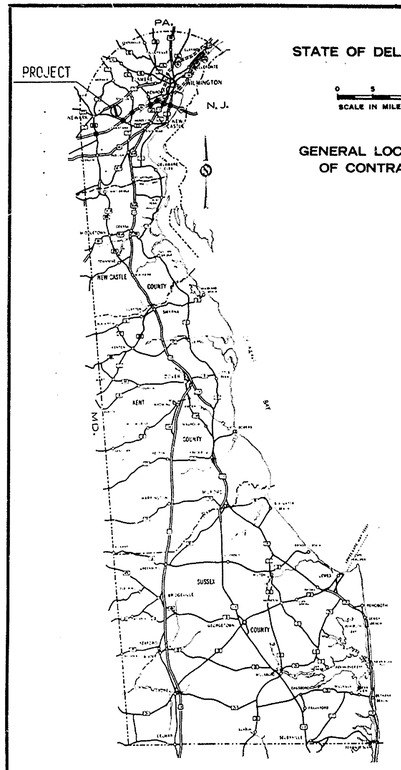


DESIGN DESIGNATION

FEDERAL CLASS	SECONDARY
A.D.T.	6,500
D.H.V.	650
DESIGN SPEED	50 M.P.H.
MIN. STOPPING SIGHT DISTANCE	350 FT.
MAX. S.E.	0.06 FT./FT.
MAX. DEGREE CURVE	7°
MAX. % GRADE	6%

THE STATE OF DELAWARE

AS BUILT PLANS — G.H.S. 11/19/76

DEPARTMENT OF HIGHWAYS AND TRANSPORTATION

CONSTRUCTION PLAN FOR:

CONTRACT NUMBER 68-03-012

FEDERAL AID PROJECT NUMBER SU-SUG-9(7)

BEGIN PROJECT: STATION NO. 0+00 **END:** STATION NO. 34+05

LENGTH: 3405.00 FEET = 0.645 MILES

CONTRACT	COUNTY	STATE	B.P.R. REG. NO.	FEDERAL AID PROJECT NUMBER	FISCAL YEAR	SHEET NUMBER	TOTAL SHEETS
68-03-012	NEW CASTLE	DEL.	2	SU-SUG-9(7)		1	43

HARMONY ROAD - ROAD 355
ROAD 358 TO FUTHAR DRIVE

SURVEY BOOKS

9514
9518

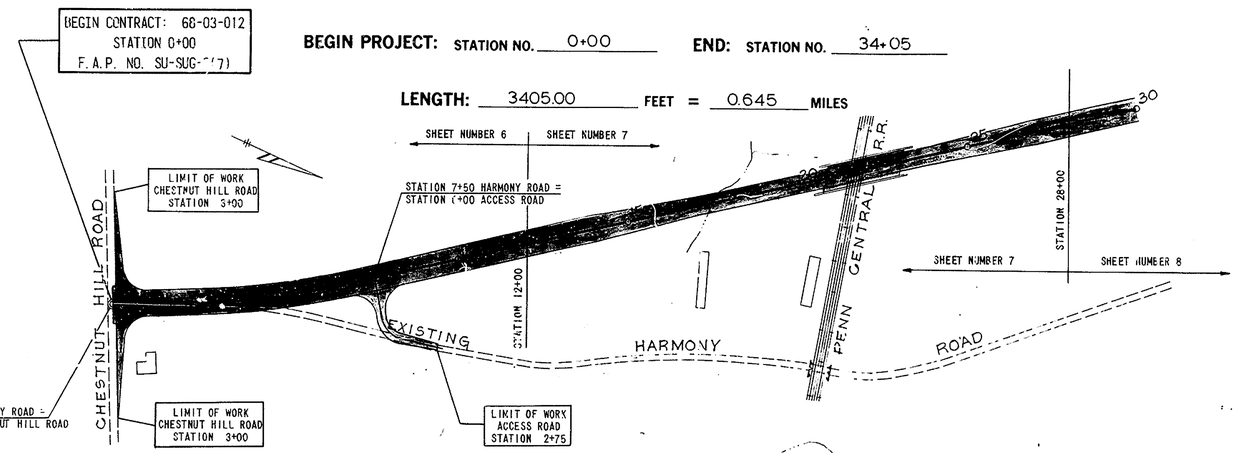
INDEX OF SHEETS

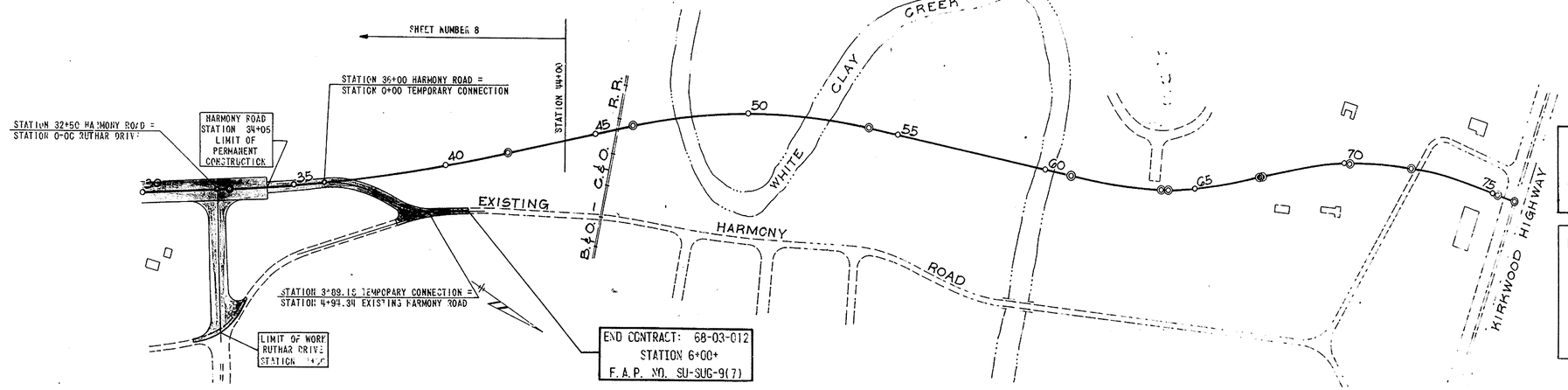
1	TITLE SHEET
2, 3, 4, 5	TYPICAL SECTION SHEETS
24, 25	QUANTITY SHEET
6, 7, 8, 9, 10	PLANS & PROFILE SHEETS
11 THRU 23	BRIDGE SHEETS
26 THRU 43	STANDARD SHEETS C-1, C-2, C-3, D-1, D-7, D-9, D-11, D-13, D-14, D-15, D-16, G-2, G-3, C-4, D-19, G-4, G-5, G-7,

UTILITIES

NEW CASTLE COUNTY DEPT. OF PUBLIC WORKS
DIAMOND STATE TELEPHONE COMPANY
AMERICAN TELEPHONE & TELEGRAPH COMPANY
COLUMBIA GAS & LIGHT COMPANY
PENN CENTRAL RAILROAD
BALTIMORE & OHIO RAILROAD
TIDEWATER WATER COMPANY
NEW CASTLE WATER COMPANY
DELAWARE WATER COMPANY

As Built Shown on Red - Noack - G.H.S.





For:
PENN CENTRAL TRANSPORTATION COMPANY
APPROVED: _____ 19__ _____
CHIEF ENGINEER

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND
By: A. W. Noack, Jr.
A. W. Noack, Jr. - Partner
Date: 7/28/70

AUGUST W. NOACK JR. REGISTERED NO. 1905 DELAWARE PROFESSIONAL ENGINEER

CONVENTIONAL SIGNS

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

SCALES

TITLE SHEET	1" = 200'	FEET
CONSTRUCTION PLAN	1" = 50'	FEET
VERTICAL PROFILE	1" = 10'	FEET

DIVISION OF HIGHWAYS

RECOMMENDED

RECOMMENDED _____ 19__ _____ CHIEF PLANS AND DESIGN

RECOMMENDED _____ 19__ _____ ASSISTANT CHIEF ENGINEER

APPROVED

APPROVED 10/8 19 70 Jae S Robinson DEPUTY DIRECTOR-CHIEF ENGINEER

APPROVED 10 8 19 70 _____ DIRECTOR OF HIGHWAYS

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____ 19__

_____ DIVISION ENGINEER

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
New Castle	68-03-012	2	DEL.	SU-SUG-9(7)	2	43

Harmony Road - Road 355
Road 358 To Route 2

PREL. TRACING _____ DESIGN _____ CHKD. _____

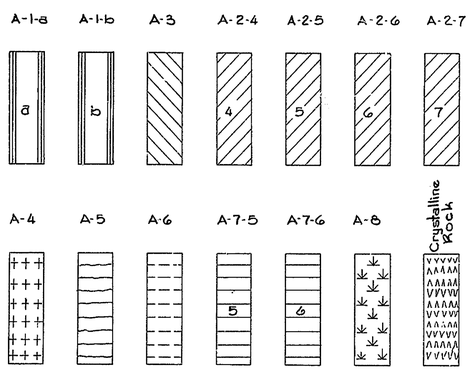
REVISIONS

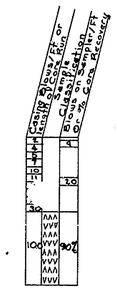
GENERAL NOTES

1. All work under this contract shall be governed by those specifications entitled "State of Delaware, State Highway Department, Standard Specifications for Road & Bridge Constr." dated June 1, 1970 and the Special Provisions thereto.
2. All disturbed areas not to be paved shall be graded, seeded and mulched. Existing lawns disturbed by this construction shall be graded as directed by the Engineer, and Sodded.
3. Grade existing drives in conformity with the plans and/or as directed by the Engineer. Replace disturbed portions of the existing drives in kind and/or indicated on the plans.
4. At all limits of work, heel into existing pavement, warp the new pavement grades and feather Asphaltic Concrete Surface Course to provide a smooth connection to existing pavements.
5. Contractor shall remove and reset all mail boxes, street signs and traffic devices as directed by the Engineer. The cost thereof shall be considered incidental to Section 201, "Clearing and Grubbing."
6. All underground utilities, drains and sewers shown on the plans are from the best available information. Conflicts of these items with proposed construction shall be coordinated by the Contractor with the Engineer.
7. All stationing and offset distances are to the centerline of pipes or structures.
8. Ditches shall be constructed as detailed on the plan drawings. All remaining surfaces of the ditches shall be topsoiled, seeded and mulched.
9. All ditch transitions from one type to another, or into and from existing ditches shall be made uniformly in a distance of 25 feet and surfacing adjusted accordingly.
10. Place 4" of topsoil on all construction slopes and seed & mulch as directed by the Engineer.
11. Two permanent wood barricades are to be erected on existing Harmony Road adjacent to the Penn Central Railroad at locations as specified by the Engineer.
Existing pavement between the barricades is to be removed and the area graded. Disturbed area shall be dressed with 4" of topsoil, seeded and mulched.

SOILS DATA

LEGEND

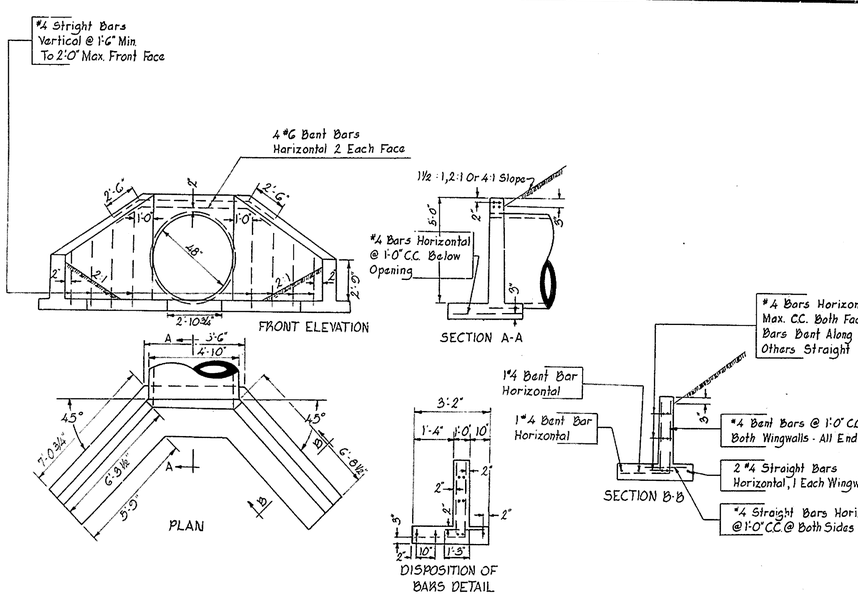




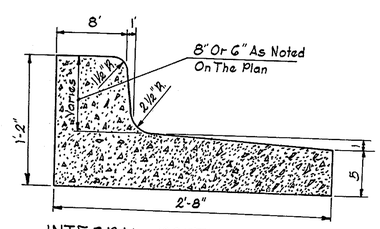
Typical Core Roadway Boring

SOILS NOTES

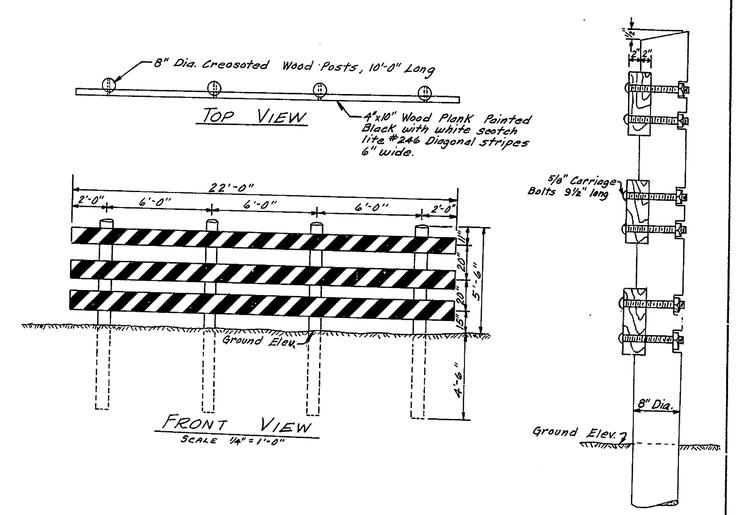
1. All Auger Borings Made By Walton Corporation During November, 1969.
2. All Roadway And Structure Core Borings Made By Walton Corporation During November And December, 1969.
3. All Laboratory Soils Tests Performed By Rummel, Klepper & Kahl Engineers Of Baltimore, Maryland And Reported To State Highway Department, State Of Delaware.
4. Soil Classification For Auger Borings Made In Accordance With Standard Recommended Practice For The Classification Of Soils And Soil Aggregate Mixtures For Highway Construction Purposes, A.A.S.H.O. Designation M 145-49 As Modified By Delaware State Highway Department.
5. G.W. = Water Table
6. R. = Refusal
7. ⊕ A-31 = Auger Boring Nº 31 ☒ TP-3 = Test Pit #3
8. ◐ C-5 = Core Boring Nº 5
9. Ground Elevation Not Shown If Boring Plotted To Correct Elevation.
10. Structure Borings Not Shown In Roadway Plan Or Profile.... See Contract Plans For Each Structure.
11. ☒ Location Of Settlement Platform



HEADWALL FOR 48" PIPE



INTEGRAL PORTLAND CEMENT CONCRETE CURB AND GUTTER
TYPE 1 MODIFIED



PERMANENT WOOD BARRICADE
Scale As Noted

COUNTY	CONTRACT	P. P. A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
New Castle	68-03-012	2	DEL.	SU-SUG-0(7)	3	43

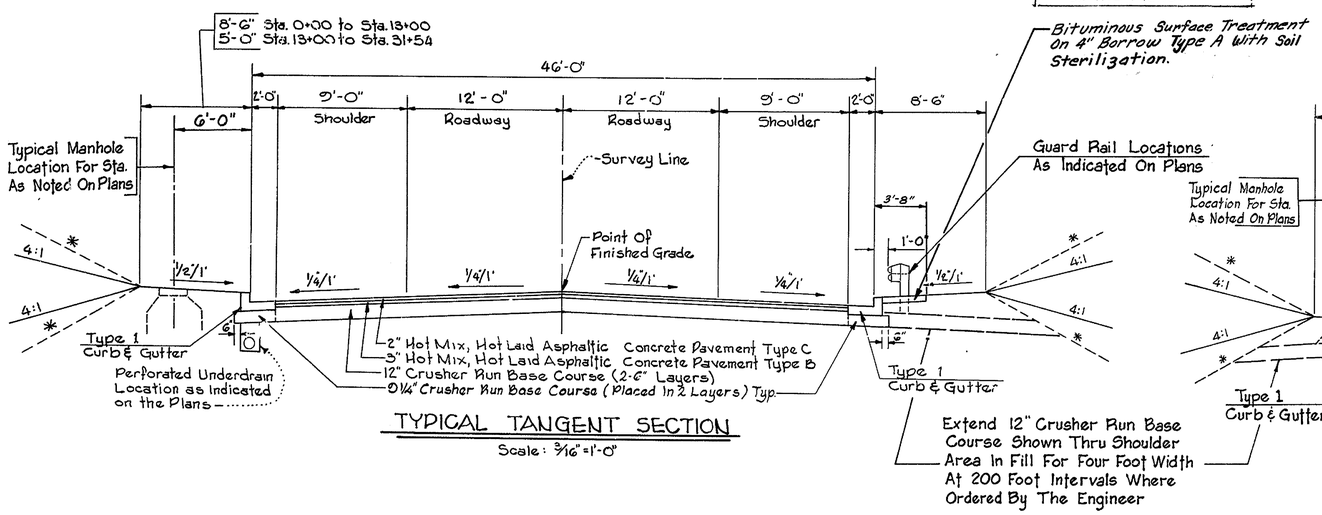
Harmony Road - Road 355
Road 358 To Route 2

PREL. TRACING _____ DESIGN _____ CHKD. _____

REVISIONS

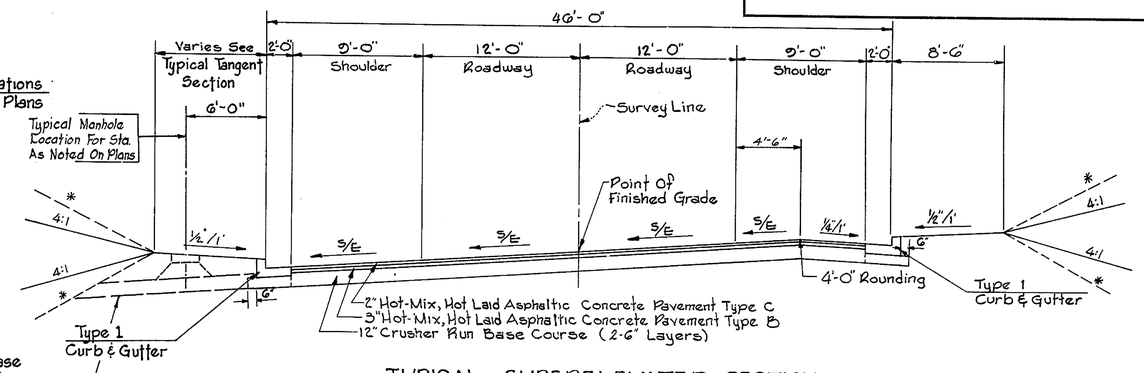
Note: Place 4" Topsoil And Seed & Mulch All Construction Slopes, Except Replace Seed And Mulch With Crown Vetch Seeding And Mulching On Slopes Between Sta. 14+00 to Sta. 28+00 Left & Right.

* 2:1 Slopes For Fills And/Or Cuts Over 15', Except As Noted On The Plans.



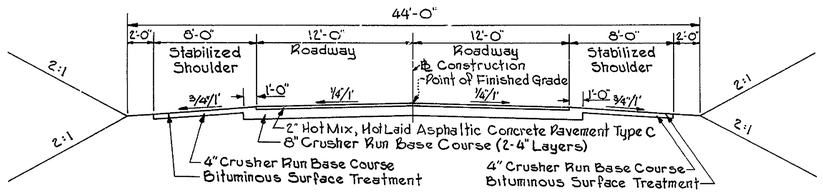
TYPICAL TANGENT SECTION

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



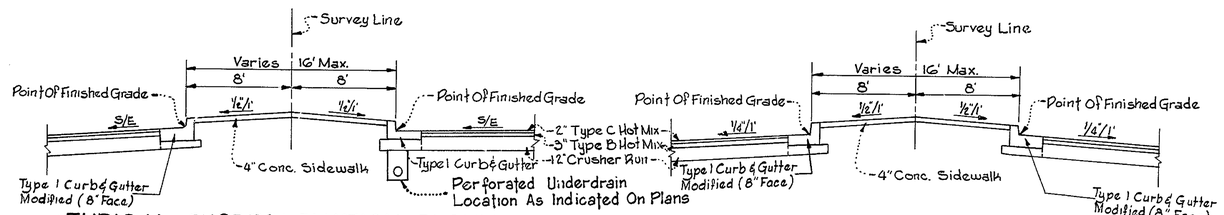
TYPICAL SUPERELEVATED SECTION

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



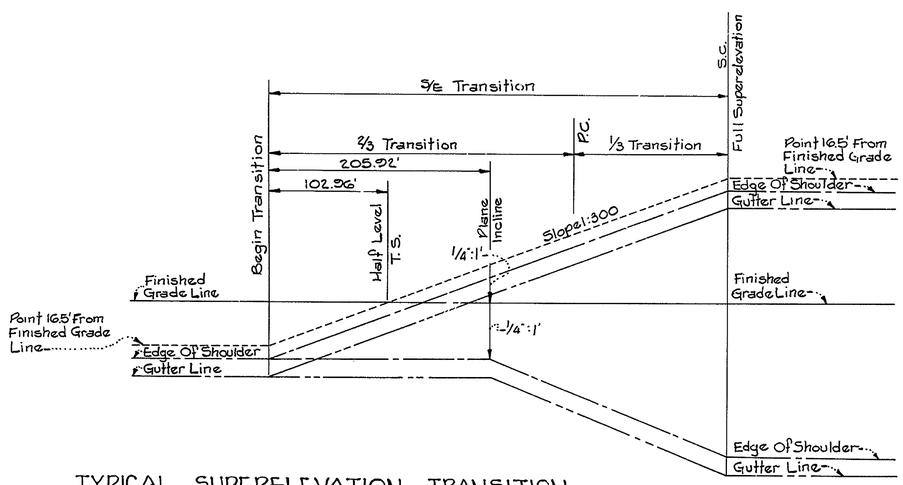
TYPICAL SECTION
ACCESS ROAD RT. STATION 7+50

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

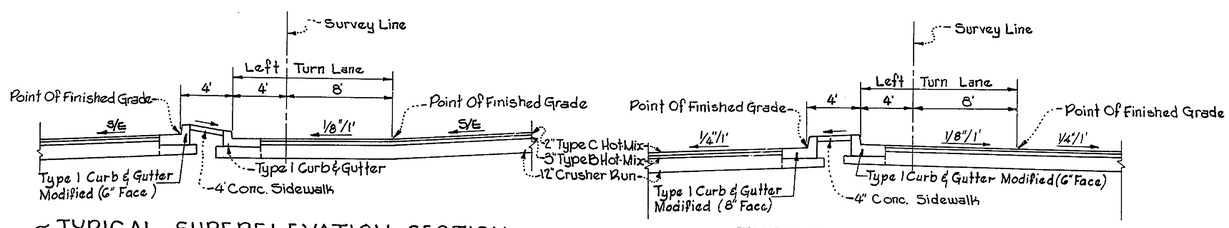


~ TYPICAL SUPERELEVATION SECTION ~
WITH MEDIAN DIVIDER

~ TYPICAL NORMAL SECTION ~
WITH MEDIAN DIVIDER



TYPICAL SUPERELEVATION TRANSITION



~ TYPICAL SUPERELEVATION SECTION ~
WITH LEFT TURN LANE

~ TYPICAL NORMAL SECTION ~
WITH LEFT TURN LANE

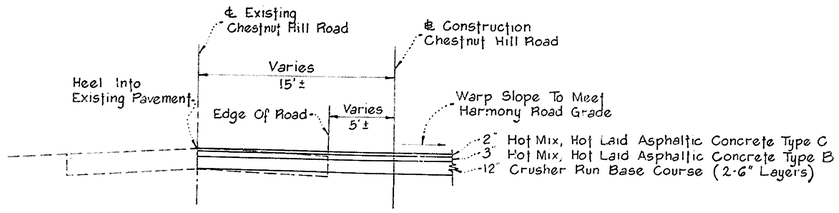
TEMPORARY EROSION CONTROL DETAILS

COUNTY	CONTRACT	P & A REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
New Castle	68-03-012	2	DEL.	SU-SUG-9(7)	4	43

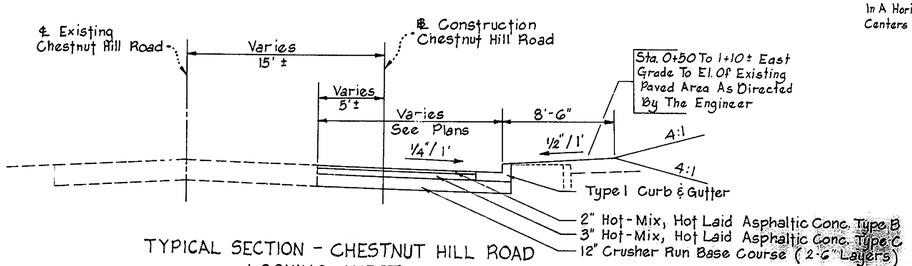
Harmony Road - Road 355
Road 358 To Route 2

PREL. TRACING _____ DESIGN _____ CHKD _____

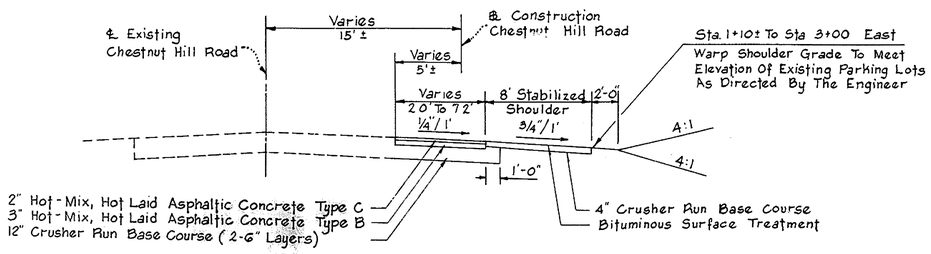
REVISIONS



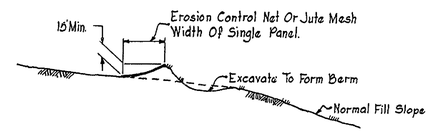
TYPICAL SECTION - CHESTNUT HILL ROAD
LOOKING WEST
Sta 0+50 East To Sta 0+50 West
Not To Scale



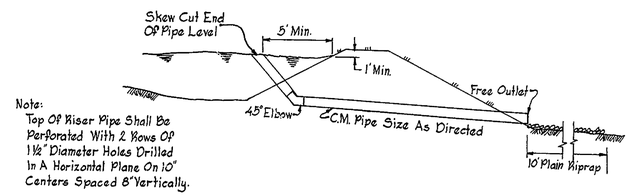
TYPICAL SECTION - CHESTNUT HILL ROAD
LOOKING WEST
Sta. 0+50 To 1+10± East
Sta. 0+50 To 1+10± West
Not To Scale



TYPICAL SECTION - CHESTNUT HILL ROAD
LOOKING WEST
Sta. 1+10± To 3+00 East
Sta. 1+10± To 3+00 West
Not To Scale

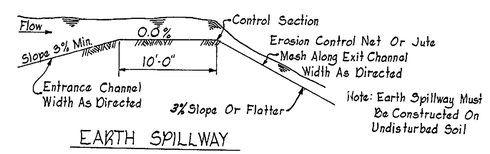


INTERCEPTING DITCH

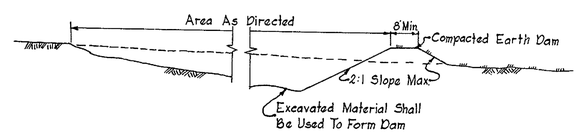


Note:
Top Of Riser Pipe Shall Be Perforated With 2 Rows Of 1 1/2" Diameter Holes Drilled In A Horizontal Plane On 10" Centers Spaced 8" Vertically.

