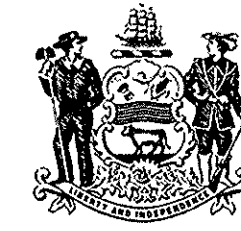


STATE OF DELAWARE

THE STATE OF DELAWARE



DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS SPECIFICATION AND CONSTRUCTION PLANS FOR: DELAWARE ROUTE 7 PHASE II

CONTRACT NUMBER 83-101-03
FEDERAL AID PROJECT NUMBER F-1045 (19)

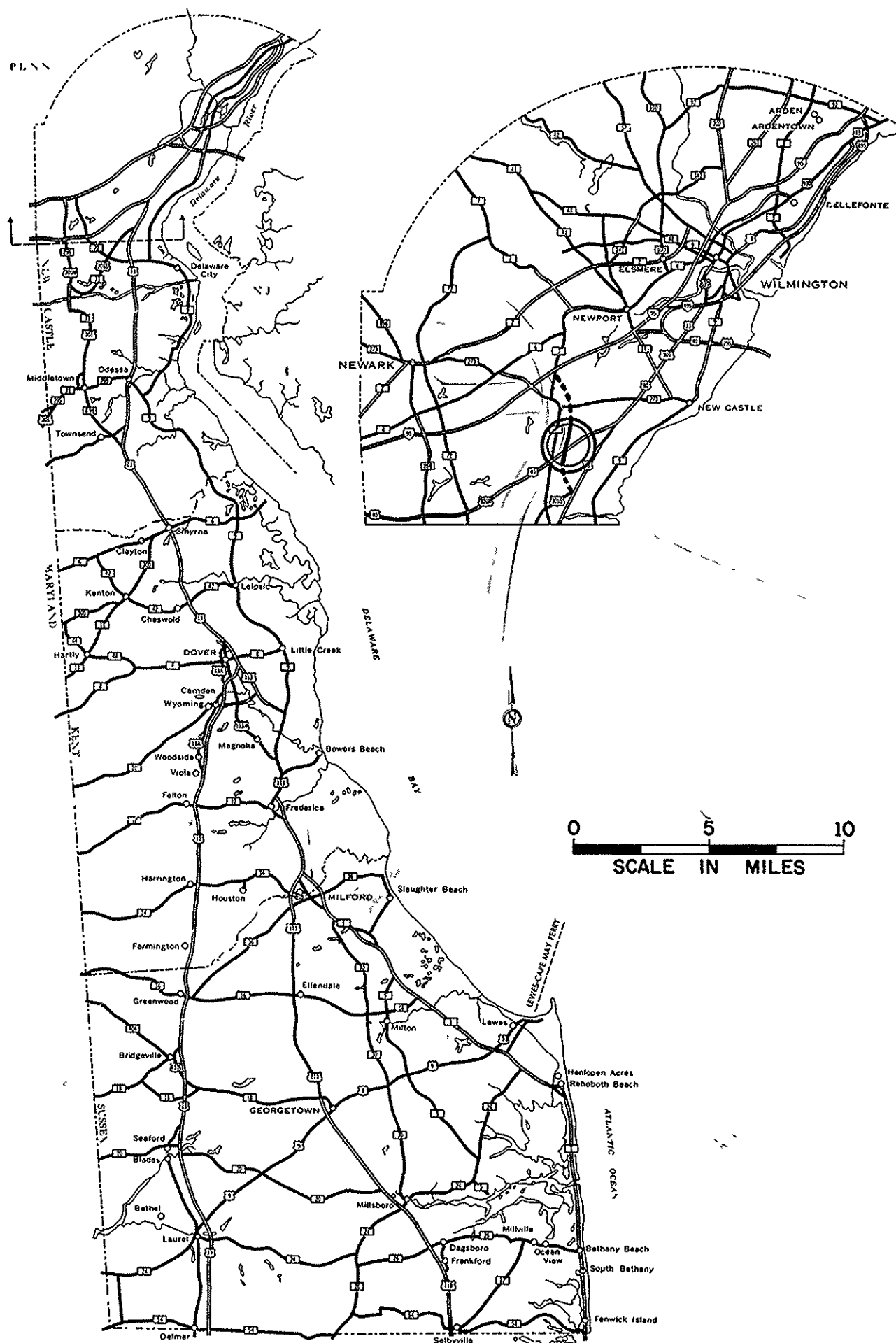
ROADWAY LENGTH ⁹⁴⁹⁰8410 FEET = ^{1.797}1.593 MILES
STRUCTURE LENGTH 390 FEET = 0.074 MILES
TOTAL LENGTH ⁹⁸⁸⁰8800 FEET = ^{1.871}1.667 MILES

ALSO INCLUDES SHEETS:

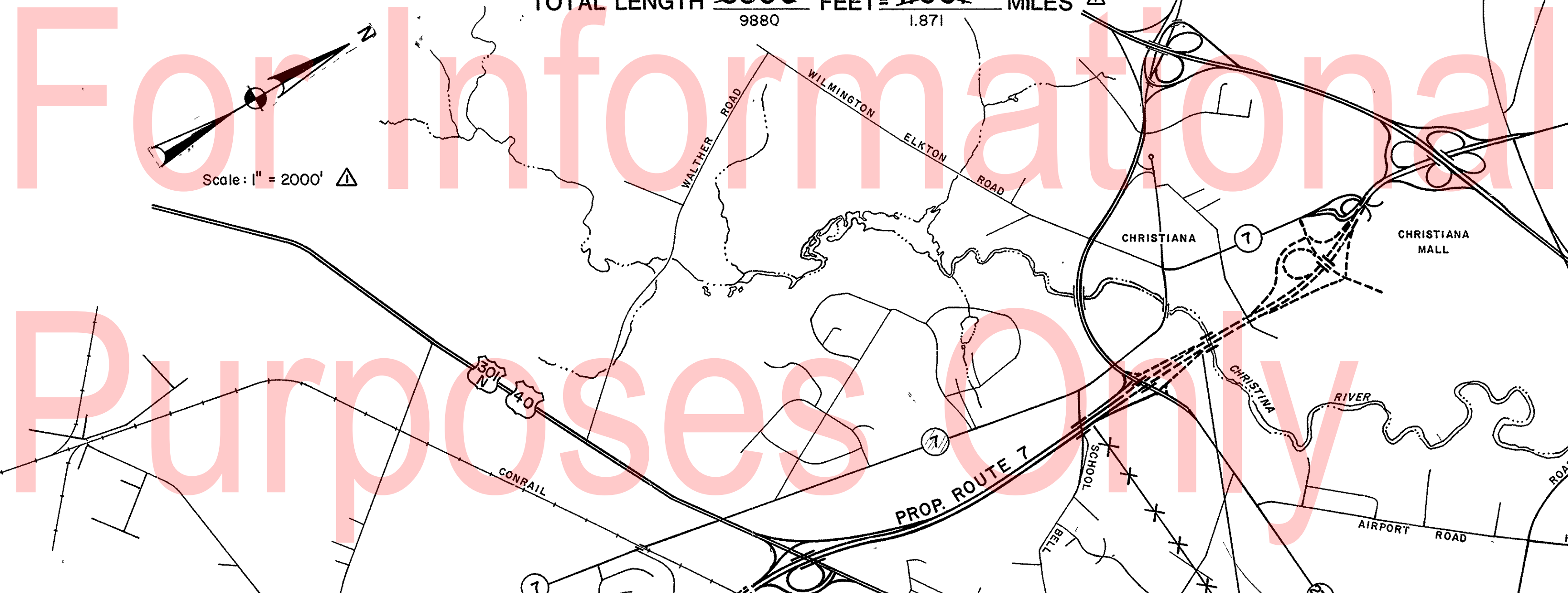
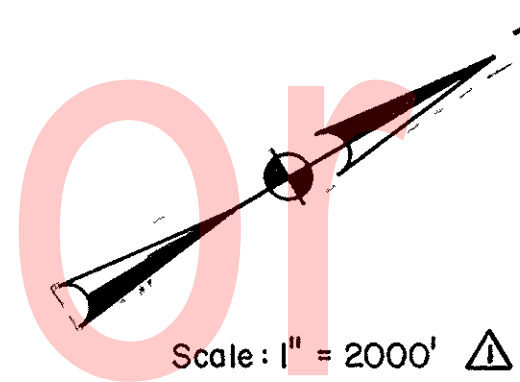
3A, 4A, 5A, 6A, 7A, 8A, 13A, 26A-26H, 27A, 28A, 29A, 32A, 41A-41C, 48A, 48B, 58A-58H, 59A, 60A, 67A, 72A-72E, 80A, 81A, 82A, 85A, 89A-89E, 92A, 92B, 94A, 104A, 105A-105Q, 135A, 157A, 157A, 158A, 175A-175F, 176A, 177A, 178A, 188A

7-28-92 L.R.

CONTRACT	COUNTY	STATE	F.H.W.A. REG. NO.	FEDERAL AID PROJECT NUMBER	SHEET NUMBER	TOTAL SHEETS
83-101-03	NEW CASTLE	DEL.	3	F-1045 (19)	1	23
DESIGN DESIGNATION				SCALES		
FUNCTIONAL CLASS <u>Arterial</u>				PLAN SHEET: 1" = 30' Feet		
TYPE OF CONSTRUCTION <u>New Const.</u>				PROFILE SHEET: Horizontal: 1" = 50' Feet		
A.D.T. CURRENT <u>15,740 (Yr.1983)</u>				Vertical: 1" = 5' Feet		
A.D.T. PROJECTED <u>38,120 (Yr.2000)</u>				DETAIL SHEET: 1" = _____ Feet		
D.H.V. PROJECTED <u>3,800</u>						
DESIGN SPEED <u>60 MPH</u>						
% TRUCKS <u>5</u>						
DIRECTION DISTRIBUTION % <u>55 (NB)</u>						
INDEX OF SHEETS						
SHEET N°	TABLE OF CONTENTS					
1	TITLE SHEET					
2-3	PLAN SHEET INDEX AND GENERAL NOTES					
	QUANTITY SHEETS					
11-15	TYPICAL SECTIONS					
16-37	PLAN SHEETS (LEGEND - SHEET 16)					
38-48	PROFILE SHEETS					
49-58	TRAFFIC CONTROL AND STAGE CONSTRUCTION PLANS					
59-60	ALIGNMENT DATA PLANS					
61	ALIGNMENT DATA TABLE AND EARTHWORK SUMMARY					
62-72	PAVEMENT GRADE PLANS					
73-89	PAVEMENT JOINT LAYOUT AND CONTOUR GRADING PLANS					
90-92	DRAINAGE DETAILS					
93-95	MISCELLANEOUS DETAILS					
96-100	EROSION CONTROL DETAILS					
101-102	SIGN LOCATION PLANS					
103-105	SIGN PANEL TABULATION AND DETAILS					
106-157	BRIDGE PLANS					
158-164	SIGN STRUCTURE PLANS					
165-186	SIGNING AND STRIPING PLANS					
187-188	TRAFFIC SIGNAL PLANS					
189-209	STANDARD DETAIL SHEETS (C-2, C-3, C-4, D-1-I, D-2-4, D-7-5, D-9-7, D-14-2, D-15, D-16, E-1, G-2-9, G-3-5, G-4-7, G-5, G-6-6, G-7-1, G-8, M-3, S-3, T-5)					



GENERAL LOCATION OF CONTRACT



△ - MODIFIED ROADWAY LENGTH & TOTAL LENGTH, RELOCATED SCALE, CHANGED END OF PROJECT, ADDED CONSULTANT ENGINEERING BOX, ADDED NOTE FOR LEGEND, SHEET 16 JAN. 30, 1987

UTILITIES

AMERICAN TELEPHONE & TELEGRAPH COMPANY
ARTESIAN WATER COMPANY
DELMARVA POWER & LIGHT COMPANY (ELECTRIC)
DIAMOND STATE TELEPHONE
NEW CASTLE COUNTY SANITARY SEWERS
ROLLINS CABLE TELEVISION

As built on rd. 7-28-92 L.R. Plans

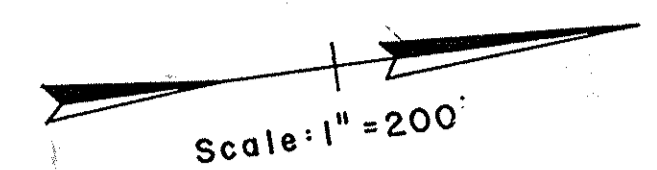
PREPARED AND RECOMMENDED
PRC ENGINEERING, INC.
CONSULTING ENGINEERS
ISELIN, NEW JERSEY
John P. Dalonico DATE 9/3/86
DELAWARE PROF. ENGINEER LICENSE NO. 6298

ALL ASPECTS OF DESIGN FROM STA. 318+48.70 TO STA. 353+34.79 HAVE BEEN PREPARED AND RECOMMENDED BY
URBAN ENGINEERS, INC.
CONSULTING ENGINEERS
PHILADELPHIA, PA. 19106
Harry D. Talley DATE 2/10/87
DELAWARE PROF. ENGINEER LICENSE NO. 5673

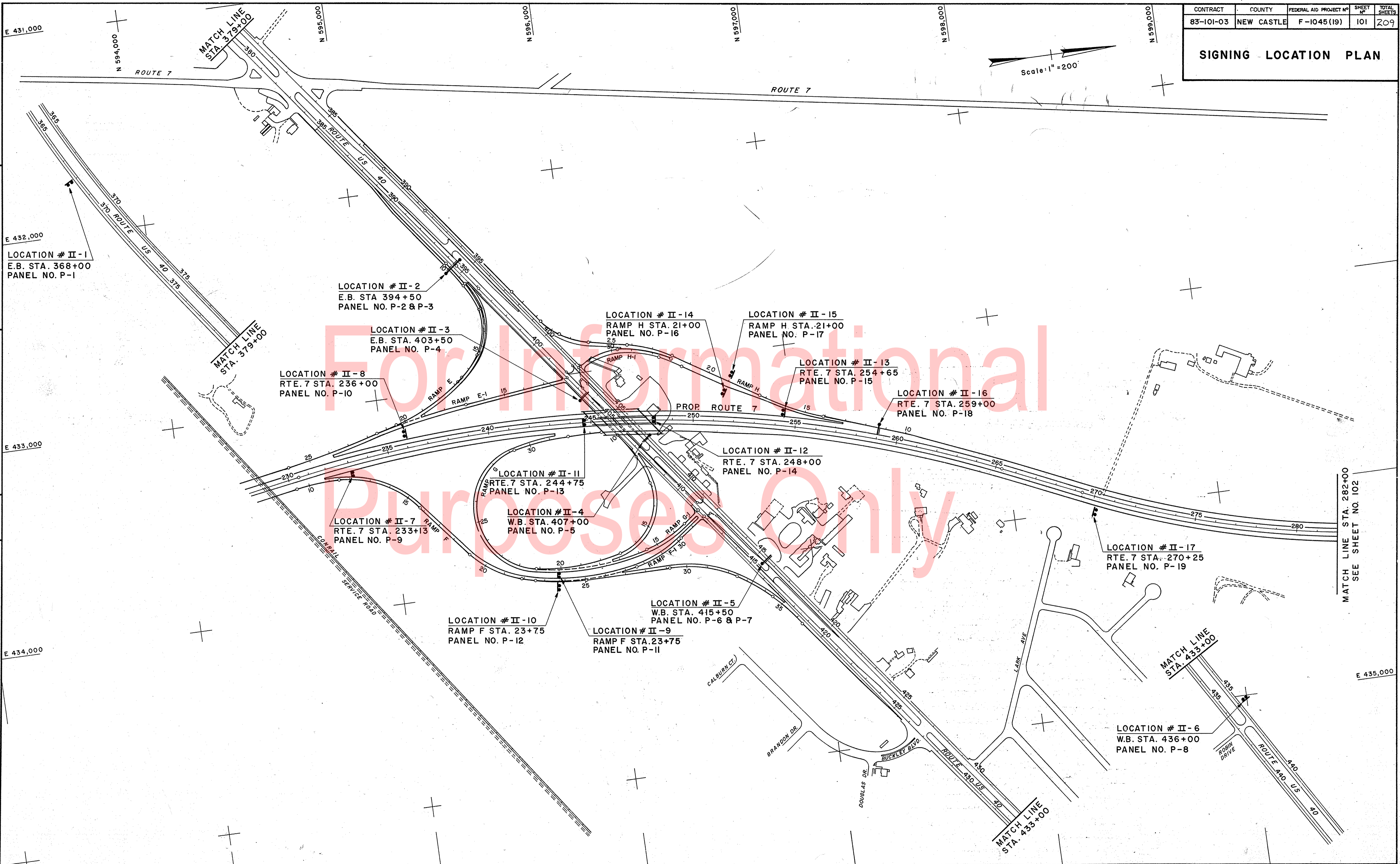
RECOMMENDED		RECOMMENDED		RECOMMENDED		RECOMMENDED		APPROVED		DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION	
<i>Joseph M. Satterfield</i> PROJECT ENGINEER		<i>C. David Jamison</i> REVIEW ENGINEER		<i>Chas. H. Hu</i> BRIDGE ENGINEER		<i>Gary B. Homewood</i> DEPUTY DIRECTOR OF HIGHWAYS		<i>John P. Dalonico</i> DIRECTOR OF HIGHWAYS		APPROVED _____ 19 ____ DIVISION ADMINISTRATOR	
RECOMMENDED Sept 17, 1986	SEAL	RECOMMENDED 9/17 1986	SEAL	RECOMMENDED 9/17 1986	SEAL	RECOMMENDED 9-17 1986	SEAL	APPROVED 9/17 1986	SEAL		

CONTRACT	COUNTY	FEDERAL AID PROJECT #	SHEET #	TOTAL SHEETS
83-101-03	NEW CASTLE	F-1045(19)	101	209

SIGNING LOCATION PLAN



REVISIONS
 PREL. TRACING
 DESIGN
 CHKD.



E 431,000

E 432,000

E 433,000

E 434,000

E 435,000

N 594,000

N 595,000

N 596,000

N 597,000

N 598,000

N 599,000

MATCH LINE
STA. 379+00

ROUTE 7

ROUTE 7

LOCATION # II-1
E.B. STA. 368+00
PANEL NO. P-1

LOCATION # II-2
E.B. STA. 394+50
PANEL NO. P-2 & P-3

LOCATION # II-3
E.B. STA. 403+50
PANEL NO. P-4

LOCATION # II-8
RTE. 7 STA. 236+00
PANEL NO. P-10

LOCATION # II-14
RAMP H STA. 21+00
PANEL NO. P-16

LOCATION # II-15
RAMP H STA. 21+00
PANEL NO. P-17

LOCATION # II-13
RTE. 7 STA. 254+65
PANEL NO. P-15

LOCATION # II-16
RTE. 7 STA. 259+00
PANEL NO. P-18

LOCATION # II-11
RTE. 7 STA. 244+75
PANEL NO. P-13

LOCATION # II-12
RTE. 7 STA. 248+00
PANEL NO. P-14

LOCATION # II-7
RTE. 7 STA. 233+13
PANEL NO. P-9

LOCATION # II-4
W.B. STA. 407+00
PANEL NO. P-5

LOCATION # II-5
W.B. STA. 415+50
PANEL NO. P-6 & P-7

LOCATION # II-9
RAMP F STA. 23+75
PANEL NO. P-11

LOCATION # II-10
RAMP F STA. 23+75
PANEL NO. P-12

LOCATION # II-17
RTE. 7 STA. 270+25
PANEL NO. P-19

LOCATION # II-6
W.B. STA. 436+00
PANEL NO. P-8

MATCH LINE STA. 282+00
SEE SHEET NO. 102

MATCH LINE
STA. 433+00

MATCH LINE
STA. 433+00

ROUTE AND US 50

CALBURN CT

BRANDON DR

DOUGLAS DR

BUCKLEY BLVD

LARK AVE

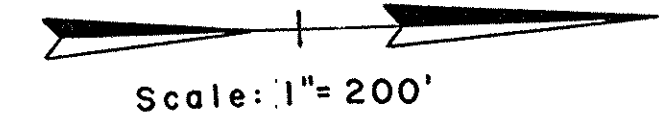
ROBIN DRIVE

ROUTE 430 US 50

ROUTE 440 US 50

For Informational Purposes Only

SIGNING LOCATION PLAN



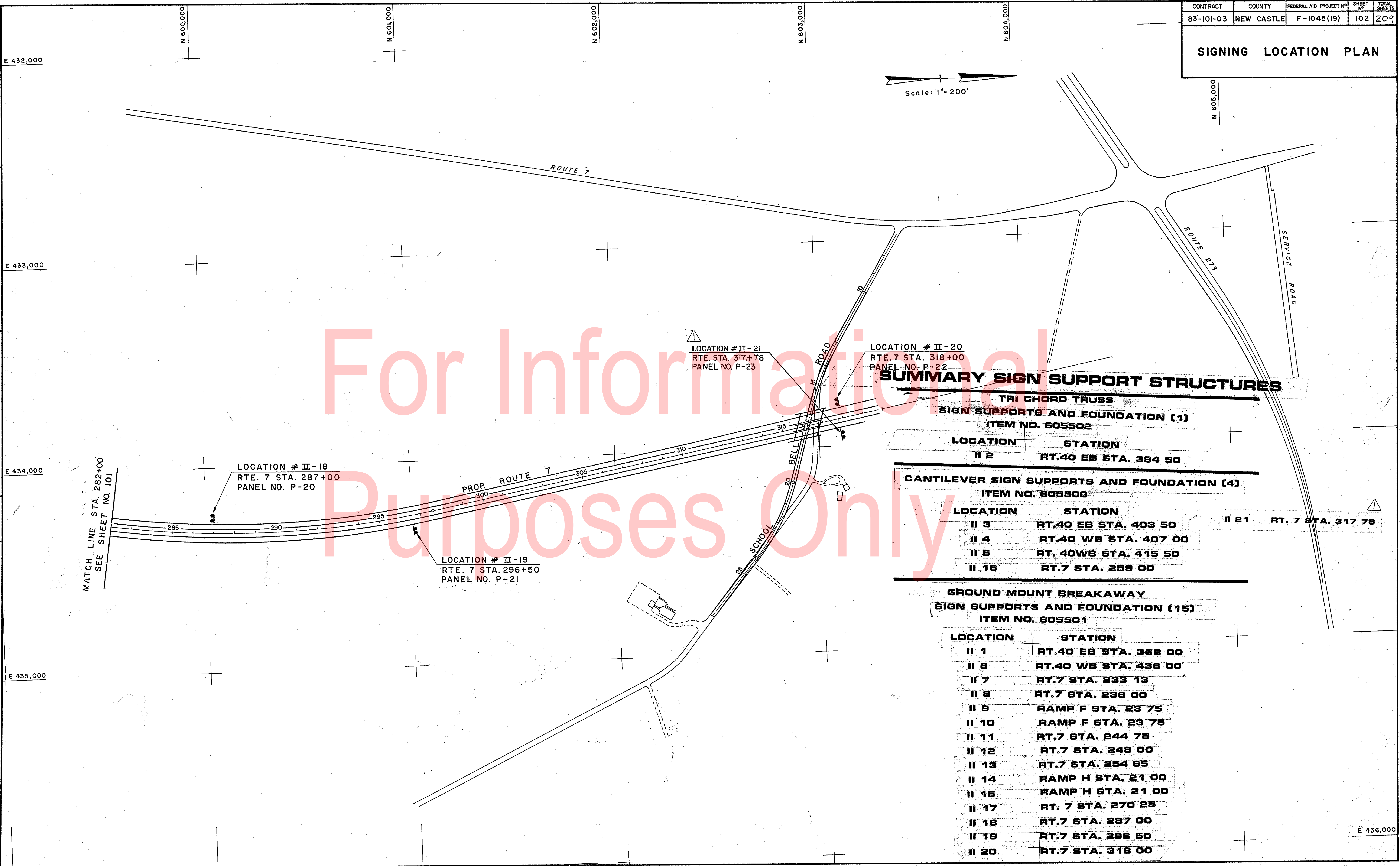
REVISIONS

Added new sign 2/24/87 JMS

PREL. TRACING

DESIGN

CHKD.



