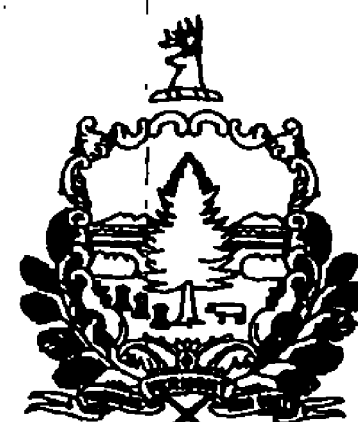
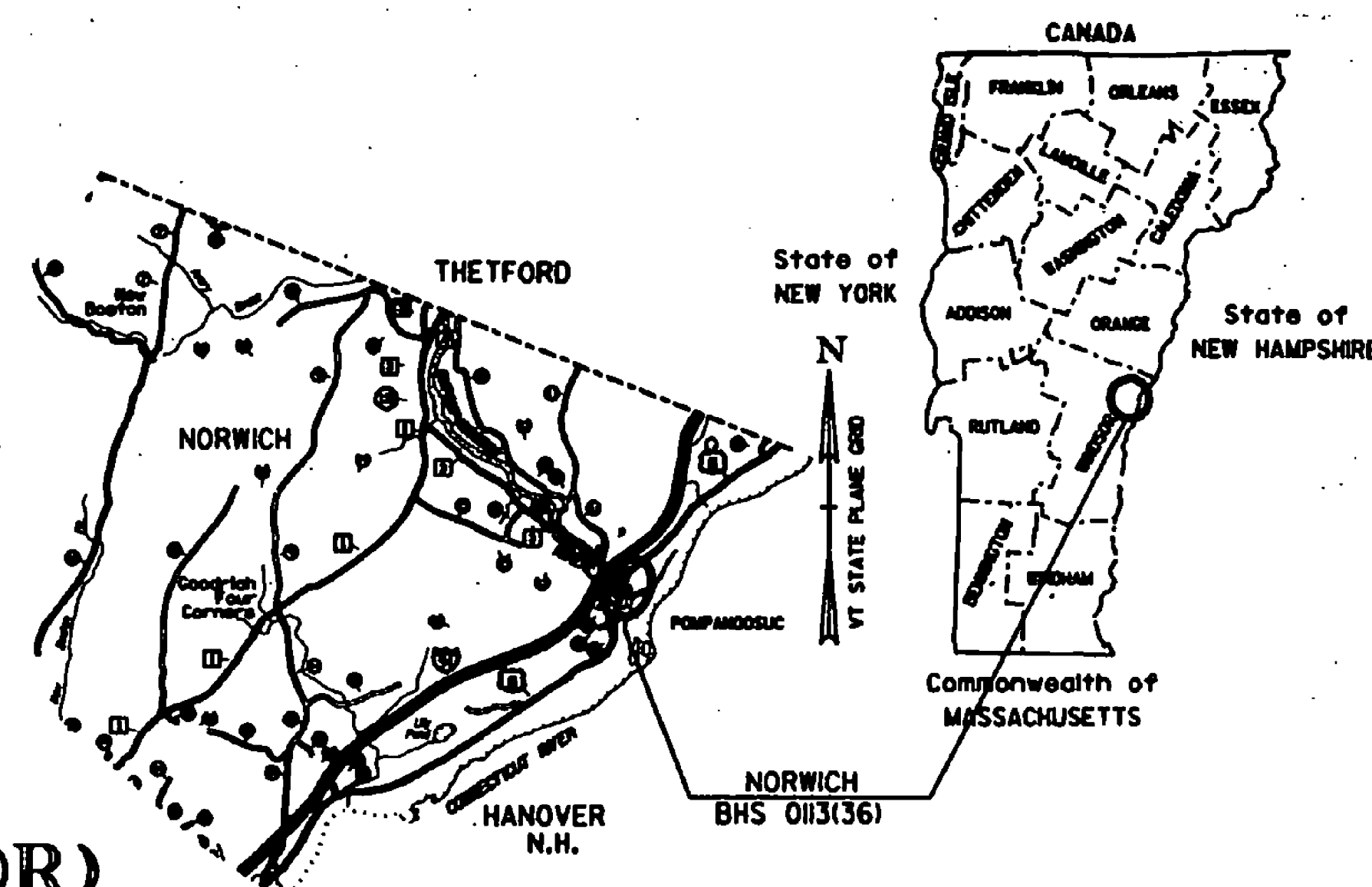


STATE OF VERMONT AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT TOWN OF NORWICH COUNTY OF WINDSOR U.S. ROUTE 5 (F.A.S.) (MAJOR COLLECTOR)

Dated SEP 10 1992Miller Construction Inc.
Contractor

Royal Gilman
Signature

President
Title

S. Barab
Transportation Secretary's Signature

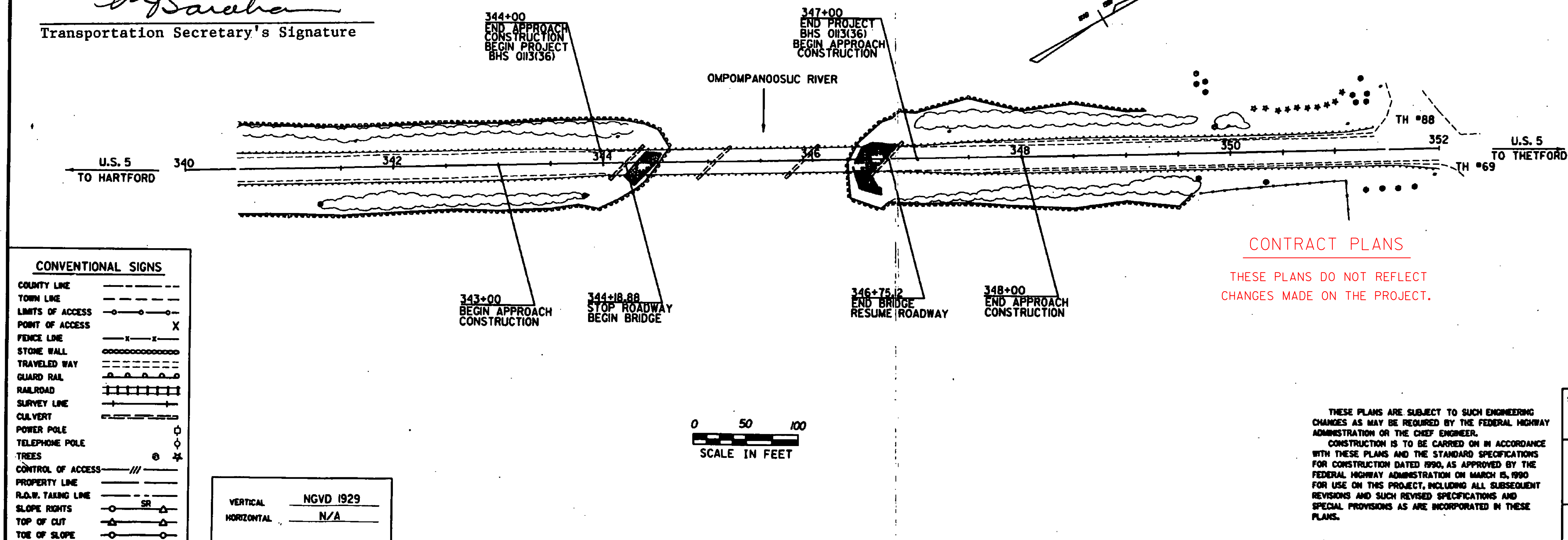
BEGINNING AT A POINT ON U.S. ROUTE 5 APPROXIMATELY 6.515 MILES
NORTHERLY OF THE HARTFORD/NORWICH TOWN LINE AND EXTENDING
NORTHERLY 0.057 MILES.

PROJECT LENGTH: ROADWAY 43.76 FEET=0.008 MILES
BRIDGE 256.24 FEET=0.049 MILES
PROJECT 300.00 FEET=0.057 MILES

PROJECT CONSISTS OF REHABILITATION TO BRIDGE #81 WITH
NECESSARY APPROACH CONSTRUCTION.

TRAFFIC DATA

1992 ADT=1900
2012 ADT=2810
2012 DHV=385
T=6%
D=65%
V=50 MPH
1992/2012 18 KIP ESAL 1,095,000



SUBMITTED BY ORDER OF THE STATE TRANSPORTATION BOARD

APPROVED *James J. O'Connell* DATE *9/14/92*
DIRECTOR OF ENGINEERING

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED *William M. Bennett* DATE *9/14/92*
DEPUTY DIVISION ADMINISTRATOR

PROJECT NORWICH
BHS 0113(36)
SHEET 1 OF 70 SHEETS

INDEX OF SHEETS

1		TITLE SHEET	
2		INDEX OF SHEETS	
3		TYPICAL SHEET	
4-5		QUANTITY SHEETS	
6		BLANK	
7		GRADE AND EARTHWORK SHEET	
8-11		PLAN AND PROFILE SHEETS	
12		BLANK	
13		TRAFFIC SIGN AND DETAIL SHEET	
14		TEMPORARY DETOUR SHEET	
15		BLANK	
16-40		BRIDGE 100 SERIES U.S. ROUTE 5 OVER THE OMPOMPANOOSUC RIVER	
41-42		BLANKS	
43-46		CROSS SECTION SHEETS	
47	B-1	BANKING TABLES	10-25-85 R
48	B-5	SLOPE GRADING, EMBANKMENTS, MUCK	12-06-71
49	E-10	APPROACH SIGNS - MINOR MAINTENANCE	02-03-86 R
50	E-100	CONSTRUCTION APPROACH SIGNS	05-26-89 R
51	E-101	CONSTRUCTION SIGN DETAILS	10-30-87
52	E-102	CONSTRUCTION SIGN DETAILS	01-23-89 R
53	E-106	TRAFFIC CONTROL - MISC. DETAILS	01-23-89 R
54	E-107	DELINEATION, BARRICADES & DETOURS FOR CONSTRUCTION AREAS	04-29-88 R
55	E-107A	BREAKAWAY BARRICADE DETAILS	09-10-87
56	E-110	MAJOR MAINTENANCE OPERATION LANE CLOSURE	03-01-88 R
57	E-120	STANDARD SIGN PLACEMENT - EXPRESSWAY & FREEWAY	06-21-89 R
58	E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	01-23-89
59	E-123	GUIDE SIGN PLACEMENT - MISCELLANEOUS DETAILS	01-23-89 R
60	E-130	TYPE 'B' GUIDE SIGN, ATTACHMENT DETAILS	03-01-88 R
61	E-134	BRIDGE NUMBER PLAQUE	12-18-89
62	E-136	U.S. AND STATE ROUTE MARKER SIGN DETAILS (COLORS & DESIGN ONLY - MATERIALS AS E-100)	04-29-88 R
63	E-140	REGULATORY SIGN DETAILS	04-25-88 R
63A	E-142	REGULATORY SIGN DETAIL	10-30-87
64	E-160	FLANGED CHANNEL STEEL SIGN POST DETAIL	03-01-88 R
65	E-162	TUBULAR ALUMINUM SIGN POST	03-01-88 R
66	G-1	STEEL BEAM GUARDRAIL (50MPH & OVER) HEAVY DUTY STEEL BEAM GUARDRAIL TWISTED END TERMINAL ANCHOR FOR STEEL BEAM RAIL	10-31-85 R
67	T-1	TEMPORARY EROSION CONTROL DETAILS	12-07-76 R
68	T-2	TEMPORARY EROSION CONTROL DETAILS	07-05-72
69	SB-R4A-82	BRIDGE RAILING - GALVANIZED BOX BEAM	09-18-89 R
69A	SB-R4B-82	GUARD RAIL APPROACH SECTION, TYPE I & II	03-30-88 R
70	SB-R6-82	BRIDGE RAILING - HVY. DUTY STEEL BEAM	12-28-81 R

DATUM
VERTICAL N/A
HORIZONTAL N/A

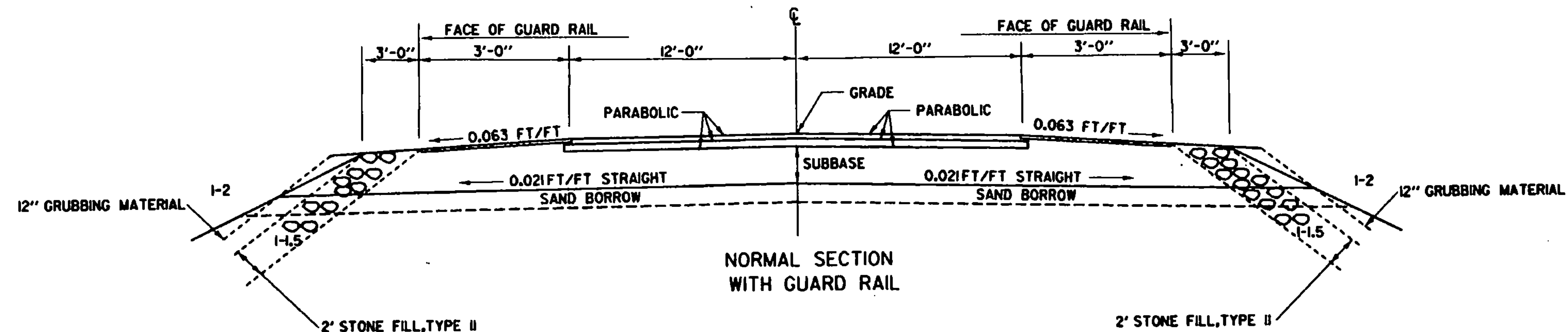
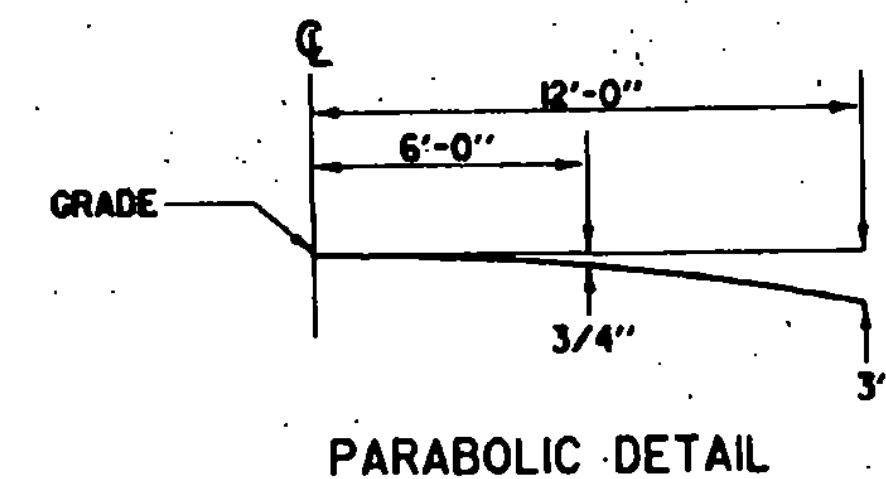
SURVEYED BY N/A DATE N/A
DRAWN BY COTA DATE 3-90
SQUAD LEADER SHERIDAN
DESIGN FILE NO. 77B069.DGN
PRF FILE 77B069.IND DATE PLOTTED 6-MAY-1992
PROJ. NAME NORWICH
PROJ. NO. BHS 0113(36)
SHEET 2 OF 70 SHEETS

TYPICAL SECTIONS

MATERIAL ITEM	THICKNESS TOLERANCE
PAVEMENT(OVERALL DEPTH) ± 1/4"	
SUBBASE ± 1"	
SAND BORROW ± 1"	

3 1/2" BITUMINOUS CONCRETE PAVEMENT (1 1/2" LIFT OF TYPE III OVER 2" LIFT TYPE II)
 3" BASE COURSE BITUMINOUS CONCRETE PAVEMENT (1 LIFT OF TYPE II)
 * 0" - 48" SUBBASE OF CRUSHED GRAVEL (FINE GRADED)
 SHOULDERS: 1 1/2" BITUMINOUS CONCRETE PAVEMENT (TYPE III)
 0" - 12" SAND BORROW (AS INDICATED ON PLANS OR AS DIRECTED BY THE ENGINEER)

* SUBBASE IN TRANSITION (SEE DETAILS ON SHEETS 43 AND 46 OF 70)



SEEDING FORMULA, ITEM 651.15 RURAL AREAS

L WT.	LBS./A.	NAME	PUR X	GERM X
1.5	22.5	CREeping RED FESCUE	95	95
1.5	22.5	TALL FESCUE	95	95
1.0	15.0	RED TOP	95	95
1.0	15.0	BROADFOOT TREFOIL	95	95
1.0	15.0	ANNUAL RYE GRASS	95	95
4.0	60.0			

* SEED MIXTURE SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40%
 * WEIGHT AND SHALL BE FREE OF ALL NOXIOUS WEED SEED.
 * SEED- TO BE APPLIED PER SEEDING FORMULAS DIRECTED BY THE ENGINEER.
 * FERTILIZER- FORMULA 19-19-19 TO BE USED WITH SEED, APPLIED AT THE RATE OF 500 LBS./ACRE.
 * ORG. CULTURAL LIMESTONE- TO BE APPLIED AT THE RATE OF 2 TONS/ACRE
 * AS DIRECTED BY THE ENGINEER.
 * MULCH- TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE,
 * AS DIRECTED BY THE ENGINEER.
 * OPSOL- TO BE USED WITH SEED AS INDICATED ON THE PLANS,
 * AS DIRECTED BY THE ENGINEER.
 * ANKER POSTS- TO BE PLACED AS DIRECTED BY THE ENGINEER.
 * SLOPE ROUNDING- ALL CUT SLOPES TO BE ROUNDED IN ACCORDANCE WITH STANDARD SHEET B-6.
 * AT LIMITS OF SAND BORROW WHEN USED IN CONJUNCTION WITH
 * REVISIONS- SEE STANDARD SHEET D-2.

