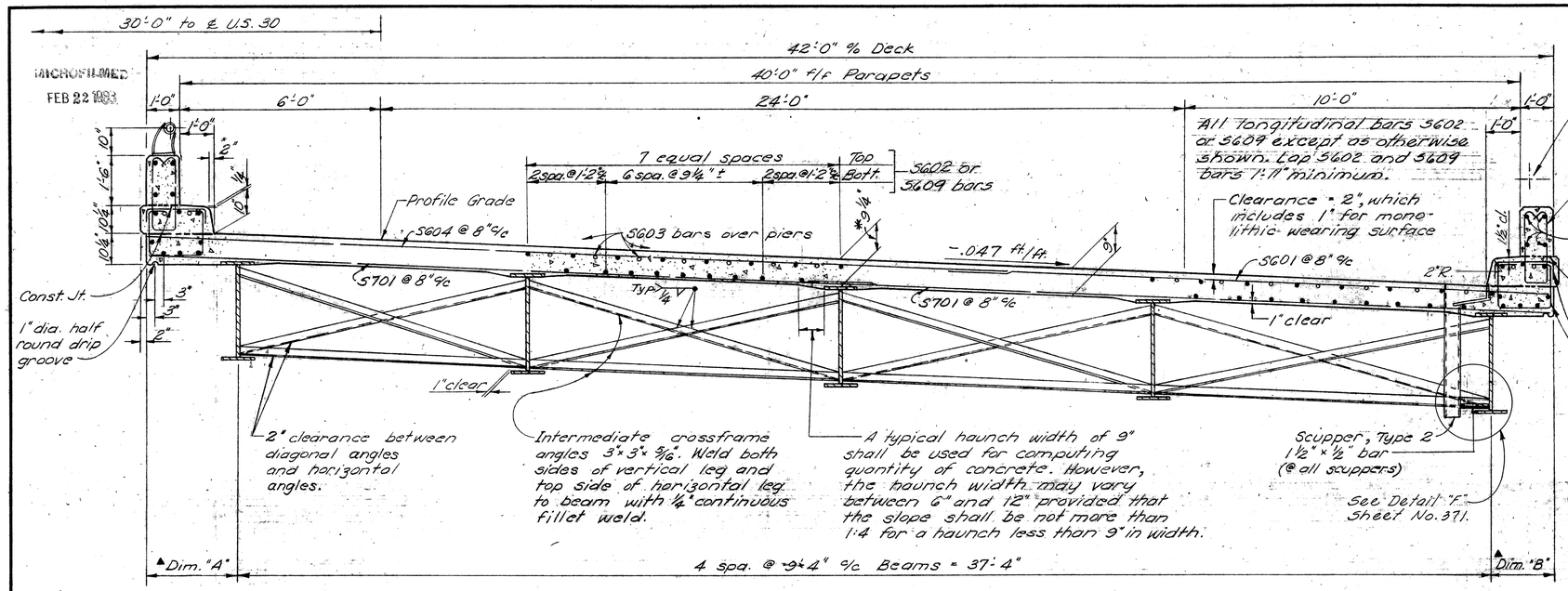
7808

HILLS CO.—1958—30—448

FED. ROAD DIVISION	STATE	PROJECT		433 541
2	OHIO			

CRAWFORD COUNTY CRA-30N-4.04

MICROFILMED FEB 22 1983



TRANSVERSE SECTION

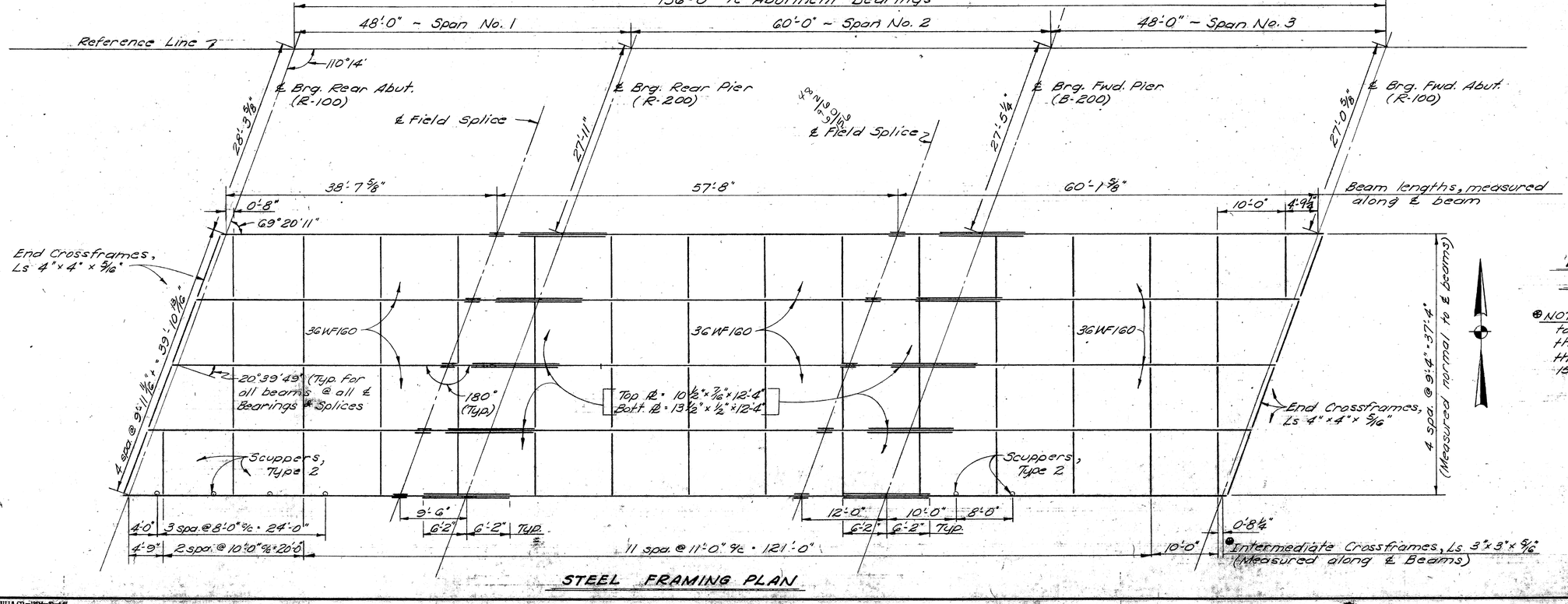
*DECK SLAB DEPTH - The distance shown from top of deck slab to top of steel beam is the nominal dimension. The quantity of deck concrete to be paid for shall be based on this dimension, even though deviation from it may be necessary because the top flange of the beam may not have the exact camber or conformation required to place it parallel to the finished grade.

▲Radial Dimensions

Location	℄ Brg. Rear Abut.	Mid-Point Span No. 1	℄ Brg. Rear Pier	Mid-Point Span No. 2	℄ Brg. Fwd. Pier	Mid-Point Span No. 3	℄ Brg. Fwd. Abut.
Dim. "A"	2'-5⅛"	2'-9⅛"	2'-11⅛"	2'-11¼"	2'-8½"	2'-4⅜"	1'-10½"
Dim. "B"	2'-6"	2'-1⅛"	1'-9⅞"	1'-8½"	1'-9⅞"	2'-1"	2'-6"

REFERENCES TO STANDARD DRAWINGS	
DETAIL	STD. DWG.
Rocker and Bolster	RB-1-65
End Dam	SD-1-65
Bolted Field Splice (36WF160)	SD-1-65
Scuppers (Type 2)	SD-1-65
End Crossframes	SD-1-65
Curb Plates	SD-1-65
Moment Plate Weld	SD-1-65

For additional details and notes see Sh. No. 436.



STEEL FRAMING PLAN

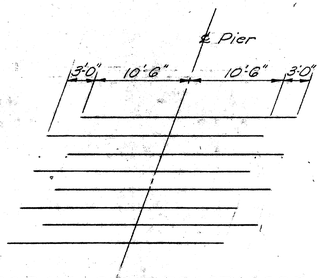


DIAGRAM SHOWING STAGGER OF S603 BARS OVER PIERS

⊕NOTE: Crossframes may be adjusted to clear the web splice plate of the Bolted Field Splice; however, the spacing shall not exceed 15 feet.

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

SUPERSTRUCTURE DETAILS
BRIDGE No. CRA-30N-0851 Rt.
OVER N. & W. R.R.

CRAWFORD COUNTY STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVISED	DATE	REVISED
V.L.A	V.V.		6-8 3-83	D.G.K.		

7309

BILLS CO.—1975M—80-446

FED. RD. DIVISION	STATE	PROJECT		
2	OHIO			

434
541

CRAWFORD COUNTY CRA-30N-4.04

R501 - Intermediate prpt. panels
R507 - End parapet panels
Included with railing for payment

30'-0" to ℄ U.S. 30

Varies % Deck (59.69' Average)

Varies f/f Parapets (57.69' Average)

1'-0" | 6'-0" | Varies | 24'-0" | 6'-0" | 1'-0"

1'-0"

For longitudinal reinforcing in this slab span see "Superstructure Details", Sh. No. 7312.

All longitudinal bars S602 except as otherwise shown. Lap S602 bars 1'-11" minimum.

10 3/8" | 10 1/2" | 1 1/2" | 10"

9"

.047 ft²/ft.

3 1/4"

S604, S605 or S606 bars @ 8" %

7 equal spaces: 2 spa. @ 1'-2" | 6 spa. @ 9 1/4" ± | 2 spa. @ 1'-2" | Top / Bott. S602

S601 bars @ 8" %

Clearance = 2" which includes 1" for monolithic wearing surface.

S603 bars over piers

Profile Grade

10 1/4" | 2" | 2 1/2"

See Std. Dwg. BR-1-65 for details of Type 1 post, railing, parapet and endpost.

S503 spa. @ 1'-6" %, except where necessary to clear parapet deflection joints.

R501 - Intermediate prpt. panels
R502 - End parapet panels
Included with railing for payment

Class "C" concrete for parapets above this const. jt. is included with railing for payment.

S502 @ 1'-6" %
S501 @ 1'-6" %

Const. Jt.

1" dia. half round drip groove

3" | 3" | 2"

S702, S703 or S704 bars @ 8" %

Typ. 1/4

1" clear

1" clear

S701 @ 8" %

Intermediate crossframe angles 3" x 3" x 5/16". Weld both sides of vertical leg and top side of horizontal leg to beam with 1/4" continuous fillet weld.

A typical haunch width of 9" shall be used for computing quantity of concrete. However, the haunch width may vary between 6" and 12" provided that the slope shall be not more than 1:4 for a haunch less than 9" in width.