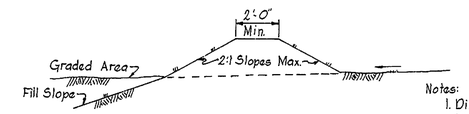
DIKE WITH PIPE SPILLWAY



EARTH SPILLWAY

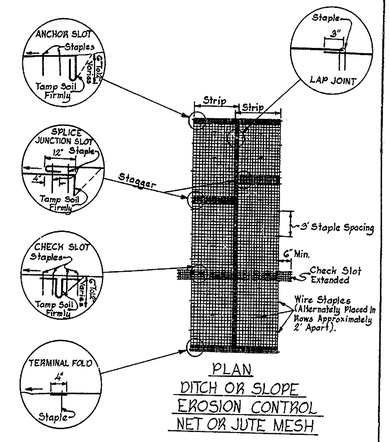


SEDIMENT BASIN

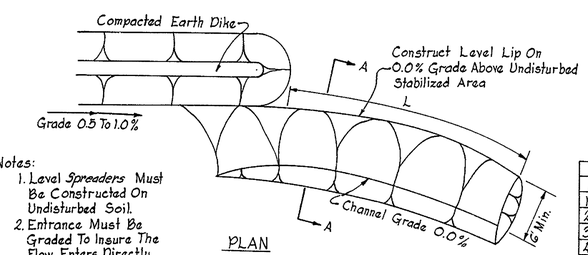


DIKE

Notes:
1. Dikes Must Be Machine Compacted.
2. Dikes Must Have A Positive Grade Draining To A Stabilized Outlet.



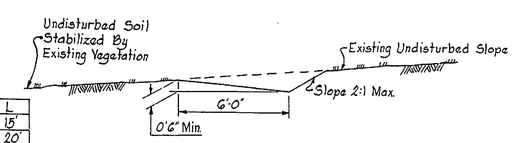
PLAN
DITCH OR SLOPE
EROSION CONTROL
NET OR JUTE MESH



PLAN

Notes:
1. Level Spreaders Must Be Constructed On Undisturbed Soil.
2. Entrance Must Be Graded To Insure The Flow Enters Directly Into The 0.0% Graded Channel.

C.F.S.	L
0 To 10	15'
11 To 20	20'
21 To 30	26'
31 To 40	36'
41 To 50	44'



SECTION A-A

LEVEL SPREADER

COUNTY	CONTRACT	F.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
New Castle	68-09-012	2	DEL.	SU-SUG-9(7)	5	49

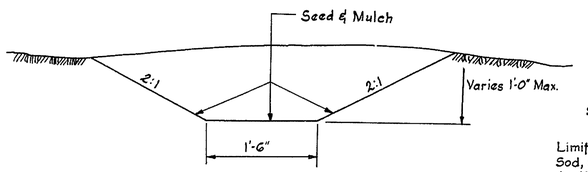
Harmony Road - Road 355
Road 358 To Route 2

PREL. TRACING _____ DESIGN _____ CHKD. _____

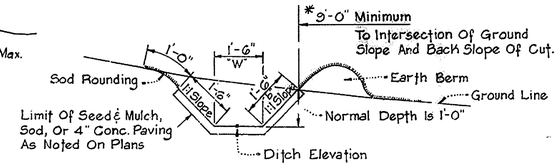
REVISIONS

Revised Berm Ditch Lt. Sta. 9+ To Sta. 13+ R.R.5-19-71
Added 30" E.S.R.C.P. connecting To Bend Structure Lt. Sta. 22+50 R.R.9-1-71

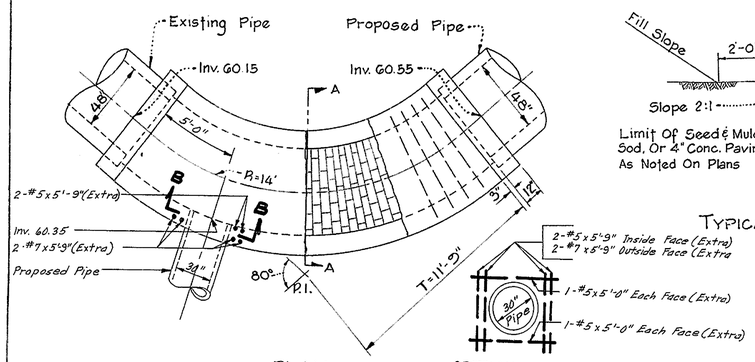
* Distance Varies and eliminate Berm between Sta. 9+00 To Sta. 13+00 Left ℄.



TYPICAL LATERAL DITCH

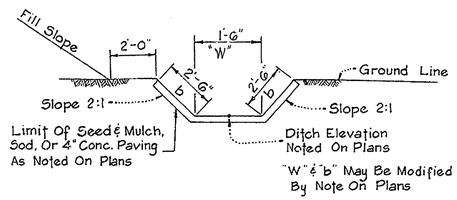


BERM DITCH

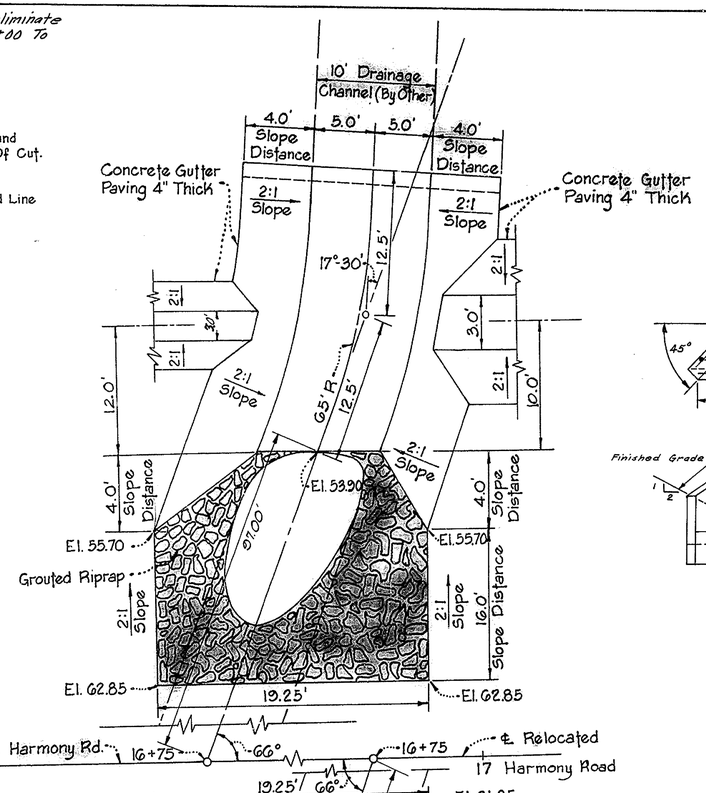


PLAN

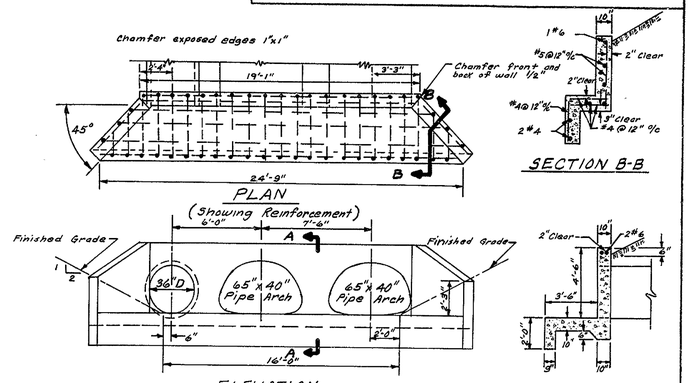
SECTION B-B
REINFORCING AT 30" PIPE ENTRANCE
N.T.S.



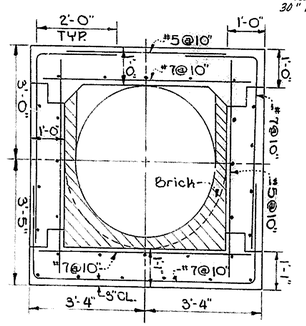
TYPICAL SIDE DITCH



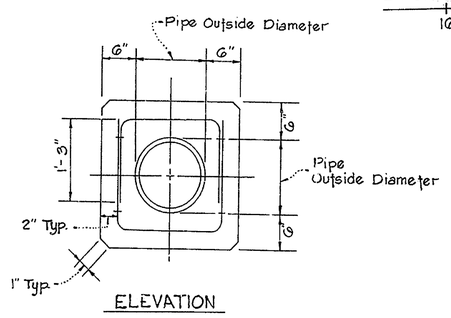
STA. 16+75
INLET & OUTLET STRUCTURE
11'-5" x 7'-3" S.P.P.A. - STEEL
OR 10'-9" x 7'-5" - ALUMINUM



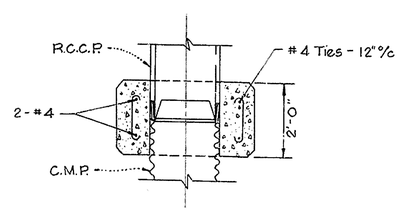
DETAIL
SPECIAL HEADWALL



SECTION AA

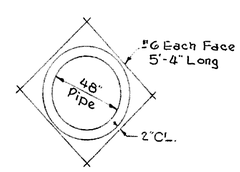


ELEVATION



SECTION

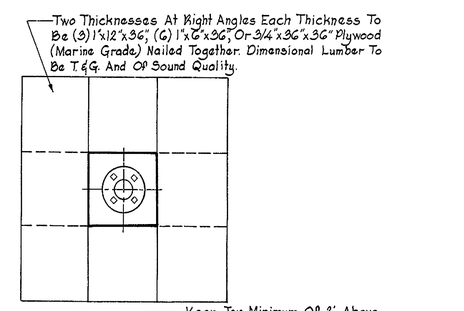
DETAIL - CONCRETE PIPE COLLAR

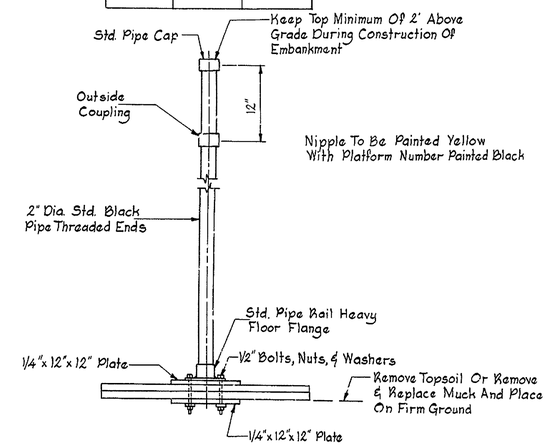


Reinforcing At Pipe Entrance & Exit

Note: All Traverse Bars Are To Be Placed Radially; Spacing Shown Shall Be Measured At The Center Line Of The Transitional Section. All Longitudinal Bars Are To Be #4 Spaced As Shown.

BEND STRUCTURE
LEFT OF STA. 22+50
Not To Scale





DETAIL OF SETTLEMENT PLATFORM

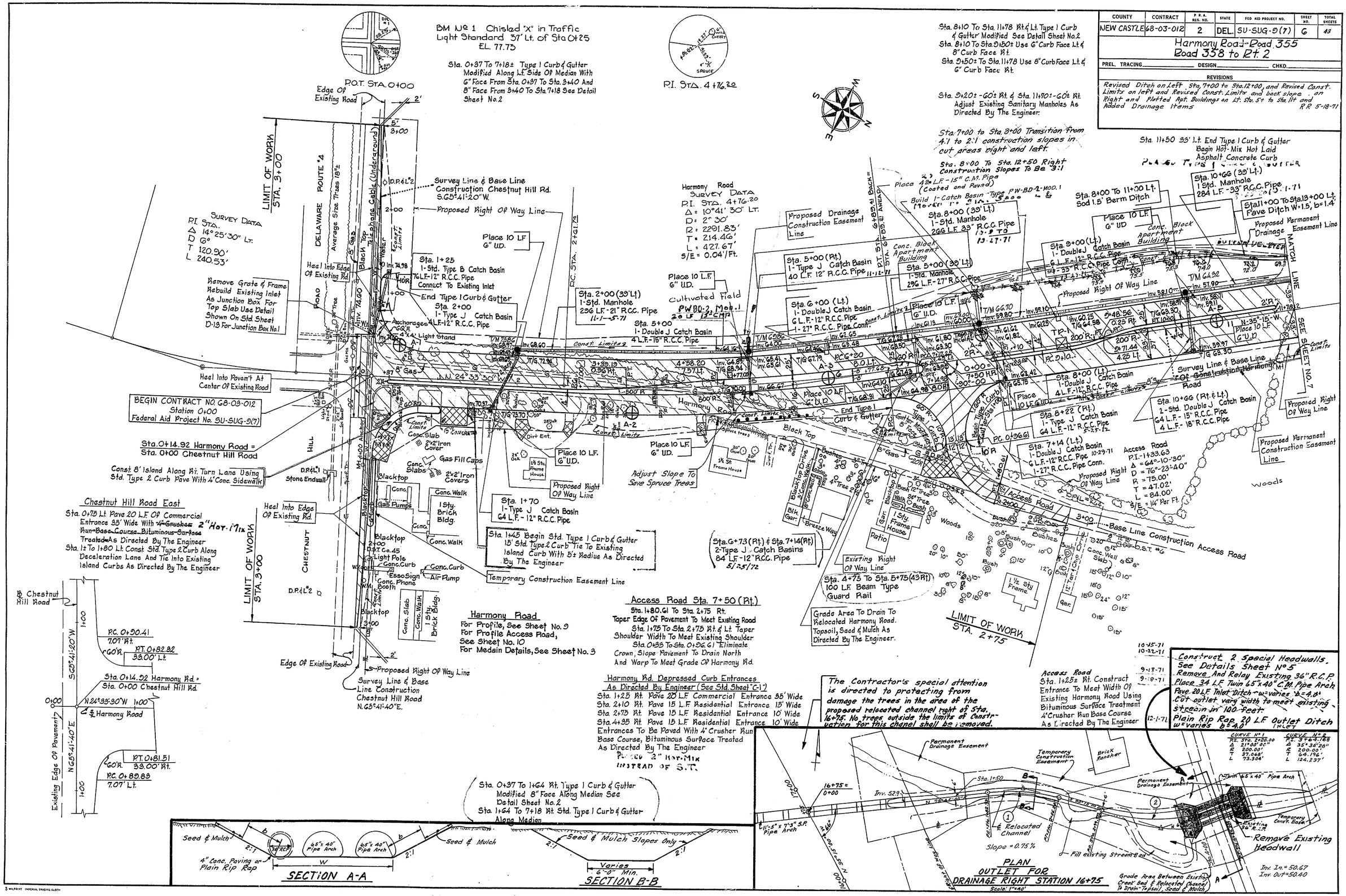
COUNTY	CONTRACT	P. R. A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	6	43

Harmony Road-Road 355
Road 358 to Rt. 2

PREL. TRACING _____ DESIGN _____ CHKD. _____

REVISIONS

Revised Ditch on Left Sta. 7+00 to Sta. 12+00, and Revised Const. Limits on left and Revised Const. Limits and back slope on Right and Plotted Apt. Buildings on Lt. Sta. 5+ to Sta. 11+ and Added Drainage Items R.R. 5-18-71



COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED AID PROJECT NO.	SH. EET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-0(7)	7	43

Harmony Road-Road 355
Road 358 to Rt 2

PREL. TRACING _____ DESIGN _____ CHKD. _____

REVISIONS

Added 30" ESRCP connection to Bend Structure Lt. Sta. 22+50 9-1-71 R.R.

Place Steel Beam Guard Rail @
600 L.F. Sta. 14+80 To Sta. 20+80 Rt.
650 L.F. Sta. 14+55 To Sta. 21+05 Lt.
450 L.F. Sta. 25+15 To Sta. 27+65 Rt.
375 L.F. Sta. 23+35 To Sta. 27+10 Lt.

Place Twisted End Anchorage
1@ Sta. 14+55 To Sta. 14+80 Rt.
1@ Sta. 27+10 To Sta. 27+35 Lt.
1@ Sta. 27+65 To Sta. 27+90 Rt.
1@ Sta. 14+30 To Sta. 14+55 Lt.

Sta. 12+00 To Sta. 15+00 Rt. & Lt.
Undercut One Foot And Backfill With Type A Borrow

BM No. 2 R.R. Spike in 30" Gum Tree 1' Lt. of Sta. 12+75 EL. 69.87

POT. STA. 12+04.54

Corrugated Aluminum 10'x 9"x 7'-5" with 0.175" metal thickness may be used as an alternate for the 11'-5"x 7'-3" Structural Plate Arch.

Sta. 16+75 ℄ (See Detail Sheet No. 5)
196 L.F. 11'-5"x 7'-3" Structural Plate Pipe Arch 9-30-71 & 9-26-71
Top & Side Plates 10 Ga., Bottom Plates 8 Ga.
Pave 25 L.F. Inlet Ditch W=10.0 b=4.0

Rip Rap 25 L.F. Outlet Ditch
W=Varies b=4.0
Remove 1' Of Unsuitable Material Below Invert And Backfill With Course Aggregate For Foundation Stabilization.

Sta. 16+50 (Rt. & Lt.)
2-Type J Catch Basins
46 L.F.-15" R.C.C. Pipe
48 L.F. 15" C.M.P. Pipe Coated & Paved

Sta. 16+25 56' LT
1- Std Type B Manhole
26 L.F. 36" R.C.P.
1 - Std Flared End Section (R.C.P.) 9-13-71

Proposed 10' Drainage Channel By Others

Sta. 13+00 To Sta. 16+50
Pave Side Ditch
W=1.5' b=1.4'

Sta. 16+50 To Sta. 17+10
Pave Side Ditch
W=3.0' b=4.0'

Backfill Existing Ditch

Sta. 17+25 To Sta. 21+25 Lt.
Pave Side Ditch
W=3.0' b=3.13'

Proposed Right Of Way Line

A-277 ac
Q50-507 cfs
Q100-874 cfs

Sta. 13+50 (Rt. & Lt.)
2-Type J Catch Basins
68 L.F.-12" R.C.C. Pipe

Proposed Right Of Way Line

Proposed Permanent Construction Easement Line

Sta. 19+50 (39' Lt.)
274 L.F.- 36" RCC Pipe
1-Std. Type B Manhole

Sta. 19+00 (Rt. & Lt.)
2- Type J Catch Basins
46 L.F.- 15" R.C.C. Pipe
86 L.F.- 15" C.M. Pipe Coated & Paved
2-C.M.P. 30° Bends
1-C.M.P. Std. Flared End Section

Sta. 13+30-35' Lt. End Hot-Mix Hot Laid Asphalt Concrete Curb Begin Type 1 Curb & Gutter

Proposed Permanent Drainage Easement Line

For Profile Harmony Road. See Sheet No. 9
For Median Details See Sheet No. 3
For Details Of Bridge Overpass Penn Central Rt. See Sheet Nos. 11 Thru 23

Sta. 12+70± To Sta. 15+70± Type 1 Curb & Gutter Modified Along Median Rt. & Lt. See Detail Sheet No. 2.

Sta. 11+60 ± to Sta. 12+90 ± Rt. relocate existing Sanitary Sewer as follows:
129 LF-8" V.C.P.X. Connect to existing MH #17-1 9-21-71
Remove and rebuild existing invert channel
Plug abandon sewer pipe
Construct Sanitary MH #17-A @ Sta. 12+90-38' Rt.
210 LF-8" C.I. pipe Connect to existing MH #17 9-21-71
Remove and rebuild existing invert channel
Plug abandon sewer pipe
Encase in concrete 72 L.F. of 8" C.I. pipe
Placed under proposed Harmony Road.
See details this sheet for Sanitary Sewer Const.
Remove abandon Sanitary Sewer as directed by the Engineer and plug any pipe left in place.

BM No. 3 RR Spike in 24' Oak Tree; 1' Rt Sta 17+35 EL. 56.94

POT. STA. 16+21.63

Sta. 13+ To Sta. 21+ (Rt. & Lt.)
Sta. 23+ To Sta. 26+50 (Rt. & Lt.)
Low Saturated Area
Place 3' Type A Borrow Over Existing Ground As Initial Embankment

Sta. 21+ To Sta. 22+ Lt.
Seed & Mulch
1.5' Side Ditch

44 L.F.-48" E.S. RCP Pipe
Connect To Existing 48" RCP
Sta. 21+50 (48' Lt.)
1-Std. Type 'D' Manhole
50 L.F.-48" E.S. RCP Pipe
1-Headwall For 48" R.C.C. Pipe (For Detail See Sheet No. 2)
20 L.F.-Pave Outlet Ditch
W=3.0' b=2.95'

Construction & Survey Line Relocated Harmony Rd.

Sta. 21+25-30' Rt.
Raise Existing Sanitary Manhole To Top Of Frame El. 75.00 As Directed By Engineer

Remove Existing 15" C.M.P.

Existing 10" Sanitary

BM No. 4 Chiseled "x" in Conc Headwall 9' Lt. of Sta 22+40 EL. 65.31

BM No. 5 RR Spike in 14" Gum Tree: 7' Rt of Sta 25+33 EL. 66.91

POT. STA. 22+16.29

Sta. 12+00 To Sta. 21+00
Sta. 23+00 To Sta. 26+50
Remove 4' Rootmat

20 L.F.- Pave Inlet Ditch
80 L.F.- 48" E.S. RCC Pipe 9-16-71
1- Headwall For 48" R.C.C. Pipe (For Detail See Sheet No. 2)
Concrete Bend Structure (For Detail See Sheet No. 5) Replaced with Type D Manhole
Connet To Existing 48" R.C. Pipe

Sta. 23+20 To Sta. 27+00
Sod 1.5' Side Ditch

Proposed Right Of Way Line

Sta. 27+00 To Sta. 28+00
Crown Vetch 1.5' Side Ditch

Sta. 25+00 (Rt. & Lt.)
2- Type J Catch Basins 10-4-71
50 L.F.- 15" R.C.C. Pipe 9-10-71
60 L.F.- 15" C.M. Pipe Coated & Paved 9-10-71
2-C.M.P. 30° Bends
1-C.M.P. Std. Flared End Sections 9-10-71

Remove Existing Headwall & Pipe
8 L.F. Of Existing Pipe left in place

Existing Headwall To Remain In Place And Protected At All Times As Directed By The Engineer, See Special Provisions

Sta. 28+00 (Rt. & Lt.)
2- Type J Catch Basins 10-4-71
64 L.F.- 15" R.C.C. Pipe 9-9-71
78 L.F.- 15" C.M. Pipe Coated & Paved 9-3-71
1-C.M.P. Std. Flared End Section 9-9-71

Seed & Mulch 40 L.F. Inlet Ditch W=2.0'
70 L.F. 30" E.S.R.C.C. Pipe
1-R.C.P. Std. Flared End Section
Connect To Concrete Bend Structure Type D Manhole
(See Detail Sheet No. 5)

8-15-71
9-15-71
12-15-71
At The Following Locations Const. Settlement Platforms As Directed By The Engineer (See Detail Sheet No. 5)
Sta. 20+65 23' Rt.
Sta. 20+85 23' Lt.
Sta. 28+30 23' Rt.
Sta. 28+50 23' Lt.

Sta. 25+13± To Sta. 28+00 Type 1 Curb & Gutter Modified Along Median Rt. & Lt. See Detail Sheet No. 2

Note: Manhole Frame & Cover Placed off Center as shown.

Notes: Walls and bottom shall be brick or concrete poured in place.

Invert channel shall be brick placed on edge with bench full height of pipe.

For brick manhole, plaster outside walls with cement motar 1/2" thick and apply two coats of Bitumastic compound over cement motor.

Abandon Existing Sanitary Sewer

Existing MH #17

Dedicated Street Harmony Crest Drive

Place 10 L.F. 6" U.D.

Proposed MH 17-A

For Construction of Relocated Sanitary Sewer, See notes this sheet.