SURVEYED BY	FALL	DATE	3/87
DRAWN BY	NAILOR	DATE	4/3/90
SQUAD LEADER	SHERIDAN		
DESIGN FILE NO.	ZF2456.501778069.DGN		
PRF FILE	778069TYP	DATE PLOTTED	7-MAY-1992
PROJ. NAME	NORWICH		
PROJ. NO.	BHS 0113(36)		
SHEET	3	OF	70 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

[illegible][illegible]

SURVEYED BY FALL DATE 3-87
DRAWN BY NOTTER DATE 3-92
SQUAD LEADER SHERIDAN
DESIGN FILE NO. 77B069.DGN
PRG FILE 77B06901 DATE PLOTTED _____
PROJ. NAME NORWICH
PROJ. NO. BHS 0113(36)
SHEET 4 OF 70 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

[illegible][illegible]

SURVEYED BY FALL DATE 3-87
DRAWN BY NUTTER DATE 3-92
SQUAD LEADER SHERIDAN

DESIGN FILE NO. 77B069.DGN

PROF FILE 77B069D02 DATE PLOTTED _____

PROJ. NAME NORWICH

PROJ. NO. BHS 011(36)

SHEET 5 OF 70 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

[illegible]

STONE FILL, TYPE II
(FOR SLOPE PROTECTION)
343+50 ~ 344+21 LT.
343+50 ~ 344+21 RT.
346+73 ~ 347+00 LT.
346+76 ~ 347+00 RT.

DURABLE 4" WHITE LINE
343+00 ~ 347+00 LT & RT.

DURABLE 4" YELLOW LINE LT & RT
343+00 ~ 343+81 S S
343+81 ~ 347+00 D S

TEMPORARY 4" WHITE LINE
SAME AS DURABLE 4" WHITE LINE

TEMPORARY 4" YELLOW LINE LT & RT
SAME AS DURABLE 4" YELLOW LINE

6"X 8" TRAFFIC SIGN, TYPE A
W/ FLANGED CHANNEL SIGN POST (1/2 LB/FT)
SEE STD. E-134 FOR DETAILS

BRIDGE
81
U.S. 5

NEW
346+93 LT

REMOVAL AND DISPOSAL OF GUARD RAIL

343+08 ~ 344+33 LT
343+08 ~ 344+08 RT
346+85 ~ 347+00 LT
346+62 ~ 347+00 RT

REMOVING SIGNS
4 (AS SHOWN)

STEEL BEAM GUARD RAIL

343+08 ~ 343+83 LT
343+08 ~ 343+58 RT

COLD PLANING BITUMINOUS PAVEMENT

343+00 ~ 343+50

GUARD RAIL APPROACH SECTION TYPE I

343+83 ~ 344+33 LT
343+58 ~ 344+08 RT
346+85 ~ 347+00 LT
346+62 ~ 347+00 RT

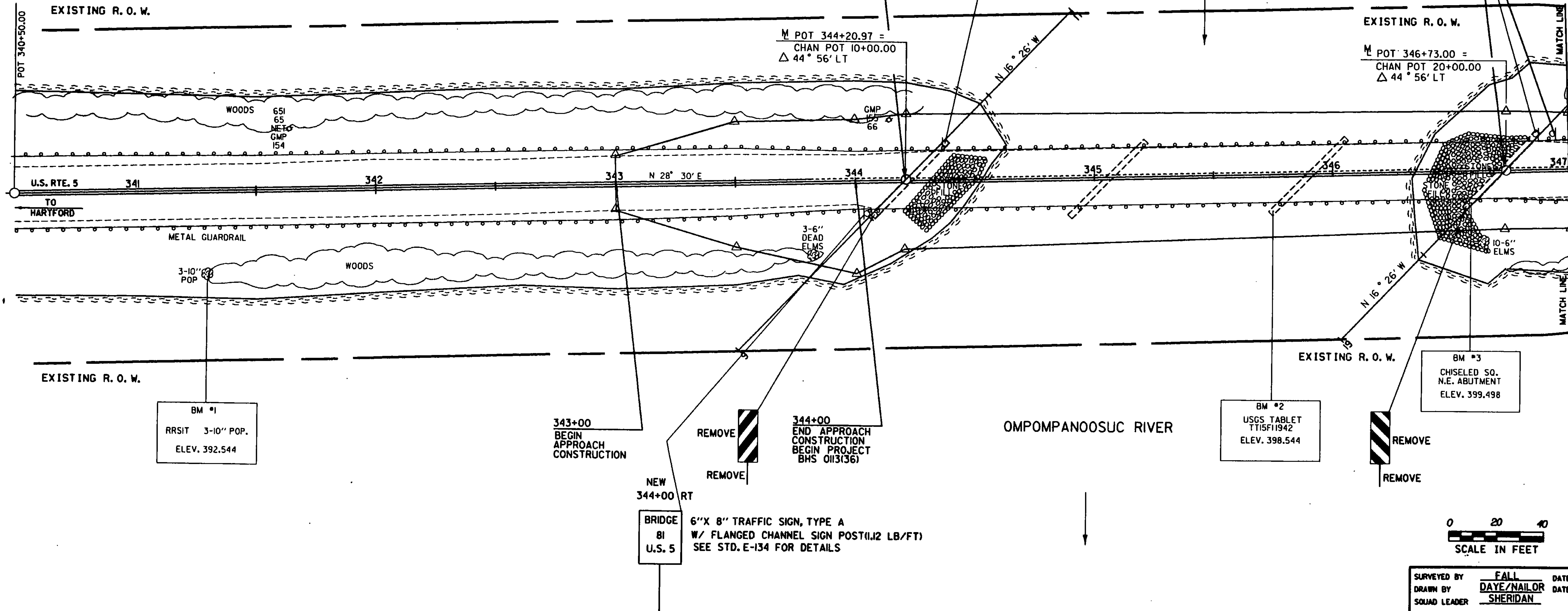
• ALTHOUGH THE ROADWAY IS CONSTRUCTED WITH A 3-12-12-3 TYPICAL THE ROADWAY SHOULD BE STRIPED FOR A 4-11-11-4 TYPICAL TO BE CONSISTENT WITH THE REST OF THE HIGHWAY.

344+18.88
STOP ROADWAY
BEGIN BRIDGE

M POT 344+20.97 =
CHAN POT 10+00.00
Δ 44° 56' LT

346+75.12
END BRIDGE
RESUME ROADWAY

M POT 346+73.00 =
CHAN POT 20+00.00
Δ 44° 56' LT



DATUM
VERTICAL NGVD 1929
HORIZONTAL N/A

0 20 40
SCALE IN FEET

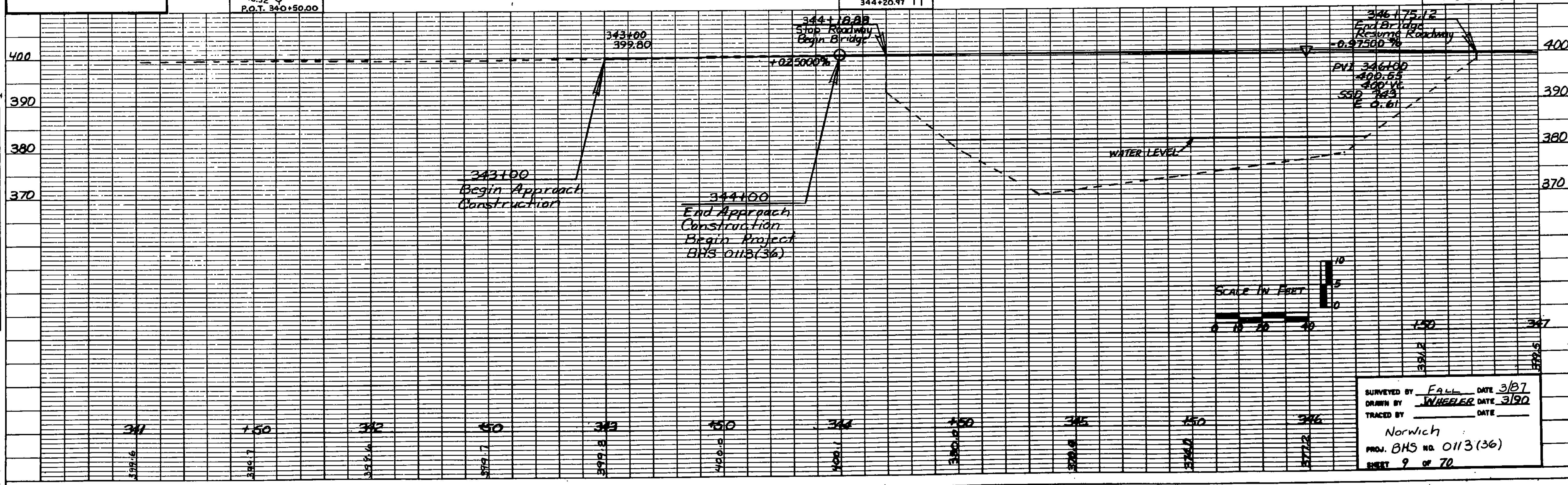
SURVEYED BY FALL DATE 3/87
DRAWN BY DAYE/NAILOR DATE 3/90
SQUAD LEADER SHERIDAN
DESIGN FILE NO. 77B069.DGN
PRF FILE 77B069.LOI DATE PLOTTED 7-APR-1992
PROJ. NAME NORWICH
PROJ. NO. BHS 0113(36)
SHEET 8 OF 70 SHEETS

NOTE BOOK	PLOTTED	
GRADES CHECKED		
B. M.'S NOTED		
EXTRA PLOTS MADE		
ADJUST & RE-ADJUST		
CHANGES		

TIES TIPS OF REBAR



P.O.T. 346+73.00



SURVEYED BY FALL DATE 3/87
DRAWN BY WHEELER DATE 3/90
TRACED BY _____ DATE _____

Norwich

PROJ. BHS NO. 0113(36)

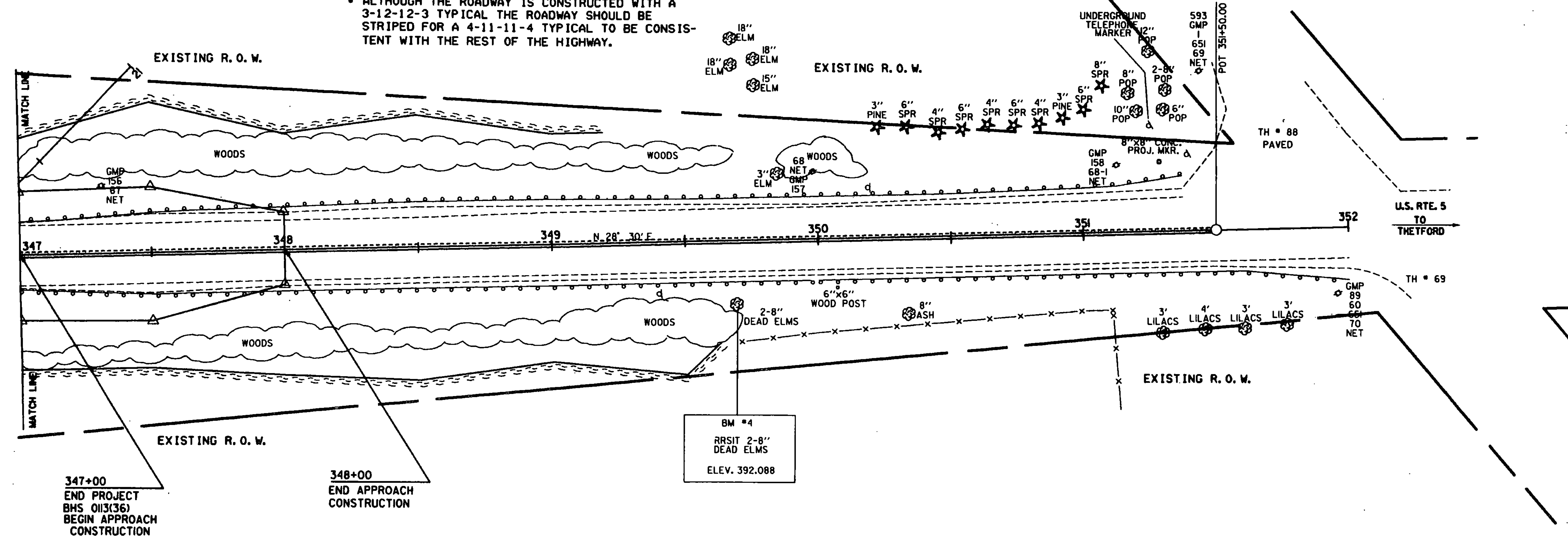
SHEET 9 OF 70

TEMPORARY 4" WHITE LINE
 SAME AS DURABLE 4" WHITE LINE
 TEMPORARY 4" YELLOW LINE LT & RT
 SAME AS DURABLE 4" YELLOW LINE

DURABLE 4" YELLOW LINE LT & RT
 347+00 ~ 348+00 D S

DURABLE 4" WHITE LINE
 347+00 ~ 348+00 LT & RT

• ALTHOUGH THE ROADWAY IS CONSTRUCTED WITH A 3-12-12-3 TYPICAL THE ROADWAY SHOULD BE STRIPED FOR A 4-11-11-4 TYPICAL TO BE CONSISTENT WITH THE REST OF THE HIGHWAY.



347+00
 END PROJECT
 BHS 0113(36)
 BEGIN APPROACH
 CONSTRUCTION

348+00
 END APPROACH
 CONSTRUCTION

BM #4
 RRSIT 2-8"
 DEAD ELMS
 ELEV. 392.088

STONE FILL, TYPE II
 (FOR SLOPE PROTECTION)
 347+00 ~ 347+50 RT.
 347+00 ~ 347+50 LT.

COLD PLANING BITUMINOUS PAVEMENT
 347+50 ~ 348+00 C

STEEL BEAM GUARD RAIL
 347+35 ~ 347+85 LT
 347+12 ~ 347+99.5 RT

GUARD RAIL APPROACH SECTION, TYPE I
 347+00 ~ 347+35 LT
 347+00 ~ 347+12 RT

REMOVAL AND DISPOSAL OF GUARD RAIL
 347+00 ~ 347+85 LT
 347+00 ~ 347+99.5 RT

0 20 40
 SCALE IN FEET

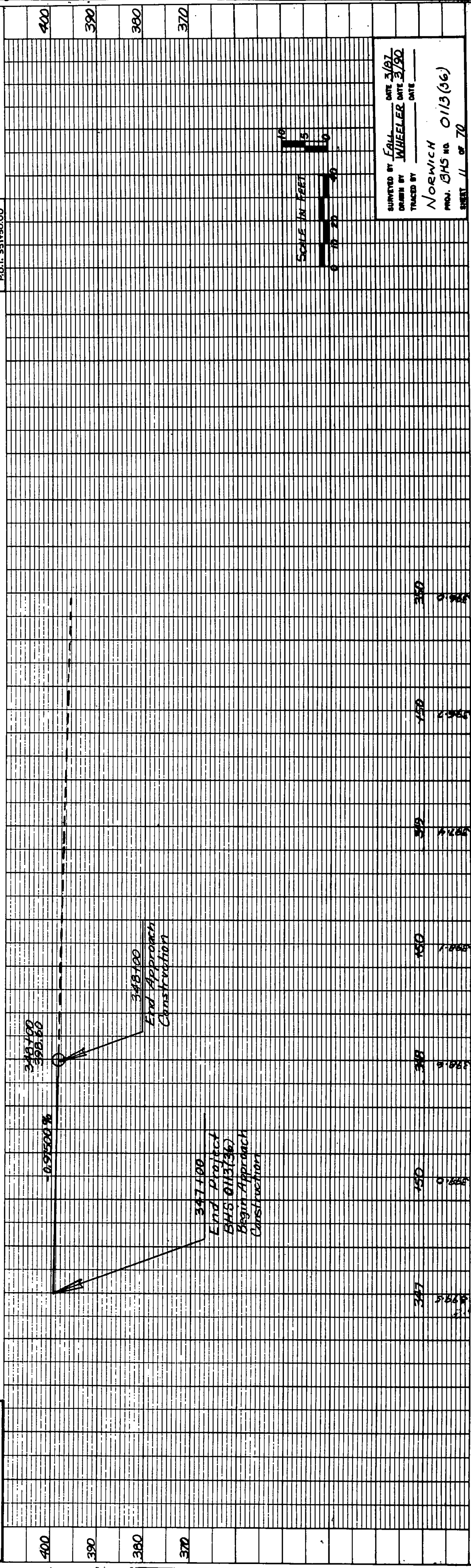
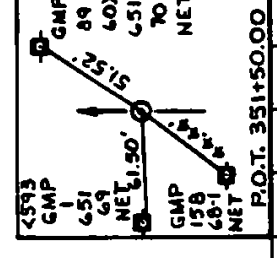
DATUM
 VERTICAL NGVD 1929
 HORIZONTAL N/A

SURVEYED BY FALL DATE 3/87
 DRAWN BY DAYE/NAILOR DATE 3/90
 SQUAD LEADER SHERIDAN
 DESIGN FILE NO. 77B069.DGN
 PRF FILE 77B069L02 DATE PLOTTED 7-APR-1992
 PROJ NAME NORWICH
 PROJ NO. BHS 0113(36)
 SHEET 10 OF 70 SHEETS