Scupper, Type 2 or Special

1 1/2" x 1/2" bar (@ all scuppers)

See Detail "F" Sheet No. 371

2' clearance between diagonal angles and horizontal angles

Dim. "A" | Varies | 5 spa. @ 9'-4" % c Beams = 46'-8" | Dim. "B"

Location	℄ Brg. Rear Abut.	Mid-Point Span No. 1	℄ Brg. Rear Pier	Mid-Point Span No. 2	℄ Brg. Fwd. Pier	Mid-Point Span No. 3	℄ Brg. Fwd. Abut.
Dim. "A"	2'-0 1/4"	2'-5 3/4"	2'-9 1/4"	2'-10 7/8"	2'-9 3/8"	2'-5 3/4"	2'-0 1/4"
Dim. "B"	2'-8"	2'-2 3/8"	1'-10 7/8"	1'-9 3/8"	1'-10 7/8"	2'-2 1/2"	2'-8"

✱NOTE: All crossframes shall be placed normal to the ℄ of the South Fascia beam. The crossframe spacing may be adjusted to clear the web splice plate of the Bolted Field Splice; however, the spacing shall not exceed 15 feet.

* See Deck Slab note Sheet No. 433.

MICROFILMED FEB 22 1983

TRANSVERSE SECTION

STEEL FRAMING PLAN

1'-1 3/4" | 42'-2 3/4" | ℄ Field Splice | 61'-10 3/16" | ℄ Field Splice | 63'-10 1/4" | 4'-7 3/16"

9'-6 11/16" | 12'-0 13/16"

21°04'50" (Typ. for North Fascia Beam @ ℄ Bearings & Splices)

8'-5 5/8" | 8'-7 1/2" | 9'-5 3/4" | 9'-8 1/8" | 10'-0" | 10'-6 1/4"

7'-9 3/8"

5 spa. @ 9'-11 3/16" + 4 c. = 49'-8 11/16"

36WF170 | 36WF170 | 36WF170

20°12'12" (Typ. for all beams @ ℄ Bearings & Splices, except North Fascia beam)

End Crossframes, Ls 4" x 4" x 5/16"

180° (Typ.)

10'-0" | 10'-0"

End Crossframes, Ls 4" x 4" x 5/16"

Top: 2 - 10 1/2" x 7/16" x 14'-2"
Bott: 2 - 13 1/2" x 1/2" x 14'-2"

5 spa. @ 9'-4" % = 46'-8" (Measured normal to ℄ beam)

Varies

41'-11 7/8" | 61'-5 7/8" | 63'-5 7/8"

Typ. for all except North Fascia Beam (Measured along ℄ beam)

✱Scuppers, Special | Scuppers, Type 2 | 7'-1" | 7'-1" Typ. | 7'-1" | 7'-1" Typ. | Scuppers, Type 2

10°12'12" (Typ.)

3'-6" | 12'-0"

4'-0" | 5 spa. @ 7'-0" % = 35'-0" | 16'-0" | 8'-0"

10'-0" | 11'-0" | 2 spa. @ 11'-6" % = 23'-0" | 10'-0" | 5 spa. @ 11'-0" % = 55'-0" | 10'-0" | 4 spa. @ 11'-0" % = 44'-0" | 3'-11 5/8" ⊛ Intermediate Crossframes, Ls 3" x 3" x 5/16" (Spacings measured along ℄ beam)

26'-5 1/2" | ℄ Brg. Rear Abut. (R-100) | 26'-5 1/8" | ℄ Brg. Rear Pier (R-200) | 26'-4 11/16" | ℄ Brg. Fwd. Pier (B-200) | 26'-4 3/8" | ℄ Brg. Fwd. Abut. (R-100)

167'-0" % c Abut. Bearings

51'-6" - Span No. 1 | 64'-0" - Span No. 2 | 51'-6" - Span No. 3

69°46' (Typ.) | Skew: 20°14' | Reference Line

Dimensions for North Fascia Beam Only (Measured along ℄ beam)

For notes and references to Standard Drawings see "Superstructure Details", Sh. No. 433, with the exception that the Bolted Field Splice Detail shall be for a 36WF170, instead of a 36WF160.

For additional details and notes see Sh. No. 436.

▲ Radial Dimensions

✱ For Special Scupper Detail see Sh. No. 436.

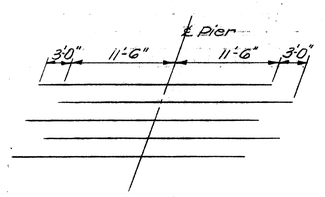


DIAGRAM SHOWING STAGGER OF S603 BARS OVER PIERS

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SUPERSTRUCTURE DETAILS
BRIDGE No. CRA-30N-0851 LT.
OVER N. & W. R.R.

CRAWFORD COUNTY | STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
V.L.A.	V.N.		C.B. J.K.S.	B.G.L.		

7310

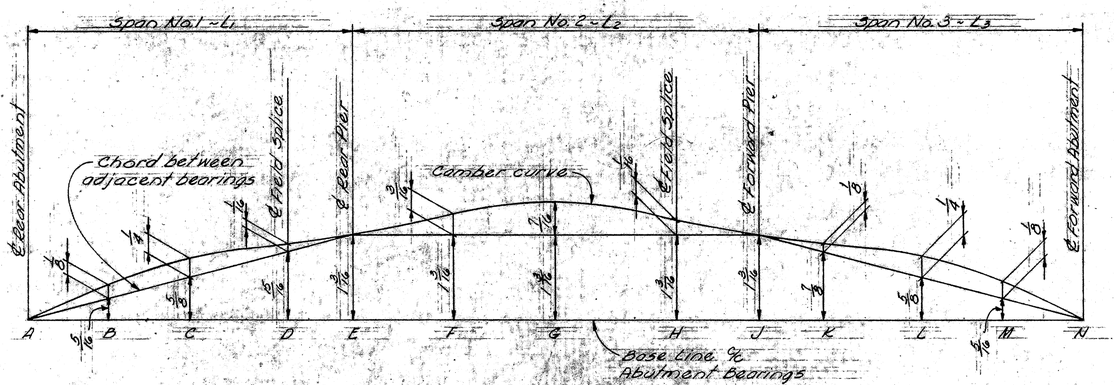
HILLS CO.—1954—50—465

MICROFILMED
FEB 22 1993

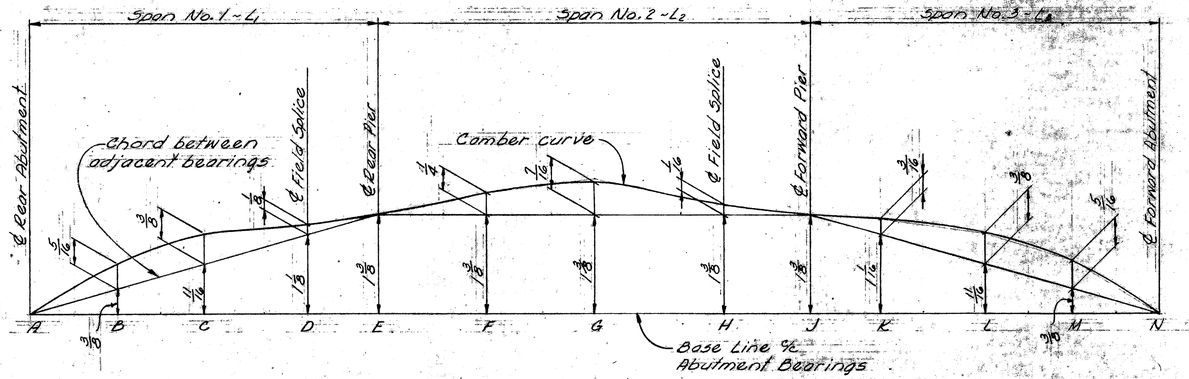
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

435
541

CRAWFORD COUNTY CRA-30N-4.04



CAMBER DIAGRAM
(Right Bridge)



CAMBER DIAGRAM
(Left Bridge)

Dimensions in inches

DEFLECTION AND CAMBER TABLE

Location	Span No.1 ~ L1			Span No.2 ~ L2			Span No.3 ~ L3		
	¼ L1 B	½ L1 C	℄ Field Splice D	¼ L2 F	½ L2 G	℄ Field Splice H	¼ L3 K	½ L3 L	¾ L3 M
Defl. due to weight of steel	0	0	0	0	1/16	0	0	0	0
Defl. due to remaining dead load	3/16	3/16	0	1/8	1/4	0	1/16	3/16	1/8
Adjustment reqd. for vertical curve	1/16	1/8	1/16	1/8	3/16	1/8	1/8	1/8	1/16
Adjustment reqd. for horiz. curve	-1/16	-1/16	0	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16
Required Shop Camber	1/8	1/4	1/16	3/16	1/16	1/16	1/8	1/4	1/8

DEFLECTION AND CAMBER TABLE

Location	Span No.1 ~ L1			Span No.2 ~ L2			Span No.3 ~ L3		
	¼ L1 B	½ L1 C	℄ Field Splice D	¼ L2 E	½ L2 G	℄ Field Splice H	¼ L3 K	½ L3 L	¾ L3 M
Defl. due to weight of steel	1/16	1/16	0	0	1/16	0	0	1/16	1/16
Defl. due to remaining dead load	3/16	3/16	0	3/16	1/4	0	1/8	3/16	3/16
Adjustment reqd. for vertical curve	1/8	3/16	1/8	1/8	3/16	1/8	1/8	3/16	1/8
Adjustment reqd. for horiz. curve	-1/16	-1/16	0	-1/16	-1/16	-1/16	-1/16	-1/16	-1/16
Reqd. Shop Camber	5/16	3/8	1/8	1/4	1/16	1/16	3/16	3/8	5/16

(RIGHT BRIDGE) DECK ELEVATIONS (given at face of curb)

Location	Span No.1 ~ L1				Span No.2 ~ L2					Span No.3 ~ L3			
	North Fascia												
℄ U.S.30N Station	449+38.63	449+50.74	449+62.85	449+71.9	449+87.69	450+02.22	450+17.36	450+35.54	450+47.65	450+59.76	450+71.86	450+83.98	450+96.09
* Construction Elev.	1039.38	1039.50	1039.62	1039.73	1039.81	1039.93	1040.05	1040.15	1040.23	1040.30	1040.37	1040.43	1040.47
	South Fascia												
℄ U.S.30N Station	449+23.70	449+35.92	449+48.14	449+62.82	449+72.62	449+87.90	450+03.20	450+21.53	450+33.77	450+46.00	450+58.23	450+70.45	450+82.69
* Construction Elev.	1037.44	1037.57	1037.70	1037.82	1037.90	1038.00	1038.17	1038.28	1038.36	1038.44	1038.52	1038.58	1038.62

(LEFT BRIDGE) DECK ELEVATIONS (given at face of curb)

Location	Span No.1 ~ L1				Span No.2 ~ L2					Span No.3 ~ L3			
	North Fascia												
℄ U.S.30N Station	449+72.22	449+84.92	449+97.61	450+12.82	450+22.98	450+38.75	450+54.51	450+73.42	450+86.03	450+98.71	451+11.39	451+24.06	451+36.73
* Construction Elev.	1041.76	1041.90	1042.01	1042.12	1042.20	1042.33	1042.45	1042.55	1042.62	1042.69	1042.76	1042.82	1042.85
	South Fascia												
℄ U.S.30N Station	449+51.65	449+64.83	449+77.21	449+92.56	450+02.80	450+18.69	450+34.58	450+53.67	450+66.38	450+79.16	450+91.96	451+04.75	451+17.53
* Construction Elev.	1039.03	1039.16	1039.27	1039.38	1039.46	1039.59	1039.70	1039.79	1039.86	1039.93	1040.00	1040.05	1040.08

* NOTE
The Construction Elevations shown are those required before the concrete deck is placed. Proper allowance has been made for the dead load deflection caused by the weight of the concrete.