1½ Story Stucco House

Woods

Field

Tree Stumps and brush

Cyclone Fence

Backfill Existing Ditch

Conc. Block Garage

FOR DETAILS OF RELOCATED CHANNEL SEE SHEETS 5 & 6

1 Sty. Brick House

65"x40" CMP

Existing Signal Cable

Existing 20" Water

Existing 10" Sanitary

Dirt Road

RAILROAD

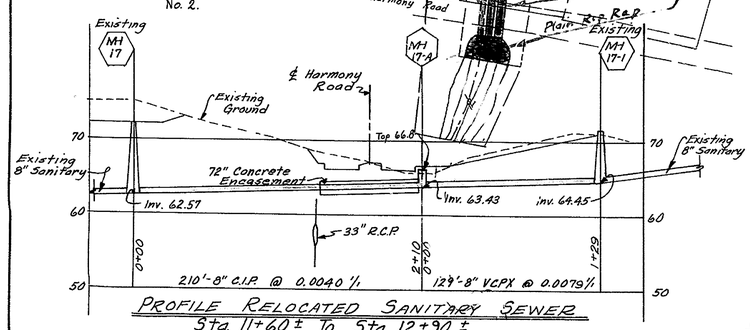
PENN CENTRAL

N 35°-15' W

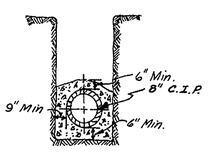
N 78° 07' E

Match Line Sta. 10+00 Sheet No. 6

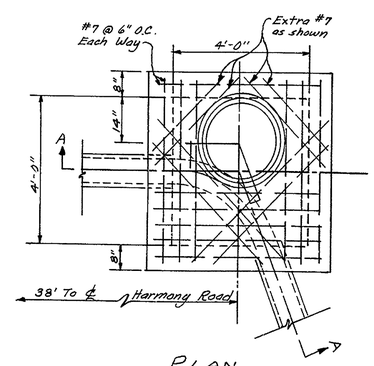
Match Line See Sheet No. 8



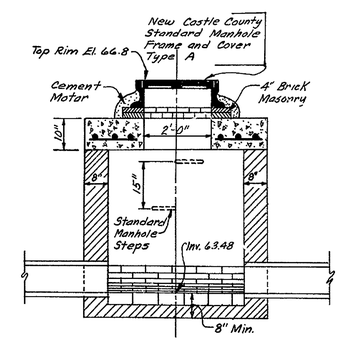
PROFILE RELOCATED SANITARY SEWER
Sta. 11+60 ± To Sta. 12+90 ±
Scale: 1"=10' Vertical
1"=50' Horizontal



CONCRETE ENCASEMENT



PLAN



DETAIL SANITARY SECTION A-A
38' RIGHT-STATION 12+90±

COUNTY	CONTRACT	F.A. PROJ. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	8

Harmony Road - Road 355
Road 358 To Route 2

PREL TRACING _____ DESIGN _____ CHKD _____

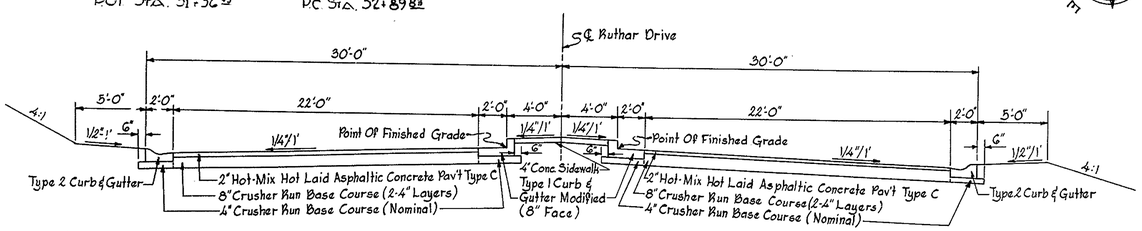
REVISIONS

ADDED PERMANENT EASEMENT LINE ON PARCELS 14-3, L 15-2, L16-2

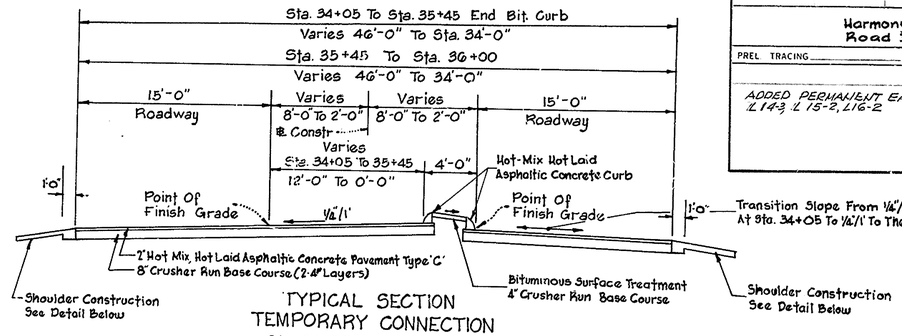
POT STA. 31+36.55

PC STA. 32+89.82

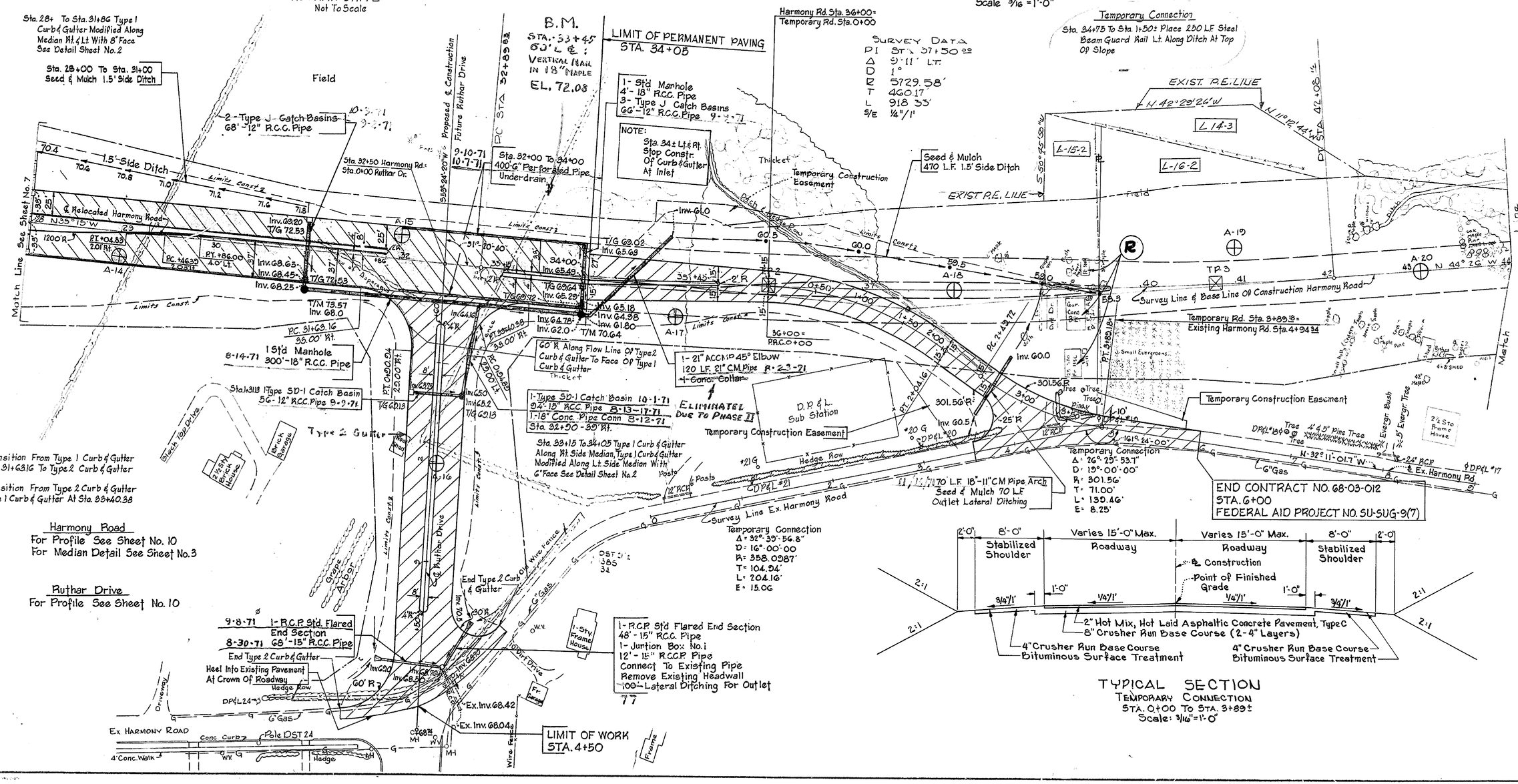
Sta. 31+30 To 33+70 Eliminate 240 L.F. Of Type 1 Curb & Gutter 33' Lt. Construct 240 L.F. Of Hot-Mix Hot Laid Asphaltic Concrete Curb



TYPICAL SECTION
RUTHAR DRIVE
Not To Scale



TYPICAL SECTION
TEMPORARY CONNECTION
Sta. 34+05 To Sta. 36+00
Scale 3/16" = 1'-0"



TYPICAL SECTION
TEMPORARY CONNECTION
STA. 0+00 TO STA. 3+89±
Scale: 3/16" = 1'-0"

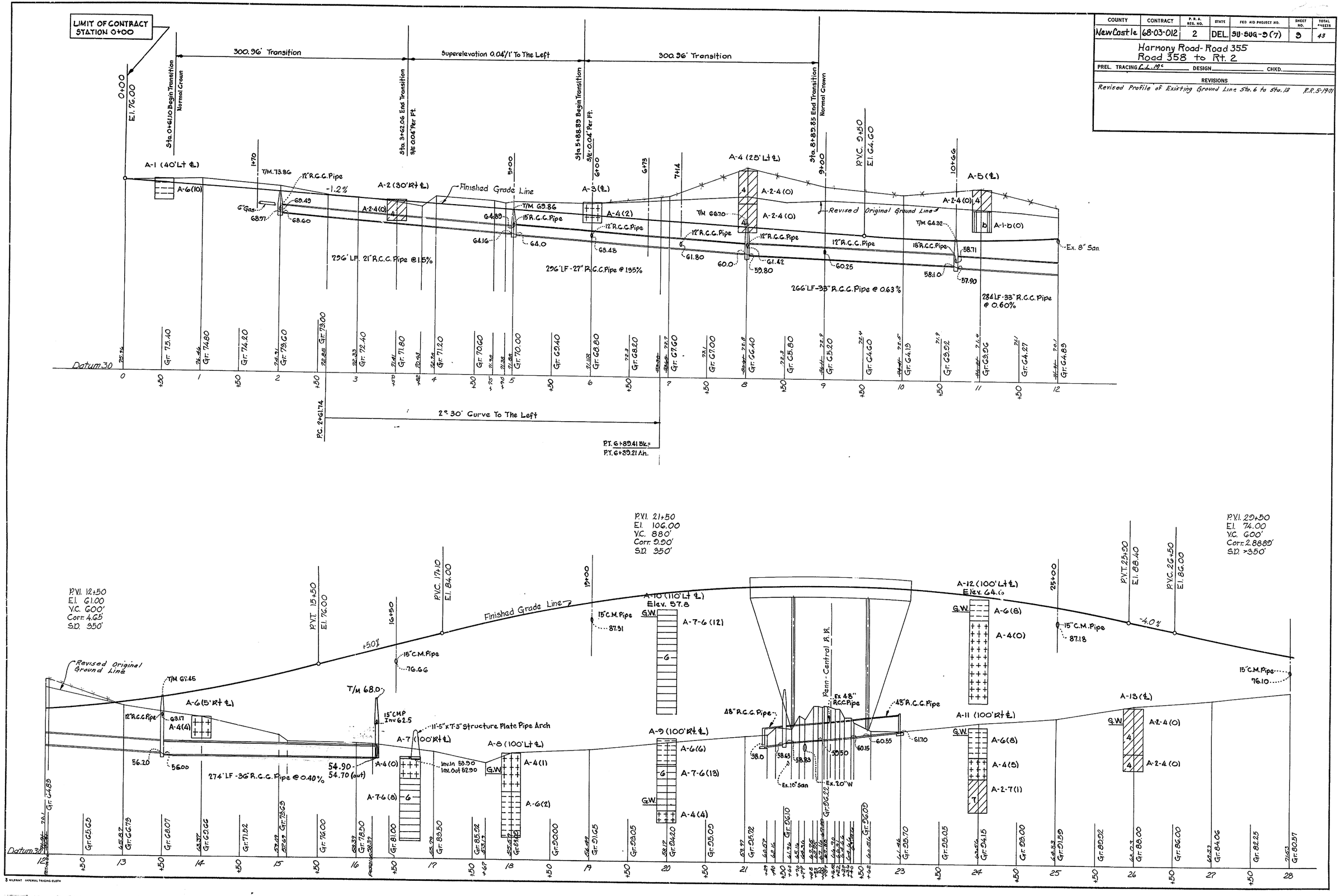
COUNTY	CONTRACT	P. R. A. REG. NO.	STATE	FED AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
New Castle	68-03-012	2	DEL.	SU-SUG-9(7)	3	43

Harmony Road - Road 355
Road 358 to Rt. 2

PREL. TRACING L.L.M^c DESIGN _____ CHKD. _____

REVISIONS

Revised Profile of Existing Ground Line Sta. 6 to Sta. 13 R.R. 5-19-71

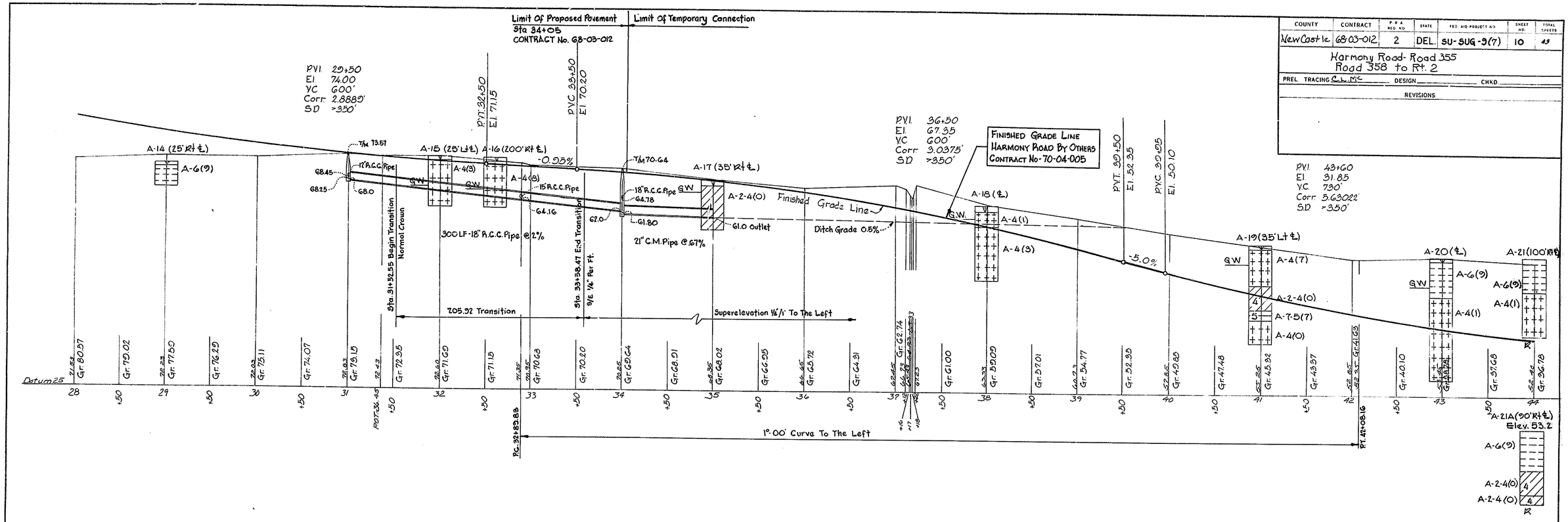


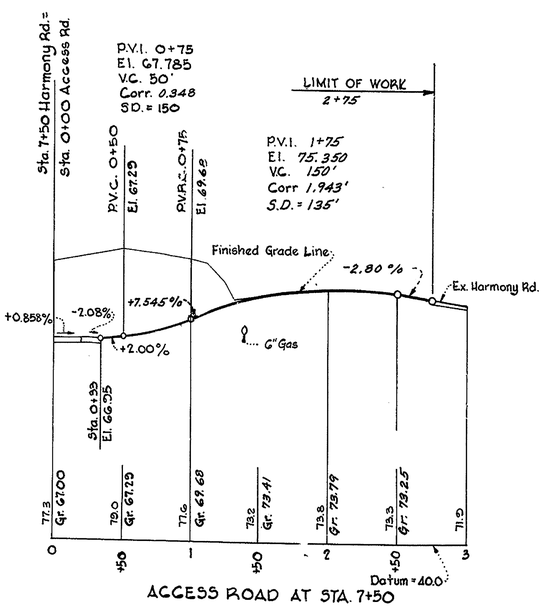
COUNTY	CONTRACT	P.B.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
New Castle	68-03-012	2	DEL.	SU-SUG-9(7)	10	43

Harmony Road- Road 355
Road 358 to Rt. 2

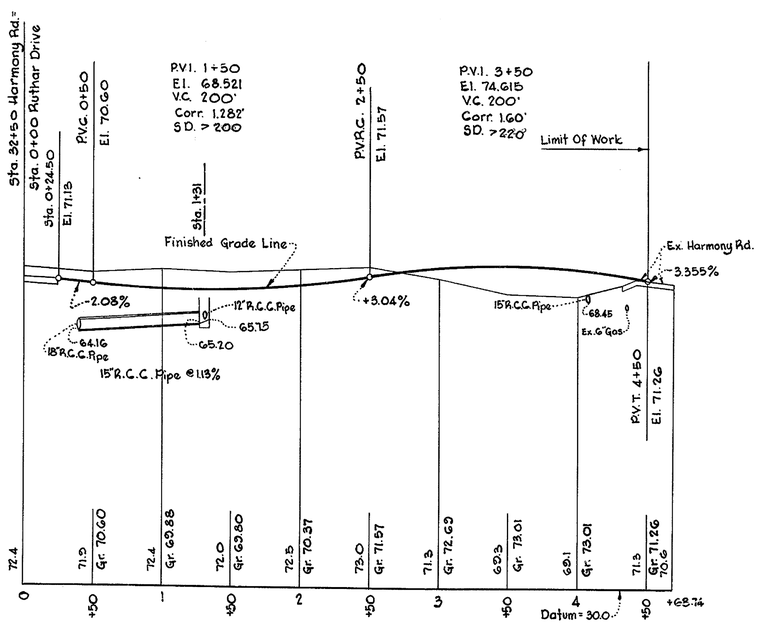
PREL. TRACING C.L.W. M.C. DESIGN _____ CHKD. _____

REVISIONS

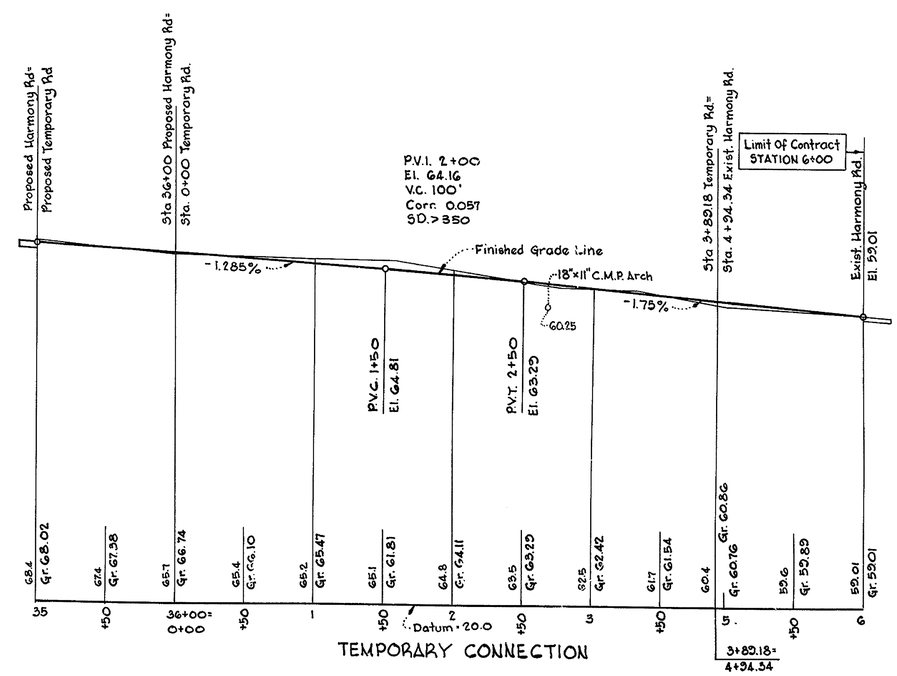




ACCESS ROAD AT STA. 7+50



PROPOSED
RUTHAR DRIVE



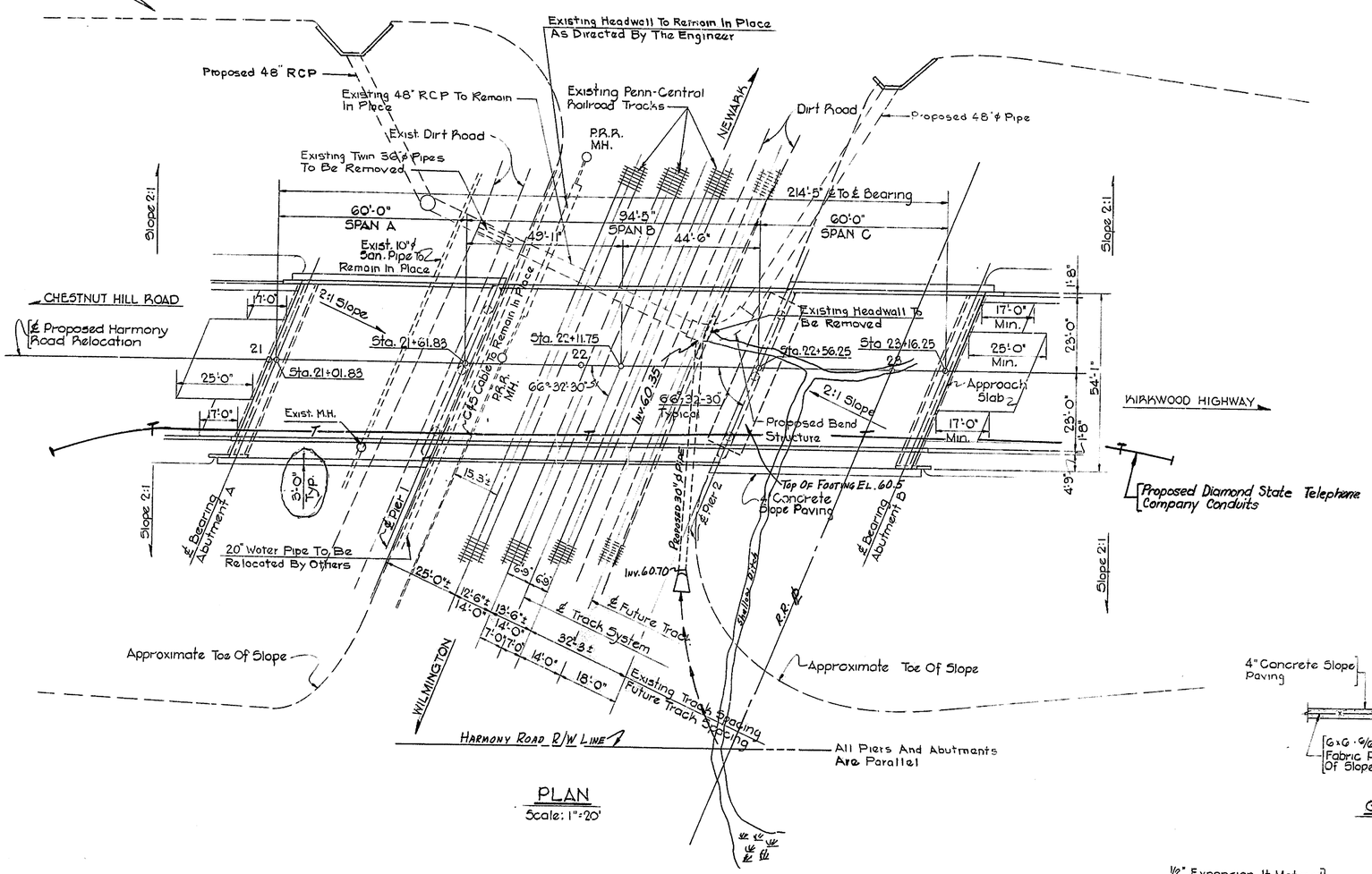
TEMPORARY CONNECTION

K&E BALTIMORE 17 0453 PHOENIX

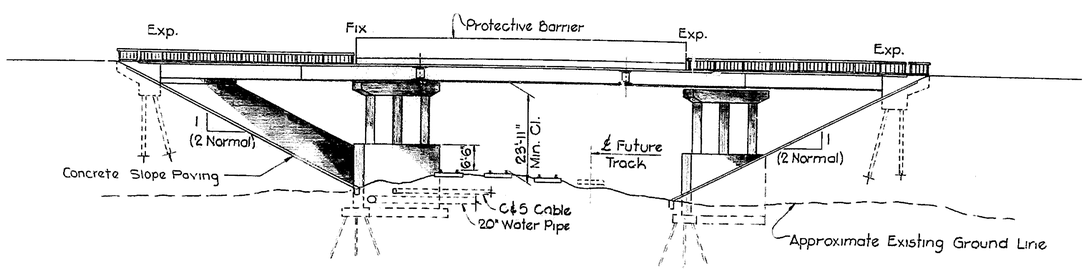
IVC 9-1

COUNTY	CONTRACT	F.A.P. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	11	43

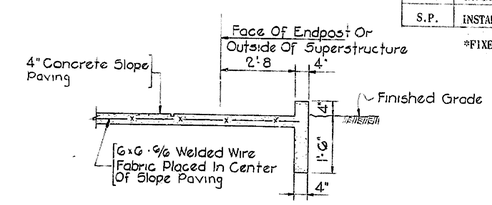
NO.	REVISIONS	BY	DATE
1	Added 30"ESRCP Connecting to Bend Struc-Lt 22+50	R.R.	9-1-71



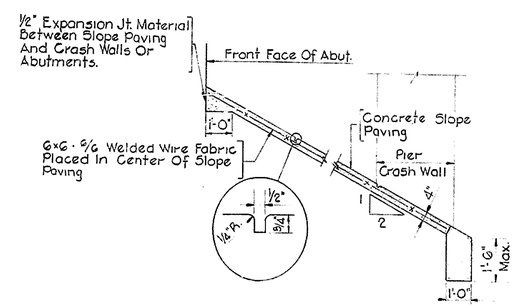
PLAN
Scale: 1"=20'



ELEVATION
Scale: 1"=20'



GUTTER DETAIL
Scale: 1/2"=1'-0"



TOE WALL DETAIL
Scale: 3/8"=1'-0"

SLOPE PAVING DETAILS

ESTIMATED QUANTITIES

SECTION	DESCRIPTION	UNIT	QUANTITY
207	EXCAVATION FOR STRUCTURES	C.Y.	400
401	HOT MIX, HOT LAID ASPHALTIC CONCRETE PAVEMENT	TONS	48
602 *	P.C.C. MASONRY-FOOTINGS-HIGHWAY BRIDGES	C.Y.	240
602 *	P.C.C. MASONRY-ABOVE FOOTINGS-HIGHWAY BRIDGES	C.Y.	235
602 *	P.C.C. MASONRY-SUPERSTRUCTURE-HIGHWAY BRIDGES	C.Y.	360
602 *	P.C.C. MASONRY-APPROACH SLAB-HIGHWAY BRIDGES	C.Y.	87
605 *	BAR REINFORCEMENT-HIGHWAY BRIDGES	LBS.	159,000
606	STRUCTURAL STEEL HIGHWAY BRIDGES-OVERPASS AT PENN-CENTRAL RAILROAD (290.000)	L.S.	L.S.
607 *	BRIDGE RAILING (ALUMINUM)	L.F.	140
624	CAST IN PLACE CONCRETE PILES	L.F.	4,700
624	STEEL SHELL TEST PILES	L.F.	300
S.P.	CONCRETE SLOPE PAVING	S.Y.	890
S.P.*	PROTECTIVE BARRIER 3' 9" HIGH	L.F.	95
S.P.*	PROTECTIVE BARRIER 5' 3" HIGH	L.F.	95
S.P.	MAINTENANCE OF RAILROAD TRAFFIC	L.S.	L.S.
S.P.	PROTECTIVE SHIELDS OVER RAILROAD	L.S.	L.S.
S.P.	PROTECTIVE COATING FOR P.C.C.-BRIDGE SUPERSTRUCTURE	GAL.S.	60
S.P.	CATENARY ATTACHMENTS & CONCRETE INSERTS	L.S.	L.S.
S.P.	INSTALLING TELEPHONE CONDUITS	L.S.	L.S.

*FIXED QUANTITY ITEMS

GENERAL NOTES

DESIGN: A.A.S.H.O. STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES DATED 1969.

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

SPECIFICATIONS: MATERIAL AND WORKMANSHIP STANDARD SPECIFICATIONS OF THE DELAWARE STATE HIGHWAY DEPARTMENT DATED, JUNE 1, 1970 UNLESS OTHERWISE NOTED AND SPECIFIED IN THE SPECIAL PROVISIONS.

P.C.C. MASONRY: ALL CONCRETE SHALL HAVE A MINIMUM 28 DAY ULTIMATE COMPRESSIVE STRENGTH OF 3000 P.S.I. EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.

BAR REINFORCEMENT: BAR REINFORCEMENT SHALL MEET THE REQUIREMENTS OF A.S.T.M. A615-68 GRADE 40.

REINFORCEMENT COVER: UNLESS OTHERWISE NOTED ON PLANS, THE MINIMUM COVER FOR BAR REINFORCEMENT SHALL BE 2".

STRUCTURAL STEEL: STRUCTURAL STEEL SHALL CONFORM TO A.S.T.M. A-36 STEEL.

DATUM: B.M. NO. 4 - CHISELED "X" IN CONCRETE HEADWALL 9 FEET LEFT OF STATION 22+40. EL. 65.31.