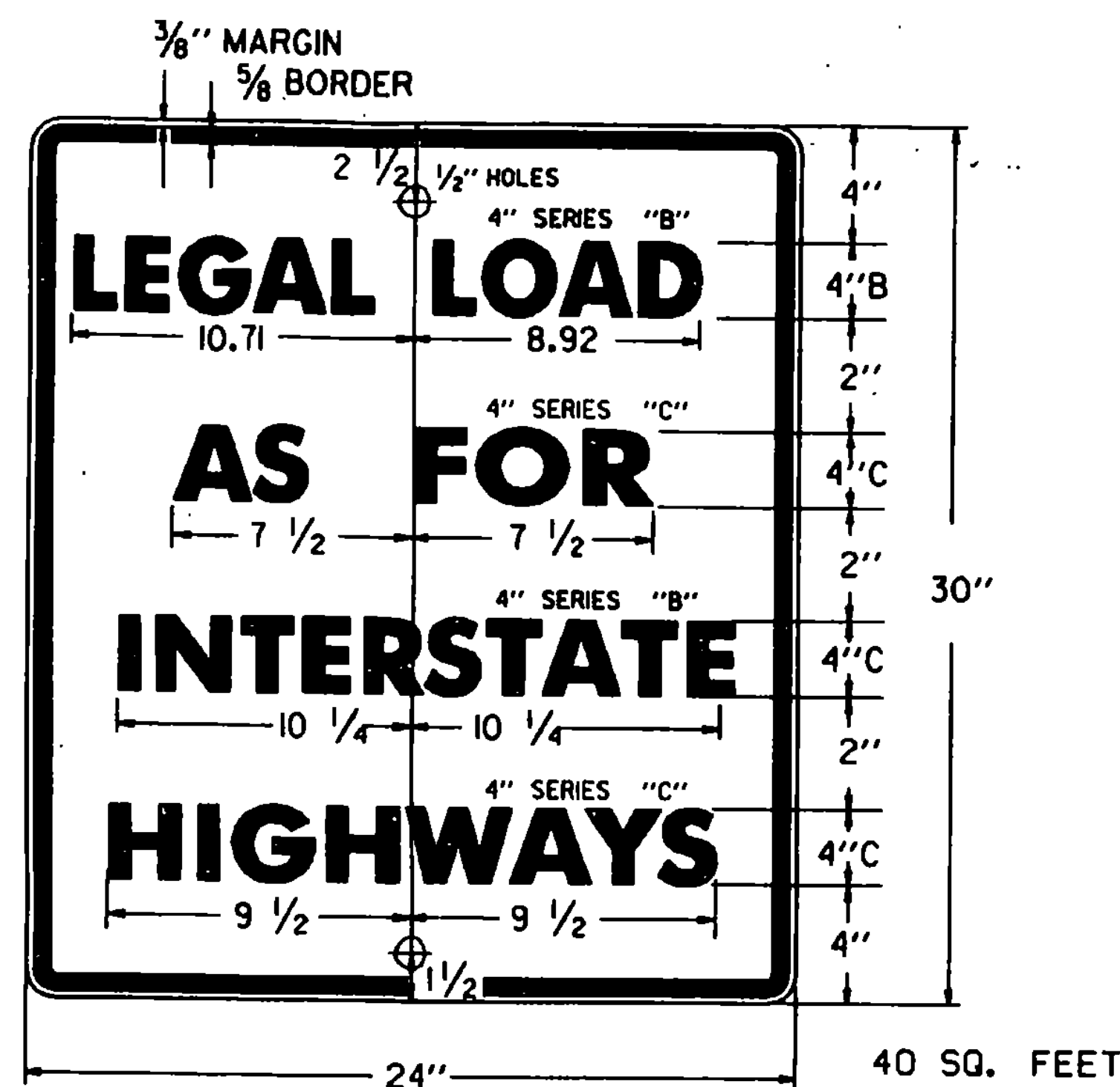
DATUM
VERTICAL
HORIZONTAL

MSVD 1922

N/A

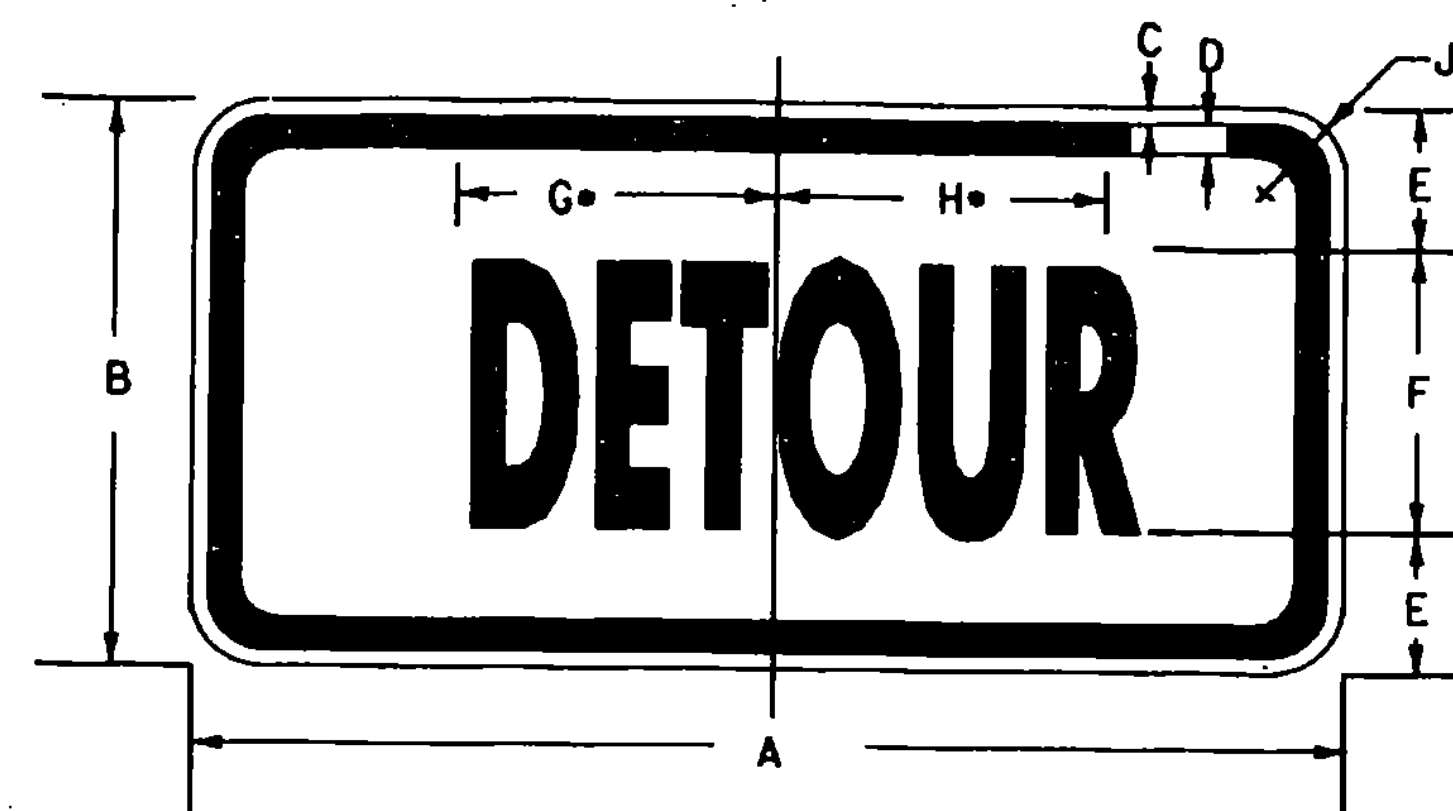


SUPPLIED BY: WHEELER DATE: 3/92
DRAWN BY: NOENWICH
PROJ. SHS NO. 0113 (36)
SHEET 11 OF 70



ADD THIS SIGN TO ASSEMBLIES 3, 9, 14, 18, 29, 38, 42 & 52
COLORS:

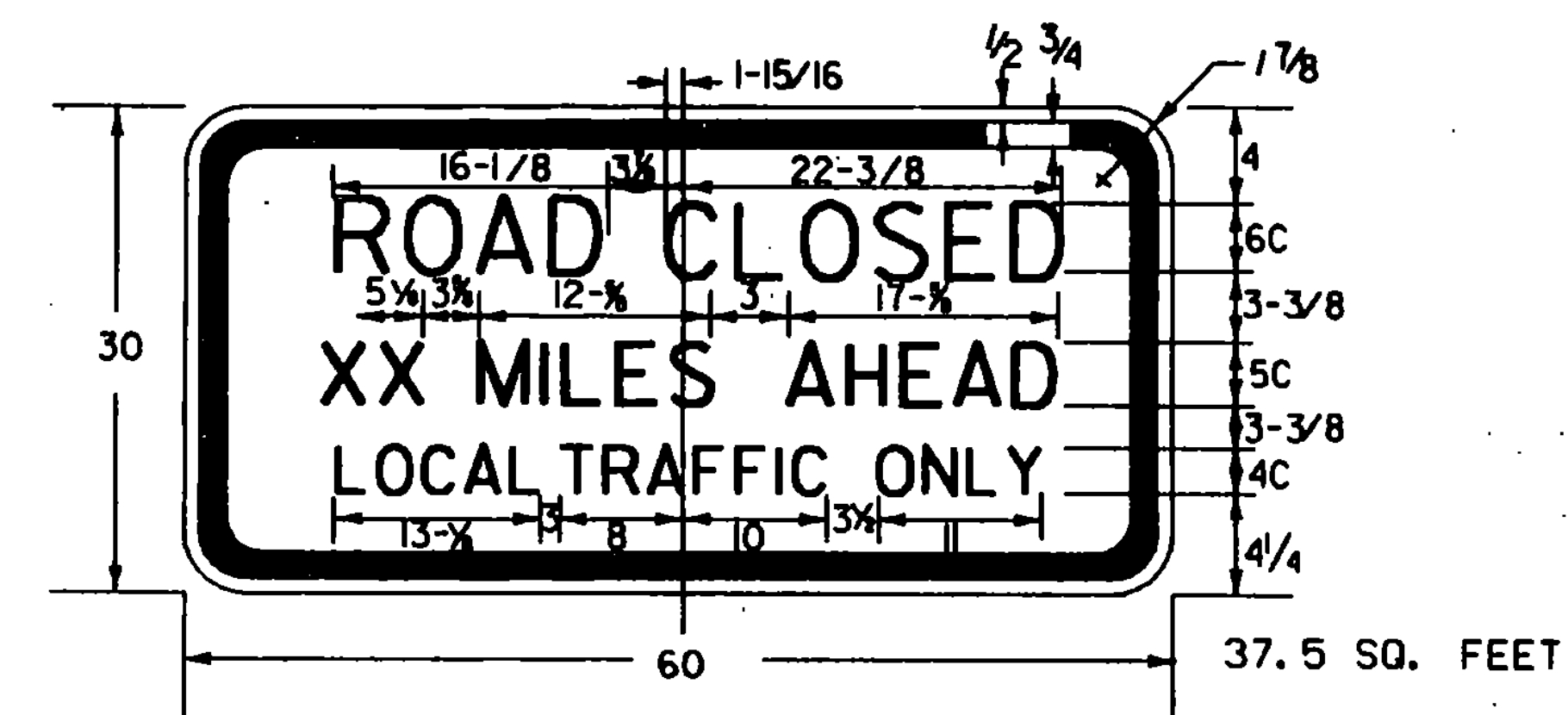
LEGEND = BLACK
BACKGROUND = WHITE (REFL., ENG. GRADE)
MATERIALS (REFER TO STD. E-140)



• REDUCE SPACING 20%

SIGN	DIMENSIONS (INCHES)								
	A	B	C	D	E	F	G	H	J
STD. & MIN.	24	12	3/8	5/8	3	68	3-3/16	9-1/16	1-1/2
SPECIAL	30	15	3/8	5/8	3-1/2	88	12-1/4	2-3/4	1-1/2

COLORS
TEXT AND BORDER - BLACK (NON REFL.)
BACKGROUND - ORANGE (REFL.)
MATERIALS (REFER TO STD. E-100)



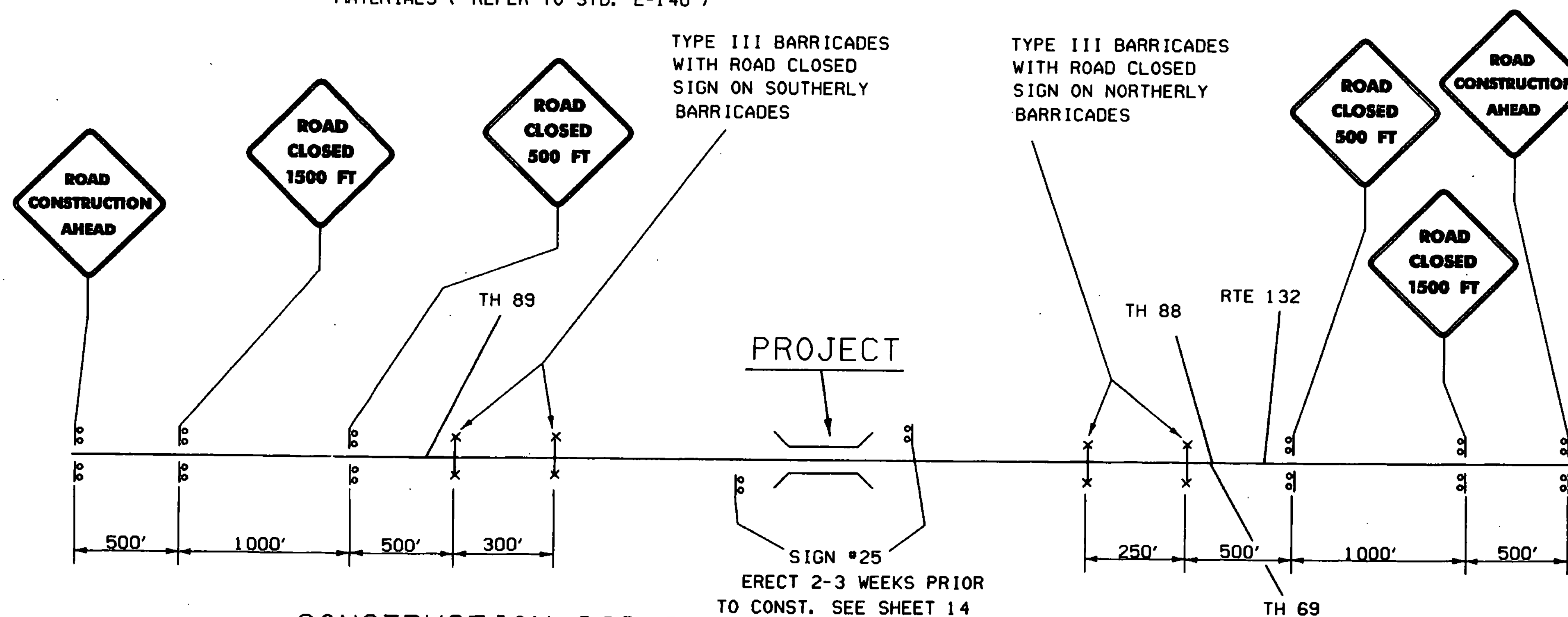
MOUNT ON 2 - 3"/FT FLANGED CHANNEL POSTS

(22) - 4 MILES
(26) - 0.2 MILES
(35) - 4.7 MILES

COLORS
LEGEND - BLACK (NON-REFL.)
BACKGROUND - WHITE (REFL.)
MATERIALS (REFER TO STD. E-140) (36" X 48" SIZE)

NOTES:

DETOUR SIGNING SHALL BE PAID AT THE UNIT BID PRICES FOR TRAFFIC SIGNS, TYPE A, MOD., ITEM 675.20 MOD. OR TRAFFIC SIGNS TYPE B MOD, ITEM 675.21 MOD. COSTS SHALL INCLUDE ALL EXPENSE OF FABRICATING, FURNISHING SIGNS & POSTS, ERECTING, MAINTAINING, COVERING, UNCOVERING AND REMOVING THESE SIGNS AND POSTS. PAYMENT FOR DETOUR SIGNING (TYPES A AND B MOD.) WILL BE MADE AT 75% OF THE BID PRICE WHEN THE SIGNS ARE ERECTED AND THE REMAINING 25% WHEN THEY ARE REMOVED. PAYMENT FOR NORMAL CONSTRUCTION SIGNS, BARRICADES, ETC. TO BE SUBSIDIARY TO OTHER ITEMS. THE LARGE GROUND MOUNTED DETOUR SIGNS (8' X 4') SHALL BE ERECTED ON TWO 3" DIA. ALUMINUM TUBES SPACED A MINIMUM OF 7' APART. SIGNS (57) AND (63) ARE TO BE MOUNTED ON TWO 3"/FT. FLANGED CHANNEL POSTS. ALL THE DETOUR ASSEMBLIES LISTED IN THE TABLE ON SHEET 13 WILL BE MOUNTED ON SINGLE 3"/FT. FLANGED CHANNEL POSTS. SIGNS (22), (26) AND (35) ARE TO BE MOUNTED ON TWO 3"/FT. FLANGED CHANNEL POSTS. THE CONTRACTORS ATTENTION IS DIRECTED TO THE FACT THAT ONE (8' X 4') DETOUR SIGN IS TO BE MOUNTED ON THE OVERHEAD SIGN STRUCTURE NEAR THE WEST END OF ROUTE 10A. * LEGAL LOAD AS FOR INTERSTATE HIGHWAYS * SIGNS DETAILED ON SHEET 13 ARE TO BE MOUNTED ON THE ROADSIDE POSTS OF THE INDICATED ASSEMBLIES. ALL CONSTRUCTION AND DETOUR SIGNS TO CONFORM TO THE MATERIALS AS SPECIFIED ON STANDARD E-100. COLORS TO BE AS NOTED IN PLANS. ALL SIGNS THAT ARE BLACK LEGEND ON REFLECTORIZED WHITE BACKGROUND (U.S. 5 SHIELDS, NORTH, SOUTH, AND DIRECTIONAL ARROWS) WILL BE REMOVED AFTER THE BRIDGE IS REOPENED AND DELIVERED TO THE VAOT DISTRICT #4 GARAGE IN THETFORD. THE COST OF REMOVING AND TRANSPORTING THESE SIGNS SHALL NOT BE PAID DIRECTLY BUT SHALL BE SUBSIDIARY TO ITEM 675.20 MOD., TRAFFIC SIGNS, TYPE A, MOD. ALL SIGN POSTS SHALL REMAIN THE PROPERTY OF THE CONTRACTOR.