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SUPERSTRUCTURE DETAILS
BRIDGE NO. CRA-30N-0851 LT/RT
OVER N.&W. RR.
CRAWFORD COUNTY
STA. 450+32.53

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
V.L.A.	BPB		JLS	DGL		

7311

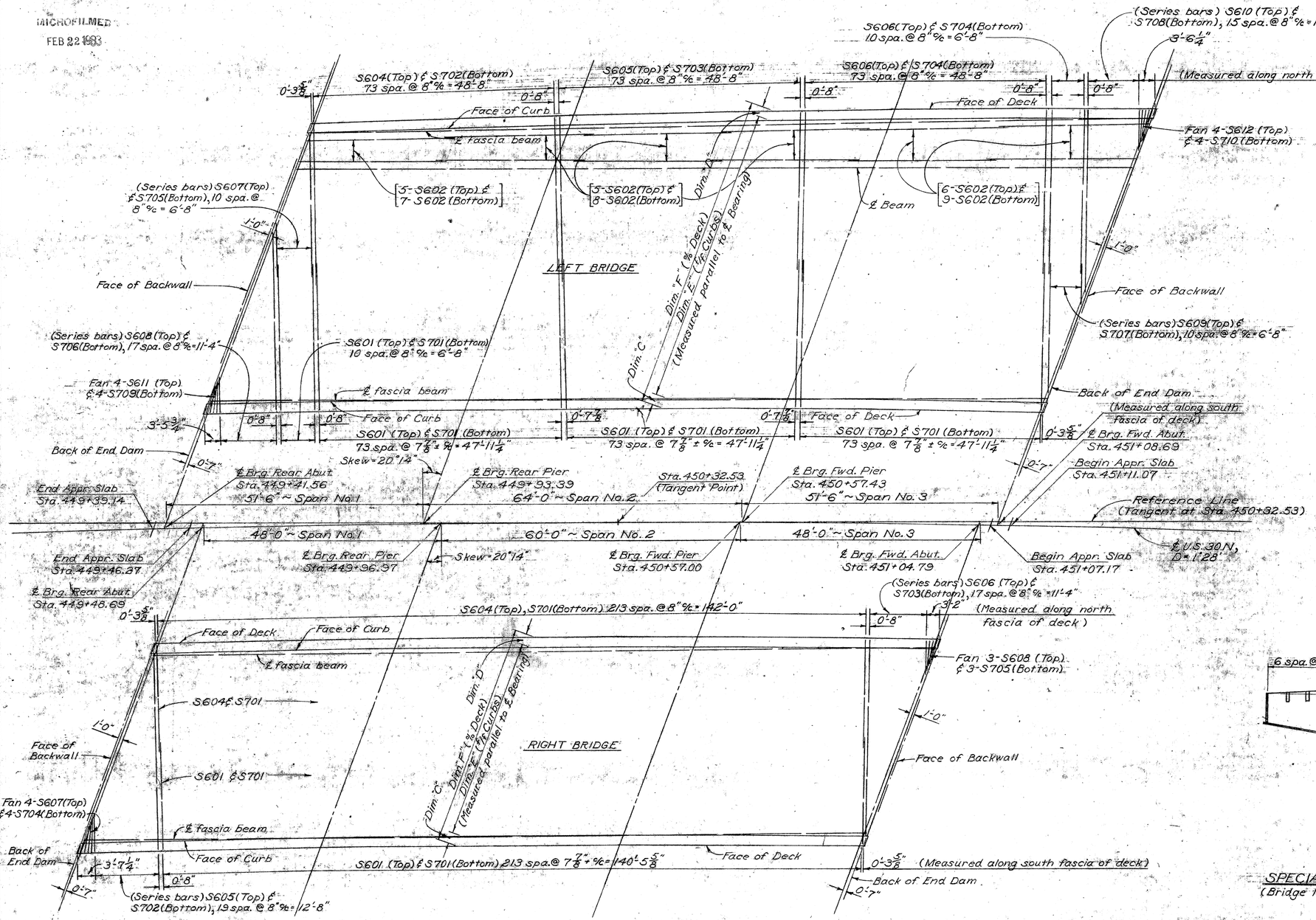
HILLS CO.—1934—30—446

MICROFILMED
FEB 22 1983

FED. SECTION	STATE	PROJECT	
2	OHIO		

436
541

CRAWFORD COUNTY CRA-30N-4.04



DECK PLAN AND REINFORCING LAYOUT

LEFT BRIDGE

Location	℄ Brg. Rear Abut.	Mid-Point Span No. 1	℄ Brg. Rear Pier	Mid-Point Span No. 2	℄ Brg. Fwd. Pier	Mid-Point Span No. 3	℄ Brg. Fwd. Abut.
Dim. "C"	2'-1 7/16"	2'-1 3/16"	2'-1 5/16"	2'-1 5/16"	2'-1 1/2"	2'-1 1/2"	2'-1 3/16"
Dim. "D"	2'-1 7/16"	2'-1 7/16"	2'-1 3/16"	2'-1 3/16"	2'-1 5/16"	2'-1 5/16"	2'-1 1/2"
Dim. "E"	58'-2 3/16"	58'-7 1/16"	59'-0 3/16"	59'-7"	60'-1 3/16"	60'-6 3/16"	60'-11 3/16"
Dim. "F"	62'-6 3/16"	62'-11 3/16"	63'-4 3/16"	63'-10 3/16"	64'-4 3/16"	64'-9 3/16"	65'-2 3/16"

RIGHT BRIDGE

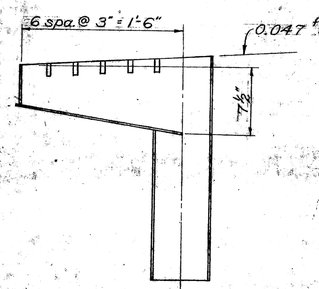
Location	℄ Brg. Rear Abut.	Mid-Point Span No. 1	℄ Brg. Rear Pier	Mid-Point Span No. 2	℄ Brg. Fwd. Pier	Mid-Point Span No. 3	℄ Brg. Fwd. Abut.
Dim. "C"	2'-1 7/16"	2'-1 3/16"	2'-1 3/16"	2'-1 5/16"	2'-1 5/16"	2'-1 1/2"	2'-1 1/2"
Dim. "D"	2'-1 5/16"	2'-1 3/16"	2'-1 3/16"	2'-1 3/16"	2'-1 5/16"	2'-1 5/16"	2'-1 3/16"
Dim. "E"	40'-10 7/16"	40'-9 5/16"	40'-8 3/16"	40'-7"	40'-5 13/16"	40'-4 11/16"	40'-3 5/8"
Dim. "F"	45'-2 7/16"	45'-1 5/16"	45'-0"	44'-10 1/16"	44'-8 3/16"	44'-7 1/16"	44'-6 1/16"

NOTES

Longitudinal reinforcing bars (S602) shall be uniformly spaced in the top of the slab. In the bottom of the slab the bars shall be spaced so two-thirds of the bars are in the middle half of the slab span.

For longitudinal reinforcing not shown see the Transverse Section on Sheet No. 433 and Sheet No. 434.

Transverse bars shall be lapped a minimum of 1'-11" for No. 6 bars and 2'-2" for No. 7 bars.



SPECIAL SCUPPER DETAIL
(Bridge No. CRA-30N-0851 Left)

For additional scupper details see Std. Dwg. SD-1-65, Sheet No. 2.

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SUPERSTRUCTURE DETAILS
BRIDGE No. CRA-30N-0851 Lt/Rt
OVER N. & W. R.R.
CRAWFORD COUNTY
STA. 450+80.53

DESIGNED	DRAWN	TRACED	CHECKED	APPROVED	DATE	REVISED
V.L.A.	V.L.A.		C.W. 2/16/82	A.G.T.		

1982

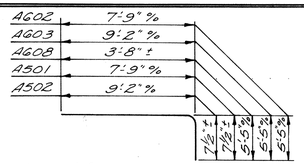
HILLS CO.—1981M—10-445

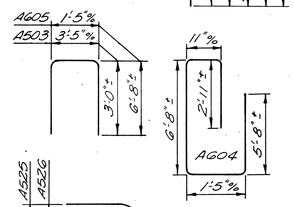
MICROFILMED
FEB 22 1983

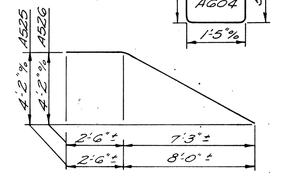
BRIDGE NO. CRA-30N-0851 LT.

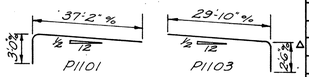
MARK	NO.	LENGTH	WEIGHT	SHP
ABUTMENTS				
AG01	8	34'-1"	410	S
AG02	45	13'-0"	879	B
AG03	43	14'-5"	931	B
AG04	98	16'-11"	2490	B
AG05	24	14'-5"	520	B
AG06	6	11'-11"	107	S
AG07	8	8'-11"	107	S
AG08	6	8'-11"	80	B
AG09	8	35'-2"	423	S
AG10	8	11'-0"	132	S
AG11	6	9'-11"	89	S
AG12	10	10'-0"	150	S
A501	45	8'-3"	387	B
A502	43	9'-8"	434	B
A503	88	9'-2"	841	B
A504	24	29'-8"	743	S
A505	13	31'-2"	423	S
A506	2	40'-1"	84	S
A507	4	38'-8"	161	S
A508	2	39'-2"	82	S
A509	4	36'-6"	152	S
A510	3	25'-9"	81	S
A511	3	10'-8"	33	S
A512	1	34'-8"	36	S
A513	1	33'-8"	35	S
A514	4	7'-1"		
	Series of 9	to 11'-1"	341	S *
A515	4	9'-10"		
	Series of 9	to 13'-10"	444	S *
A516	8	11'-3"	94	S
A517	8	14'-0"	117	S
A518	11	33'-11"	389	S
A519	4	22'-0"	92	S
A520	4	21'-6"	90	S
A521	1	29'-0"	30	S
A522	1	9'-2"	10	S
A523	1	32'-8"	34	S
A524	1	37'-8"	39	S
A525	4	11'-6"	48	B
A526	4	10'-10"	45	B
PIERS				
P1101	12	39'-11"	2545	B
P1102	6	37'-2"	1185	S
P1103	12	32'-1"	2046	B
P1104	6	29'-10"	951	S
P901	72	12'-2"	2978	B
P801	128	6'-2"	2108	B
P802	40	25'-8"	2741	S
P803	40	24'-1"	2572	S
P804	24	13'-9"	881	S
P805	24	12'-11"	828	S
P701	10	30'-4"	620	S

