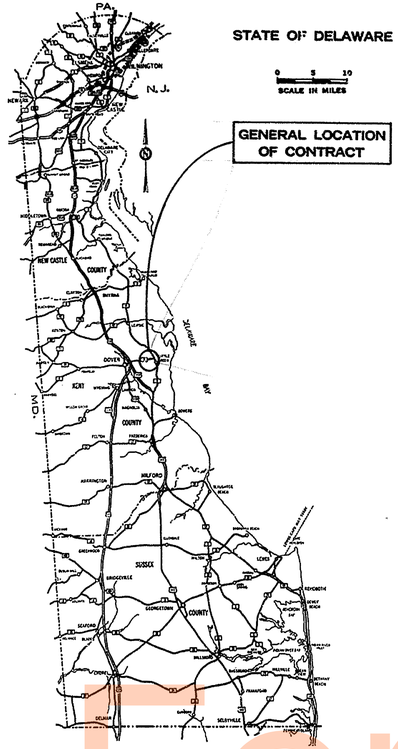
3-20-9



DESIGN DESIGNATION

FEDERAL CLASS	Secondary
A.D.T.	2,000 (1994)
D.H.V.	200 (1994)
DESIGN SPEED	60 M.P.H.
MIN. STOPPING SIGHT DISTANCE	475 FT.
MAX. S.E.	___ FT./FT.
MAX. DEGREE CURVE	1° 20' 00"
MAX. % GRADE	1.13 %

THE STATE OF DELAWARE

AS BUILT PLANS
Nov. 10, 1977

DEPARTMENT OF HIGHWAYS AND TRANSPORTATION
DIVISION OF HIGHWAYS

CONSTRUCTION PLAN FOR:

CONTRACT NUMBER 75-08-015

FEDERAL AID PROJECT NUMBER RS48(4)

BEGIN PROJECT: STATION NO. 108+00.0 END: STATION NO. 113+00.0

LENGTH: 500.00 FEET = 0.0947 MILES

CONTRACT	COUNTY	STATE	B.P.R. REQ. NO.	FEDERAL AID PROJECT NUMBER	FISCAL YEAR	SHEET NUMBER	TOTAL SHEETS
75-08-015	Kent	DEL.	2	RS 48(4)		1	8

REPLACEMENT of BRIDGE No. 16B on ROUTE No. 8

SURVEY BOOKS

Loose Leaf

INDEX OF SHEETS

1	TITLE SHEET
	TYPICAL SECTION SHEETS
	QUANTITY SHEET
	PLANS & PROFILE SHEETS
2-4	BRIDGE SHEETS
5-8	STANDARD SHEETS G-2, G-3, G-4, G-5

UTILITIES

City of Dover - Electric
Diamond State Telephone Company

ESTIMATED CONTRACT QUANTITIES

Section	Item	Unit	Proposal
201	Clearing and Grubbing	L.S.	L.S.
202 *	Excavation and Embankment	C.Y.	258
207 *	Excavation and Backfill for Structures	C.Y.	185
208	Excavation and Backfill for Pipe Trenches	C.Y.	10
209	Borrow Type C	C.Y.	676
210	Removal of Structures and Obstructions	L.S.	L.S.
302	Select Borrow Base (t = 6")	C.Y.	223
303	Crusher Run Base Course (t = 6")	S.Y.	245
401	Hot-Mix, Hot Laid Bituminous Concrete Pavement	Tons	160
615	Reinforced Concrete Pipe - 15"ø	L.F.	22
619	Structural Plate Pipe	L.F.	160
715	Galvanized Steel Beam Guardrail (Steel Posts)	L.F.	610
716	Twisted End Anchorages	Each	4
724	Crownvetch Seeding and Mulching	S.Y.	690
731	Sand	Tons	136
732	Sacked Concrete Riprap	C.Y.	28
209	Borrow Type F	C.Y.	450
S.P.	Erosion Protection	S.Y.	60
S.P.	Maintenance of Traffic	L.S.	L.S.
736	Removal of Existing Portland Cement Concrete Pavement, Curb, Sidewalk, Etc.	S.Y.	256
738	Flagman	Hrs.	500

* Fixed Quantity Item - Section 109.06 of Standard Specifications

General Notes

LOCATION : The replacement of Bridge No. 16B is located on Route No. 8, Kent County.