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR
GENERAL PLAN AND ELEVATION

D. J.M.K.
T. J.M.K.
C. R.B.B.

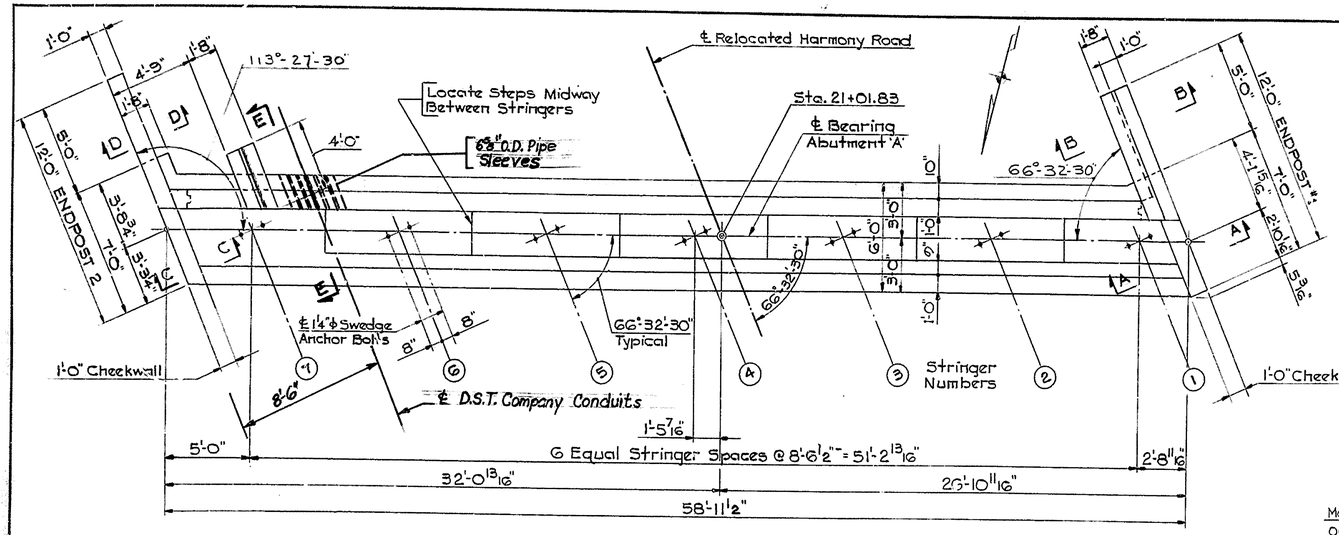
SCALE: AS NOTED

APPROVED BY: John E. Duke
BRIDGE ENGINEER

I Scale 20

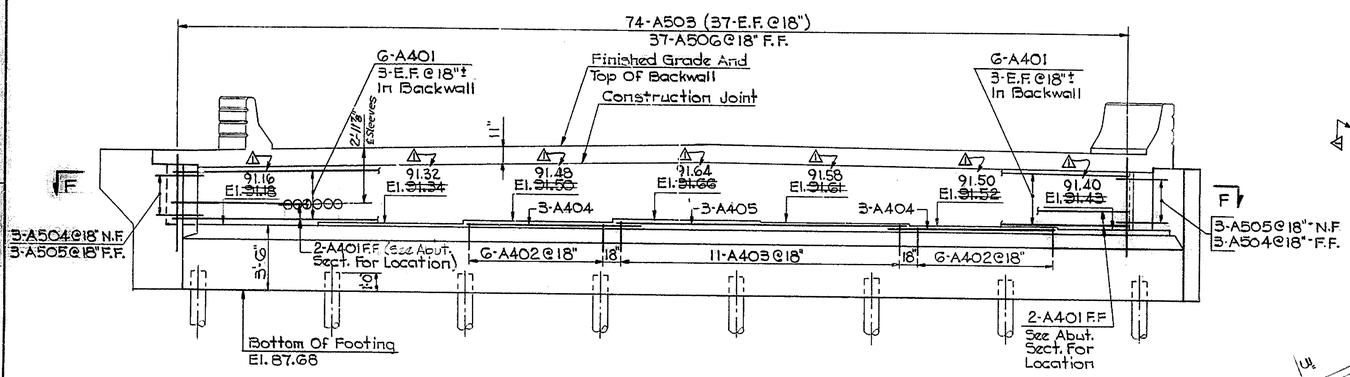
COUNTY	CONTRACT	P.V.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	12	49

NO.	REVISIONS	BY	DATE
1	BEARING SEAT ELEV. CHANGED	R.B.F.	8-11-71



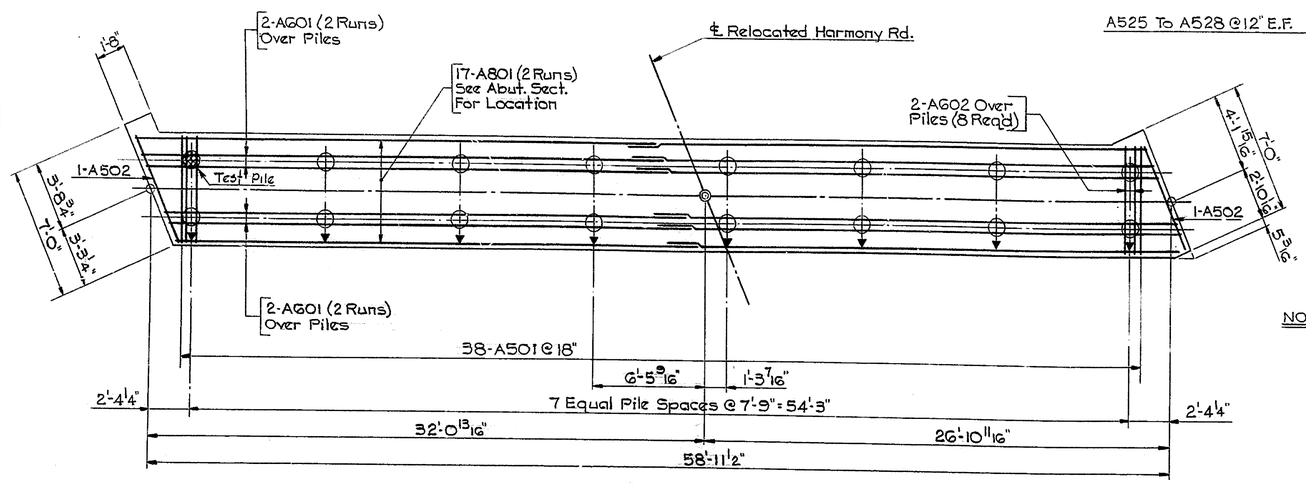
PLAN - ABUTMENT 'A'

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



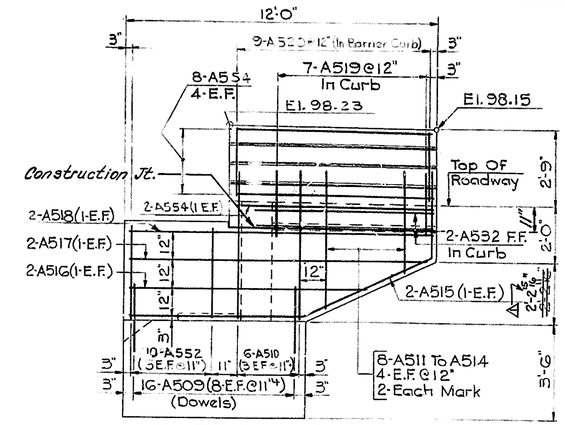
ELEVATION

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



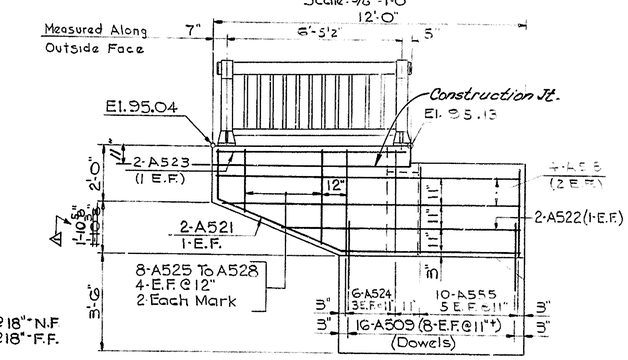
FOOTING PLAN

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



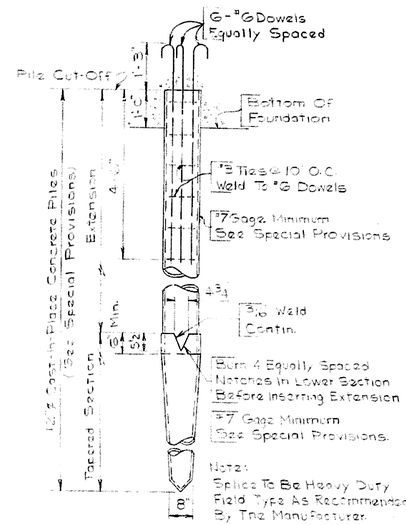
ELEVATION - ENDPOST 1

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



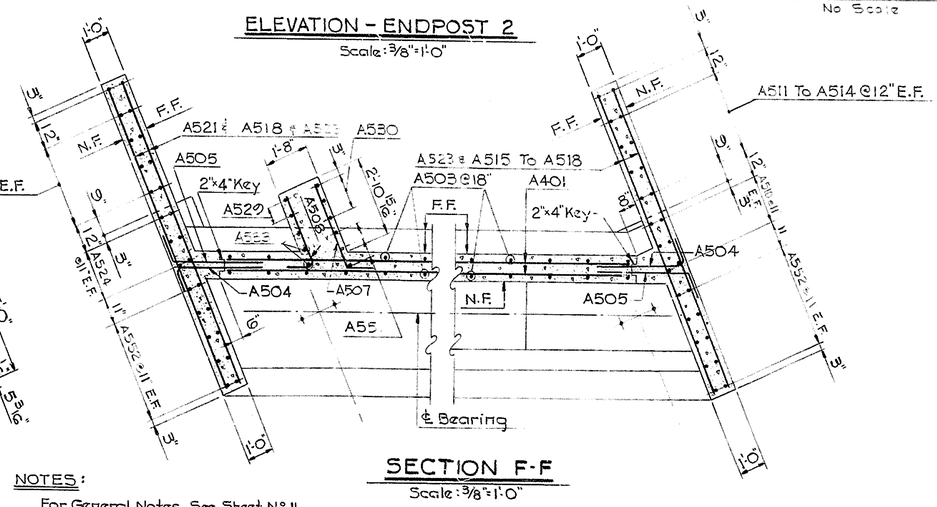
ELEVATION - ENDPOST 2

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



TYPICAL PILE SPLICE

No Scale



SECTION F-F

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

NOTES:

For General Notes, See Sheet No. 11
N.F. Denotes Near Face
F.F. Denotes Far Face
E.F. Denotes Each Face

All Piles Shall Be 12" ϕ Cast-In-Place Conc. Piles
Design Capacity = 35 Tons
(See Special Provisions)
○ Indicates Plumb Piles
→ Indicates Batter Piles (4:12)
⊗ Indicates Test Piles

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR

ABUTMENT A

D. A.T.B.
T. A.T.B.
C. R.B.B.

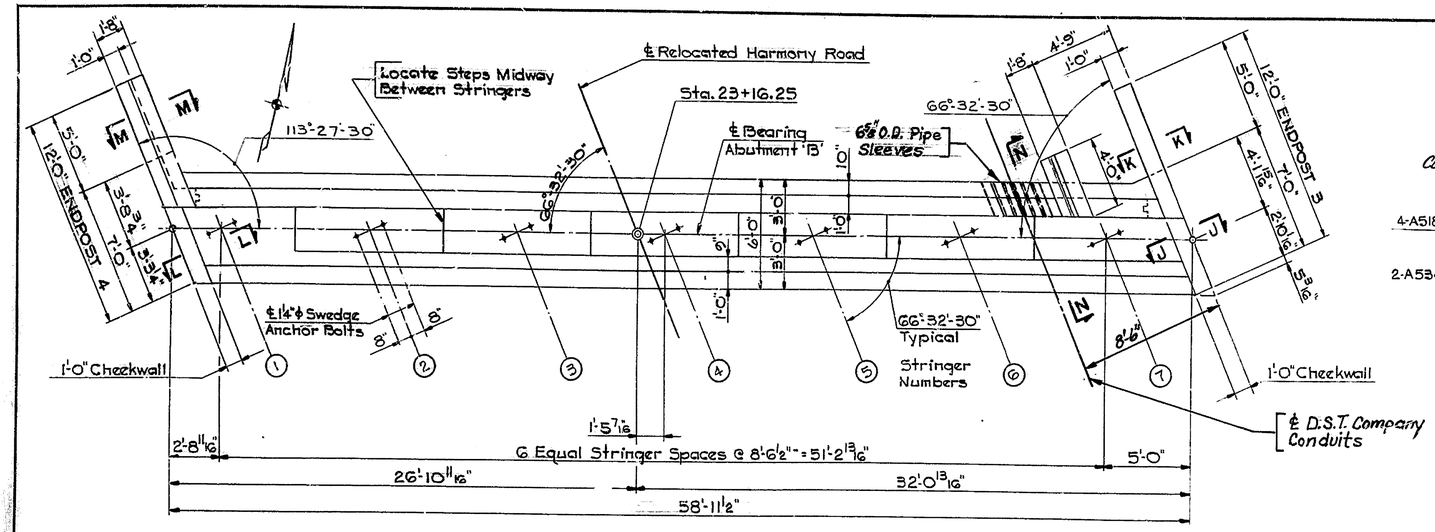
SCALE AS NOTED

APPROVED BY: John E. Lichter
BRIDGE ENGINEER

K+E BALTIMORE 17 6433 PHOENIX

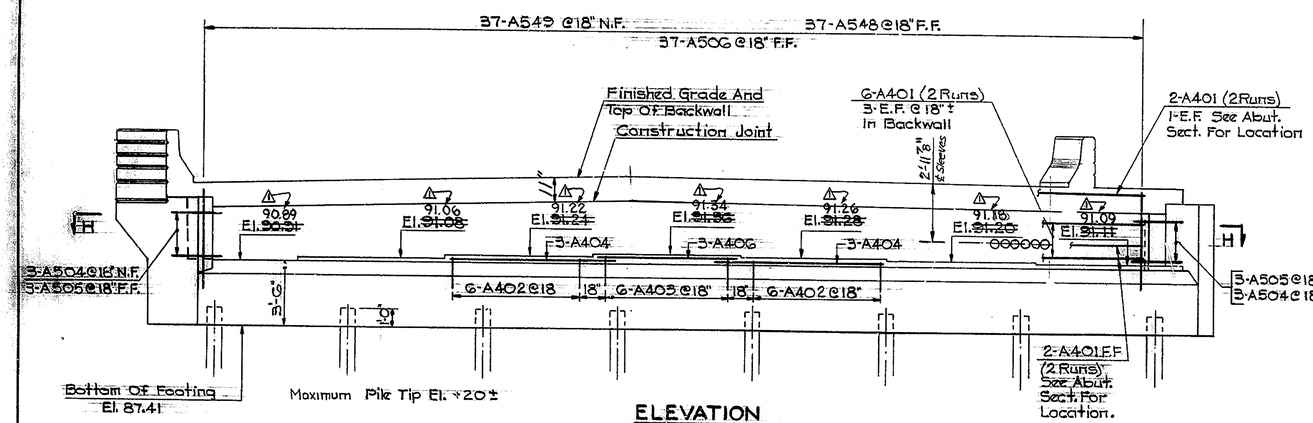
COUNTY	CONTRACT	F. A. P. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7	13	43

NO.	REVISIONS	BY	DATE
1	BEARING SEAT ELEV. CHANGED	R.B.F.	8-11-71



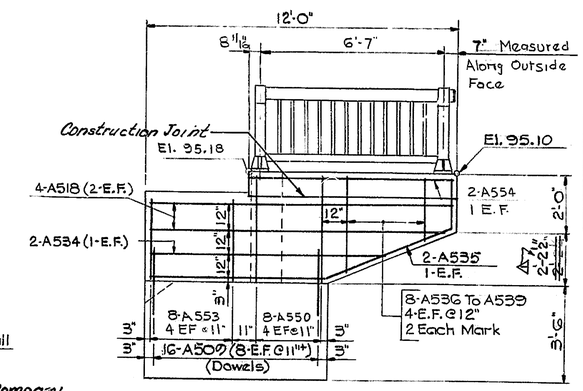
PLAN - ABUTMENT 'B'

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



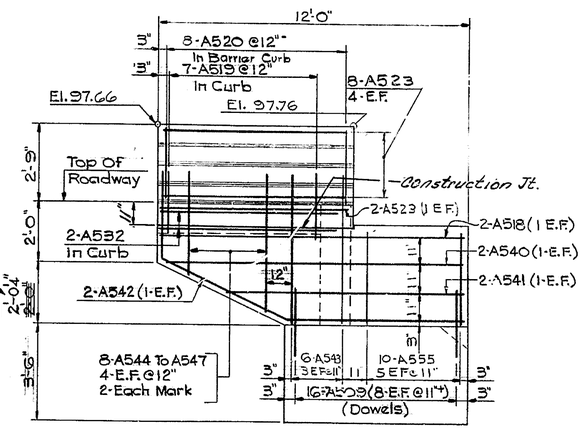
ELEVATION

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



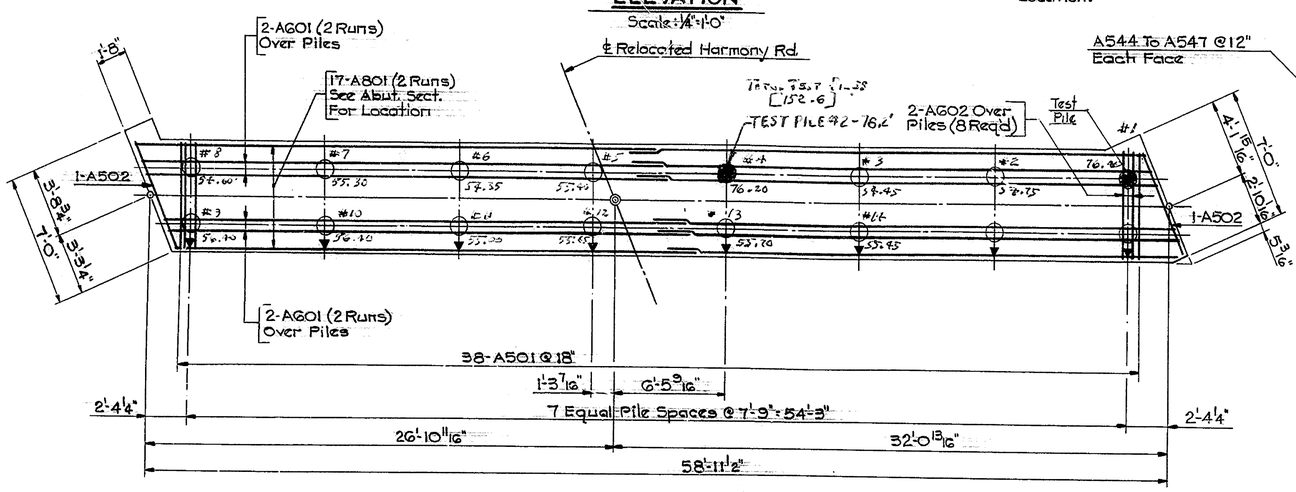
ELEVATION - ENDPOST 3

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



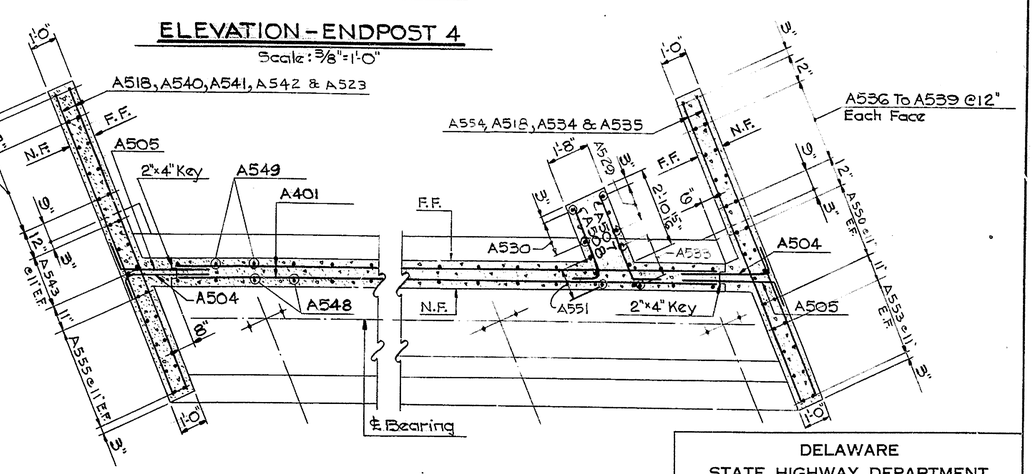
ELEVATION - ENDPOST 4

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



FOOTING PLAN

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



SECTION H-H

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

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BALTIMORE, MARYLAND

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR

ABUTMENT B

D. A. T. B.
T. A. T. B.
C. R. B. B.

SCALE AS NOTED

APPROVED BY: John E. Baker
BRIDGE ENGINEER

K&E BALTIMORE 17 0453 PHOENIX

COUNTY	CONTRACT	F.B.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	63-03-012	2	DEL.	SU-SUG-9(7)	14	43

NO.	REVISIONS	BY	DATE

BAR SCHEDULE

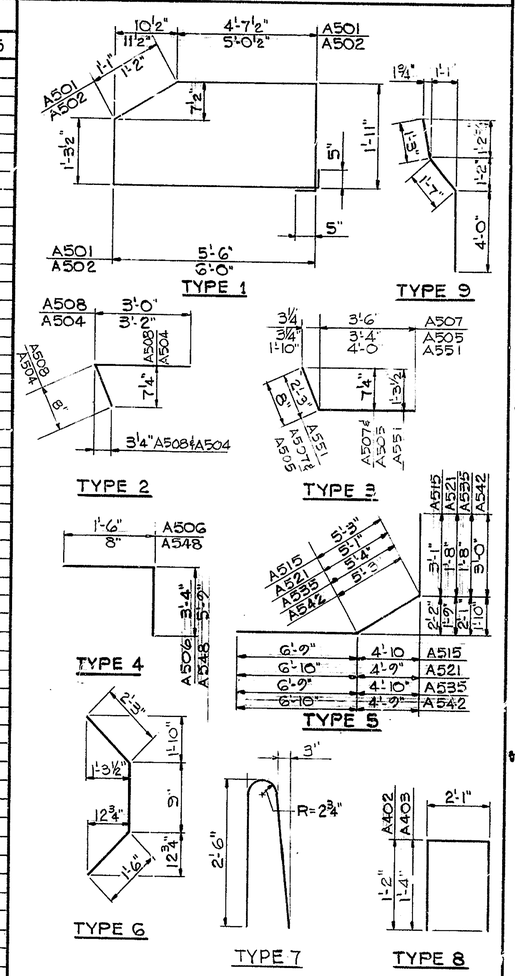
ABUTMENT A

MARK	NO.	SIZE	TYPE	LENGTH	REMARKS
A401	16	#4	Str.	27'-9"	
A402	12	#4	8.	4'-5"	
A403	11	#4	8.	4'-9"	
A404	6	#4	Str.	9'-3"	
A405	3	#4	Str.	16'-7"	
A501	38	#5	1.	15'-3"	
A502	2		1.	16'-3"	
A503	74		Str.	5'-6"	
A504	6		2.	3'-10"	
A505	6		3.	4'-0"	
A506	37		4.	4'-10"	
A507	3		3.	4'-2"	
A508	3		2.	3'-8"	
A509	38		Str.	2'-6"	
A510	6		"	5'-7"	
A511	2		"	5'-0"	
A512	2		"	4'-7"	
A513	2		"	4'-2"	
A514	2		"	3'-8"	
A515	2		5.	15'-1"	
A516	2		Str.	9'-3"	
A517	2		"	11'-6"	
A518	4		"	11'-8"	
A519	7		6.	4'-6"	
A520	12		7.	5'-0"	
A521	2		5.	13'-7"	
A522	2		Str.	9'-6"	
A523	2		Str.	7'-3"	
A524	6		Str.	3'-9"	
A525	2		"	5'-3"	
A526	6		"	2'-11"	
A527	2		"	2'-6"	
A528	2		"	2'-2"	
A529	2		"	6'-7"	
A530	3		9.	6'-10"	
A531	4		Str.	3'-8"	
A532	2	#5	"	6'-10"	
A533	3	#5	Str	5'-4"	
A551	3	#5	3	6'-3"	
A552	10	#5	Str.	3'-3"	
A601	8	#6	Str.	30'-0"	
A602	16	#6	Str.	5'-6"	
A554	8	#5	Str.	7'-4"	
A555	10	#5	Str.	3'-0"	
A801	34	#8	Str.	30'-3"	

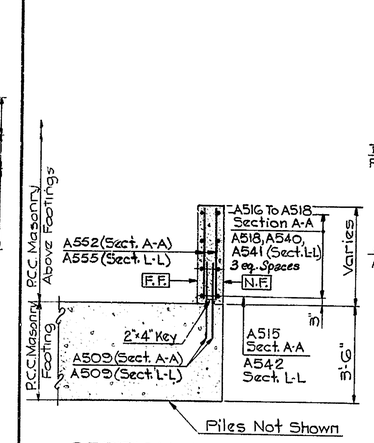
ABUTMENT B

MARK	NO.	SIZE	TYPE	LENGTH	REMARKS
A401	20	#4	Str.	27'-9"	
A402	12	#4	8.	4'-5"	
A403	6	#4	8.	4'-9"	
A404	6	#4	Str.	9'-3"	
A406	3	#4	Str.	8'-2"	
A501	38	#5	1.	15'-3"	
A502	2		1.	16'-3"	
A504	6		2.	3'-10"	
A505	6		3.	4'-0"	
A506	37		4.	4'-10"	
A507	3		3.	4'-2"	
A508	3		2.	3'-8"	
A509	38		Str.	2'-6"	
A518	2		Str.	11'-8"	
A519	7		6.	4'-6"	
A520	11		7.	5'-0"	
A532	2		Str.	6'-10"	
A533	3		"	5'-4"	
A534	2		"	9'-1"	
A535	2		5.	13'-9"	
A536	2		Str.	3'-9"	
A537	2		"	3'-3"	
A538	2		"	2'-9"	
A539	2		"	2'-3"	
A540	2		"	11'-7"	
A541	2		"	9'-4"	
A542	2		5.	15'-1"	
A543	6		Str.	5'-5"	
A544	2		"	4'-10"	
A545	2		"	4'-5"	
A546	2		"	4'-0"	
A547	2		"	3'-9"	
A548	37		4.	6'-5"	
A550	8		Str.	4'-3"	
A529	5		"	6'-7"	
A530	3		9.	6'-10"	
A531	4		Str.	3'-8"	
A549	37	#5	Str.	5'-1"	
A551	3	#5	3	6'-3"	
A523	10	#5	Str	7'-3"	
AG01	8	#6	Str.	30'-0"	
AG02	16	#6	Str.	5'-6"	
A526	4	#5	Str.	2'-11	
A553	8	#5	Str.	3'-5"	
A554	2	#5	Str.	7'-4"	
A801	34	#8	Str.	30'-3"	
A555	10	#5	Str.	3'-0"	

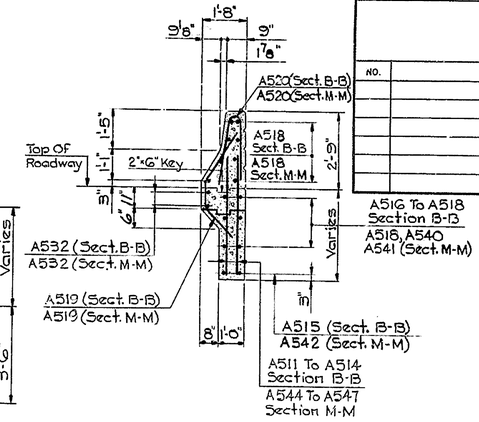
BAR TYPES



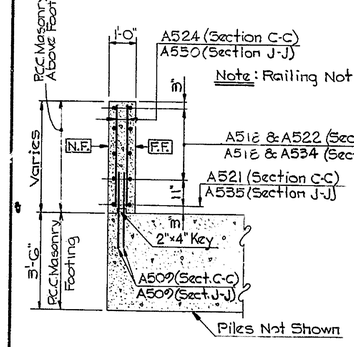
Note: All Bar Dimensions Are Out To Out.