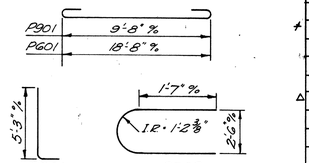
BENDING DIAGRAM

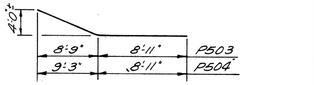


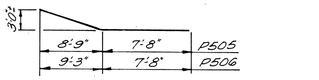


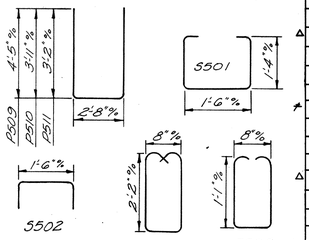


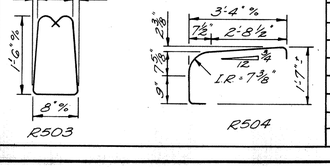












MARK	NO.	LENGTH	WEIGHT	SHP
PIERS (cont'd.)				
PG01	32	20'-0"	961	B
P501	96	12'-0"	1202	S
P502	96	7'-0"	701	B
P503	2	18'-7"	39	B
P504	2	18'-11"	39	B
P505	2	16'-11"	35	B
P506	2	17'-5"	36	B
P507	8	28'-9"	240	S
P508	8	32'-7"	272	S
P509	104	11'-3"	1220	B
P510	80	10'-3"	855	B
P511	32	8'-9"	292	B
P512	60	7'-0"	438	S
P513	10	3'-4"	37	S
SUPERSTRUCTURE				
S701	233	31'-7"	15042	S
S702	74	30'-5"	4601	S
S703	74	31'-3"	4727	S
S704	85	32'-1"	5574	S
S705	1	8'-5"		
	Series of 11	to 26'-9"	395	S
S706	1	7'-0"		
	Series of 18	to 35'-4"	779	S †
S707	1	9'-9"		
	Series of 11	to 28'-1"	425	S △
S708	1	8'-0"		
	Series of 16	to 36'-9"	732	S •
S709	4	6'-0"	49	S
S710	4	7'-0"	57	S
S601	233	36'-2"	12657	S
S602	669	29'-10"	29978	S
S603	91	26'-0"	3554	S
S604	74	25'-6"	2834	S
S605	74	26'-4"	2927	S
S606	85	27'-4"	3490	S
S607	1	3'-6"		
	Series of 11	to 21'-10"	209	S △
S608	1	7'-0"		
	Series of 18	to 35'-4"	572	S †
S609	1	14'-6"		
	Series of 11	to 32'-10"	391	S △
S610	1	8'-0"		
	Series of 16	to 36'-9"	538	S •
S611	4	6'-0"	36	S
S612	4	7'-0"	42	S
S501	227	4'-11"	1164	B
S502	227	2'-6"	592	B
S503	246	5'-7"	1433	B

MARK	NO.	LENGTH	WEIGHT	SHP
RAILING				
R501	72	15'-2"	Included with railing for payment	S
R502	8	15'-10"		S
R503	12	4'-2"		B
R504	8	5'-4"		B
R505	8	3'-5"		B
R506	8	3'-0"		S
R507	8	16'-3"		S

REINFORCING STEEL FOR 2- BRIDGES.

BAR SIZE is included in the bar mark. The first digit where three digits are used and the first two digits where four are used, indicate the bar size number. For example, A700 is a number 7 size bar and A1014 is a number 10 size bar.

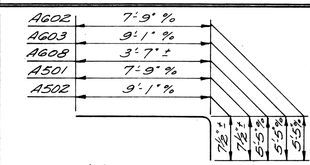
LEGEND

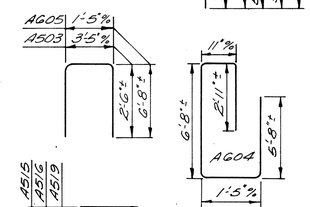
* Varies by 6" increments
◨ Varies by 7" increments
† Varies by 1'-8" increments
△ Varies by 1'-10" increments
• Varies by 1'-11" increments

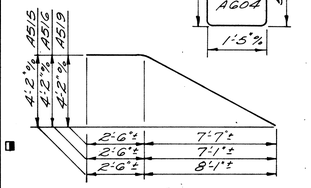
BRIDGE NO. CRA-30N-0851 RT.

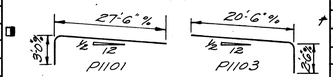
MARK	NO.	LENGTH	WEIGHT	
ABUTMENTS				
AG01	16	25'-4"	609	S
AG02	40	13'-0"	781	B
AG03	20	14'-4"	431	B
AG04	50	16'-11"	1270	B
AG05	30	14'-5"	650	B
AG06	6	12'-2"	110	S
AG07	14	9'-10"	207	S
AG08	6	8'-10"	80	B
AG09	8	10'-9"	129	S
A501	40	8'-3"	344	B
A502	20	9'-7"	200	B
A503	60	8'-2"	511	B
A504	44	22'-8"	1040	S
A505	4	32'-0"	134	S
A506	4	30'-2"	126	S
A507	2	26'-4"	55	S
A508	2	29'-4"	61	S
A509	2	15'-2"	32	S
A510	2	10'-0"	21	S
A511	4	7'-1"		
	Series of 8	to 11'-2"	305	S ◨
A512	4	8'-11"		
	Series of 8	to 13'-0"	366	S ◨ †
A513	12	11'-4"	142	S
A514	12	13'-2"	165	S
A515	2	11'-7"	24	B
A516	4	10'-6"	44	B
A517	4	31'-4"	131	S
A518	4	29'-6"	123	S
A519	2	11'-2"	23	B
PIERS				
P1101	8	30'-3"	1286	B
P1102	16	27'-6"	2338	S
P1103	8	22'-9"	967	B
P1104	16	20'-6"	1743	S
P1001	34	12'-6"	1829	B
P801	88	6'-2"	1449	B
P802	26	23'-4"	1620	S
P803	26	21'-9"	1510	S
P804	18	12'-6"	601	S
P805	18	11'-9"	565	S
PG01	16	24'-0"	577	B
P501	44	17'-0"	780	S
P502	44	7'-0"	321	B
P503	4	33'-9"	141	S
P504	8	22'-10"	191	S
P505	4	24'-4"	102	B
P506	4	22'-1"	92	B
P507	88	10'-9"	987	B
P508	40	9'-9"	407	B
P509	32	8'-3"	275	B
P510	40	7'-0"	292	S
P511	10	3'-6"	37	S
SUPERSTRUCTURE				
S701	428	21'-11"	19173	S

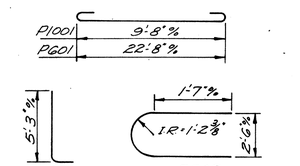
BENDING DIAGRAM

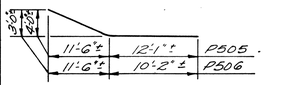


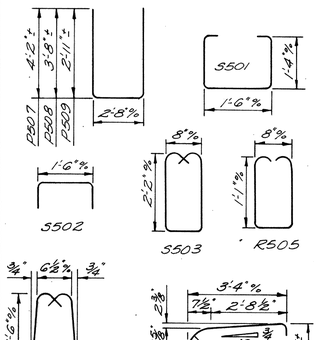


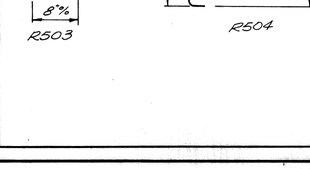












FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

CRAWFORD COUNTY CRA-30N-4.04

RT. BRIDGE (cont'd.)

MARK	NO.	LENGTH	WEIGHT	SHP
SUPERSTRUCTURE (cont'd.)				
S702	1	8'-2"		
	Series of 20	to 39'-10"	981	S †
S703	1	7'-3"		
	Series of 18	to 39'-10"	866	S •
S704	4	7'-0"	57	S
S705	3	6'-0"	37	S
S601	214	17'-2"	5518	S
S602	405	30'-0"	18,249	S
S603	64	24'-0"	2307	S
S604	214	26'-2"	8411	S
S605	1	8'-2"		
	Series of 20	to 39'-10"	721	S †
S606	1	7'-3"		
	Series of 18	to 39'-10"	636	S •
S607	4	7'-0"	42	S
S608	3	6'-0"	27	S
S609	81	17'-4"	2109	S
S501	212	4'-11"	1087	B
S502	212	2'-6"	553	B
S503	240	5'-7"	1398	B
RAILING				
R501	64	15'-8"	Included with railing for payment	S
R502	16	16'-2"		S
R503	12	4'-2"		B
R504	8	5'-4"		B
R505	8	3'-5"		B
R506	8	3'-0"		S
REPLACEMENT BARS (both bridges)				
RE1100	1	8'-6"		S
RE1000	1	8'-2"		S
RE900	1	7'-10"		S
RE800	1	7'-6"		S
RE700	3	7'-2"		S
RE600	6	6'-11"		S
RE501	2	6'-7"		S

BRILL ENGINEERING CORPORATION
CONSULTING ENGINEERS
NEW YORK, N.Y. • COLUMBUS, OHIO • BUFFALO, N.Y.

REINFORCING STEEL LIST
BRIDGE No-CRA-30N-0851 LT./RT.
OVER N. & W. R.R.
CRAWFORD COUNTY STA.

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
V.L.A.	V.N.		GAB JRD.	DLS		

GENERAL INFORMATION

INTRODUCTION

The project consists of the relocation of 6 miles of USR 30N (Bucyrus By-pass), beginning immediately west of existing USR 30N, approximately 1.4 miles west of the USR 30N-SR 182 intersection, extending eastward to southeastward and terminating immediately south of existing USR 30N, approximately 0.7 mile east of the USR 30N-SR96 intersection.

Proposed grade indicates cuts, maximum 36 feet in depth, and fill embankments, maximum 35 feet in height.

GEOLOGY AND OBSERVATIONS OF THE PROJECT

The alignment traverses a gently rolling portion of the glaciated Mississippi Valley Plain, where moderately deep glacial drift overlies shale and limestone bedrock, of Devonian age. Several areas of poor surface drainage were observed along the project.

EXPLORATION

Exploratory borings were made by means of truck-mounted mechanical soil auger, hand auger (in areas of difficult access), and rotary type drill rig, between August 17, and 24, and on September 23 and 24, 1965.

INVESTIGATIONAL FINDINGS

Materials encountered immediately below proposed grade and in the embankment foundation areas are predominantly comprised of silt clays (A-6a) with some sandy silts (A-4a and A-4b) and clays (A-7-6), generally having low moisture contents and moisture contents in the lower portions of the plastic range.