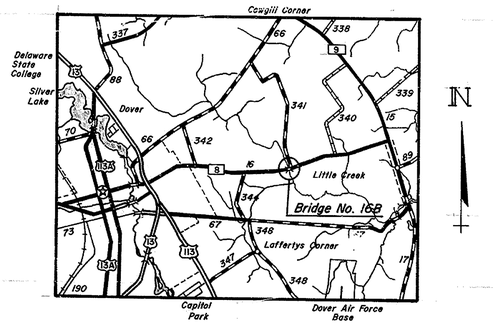
DESIGN CRITERIA : A.A.S.H.T.O. Standard Specifications for Highway Bridges 1973 with current additions.

LOADING : A.A.S.H.T.O. HS20-44

SPECIFICATIONS : Material and Workmanship shall conform to the Standard Specifications of Delaware Department of Highways and Transportation, Division of Highways dated January 1, 1974, unless otherwise noted and specified in the Special Provisions.

GENERAL :

1. CLEARING and GRUBBING : Do not remove any trees and vegetation unless absolutely necessary for construction.
2. Existing structure shall be removed completely.
3. Elevations are based on U.S.C. & G.S. datum.
4. Watch for existing utilities.
5. Backfilling shall be done simultaneously on all sides of the arch and in accordance with Article 2.23.9 of A.A.S.H.T.O. Specifications of 1973, and Manufacture's requirements as approved by the Engineer.
6. Boring locations are shown as ⊕
7. Standard disk for U.S.C. & G. bench mark W-36 on the existing bridge shall be salvaged and delivered to the Department. Payment for such work shall be included in Section 210.



LOCATION MAP

Scale : 1" = 1 Mile

RICHARD A. HABER
REGISTERED
NO. 410
DELAWARE
PROFESSIONAL ENGINEER

JACK J. SCHMITT
NO. 8972

CONVENTIONAL SIGNS

PROPOSED CENTER LINE	2 3	WOODED AREA	
NEW RIGHT OF WAY LINE		TELEPHONE OR UTILITY POLE	
PROPERTY LINE	PL	EXISTING CULVERT OR PIPE	
CONCRETE ROAD		RAILROAD	
MACADAM OR ASPHALT ROAD		GUARD RAIL	

SCALES

TITLE SHEET	1" =	FEET
CONSTRUCTION PLAN	1" =	FEET
VERTICAL PROFILE	1" =	FEET

DIVISION OF HIGHWAYS

RECOMMENDED

RECOMMENDED 4/21 19 76 Jack J. Schmitt
CHIEF, PLANS AND DESIGN

RECOMMENDED 21 April 19 76 C. B. Cullen Jr.
ASSISTANT CHIEF ENGINEER

RECOMMENDED

RECOMMENDED 4-21 19 76 R. E. Tassotti
CHIEF ENGINEER

APPROVED

APPROVED 4-21 19 76 R. Taylor
DIRECTOR OF HIGHWAYS

DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____ 19 ___

_____
DIVISION ENGINEER

For information only

For Information only

COUNTY	CONTRACT	P. B. A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
Kent	75-08-015	2	DEL	RS48(4)	2	8