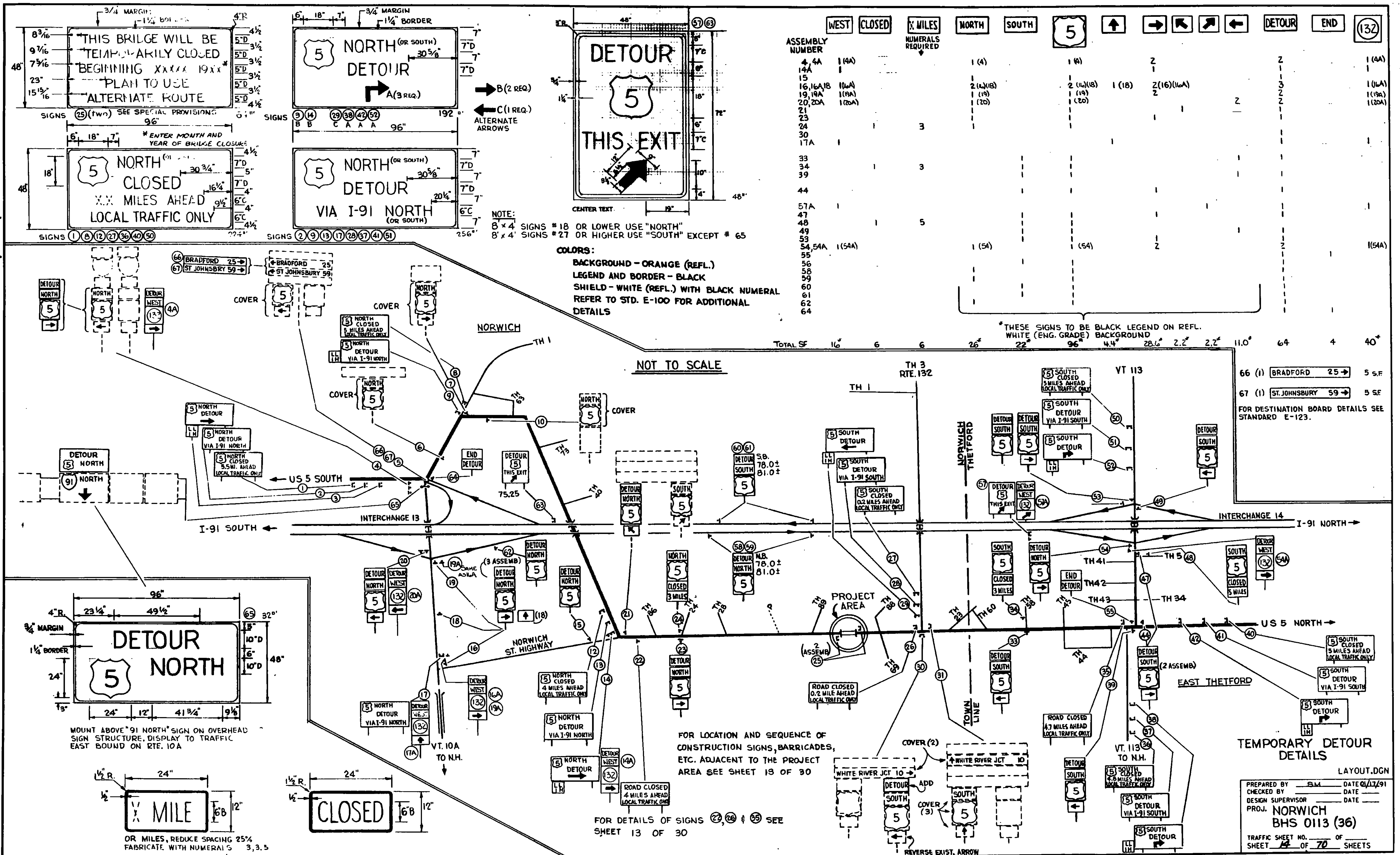


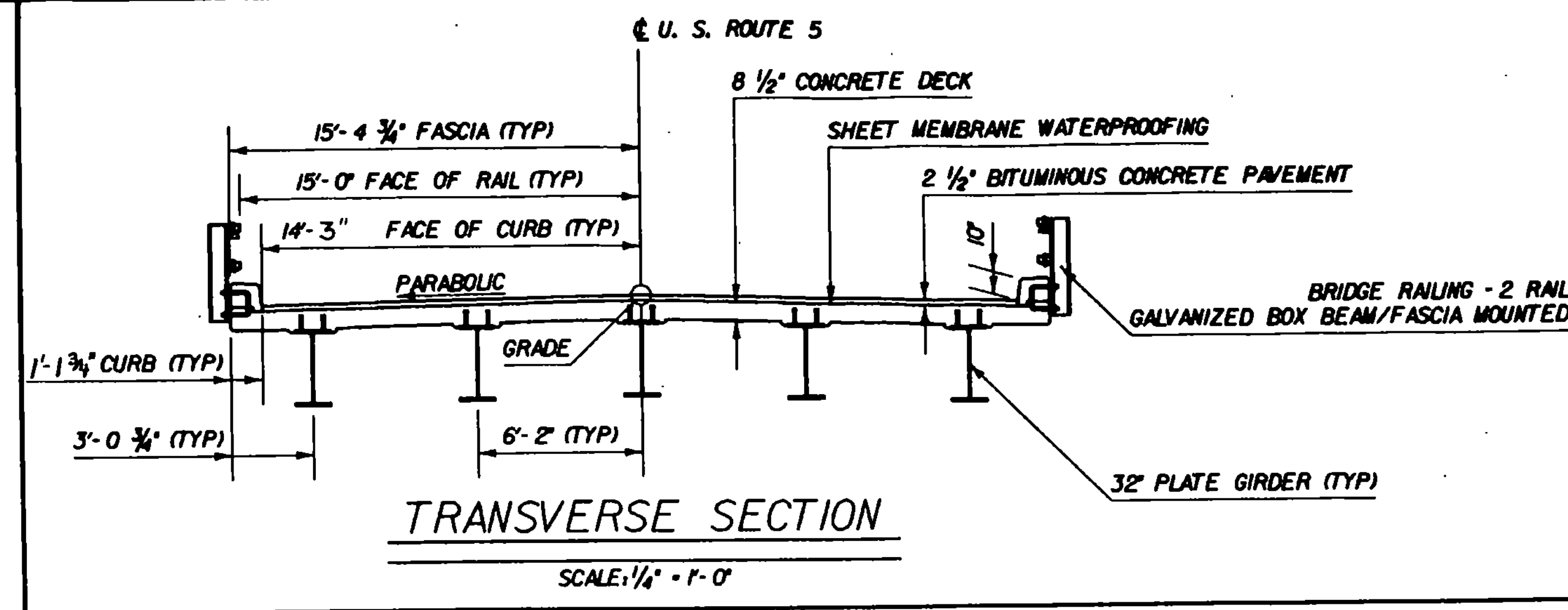
CONSTRUCTION SIGNS

FOR ADDITIONAL DETAILS SEE
STANDARDS E-100, E-101 & E-102

DATUM
VERTICAL N/A
HORIZONTAL N/A

SURVEYED BY N/A DATE N/A
DRAWN BY S. N. / S. M. DATE 12-90
SQUAD LEADER SHERIDAN
DESIGN FILE NO. ZF245650377B069.DGN
PRF FILE 77B069SD.PRF DATE PLOTTED 14-MAY-1992
PROJ. NAME NORWICH
PROJ. NO. BHS 0131361
SHEET 13 OF 70 SHEETS





LIST OF SHEETS

BRI00 PRELIMINARY INFORMATION
 BRI01 GENERAL NOTES
 BRI02 BRIDGE QUANTITY SHEET
 BRI03 PLAN AND ELEVATION
 BRI04 TYPICAL SECTION AND DECK REINFORCING PLAN
 BRI05 FRAMING PLAN AND GIRDER ELEVATION
 BRI06 DIAPHRAGM AND SPLICE DETAILS
 BRI07 MISCELLANEOUS DETAILS
 BRI08 APPROACH SLAB DETAILS
 BRI09 ISOLATION BEARING DETAILS
 BRI10 EXPANSION JOINT DETAILS
 BRI11 HOPPER AND DOWNSPOUT DETAILS
 BRI12 SCUPPER DETAILS
 BRI13 ABUTMENT #1 AND #2 DETAILS
 BRI14 PIER #1 AND #2 DETAILS
 BRI15 REINFORCING STEEL SCHEDULE
 BRI16 - BRI21 CHANNEL SECTIONS
 BRI22 - BRI24 REFERENCE SHEETS

LIST OF STANDARD

SB-R40-82	9-18-89R
SB-R40-82	3-30-88R
SB-R6-82	12-28-81R

EXISTING STRUCTURE

1. STRUCTURE TYPE 3 span rolled beam OVERALL LENGTH 252.00' INVENTORY RATING
 2. SPAN LENGTH(S) CENTER TO CENTER OF BEARINGS 82'-7\"/>

NEW STRUCTURE

STRUCTURE GEOMETRY:
 1. STRUCTURE TYPE 3 span continuous plate girder OVERALL LENGTH 256.24'
 2. SPAN LENGTH(S) CENTER TO CENTER OF BEARINGS 82'-7\"/>

HYDRAULIC DATA

1. 0 2.33 <u>2050 cfs</u>	WATER ELEVATION <u>388.0</u>	VELOCITY <u>1.1 f/s</u>
0 18 <u>2800 cfs</u>	WATER ELEVATION <u>392.0</u>	VELOCITY <u>1.1 f/s</u>
0 25 <u>2850 cfs</u>	WATER ELEVATION <u>394.0</u>	VELOCITY <u>1.1 f/s</u>
0 50 <u>3000 cfs</u>	WATER ELEVATION <u>397.0</u>	VELOCITY <u>1.1 f/s</u>
0 100 <u>3375 cfs</u>	WATER ELEVATION <u>397.5</u>	VELOCITY <u>1.2 f/s</u>

2. DRAINAGE AREA 136.0 sq. mi. CHARACTER OF TERRAIN hilly to mountainous wide floodplain at bridge
 3. ARE THERE OBSTRUCTIONS TO A PIER IN THE STREAM? NO
 4. DOES STREAM REACH ITS MAXIMUM HIGH WATER ELEVATION RAPIDLY? NO IS ORDINARY RISE RAPID? NO
 5. NATURE OF NATURAL STREAMBED fine sand and clay IS ICE HEAVY? NO
 6. ESTIMATED SCOUR DEPTH 2' COMMENT ON: DRIFT slight ICE heavy
 7. WILL ALL WATER PASS THROUGH NEW STRUCTURE? NO IF NOT, WHAT FREQUENCY AND ELEVATION WILL RELIEF OCCUR? 0.60' - 395.0'
 8. VERTICAL CLEARANCE ABOVE 0 WATER LINE BEAMS AT 0+0 7'-7"
 9. ALLOWABLE WATER SURFACE ELEVATION 395.0 LIMITED BY average bottom of low beam elevation
 10. IS DESIGN STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? YES IF YES, DESCRIBE Connecticut River Wilder Dam
 11. AVERAGE DAILY LOW FLOW 125 cfs DEPTH 1.5 ft AVERAGE DAILY HIGH FLOW 500 cfs DEPTH
 12. STREAMBANK OR CHANNEL PROTECTION REQUIRED Stone Fills Type A
 13. DISTANCE TO EXISTING UPSTREAM STRUCTURE 2500' SPAN 219' WATERWAY AREA OF FULL OPENING 0
 14. DISTANCE TO EXISTING DOWNSTREAM STRUCTURE 800' SPAN 121' WATERWAY AREA OF FULL OPENING 0

ALLOWABLE STRESSES:

1. DESIGN LIVE LOAD AASHTO HS 25 ON LEDGE
 2. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL TYPE ESTIMATED LENGTH
 3. ALLOWABLE LOAD FOR PILING TYPE grade 50 TENSION 27 ksi
 4. ALLOWABLE STRESS FOR STRUCTURAL STEEL AASHTO M 270 grade 50 TENSION 24 ksi COMPRESSION 20 ksi
 5. ALLOWABLE STRESS FOR REINFORCING STEEL grade 60 TENSION 24 ksi COMPRESSION 20 ksi
 6. ALLOWABLE STRESS FOR CONCRETE CLASS A 4000 psi CLASS B 4000 psi

TRAFFIC MAINTENANCE:

1. IS TRAFFIC TO BE MAINTAINED? X YES IF YES, ON EXISTING STRUCTURE NO OR ON TEMPORARY BRIDGE NO
 2. TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY NA TRAFFIC CONTROL SIGNALS REQUIRED NA
 MINIMUM CLEAR SPAN NA MINIMUM CLEAR HEIGHT NA SURV. STA. 345+47
 ARE SIDEWALKS REQUIRED? NA IF SO, ON WHAT SIDE? NA

x traffic to be maintained by a detour via I91 between the Thetford and Norwich Interchanges

ADDITIONAL DESIGN CONSIDERATIONS

LOAD RATING (TONS)

STRESS LEVELS	TRUCK						
	H	HS	352	6 AXLE	3A STR.	4A STR.	BASED
INVENTORY 0.55 F _y	36	45					
POSTED 0.67 F _y	53	64	75		57	59	69
OPERATING 0.75 F _y		76	90	105	68	71	

REVISIONS

NO.	DESCRIPTION	BY & DATE

STATE OF VERMONT AGENCY OF TRANSPORTATION

Town Of NORWICH Bridge No. 81
 Highway No. U. S. ROUTE 5 Log Sta. 345+47
 Surv. Sta. 345+47

PRELIMINARY INFORMATION

U. S. ROUTE 5 OVER THE OMPOMPANOOSUC RIVER
 Designed By D. J. HOYNE Drawn By K. S. CLAIRMONT
 Checked By D. J. HOYNE Date 2/92 Bridge Design Supervisor F. W. Bol/kum Date 4/92
 PROJECT NORWICH PROJECT NO. BHS 0113361
 I.G.C. Info. ZH1(30,47) 77B069.DGN;1
 Bridge Sheet No. BRI00 Sheet 16 of 70

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO STATE OF VERMONT, AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 1990, AND ITS LATEST REVISIONS, AND THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DATED 1989, AND ITS LATEST REVISIONS.
2. DESIGN IS FOR HS-25 LIVE LOADING WITH NO ALLOWANCE FOR FUTURE PAVEMENT.
3. TRAFFIC WILL BE DETOURED VIA I-91 BETWEEN THE THETFORD AND NORWICH INTERCHANGES.
4. THE STONE FILL TYPE IV SHALL BE USED TO FILL THE SCOUR HOLES AROUND BOTH PIERS SO THAT THE STONE FILL IS AS CLOSE AS POSSIBLE TO THE EXISTING STREAMBED ELEVATION. THE STONE FILL WILL BE PLACED BEFORE THE NEW GIRDERS ARE SET. THE RESIDENT ENGINEER SHALL TAKE ELEVATIONS OF THE EXISTING STREAMBED IN THE AREAS UPSTREAM AND DOWNSTREAM OF THE BRIDGE IN ORDER TO DETERMINE A CHANNEL PROFILE, WHICH WILL BE USED IN DETERMINING TO WHAT ELEVATION THE STONE FILL SHALL BE PLACED. THERE SHALL BE A 4' MINIMUM DEPTH OF STONE FILL.
5. THE EXISTING SUPERSTRUCTURE SHALL BE REMOVED UNDER THE ITEM "PARTIAL REMOVAL OF STRUCTURE". THIS INCLUDES THE BRIDGE RAILING CURTAIN WALLS, PAVEMENT, CURBS, CONCRETE DECK, BEAMS, DIAPHRAGMS AND BEARINGS. THE EXISTING BEAMS AND THE HEAVY DUTY STEEL BEAM RAIL SHALL REMAIN THE PROPERTY OF THE STATE AND SHALL BE LOADED ONTO TRUCKS SUPPLIED BY OTHERS.
6. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68 DEGREES F.
7. THE FOLLOWING TABLE OF ALLOWABLE STRESSES AND WEIGHTS APPLY TO THESE PLANS FOR DESIGN PURPOSES:

CONCRETE:	
CLASS 'A' $f'c = 3500$ PSI • $fc = 1400$ PSI •	
CLASS 'B' $f'c = 3500$ PSI $fc = 1400$ PSI	
REINFORCING STEEL:	
GRADE 60	$ft = 24,000$ PSI $fc = 20,000$ PSI
SOIL: UNIT WEIGHT 140 PCF	
• CONCRETE 'CLASS A' SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSIAS PER SPEC. 501.	
8. REINFORCING PLACEMENT TOLERANCES SHALL BE:

SPACING	+/- 1"
CLEARANCE	+/- 1/4"
9. MINIMUM COVER FOR REINFORCING STEEL (EXCEPT IN DECKS) SHALL BE TWO (2) INCHES ALONG BACK FACES OF WALLS AGAINST EARTH, AND THREE (3) INCHES ELSEWHERE.
10. DECK CONCRETE SHALL BE CONCRETE, CLASS A, AND ALL OTHER CONCRETE SHALL BE CONCRETE, CLASS B UNLESS NOTED OTHERWISE.
11. THE CURB ON THE BRIDGE DECK AND THE CURB ON THE APPROACH SLABS SHALL BE SILICA-FUME CONCRETE AND PAID UNDER ITEM 501.60 "SILICA-FUME CONCRETE".
12. THE DECK CONCRETE FINISHING MACHINE SHALL BE SET ON A SKEW THAT IS PARALLEL TO THE CENTERLINE OF BEARING. THE DECK CONCRETE SHALL BE DEPOSITED PARALLEL TO THE CENTERLINE OF BEARING.
13. THE ITEM 580.14 "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE CLASS II" SHALL BE USED TO REPAIR SPALLED OR DETERIORATED CONCRETE THAT WILL NOT BE ENCASED BY NEW CONCRETE. AREAS OF SUBSTRUCTURES TO BE REPAIRED SHALL BE MARKED BY THE RESIDENT ENGINEER PRIOR TO REMOVAL. ACCESS FOR INVESTIGATING AND MARKING THE CONCRETE MUST BE PROVIDED BY THE CONTRACTOR. PAYMENT FOR ACCESS SHALL BE SUBSIDIARY TO OTHER ITEMS IN THE CONTRACT. CARE SHALL BE TAKEN WHEN REMOVING DETERIORATED CONCRETE NOT TO DAMAGE OR DELAMINATE THE EXISTING REINFORCING STEEL. ANY RESULTING DAMAGE WILL BE REPAIRED AT THE CONTRACTORS EXPENSE.
14. THE ITEM 580.14 MODIFIED SHALL BE USED TO REPAIR AREAS THAT WILL BE ENCASED BY CONCRETE. THIS ITEM COVERS THE PREPARATION OF THE DETERIORATED SURFACES FOR ENCASEMENT. THE VOLUME OF CONCRETE TO FILL THESE AREAS BACK TO THE ORIGINAL SURFACE SHALL BE SUBSIDIARY TO ITEM 501.25 "CONCRETE CLASS B".
15. THE REPAIRS TO THE PIERS SHALL INCLUDE THE SPALLED AND DETERIORATED CONCRETE AT WATER LINE. NEW ENGLAND POWER WILL LOWER THE WATER LEVEL OF THE WILDER DAM FOR A MAXIMUM OF 3 DAYS ONLY ONCE. ALL REPAIRS WHICH WILL SUBSEQUENTLY BE UNDER WATER WILL BE COMPLETED IN THIS 3 DAY PERIOD. THE CONCRETE USED FOR THESE REPAIRS WILL BE REQUIRED TO DEVELOP A STRENGTH OF 3500 PSI BEFORE THE WATER LEVEL RISES.
16. THE ITEM 529.25 "REMOVAL OF CONCRETE OR MASONRY" SHALL BE USED TO REMOVE THE PORTIONS OF THE ABUTMENTS AND PIERS TO THE CUT LINES SHOWN ON SHEETS BR13 AND BR14, INCLUDING THE 'EAR' WALLS ON ALL SUBSTRUCTURES, BOTH ABUTMENT BEAM CAPS, NECESSARY PORTIONS OF THE COLUMNS AT THE ABUTMENTS AND PORTIONS OF THE PIER CAPS NECESSARY TO POUR THE NEW CAP.
17. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" BY 1".
18. WATER REPELLENT SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES EXCEPT THE UNDERSIDE OF DECK BETWEEN DRIP BEADS, (INCLUDING EXISTING SUBSTRUCTURES)
19. JOINTS AND SCORE MARKS IN CONCRETE SHALL BE CONSTRUCTED AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
20. THE KEY IN CONCRETE CONSTRUCTION JOINTS SHALL BE MONOLITHIC AND CONTINUOUS FOR THE FULL LENGTH OF THE JOINT.
21. FLEMING BRACKETS OR SIMILAR FALSEWORK SHALL BE SPACED AS REQUIRED BY DESIGN UP TO A MAXIMUM OF 4 FEET.
22. SURFACES OF BRIDGE SEATS UNDER BEARING DEVICES SHALL BE LEVEL. OTHER BRIDGE SEAT AREAS SHALL BE SLOPED 1/2" PER FOOT. ABUTMENT SEATS SHALL BE SLOPED FULL WIDTH TOWARD MID-SPAN. PIER SEATS SHALL BE SLOPED EACH WAY FROM CENTER. THE ENTIRE BRIDGE SEAT SURFACE SHALL BE SMOOTH STEEL TROWEL FINISHED.
23. ALL REINFORCING STEEL IN THE CONCRETE DECK, BRIDGE CURBS AND APPROACH SLABS SHALL BE EPOXY COATED AND PAID UNDER ITEM 507.17. WHEN EPOXY COATED REBAR IS CUT THE UNCOATED ENDS SHALL BE REPAIRED WITH MATERIALS AND PROCEDURES APPROVED BY THE COATING MANUFACTURER. FLAME CUTTING OF EPOXY COATED REBAR WILL NOT BE PERMITTED.
24. ALL STRUCTURAL STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE "AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)".
25. ALL STEEL PAID UNDER THE ITEM 506.55 "STRUCTURAL STEEL (PLATE GIRDER)" SHALL CONFORM TO AASHTO M270 GRADE 50 PAINTED UNLESS NOTED OTHERWISE ON THE PLANS. THE MAIN GIRDER FLANGES, WEBS, AND ALL STEEL IN THE FIELD SPLICES EXCLUDING THE 1/8" FILLER PLATES WILL REQUIRE CHARPY V-NOTCH TESTING.
26. INTERMEDIATE DIAPHRAGM BOLTS SHALL ONLY BE SNUG TIGHT UNTIL AFTER THE ENTIRE DECK HAS BEEN PLACED.
27. NOT USED.
28. AFTER SUPERSTRUCTURE STEEL HAS BEEN ERECTED, ELEVATIONS ALONG THE TOP OF THE GIRDERS SHALL BE TAKEN AS DIRECTED BY THE ENGINEER FOR USE IN DETERMINING FINAL GRADE.
29. ANY BOLT HOLES IN THE WEB OF THE FASCIA GIRDERS NOT OTHERWISE FILLED SHALL BE FILLED WITH BUTTON HEAD OR HEX HEAD BOLTS. THE BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH SUBSECTION 506.19.
30. ALL FIELD CONNECTIONS SHALL BE MADE USING 7/8 INCH DIAMETER TYPE 1 BOLTS MEETING AASHTO M 164. HOLES SHALL BE 15/16 INCH DIAMETER, UNLESS OTHERWISE NOTED. CONNECTIONS NOT DESIGNATED SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE STRUCTURES DIVISION FOR APPROVAL.
31. CONCRETE PORTIONS OF THE ABUTMENT AND WINGWALL ABOVE ADJACENT BRIDGE SEAT ELEVATIONS SHALL NOT BE PLACED UNTIL THE FINISH GRADE HAS BEEN DETERMINED BY THE RESIDENT ENGINEER.

STATE OF VERMONT AGENCY OF TRANSPORTATION

Town Of	NORWICH	Bridge No.	81
Highway No.	U. S. ROUTE 5	Log Sta.	345+47
		Surv. Sta.	345+47
GENERAL NOTES			
U. S. ROUTE 5 OVER THE OMPOMPANOOSUC RIVER			
Designed By	D. J. HOYNE	Drawn By	K. S. CLAIRMONT
Checked By	D. J. HOYNE	Bridge Design Supervisor	F. W. Bolkum
	2/92	Date	5/92
PROJECT	NORWICH	PROJECT NO.	BHS 01131361
L&C Info.	ZHI 130.47 778069NOT.DGN:1		
Bridge Sheet No.	BR101	Sheet	17 of 10

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BRIDGE QUANTITY SHEET										STATE OF VERMONT AGENCY OF TRANSPORTATION STRUCTURES DIVISION		
NO.	ITEM	UNIT	QUANTITY BREAKDOWN								TOTAL	FINAL
			SUPER- STRUCTURE	ABUT #1	PIER #1	PIER #2	ABUT #2	CHANNEL				
*	DENOTES ROADWAY QUANTITY											
204.25	STRUCTURE EXCAVATION	CY		80				80			160	
204.30	GRANULAR BACKFILL FOR STRUCTURES	CY		60				60			120	
*406.25	BITUMINOUS CONCRETE PAVEMENT	TON	137								137	
501.22	CONCRETE CLASS A	CY	218								218	
501.25	CONCRETE CLASS B	CY		69	12	12		69			162	
501.60	SILICA-FUME CONCRETE	CY	24								24	
506.55	STRUCTURAL STEEL (PLATE GIRDER)	lb	240,470								240,470	
507.15	REINFORCING STEEL	lb		5,960	1,330	1,330		5,960			14,580	
507.16	DRILLING AND GROUTING DOWELS	LF		36	120	120		36			312	
507.17	EPOXY COATED REINFORCING STEEL	lb	67,590	5,220				5,260			78,070	
508.15	SHEAR CONNECTORS (2430 - "6" Ø x 7")	LS	1								1	
514.10	WATER REPELLENT	GAL	20	5	15	15		5			60	
516.10	BRIDGE EXPANSION JOINT	LF		44				44			88	
519.20	SHEET MEMBRANE WATERPROOFING	SY	980								980	
525.31	BRIDGE RAILING 2-RAIL GALVANIZED BOX BEAM - FASCIA MOUNTED	LF	538								538	
529.20	PARTIAL REMOVAL OF STRUCTURE	LS	1								1	
529.25	REMOVAL OF CONCRETE OR MASONRY	CY		12	12	12		12			48	
531.10	BEARING DEVICE ASSEMBLY (MODIFIED)	EA		5	5	5		5			20	
580.14	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE - CLASS II	SY			30	30					60	
580.14	REPAIR OF CONCRETE SUBSTRUCTURE SURFACE CLASS II - MODIFIED	SY			5	5					10	
613.13	STONE FILL - TYPE IV	CY		30	200	200		20			450	
649.31	GEOTEXTILE UNDER STONE FILL	SY			290	290					580	

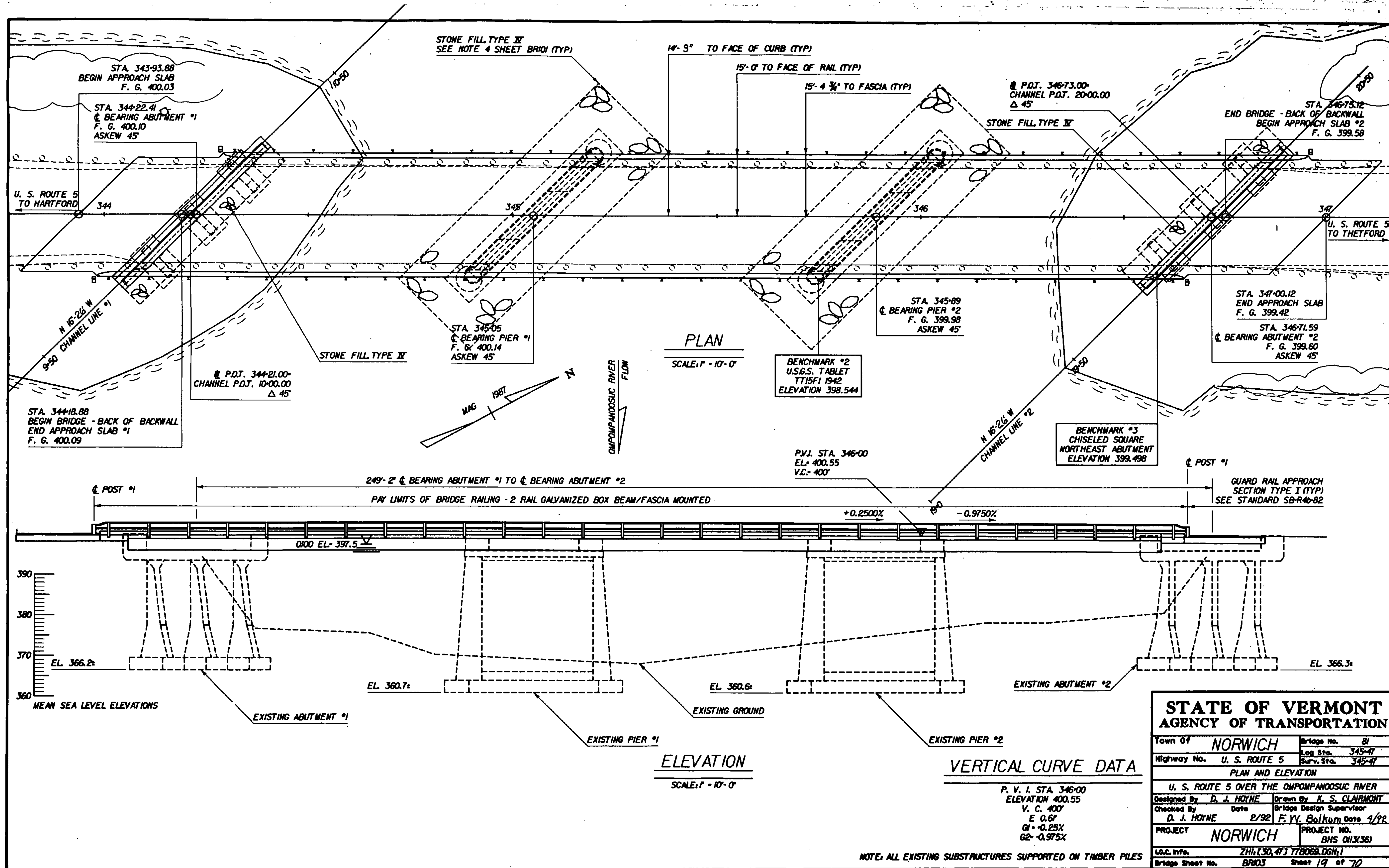
BRIDGE (S) AT STATION (S) _____
 LOCATION (S) U.S. ROUTE 5 OVER THE OMPOMPOOOSUC RIVER