Frost susceptible silt was encountered within three feet below proposed grade at station 505+45.

Wet materials were encountered at stations 225+70, 321+85, 365+00, 368+20, 402+55, and 521+30.

Materials containing organic matter were encountered at stations 225+70 and 376+10.

LEGEND FOR PROJECT AVERAGE RESULTS OF TESTS — 196 SAMPLES TESTED

DESCRIPTION	AASHO CLASS	OHIO CLASS	% AGG	% C SAND	% F SAND	% SILT	% CLAY	LIQUID LIMIT	PLASTICITY INDEX	WATER CONTENT	SAMPLES TESTED
Gravel	A-1-a(0)	A-1-a	66	21	5	-	8	-	NP	NP	13	1
Gravel and/or stone fragments with sand	A-1-b(0)	A-1-b	40	17	27	-	16	-	NP	NP	10	3
Coarse and fine sand	---	A-3a	10	25	28	19	15	NP	NP	15	1
Stone fragments with sand and silt	A-2-4(0)	A-2-4	35	12	20	21	12	20	3	12	2
Sandy silt	A-4(4)	A-4a	10	10	23	34	23	23	5	16	39
Silt	A-4(8)	A-4b	2	3	9	55	31	26	7	17	14
Silt and clay	A-6(9)	A-6a	6	6	13	36	39	29	12	15	102
Silty Clay	A-6(11)	A-6b	1	5	14	35	45	38	18	16	16
Clay	A-7-6(14)	A-7-6	2	3	11	36	48	45	23	19	18
Bouldery zone											

VISUAL CLASSIFICATION

- Sod or Topsoil=X'=Approximate depth.
- Auger boring-plan view.
- Drive sample boring-plan view.
- Auger boring plotted to vertical scale only.
- Drive sample boring plotted to vertical scale only.
- Water content nearly equal to or greater than liquid limit.
- Indicates a non-plastic material with a high water content.
- Free water
- Static water level
- Number of blows per "Standard Penetration" test (X/Y): X=number of blows for first 6 inches. Y=number of blows for second 6 inches.

NOTE: Figures beside borings indicate water content in percent e.g. *15*

SOIL PROFILE

(1/52)

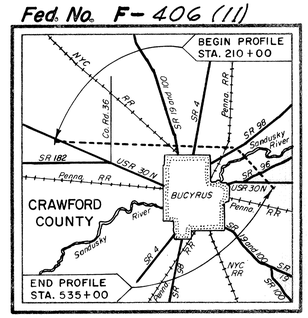
CRAWFORD COUNTY
CRA-30N-4.04

(1/13)

OHIO STATE HIGHWAY TESTING LABORATORY
1620 W. BROAD ST. COLUMBUS 23. OHIO

NOTE: INFORMATION SHOWN BY THIS SUBGRADE PROFILE WAS OBTAINED SOLELY FOR USE IN ESTABLISHING DESIGN CONTROLS FOR THE PROJECT. THE STATE OF OHIO DOES NOT GUARANTEE THE ACCURACY OF THIS DATA AND IT IS NOT TO BE CONSTRUED AS A PART OF THE PLANS GOVERNING CONSTRUCTION OF THE PROJECT.

Fed. No. F-406 (11)



LOCATION MAP

Recon - J.S.M. - 8/12/65
Drilling - Auger - C.M.C. - 8/17/65 to 8/24/65
Drilling - Core - C.S.C. - 9/23/65 and 9/24/65
Drafting - C.L.I. - 10/11/65

SOIL PROFILE

CRAWFORD COUNTY
CRA – 30 N – 4.04

OHIO STATE HIGHWAY TESTING LABORATORY
1620 W. BROAD ST. COLUMBUS 23, OHIO

2/52

2/13

SUMMARY OF SOIL TEST DATA

NOTE: NP shown in Liquid Limit and Plasticity Index columns indicates that the material is non-plastic.
*Denotes sample taken at or near grade.

STATION & OFFSET	DEPTH FROM – TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SHTL CLASS
214+00 CL	0.4-5.0	5	10	14	33	38	29	11	12	A-6a
	5.0-10.0	6	11	15	34	34	26	11	18	A-6a
217+00 CL	0.4-5.0	5	8	13	32	42	31	11	9	A-6a
	5.0-10.0	7	8	8	53	24	30	12	9	A-6a
223+00 CL	0.4-5.0	0	5	17	42	36	34	14	16	A-6a
	5.0-10.0	9	8	16	45	22	24	9	15	A-4a
	10.0-12.0	12	15	18	32	23	23	7	16	A-4a
	12.0-16.0	11	5	12	42	30	29	11	15	A-6a
225+70 CL	0.4-4.0	7	2	8	35	48	51	25	22	A-7-6
	4.0-8.0	0	6	26	39	29	34	15	20	A-6a
	8.0-10.0	25	29	30	-	16 -	NP	NP	13	A-1-b
	10.0-15.0	3	4	12	45	36	28	11	20	A-6a
	15.0-20.0	0	3	17	49	31	24	6	23	A-4a
	20.0-24.0	0	1	13	57	29	NP	NP	22	A-4b
	24.0-27.0	0	2	15	55	28	29	12	20	A-6a
	27.0-30.0	7	9	15	40	29	25	7	15	A-4a
232+00 CL	0.4-2.0	0	4	15	43	38	39	11	12	A-6a
	2.0-5.0	0	2	13	39	46	44	22	16	A-7-6
237+30 CL	0.4-3.0	0	7	20	42	31	34	15	12	A-6a
	3.0-6.0	0	9	17	36	38	27	11	14	A-6a
242+00 CL	0.4-4.0	0	6	16	35	43	40	20	14	A-6b
	4.0-8.0	0	4	18	51	27	23	6	16	A-4b
	8.0-11.0	0	4	14	51	31	21	6	15	A-4b
	11.0-15.0	0	9	15	37	39	26	11	15	A-6a
247+00 CL	0.4-5.0	0	5	12	40	43	30	11	13	A-6a
	5.0-10.0	11	7	11	36	35	31	11	18	A-6a
251+00 CL	0.4-5.0	0	4	12	33	51	41	20	19	A-7-6 *
	5.0-8.0	0	11	14	39	36	34	13	21	A-6a
	8.0-10.0	31	20	11	22	16	28	9	10	A-4a
255+50 CL	0.4-4.0	0	9	23	22	16	NP	NP	5	A-4a *
	4.0-10.0	0	8	14	37	41	30	12	15	A-6a
259+15 CL	0.4-5.0	11	8	19	32	30	33	14	10	A-6a
	5.0-8.0	8	4	13	36	37	35	14	15	A-6a
	8.0-10.0	12	6	11	35	36	24	11	13	A-6a
263+00 CL	0.4-5.0	0	4	12	37	47	52	28	22	A-7-6
271+00 CL	0.4-4.5	0	3	10	34	53	49	29	19	A-7-6
275+00 CL	0.4-4.0	0	5	20	28	47	42	19	18	A-7-6 *
279+00 CL	0.4-5.5	0	5	21	33	41	44	21	19	A-7-6
282+25 CL	0.0-5.0	19	6	15	30	30	29	12	14	A-6a
	5.0-10.0	13	8	11	33	35	32	12	16	A-6a
	10.0-15.0	13	6	14	32	35	28	11	13	A-6a
287+00 CL	0.4-5.0	0	7	12	36	43	31	14	12	A-6a *
	5.0-11.0	7	7	13	34	39	28	11	15	A-6a
292+00 CL	0.4-5.0	0	3	12	50	35	31	9	10	A-4b
294+75 CL	0.4-6.0	0	9	13	26	52	35	13	17	A-6a
298+00 CL	0.4-4.5	0	5	16	34	45	32	12	15	A-6a *
302+10 CL	0.4-5.0	16	3	8	29	44	43	21	19	A-7-6
	5.0-10.0	10	6	10	37	37	28	11	13	A-6a
	10.0-12.0	0	5	5	50	40	26	9	15	A-4b

STATION & OFFSET	DEPTH FROM – TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SHTL CLASS
307+10 CL	0.4-5.0	11	4	9	32	43	31	11	14	A-6a *
	5.0-8.0	0	3	11	36	50	34	15	13	A-6a
	8.0-10.0	8	7	13	36	36	25	11	13	A-6a
315+00 CL	0.4-5.0	0	10	5	33	52	37	17	21	A-6b
	5.0-8.0	11	10	17	32	30	25	11	17	A-6a
	8.0-10.0	0	8	15	37	40	26	11	13	A-6a
318+50 CL	0.4-5.0	0	5	13	40	42	30	11	15	A-6a
	5.0-8.0	16	8	12	29	35	27	11	16	A-6a
	8.0-10.0	8	8	13	32	39	24	11	9	A-6a
321+85 CL	0.4-5.0	0	2	14	44	40	32	14	14	A-6a
	5.0-8.0	0	0	2	56	42	28	9	21	A-4b
	8.0-12.0	0	0	1	59	40	25	9	22	A-4b
329+00 CL	0.0-5.0	0	3	18	36	43	39	20	15	A-6b
	5.0-10.0	12	10	15	44	19	26	9	15	A-4a
	10.0-12.0	10	6	12	33	39	26	11	14	A-6a
335+00 CL	0.4-5.0	6	5	13	35	41	35	15	17	A-6a
	5.0-8.0	5	7	12	34	42	32	14	16	A-6a
	8.0-10.0	11	7	12	30	40	25	11	14	A-6a
340+00 CL	0.4-5.0	0	3	11	33	53	45	22	19	A-7-6
	5.0-8.0	0	5	14	35	46	40	20	21	A-6b
	8.0-11.0	0	5	11	39	45	26	11	16	A-6a
	11.0-15.0	0	7	13	37	43	26	11	15	A-6a
345+00 CL	0.4-5.0	0	4	11	32	53	44	19	16	A-7-6
	5.0-8.0	0	5	12	35	48	36	14	20	A-6a
	8.0-11.0	0	7	13	37	43	26	11	16	A-6a
	11.0-15.0	0	7	15	37	41	24	11	14	A-6a
350+00 CL	0.4-5.0	0	9	21	30	40	37	16	17	A-6b
	5.0-8.0	9	5	15	46	25	NP	NP	14	A-4a
	8.0-10.0	0	7	11	37	45	27	11	15	A-6a
	10.0-15.0	11	7	12	32	38	26	11	15	A-6a
355+00 20'Rt	0.4-5.0	0	7	10	34	49	34	16	15	A-6b
	5.0-8.0	0	6	12	32	50	33	16	17	A-6b
	8.0-12.0	11	6	4	50	29	24	4	13	A-4b
	12.0-15.0	13	8	13	32	34	23	11	12	A-6a
361+00 CL	0.4-5.0	6	6	12	32	44	35	17	20	A-6b
	5.0-8.0	0	6	14	37	43	28	11	12	A-6a
	8.0-10.0	0	7	11	37	45	28	11	13	A-6a
365+00 25'Lt	0.4-2.0	0	5	41	23	31	29	13	12	A-6a
	2.0-6.0	0	2	10	47	41	32	12	29	A-6a
	6.0-10.0	8	6	13	31	42	24	11	15	A-6a
	10.0-15.0	8	7	12	35	38	25	11	14	A-6a
	15.0-20.0	0	8	13	35	44	28	12	14	A-6a
371+00 CL	0.4-5.0	0	5	16	35	44	39	18	14	A-6b
	5.0-8.0	9	7	12	31	41	31	12	16	A-6a
	8.0-12.0	13	6	12	32	37	27	11	14	A-6a
	12.0-16.0	0	2	3	52	43	26	9	18	A-4b
	16.0-20.0	10	6	11	34	39	26	11	16	A-6a
376+10 CL	0.4-5.0	0	5	19	39	37	28	11	22	A-6a
	5.0-8.0	0	1	11	61	27	24	6	19	A-4b
	8.0-12.0	0	7	37	38	18	NP	NP	15	A-4a
381+00 CL	0.4-2.0	0	4	7	45	44	38	14	15	A-6a
	2.0-5.0	0	4	8	40	48	42	21	16	A-7-6