SUMMARY SIGN SUPPORT STRUCTURES

TRI CHORD TRUSS
SIGN SUPPORTS AND FOUNDATION (1)
ITEM NO. 605502

LOCATION	STATION
II 2	RT.40 EB STA. 394 50

CANTILEVER SIGN SUPPORTS AND FOUNDATION (4)
ITEM NO. 605500

LOCATION	STATION
II 3	RT.40 EB STA. 403 50
II 4	RT.40 WB STA. 407 00
II 5	RT. 40WB STA. 415 50
II,16	RT.7 STA. 259 00
II 21	RT. 7 STA. 317 78

GROUND MOUNT BREAKAWAY
SIGN SUPPORTS AND FOUNDATION (15)
ITEM NO. 605501

LOCATION	STATION
II 1	RT.40 EB STA. 368 00
II 6	RT.40 WB STA. 436 00
II 7	RT.7 STA. 233 13
II 8	RT.7 STA. 236 00
II 9	RAMP F STA. 23 75
II 10	RAMP F STA. 23 75
II 11	RT.7 STA. 244 75
II 12	RT.7 STA. 248 00
II 13	RT.7 STA. 254 65
II 14	RAMP H STA. 21 00
II 15	RAMP H STA. 21 00
II 17	RT. 7 STA. 270 25
II 18	RT.7 STA. 287 00
II 19	RT.7 STA. 296 50
II 20	RT.7 STA. 318 00

For Informational Purposes Only

E 436,000

SIGN LOC. 2

SIGN PANEL TABULATION

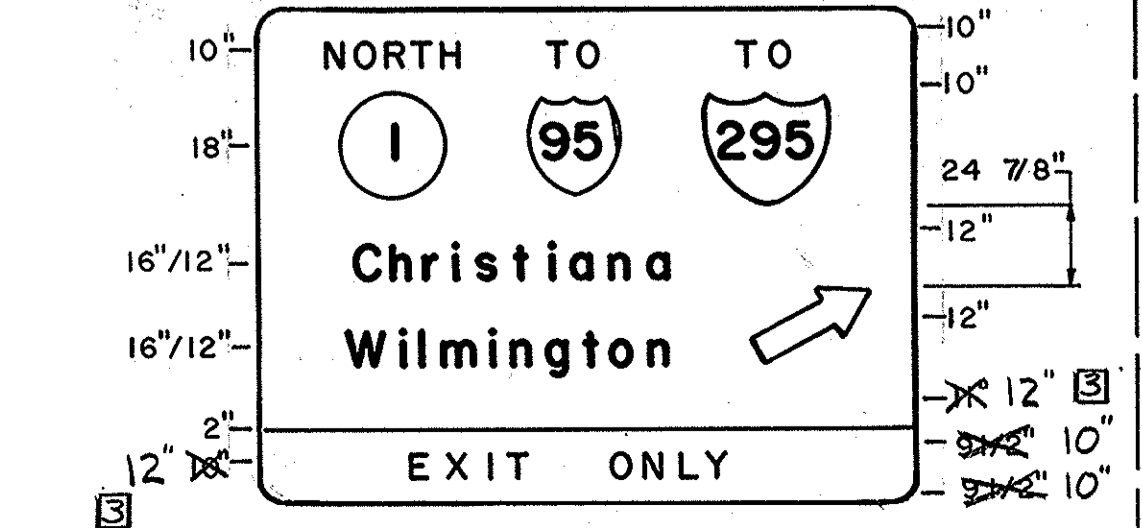
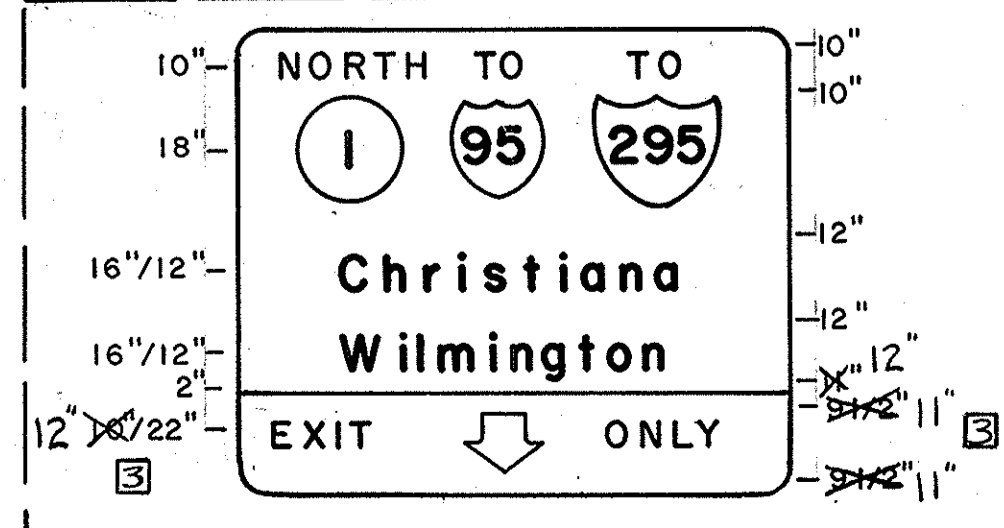
REVISIONS
 1 Revised Panels P-2 & P-4
 2 Connected dimension on P-2 & P-4 12/15/88 JMS-1
 3 DMB 9/30/88
 4 CHANGE REF 7 to REF 1 10/13/88 RFA
 PREL. TRACING DESIGN CHKO.

SEE REVISED LEGEND AT LOWER RIGHT

SEE REVISED LEGEND AT LOWER RIGHT

PANEL NO.	SHEET NO.	QUANTITY	LEGEND	SIZE		COLOR		BORDER		ARROW	SHIELD	REMARKS
				WIDTH	HEIGHT	LEGEND	BACK-GRD	WIDTH	RADIUS			
P-1	II-1	1		12'-6"	14'-0"	W	G	2"	12"		3-36"	175.0 SF
P-2	II-2	1		14'-6"	15'-0"	W	G	2"	12"		36"-36" 45"	217.5 188.5 SF
P-3	II-2	1		12'-0"	10'-6"	W	G	2"	12"	A (45°)	2-36"	126.0 SF
P-4	II-3	1		17'-6"	14'-0"	W	G	2"	12"	A (30°)	36"-36" 45"	245.0 201.25 SF
P-5	II-4	1		12'-0"	9'-0"	W	G	2"	12"	A (HORIZ.)	2-36"	108.0 SF
P-6	II-5	1		17'-6"	9'-0"	W	G	2"	12"	A (HORIZ.)	36"-36" 45"	157.5 SF

PANEL NO.	SHEET NO.	QUANTITY	LEGEND	SIZE		COLOR		BORDER		ARROW	SHIELD	REMARKS
				WIDTH	HEIGHT	LEGEND	BACK-GRD	WIDTH	RADIUS			
P-7	II-5	1		10'-0"	13'-6"	W	G	2"	12"		2-36"	135.0 SF
P-8	II-6	1		13'-6"	15'-0"	W	G	2"	12"		3-36"	202.5 SF
P-9	II-7	1		6'-0"	5'-0"	W	G	1 1/2"	10"	A (45°)		30.0 SF
P-10	II-8	1		12'-6"	10'-0"	W	G	2"	12"		36"	125.0 SF
P-11	II-9	1		16'-0"	7'-6"	W	G	2"	12"	A (VERT.)	36"	120.0 SF



DELAWARE
DEPARTMENT OF HIGHWAYS & TRANSPORTATION
DIVISION OF HIGHWAYS

SIGN PANELS

D.	SCALE	APPROVED BY:
T.	NO SCALE	
C.		BRIDGE ENGINEER

SIGN PANEL TABULATION

PANEL NO	SHEET NO	QUANTITY	LEGEND	SIZE		COLOR		BORDER		ARROW	SHIELD	REMARKS
				WIDTH	HEIGHT	LEGEND	BACK-GRD	WIDTH	RADIUS			
P-12		1		14'-0"	11'-0"	W	G	2"	12"	A (45°)	36"	154.0 SF
P-13		1		17'-6"	12'-0"	W	G	2"	12"		36"-36" 45"	210.0 SF
P-14		1		16'-6"	9'-6"	W	G	2"	12"		36"	156.75 SF
P-15		1		6'-0"	6'-0"	W	G	1 1/2"	10"	A (60°)	36"	36.0 SF
P-16		1		14'-0"	11'-0"	W	G	2"	12"	A (45°)	36"	154.0 SF
P-17		1		13'-0"	11'-0"	W	G	2"	12"	A (45°)	36"	143.0 SF
P-18		1		17'-0"	10'-0"	W	G	2"	12"	*	36"	* USE NON-INTERSTATE DOUBLE LINE VERTICAL OR DIAGONAL ARROW @ 60° 190.0 SF

PANEL NO	SHEET NO	QUANTITY	LEGEND	SIZE		COLOR		BORDER		ARROW	SHIELD	REMARKS
				WIDTH	HEIGHT	LEGEND	BACK-GRD	WIDTH	RADIUS			
P-19		1		14'-0"	11'-6"	W	G	2"	12"		45"	181.0 SF
P-20		1		14'-0"	11'-0"	W	G	2"	12"		36"	174.0 SF
P-21		1		14'-0"	11'-6"	W	G	2"	12"		45"	181.0 SF
P-22		1		14'-0"	11'-0"	W	G	2"	12"		36"	174.0 SF

REVISIONS
I CHANGED RITE TO RITE 1 10-15-88 RPP

PREL. TRACING _____ DESIGN _____ CHKD _____

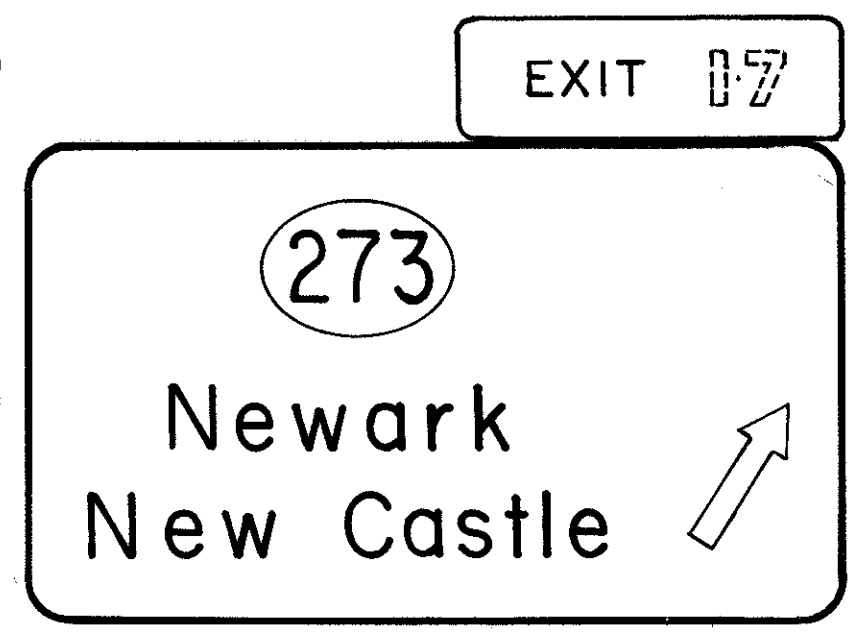
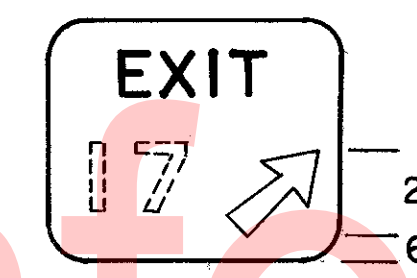
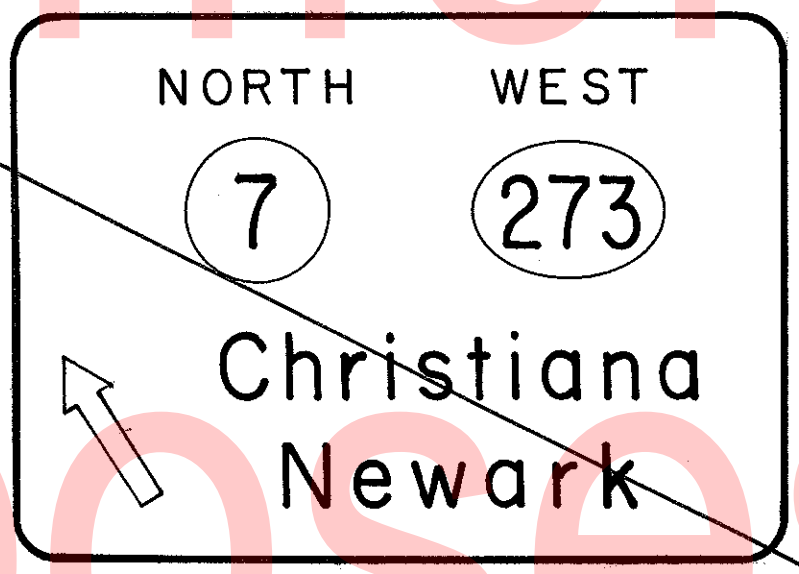
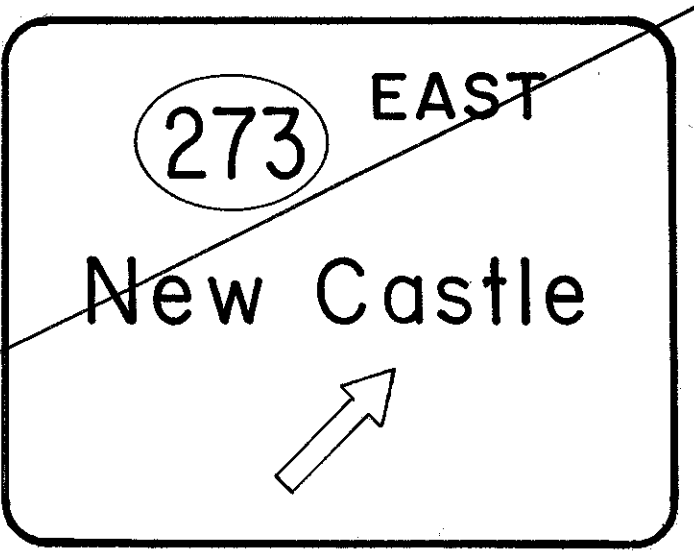
DELAWARE
DEPARTMENT OF HIGHWAYS & TRANSPORTATION
DIVISION OF HIGHWAYS

SIGN PANELS

D.	SCALE	APPROVED BY:
T.	NO SCALE	
C.		BRIDGE ENGINEER

SIGN PANEL TABULATION

NEW SHEET 

PANEL NO.	SHEET NO.	QUANTITY	LEGEND	SIZE		COLOR		BORDER		ARROW	SHIELD	REMARKS	
				WIDTH	HEIGHT	LEGEND	BACK-GRD	WIDTH	RADIUS				
P-23	II-21			10'-15"	18"	8'-0"	2'-6"	W	G	1"	3"	45"	190.0 S.F.
P-24	II-22			12"	18"	6'-0"	5'-0"	W	G	1 1/2"	10"	A (45°)	30.0 S.F.
P-25	LOC. NO.			10"	18"	16'-0"	11'-6"	W	G	2"	12"	45"	184.0 S.F.
P-26	LOC. NO.			12"	18"	14'-0"	11'-0"	W	G	2"	12"	45"	154.0 S.F.

For Informational Purposes Only

REVISIONS
ADDED NEW SHEET - JAN. 30, 1987

PREL. TRACING DESIGN CHKD.