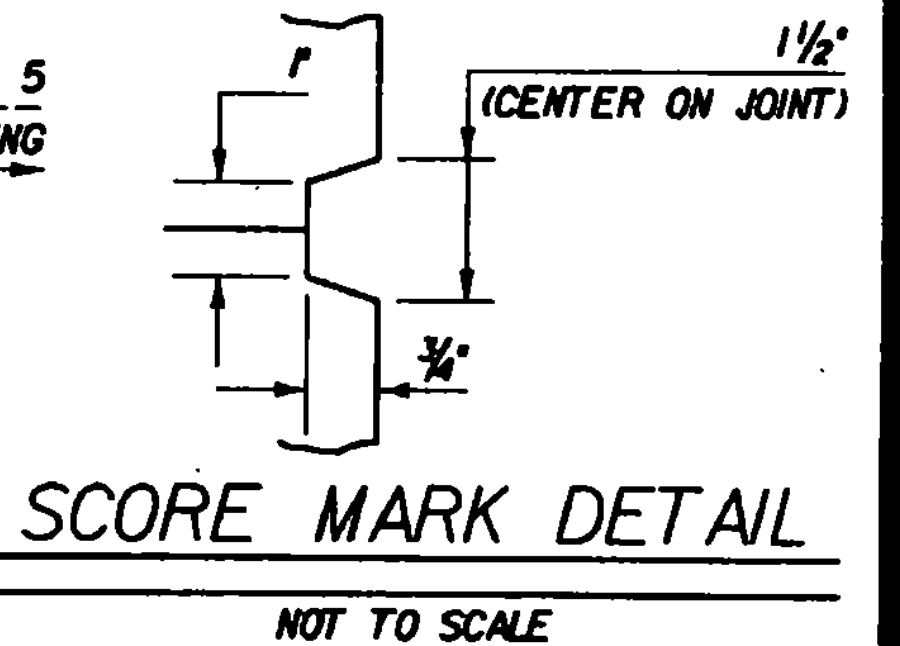
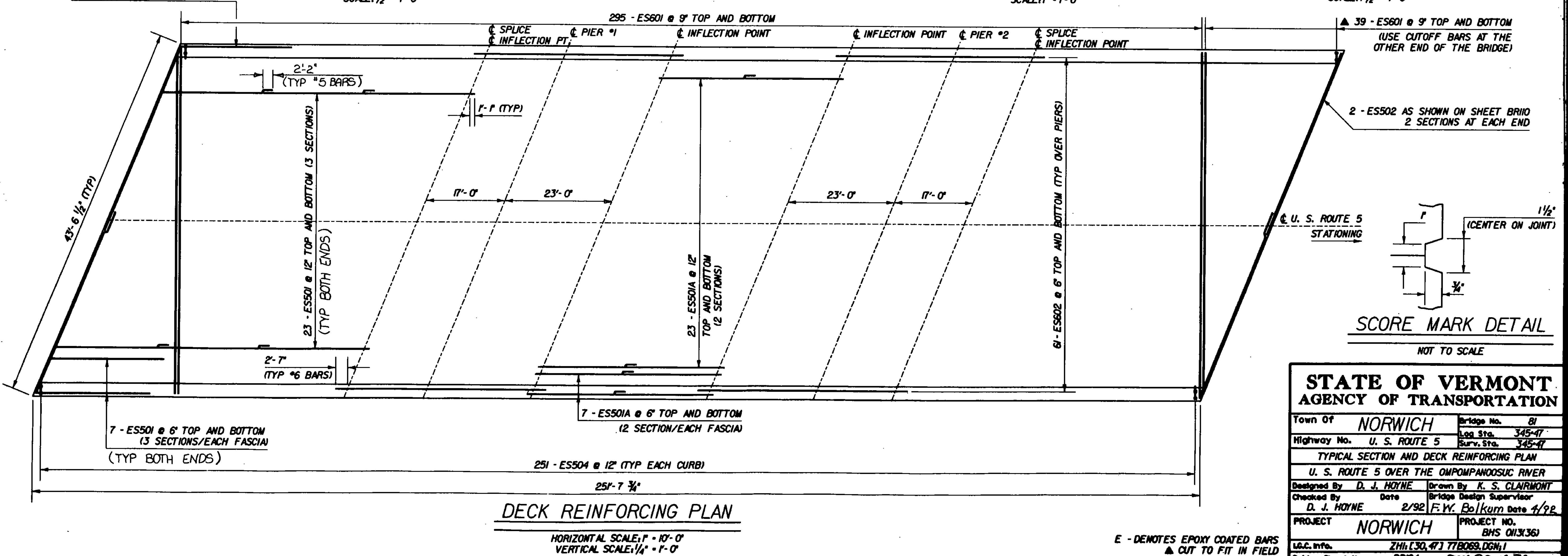
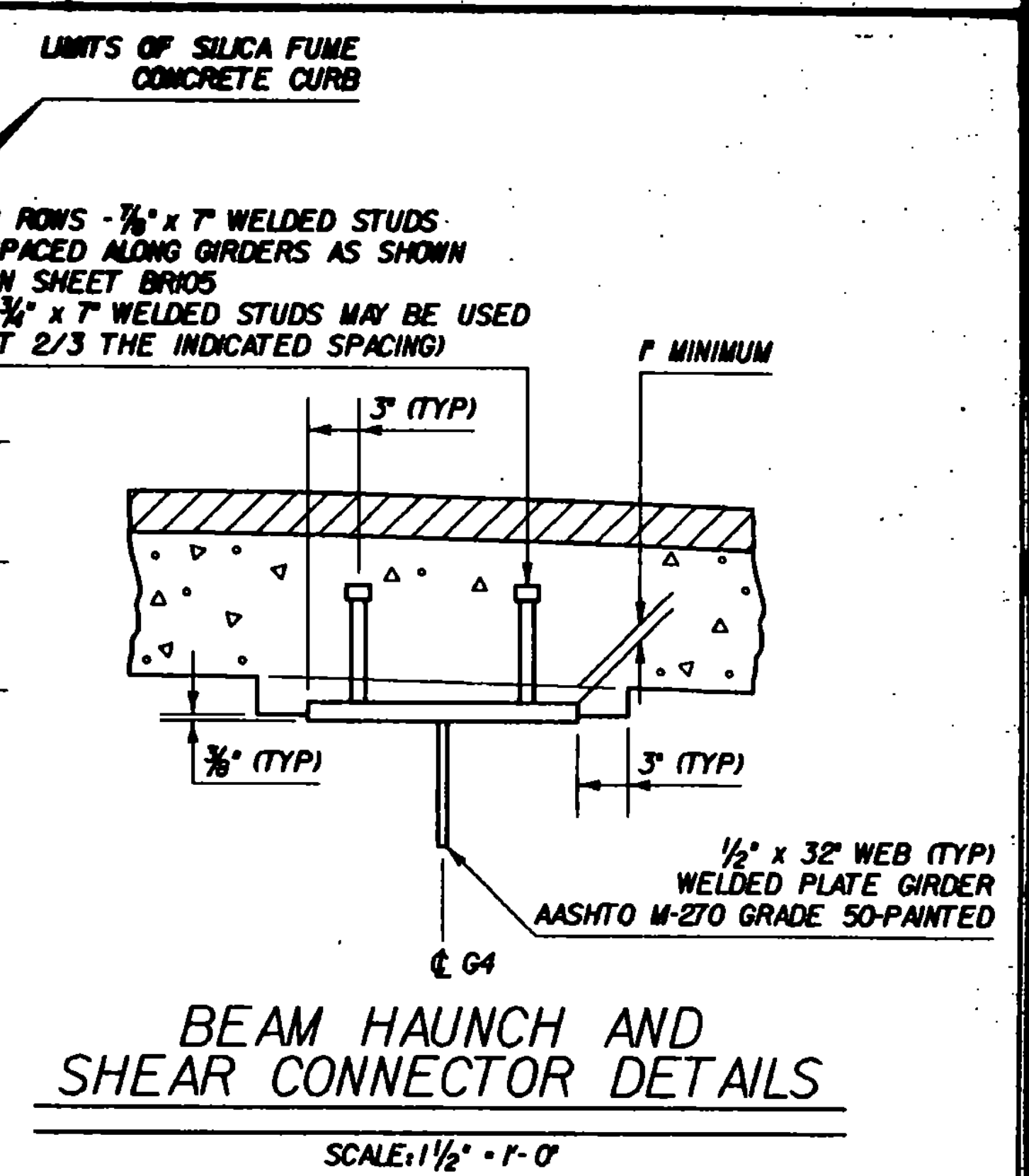
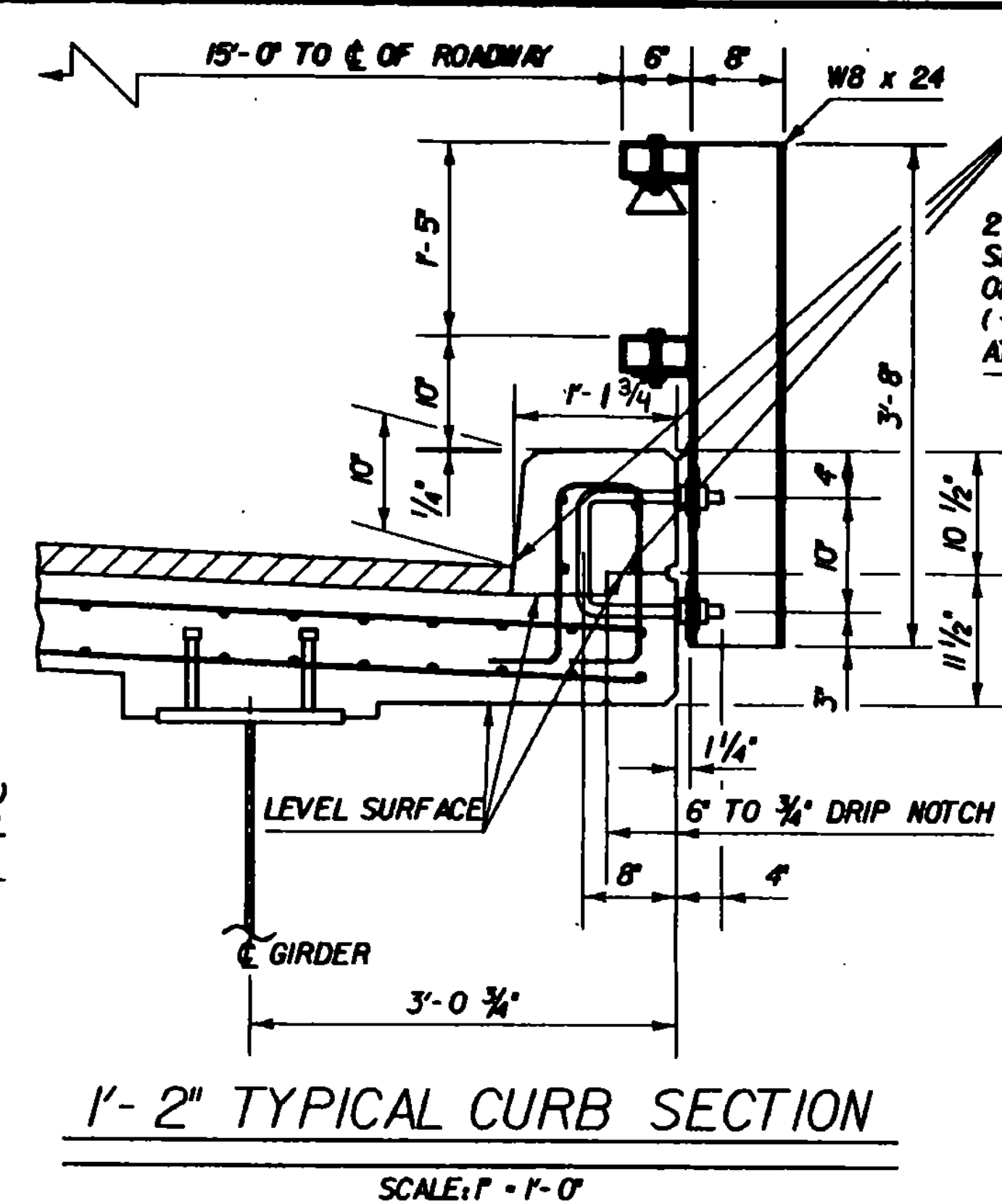
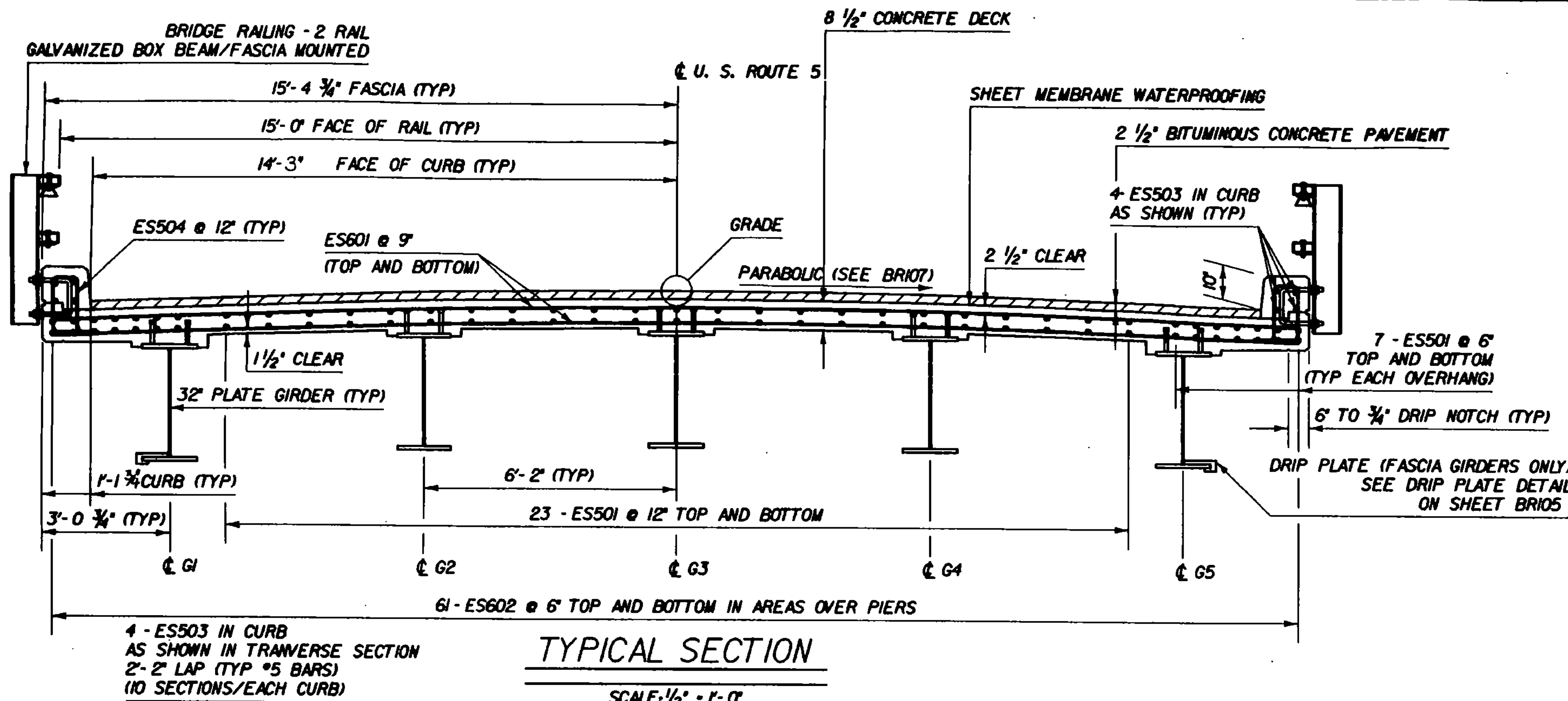
Prepared By: D.J. ROYNE Checked By: RE. SWEET
 SUPERVISOR: E.W. Balkum

NORWICH
BR 102 OF BR 124

PROJECT NO. BHS 0113 (36)
 SHEET NO. 18 OF 70

**STATE OF VERMONT
AGENCY OF TRANSPORTATION
STRUCTURES DIVISION**



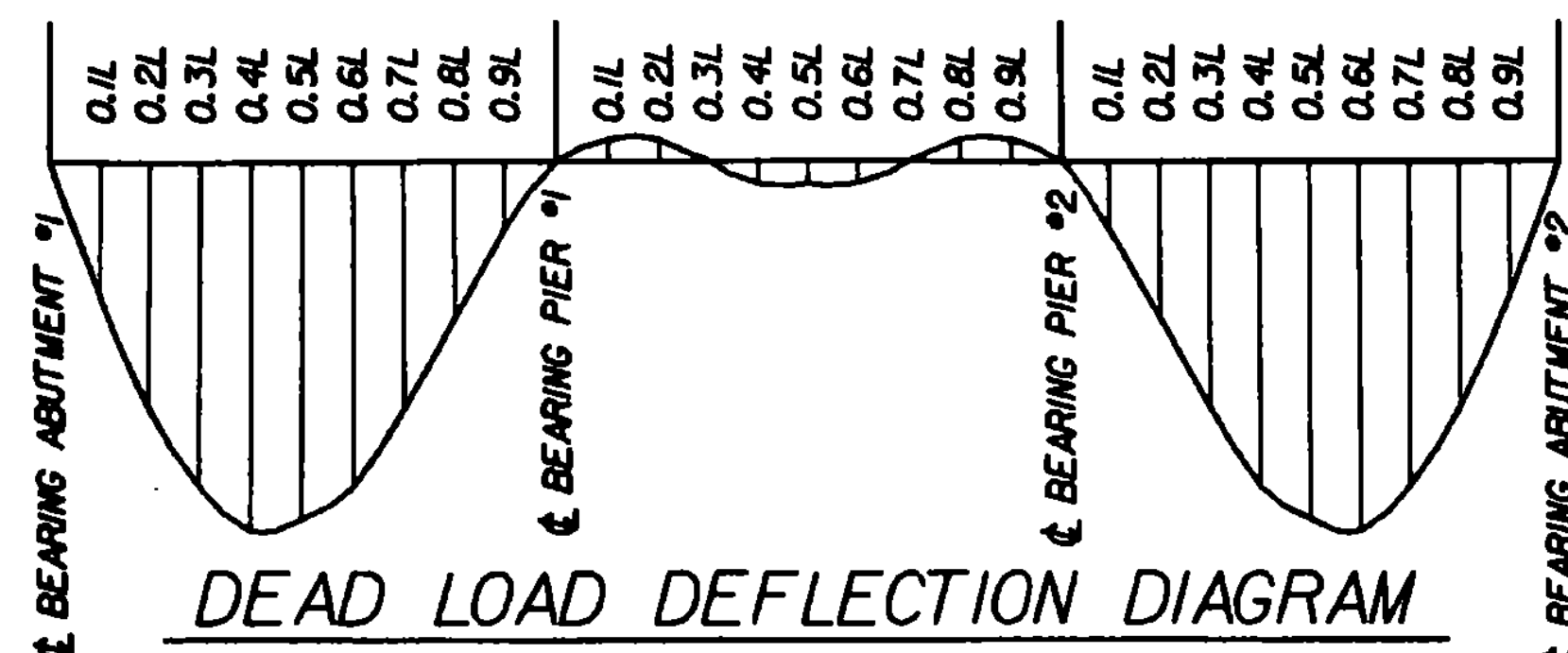


STATE OF VERMONT AGENCY OF TRANSPORTATION			
Town of	NORWICH	Bridge No.	81
Highway No.	U. S. ROUTE 5	Log Sta.	345+47
		Surv. Sta.	345+47
TYPICAL SECTION AND DECK REINFORCING PLAN			
U. S. ROUTE 5 OVER THE OMPOMPANOOSUC RIVER			
Designed By	D. J. HOYNE	Drawn By	K. S. CLAIRMONT
Checked By	D. J. HOYNE	Bridge Design Supervisor	
	2/92	F.W. Bolikum	Date 4/92
PROJECT	NORWICH	PROJECT NO.	BHS 013361
L&C Info.	ZHI (30,47) 778069.DGN/1		
Bridge Sheet No.	BR104	Sheet	20 of 70