STATION & OFFSET	DEPTH FROM – TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SHTL CLASS
388+20 CL	0.4-5.0	0	8	30	35	27	25	8	22	A-4a
	5.0-8.0	0	6	15	39	40	29	11	18	A-6a
	8.0-12.0	13	7	9	33	38	26	11	11	A-6a
396+60 CL	0.0-2.0	0	3	20	36	41	40	18	13	A-6b
	2.0-6.0	0	3	22	49	26	31	13	12	A-6a
402+55 CL	0.4-5.0	0	2	8	48	42	39	18	20	A-6b
	5.0-7.0	13	9	16	38	24	30	10	27	A-4a
	7.0-10.0	9	5	9	34	43	31	12	16	A-6a
	10.0-12.0	0	2	5	26	67	35	14	21	A-6a
	12.0-18.0	0	7	12	41	40	29	11	17	A-6a
	18.0-24.0	14	5	11	38	32	26	11	14	A-6a
	24.0-27.0	0	5	10	50	35	25	7	12	A-4b
	27.0-30.0	0	7	11	40	42	27	11	14	A-6a
409+50 CL	0.4-4.0	5	1	8	48	38	41	21	17	A-7-6
	4.0-7.5	0	3	14	52	31	29	10	18	A-4b
415+00 CL	0.0-5.0	0	2	9	37	52	43	22	15	A-7-6
	5.0-8.0	0	3	11	33	53	41	20	17	A-7-6
	8.0-12.0	10	6	14	34	36	25	11	14	A-6a
419+50 CL	0.4-5.0	0	3	7	59	31	27	7	18	A-4b
	5.0-8.0	0	2	7	43	48	29	11	18	A-6a
	8.0-10.0	14	6	11	32	37	26	11	15	A-6a
423+00 CL	0.4-5.0	0	2	7	38	53	44	21	15	A-7-6
	5.0-8.0	10	8	13	30	39	29	11	13	A-6a
	8.0-10.0	0	6	15	34	45	26	11	12	A-6a
428+00 CL	0.4-5.5	0	1	7	38	54	37	13	18	A-6a
434+00 CL	0.4-6.0	0	1	10	37	52	40	19	14	A-6b
440+80 CL	0.0-5.0	21	5	11	28	35	29	11	14	A-6a
	5.0-8.0	0	8	16	35	41	28	11	14	A-6a
	8.0-10.0	0	9	12	36	43	25	11	12	A-6a
445+00 CL	0.4-4.5	0	4	36	31	29	25	8	9	A-4a
451+00 CL	0.4-5.0	0	2	11	10	77	34	14	18	A-6a
	5.0-8.0	30	9	14	29	18	22	4	18	A-4a
	8.0-11.0	0	6	11	38	45	25	11	14	A-6a
	11.0-15.0	8	12	31	22	27	NP	NP	12	A-4a
	15.0-17.0	0	14	27	30	29	18	4	13	A-4a
	17.0-22.0	11	5	12	39	33	23	11	11	A-6a
	22.0-28.0	13	6	12	36	33	25	11	12	A-6a
	28.0-30.0	0	5	34	44	17	NP	NP	15	A-4a
457+65 CL	0.4-5.0	7	6	14	36	37	29	11	14	A-6a
	5.0-8.0	24	9	11	38	18	21	5	11	A-4a
	8.0-11.0	66	21	5	- 8 -		NP	NP	18	A-1-a
	11.0-15.0	26	9	17	18	30	21	7	10	A-4a
462+00 CL	0.4-5.0	0	3	11	40	46	36	15	21	A-6a
	5.0-8.0	0	8	11	32	49	27	11	11	A-6a
	8.0-10.0	9	9	14	48	20	25	8	13	A-4a
	10.0-15.0	63	2	22	- 13 -		NP	NP	9	A-1-b
467+00 CL	0.4-5.0	0	4	11	39	46	41	21	15	A-7-6
	5.0-9.0	8	10	12	29	41	28	11	15	A-6a
	9.0-15.0	12	9	13	32	34	25	11	13	A-6a
470+00 CL	0.4-5.0	11	6	15	28	40	35	12	15	A-6a
	5.0-8.0	28	10	18	21	23	30	11	18	A-6a
	8.0-10.0	29	6	12	12	41	26	11	12	A-6a

STATION & OFFSET	DEPTH FROM – TO	% AGG.	% C.S.	% F.S.	% SILT	% CLAY	L.L.	P.I.	% W.C.	SHTL CLASS
474+00 CL	0.4-5.0	21	8	10	32	29	36	15	13	A-6a
478+50 CL	0.4-3.5	0	4	51	26	19	NP	NP	7	A-4a
483+60 CL	0.4-4.0	9	4	12	39	36	36	17	14	A-6b *
494+00 CL	0.4-5.0	0	10	17	26	47	38	17	14	A-6b
	5.0-8.0	8	1	11	53	27	30	11	16	A-6a
	8.0-10.0	12	10	17	37	24	22	8	11	A-4a
	10.0-12.0	15	9	19	36	21	20	6	12	A-4a
	12.0-15.0	25	12	20	27	16	17	3	11	A-4a
	15.0-20.0	10	9	19	39	23	22	8	12	A-4a
500+00 CL	0.4-4.0	0	4	10	27	59	35	12	14	A-6a
	4.0-5.5	Brown Silty Clay					37	16	14	A-6b
505+45 CL	0.4-5.0	0	11	18	26	45	28	11	21	A-6a
	5.0-8.0	7	7	11	45	30	30	12	13	A-6a
	8.0-10.0	0	19	27	25	29	25	9	13	A-4a
	10.0-11.5	31	21	29	- 19 -		NP	NP	7	A-1-b
	11.5-15.0	11	9	15	32	33	22	8	11	A-4a
	15.0-20.0	15	3	8	56	18	25	10	13	A-4b *
512+65 CL	0.4-4.0	0	5	10	35	50	41	19	22	A-7-6
	4.0-8.0	12	10	17	30	31	29	12	14	A-6a
	8.0-13.0	21	9	15	33	22	21	6	11	A-4a
	13.0-17.0	16	11	16	34	23	21	7	11	A-4a *
	17.0-20.0	45	7	13	19	16	20	5	12	A-2-4 *
521+30 CL	0.4-5.0	6	5	11	41	37	32	13	15	A-6a *
	5.0-8.0	11	7	40	27	15	NP	NP	14	A-4a
	8.0-13.5	0	2	26	44	28	19	6	22	A-4a
	13.5-16.0	0	0	2	46	52	32	14	25	A-6a
528+00 CL	0.4-4.5	14	1	3	51	31	63	41	30	A-7-6
530+35 20'Rt	0.4-5.0	0	7	13	32	48	32	13	13	A-6a
	5.0-8.0	0	6	12	38	44	30	11	17	A-6a
	8.0-10.0	13	25	28	19	15	NP	NP	15	A-3a
	10.0-15.0	12	12	19	34	23	21	8	13	A-4a
534+50 CL	0.0-5.0	0	5	11	40	44	36	16	14	A-6b
	5.0-8.0	0	5	9	42	44	33	13	14	A-6a
	8.0-12.0	8	7	19	39	27	21	7	13	A-4a

DRIVE SAMPLE SOIL TEST DATA

486+50 CL	5.0-6.0	0	5	10	40	45	32	12	15	A-6a
	10.0-11.0	0	8	15	41	36	25	8	15	A-4a
	20.0-21.0	31	11	14	22	22	22	7	13	A-4a
	25.0-26.0	0	9	13	44	34	22	6	15	A-4a
	30.0-31.0	26	16	28	22	8	NP	NP	11	A-2-4
	35.0-36.0	21	7	12	33	27	24	9	13	A-4a *
	40.0-41.0	21	10	11	32	26	23	8	14	A-4a
	45.0-46.0	27	9	14	31	19	19	6	14	A-4a
	50.0-51.0	0	11	21	40	28	20	4	15	A-4a