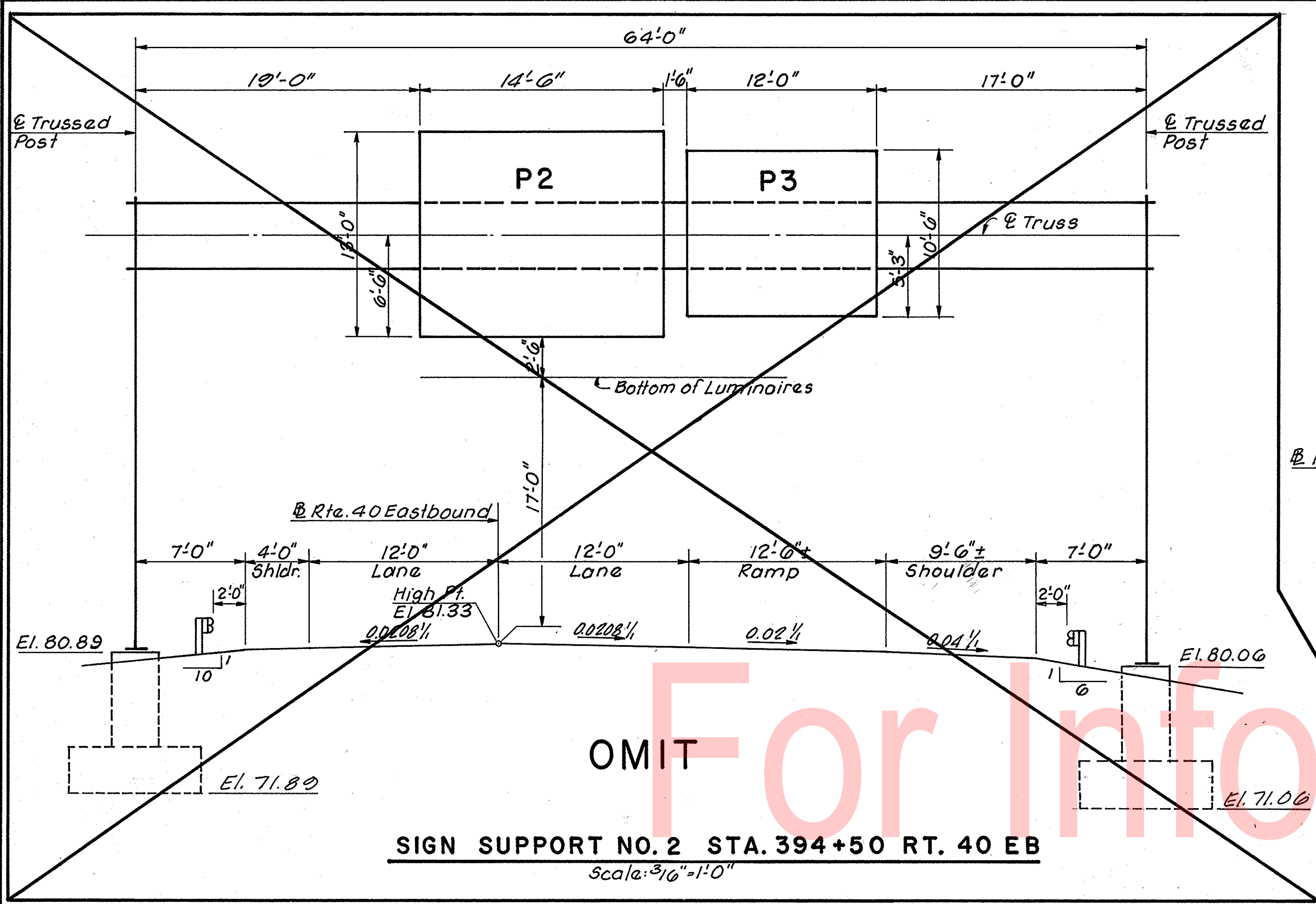
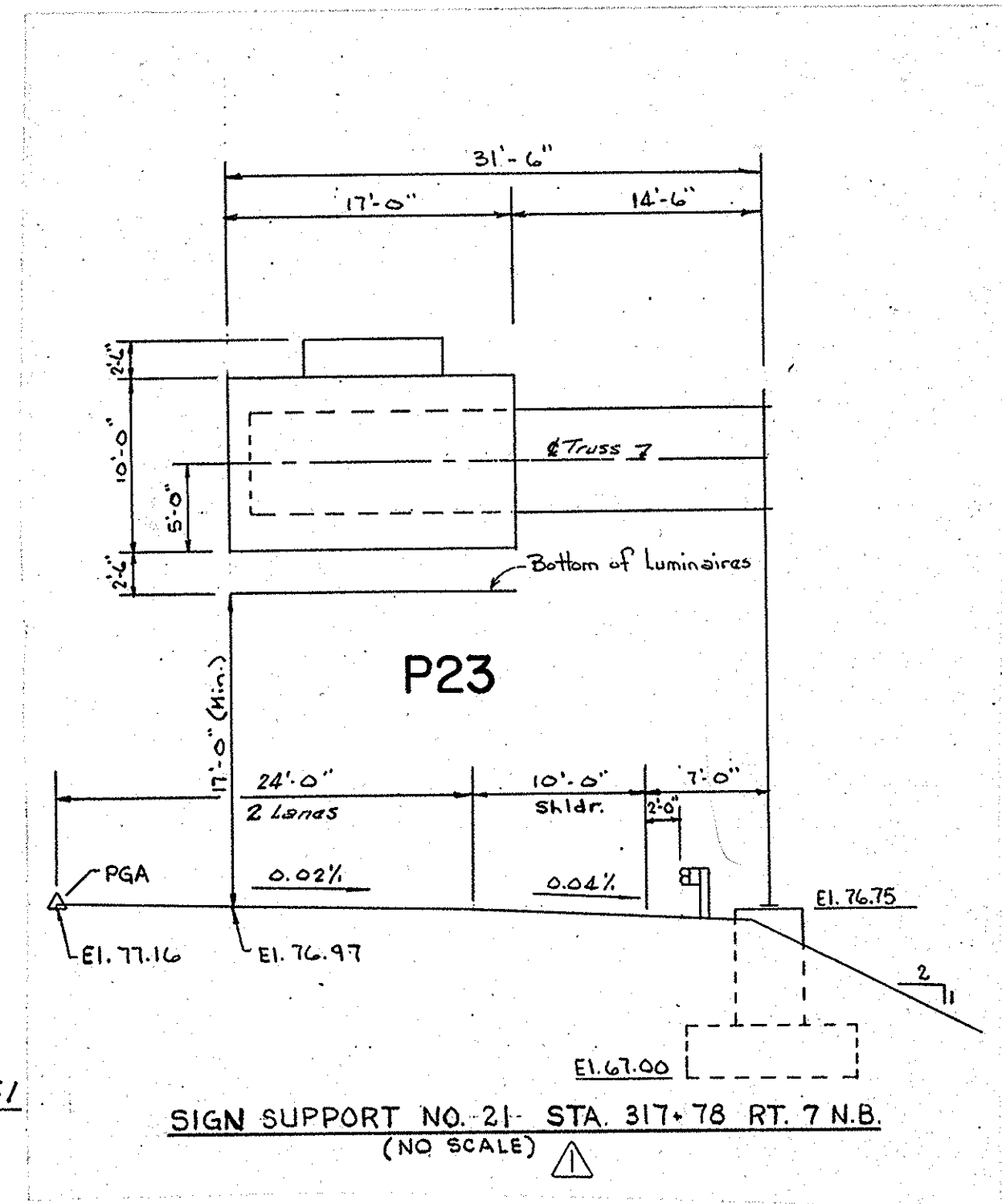
DELAWARE
DEPARTMENT OF HIGHWAYS & TRANSPORTATION
DIVISION OF HIGHWAYS

SIGN PANELS

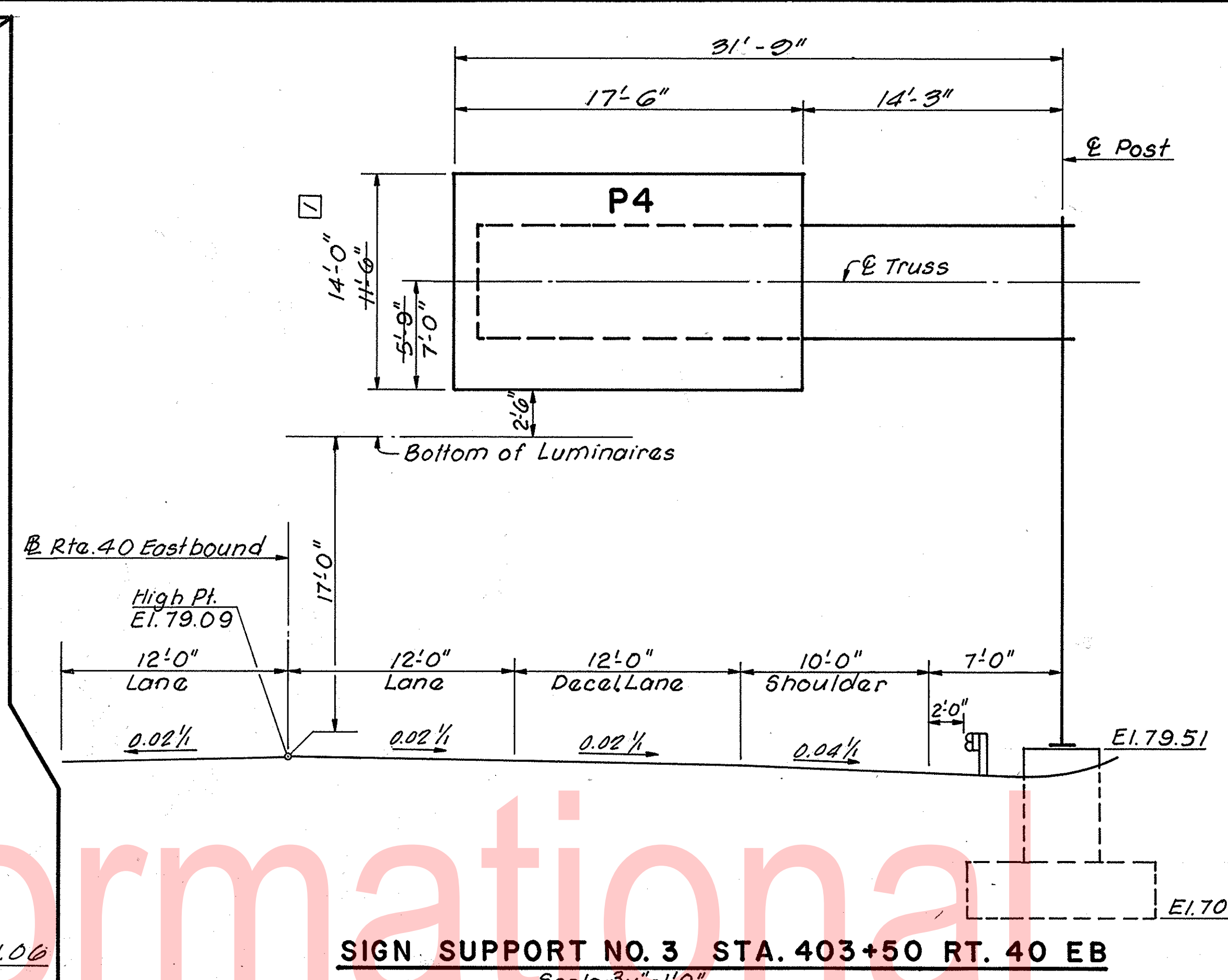
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T.	NO SCALE	
C.		

DWG. NO.	CONTRACT	COUNTY	FEDERAL AID PROJECT #	SHEET #	TOTAL SHEETS
53	83-101-03	NEW CASTLE	F-1045 (19)	158	209

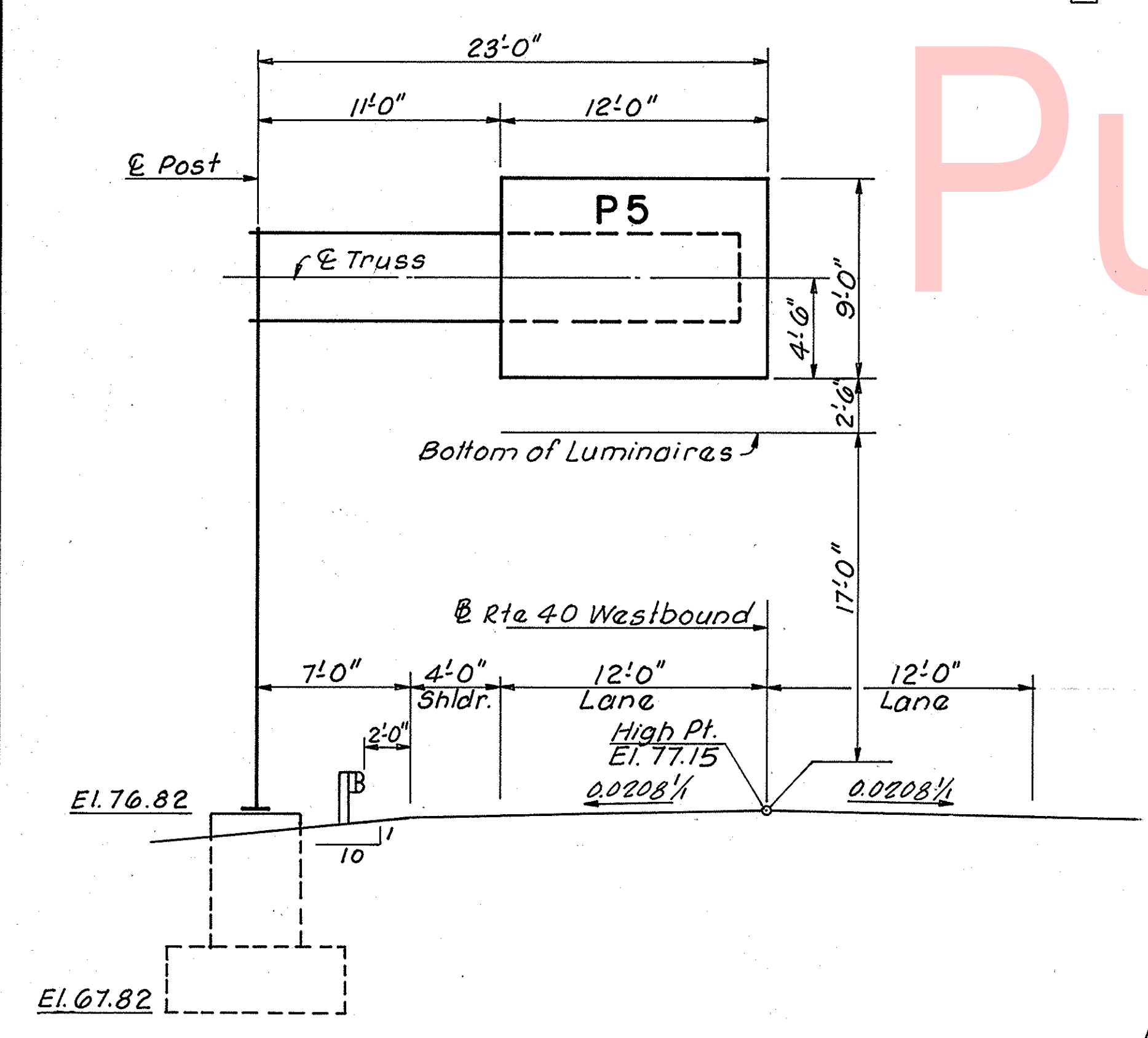
SIGN SUPPORT ELEVATIONS



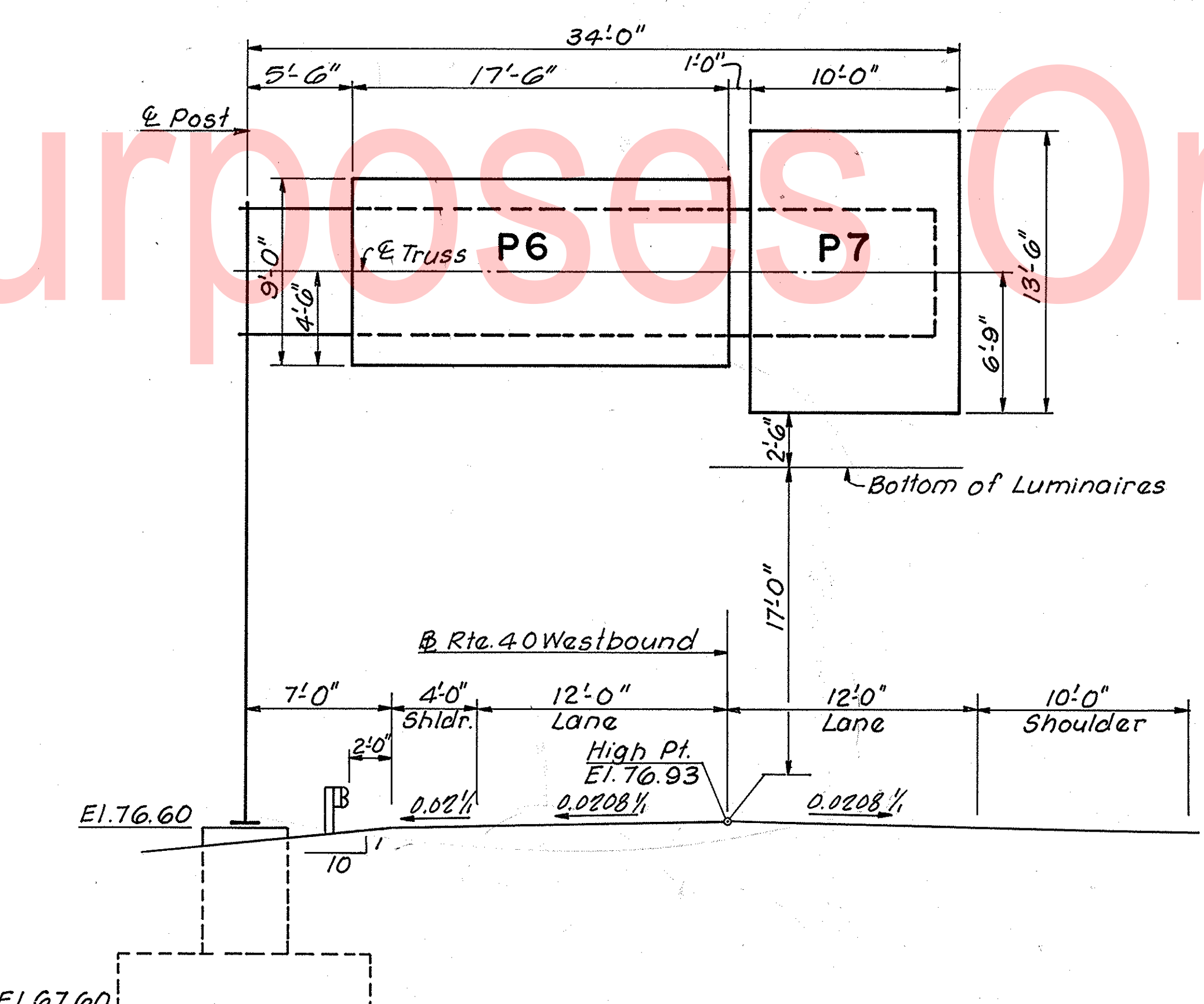
SIGN SUPPORT NO. 2 STA. 394+50 RT. 40 EB
Scale: 3/16"=1'-0"



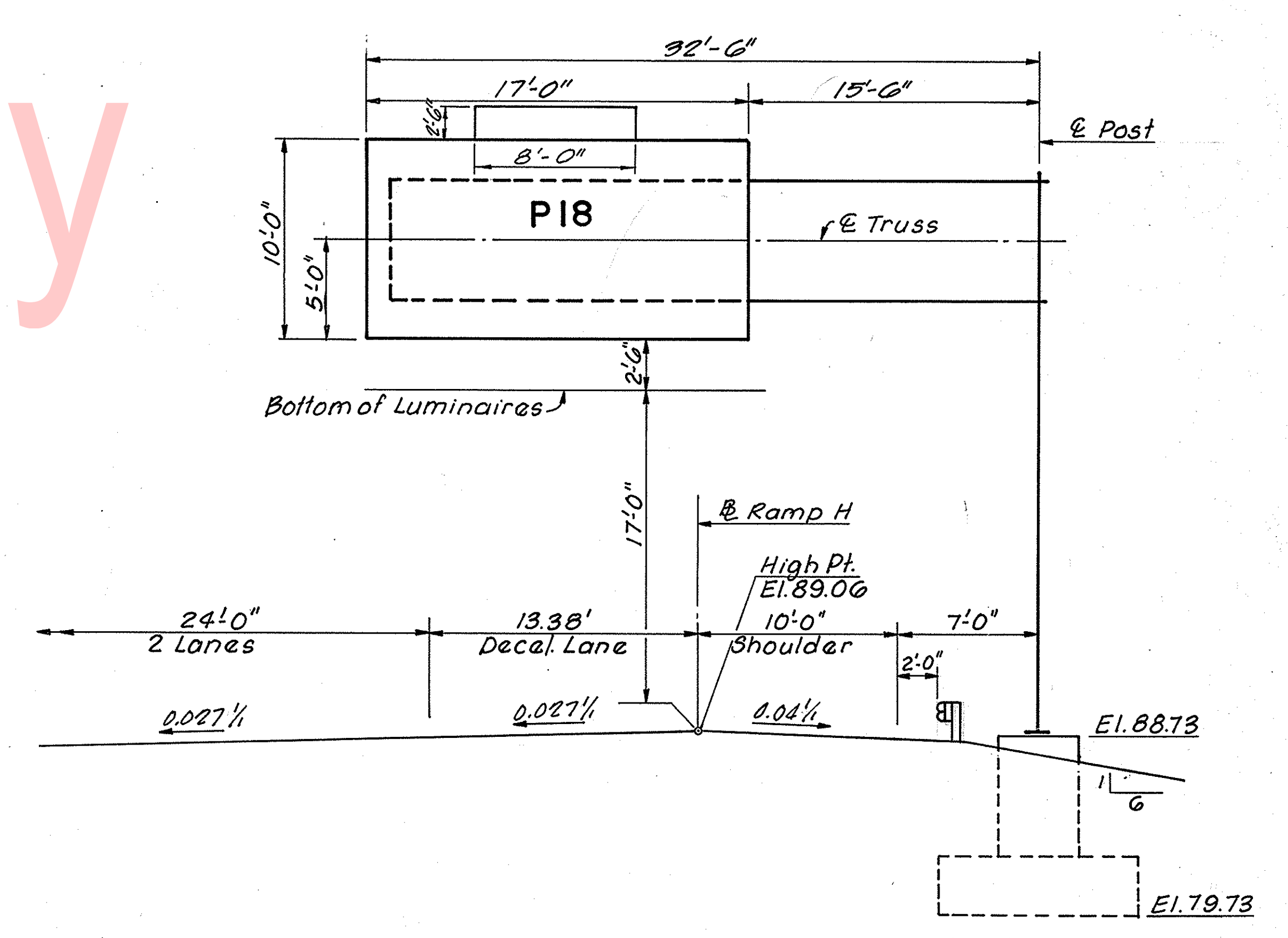
SIGN SUPPORT NO. 3 STA. 403+50 RT. 40 EB
Scale: 3/16"=1'-0"



SIGN SUPPORT NO. 4 STA. 407+00 RT. 40 WB
Scale: 3/16"=1'-0"



SIGN SUPPORT NO. 5 STA. 415+50 RT. 40 WB
Scale: 3/16"=1'-0"



SIGN SUPPORT NO. 16 STA. 259+00 RT. 7 SB
Scale: 3/16"=1'-0"

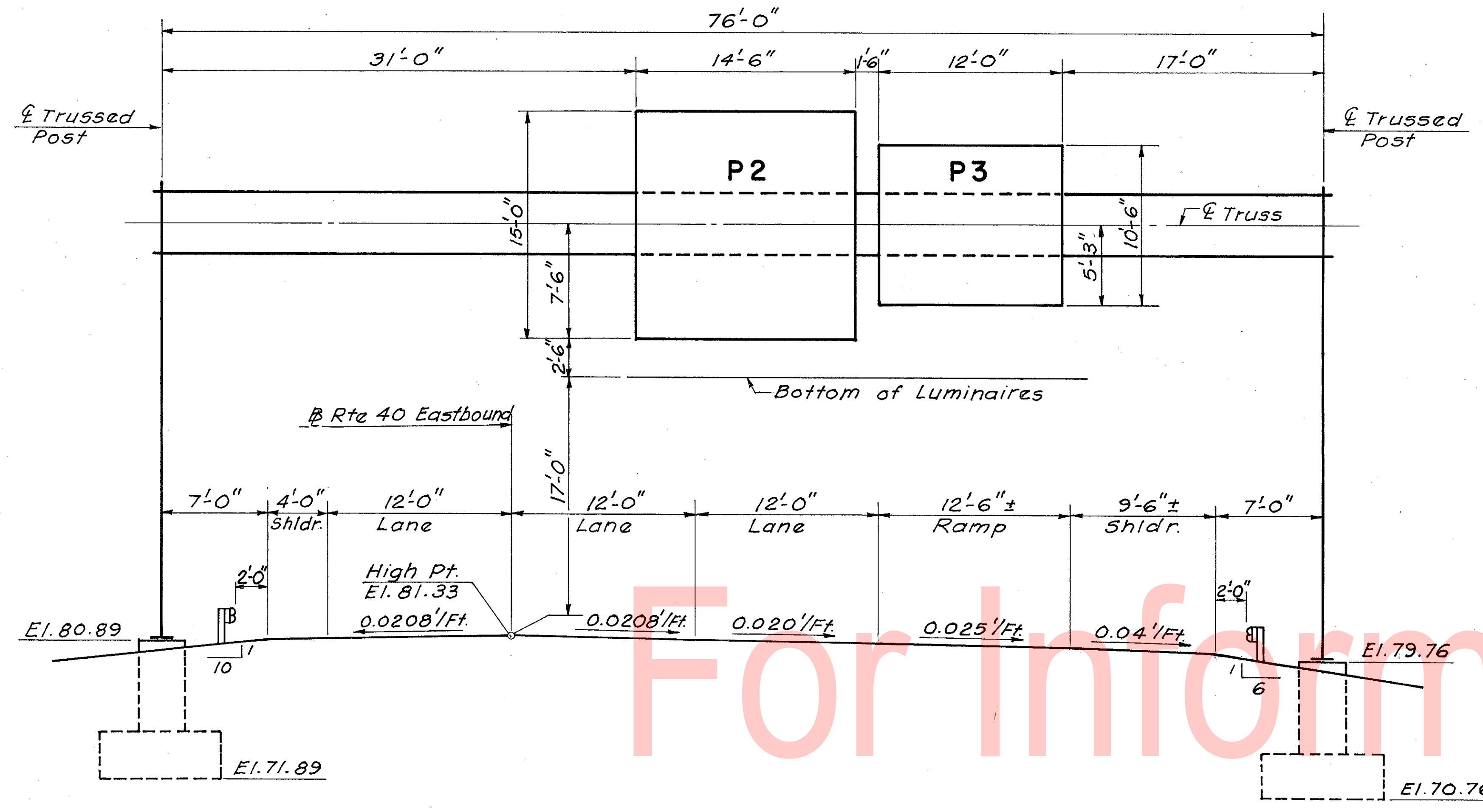
REVISIONS
 1. Added sign support no. 21, 2/24/87, JMS/SK.
 2. Omit sign support no. 2 & Rev. Sign Panel, P4, PRC, Aug. 88.