E - DENOTES EPOXY COATED BARS
▲ CUT TO FIT IN FIELD

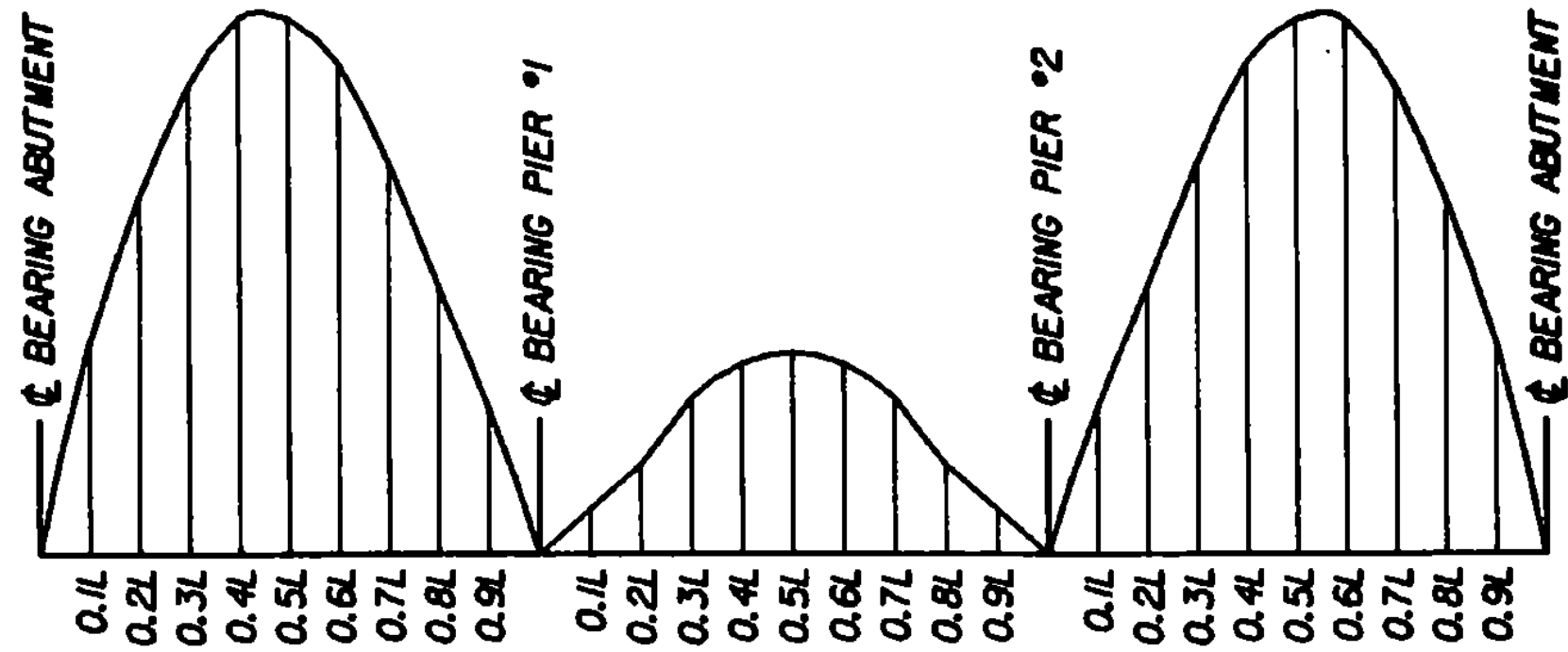
SPAN	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L
1	3/4	1 1/8	1 1/4	2 1/16	2	1 1/8	1 1/4	1 1/8	3/4
2	-1/8	-1/8	0	1/8	1/8	1/8	0	-1/8	-1/8
3	3/8	1/2	1 1/8	1 1/4	2	2 1/8	1 1/4	1 1/8	3/4

SPAN	0.1L	0.2L	0.3L	0.4L	0.5L	0.6L	0.7L	0.8L	0.9L
1	1 1/8	2	2 3/8	3	3	2 3/8	2 3/8	1 1/2	1 1/8
2	1/4	1/2	3/4	1 1/8	1 1/8	1 1/8	3/4	1/2	1/4
3	1 1/8	1 1/2	2 3/8	2 3/4	3	3	2 3/8	2	1 1/8



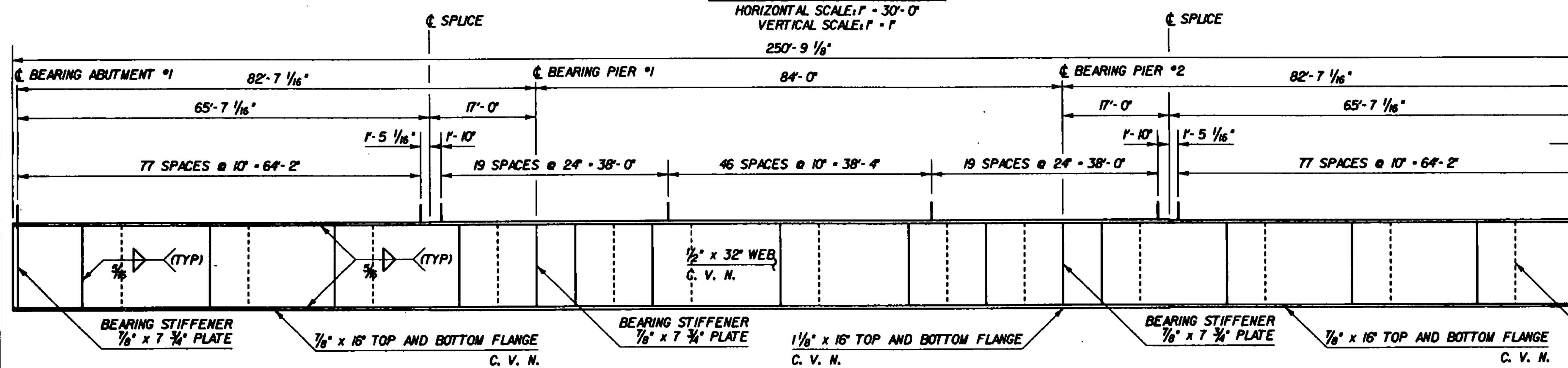
DEAD LOAD DEFLECTION DIAGRAM

HORIZONTAL SCALE: 1" = 30'-0"
VERTICAL SCALE: 1" = 1"



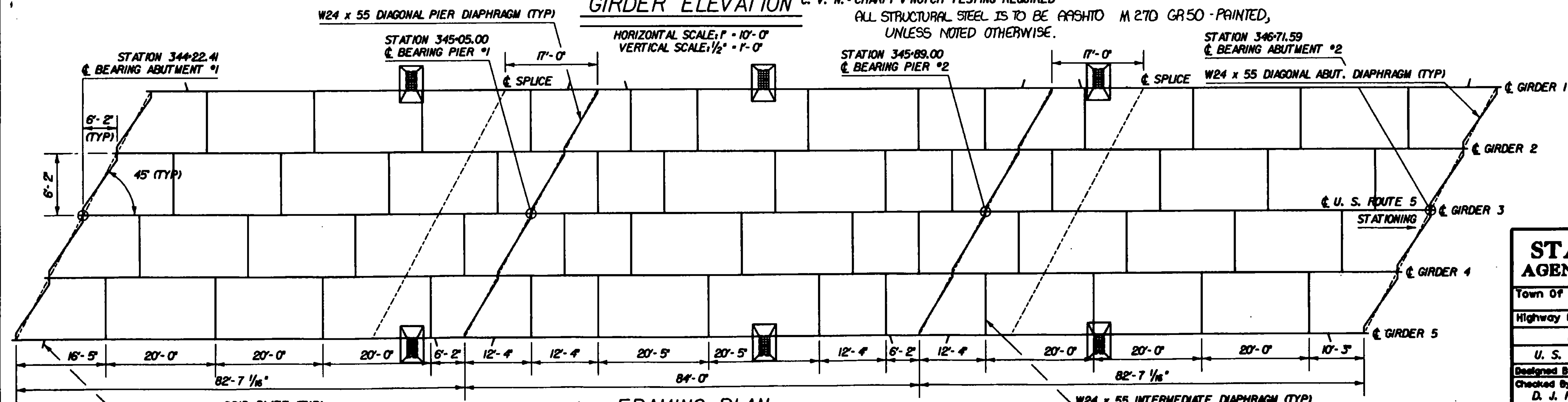
CAMBER DIAGRAM

HORIZONTAL SCALE: 1" = 30'-0"
VERTICAL SCALE: 1" = 1"



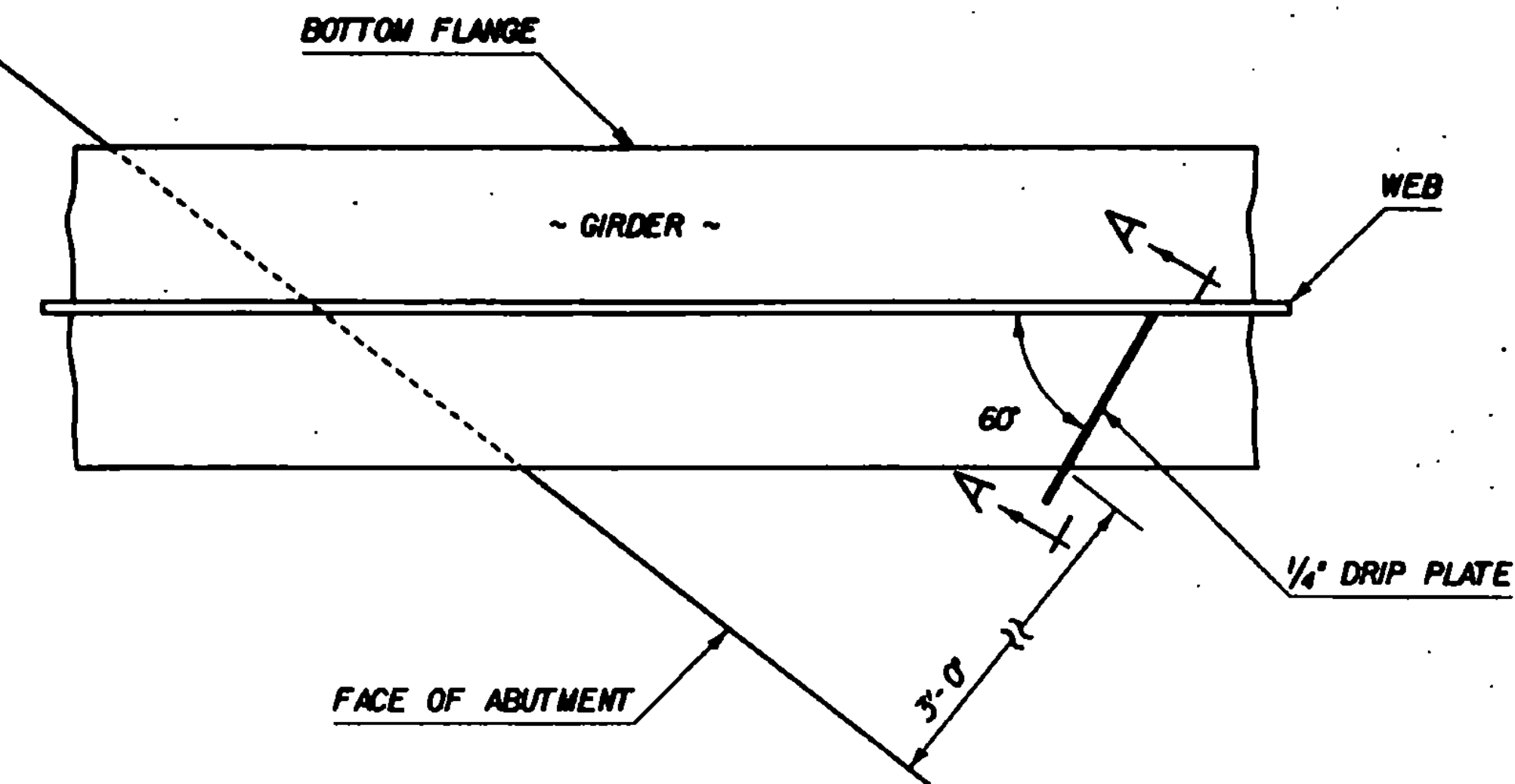
GIRDER ELEVATION

HORIZONTAL SCALE: 1" = 10'-0"
VERTICAL SCALE: 1/2" = 1'-0"



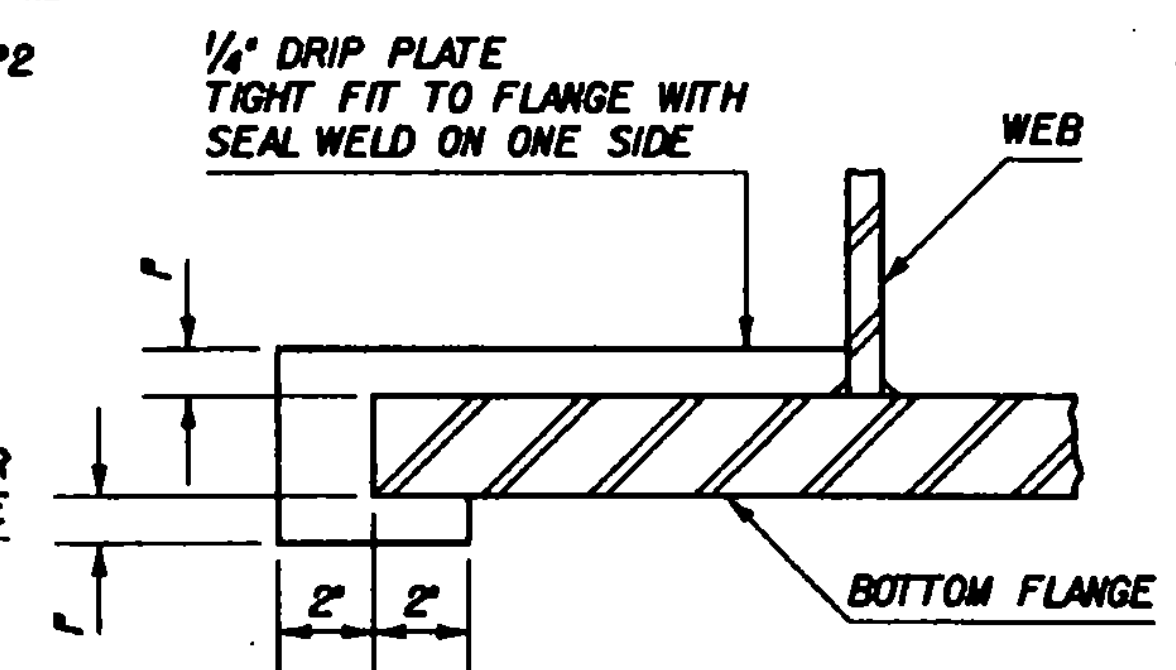
FRAMING PLAN

HORIZONTAL SCALE: 1" = 10'-0"
VERTICAL SCALE: 1/8" = 1'-0"



DRIP PLATE PLAN

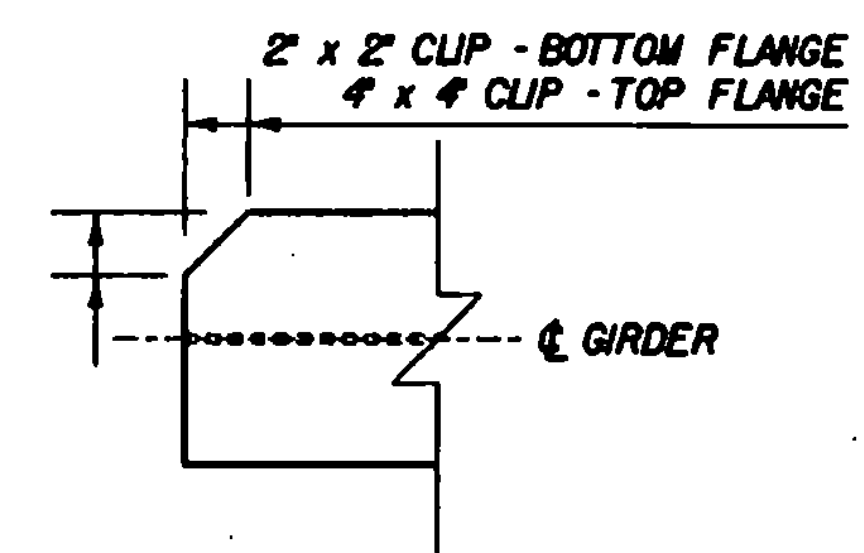
NOT TO SCALE



SECTION A-A

NOT TO SCALE

NOTE: Drip plates shall be placed on the outside edge of fascia girders, or as indicated on the project plans.