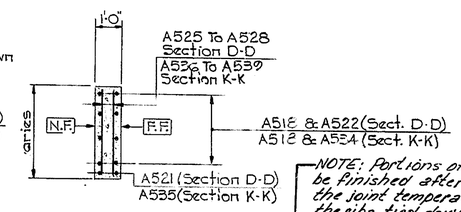
SECTION A-A
SECTION L-L
Scale: 3/8"=1'-0"



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

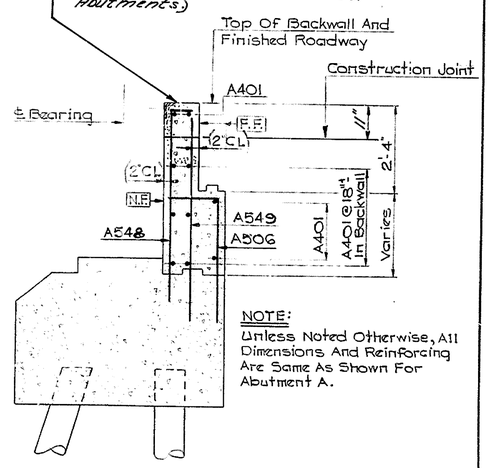


SECTION C-C
SECTION J-J
Scale: 3/8"=1'-0"



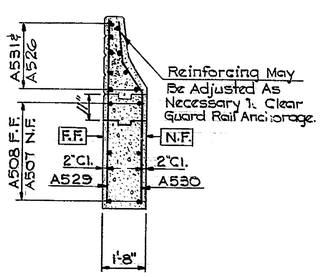
SECTION D-D
SECTION K-K
Scale: 3/8"=1'-0"

NOTE: Portions of Abutment above Constr. Jt. shall be finished after deck concrete has been poured, the joint temperature requirements fulfilled and the ribs tied down to backwall. (Typical all Abutments.)

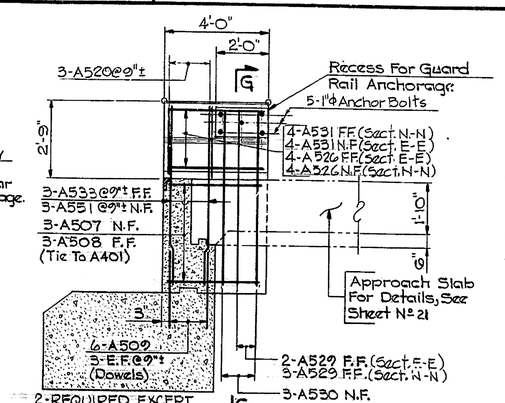


NOTE:
Unless Noted Otherwise, All Dimensions And Reinforcing Are Same As Shown For Abutment A.

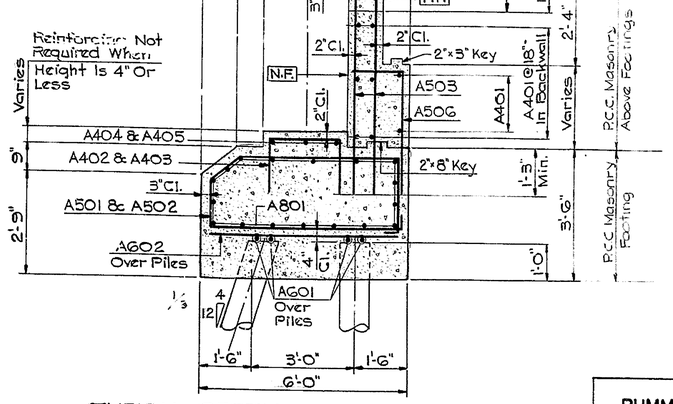
TYPICAL SECTION THRU ABUTMENT B
Scale: 1/2"=1'-0"



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



SECTION E-E SHOWN
SECTION N-N SIMILAR



TYPICAL SECTION THRU ABUTMENT A
Scale: 1/2"=1'-0"

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR

ABUTMENT DETAILS

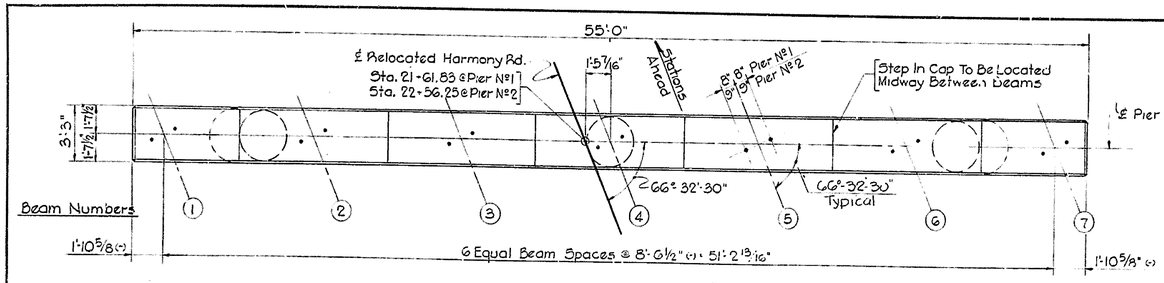
RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

D. A.T.B.
T. A.T.B.
C. R.B.B.

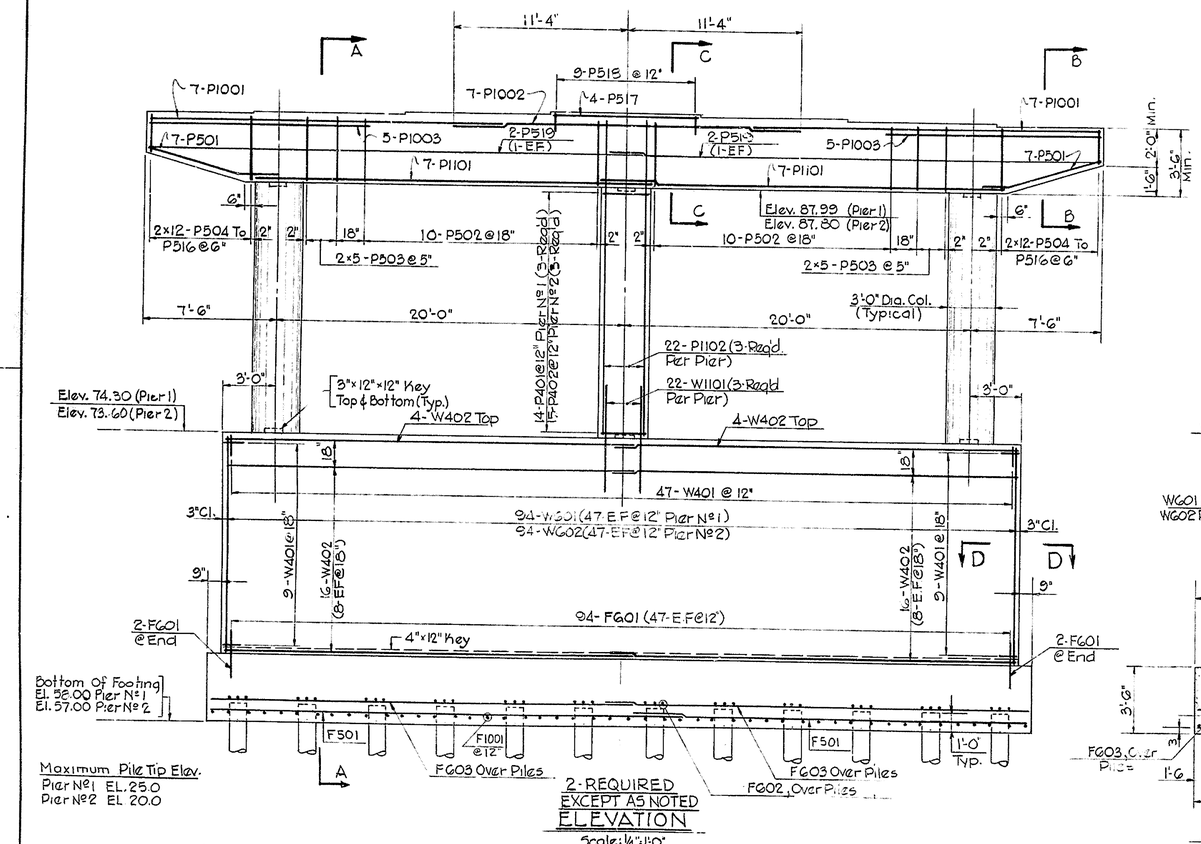
SCALE AS NOTED

APPROVED BY: John E. Dickey
BRIDGE ENGINEER

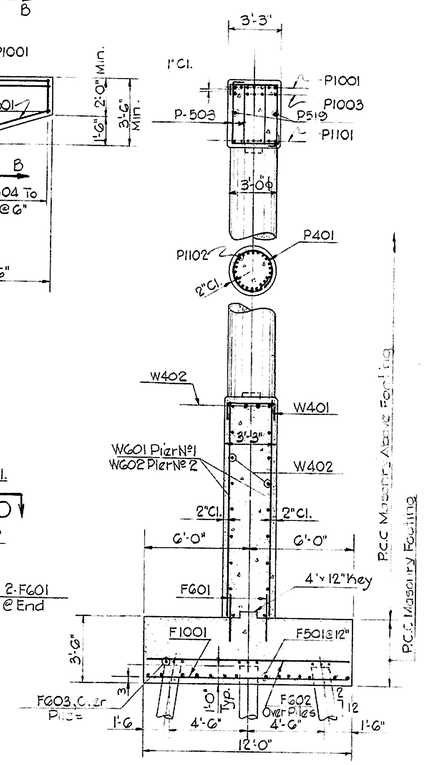
K+E BALTIMORE 17 0453 PHOENIX



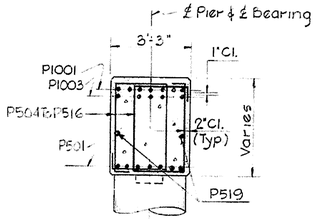
PLAN
Scale: 1/4" = 1'-0"



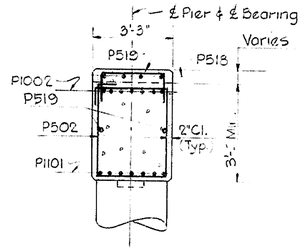
2-REQUIRED EXCEPT AS NOTED
ELEVATION
Scale: 1/4" = 1'-0"



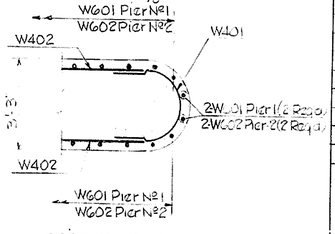
SECTION A-A
Scale: 1/4" = 1'-0"



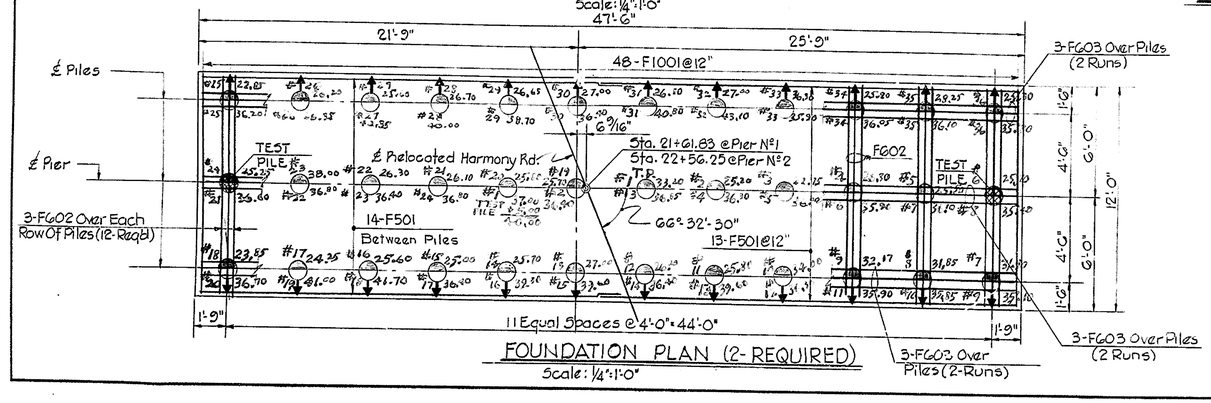
SECTION B-B
Scale: 3/8" = 1'-0"



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



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



FOUNDATION PLAN (2-REQUIRED)
Scale: 1/4" = 1'-0"

Red - Pier #1
Clear (Yellow) - #2

BEARING ELEVATIONS

Stringer Number	Pier 1	Pier 2
1	91.61	91.30
2	91.73	91.44
3	91.84	91.59
4	91.90	91.69
5	91.77	91.58
6	91.63	91.48
7	91.49	91.37

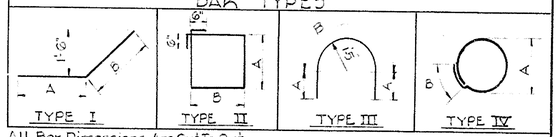
COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68 G3-012	2	DEL.	SU-SUG-9(7)	15	43

NO.	REVISIONS	BY	DATE

BAR SCHEDULE

MARK	NUMBER PIER 1	NUMBER PIER 2	SIZE	TYPE	LENGTH	A	B	REMARKS
P401	42	45	#4	IV	9'-8"	2'-8"	1'-3"	
P501	14	14	#5	I	6'-9	1'-3"	5'-6	
P502	20	20	#5	II	13'-2"	3'-2"	2'-11"	
P503	20	20	#5	II	11'-4"	3'-2"	2'-0"	
P504 To P516	48	48	#5	II	8'-7" To 11'-4"	1'-9" To 3'-2"	2'-0"	See NOTE-A
P517	4	4	#5	Str.	8'-2"			
P518	9	9	#5	III	5'-11"	1'-6"	2'-11"	
P519	4	4	#5	Str.	28'-0"			
P1001	14	14	#10	Str.	18'-10"			
P1002	7	7	#10	Str.	22'-8"			
P1003	10	10	#10	Str.	12'-6"			
P1101	14	14	#11	Str.	23'-5"			
P1102	66	66	#11	Str.	17'-0			
W401	65	65	#4	III	6'-11"	1'-3"	4'-5"	
W402	4[illegible]	[illegible]	#4	Str.	22'-0"			
WG01	9[illegible]		#6	Str.	[illegible]			
WG02		9[illegible]	#6	Str.	[illegible]			
W1101	66	66	#11	Str.	5'-8"			
F501	28	28	#5	Str.	24'-[illegible]			
FG01	[illegible]	[illegible]	#6	Str.	[illegible]			
FG02	[illegible]	[illegible]	#6	Str.	11'-8"			
FG03	18	18	#6	Str.	24'-5			
F1001	48	48	#10	Str.	11'-6			NOTE-A Vary 2 Each Pier Vary 4'-[illegible]

BAR TYPES



All Bar Dimensions Are Out To Out

NOTES:

- Indicates Plumb Piles
- Indicates Batter Piles (2:12)
- Indicates Test Piles

See Sheet №12 For Pile Splice Detail
E.F. Indicates Each Face
All Piles Shall Be 12 ϕ Cast-In-Place Concrete Piles Design Capacity = 85 Tons (See Special Provisions)

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR
PIER DETAILS

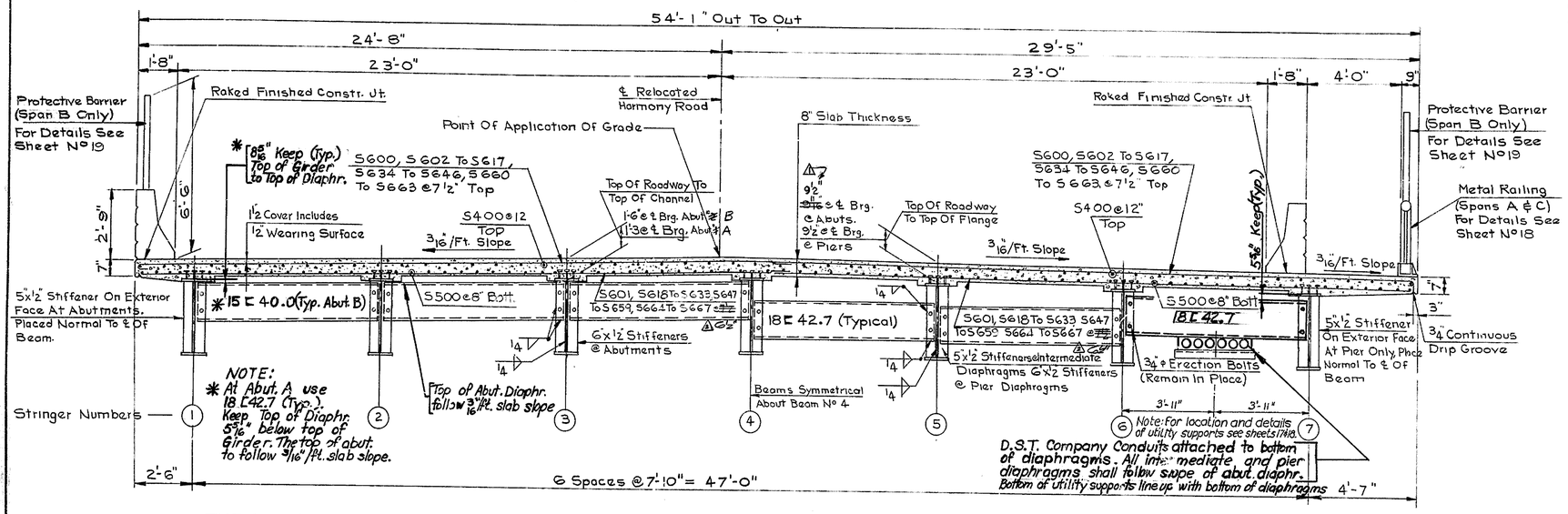
D. J.M.K.
T. J.M.K.
C. R.B.B.

SCALE
AS NOTED

APPROVED BY:
John E. Sutter
BRIDGE ENGINEER

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	16	43

NO.	REVISIONS	BY	DATE
1	SLAB THICKNESS AT ℄ ABUTMENT BEARING	R.B.F.	8-11-71
2	Location Bottom Slab Bars.	G.S.S.	5/4/72

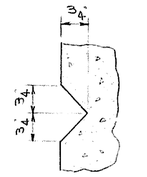


TYPICAL HALF-SECTION AT ABUTMENTS

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

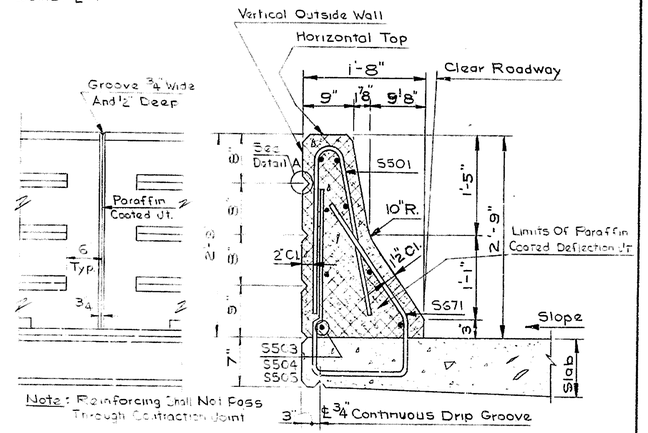
TYPICAL HALF-SECTION AT INTERMEDIATE AND PIER DIAPHRAGMS

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



DETAIL A

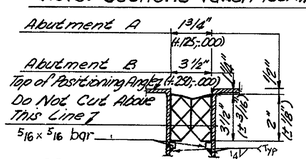
Scale: 1/2" = 1'



BARRIER RAIL DETAIL

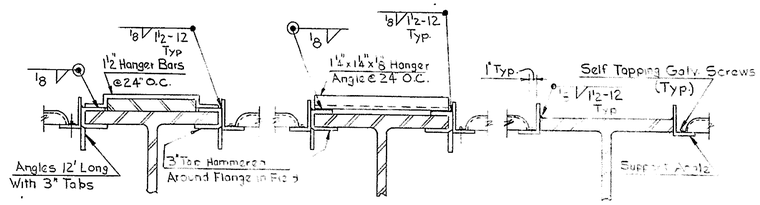
Scale: 1" = 1'-0"

Note: Sections taken looking Ahead Station



PREFORMED ELASTIC JOINT SEALER

NOTE! Sealer shall be of minimum size indicated above and comply to requirements of Special Provisions.

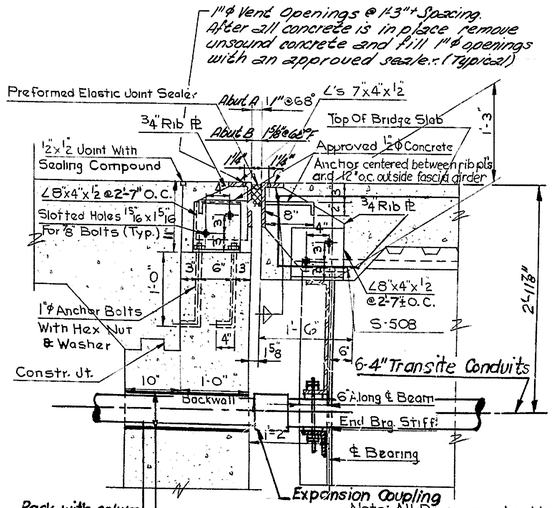


BEAM WITH COVER PLATE BEAM WITHOUT COVER PLATE

TENSION FLANGE DETAILS

COMPRESSION FLANGE DETAIL

Note: See Detail Denoting Limits Of Tension And Compression Flange Areas



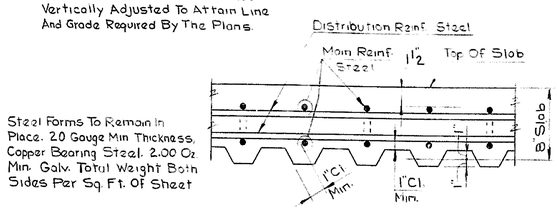
ABUTMENT A (Typical)

Note: All Dimensions Are Normal To ℄ Of Bearing, Unless Noted Otherwise.

ROADWAY JOINT DETAILS

Scale: 1" = 1'-0"

Note:
No Welding Of These Forms To Parts Carrying Tension Will Be Permitted. These Forms Shall Be Vertically Adjusted To Attain Line And Grade Required By The Plans.

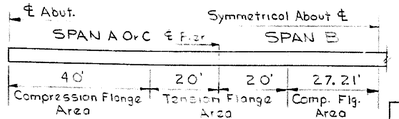


Steel Forms To Remain In Place. 20 Gauge Min Thickness, Copper Bearing Steel. 2.00 Oz Min. Galv. Total Weight Both Sides Per Sq. Ft. Of Sheet

STEEL FORM SECTION

SUGGESTED DETAIL OF STEEL FORMS

No Scale



LIMITS OF TENSION AND COMPRESSION AREAS

TABLE OF GRADE ELEVATIONS AND DEAD LOAD DEFLECTIONS IN FEET

Stringer	1	2	3	4	5	6	7	Deflections	
Point	Grade El.	Grade El.	Grade El.	Grade El.	Grade El.	Grade El.	Grade El.	Beam 1	Beam 2-7
1	95.488	95.576	95.666	95.713	95.556	95.398	95.239	0.000	0.000
2	95.607	95.704	95.799	95.853	95.700	95.547	95.393	0.014	0.016
3	95.707	95.808	95.909	95.967	95.820	95.673	95.524	0.010	0.012
4	95.783	95.890	95.996	96.059	95.918	95.775	95.632	-0.002	-0.003
5	95.837	95.949	96.060	96.128	95.992	95.855	95.717	0.000	0.000
6	95.875	95.995	96.117	96.191	96.063	95.934	95.804	0.070	0.080
7	95.855	95.984	96.112	96.196	96.076	95.956	95.838	0.115	0.130
8	95.779	95.916	96.052	96.145	96.033	95.920	95.807	0.070	0.080
9	95.646	95.791	95.935	96.036	95.933	95.828	95.723	0.000	0.000
10	95.532	95.682	95.831	95.937	95.839	95.740	95.640	-0.002	-0.003
11	95.394	95.550	95.706	95.816	95.723	95.629	95.534	0.011	0.012
12	95.234	95.395	95.554	95.671	95.584	95.495	95.405	0.014	0.016
13	95.051	95.217	95.382	95.503	95.421	95.337	95.253	0.000	0.000

NOTES:

CAMBER: Beams shall be cambered for Dead Load deflection and for Vertical Curve as shown on the Camber Blocking Diagram. Beams shall not be cambered more than shown even though the camber is less than that likely to remain permanent.

Beams shall be assembled in the shop to the correct blocking elevations before reaming or drilling splices, and likewise shall be assembled in the field before bolting.

In the Table of "Grade Elevations and Dead Load Deflections", the deflections given are for dead load due to concrete only. After all beams have been assembled, elevations shall be taken along the tops of beams at points where the grade elevations are shown. The difference between these two elevations plus the amount of deflection listed at each point will be the thickness of the slab and haunch over the top of beam at the centerline of beam. The minimum slab and haunched depth over the centerline of beam shall not be less than 8-1/2".

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR
SUPERSTRUCTURE DETAILS

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

D. W.G.B.
T. W.G.B.
C. R.B.B.

SCALE: AS NOTED

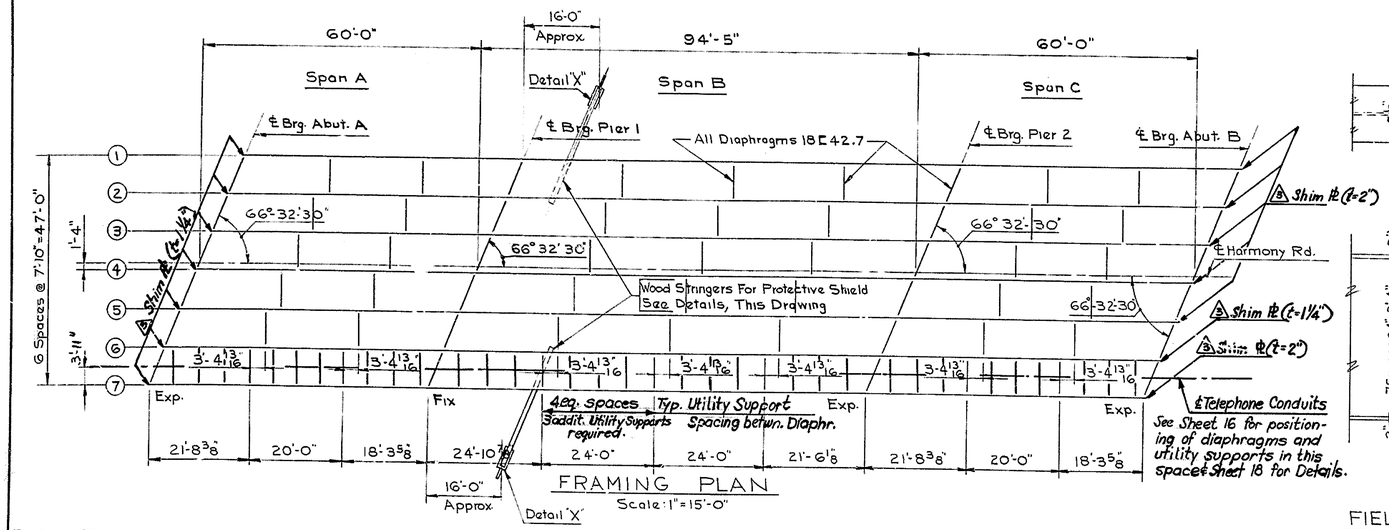
APPROVED BY: John S. Gibbs
BRIDGE ENGINEER

K&E BALTIMORE 37 0653 PHOENIX

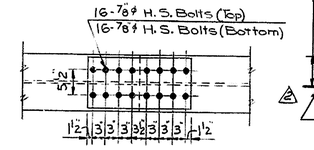
COUNTY	CONTRACT	F.B.A. REG. NO	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	17	43

NO.	REVISIONS	BY	DATE
1	ELIMIN. END SPAN SPLICE, CHANGE OF END SPAN GIRDER SIZE	R.B.E.	8-11-71
2	Length of shear studs	E.Z.	5/18/72
3	Shim Pl to raise Brg. Pl at Abut. A & B Blocking Dim.	B.G.S.	8/4/72
4			

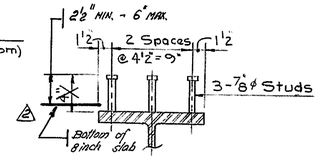
WORK COMPLETED.