REPLACEMENT of BRIDGE No. 16B on ROUTE No. 8

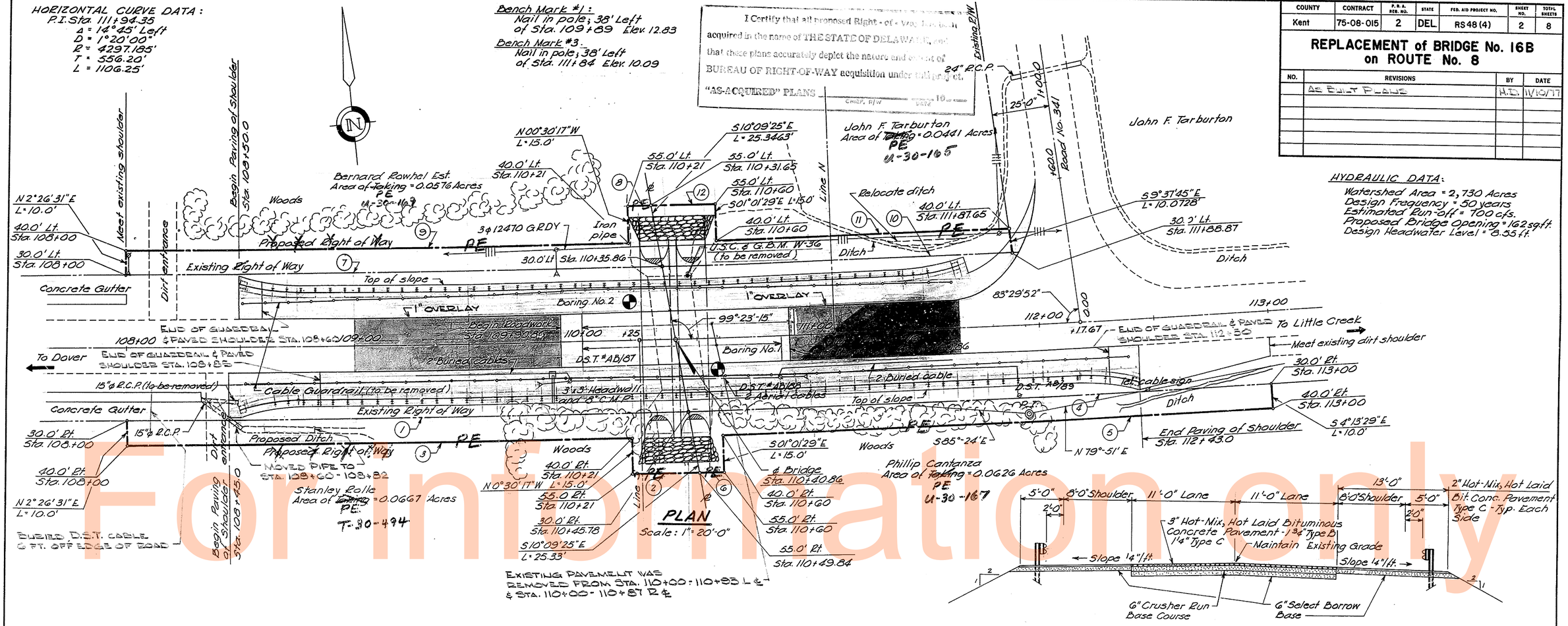
NO.	REVISIONS	BY	DATE
	As Built Plans	H.D.	11/10/77

HORIZONTAL CURVE DATA:
P.I. Sta. 111+94.35
Δ = 14°45' Left
D = 1°20'00"
R = 4297.185'
T = 556.20'
L = 1106.25'

Bench Mark #1:
Nail in pole; 38' Left of Sta. 109+89 Elev. 12.83

Bench Mark #3:
Nail in pole; 38' Left of Sta. 111+84 Elev. 10.09

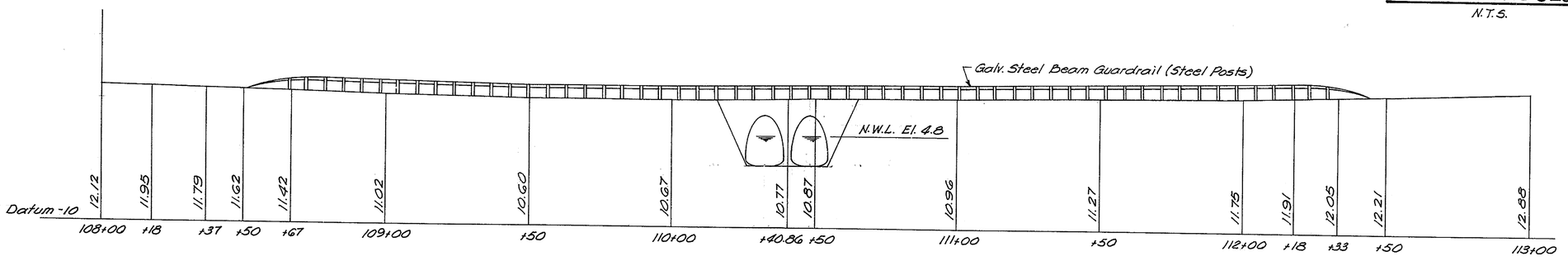
I Certify that all proposed Right-of-Way has been acquired in the name of THE STATE OF DELAWARE, and that these plans accurately depict the nature and extent of BUREAU OF RIGHT-OF-WAY acquisition under said project.
"AS-ACQUIRED" PLANS _____ CHIEF, R/W DATE 19__



HYDRAULIC DATA:

Watershed Area = 2,730 Acres
Design Frequency = 50 years
Estimated Run-off = 700 c.f.s.
Proposed Bridge Opening = 162 sq.ft.
Design Headwater Level = 8.35 ft.