SOIL PROFILE

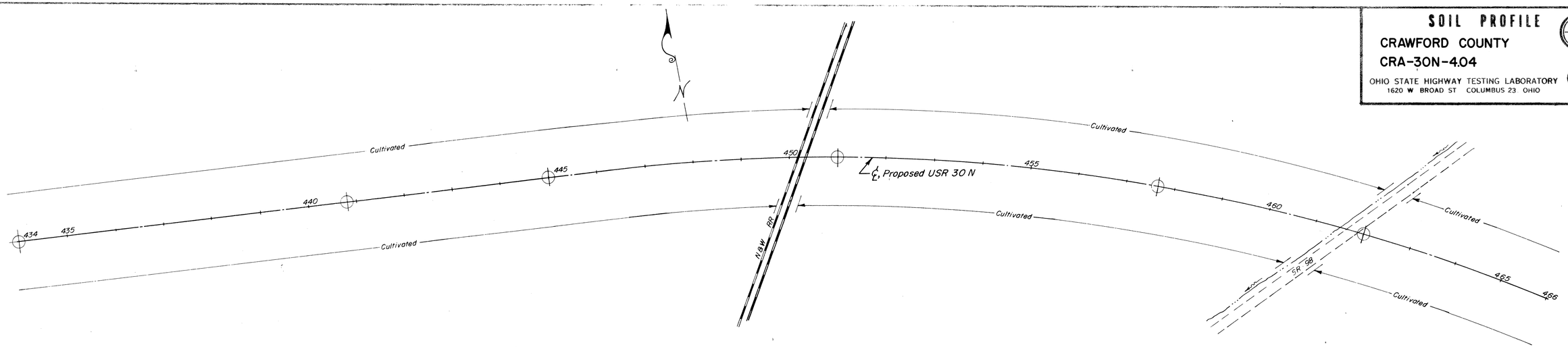
10/52

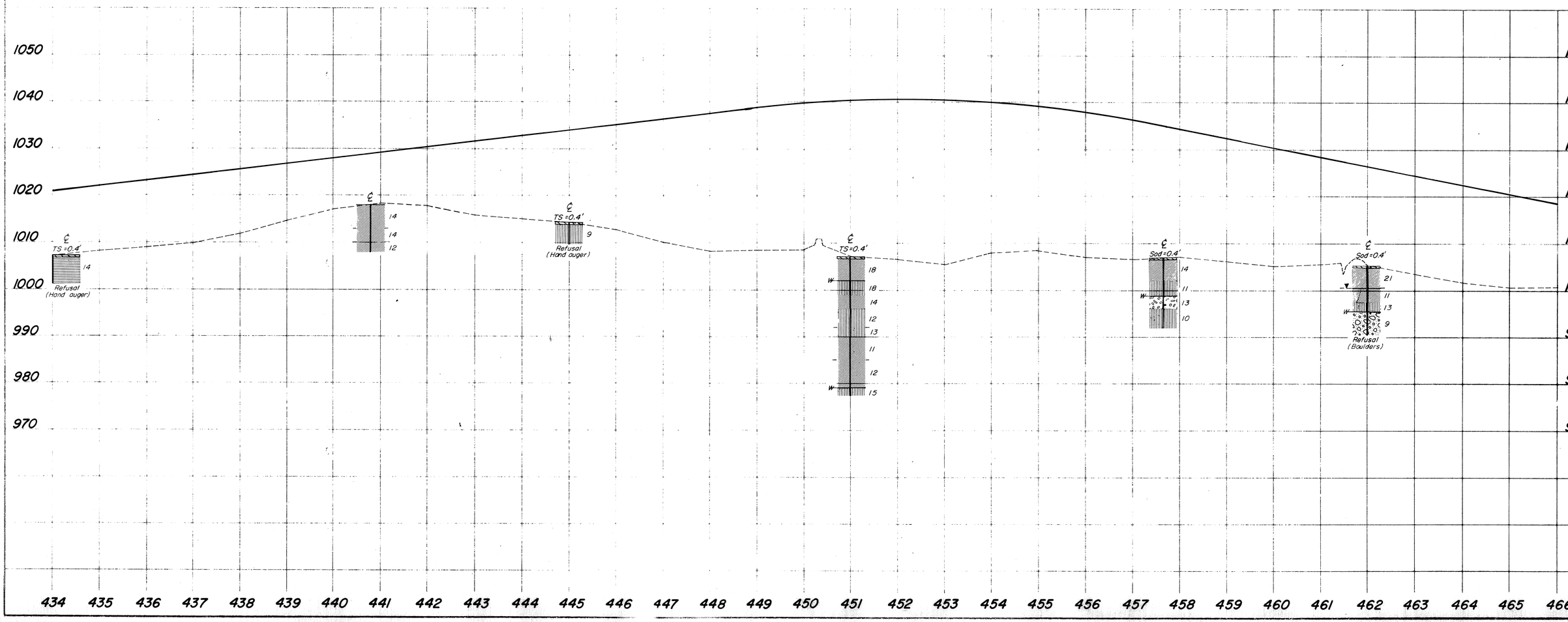
CRAWFORD COUNTY

CRA-30N-4.04

OHIO STATE HIGHWAY TESTING LABORATORY
1620 W BROAD ST COLUMBUS 23 OHIO

10/13





TE - 118
600 - 11 - 64

FEB 27 1966

CRAWFORD COUNTY
CRA-30N - 4.04

39
52
4

GEOLOGY OF THE SITE

The structure site is located on the gently rolling portion of the glaciated Mississippi Valley Plain, in an area where moderately deep glacial-derived soils overlie bedrock, of Devonian age.

EXPLORATION

The exploration consisted of two drive sample-coreborings, made between January 20 and 26, 1966, and eight drive rod penetration tests, made between February 2 and 8, 1966.

INVESTIGATIONAL FINDINGS

The borings encountered unstratified dense and extremely dense gravels, sands, and silts, and stiff and very stiff clays and boulders, overlying sloping bedrock surface, encountered at 50-foot depth, elevation 958 feet in the rear portion of the structure site, and 53-foot depth, elevation 955 feet in the forward portion of the structure site. The borings were terminated 1and 7 feet below bedrock surface, elevations 957 and 948 feet.

Rod soundings met gradually increasing penetration resistance with increasing depth and were terminated upon encounter with near refusal and refusal to penetration at 27 and 30-foot depths, between elevations 981 and 979 feet, considered to be in extremely dense sandy silt and silty sands, as revealed by the borings.

No free water was observed in any of the rod sounding holes.

LEGEND

- Auger Boring Location - Plan View.
- Press and / or Drive Sample and / or Core Boring Location - Plan View.
- Drive Rod Penetration Resistance Sounding Location - Plan View.
- Capped Pile
- Footing
- Footing on Pile
- TR — Top of Rock
- Horizontal Bar on Boring Log Indicates the Depth the Sample Was Taken.
- X/Y — Figures Beside the Boring Log in Profile Indicate the Number of Blows for Standard Penetration Test.
  X = Number of Blows for First 6 inches.
  Y = Number of Blows for Second 6 inches.
- Drive Rod Penetration Resistance Sounding Log - Profile
- Casing
- Resistance "R" < 10,000 lbs.
- Resistance "R" > 10,000 lbs.
- Z — Indicates Final Measurement of Penetration, in Inches.
- W — Indicates Free Water Elevation.
- Indicates Static Water Elevation.

SYMBOLS OF ROCK TYPES

- Coal
- Weathered Indurated Clay
- Indurated Clay
- Weathered Shale
- Shale
- Cobbles and Gravel
- Weathered Sandstone
- Sandstone
- Leached Dolomite
- Dolomite
- Leached Limestone
- Limestone

GENERAL INFORMATION

Drive Rod Penetration Sounding Tests

Drive rod penetration resistance tests constitute driving a 1.315-inch diameter steel rod, with a 45° cone point, into the ground, using a 122-pound drop-hammer with a free fall of five feet. At one or two-foot depth intervals, a measurement is taken to determine the amount of penetration achieved in three hammer drops. This reading is converted to an empirical value for capacity "R", in thousands of pounds (which is a measure of both the point resistance and frictional resistance on the rod), by using charts prepared by the Ohio Department of Highways, Bureau of Bridges, on the basis of correlation study of rod penetration with past performance of pile driving. For interpretation, a graph is prepared by plotting the value "R" against the depth at which the reading was taken, and connecting the plotted points. The curve so obtained reflects the density of subsurface materials in a manner that can be readily compared with data from similar tests at other locations on the structure site. From this comparison, the overall uniformity of subsurface condition may be evaluated.

Drive Sample Borings - Drive-Press Sample Borings

Drive sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. sampler, at 2-1/2 and / or 5-foot depth intervals, driven by means of a 140 - pound drop-hammer with a free fall of 30 inches. The number of blows required to drive the sampler 12 inches is considered the standard penetration test.

Drive-press sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. drive sampler, and 3" O.D. thin-wall press sampler. The press sampler is advanced by continuous uniform pressure, applied by the drill rig.

The boring log sheets show a graphic plot of the information obtained, including depth and elevation of the sample, number of blows for the standard penetration tests in two 6-inch increments, depth of press samples, field sample number, sample description - based on laboratory tests and the Casagrande AC classification system - and gradation, plasticity, and moisture content determinations. Results of strength and consolidation testing, if performed, appear on separate enclosures.

At depths where materials are bouldery or gravelly to the extent that the sampler can not be driven, a wash sample is procured for visual classification, in order to determine the general character of the material. These samples are not considered sufficiently representative to warrant laboratory testing.

Particle Size Definitions

Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
8"	3"	2.0mm (No. 10 sieve)	0.42mm (No. 40 sieve)	0.074mm (No. 200 sieve)	0.005mm	

NOTE: Information shown by this subsurface investigation was obtained solely for the use in establishing design controls for the project. The State of Ohio does not guarantee the accuracy of this data and it is not to be construed as a part of the plans governing construction of the project.

OHIO DEPARTMENT OF HIGHWAYS
TESTING LABORATORY
1620 WEST BROAD STREET, COLUMBUS 23, OHIO

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. CRA-30N-0851 L&R
OVER N&W RAILROAD
SEC. CRA-30N-4.04