PREL. TRACING P. M. I.
 DESIGN P. D. K.
 CHKD. P. S.

For Informational Purposes Only

DWG. NO.	CONTRACT	COUNTY	FEDERAL AID PROJECT #	SHEET #	TOTAL SHEETS
53 A	83-101-03	NEW CASTLE	F-1045 (9)	158 A	
NEW SHEET					

SIGN SUPPORT ELEVATION



SIGN SUPPORT NO. 2 STA. 394+50 RT. 40 EB
 Scale: 3/16" = 1'-0"

For Informational Purposes Only

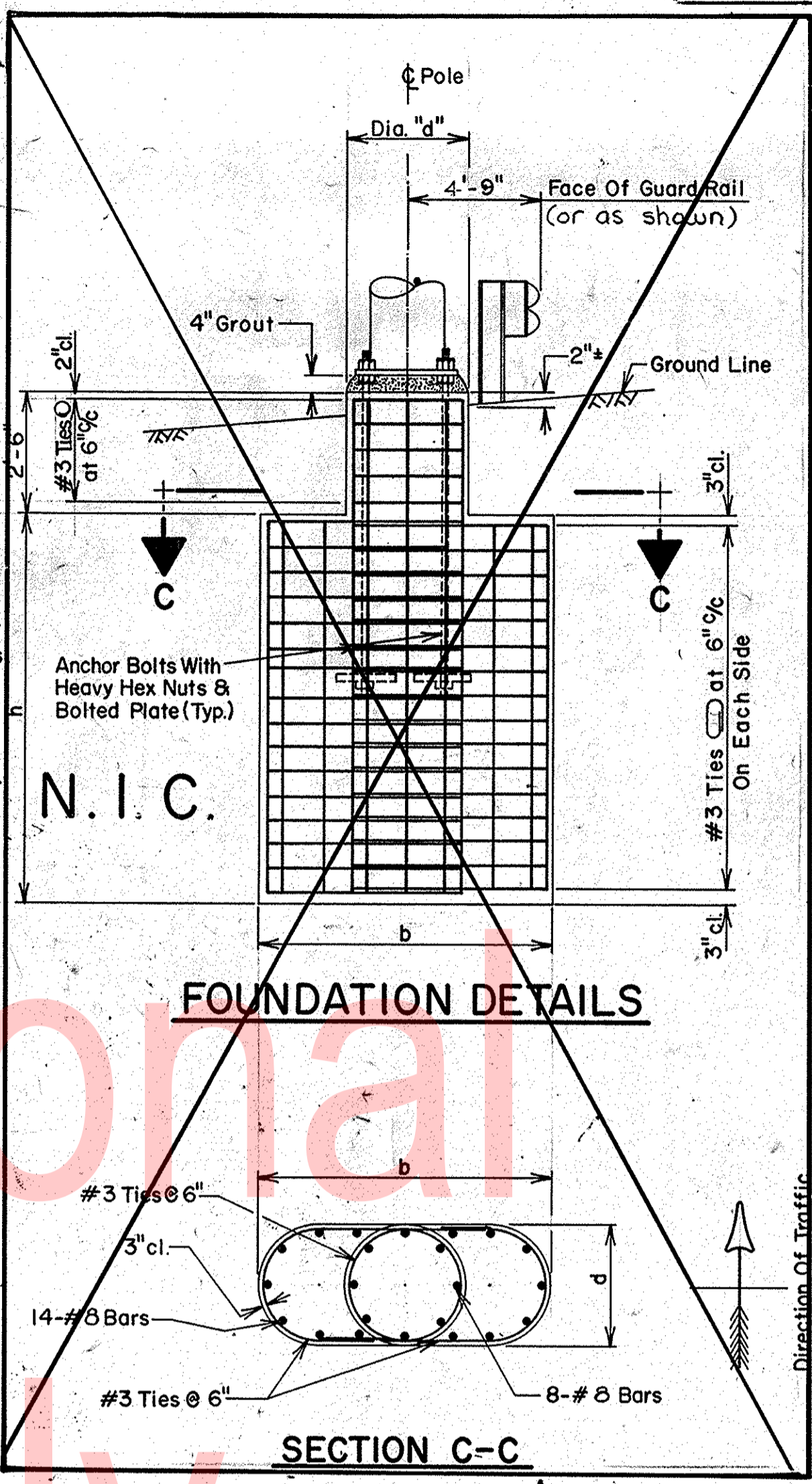
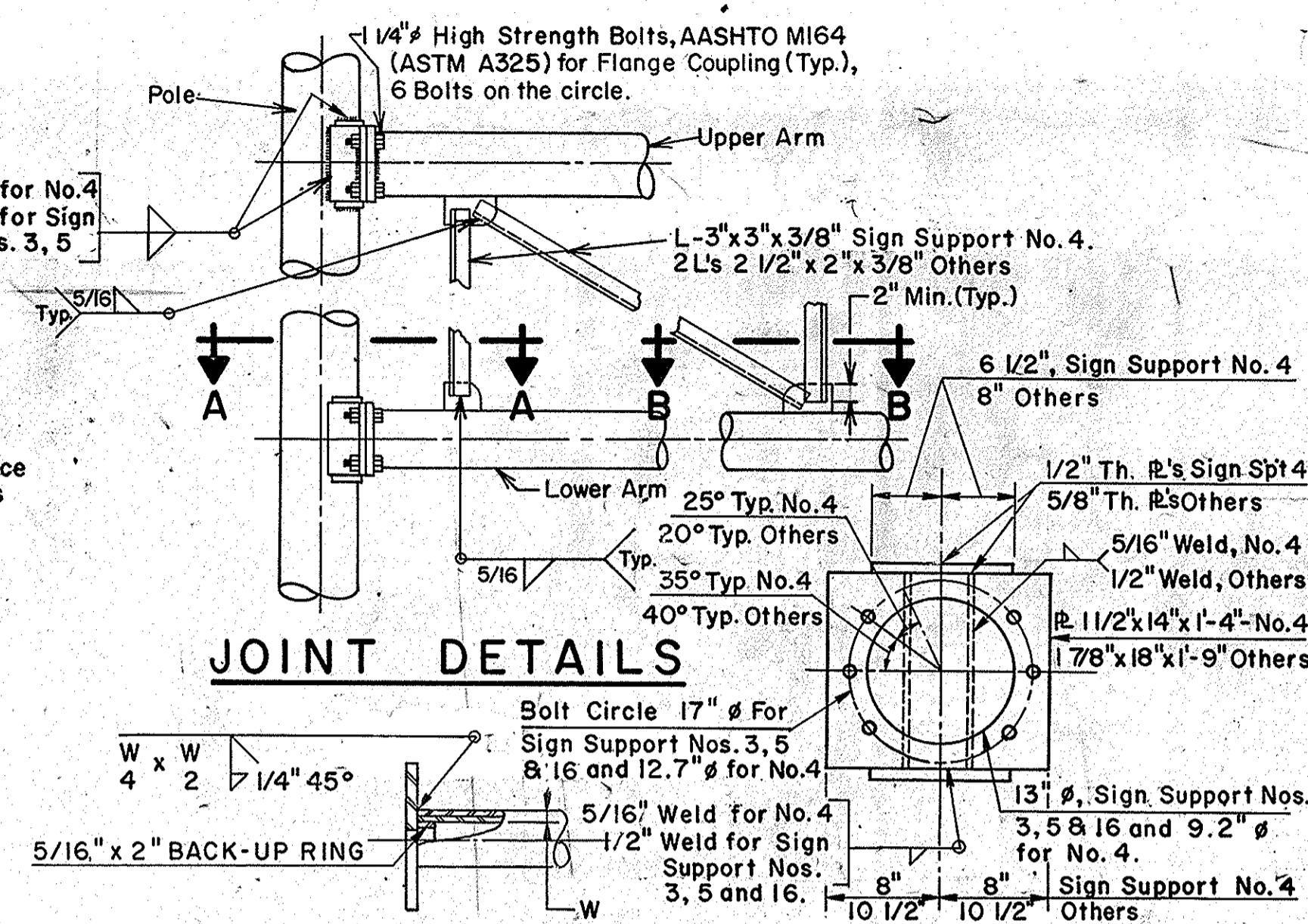
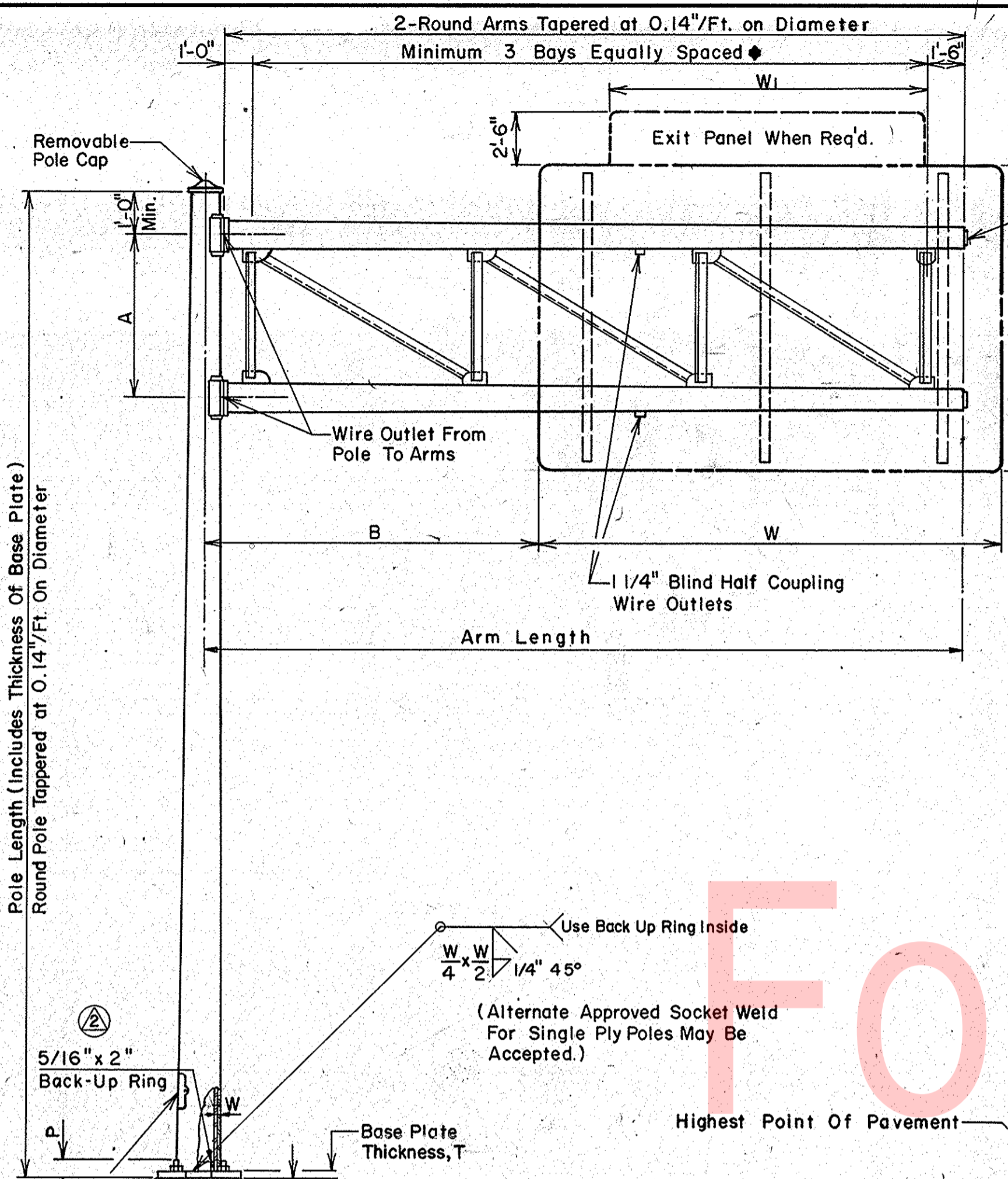
REVISIONS

6283
 PREL. TRACING N. V. P. DESIGN A. M. A. CHKD. J. J. S.

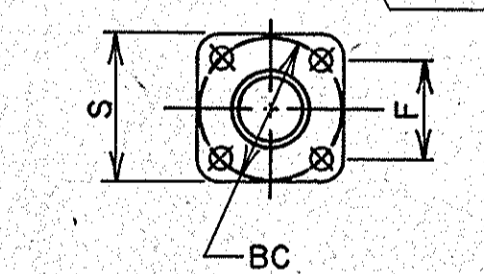
NO.	REVISIONS	BY	DATE
1	GENERAL NOTE 4	PRC	8/86
2	ADD DETAILS OF 2 PLY POLE BASE PL	PRC	8/86
3	ADD DETAILS OF 2 PLY ARM	PRC	8/86
4	FOUNDATION DETAILS	PRC	8/86
	Added sign support no. 21	JMSJ	2/24/87

GENERAL NOTES

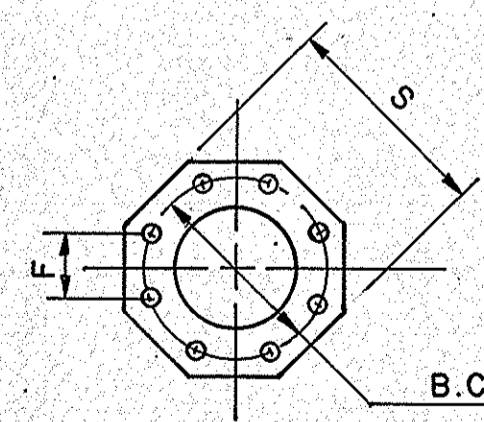
- All tubular materials for poles and arms shall conform to ASTM A595 Grade A with a minimum yield stress of 55,000 psi. L-Sections used as members of the truss, gusset plates and anchor plates shall be of AASHTO M183 (ASTM A36). Plates used in flange couplings and base plates shall conform to AASHTO M223 (ASTM A572 Grade 42). All structural members and hardware shall be galvanized in accordance with AASHTO M111 (ASTM A123) and AASHTO M232 (ASTM A153) respectively.
- Anchor bolts with nuts, and bolted plates, satisfying AASHTO design specifications, shall meet the requirements of ASTM A687 for studs and ASTM A563 Grade DH for nuts. Details shall be shown in the shop drawings to be submitted by the contractor for approval by the Bridge Engineer.
- The welding size, except as otherwise specified or any alternate design, shall be furnished by the manufacturer. All welded joints shall have at least the same strength as the members they connect.
- An auger shall be used to drill through the soil and the foundation shall be carefully excavated. Reinforced concrete footings shall be placed on undisturbed soil to secure a firm contact between undisturbed soil and concrete. Circular footing tops (2'-6" high) shall be formed above and below ground line.



1 PLY POLE BASE PLATE DETAILS

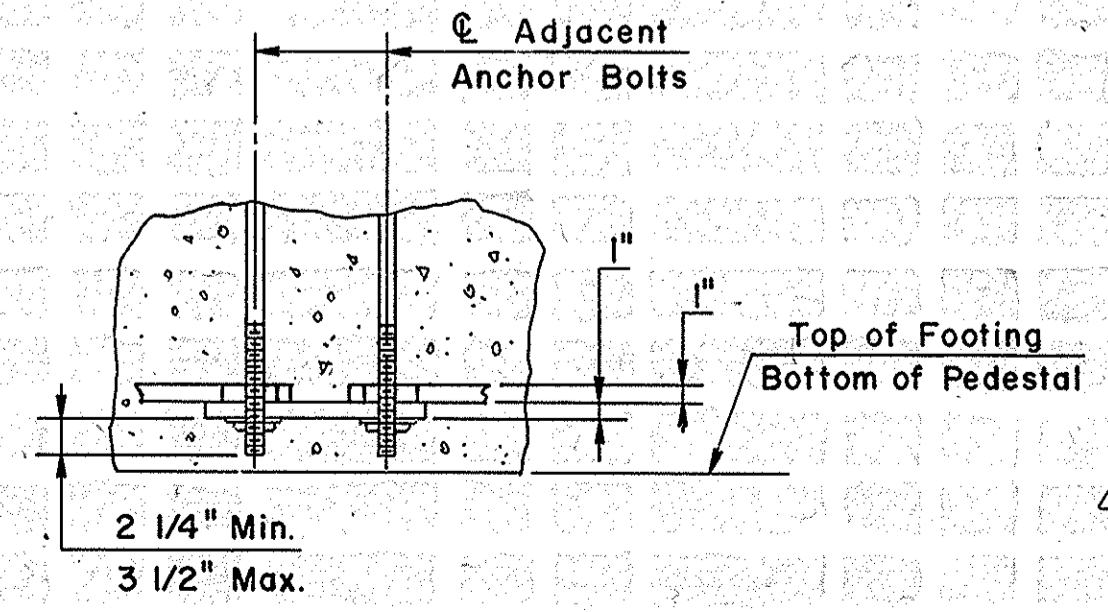
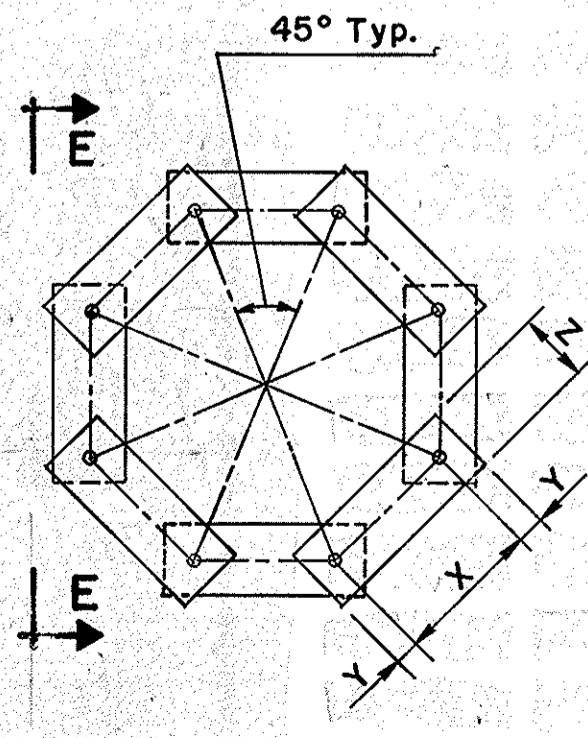