TYPICAL ROAD SECTION
N.T.S.



PROFILE
Horizontal Scale: 1" = 20'-0"
Vertical Scale: 1" = 10'-0"

R/W CURVE DATA

Curve No.	Radius	Arc ℓ	Chord ℓ	Chord Bearing
1	4327.1850	247.5008	247.4671	S89°11'48"E
2	4352.1850	29.2055	29.2054	S89°18'11"W
3	4937.1850	223.0572	223.0326	N89°01'53"W
4	4327.1850	255.9899	255.9526	N89°28'12"E
5	4337.1850	242.2340	242.2076	S87°22'31"W
6	4352.1850	10.2937	10.2937	S89°02'35"W
7	4267.1850	234.2183	234.1889	N89°07'50"W
8	4242.1850	10.5113	10.5113	N89°25'28"E
9	4257.1850	218.9428	218.9187	S89°01'53"E
10	4267.1850	151.9344	151.9264	S88°16'38"W
11	4257.1850	126.4602	126.4555	N88°07'28"E
12	4242.1850	27.9895	27.9895	N89°09'52"E

DELAWARE
DEPARTMENT OF HIGHWAYS & TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN, PROFILE and RIGHT-OF-WAY

D. M.T.C.
T. H.D.
C. C.H.

SCALE: As shown

APPROVED BY: W. [illegible] BRIDGE ENGINEER

DEPT. OF HIGHWAYS & TRANSPORTATION STATE OF DELAWARE

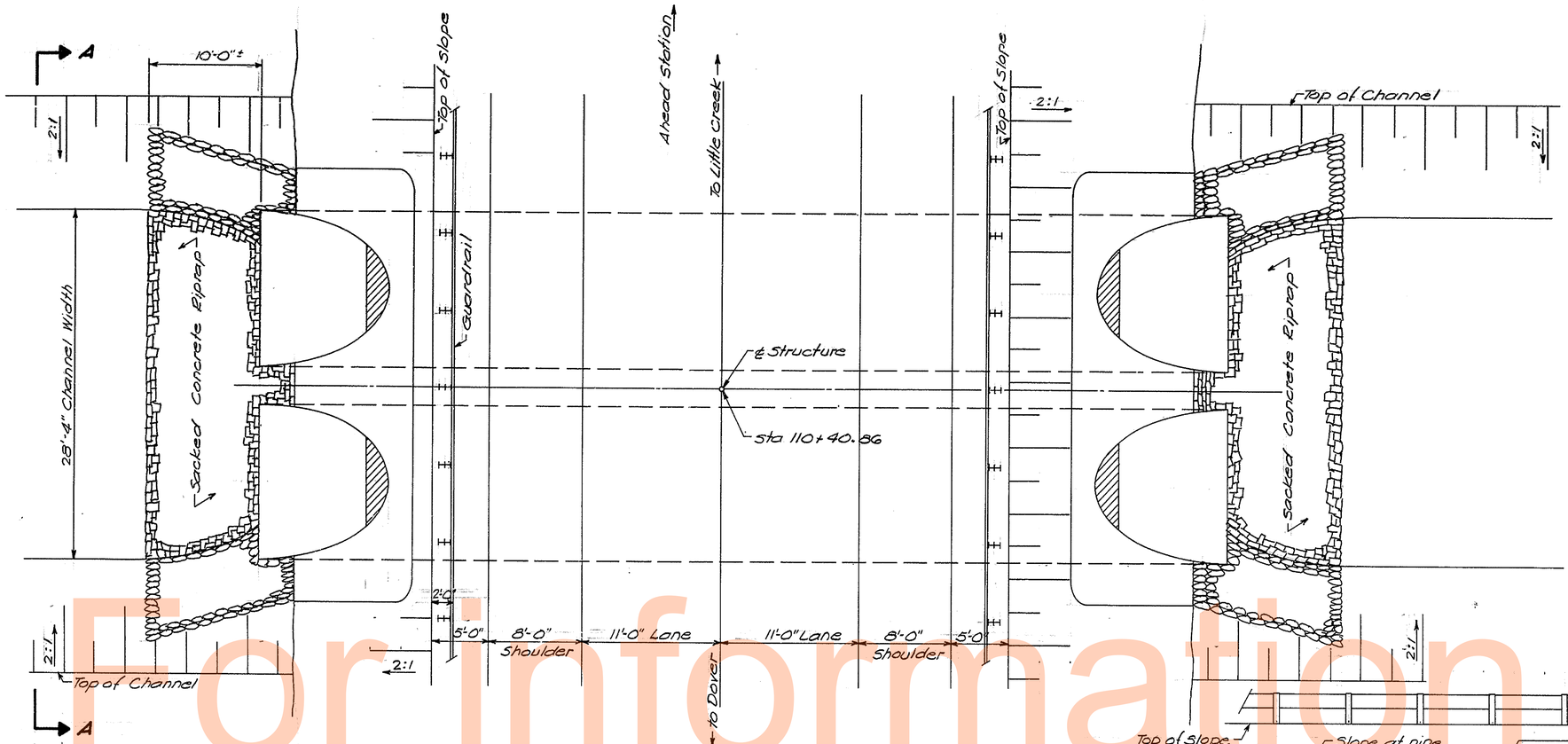
VAN PRINT 19 1233

COUNTY	CONTRACT	P. O. E. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
Kent	75-08-015	2	DEL	RS 48 (4)	3	8

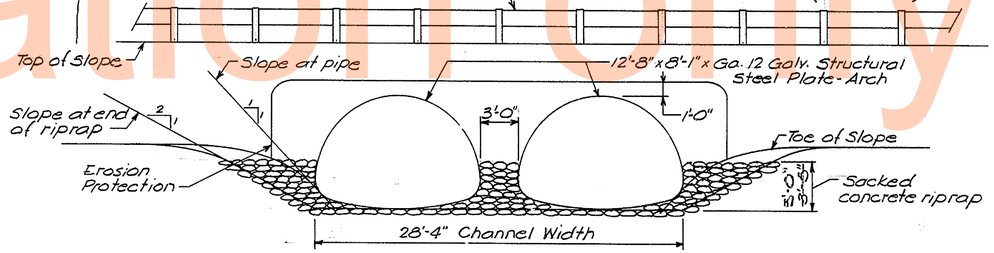
REPLACEMENT of BRIDGE No. 16B on ROUTE No. 8

NO.	REVISIONS	BY	DATE
	As Built Plans	H.D.	11/10/11

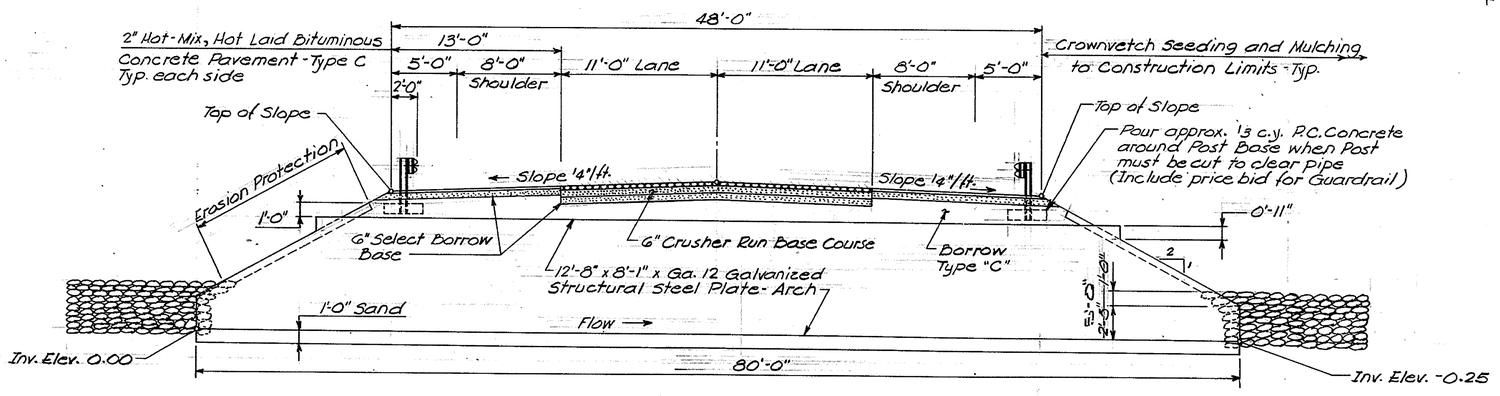
For information only



PLAN



SECTION A-A



ELEVATION

Note: Use Borrow Type C for Backfill for Structures and Borrow Type F for Shoulder Backfill.