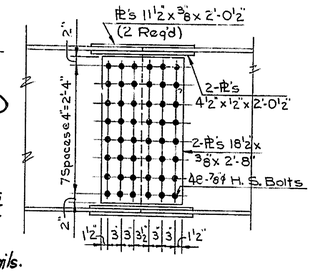
FRAMING PLAN
Scale: 1" = 15'-0"



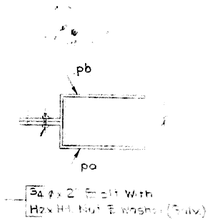
PLAN



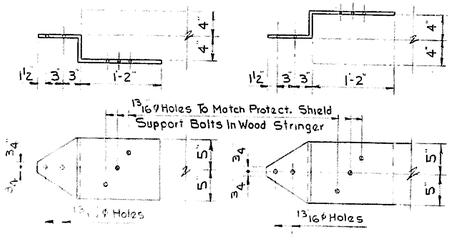
SHEAR CONNECTOR DETAIL
Scale: 1½" = 1'-0"



ELEVATION
FIELD SPLICE DETAIL



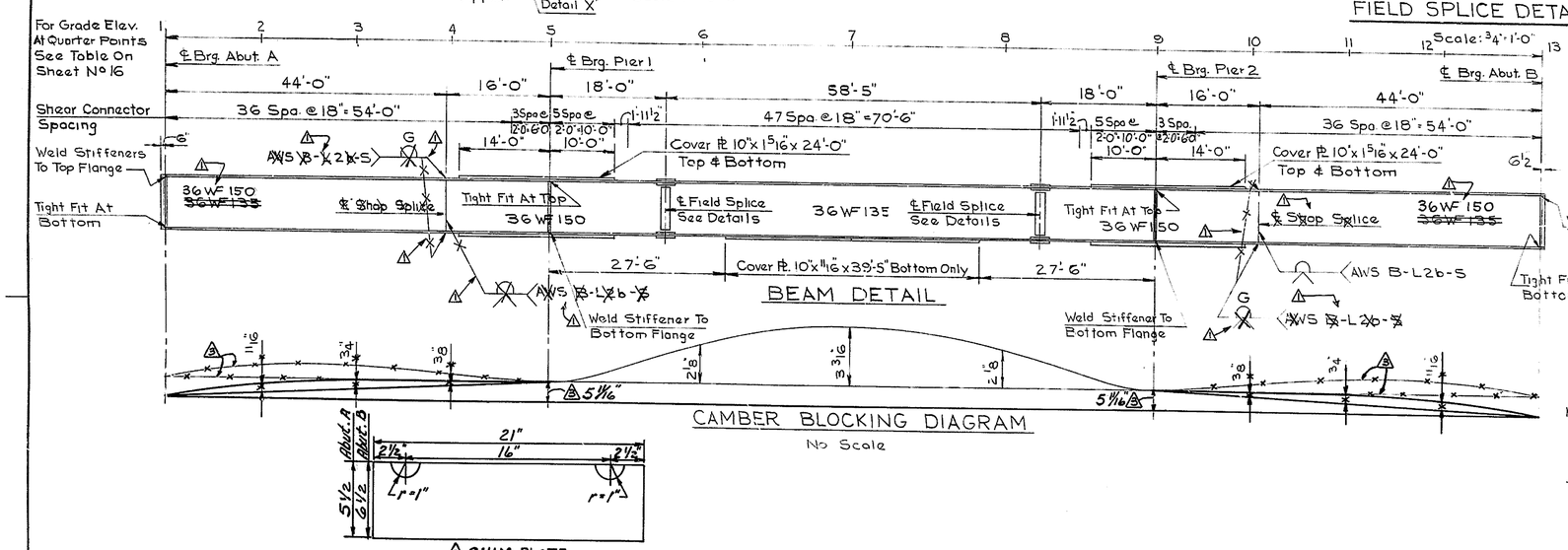
PLAN
DETAIL "X"
Scale: 1" = 1'-0"



Pl-10 x 3/8 x 2'-2¼
MK-pa (GALV)
Scale: 1" = 1'-0"

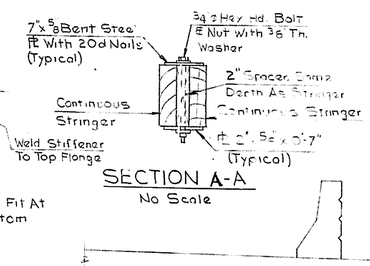
Pl-10 x 3/8 x 2'-2¼
MK-pb (GALV.)
Scale: 1" = 1'-0"

Note: For Assembly Of Mark-pa And Mark-pb, See Detail "X"

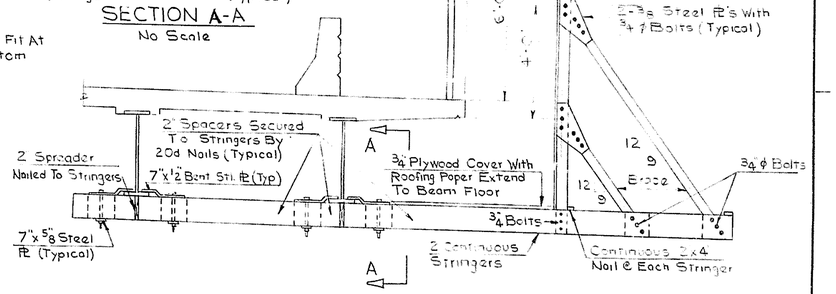


BEAM DETAIL

CAMBER BLOCKING DIAGRAM
No Scale

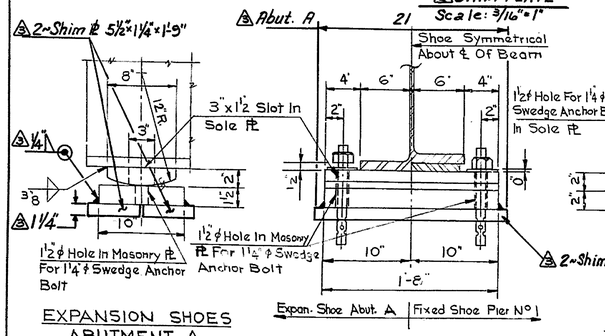


SECTION A-A
No Scale



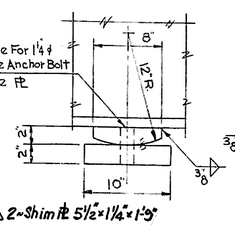
SUGGESTED PROTECTIVE SHIELD DETAILS
Scale: ⅜" = 1'-0"

Note
All Timber Shall Be Structural Grade 1600f Southern Pine. Protective Shield Shall Be Erected On Both Sides Of The Superstructure Before Placement Of Concrete Deck & Protective Barrier. Length Of Protective Shield To Be The Same As Length Of Protective Barrier.
Protective Shield Shall Be Placed With Continuous Stringers Parallel To The Overhead Catenary Lines And No Stringers Shall Be Placed Closer Than 2'-6" To The Overhead Catenary Lines.

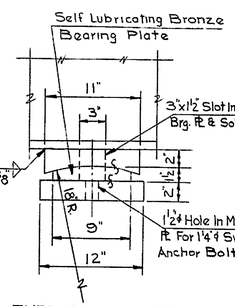


EXPANSION SHOES
ABUTMENT A

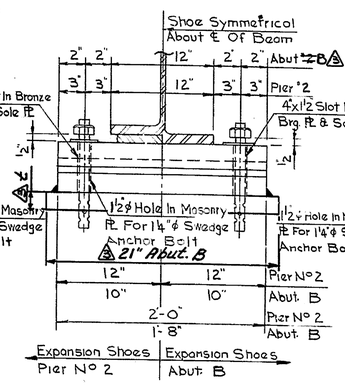
All Anchor Bolts Shall Be 1¼ ϕ Swedge Bolts 1'-9" Long With Hex Nuts & Round Washer With 1'-0" Min. Set Into Concrete. Burr Threads Above And Below Nuts On All Bolts.



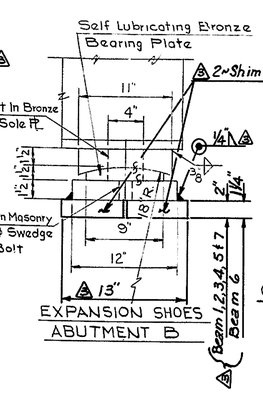
FIXED SHOES
PIER No 1



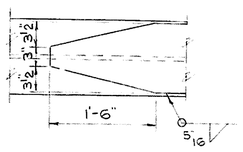
EXPANSION SHOES
PIER No 2



BEARING DETAILS
Scale: 1½" = 1'-0"



EXPANSION SHOES
ABUTMENT B



COVER PLATE DETAIL
Scale: 1" = 1'-0"

SHIM PLATE
Scale: 3/16" = 1"

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR
SUPERSTRUCTURE DETAILS

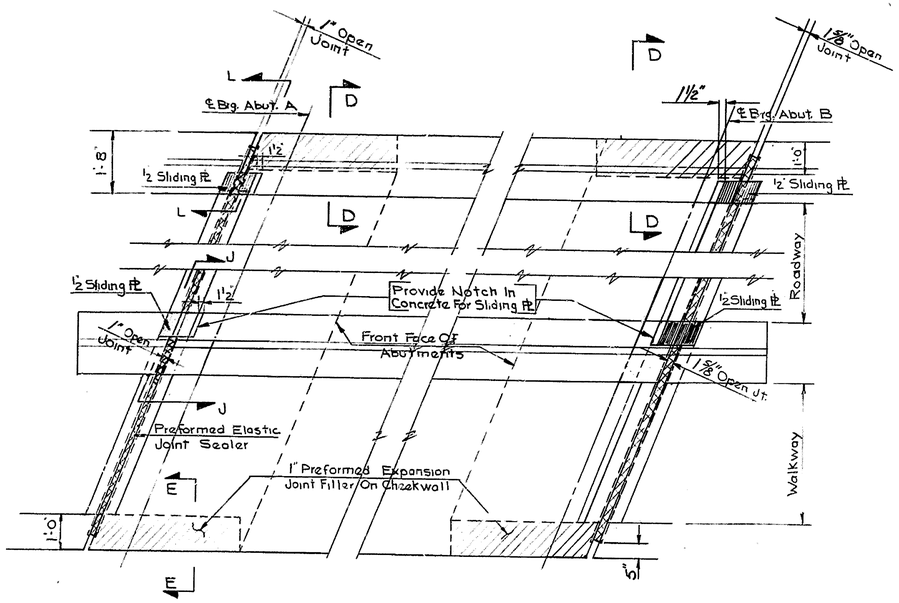
D. W.G.B.	SCALE	APPROVED BY:
T. W.G.B.	AS NOTED	John E. Schlitter
C. R.B.B.		BRIDGE ENGINEER.

K+E BALTIMORE 17 5433 PHOENIX

8-3

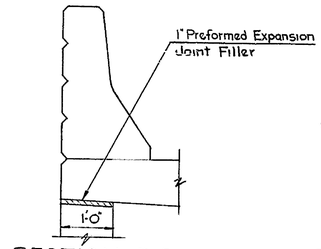
COUNTY	CONTRACT	F. H. A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	18	43

NO.	REVISIONS	BY	DATE



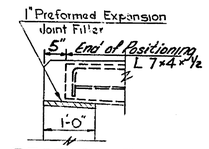
TYPICAL PLAN OF ROADWAY EXPANSION JOINTS

Scale: ½" = 1'-0"



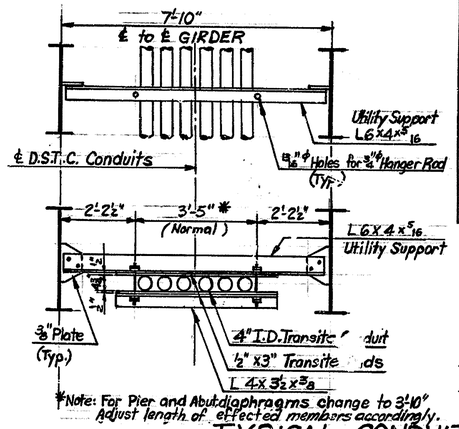
SECTION D-D

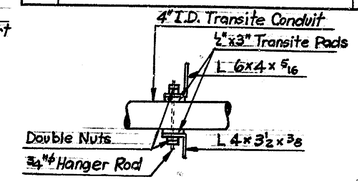
Scale: ¾" = 1'-0"



SECTION E-E

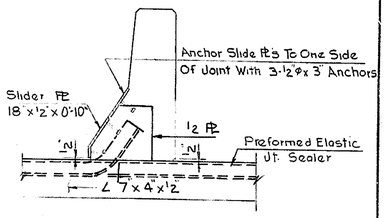
Scale: ¾" = 1'-0"





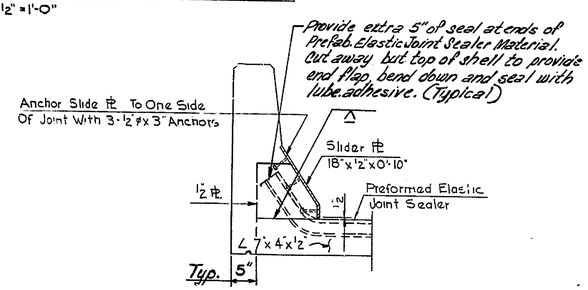
TYPICAL CONDUIT HANGER DETAILS

Note: See Special Provisions for material to be supplied by others.



SECTION J-J

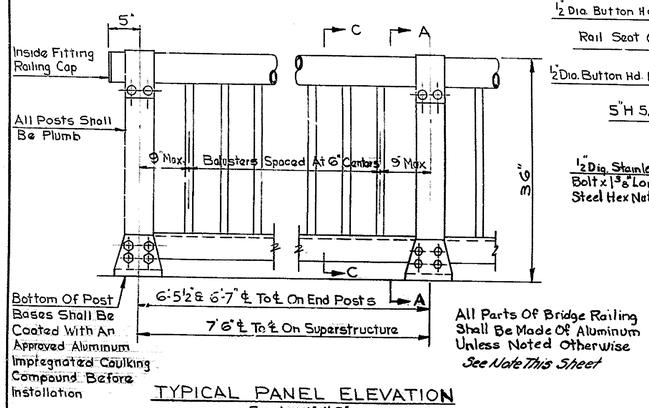
Scale: ¾" = 1'-0"



SECTION L-L

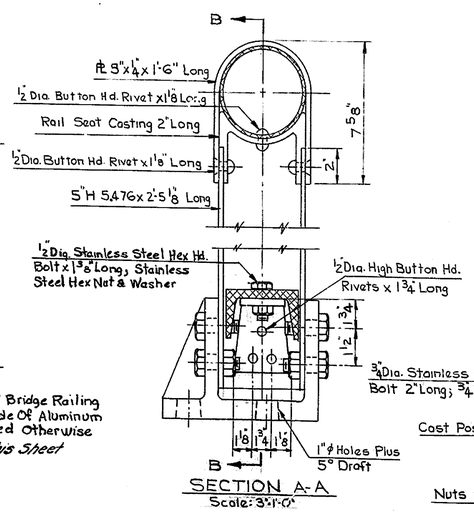
Scale: ¾" = 1'-0"

NOTE:
Material for Balusters & Baluster Frame shall conform to ASTM: B221, Alloy 6061-T6 or 6351-T5.
Material for Stainless Steel Set Screws shall conform ASTM: A193, Grade B8.



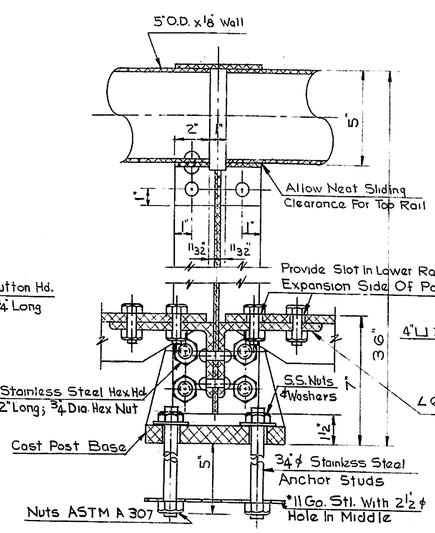
TYPICAL PANEL ELEVATION

Scale: 1" = 1'-0"



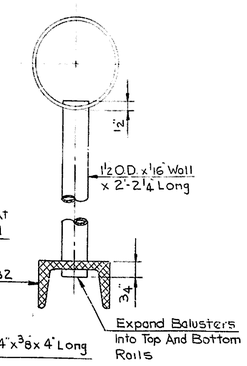
SECTION A-A

Scale: 3" = 1'-0"



SECTION B-B

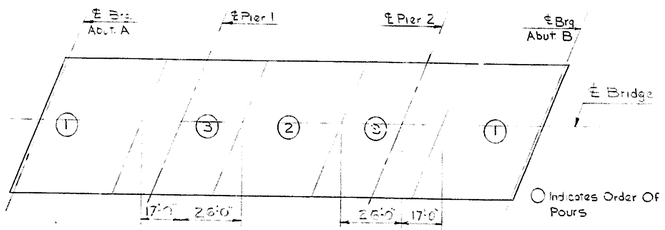
Scale: 3" = 1'-0"



SECTION C-C

Scale: 3" = 1'-0"

ALUMINUM BRIDGE RAILING DETAILS



ROADWAY SLAB POURING SEQUENCE

Scale: 1" = 30'-0"

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR
SUPERSTRUCTURE DETAILS

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

D. W.G.B.
T. W.G.B.
C. R.B.B.

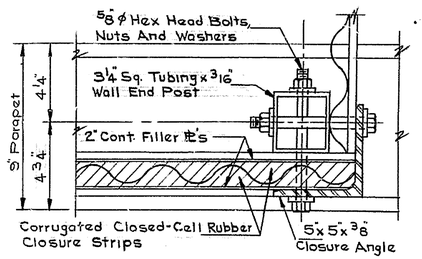
SCALE AS NOTED

APPROVED BY: John E. Fisher
BRIDGE ENGINEER

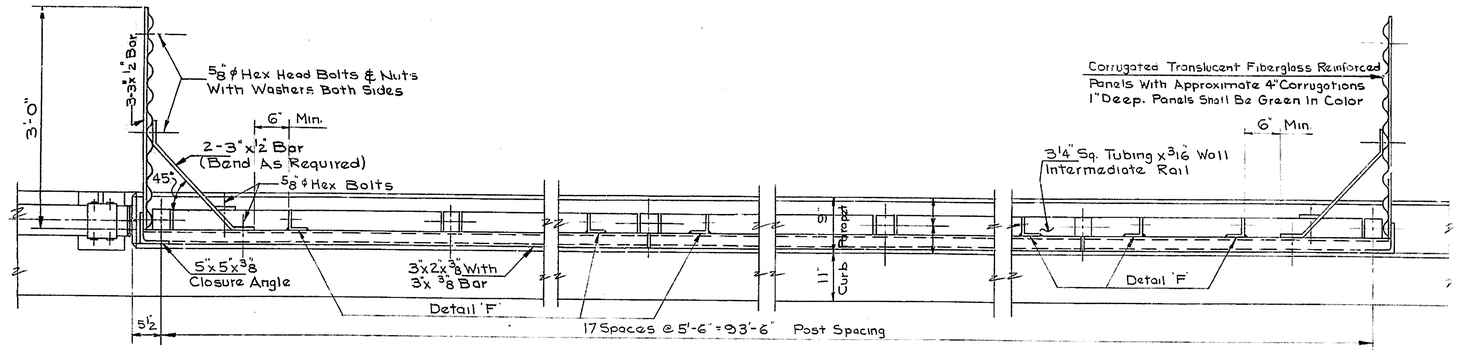
K+E BALTIMORE 17 0453 PHOENIX

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	19	43

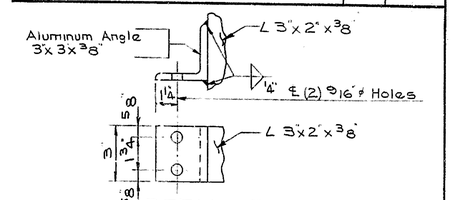
NO.	REVISIONS	BY	DATE



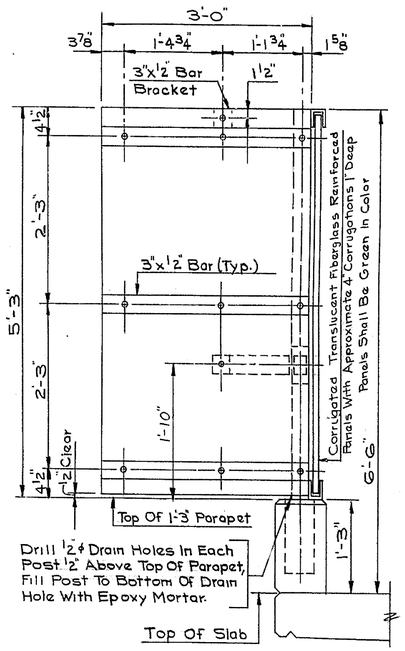
SECTION A-A
Scale: 3"=1'-0"



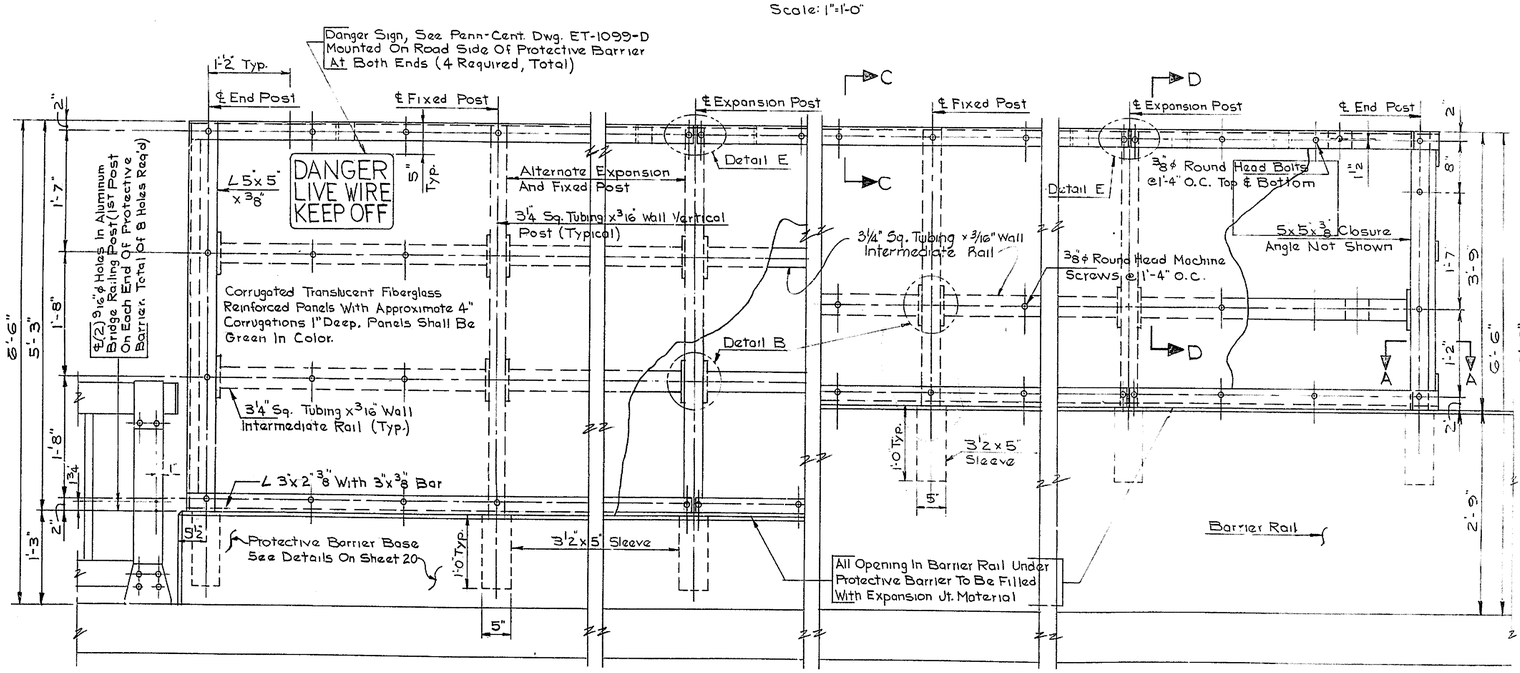
PLAN
Scale: 1"=1'-0"



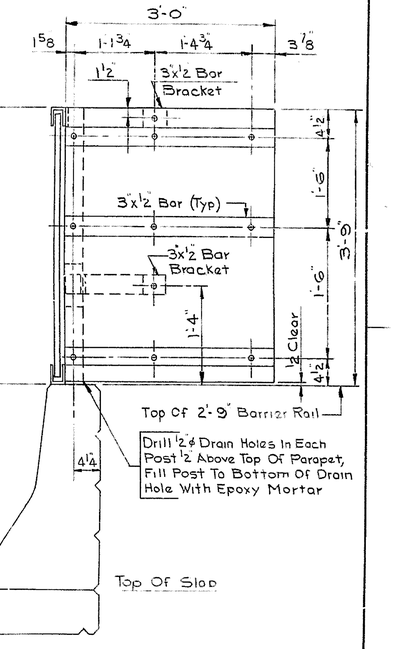
DETAIL F
Scale: ¼"=1"



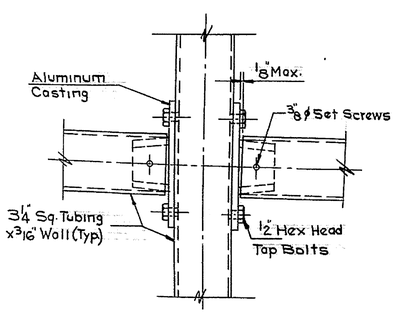
END ELEVATION
Scale: 1"=1'-0"



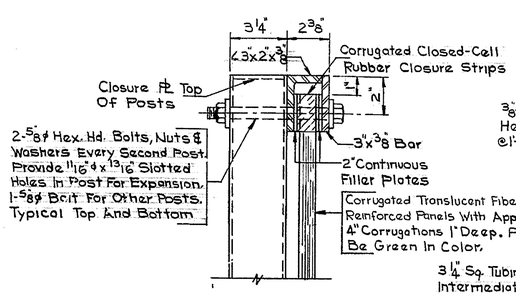
ELEVATION
Scale: 1"=1'-0"



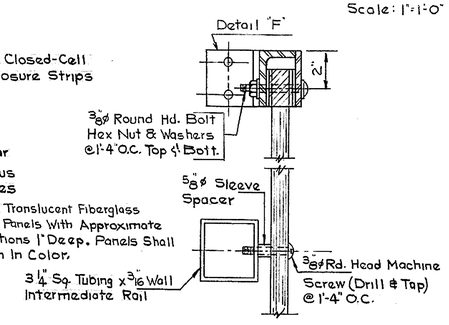
END ELEVATION
Scale: 1"=1'-0"



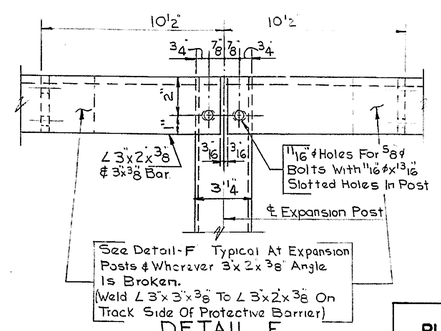
DETAIL B
Scale: 3"=1'-0"



SECTION C-C
Scale: 3"=1'-0"



SECTION D-D
Scale: 3"=1'-0"



DETAIL E
Scale: 3"=1'-0"

Note:
All Posts, Rails, Fasteners And Castings Shall Be Aluminum. See Special Provisions For Materials.