2 PLY POLE BASE PLATE DETAILS



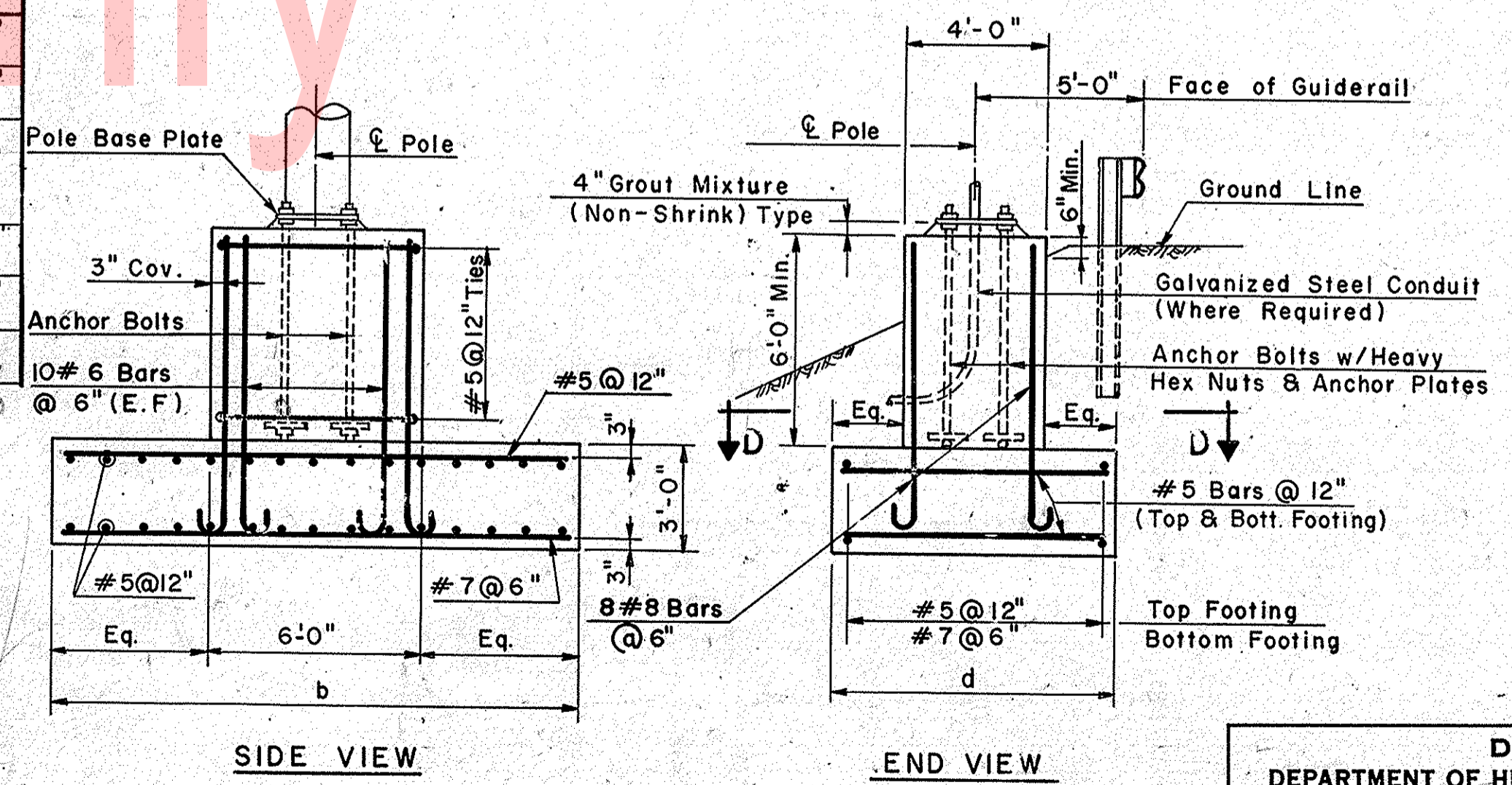
DATA TABLE

SIGN SUPPORT NO.	SHEET NO.	SIGN PANEL NO.	SIGN PANEL				POLE DETAILS			ARM DETAILS				BASE PLATE DETAILS				FOUNDATION DETAILS			DL/DEFL. AT FREE END
			B	W	H	Wi	SIZE	GA.	A	SIZE	GA.	BC	F	S	T	P	b	d	ANCHOR BOLTS		
3	53	P4	14.25'	17.5'	11.5'	-	18" x 14" x 28'-6"	3+3	6'	13" x 8.70" x 30'-9"	0	25"	9 9/16"	29"	3 3/4"	5"	24'-0"	10'-0"	3 3/4"	4 13/16"	
4	53	P5	11'	12'	9'	-	15" x 11.22" x 27'-7"	7+7	4'	9.2" x 6.05" x 22'-6"	3	21"	8"	25"	2 3/4"	4 1/4"	15'-0"	8'-0"	1 1/4"	2 9/16"	
5	53	P6	5.5'	17.5'	9'	-	18" x 13.76" x 30'-3"	0+0	6'	13" x 8.59" x 31'-6"	3+7	25"	9 9/16"	29"	4"	6"	24'-0"	12'-0"	3 3/4"	5 1/8"	
16	53	P18	15.5'	17'	10'	8'	18" x 14" x 28'-6"	3+3	6'	13" x 8.66" x 31'-0"	0	25"	9 9/16"	29"	3 3/4"	5"	24'-0"	10'-0"	3 3/4"	4 13/16"	
21		P23	14.5'	17'	10'	8'	18" x 13.94" x 29'-0"	3+3	6'	13" x 8.80" x 30'-0"	0	25"	9 9/16"	29"	3 3/4"	5"	24'-0"	10'-0"	3 3/4"	4 13/16"	



ANCHOR BOLT PLATE DATA

SIGN SUPPORT NO.	BOLT CIRCLE DIAMETER	BOLT DIAMETER	X Y Z		
			X	Y	Z
3	25"	1 3/4"	9.56	3 1/16"	5"
4	21"	1 1/4"	8.03	2 1/4"	4"
5	25"	1 3/4"	9.56	3 1/16"	5"
16	25"	1 3/4"	9.56	3 1/16"	5"
21	25"	1 3/4"	9.56	3 1/16"	5"



REFERENCE:
1. SEE FOUNDATION NOTES, DWG. NO 53.

DELAWARE
DEPARTMENT OF HIGHWAYS & TRANSPORTATION
DIVISION OF HIGHWAYS

CANTILEVER SIGN STRUCTURES

D. R. D. K.
T. A. W.
C. P. S.

SCALE
N.T.S.

APPROVED BY
BRIDGE ENGINEER

DWG. NO.	COUNTY	CONTRACT	P. R. A. REG. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
55	NEW CASTLE	83-101-03	2	DEL.	F-1045(19)	160	209

GENERAL NOTES

DESIGN AND CONSTRUCTION SPECIFICATIONS

- 1983 A.A.S.H.T.O. Standard Specifications For Highway Bridges, And Interim Specifications 1984 & 1985
- 1975 A.A.S.H.T.O. Specifications For The Design And Construction Of Structural Supports For Highway Signs. Design Wind Velocity - 85 MPH.
- 1985 Delaware State Highway Department Standard Specifications.

MATERIALS

- Steel for Tubular Truss Members and Poles shall have a Minimum yield strength of 55,000 psi.
- All structural steel, unless otherwise noted on the plans, shall be ASTM A36. High strength bolts shall conform to ASTM A325.
- Aluminum shall be alloy 6061-T6, except as noted.
- For additional note see Sheet No. 54.

SIGN PANEL

Sign colors, letters, shields and arrows shall conform to the requirements of the Manual On Uniform Traffic Control Devices For Streets And Highways, published by the U.S. Department Of Transportation, Federal Highway Administration 1978.

ILLUMINATION

Under the contract item 605500, "Cantilever Sign Support and Foundation" and item 605502, "Tri-chord Truss Type Sign Supports and Foundation", the contractor shall furnish and install all sign luminaires, photoelectric control cell, conduits and conduit connectors, weatherproof ballast units, and supports, as well as fasteners, cables, wiring and accessories required for a complete installation up to designated service connection points. All materials and workmanship shall conform with the 1975 National Electric Code For Electric Wiring And Apparatus of the National Board of Underwriters (See Special Provisions). After installation is complete, the signs will be inspected by the Engineer, at night and during the day. Specular reflection will be eliminated or minimized by an adjustment of the sign face(s), at the Contractor's expense.

FOUNDATION

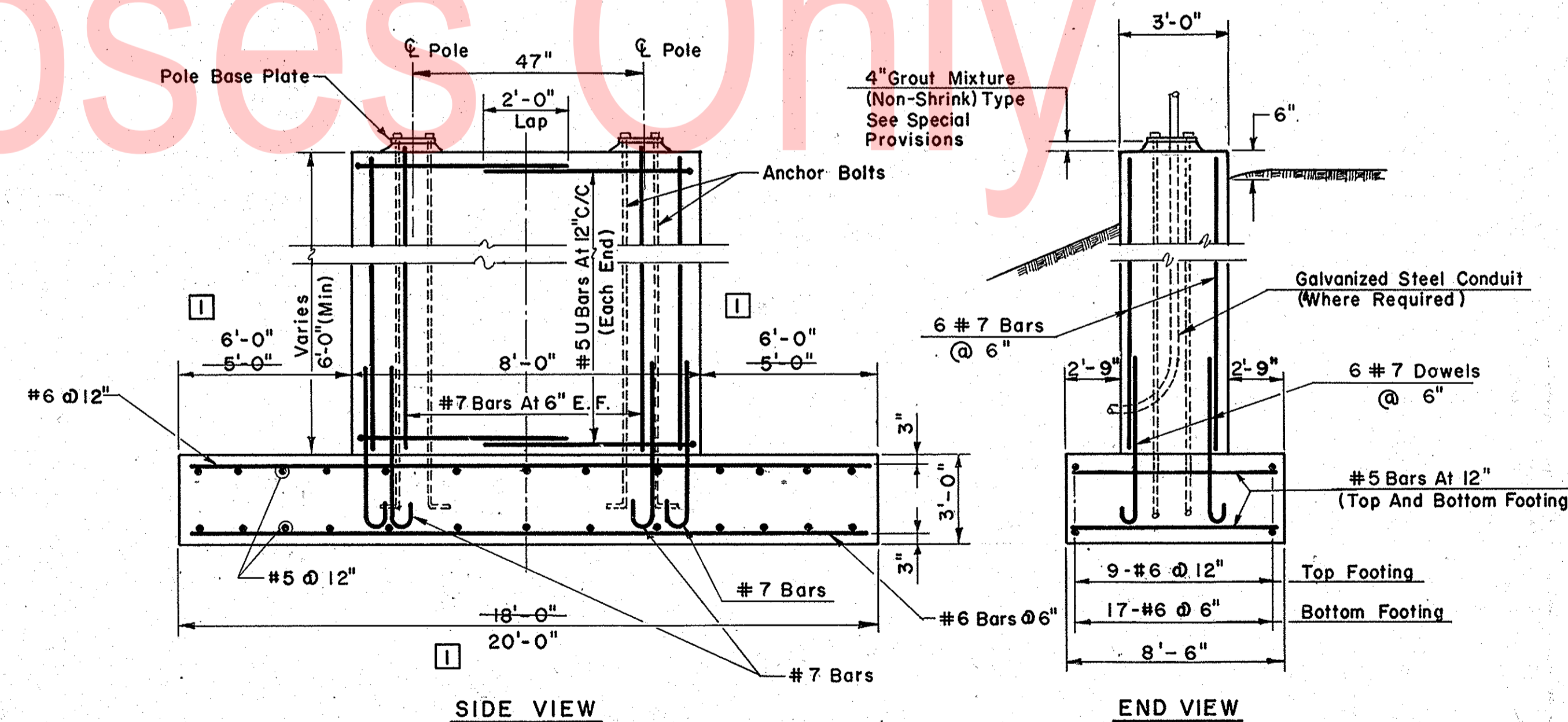
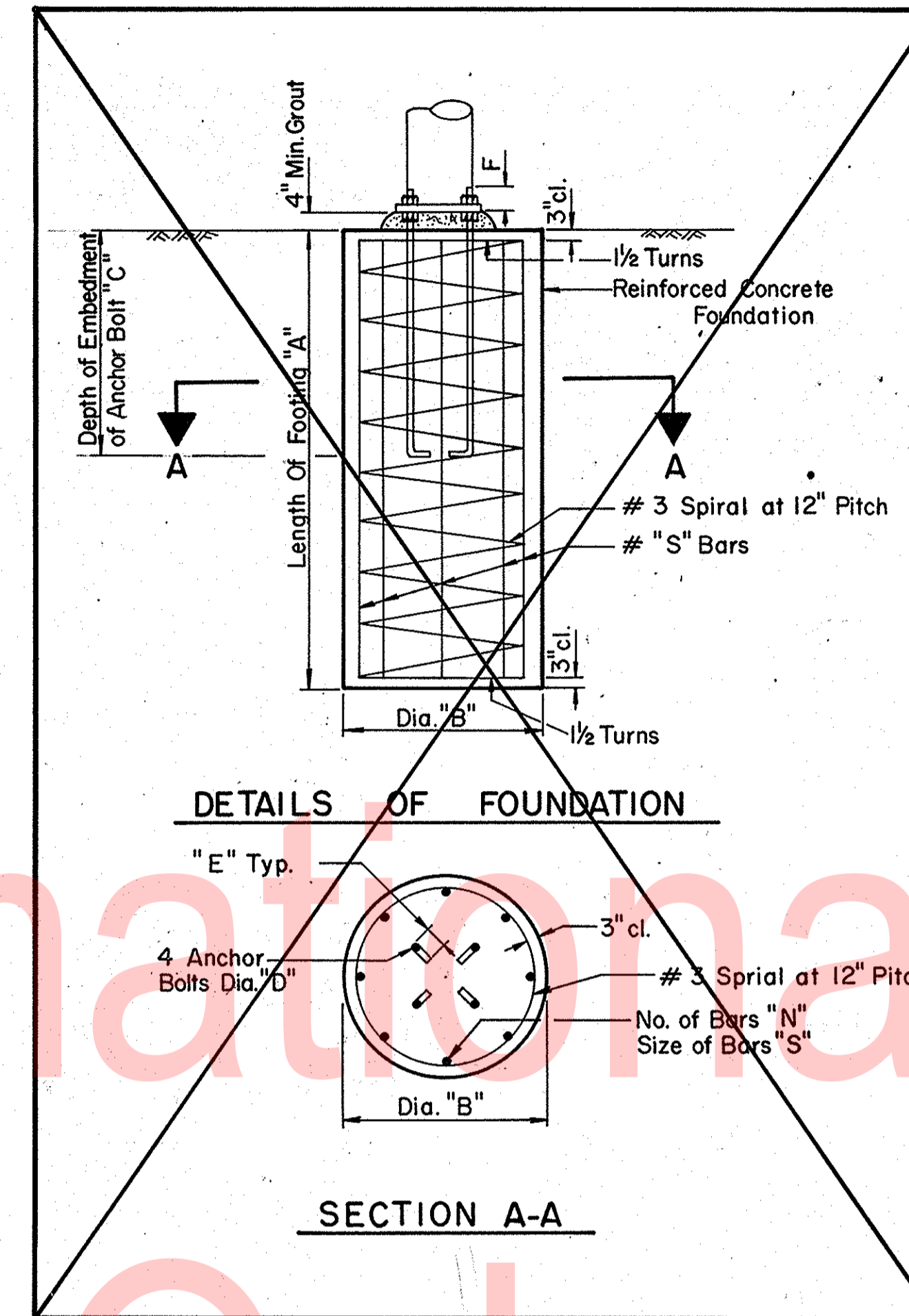
- The concrete shall have a 28 day strength of 3,000 psi, minimum cover over Bar Reinforcement shall be 3 inches except as otherwise noted on the drawings.
- Bar Reinforcement shall conform with ASTM A615, Grade 60.
- The foundation shall be built above the existing ground water table. If this water table is higher than the bottom of the foundation, an alternate design shall be used. The designer will prepare the alternate design at the time of receiving a written report of field water table conditions. Change in cost shall be negotiated. All exposed edges shall be chamfered 3/4".

POWER SOURCES

- Electricity for all signs shall be obtained from the junction well nearest to the sign locations.

NO.	REVISIONS	BY	DATE
1	1983 AASHTO Std. Specs for Hwy Bridges	PRC	8/86
2	1975 AASHTO Specs. for Design & Constr. Hwy. Signs	PRC	8/86
3	1985 DEL DOT Standard Specs.	PRC	8/86
4	1978 UTCD	PRC	8/86
5	Materials Notes 1 & 4	PRC	8/86
6	Foundation Notes 2 & 3	PRC	8/86
7	Illumination Note	PRC	8/86
8	Rev. Footing Dimension	PRC	8/88

DETAILS OF FOUNDATION									
SIGN NO./FOOTING	SHEET NO.	A	B	C	D	E	F	N	S



FOUNDATION NOTES:

FOUNDATIONS SHALL BE PLACED ON UNDISTURBED MATERIAL OR FILL MADE BY CONTROLLED COMPACTION AND AT DEPTHS UNAFFECTED BY FROST NO FOUNDATION CONSTRUCTION SHALL BE BEGUN UNTIL THE ENGINEER HAS INSPECTED THE EXCAVATION AND APPROVED THE CHARACTER AND CONDITION OF THE EXPOSED FOUNDATION MATERIAL.

FOUNDATION DETAILS SHOWN ON THE CONTRACT ARE OF A GENERAL NATURE AND SUBJECT TO ALTERATIONS AND MODIFICATIONS, WHEN ORDERED BY THE ENGINEER, TO MEET THE REQUIREMENTS OF FIELD CONDITIONS.

DELAWARE DEPARTMENT OF HIGHWAYS & TRANSPORTATION DIVISION OF HIGHWAYS		
GENERAL NOTES FOR OVERHEAD SIGN SUPPORTS AND FOUNDATION DETAILS		
D. P. D. K. T. N. V. P. C. P. S.	SCALE N. T. S.	APPROVED BY: BRIDGE ENGINEER

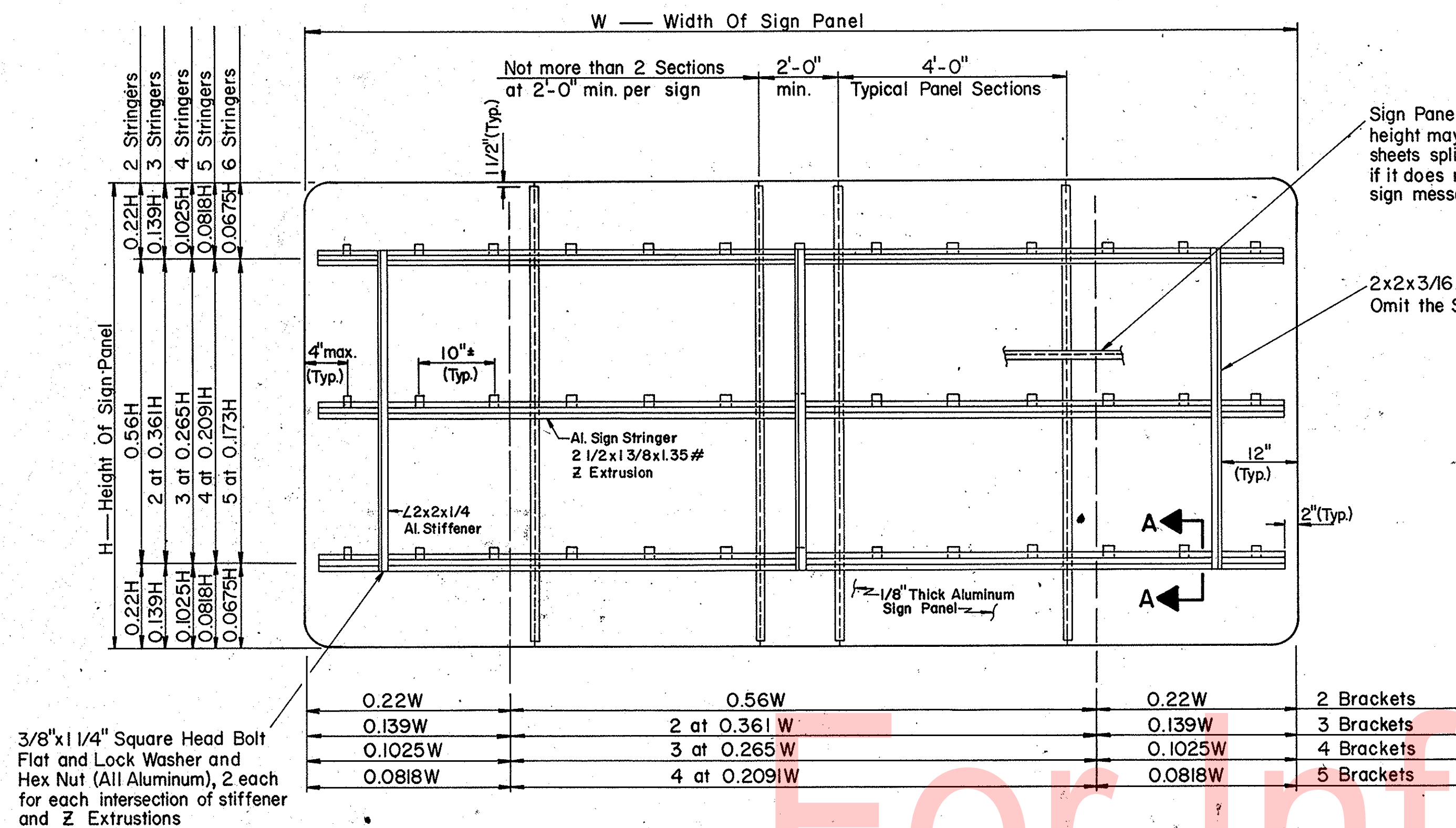
NO.	REVISIONS	BY	DATE
1	Added lighting & ground rods	JMSJv	2/24/87

NOTES:

- All Steel, Connections and Hardwares shall be galvanized to meet the requirements of AASHO M111.
- Number and Spacing of Luminaires shall be specified by the Engineer.
- Length and Number of Ground Rods shall be specified by the Engineer.
- Use 3/4" flexible Conduit to top of sign panel for remote mounted photocell. (1 required for each sign support.)