CHECKED BY	REVIEWED BY	DATE
L.N.L.	R.D.R.	2/15/66

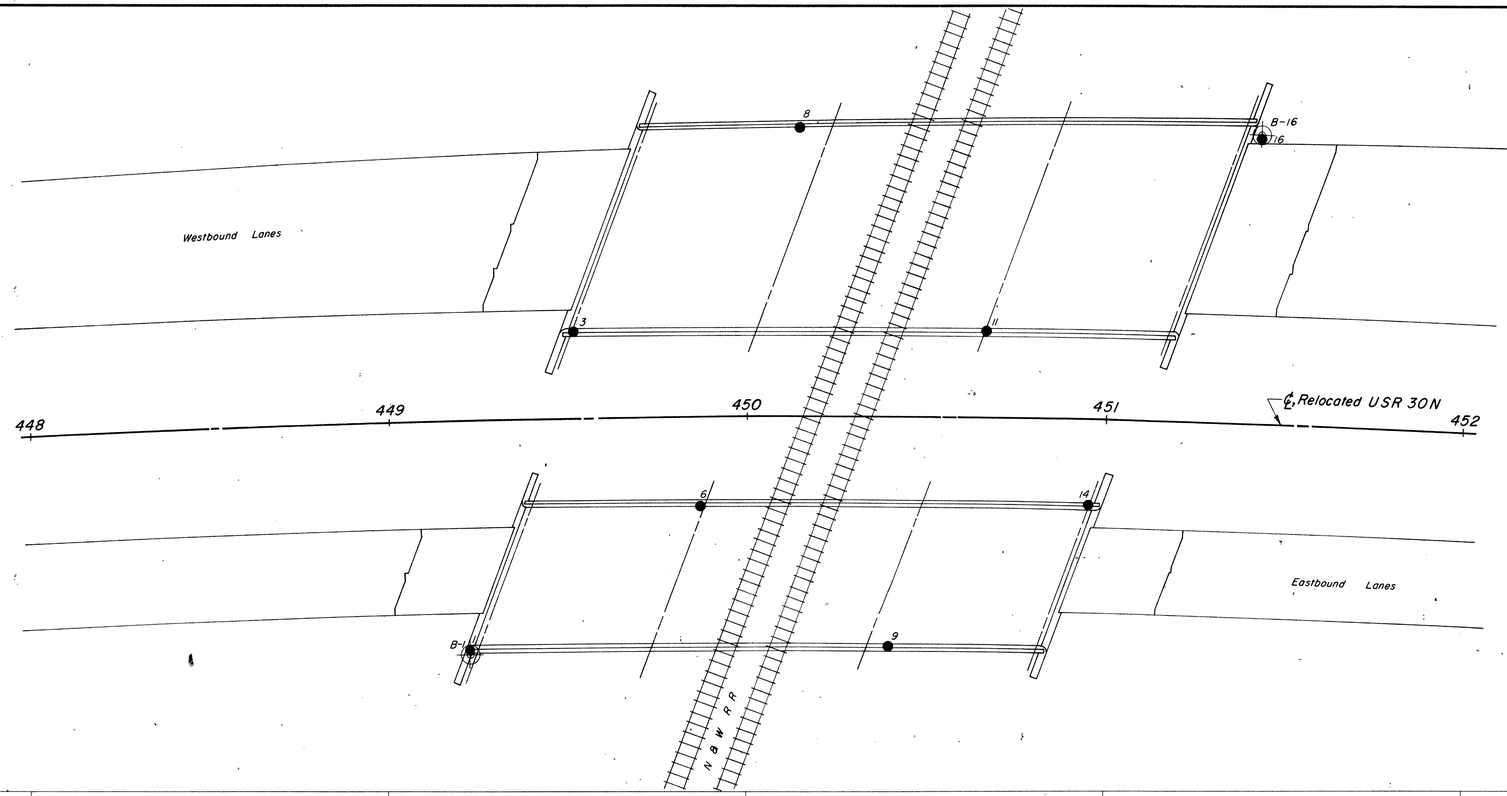
TE - 119
500 - 11 - 64

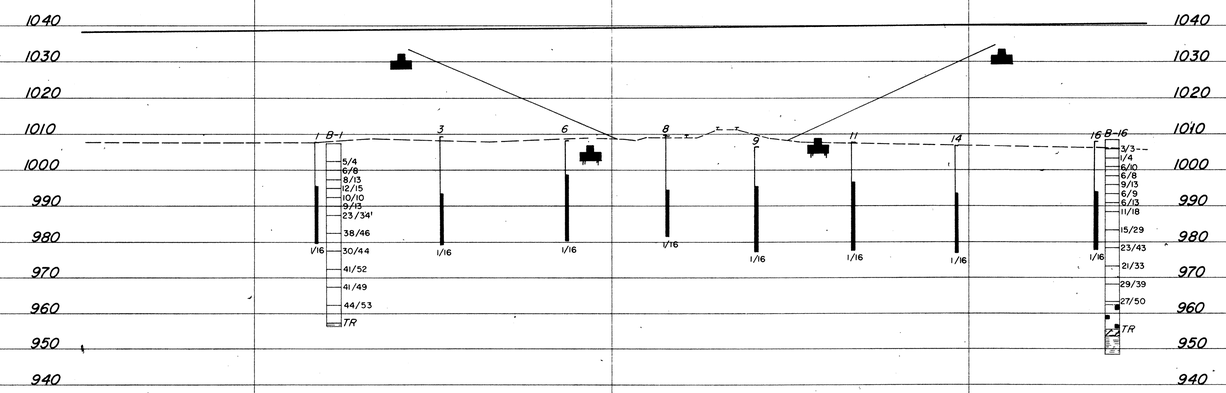
FEB 17 [illegible]

CRA - 30N - 4.04

40/52

2/4





SCALE: 1" = 20'

OHIO DEPARTMENT OF HIGHWAYS
TESTING LABORATORY
1620 WEST BROAD STREET, COLUMBUS 23, OHIO

STRUCTURE FOUNDATION INVESTIGATION

BRIDGE NO. CRA - 30N - 0851 L&R
OVER N & W RAILROAD

SEC. CRA - 30N - 4.04

PLAN AND PROFILE

DRAWN BY	CHECKED BY	REVIEWED BY	DATE
R.L.D.	L.N.L.	R.D.R.	2/15/66

TE - 122
600 - 11 - 64

FEB 17 1966

CRA-30N-4.04

41/52

3/4

LOG OF BORING

Date Started 1-26-66 | Sampler Type SS | Dia. 1 3/8" | Water Elev.
Date Completed 1-26-66 | Casing: Length 35' | Dia. 3 1/2"
Boring No. B-1 | Station & Offset 449+22, 65' Rt. (Rear Abutment) | Surface Elev. 1007.5'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics: % Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
1007.5	0														
	2														
	4														
1002.5	6	5/4			Brown Silty Clay	1	0	6	10	31	53	37	17	23	A-6b
1000.0	8	6/8			Brown Sandy Silt	2	0	9	14	32	45	28	10	24	A-4a
997.5	10	8/13			Brown and Gray Gravelly Sandy Silt	3	17	9	14	25	35	25	6	15	A-4a
995.0	12	12/15			Gray Gravelly Sandy Silt	4	16	7	12	31	34	25	7	13	A-4a
992.5	14	10/10			Gray Sandy Silt	5	0	10	13	35	42	24	7	15	A-4a
990.0	16	9/13			Gray Clayey Silt	6	0	8	11	37	44	26	9	15	A-4a
987.5	18														
	20	23/34			Gray Silty Sand	7	11	16	26	16	21	NP	NP	13	A-4a
	22														
982.5	24														
	26	38/46			Gray Silty Sandy Gravel	8	39	19	17	13	12	NP	NP	13	A-1-b
	28														
977.5	30														
	32	30/44			Gray Silty Gravelly Sand	9	20	42	18	-20-		NP	NP	6	A-1-b
972.5	34														
	36	41/52			Gray Sandy Gravelly Silt	10	26	3	22	34	15	NP	NP	13	A-4a
967.5	38														
	40	41/49			Gray Gravelly Sandy Silt	11	16	5	13	40	26	19	6	12	A-4a
	42														
962.5	44														
	46	44/53			Gray Silt	12	0	3	8	53	36	NP	NP	7	A-4b
	48														
957.5	50				TOP OF ROCK										
956.5			0.8	0.2	Shale, gray, fissile, medium-firm, badly broken. Core loss 20%.										
					BOTTOM OF BORING										

LOG OF BORING

Date Started 1-26-66 | Sampler Type SS | Dia. 1 3/8" | Water Elev.
Date Completed 1-25-66 | Casing: Length 45' | Dia. 3 1/2"
Boring No. B-16 | Station & Offset 451+40, 80' Lt. (Forward Abutment) | Surface Elev. 1008.4'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics: % Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
1008.4	0														
	2														
1005.9	4	3/3			Brown and Gray Silt and Clay	1	0	1	9	48	42	30	11	28	A-6a
1003.4	6	1/4			Brown and Gray Silt	2	0	5	13	50	32	24	5	25	A-4b
1000.9	8	6/10			Brown and Gray Clayey Silt	3	0	8	12	38	42	27	7	17	A-4a
998.4	10	6/8			Brown and Gray Sandy Silt	4	10	13	19	29	29	21	5	13	A-4a
995.9	12	9/13			Gray Gravelly Sandy Silt	5	16	11	24	31	18	NP	NP	9	A-4a
993.4	14	6/9			Gray Silty Sandy Gravel	6	50	8	8	12	22	PL=	18	16	-
990.9	16	6/13			Gray Gravelly Sandy Silt	7	22	8	15	25	30	24	8	14	A-4a
988.4	18														
	20	11/18			Gray Sandy Gravelly Silt	8	39	10	10	17	24	23	8	11	A-4a
	22														
983.4	24														
	26	15/29			Gray Sandy Gravelly Silt	9	28	8	12	25	27	23	10	12	A-4a
	28														
978.4	30														
	32	23/43			Gray Silt	10	0	1	18	66	15	NP	NP	20	A-4b
973.4	34														
	36	21/33			Gray Silt	11	0	3	11	57	29	NP	NP	15	A-4b
968.4	38														
	40	29/39			Gray Sandy Silt	12	0	1	40	46	13	NP	NP	18	A-4b
	42														
963.4	44														
	46	27/50			Gray Gravelly Sandy Silt	13	22	4	29	33	12	NP	NP	21	A-4a
	48														
958.4	50														
955.4	52		0.6	4.4	TOP OF ROCK										
	54				Clay shale, gray, very soft and extremely crumbly, moderately weathered. Core loss 70%.										
953.4	56														
	58														
	60		3.7	1.3	Shale, gray, fissile, jointed and badly broken in part, medium-firm. Core loss 26%										
948.4					BOTTOM OF BORING										

OHIO DEPARTMENT OF HIGHWAYS
TESTING LABORATORY
1620 WEST BROAD STREET, COLUMBUS 23, OHIO

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. CRA-30N-0851 L & R
OVER N&W RAILROAD
SEC. CRA-30N-4.04

BORING DATA

TYPED BY	CHECKED BY	REVIEWED BY	DATE
J.M.S.	R.C.	R.D.R.	2/15/66

TE-114
1000-1-64

FEB 17 1966

42
52
4
4

CRA-30N-4.04

Test Location No. 1
Station & Offset 449+22.64'RT REAR ABUTMENT
Surface Elev. 1007.8' Water Elev.
Piling
Hammer
Formula
Reference
Rod Condition

Test Location No. 3
Station & Offset 449+52.24'LT REAR ABUTMENT
Surface Elev. 1009.2' Water Elev.
Piling
Hammer
Formula
Reference
Rod Condition

Test Location No. 6
Station & Offset 449+87.25'RT REAR PIER
Surface Elev. 1008.2' Water Elev.
Piling
Hammer
Formula
Reference
Rod Condition GOOD

Test Location No. 8
Station & Offset 450+15.80'LT REAR PIER
Surface Elev. 1009.7' Water Elev.
Piling
Hammer
Formula
Reference
Rod Condition GOOD

Test Location No. 9
Station & Offset 450+40.64'RT FORWARD PIER
Surface Elev. 1006.4' Water Elev.
Piling
Hammer
Formula
Reference
Rod Condition GOOD

Test Location No. 11
Station & Offset 450+67.24'LT FORWARD PIER
Surface Elev. 1007.6' Water Elev.
Piling
Hammer
Formula
Reference
Rod Condition GOOD

Test Location No. 14
Station & Offset 450+96.24'RT FORWARD ABUTMENT
Surface Elev. 1006.8' Water Elev.
Piling
Hammer
Formula
Reference
Rod Condition GOOD

Test Location No. 16
Station & Offset 451+40.79'LT FORWARD ABUTMENT
Surface Elev. 1007.9' Water Elev.
Piling
Hammer
Formula
Reference
Rod Condition GOOD

1028 1024 1020 1016 1012 1008 1004 1000 996 992 988 984 980 976

TEST ROD

10 20 30 40 50 60 70 80 90 100
Capacity "R" in Thousands of Pounds

OHIO STATE HIGHWAY TESTING LABORATORY
1620 WEST BROAD ST. COLUMBUS 23, OHIO

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. CRA-30N-0851 L&R OVER N&W RAILROAD
SEC. CRA-30N-4.04

DRIVE ROD PENETRATION RESISTANCE DATA

PLOTTED BY	CHECKED BY	REVIEWED BY	DATE
R.C.	L.N.L.	R.D.R.	2/15/66