Alternate Aluminum Pipe-Arch:

- 12'-10" x 8'-3" x 0.175" thick Structural Plate Piper-Arch with 9" x 2 1/2" Corrugation.
- Engineer's approval is required.

DELAWARE
DEPARTMENT OF HIGHWAYS & TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN, ELEVATION and SECTION

D. M.T.C. T. H.D. C. C.H.	SCALE 3/16"=1'-0"	APPROVED BY: [signature] CHIEF ENGINEER

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
Kent	75-08-015	2	DEL	RS48(4)	4	8

REPLACEMENT of BRIDGE No. 16B on ROUTE No. 8

NO.	REVISIONS	BY	DATE

BORING No. 1

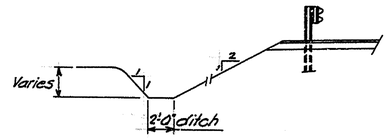
Sta. 110+59, Offset 13'-0" Right of ℄

Elev.	Depth	Casing Blows	Sample Description	Sample No.	Blows/6"
10.39	0				
10		13			
		14			
		9			
		3			
5	5	1			
		3	Saturated soft brown fine sandy silt. 14" Sple. - 14" Rec.	1	1 - 1 - 2 - 1
		4			
		10			
		5			
0	10	5			
		7	Wet stiff dark brown fine to coarse sandy silt and organic material. 14" Sple. - 14" Rec.	2	4 - 5 - 5 - 5
		11			
		60			
		75			
-5	15	71			
		30	Saturated very dense brown fine to coarse silty sand. 6" Sple. - 6" Rec.	3	25 - 44 - 36 - 37
		30			
		46			
		65			
-10	20	64			
		31	Saturated very dense brown fine to coarse sand with sand stone. 4" Sple. - 4" Rec.	4	24 - 20 - 34 - 21
		38			
		39			
		58			
-15	25	53			
		30	Ind. of small to medium gravel. No recovery	5	20 - 16 - 16 - 21
		29			
		45			
		69			
-20	30	82			
		53	Wet very dense brown coarse sand trace silt. Sand stone in tip. 3" Sple. - 3" Rec.	6	67 - 66 - 44 - 58
		83			
		154			
	35	130			
-25		135			
		50	Saturated very dense brown fine to coarse sand. 8" Sple. - 8" Rec.	7	81 - 200 on 4"
		230			

BORING No. 2

Sta. 110+25, Offset 16'-0" Left of ℄

Elev.	Depth	Casing Blows	Sample Description	Sample No.	Blows/6"
10.15	0				
		26			
		24			
		9			
		15			
5	5	12			
		2	Moist soft brown fine sandy silt. 2" Sple. - 2" Rec.	1	1 - 2 - 1 - 1
		4			
		2			
		3			
0	10	3			
		3	Moist medium dense light brown fine to coarse sand. 12" Sple. - 12" Rec.	2	2 - 4 - 12 - 16
		14			
		46			
		52			
-5	15	33			
		22	Moist dense light brown fine to coarse sand with fine to small gravel. 12" Sple. - 12" Rec.	3	11 - 19 - 16 - 19
		35			
		36			
		38			
-10	20	28			
		18	Moist dense light brown fine to coarse sand with small to medium gravel. 6" Sple. - 6" Rec.	4	10 - 13 - 24 - 21
		26			
		42			
		66			
-15	25	56			
		27	Wet medium dense light brown fine to coarse sand with small to large gravel. 4" Sple. - 4" Rec.	5	11 - 14 - 14 - 13
		44			
		53			
		56			
-20	30	81			
		54	Wet very dense light brown fine to coarse sand some silt. 15" Sple. - 15" Rec.	6	9 - 23 - 33 - 54
		56			
		80			
		83			
-25	35	174			
		59	Saturated very dense light brown fine sand. 18" Sple. - 18" Rec.	7	17 - 60 - 178
		165			
		400			
-30					



LONGITUDINAL DITCH DETAIL

Scale: 3/16" = 1'-0"

For information only

DELAWARE
DEPARTMENT OF HIGHWAYS & TRANSPORTATION
DIVISION OF HIGHWAYS

BORINGS

	SCALE	APPROVED BY:
D. M.T.C.		
T. H.D.		
C. C.H.		BRIDGE ENGINEER