MATERIALS SPECIFICATIONS:

Structural Shapes and Plate (Steel): AASHO M183 (ASTM A36)
 U-Bolts: AASHO M183 (ASTM A36)
 Other Steel Bolts: ASTM A307
 Aluminum Plates, Stiffeners, Extrusions, Panel Clips, Backing Strips: Alloy 6061-T6

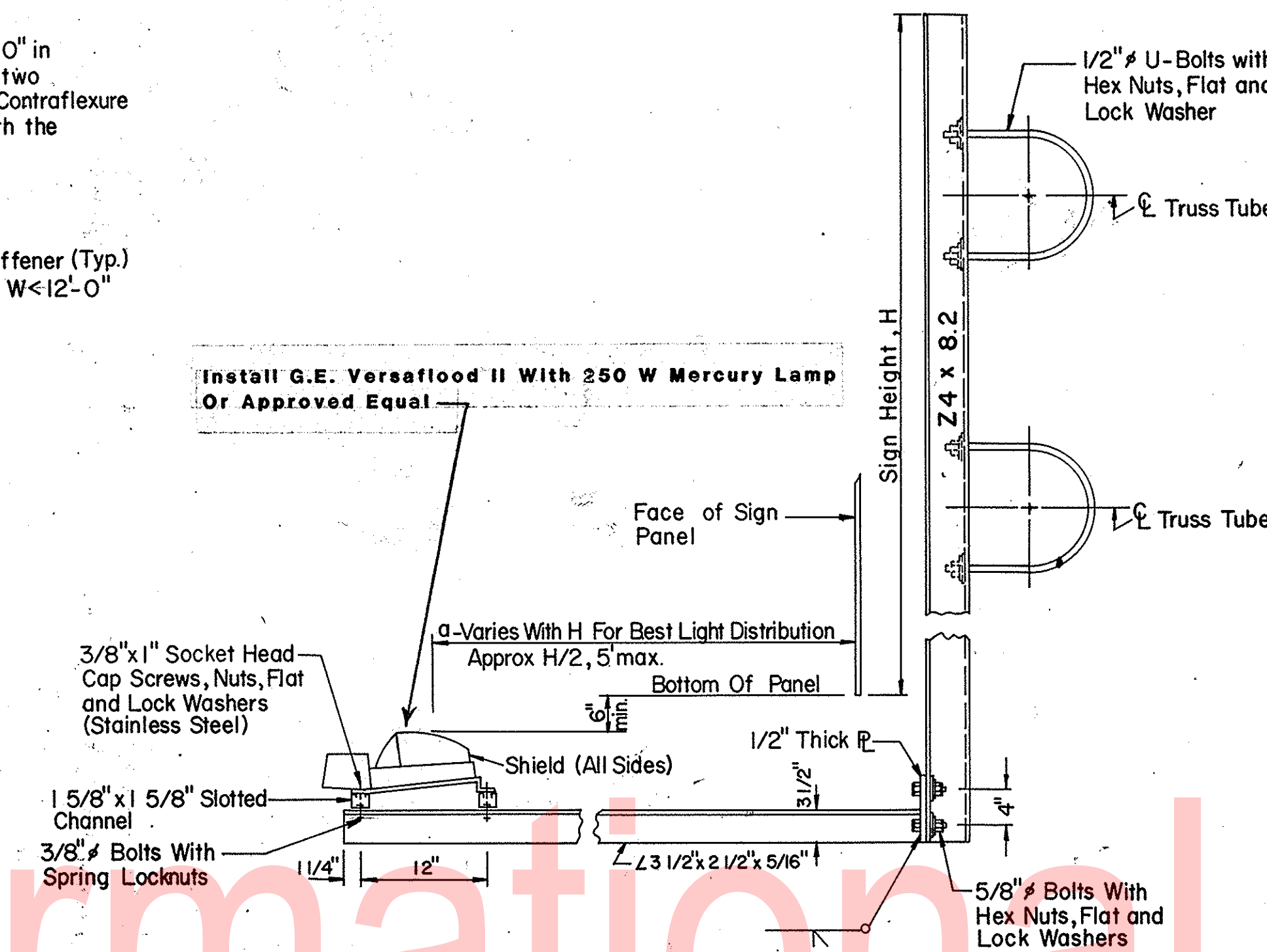


Sign Panel more than 12'-0" in height may be made from two sheets spliced at point of Contraflexure if it does not interfere with the sign message

2x2x3/16 L Aluminum Stiffener (Typ.)
Omit the Stiffeners when W < 12'-0"

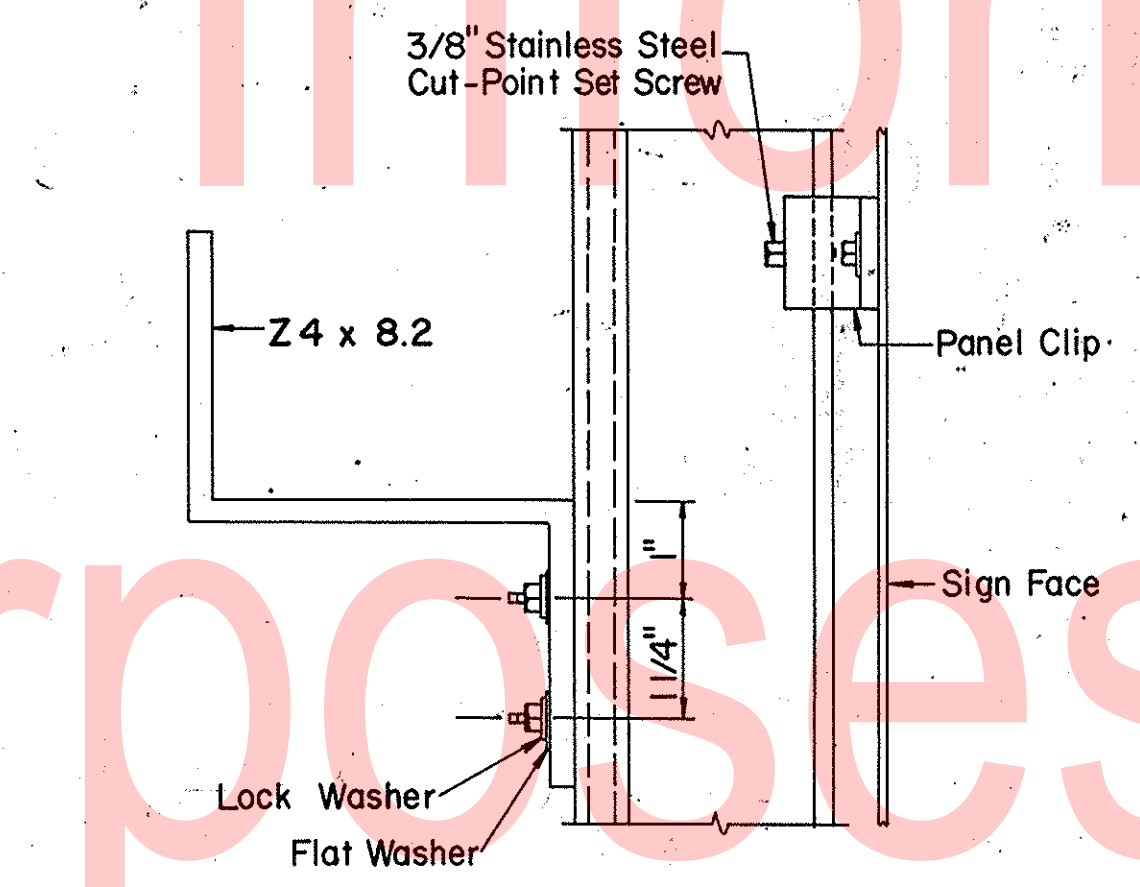
3/8" x 1/4" Square Head Bolt Flat and Lock Washer and Hex Nut (All Aluminum), 2 each for each intersection of stiffener and Z Extrusions

DETAILS OF SIGN PANEL



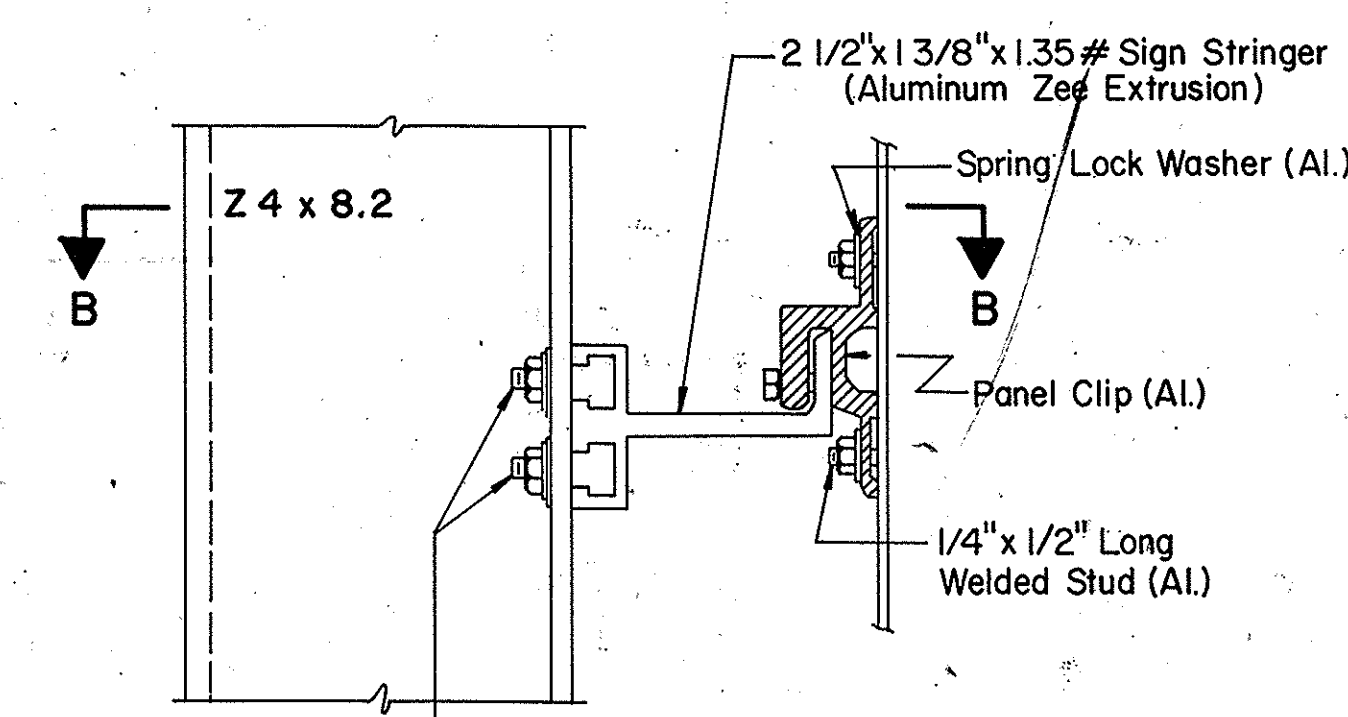
SIGN BRACKET ASSEMBLY

HEIGHT H	NUMBER OF STRINGERS							
	2 Brackets		3 Brackets		4 Brackets		5 Brackets	
	No.	Max. W	No.	Max. W	No.	Max. W	No.	Max. W
3'-0" or Less	2	15'-0"	2	22'-0"	2	30'-0"	2	38'-0"
4'-0"	2	15'-0"	2	22'-0"	2	30'-0"	2	38'-0"
5'-0"	2	15'-0"	2	22'-0"	2	30'-0"	2	37'-0"
6'-0"	3	15'-0"	3	22'-0"	3	29'-0"	3	36'-0"
7'-0"	3	15'-0"	3	22'-0"	3	28'-0"	3	35'-0"
8'-0"	3	15'-0"	3	22'-0"	3	27'-0"	3	34'-0"
9'-0"	4	14'-0"	4	21'-0"	4	26'-0"	4	33'-0"
10'-0"	4	14'-0"	4	20'-6"	4	25'-0"	4	32'-0"
11'-0"	4	14'-0"	4	20'-0"	4	24'-0"	4	31'-0"
12'-0"	5	13'-0"	5	19'-0"	5	23'-0"	5	29'-6"
13'-0"	5	12'-0"	5	18'-0"	5	22'-0"	5	28'-0"
14'-0"	5	11'-0"	5	17'-0"	5	21'-0"	5	26'-6"
15'-0"	6	10'-0"	6	15'-6"	6	19'-6"	6	25'-0"
16'-0"	6	-	6	14'-0"	6	18'-0"	6	23'-0"
17'-0"	6	-	6	12'-6"	6	16'-6"	6	21'-0"



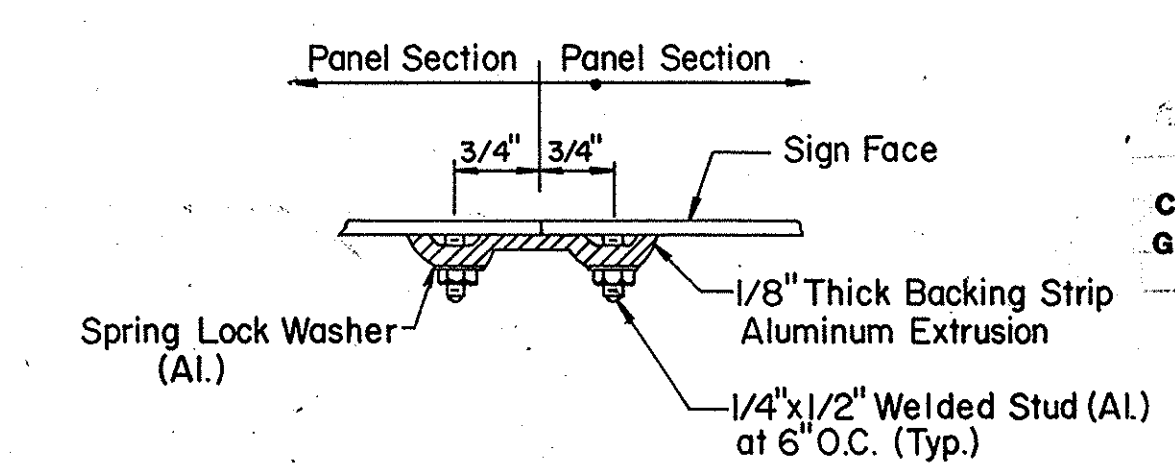
SECTION B-B

LUMINAIRES							
Panel	a	Nos. Req'd	Spacing	Panel	a	Nos. Req'd	Spacing
P-2	5'	2	7'				
P-3	5'	2	6'				
P-4	5'	2	5'-9"				
P-5	4'-6"	2	6'				
P-6	4'-6"	2	8'-9"				
P-7	5'	2	5'				
P-18	5'	2	8'				
P-23	5'	2	8'				



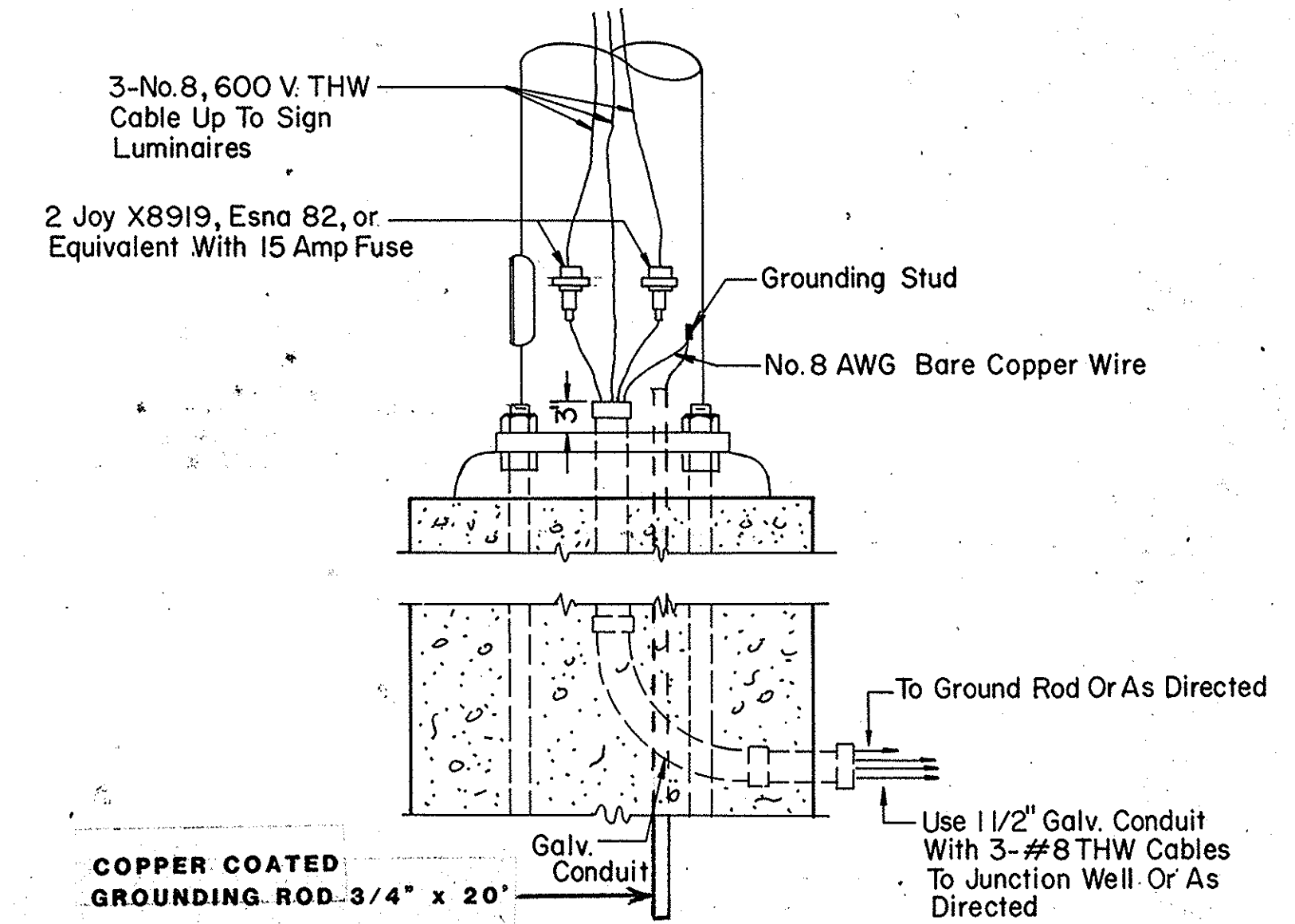
SECTION A-A

3/8" x 1/4" Aluminum Rectangular Head Bolt With Flat Washer, Lock Washer and Hex Nut (4 Req'd. For Each Intersection Of Zee Bar And Zee Extrusion)



DETAILS OF PANEL SPLICE

GROUND RODS					
Sign Support	Nos. Req'd	Size & Length	Sign Support	Nos. Req'd	Size & Length
II-2	1	3/4" x 20'	II-21	1	3/4" x 20'
II-4	1	3/4" x 20'			
II-5	1	3/4" x 20'			
II-16	1	3/4" x 20'			
II-3	1	3/4" x 20'			

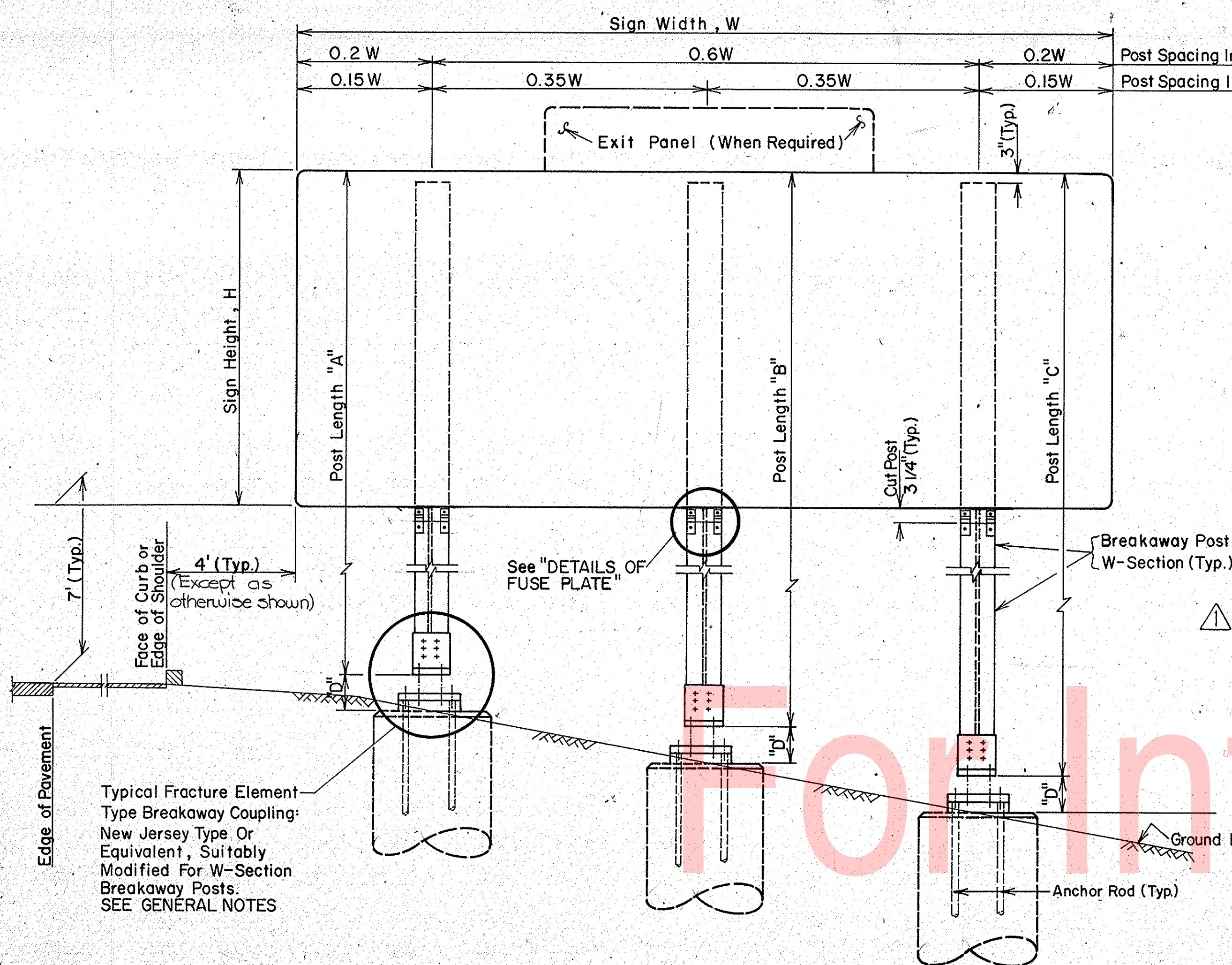


TYPICAL ELECTRICAL DETAIL POLE BASE

DELAWARE
 DEPARTMENT OF HIGHWAYS & TRANSPORTATION
 DIVISION OF HIGHWAYS

SIGN PANEL AND ELECTRICAL DETAILS
 (STANDARD SHEET)