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR
PROTECTIVE BARRIER

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CONSULTING ENGINEERS
BALTIMORE, MARYLAND

D. W. G. B.
T. W. G. B.
C. R. B. B.

SCALE
AS NOTED

APPROVED BY:
John E. Dilks
BRIDGE ENGINEER

K-E BALTIMORE 17 0453 PHOENIX

COUNTY	CONTRACT	F. H. A. REQ. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	20	43

NO.	REVISIONS	BY	DATE
△	Quantity & Location	G.S.S.	5/4/72

BAR SCHEDULE

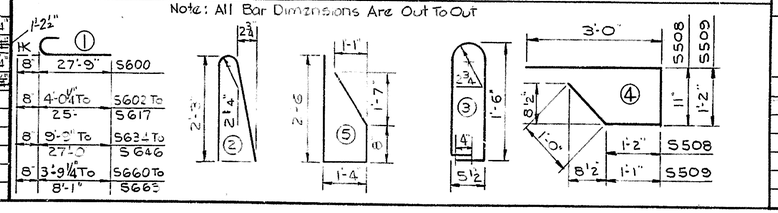
MARK	NO.	SIZE	TYPE	LENGTH	REMARKS
S400	275	#4	Str.	4'-3"	
S500	385	#5	Str.	43'-10"	
S501	448	#5	2	4'-9"	
S502	102	#5	3	4'-1"	
S503	64	#5	Str.	14'-9"	
S504	104	#5	Str.	15'-4"	
S505	56	#5	Str.	14'-10"	
S506	8	#5	Str.	8'-4"	

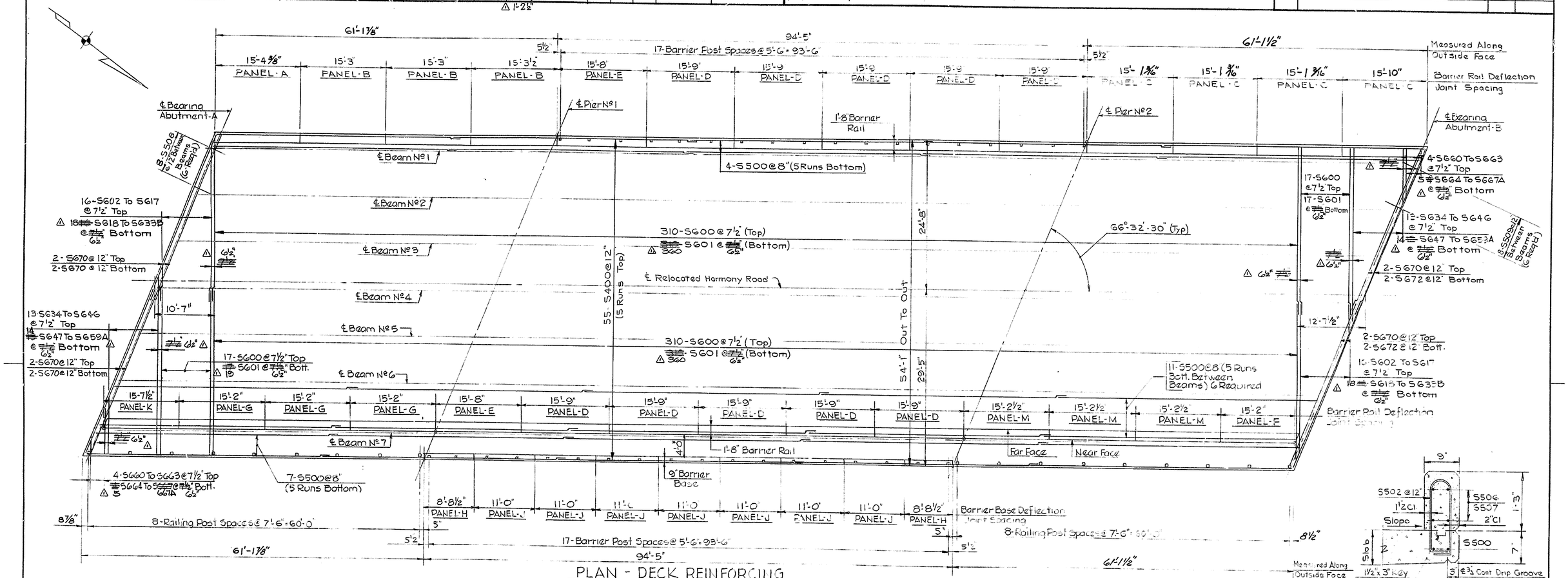
MARK	NO.	SIZE	TYPE	LENGTH	REMARKS
S507	28	#5	Str.	10'-8"	
S508	49	#5	4	6'-1"	△
S509	49	#5	4	6'-3"	
S600	658	#6	1	28'-5"	
S601	759	#6	Str.	27'-9"	
S602 To S617	32	#6	1	4'-8 11/16" To 26'-3"	Vary 2 Ea. By 1'-5 1/4"
S618 To S633B	36	#6	Str.	4'-0 1/4" To 25'-7"	Vary 2 Ea. By 1'-5 1/4" △ 1'-22"

MARK	NO.	SIZE	TYPE	LENGTH	REMARKS
S634 To S646	26	#6	1	10'-5" To 27'-8"	Vary 2 Ea. By 1'-5 1/4"
S647 To S659A	26	#6	Str.	9'-9" To 27'-0"	Vary 2 Ea. By 1'-5 1/4"
S660 To S663	8	#6	1	4'-5 1/4" To 8'-9"	Vary 2 Ea. By 1'-5 1/4"
S664 To S667A	8	#6	Str.	3'-5 1/4" To 8'-1"	Vary 2 Ea. By 1'-5 1/4"
S670	8	#6	Str.	30'-1"	11"
S671	440	#6	5	6'-5"	
S672	8	#6	Str.	27'-6"	

BAR TYPES

Note: All Bar Dimensions Are Out To Out



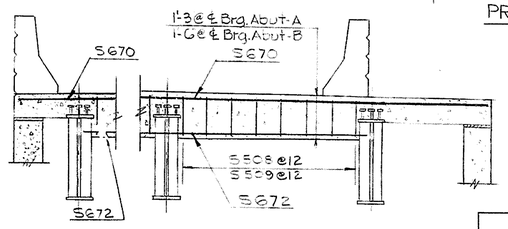


PLAN - DECK REINFORCING

Scale 1/8" = 1'-0"

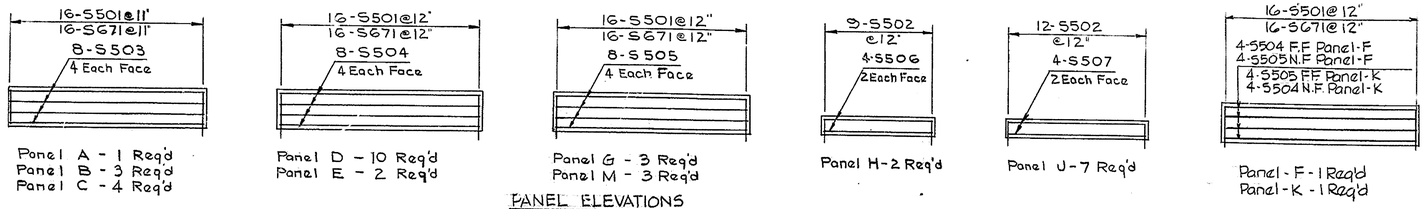
PROTECTIVE BARRIER BASE

Scale: 1" = 1'-0"



END DIAPHRAGM REINFORCING

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



Panel A - 1 Req'd
Panel B - 3 Req'd
Panel C - 4 Req'd

Panel D - 10 Req'd
Panel E - 2 Req'd

Panel G - 3 Req'd
Panel M - 3 Req'd

Panel H - 2 Req'd

Panel J - 7 Req'd

Panel - F - 1 Req'd
Panel - K - 1 Req'd

PANEL ELEVATIONS
REINFORCING DETAILS

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

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR
DECK SLAB AND BAR SCHEDULE

D. W.G.B.
T. W.G.B.
C. R.B.B.

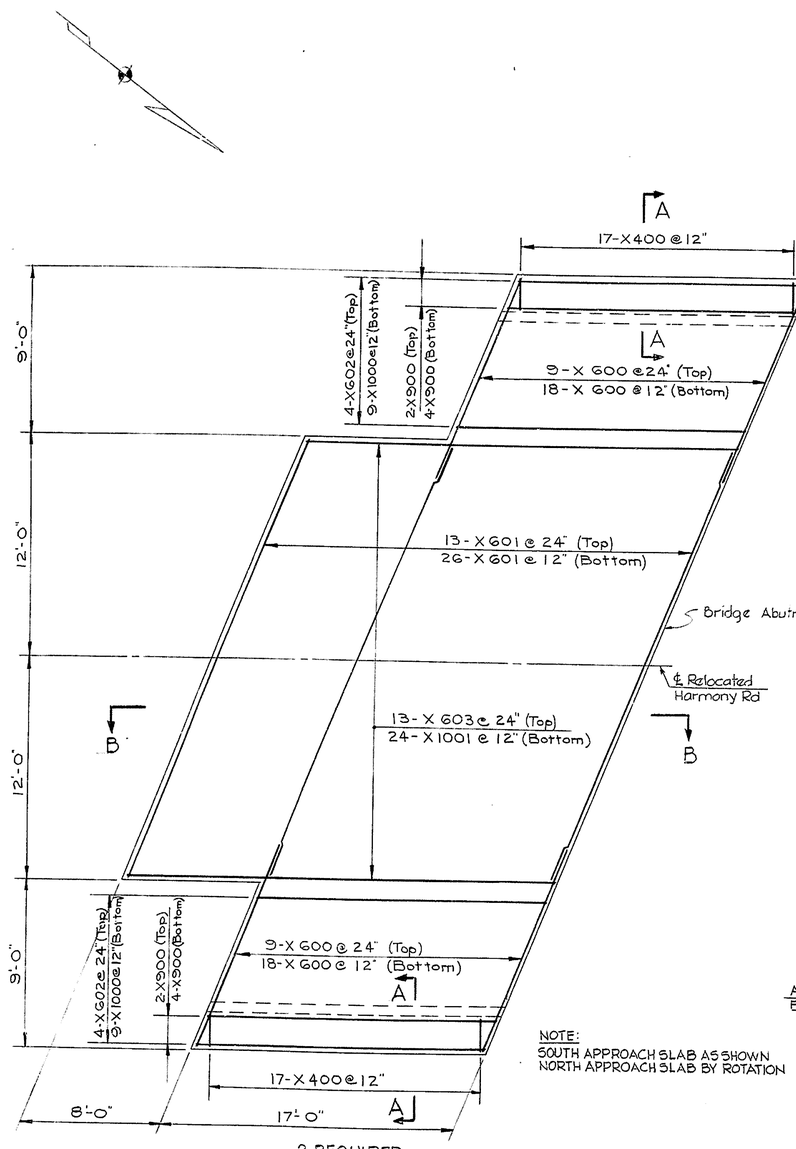
SCALE
AS NOTED

APPROVED BY:
John W. Leibly
BRIDGE ENGINEER

K+E BALTIMORE 17 0453 PHOENIX

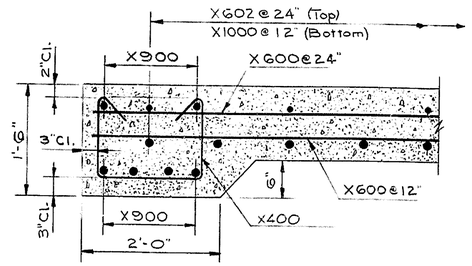
COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	21	43

NO.	REVISIONS	BY	DATE

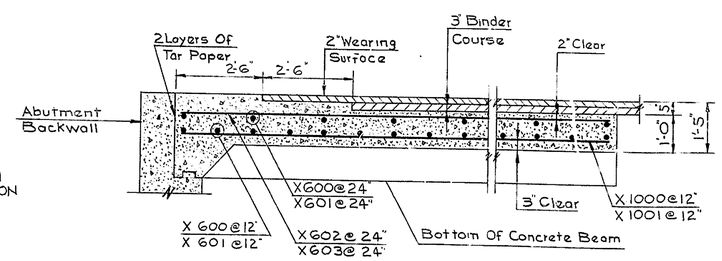


NOTE:
SOUTH APPROACH SLAB AS SHOWN
NORTH APPROACH SLAB BY ROTATION

2-REQUIRED
PLAN-APPROACH SLAB REINFORCING
Scale: 1/4"=1'-0"



SECTION A-A
Scale: 1"=1'-0"



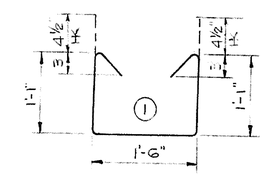
SECTION B-B
No Scale

Notes:
1. Hatched Area Denotes Limits Of Hot-Mix Asphaltic Concrete.
2. Apply R.S. 1 Asphalt Tack Coat To Approach Slab Surfaces Receiving The Hot-Mix Asphalt Concrete.

BAR SCHEDULE

MARK	NO.	SIZE	TYPE	LENGTH	REMARKS
X-400	68	#4	1	4'-5"	
X 600	108	#6	Str.	11'-9"	
X 601	78	#6	Str.	25'-7"	
X 602	16	#6	Str.	16'-6"	
X 603	26	#6	Str.	24'-6"	
X 900	24	#9	Str.	16'-6"	
X 1000	36	#10	Str.	16'-6"	
X 1001	48	#10	Str.	24'-6"	

BENDING DETAILS



Note:
All Bar Dimensions Are Out To Out

Quantities Shown In Bar Schedule are For Two Approach Slabs.

DELAWARE
STATE HIGHWAY DEPARTMENT

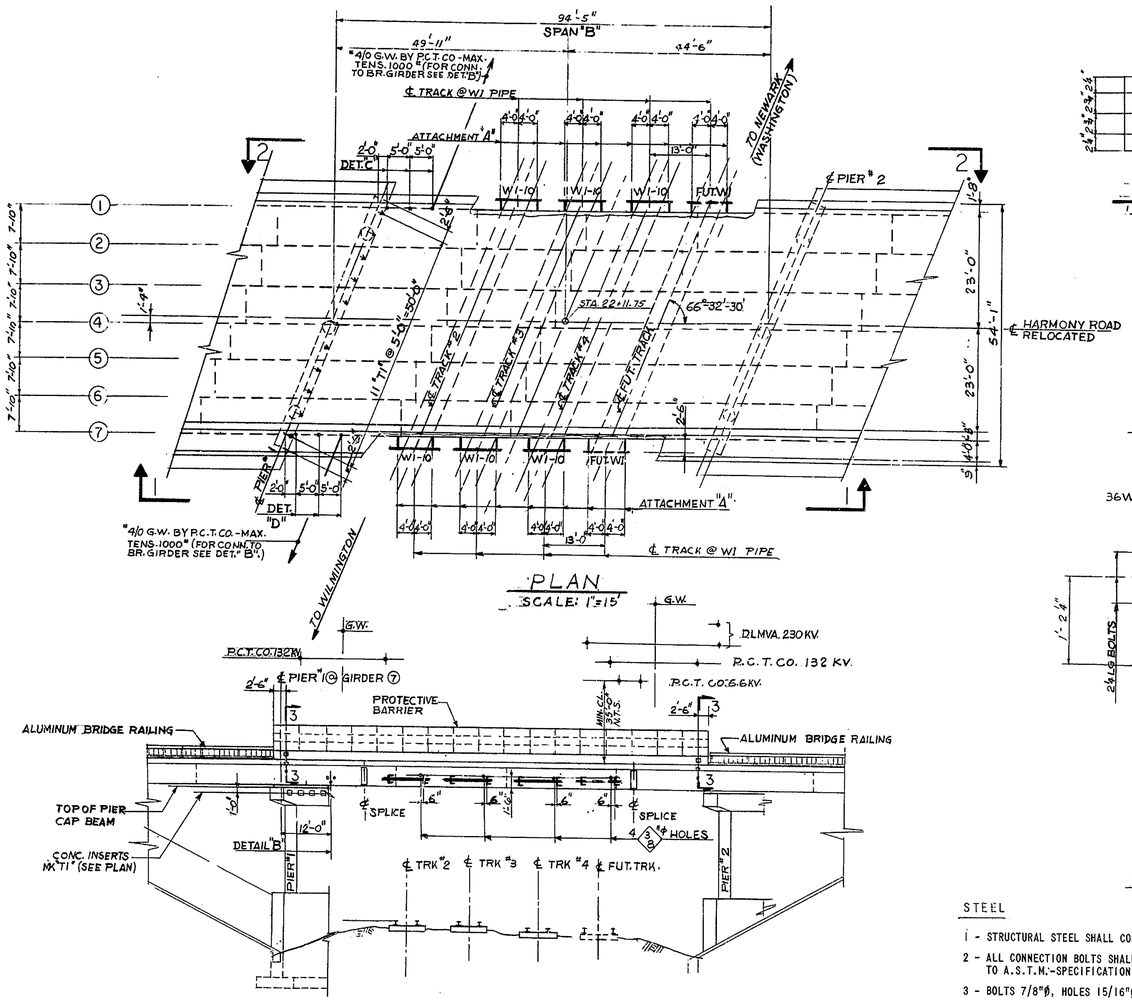
HARMONY ROAD RELOCATION

OVERPASS AT PENN-CENTRAL RR
APPROACH SLAB DETAILS

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

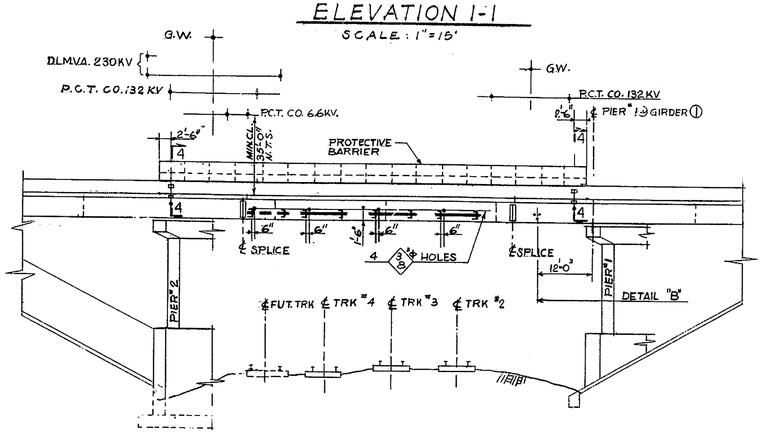
	SCALE	APPROVED BY:
D. W.G.B. T. W.G.B. C. R.B.B.	AS NOTED	John S. Ritter BRIDGE ENGINEER

COUNTY	CONTRACT	P.B.A. REG. NO.	STATE	FED. AID PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-917)		22	43

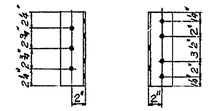


PLAN
SCALE: 1"=15'

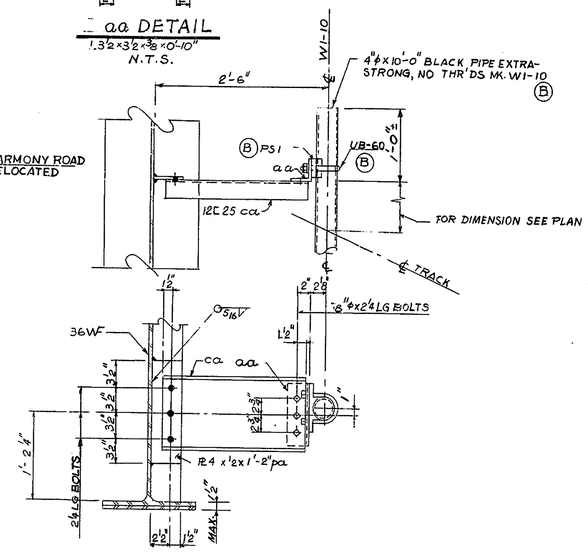
ELEVATION 1-1
SCALE: 1"=15'



ELEVATION 2-2
SCALE: 1"=15'



aa DETAIL
1.3½×3½×⅜×0'-10"
N.T.S.



ATTACHMENT "A"
(GALVANIZED)
N.T.S.

GENERAL NOTES

STEEL

1 - STRUCTURAL STEEL SHALL CONFORM TO A.S.T.M.-SPECIFICATION - DESIGNATION A36.

2 - ALL CONNECTION BOLTS SHALL BE BEARING TYPE, HEX HEAD, NUT AND WASHER AND CONFORM TO A.S.T.M.-SPECIFICATION - DESIGNATION A325 LATEST ISSUE.

3 - BOLTS 7/8"ϕ, HOLES 15/16"ϕ UNLESS OTHERWISE NOTED

4 - GALVANIZING SHALL CONFORM TO THE LATEST REQUIREMENTS OF A.S.T.M.-SPECIFICATION - DESIGNATION A-123 & A-153.

5 - WELDING TO BE IN ACCORDANCE WITH AMERICAN WELDING SOCIETY SPECIFICATION FOR WELDED HIGHWAY AND RAILWAY BRIDGES D2.0-69. ALL WELDS TO BE CONTINUOUS UNLESS OTHERWISE SHOWN.

DIVISION OF WORK LEGEND

(A) MATERIAL SUPPLIED AND ERECTED BY CONTRACTOR

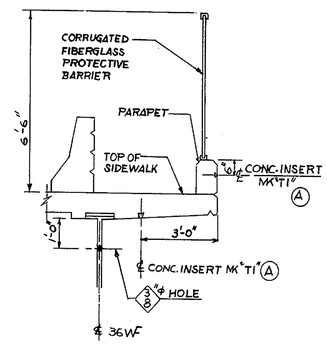
(B) MATERIAL SUPPLIED AND ERECTED BY PENN CENTRAL TRANS. Co.

REFERENCE DRAWINGS

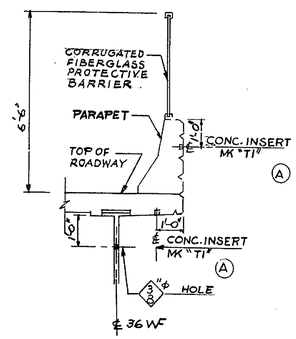
DELAWARE STATE HIGHWAY DEPARTMENT, HARMONY ROAD RELOCATION, OVERPASS AT PENN-CENTRAL R.R. - (RUMMEL, KLEPPER & KAHL - CONSULTING ENGINEERS - BALTIMORE, MARYLAND)

BILL OF MATERIAL

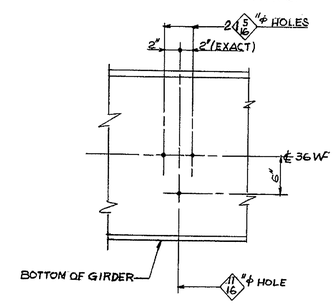
	MARK	DWG. NO.	DESCRIPTION	UNIT	QUAN.
(A)	"T1"	THIS DWG.	INSERT, THREADED, CAST BRONZE, ¾" HD. FOR ½" ϕ BOLT HOHMANN & BARNARD OR EQUAL	EA.	19
(A)	"A"	" "	CATENARY ATTACHMENT	EA.	16



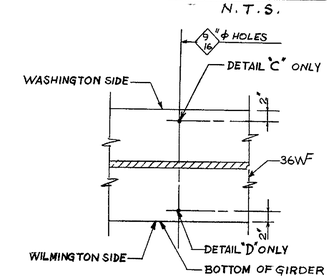
SECTION 3-3
N.T.S.



SECTION 4-4
N.T.S.



DETAIL "B" (2 REQUIRED)
N.T.S.



DETAIL "C" (3 REQUIRED)
DETAIL "D" (3 REQUIRED)
N.T.S.

REVISIONS

ISSUE NO.	DATE	DWN.	CHKD.	ARCH.	SAN.	STRUCT.	MECH.	ELEC.		ISSUED FOR	P.C.T.Co. APPROVAL
2	6-13-70	S.B.	R.M.	—	—	RCG	—	—		CONSTRUCTION	
1	4-1-70	S.B.	R.M.	—	—	RCG	—	—		STRUCTURAL APPROVAL	

APPROVALS

Gibbs & Hill, Inc.
ENGINEERS, DESIGNERS, CONSTRUCTORS
NEW YORK
JOB NO. 2103 A

SCALE: AS NOTED
2103S-1

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION

OVERHEAD BRIDGE CATENARY ATTACHMENTS AND STRUCTURE GROUNDING

SCALE

DATE

APPROVED BY: John E. Dolittle
BRIDGE ENGINEER

K-E BALTIMORE 17 NO. 1 PHOENIX

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	23	43

HARMONY ROAD - ROAD 355
ROAD 358 TO R+2

NO.	REVISIONS	BY	DATE

BORING No.

STA. 21+02 C.L.

B-1-1

TOP SOIL — GROUND ELEV. 61.15

G.W.1 & G.W.2 54.95

Depth	Material	Sample	Blows	Elev.
2	BROWN & GRAY SILT, TR. OF SAND	1	1 1 3	1.5
3				60.65
6				
7				
9				5.0
56	BROWN SAND & GRAVEL	2	22 41 30	6.5
76				54.15
30	VARIEGATED SANDY CLAY NO RECOVERY			
24				
19				10.0
20		3	9 7 7	11.5
21				
20		4	6 7 8	13.0
19				
18				15.0
18		5	5 6 7	16.5
24				
20		6	8 7 10	18.0
15				
21				20.0
51	VARIEGATED CLAYEY SAND	7	22 23 25	21.5
80				41.15
76				
78				
102				25.0
30		8	10 21 30	26.1
44				
60				
62				
55	VARIEGATED			30.0
37	SILTY CLAY	9	5 6 9	31.5
40	BROWN SILTY CLAY			31.15
38				
38				
50				35.0
83		10	4 6 8	36.5
65				
53				23.15
40	BROWN & GRAY DECOMPOSED ROCK			
33				40.0
45		11	7 12 15	41.5
44				
40				
30				
24				45.0
45		12	12 12 13	46.5
40				
53				
35				
47				50.0
36		13	11 13 16	51.5
45				
56				
48				
55				55.0
36		14	16 22 26	56.5
49				
120				
263				
117				60.0
165		15	21 25 29	61.5
				65.0
		16	16 20 28	66.5
				70.0
		17	15 25 24	71.5
				75.0
		18	15 22 29	76.5
				80.0
		19	17 25 34	81.5

2½" CASING

-20.85

STA. 21+45 28' RT.