D.	SCALE	APPROVED BY:
T. G. R. D.	NO SCALE	BRIDGE ENGINEER
C.		



BREAKAWAY SIGN STRUCTURE DATA TABLE

SIGN SUPPORT NO.	SIGN PANEL	SHEET NO.	SIGN SIZE		EXIT PANEL SIZE	NO. POSTS	POST SPACING	POST SIZE	POST LENGTH			FOOTING	
			WIDTH	HEIGHT					A	B	C	DIA., Ø	DEPTH, d
7	P-9	16	6'-0"	5'-0"	-	2	3'-6"	W8 x 31	12.84		12.73	2'-0"	8'-0"
8	P-10	17	12'-6"	10'-0"	-	2	7'-6"	W8 x 31	17.93		20.43	2'-0"	8'-0"
9	P-11	34	16'-0"	7'-6"	-	2	9'-6"	W8 x 31	15.14		15.02	2'-0"	8'-0"
10	P-12	34	14'-0"	11'-0"	-	2	8'-6"	W8 x 31	19.09		20.94	2'-6"	9'-0"
11	P-13	18	17'-6"	12'-0"	-	2	10'-6"	W8 x 35	19.54		19.51	2'-6"	9'-0"
12	P-14	18	16'-6"	9'-6"	-	2	10'-0"	W8 x 31	17.14		16.99	2'-0"	8'-0"
13	P-15	19	6'-0"	6'-0"	-	2	3'-6"	W8 x 31	13.84		14.42	2'-0"	8'-0"
14	P-16	35	14'-0"	11'-0"	-	2	8'-6"	W8 x 31	20.50		19.09	2'-6"	9'-0"
15	P-17	35	13'-0"	11'-0"	-	2	7'-6"	W8 x 31	19.09		20.65	2'-6"	9'-0"
17	P-19	21	14'-0"	11'-6"	-	2	8'-6"	W10 x 49	19.20		20.62	2'-6"	9'-0"
18	P-20	23	14'-0"	11'-0"	8'-0"x2'-6"	2	8'-6"	W8 x 35	18.71		20.12	2'-6"	9'-0"
19	P-21	24	14'-0"	11'-6"	8'-0"x2'-6"	2	8'-6"	W8 x 40	19.20		20.62	2'-6"	9'-0"
20	P-22	26	14'-0"	11'-0"	8'-0"x2'-6"	2	8'-6"	W10 x 49	19.58		23.83	2'-6"	9'-0"
1	P-1	27	12'-6"	14'-0"	-	2	7'-6"	W10 x 49	22.30		23.55	2'-6"	9'-0"
6	P-8	31	13'-6"	15'-0"	-	2	8'-0"	W10 x 49	23.35		24.68	2'-6"	9'-0"
22	P-24		6'-0"	5'-0"	-	2	3'-6"	W8 x 31	12.71		12.71	2'-0"	8'-0"

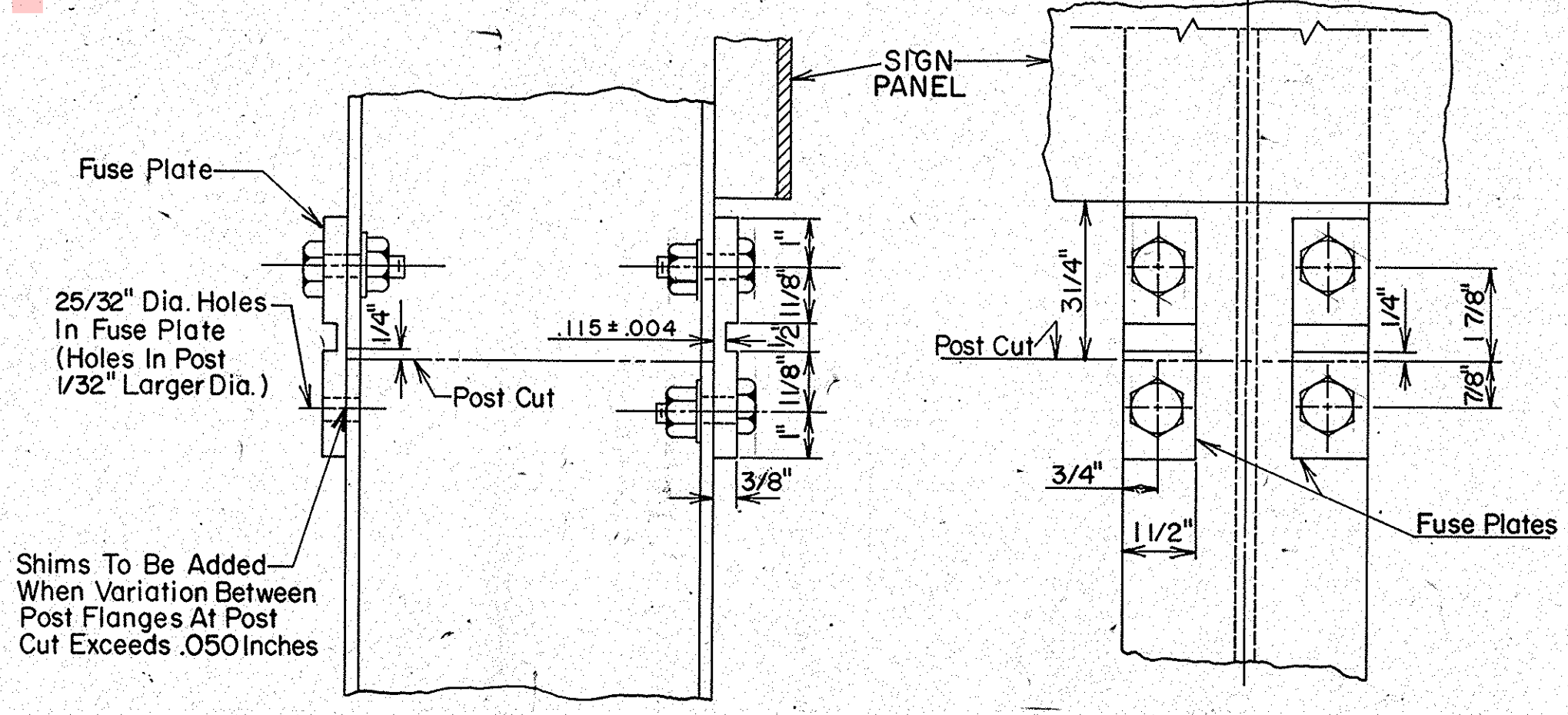
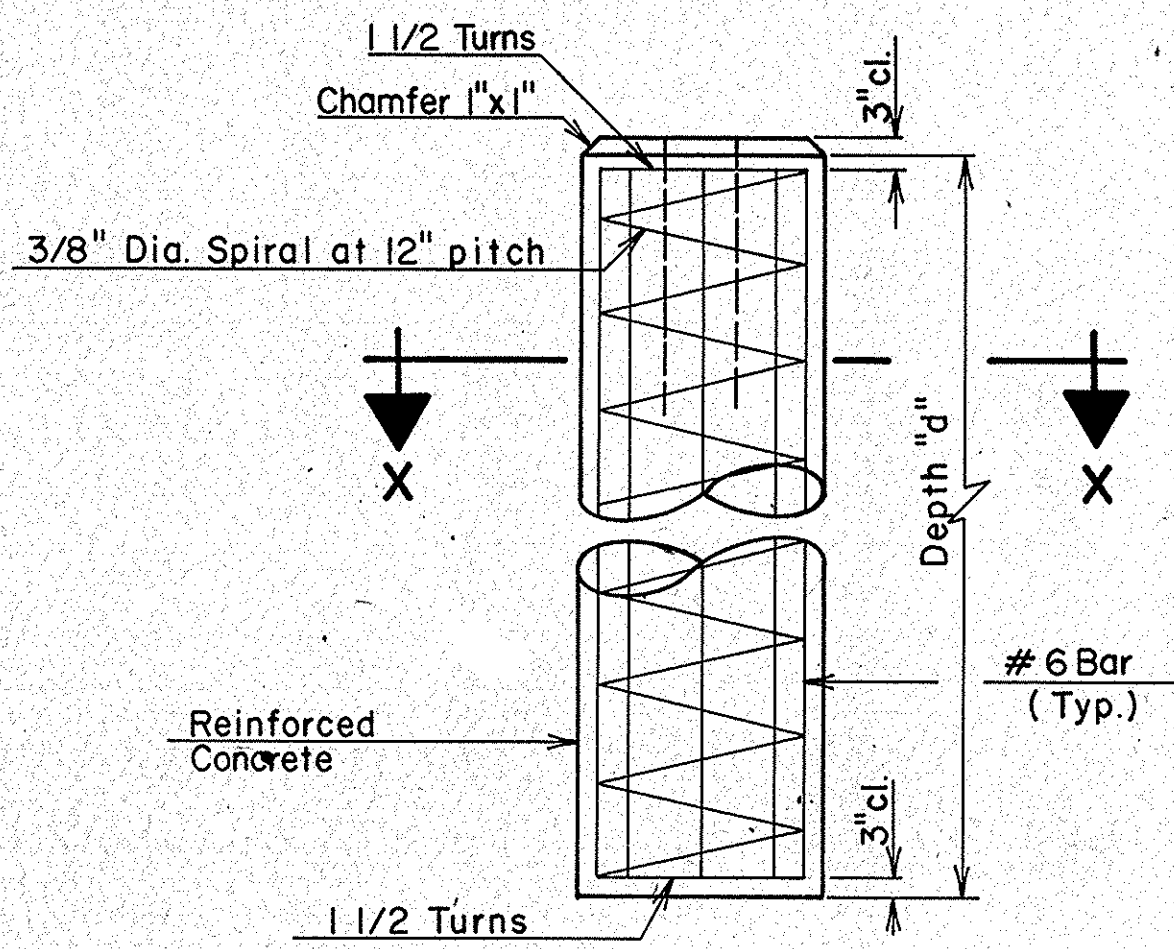
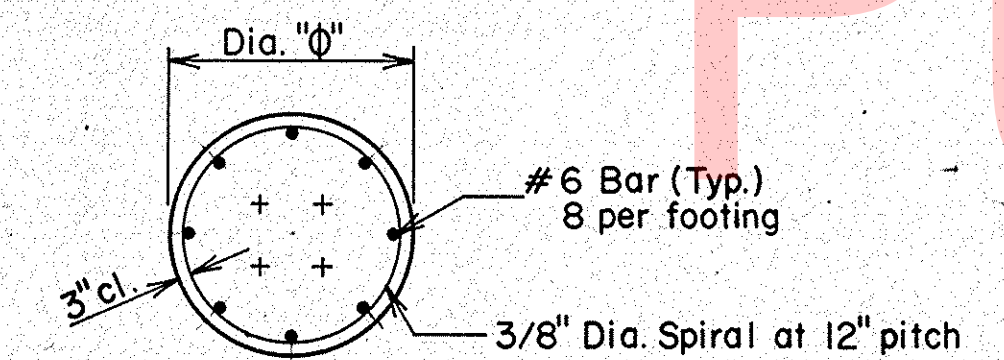
NOTE: Post Length "A" is always adjacent to roadway. The post length are tabulated based on the assumption that dimension "D" is 6 1/2".
 * These dimensions must be verified in the field prior to ordering materials.

NO.	REVISIONS	BY	DATE
1	Added sign support no. 22	JMS	2/24/87

— GENERAL NOTES —

- Design criteria are based on "Standard Specifications for Structural Supports for Highway Signs, Luminaries and and Traffic Signals, 1975" by AASHTO. Materials and Workmanship shall conform to The Delaware Department of Highways and Transportation, 1974 - Standard Specifications and Special Provisions for this project.
- Breakaway Posts shall conform to AASHTO M188 (ASTM A441) and be galvanized in accordance with AASHTO M111 (ASTM A123). Class "B" Concrete with ultimate compressive strength $f_c = 3,000$ psi. shall be used in all footings; bar reinforcement shall conform to AASHTO M31 (ASTM A615).
- An Auger shall be used to drill through the soil up to the desired depth of foundation. Reinforced concrete shall be placed on undisturbed soil to secure a firm contact between soil and conc. Footing tops shall be formed to a depth of 3" below ground surface.
- Maximum projection above ground line for footing or anchor plate shall be limited to 4" as measured above an imaginary 60° chord connecting points on the ground either side of the break-away support. Where necessary, a portion of concrete in the foundation shall be chamfered parallel to the earth slope in order to minimize footing projection above ground.
- Complete details of Breakaway Couplings, Anchor Plates and Bolts shall be submitted by the contractor for approval by the Bridge Engineer.
- The Contractor shall be required to submit vehicle crash testing reports indicating satisfactory performance of the breakaway mechanism with breakaway couplings and fuse plates under the following conditions:
 Weight of vehicle = 1800 lbs. or equivalent.
 Range of speed at impact = 20mph to 60mph.
 Impact angle = upto 25° measured from the direction of roadway.
 Maximum change of momentum = 750 lb-sec.
 Average vehicle deceleration = 6g or less.
 Change-of-velocity limit = 15 ft./sec.

TYPICAL BREAKAWAY SIGN STRUCTURE



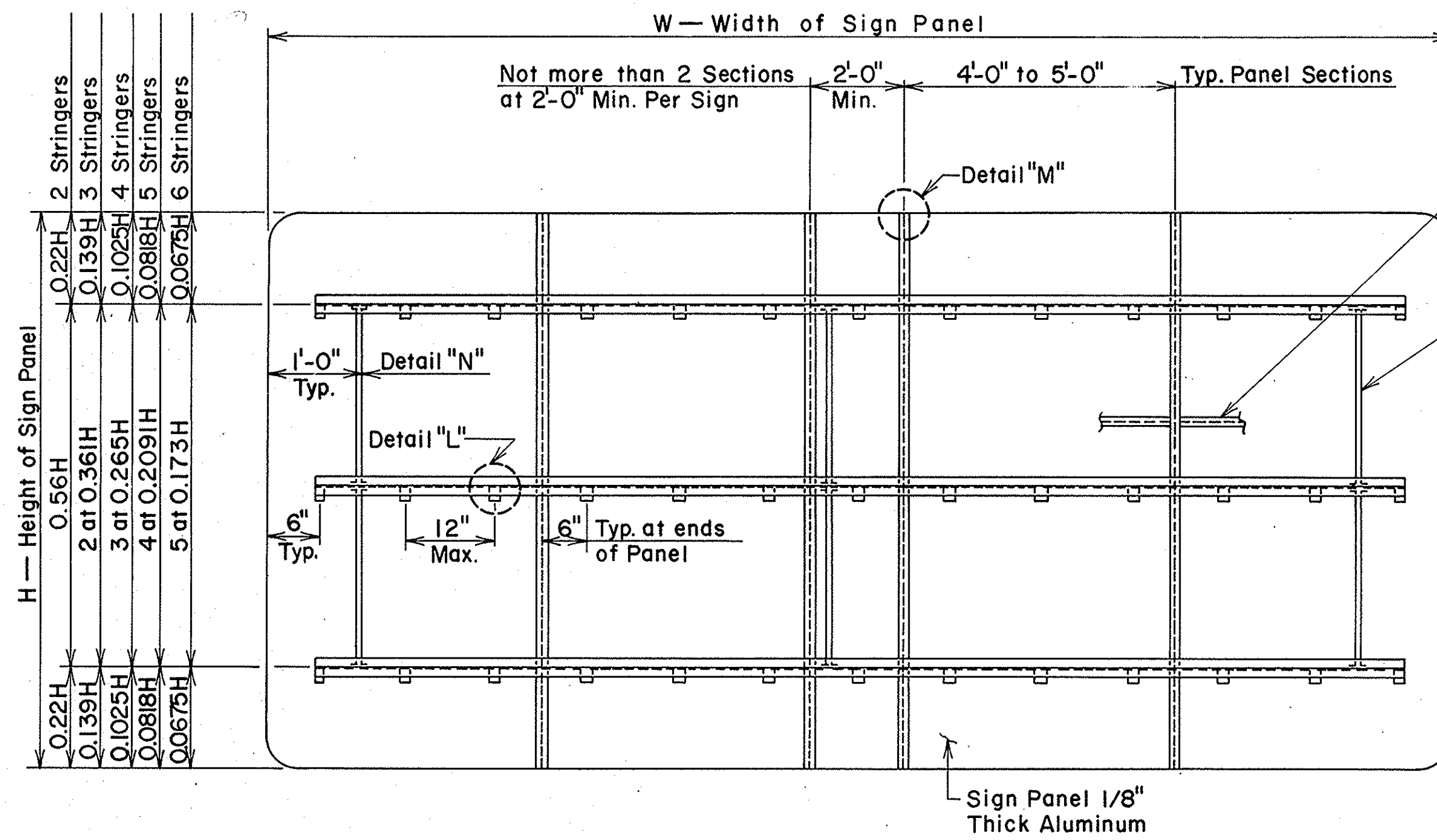
NOTE:
 Fuse plates shall be made from alloy steel which conforms to AISI 4340, 4130 or an equivalent material and shall have a minimum tensile yield stress of 90,000 psi.
 Bolts and nuts shall be made from alloy steel AASHTO M164 (ASTM A325). All steel parts shall be hot dip galvanized in conformance with AASHTO M111 (ASTM A123).

DELAWARE DEPARTMENT OF HIGHWAYS & TRANSPORTATION DIVISION OF HIGHWAYS

GROUND MOUNT BREAKAWAY TYPE SIGN SUPPORTS & FOUNDATIONS

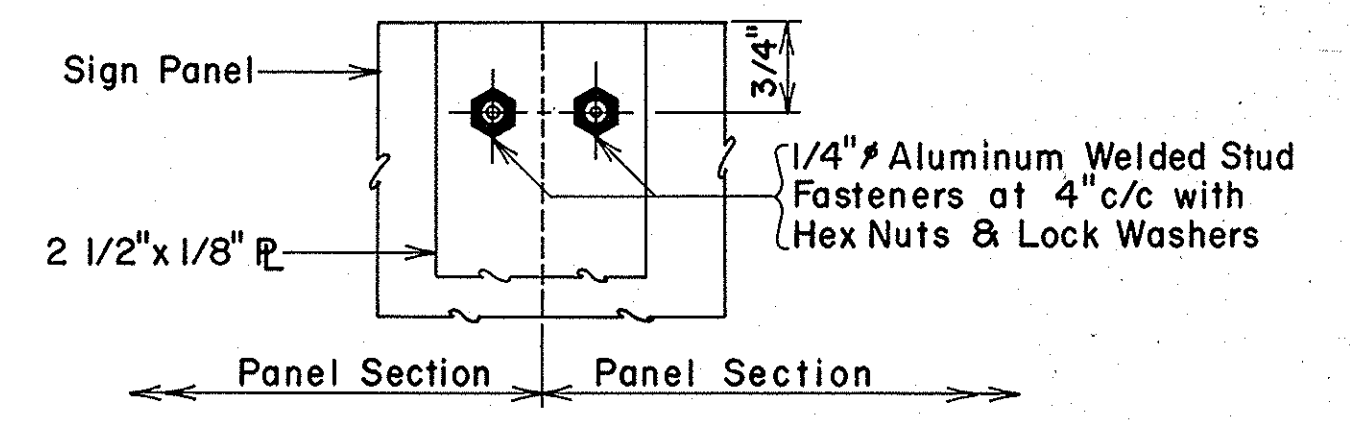
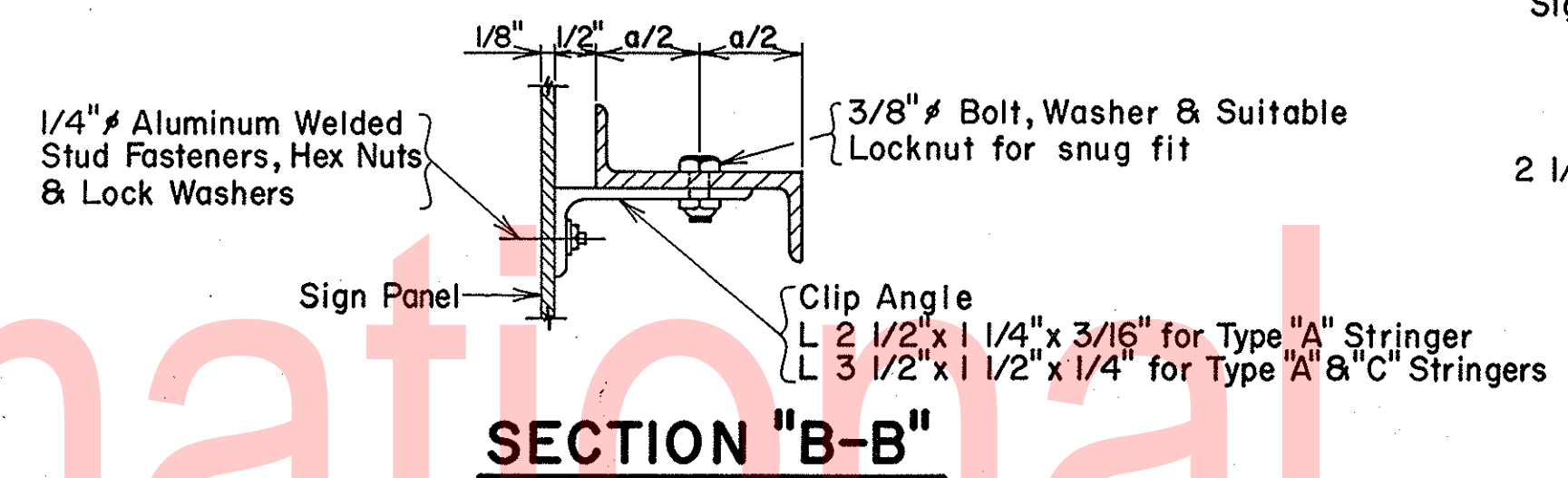
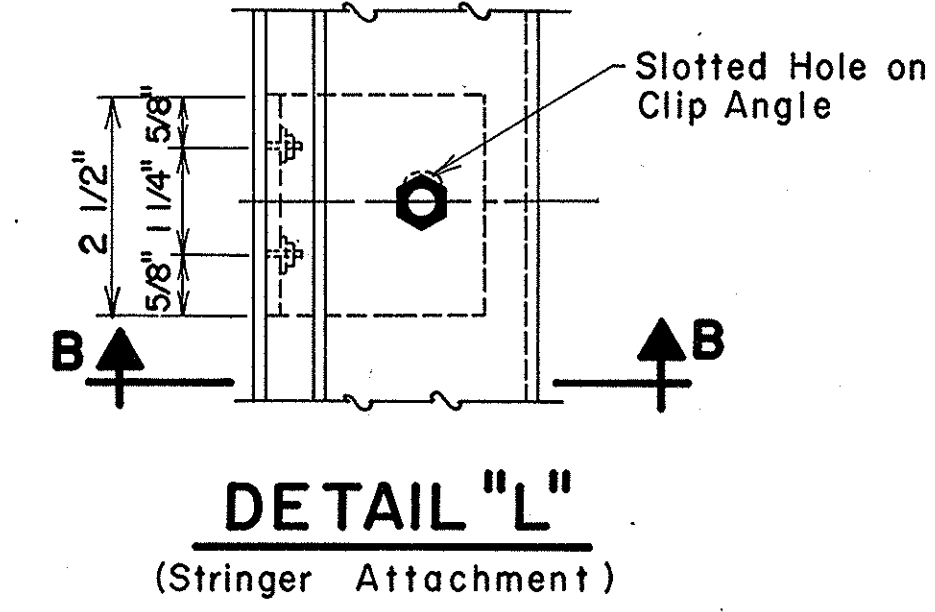
D. U.P.	SCALE	APPROVED BY:
T. G.R.D.	N.T.S.	<i>[Signature]</i>
C. C.R.L.		BRIDGE ENGINEER

NO.	REVISIONS	BY	DATE
1	Added sign panel P-24	JMSJr	2/24/87

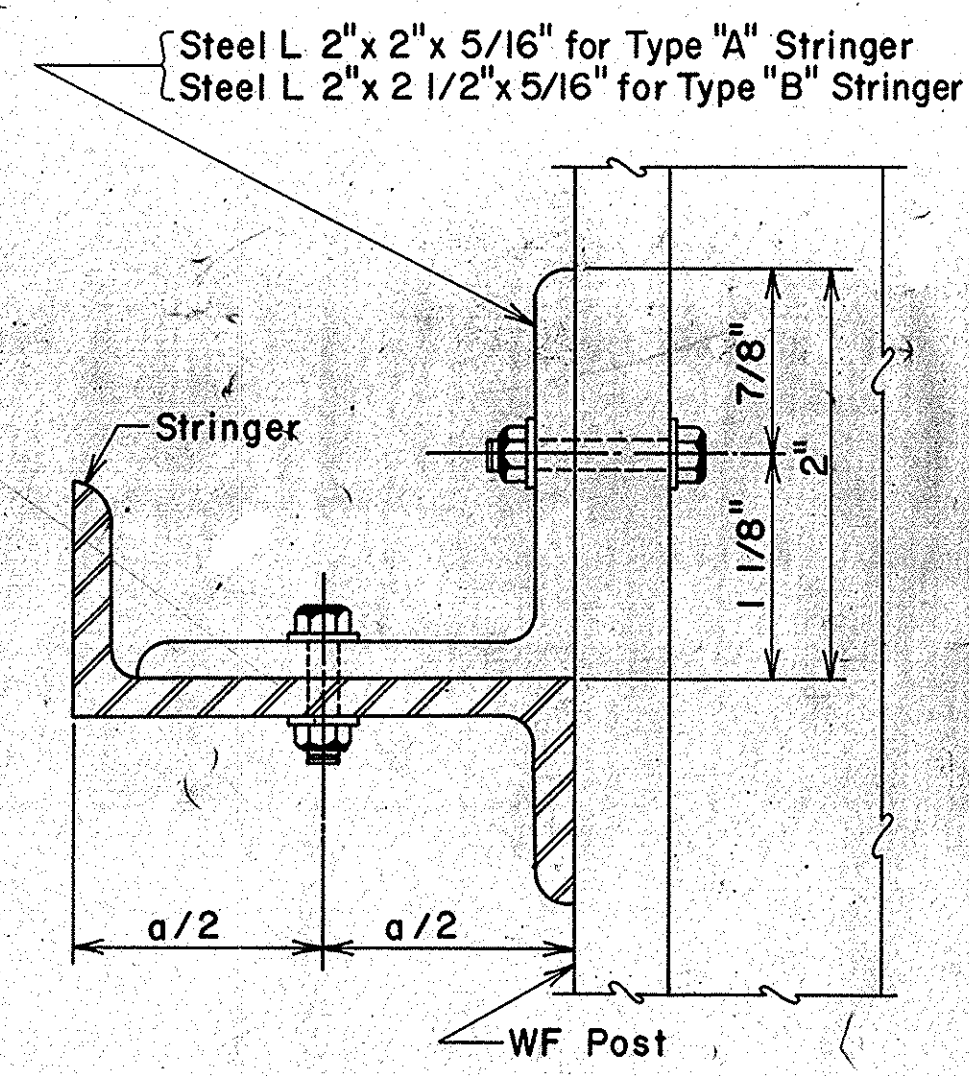


Sign Panel more than 12'-0" in height shall be made from 2 sheets spliced at the point of Contraflexure as shown in Detail "M".

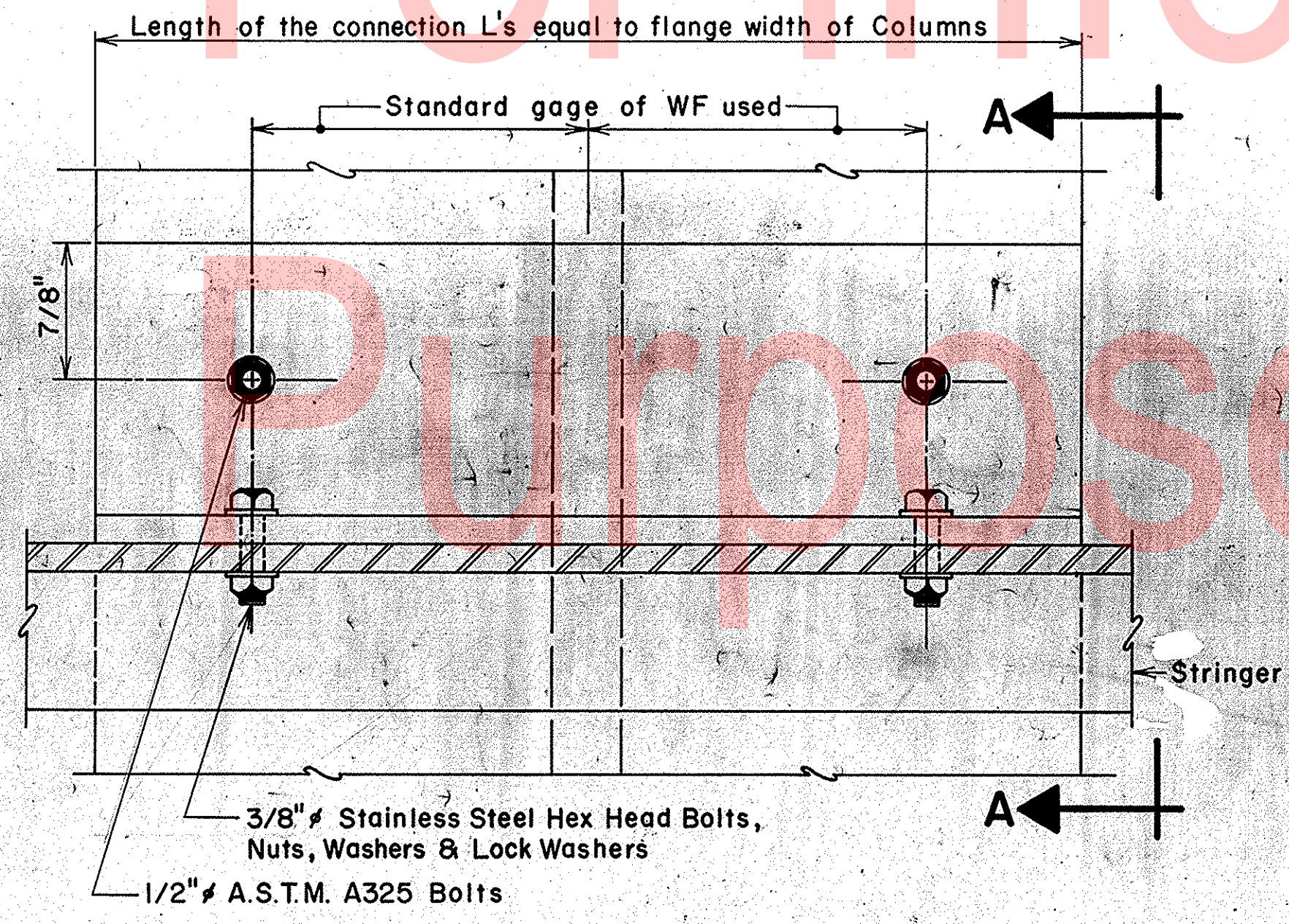
Omit the stiffeners when $W < 12'-0"$



DETAIL "M"
(Backing Strip)

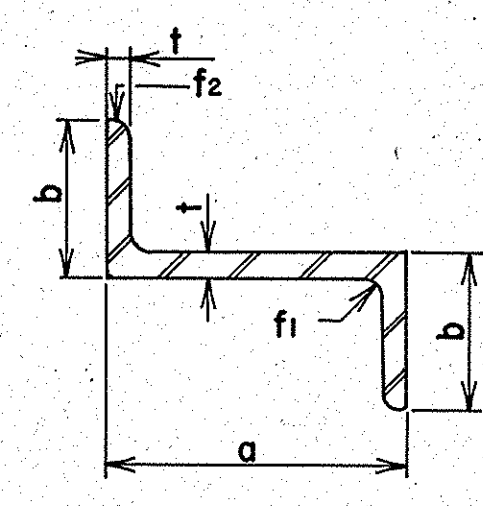


SECTION "A-A"



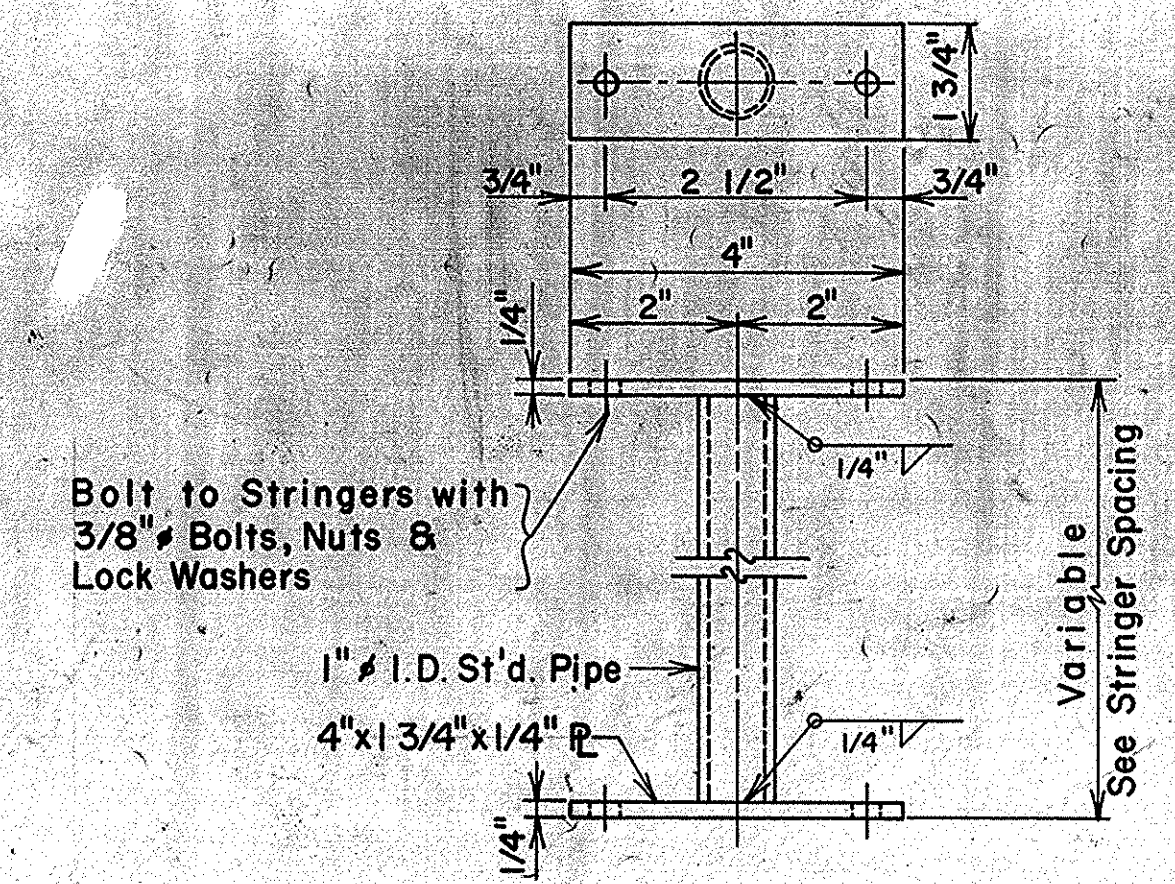
STEEL WF POST FOR ROADSIDE SIGNS POST ATTACHMENT

SIGN	W	H	NO. OF STRINGERS	TYPE
P-1	12'-6"	14'-0"	5	A
P-8	13'-6"	15'-0"	6	A
P-9	6'-0"	5'-0"	2	A
P-10	12'-6"	10'-0"	4	A
P-11	16'-0"	7'-6"	3	A
P-12	14'-0"	11'-0"	4	A
P-13	17'-6"	12'-0"	5	A
P-14	16'-6"	9'-6"	4	A
P-15	6'-0"	6'-0"	3	A
P-16	14'-0"	11'-0"	4	A
P-17	13'-0"	11'-0"	4	A
P-19	14'-0"	11'-6"	5	A
P-20	14'-0"	11'-0"	4	A
P-21	14'-0"	11'-6"	5	A
P-22	14'-0"	11'-0"	4	A
P-24	6'-0"	5'-0"	2	A



HORIZONTAL STRINGERS

HORIZONTAL STRINGERS						
Max.W.(ft.)	Type	a	b	t	Wt.#	f1 f2
20	A	2 3/8"	1 1/4"	3/16"	1.00	3/16" 1/8"
24	B	3"	2 1/16"	1/4"	2.33	5/16" 1/4"
30	C	3"	2 1/16"	1/2"	4.35	5/16" 1/4"



DETAIL "N"
(Vertical Stiffener)

DELAWARE
DEPARTMENT OF HIGHWAYS & TRANSPORTATION
DIVISION OF HIGHWAYS

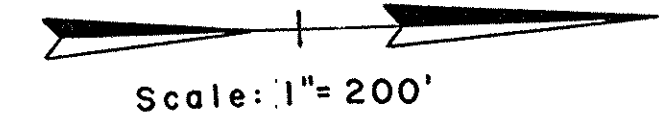
SIGN PANELS
GROUND MOUNTED-BREAKAWAY

(STANDARD SHEET)

D.	SCALE	APPROVED BY:
T.G.R.D.	NO SCALE	
C.		BRIDGE ENGINEER

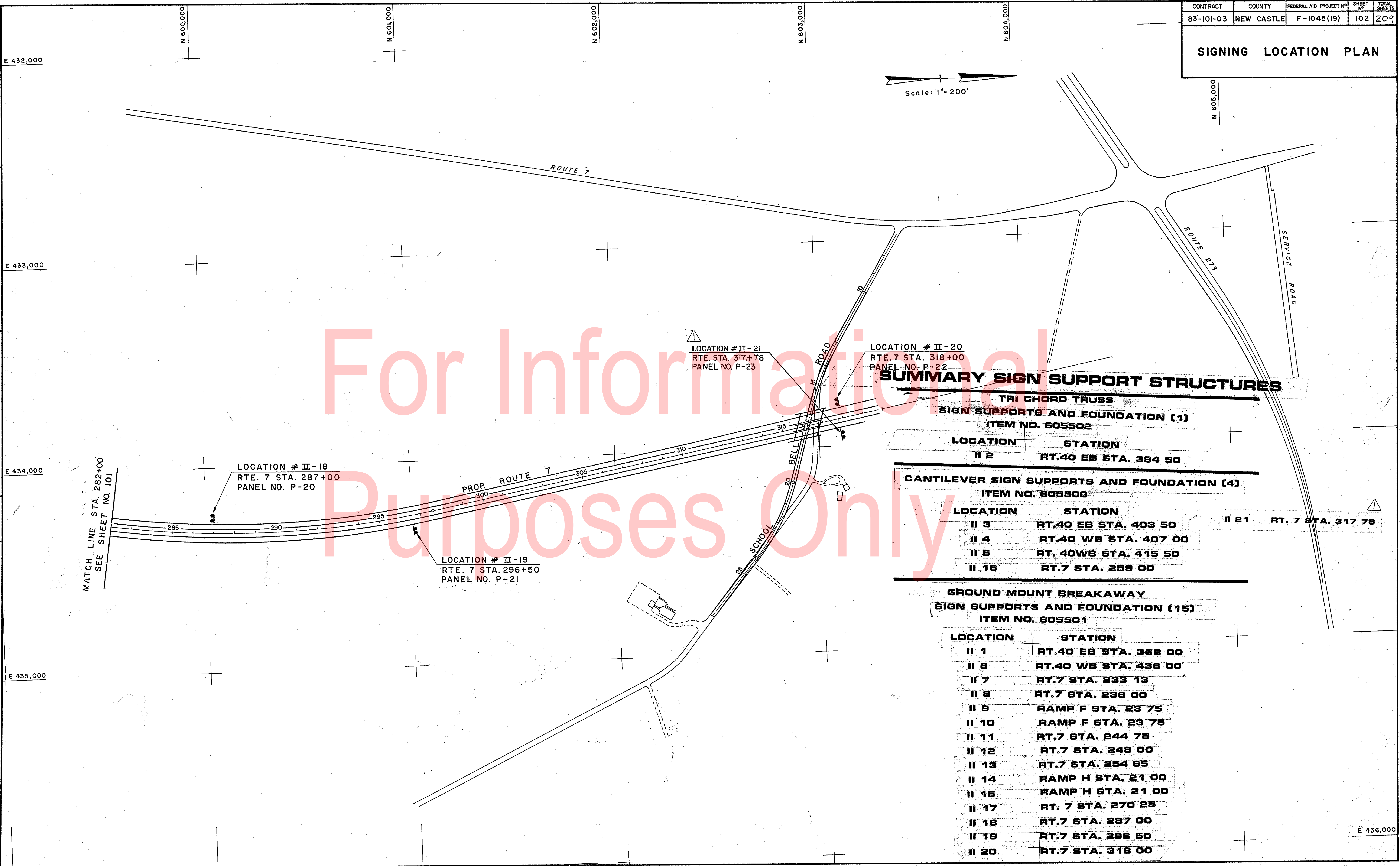
For Informational Purposes Only

SIGNING LOCATION PLAN



REVISIONS
 Added new sign 2/24/87 JMS

PREL. TRACING
 DESIGN
 CHKD.



SUMMARY SIGN SUPPORT STRUCTURES

TRI CHORD TRUSS
SIGN SUPPORTS AND FOUNDATION (1)
 ITEM NO. 605502

LOCATION	STATION
II 2	RT.40 EB STA. 394 50

CANTILEVER SIGN SUPPORTS AND FOUNDATION (4)
 ITEM NO. 605500

LOCATION	STATION
II 3	RT.40 EB STA. 403 50
II 4	RT.40 WB STA. 407 00
II 5	RT. 40WB STA. 415 50
II,16	RT.7 STA. 259 00

GROUND MOUNT BREAKAWAY
SIGN SUPPORTS AND FOUNDATION (15)
 ITEM NO. 605501

LOCATION	STATION
II 1	RT.40 EB STA. 368 00
II 6	RT.40 WB STA. 436 00
II 7	RT.7 STA. 233 13
II 8	RT.7 STA. 236 00
II 9	RAMP F STA. 23 75
II 10	RAMP F STA. 23 75
II 11	RT.7 STA. 244 75
II 12	RT.7 STA. 248 00
II 13	RT.7 STA. 254 65
II 14	RAMP H STA. 21 00
II 15	RAMP H STA. 21 00
II 17	RT. 7 STA. 270 25
II 18	RT.7 STA. 287 00
II 19	RT.7 STA. 296 50
II 20	RT.7 STA. 318 00

For Informational Purposes Only

E 436,000

SIGN LOC. 2