B-1-2

CINDER & GROUND ELEV. 62.40

G.W.1 & G.W.2 59.60

Depth	Material	Sample	Blows	Elev.
12	CLAY FILL	1	5 4 4	1.5
11	BROWN CLAYEY SILT			61.40
13				
30				
20				0
74	LARGE GRAVEL NO RECOVERY	2	60/2"	5.2
145				57.40
25				
62	BROWN SILTY SAND TR. OF GRAVEL			
43				10.0
60		3	13 11 5	11.5
49				
36				54.90
23	BROWN SILTY CLAY W/TR. OF SAND			
24				15.0
24		4	5 6 8	16.5
24				
28				
40				43.40
30	VARIEGATED CLAYEY SAND			20.0
17		5	7 13 18	21.5
21				
25				
27				
29				25.0
27		6	7 6 10	26.5
30				
32				
40				33.40
43	VARIEGATED DECOMPOSED ROCK			30.0
		7	9 6 9	31.5
				35.0
		8	6 10 17	36.5
				40.0
		9	8 11 22	41.5
				45.0
		10	18 28 43	46.5

2½" CASING

15.90

STA. 21+68 25' LT.

B-1-3

GROUND ELEV. 62.69

G.W.2 60.29

Depth	Material	Sample	Blows	Elev.
35	BR. SAND & GRAVEL W/CINDER	1	8 10 14	1.5
78				60.69
40	BROWN CLAYEY SILT			
30				
28				5.0
10	BR. SANDY CLAY W/GRAVEL	2	8 21 27	6.5
12				58.19
9				
8	BROWN SILTY CLAY W/ SAND			
9				10.0
12		3	8 7 8	11.5
11				55.69
13				
14				
16				15.0
	VARIEGATED SILTY CLAY W/SAND	4	8 20 15	16.5
				44.69
	VARIEGATED CLAYEY SAND W/SOME GRAVEL			20.0
		5	9 16 25	21.5
				25.0
		6	5 6 8	26.5
				30.0
	VARIEGATED DECOMPOSED ROCK	7	6 10 12	31.5
				35.0
		8	5 9 11	36.5
				40.0
		9	18 17 20	41.5
				45.0
		10	8 17 23	46.5

4" CASING

16.19

STA. 22+44 28' RT.

B-1-4

GROUND ELEV. 63.02

G.W.2 60.02

Depth	Material	Sample	Blows	Elev.
12	TOP SOIL	1	1 2 5	1.5
28	BROWN CLAYEY SILT			62.22
25				
50	BROWN & GRAY SILTY CLAY TR. OF SAND			
63				5.0
19		2	6 9 17	6.5
25				
31				
37				54.02
42	BR. SAND & GRAVEL			10.0
19	VARIEGATED SANDY CLAY	3	13 6 11	11.5
24				53.02
23				13.0
30			4	
27		4	5	
			7	16.5
				47.52
				20.0
	BROWN & GRAY DECOMPOSED ROCK	5	3 5 5	21.5
				25.0
		6	5 7 8	26.5
		S-1	SHELBY	28.7
		7	5 11 13	30.2
				35.0
		8	7 9 11	36.5
				40.0
		9	11 14 18	41.5
				45.0
		10	9 11 15	46.5
				50.0
		11	18 20 26	51.5

4" CASING

11.52

STA. 22+67 25' LT.

B-1-5

GROUND ELEV. 63.39

G.W.2 60.99

G.W.1 52.89

Depth	Material	Sample	Blows	Elev.
9	CINDERS (FILL)	1	2 2 2	1.5
13	BROWN SANDY CLAY			62.31
10				
10	BROWN & GRAY CLAYEY SILT			5.0
16		2	5 5 8	6.5
13				
15				
35				10.0
30				
35		3	3 4 3	11.5
18				
20				
25				15.0
35				48.39
50	GRAY CLAYEY SILT VARIEGATED SANDY CLAY W/ SILT & GRAVEL	4	4 7 9	16.5
37				
42				44.39
40				
50	VARIEGATED SANDY SILT W/ CLAY			20.0
45		5	5 4 4	21.5
55				
53				
50				39.39
47	VARIEGATED SANDY CLAY			25.0
50		6	4 4 4	26.5
				35.39
	VARIEGATED SANDY SILT			30.0
	DECOMPOSED ROCK	7	4 6 9	31.5
				35.0
		8	4 8 10	36.5
				40.0
		9	5 8 11	41.5
				45.0
		10	7 9 11	46.5
				50.0
		11	7 8 9	51.5
				55.0
		12	8 13 14	56.5
				60.0
		13	9 23 29	61.5

2½" CASING

0.89

STA. 23+16 C.L.

B-1-6

TOP SOIL ROOTS, ETC. — GROUND ELEV. 62.58

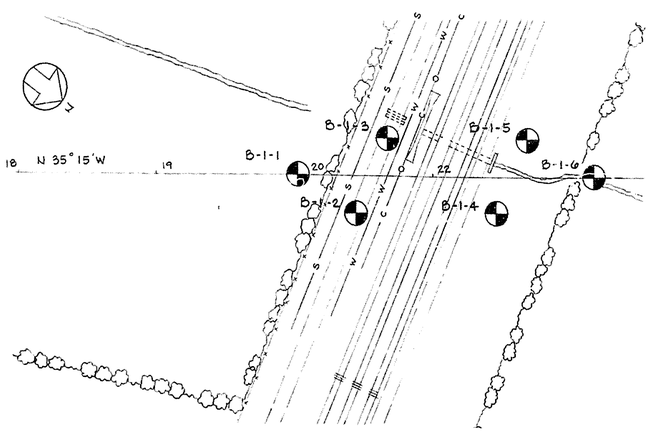
G.W.2 59.58

G.W.1 55.58

Depth	Material	Sample	Blows	Elev.
8	BROWN & GRAY SILT	1	2 2 3	1.5
11				62.08
22				59.08
27	BROWN & GRAY SILTY CLAY			5.0
20		2	7 8 9	6.5
25				
40				55.08
37				
50	BROWN & GRAY SILT			10.0
64		3	9 13 11	11.5
54				
64				
50				48.58
40	VARIEGATED SANDY CLAY W/ SILT			15.0
		4	4 6 6	16.5
				20.0
		5	3 5 5	21.5
				38.58
	VARIEGATED SANDY SILT W/ CLAY			25.0
		6	3 4 6	26.5
				30.0
		7	5 6 8	31.5
				35.0
		8	5 7 10	36.5
				40.0
	DECOMPOSED ROCK	9	9 11 15	41.5
				22.08
				45.0
		10	7 11 12	46.5
				50.0
		11	11 14 15	51.5
				11.08

2½" CASING

BORING No.



BORING LOCATION PLAN
SCALE 1" = 50'-0"

A B C D E F

LEGEND

A. NUMBER OF BLOWS OF 300 LB. HAMMER DROPPED 18 IN. REQUIRED TO DRIVE 2½" OR 4" CASING (AS NOTED) 12 INCHES.
B. DESCRIPTION OF MATERIALS
C. SAMPLE NUMBER
D. NUMBER OF BLOWS OF 140 LB. HAMMER DROPPED 30 IN. REQUIRED TO DRIVE 2 IN. SPLIT-SPOON SAMPLER FOR EACH OF THREE 6 IN. INCREMENTS.
E. PENETRATION OF SAMPLE SPOON.
F. ELEVATIONS OF STRATA
G. G.W.1 - GROUND WATER @ COMPLETION
H. G.W.2 - GROUND WATER AFTER 24 HRS.

RUMMEL, KLEPPER & KAHL
CONSULTING ENGINEERS
BALTIMORE, MARYLAND

DELAWARE
STATE HIGHWAY DEPARTMENT

HARMONY ROAD RELOCATION
OVERPASS AT PENN-CENTRAL RR
BORING LOGS

D. R.J.P.
T.
C.

SCALE 1" = 5'-0"

APPROVED BY: John E. Fuller
BRIDGE ENGINEER

SUMMARY OF QUANTITIES

COUNTY	CONTRACT	P.R.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	24	43

ADDENDUM NO. 2 ADDED SECTION 205 & 206 MARCH 22, 1971

PREL. TRACING _____ DESIGN _____ CHKD _____

SECTION NO.	201	202					205	206	207	208	GRADING ANALYSIS		
		EXCAVATION AND EMBANKMENT											
			TOPSOIL AVAILABLE		ROOTMAT AVAILABLE								
DESCRIPTION	CLEARING AND GRUBBING	ROADWAY	FILL	CUT	FILL	CUT	UNSUITABLE MATERIAL	ROCK EXCAVATION FOR ROADWAY	ROCK EXCAVATION FOR PIPE TRENCHES AND TRENCHES	EXCAVATION FOR STRUCTURE	EXCAVATION AND BACKFILL FOR PIPE TRENCHES	BORROW TYPE A AVAILABLE IN ROADWAY EXCAVATION	MATERIAL AVAILABLE FOR EMBANKMENT	EMBANKMENT ADJUSTMENT FACTOR INC.
	L.S.	C.Y.	C.Y.		C.Y.		C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.	C.Y.
RELOCATED HARMONY ROAD								200	100					
STA. 0+00 TO STA. 8+00		14,018									366			96
STA. 8+00 TO STA. 12+00		16,040			149						552	6,000		
STA. 12+90 TO STA. 21+01.83		74			1,771	37	1,000				2297			115,270
STA. 23+16.25 TO STA. 31+00		418	876		896						161			73,542
STA. 31+00 TO STA. 34+05		2,121									241			71
STA. 34+05 TO STA. 36+00		448		352										308
CHESTNUT HILL ROAD														
STA. 0+00 TO STA. 3+00 (EAST)		319												9
STA. 0+00 TO STA. 3+00 (WEST)		318												
ACCESS ROAD AT 7+50														
STA. 0+00 TO STA. 3+00		2,350												
DRAINAGE - RT. STA. 16														
RUTHAR DRIVE AT 32+50														
STA. 0+60 TO STA. 4+50		2,210									94			856
TEMPORARY CONNECTION														
STA. 36+00 = 0+00 TO STA. 6+00		2,123									18			
PENN CENTRAL RR OVERPASS														
STA 21+01.83 TO STA 23+16.25									400					
SUB-TOTAL BETWEEN STA. 12+90 TO STA. 31+00	L.S.	5,072							400	2458		SEE SUMMARY	SEE SUMMARY	
PROPOSAL	L.S.	45,520					200	100	400	3729				

SECTION NO.	209				SP	203	303				303		401		404			602			
	BORROW						CRUSHER RUN BASE COURSE						HOT-MIX HOT-LAID ASPHALTIC CONCRETE PAVT.		BITUMINOUS SURFACE TREATMENT			PORTLAND CEMENT CONCRETE MASONRY			
DESCRIPTION	BORROW	TYPE A (ADJUSTMENT INC.)		TYPE C (ADJUSTMENT INC.)	SETTLEMENT PLATFORMS	CHANNEL EXCAVATION	12" DEPTH	8" DEPTH	4" DEPTH	9-1/4" DEPTH	LATERAL SUBBASE DRAINAGE DITCHES	REMOVE & RELAY EXISTING 36" R.C.P.	TYPE B 3"	TYPE C 2"	RS-1	RS-2	COARSE AGGREGATE	FOOTING	ABOVE FOOTING	SUPER-STRUCTURE	APPROACH SLABS
	C.Y.	C.Y.		C.Y.	EA.	C.Y.	S.Y.	S.Y.	S.Y.	S.Y.	L.F.	L.F.	TONS	TONS	GALS	GALS	TONS	C.Y.	C.Y.	C.Y.	C.Y.
RELOCATED HARMONY ROAD																					
STA. 0+00 TO STA. 8+00				365			4,524		214	769			754	503	107	128	9				
STA. 8+00 TO STA. 12+00				630			3,775			515			628	419							
STA. 12+90 TO STA. 21+01.83		22,174		2,305	2		3,832			641	84		639	426							
STA. 23+16.25 TO STA. 31+00		9,742		160	2		3,987			813	84		664	443							
STA. 31+00 TO STA. 34+05				230			1,972			238			329	219							
STA. 34+05 TO STA. 36+00																					
CHESTNUT HILL ROAD																					
STA. 0+00 TO STA. 3+00 (EAST)							464		62				78	52	31	38	3				
STA. 0+00 TO STA. 3+00 (WEST)							464		160				78	52	80	97	6				
ACCESS ROAD AT 7+50																					
STA. 0+00 TO STA. 3+00								885	431					90	216	259	17				
DRAINAGE - RT. STA. 16						** 200						** 34									
RUTHAR DRIVE AT 32+50																					
STA. 0+60 TO STA. 4+50				65				2,664	460					296							
TEMPORARY CONNECTION																					
STA. 36+00 = 0+00 TO STA. 6+00				20				2,243	995					235	498	597	40				
PENN CENTRAL RR OVERPASS																					
STA 21+01.83 TO STA 23+16.25				200										48				240	235	360	87
SUB-TOTAL BETWEEN STA. 12+90 TO STA. 31+00	SEE SUMMARY	SEE SUMMARY		2765	4		7,818			1,454	168		2,220					240	235	360	87
PROPOSAL	127,657	25,916		4,115	4	200	19,018	5,792	2,322	2,976	168	34	5,953		932	1,119	75	* 240	* 235	* 360	* 87

SECTION NO.	605	606	607	608	609	615								617				619	620				SP			SP	SP	SP	SP	SP		SP	SP	SP
						REINFORCED CONCRETE PIPE								CORRUGATED METAL PIPE				STRUCTURAL PLATE PIPE	REINF. CONCRETE PIPE FLARED END SECTIONS		CORRUGATED METAL PIPE FLARED END SECTIONS		REIN. CONCRETE PIPE CONNECTIONS							HEADWALLS				
DESCRIPTION	BAR REIN-FORCEMENT	STEEL STRUCTURES (290,000 lbs.)	METAL BRIDGE RAILING (ALUMINUM)	REMOVAL OF EXISTING MASONRY	COARSE AGGREGATE FOR FOUNDATION STABILIZA-TION	12"	15"	18"	21"	27"	33"	36"	48" EXTRA STRENGTH	15" COATED & PAVED	21" PLAIN	ARCH 18"X11" PLAIN	ARCH 65"X40" COATED AND PAVED		15"	36"	15" COATED & PAVED		18"	27"	33"	CONCRETE COLLAR	REBUILDING INLET AS JUNCTION BOX	JUNCTION BOX NO. 1	REBUILDING EXISTING SANITARY MANHOLE STA. 21+25	FOR 48" R.C.P.	SPECIAL HEAD-WALL	BEND STRUCTURE LEFT OF STA. 22+50	Permanent Wood Barricade	Traffic
	LBS.	L.S.	L.F.	C.Y.	C.Y.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	L.F.	EA.	EA.	EA.		EA.	EA.	EA.	EA.	EA.	EA.	L.S.	Ea.	Ea.	L.S.	Ea.	EA.
RELOCATED HARMONY ROAD																																		3
STA. 0+00 TO STA. 8+00						293			296	296													1	2			1							
STA. 8+00 TO STA. 12+90						74	64	4			490														1									
STA. 12+90 TO STA. 21+01.83						68	46				60	300	94	126				196		1	1									1			2	
STA. 23+16.25 TO STA. 31+00				12		68	114						80	138							2									1				
STA. 31+00 TO STA. 34+05								304																										
STA. 34+05 TO STA. 36+00						66		4							120																			
CHESTNUT HILL ROAD																										1								
STA. 0+00 TO STA. 3+00 (EAST)																																		
STA. 0+00 TO STA. 3+00 (WEST)																																		
ACCESS ROAD AT 7+50																																		
STA. 0+00 TO STA. 3+00																																		
DRAINAGE - RT. STA. 16																	** 68														** 2			
RUTHAR DRIVE AT 32+50																																		
STA. 0+60 TO STA. 4+50						56	222												2									1						
TEMPORARY CONNECTION																																		
STA. 36+00 = 0+00 TO STA. 6+00																70																		
PENN CENTRAL RR OVERPASS																																		
STA 21+01.83 TO STA 23+16.25	△ 163,000 ~~159,000~~		140																															
SUB-TOTAL BETWEEN STA. 12+90 TO STA. 31+00	159,000	L.S.	140	12	600	136	160				60	300	174	264				196		1	3								L.S.	2		L.S.	2	
PROPOSAL	* 159,000	L.S.	* 140	12	600	625	446	312	296	296	550	300	174	264	120	70	* 68	196	2	1	3		1	2	1	1	1	1	L.S.	2	2	L.S.	2	3

△ Quantity Change 6-3-72

* DENOTES FIXED QUANTITY ITEMS - SECTION 109.06 OF STANDARD SPECIFICATIONS

**THIS IS A NON-PARTICIPATING ITEM FOR FEDERAL AID AND RAILROAD

**This Item is a Non-Participating Item For Railroad

SUMMARY OF QUANTITIES

COUNTY	CONTRACT	P.E.A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
NEW CASTLE	68-03-012	2	DEL.	SU-SUG-9(7)	25	43.

PREL. TRACING_____ DESIGN_____ CHKD._____

SECTION NOS.	624	624	628	SP	SP	SP	SP	SP	704	705	707			708		709
DESCRIPTION	CAST-IN PLACE CONCRETE PILES	STEEL SHELL TEST PILES	CONCRETE SLOPE PAVING	PROTECTIVE BARRIER 3'-9" HIGH	PROTECTIVE BARRIER 3'-3" HIGH	PROTECTIVE SHIELDS OVER RAILROAD	PROTECTIVE COATING FOR PORTLAND CEMENT CONCRETE BRIDGE SUPER-STRUCTURE	CATENARY ATTACHMENTS AND CONCRETE INSERTS	PORTLAND CEMENT CONCRETE GUTTER	PORTLAND CEMENT CONCRETE CURB TYPE 2	INTEGRAL PORTLAND CEMENT CONCRETE CURB & GUTTER			PORTLAND CEMENT CONCRETE SIDEWALK		HOT-MIX HOT-LAID ASPHALTIC CONCRETE CURB
											TYPE 1	TYPE 2	TYPE 1 MODIFIED	4" DEPTH	6" DEPTH	
	L.F.	L.F.	S.Y.	L.F.	L.F.	L.S.	GALS	L.S.	S.Y.	L.F.	L.F.	L.F.	L.F.	S.F.	S.F.	L.F.
RELOCATED HARMONY ROAD																
STA. 0+00 TO STA. 8+00											1,571		921	8,242	350	
STA. 8+00 TO STA. 12+90									100		1,038		736	1,472		140
STA 12+90 TO STA 21+01.83									623		2,179			3,630		40
STA 23+16.25 TO STA 31+00									33		2,142		772	6,214		
STA. 31+00 TO STA. 34+05											230		95	320		240
STA. 34+05 TO STA. 36+00																290
CHESTNUT HILL ROAD																
STA. 0+00 TO STA. 3+00(EAST)										280						
STA. 0+00 TO STA. 3+00(WEST)											125					
ACCESS ROAD AT 7+50																
STA. 0+00 TO STA. 3+00													90			
Drainage - Rt. Sta. 16									***50							
RUTHAR DRIVE AT 32+50																
STA. 0+60 TO STA. 4+50												900	596	2,156		
TEMPORARY CONNECTION																
STA. 36+00 = 0+00 TO STA. 6+00																
PENN CENTRAL RR OVERPASS																
STA 21+01.83 TO STA 23+16.25	4,700	300	890	95	95		60									
SUB-TOTAL BETWEEN STA. 12+90 TO STA. 31+00	4,700	300	890	*95	*95	L.S.	60	L.S.	656		4,321		772	9,844		40
PROPOSAL	4,700	300	890	95	95	L.S.	60	L.S.	806	280	7,285	900	3,210	22,034	350	710

SECTION NOS.	711				712			713	715	716		722	723	724	725	726	730	SP
DESCRIPTION	CATCH BASINS				MANHOLES			ADJUSTING AND REPAIRING EXISTING CATCH BASIN AND MANHOLE	GALVANIZED STEEL BEAM GUARD RAIL	TWISTED END ANCHORAGES	TOPSOIL REQUIRED FOR SLOPE AREAS	4" TOPSOIL	4" TOPSOILING	SEEDING	MULCHING	SODDING	LATERAL OR LONGITUDINAL DITCHING	SOIL STERILIZATION
	TYPE B	TYPE J	TYPE DOUBLE J	SD-1	STANDARD	TYPE B	TYPE D											
	EA.	EA.	EA.	EA.	EA.	EA.	EA.	EA.	L.F.	EA.	S.Y.	S.Y.	S.Y.	ACRES	S.Y.	S.Y.	L.F.	S.Y.
RELOCATED HARMONY ROAD																		
STA. 0+00 TO STA. 8+00		5	3		3				100									33
STA. 8+00 TO STA. 12+90		1	4		1			2			5,644			1.17	5,644	150		
STA 12+90 TO STA 21+01.83		6				2	1		1,250	2				.18	856			423
STA 23+16.25 TO STA 31+00		6			1				825	2	21,364			.51	2,462	275		258
STA. 31+00 TO STA. 34+05		3			1						889			.18	889			
STA. 34+05 TO STA. 36+00																		
CHESTNUT HILL ROAD																		
STA. 0+00 TO STA. 3+00 (EAST)																		
STA. 0+00 TO STA. 3+00 (WEST)																		
ACCESS ROAD AT 7+50																		
STA. 0+00 TO STA. 3+00																		
Drainage - Rt. Sta. 16											1,010			.21	1,010			
RUTHAR DRIVE AT 32+50														***.09	***435			
STA. 0+60 TO STA. 4+50	2			2							450			.11	528		100	
TEMPORARY CONNECTION																		
AT STA. 36+00 = 0+00 TO STA. 6+00											416			.34	1,651		70	
PENN CENTRAL RR OVERPASS									250									83
STA 21+01.83 TO STA 23+16.25																		
SUB-TOTAL BETWEEN STA. 12+90 TO STA. 31+00		12			1	2	1		2,075	4		SEE SUMMARY 13,480	SEE SUMMARY 7,884	0.69	3,318	275		691
PROPOSAL	3	21	7	2	6	2	1	2	2,425	4		18,721	11,052	2.79	13,475	425	170	807

* DENOTES FIXED QUANTITY ITEMS

SECTION NOS.	731	732		734	735	SP		SP					SP		SP	SP	SP	S.P.	S.P.	S.P.	SP
DESCRIPTION	CALCIUM CHLORIDE FOR DUST CONTROL	RIPRAP		6" PERFORATED PIPE UNDERDRAIN	FLAGMAN	Sanitary Sewer Pipe		EROSION CONTROL EXCAVATION AND EMBANKMENT (TWPC)	EROSION CONTROL NET OR JUTE MESH (TWPC)	EROSION CONTROL SODDING (TWPC)	EROSION CONTROL SEEDING (TWPC)	EROSION CONTROL MULCHING (TWPC)	TEMPORARY ROADWAY MATERIALS		MAINTENANCE OF TRAFFIC (RAILROAD)	FIELD OFFICE	MAINTENANCE OF TRAFFIC (HIGHWAY)	INSTALLATION OF TELEPHONE CONDUIT	CONCRETE ENCASEMENT	SANITARY MANHOLE RT STA. 12+90	CROWN VETCH SEEDING AND MULCHING
		PLAIN	GROUTED			8" VCPX	8" CIP Class 22						CRUSHER RUN	HOT-MIX, ASPHALTIC CONCRETE OR COLD LAID BIT. CONC.							
	TONS	S.Y.	S.Y.	L.F.	HRS.	L.F.	L.F.	C.Y.	SQUARES	S.Y.	ACRES	ACRES	TONS	TONS	L.S.	L.S.	L.S.	L.S.	L.F.	L.S.	S.Y.
RELOCATED HARMONY ROAD	25				750			25	25	25	1.0	1.0	50	50							
STA. 0+00 TO STA. 8+00				90																	
STA. 8+00 TO STA. 12+90				60		129															
STA. 12+90 TO STA. 21+01.83		65	55	20			210												72	L.S.	10,700
STA. 23+16.25 TO STA. 31+00																					7,700
STA. 31+00 TO STA. 34+05				400																	
STA. 34+05 TO STA. 36+00																					
CHESTNUT HILL ROAD																					
STA. 0+00 TO STA. 3+00 (EAST)																					
STA. 0+00 TO STA. 3+00 (WEST)																					
ACCESS ROAD AT 7+50																					
STA. 0+00 TO STA. 3+00																					
Drainage - Rt. Sta. 16		***50																			
RUTHAR DRIVE AT 32+50																					
STA. 0+60 TO STA. 4+50																					
TEMPORARY CONNECTION																					
AT STA. 36+00 = 0+00 TO STA. 6+00																					
PENN CENTRAL RR OVERPASS																					
STA. 21+01.83 TO STA.23+16.25																		L.S.			
SUB-TOTAL BETWEEN STA. 12+90 TO STA. 31+00	75	65	55	20	2,250		210	75	75	75	4.0	4.0	150	150	L.S.	L.S.	L.S.	L.S.**	72	L.S.	18,400
PROPOSAL	100	115	55	570	3,000	129	210	100	100	100	5.0	5.0	200	200	L.S.	L.S.	L.S.	L.S.*	72	L.S.	18,400

*DENOTES FIXED QUANTITY ITEMS

**THIS IS A NON-PARTICIPATING ITEM FOR FEDERAL AID & RAILROAD

***THIS ITEM IS A NON-PARTICIPATING ITEM FOR RAILROAD

GRADING SUMMARY

EXCAVATION AVAILABLE FOR EMBANKMENT

CHANNEL EXCAVATION	200 C.Y.
EXCAVATION FROM ROADWAY	40,439 C.Y.
EXCAVATION FROM STRUCTURES	200 C.Y.
EXCAVATION FROM PIPE TRENCHES	346 C.Y.
	41,185 C.Y.
MINUS EXCAVATION MEETING REQUIREMENT OF BORROW TYPE A	6,000 C.Y.
TOTAL AVAILABLE	35,185 C.Y.

EMBANKMENT REQUIRED - ADJUSTMENT FACTOR INCLUDED

ROADWAY EMBANKMENT	190,152 C.Y.
REPLACE TOPSOIL REMOVED UNDER EMBANKMENT	1,139 C.Y.
REPLACE ROOTMAT REMOVED UNDER EMBANKMENT	3,467 C.Y.
TOTAL	194,758 C.Y.
MINUS BORROW TYPE A EMBANKMENT	31,916 C.Y.
MINUS EXCAVATION AVAILABLE	35,185 C.Y.
TOTAL BORROW REQUIRED	127,657 C.Y.

BORROW TYPE A REQUIRED - ADJUSTMENT FACTOR INCLUDED

ROADWAY EMBANKMENT	31,916 C.Y.
MINUS BORROW TYPE A AVAILABLE FROM EXCAVATION	6,000 C.Y.
TOTAL BORROW TYPE A REQUIRED	25,916 C.Y.

TOPSOIL SUMMARY

TOPSOILING = TOPSOIL AVAILABLE 1,228 C.Y. X 9 =	11,052 S.Y.
TOPSOIL = SLOPE AREAS 29.773 S.Y. MINUS TOPSOILING 11,052 S.Y. =	18,721 S.Y.

5 MILFRINT MYLAR