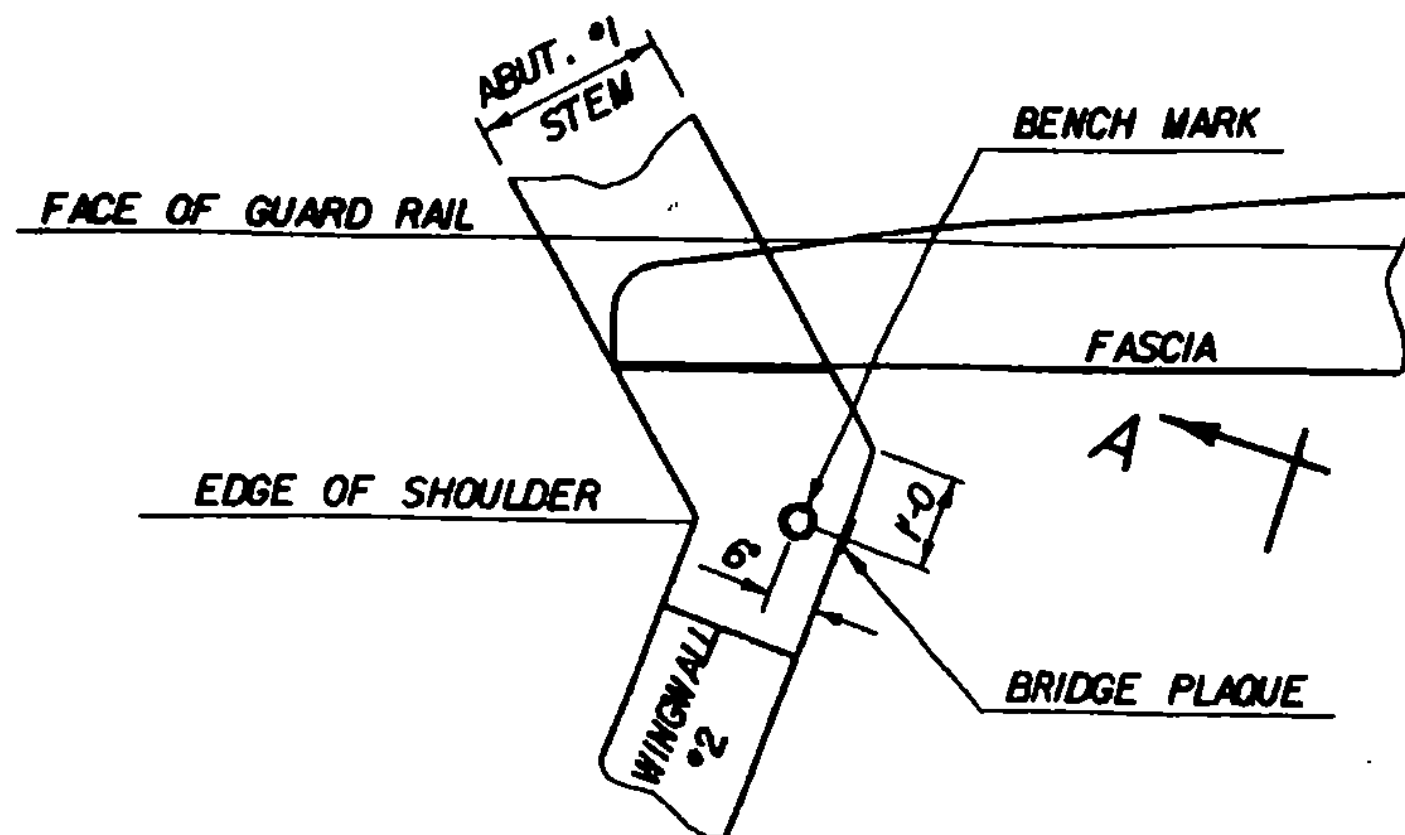


FLANGE CLIP DETAIL

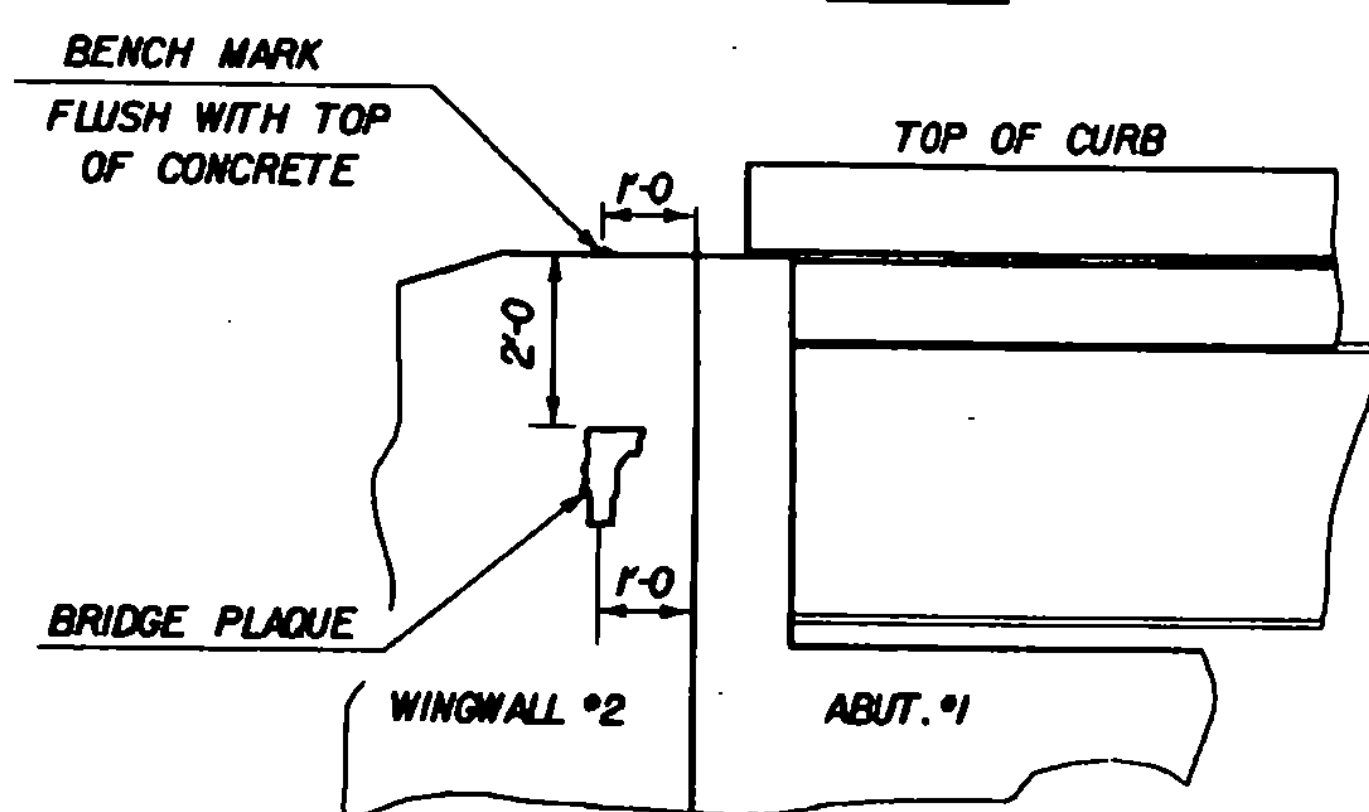
NOT TO SCALE

STATE OF VERMONT			
AGENCY OF TRANSPORTATION			
Town of	NORWICH	Bridge No.	81
Highway No.	U. S. ROUTE 5	Log Sta.	345-47
		Surv. Sta.	345-47
FRAMING PLAN AND GIRDER ELEVATION			
U. S. ROUTE 5 OVER THE OMPOMPOOSUC RIVER			
Designed By	D. J. HOYNE	Drawn By	K. S. CLARIMONT
Checked By	D. J. HOYNE	Bridge Design Supervisor	
	2/92	F.Y. Bolcum	Date 1/92
PROJECT	NORWICH	PROJECT NO.	BHS 0113136
I&C Info.	ZH1130, 471 TTB069FP, DGN11		
Bridge Sheet No.	BR05	Sheet	21 of 70





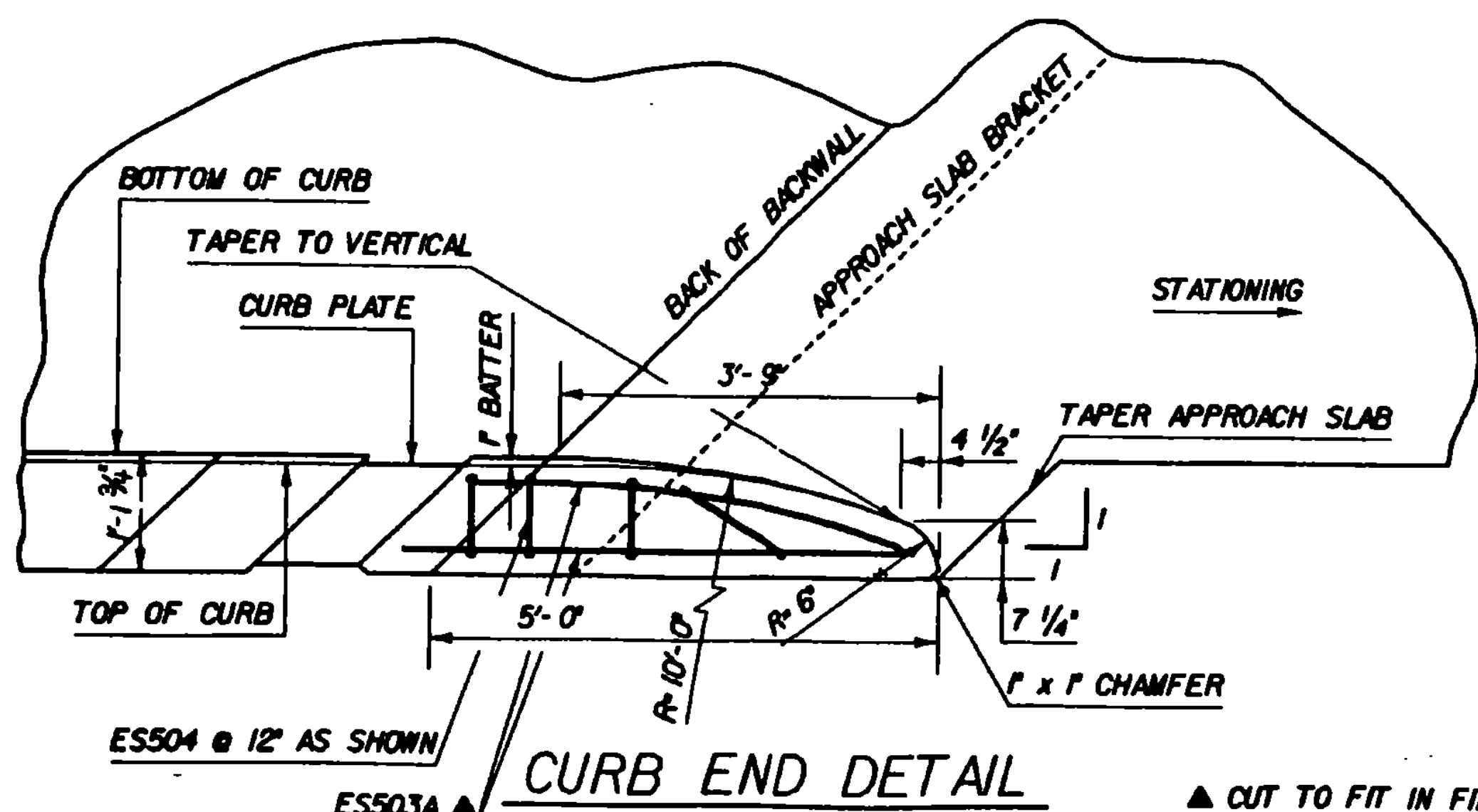
PLAN



VIEW 'A - A'

LOCATE BENCH MARK AND BRIDGE PLAQUE

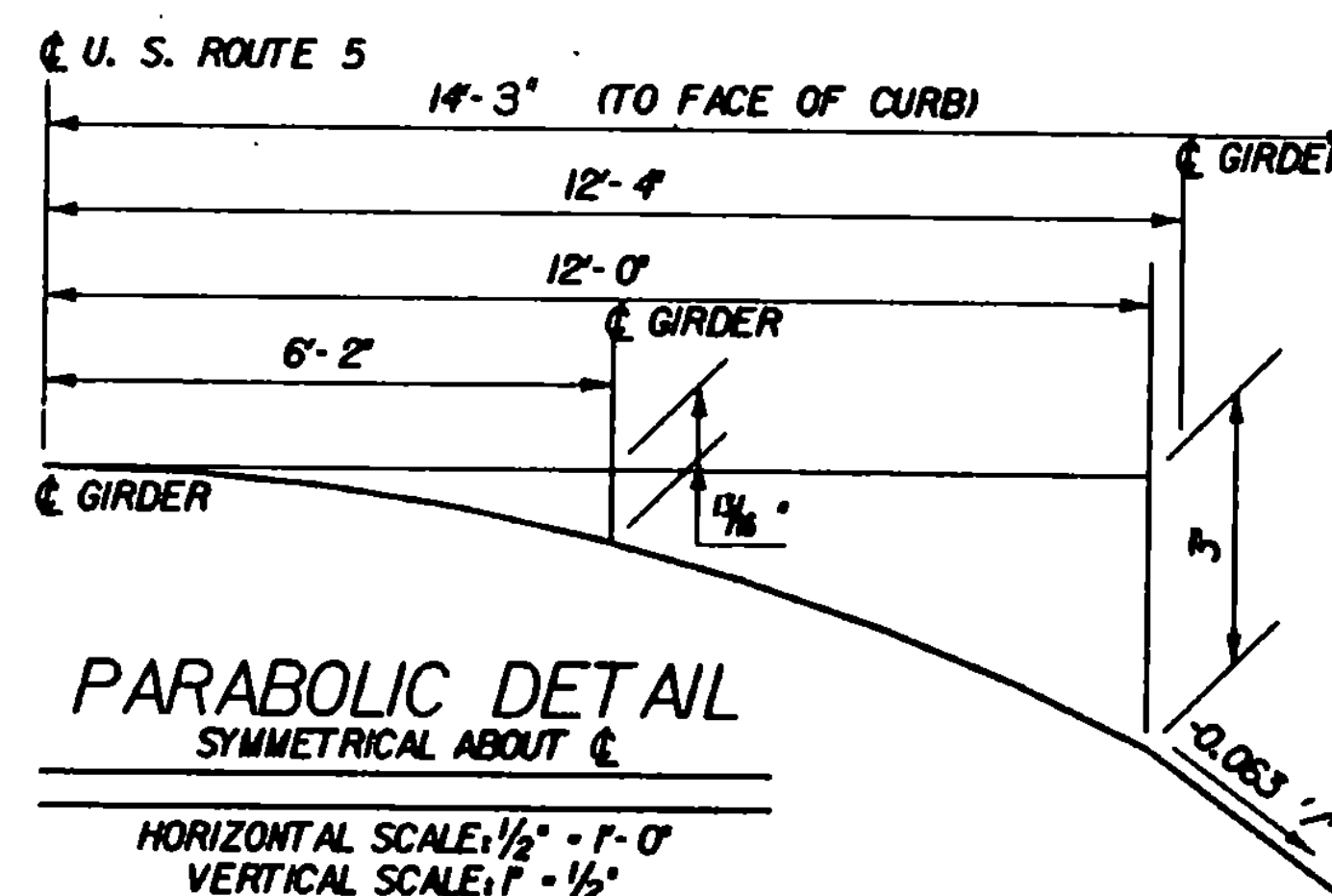
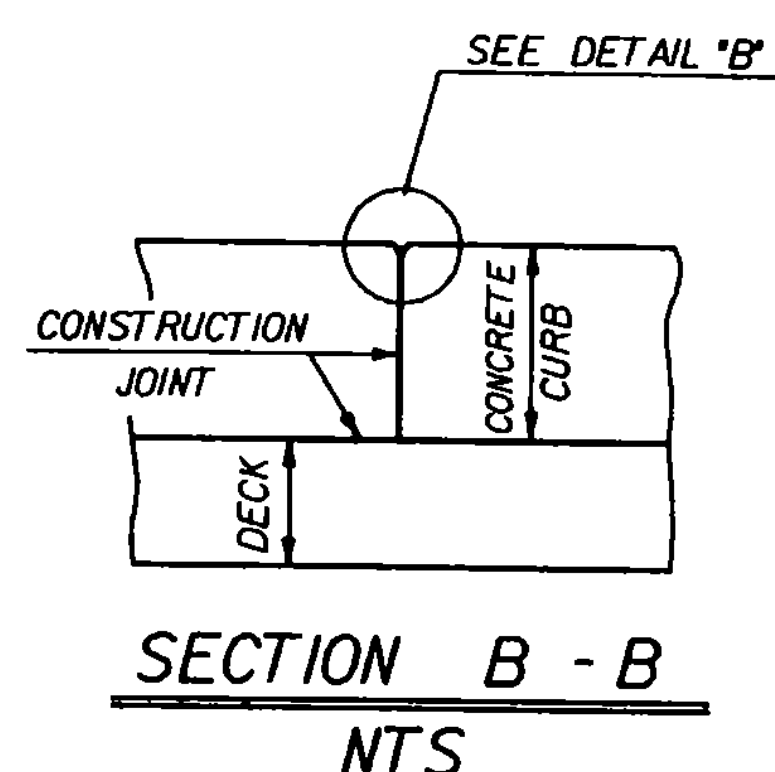
THE BENCH MARK AND BRIDGE PLAQUE WILL BE SUPPLIED BY THE AGENCY OF TRANSPORTATION AND SHALL BE INSTALLED BY THE CONTRACTOR AT ABUTMENT #1 ON THE RIGHT SIDE AS SHOWN OR AS DIRECTED BY THE ENGINEER.



CURB END DETAIL

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

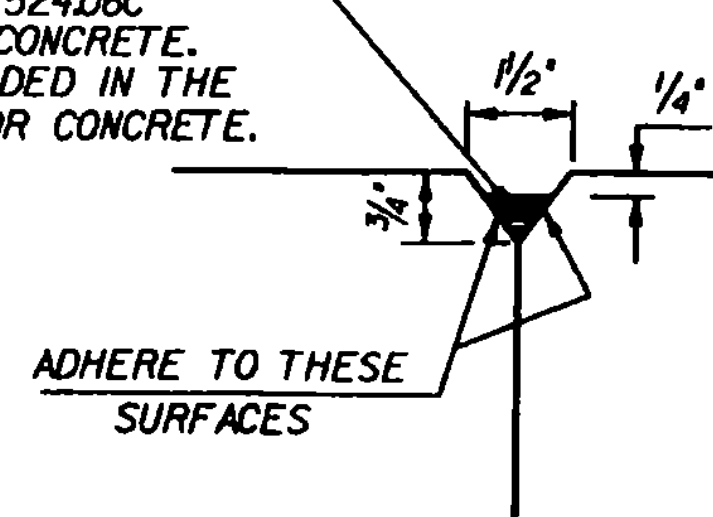
▲ CUT TO FIT IN FIELD



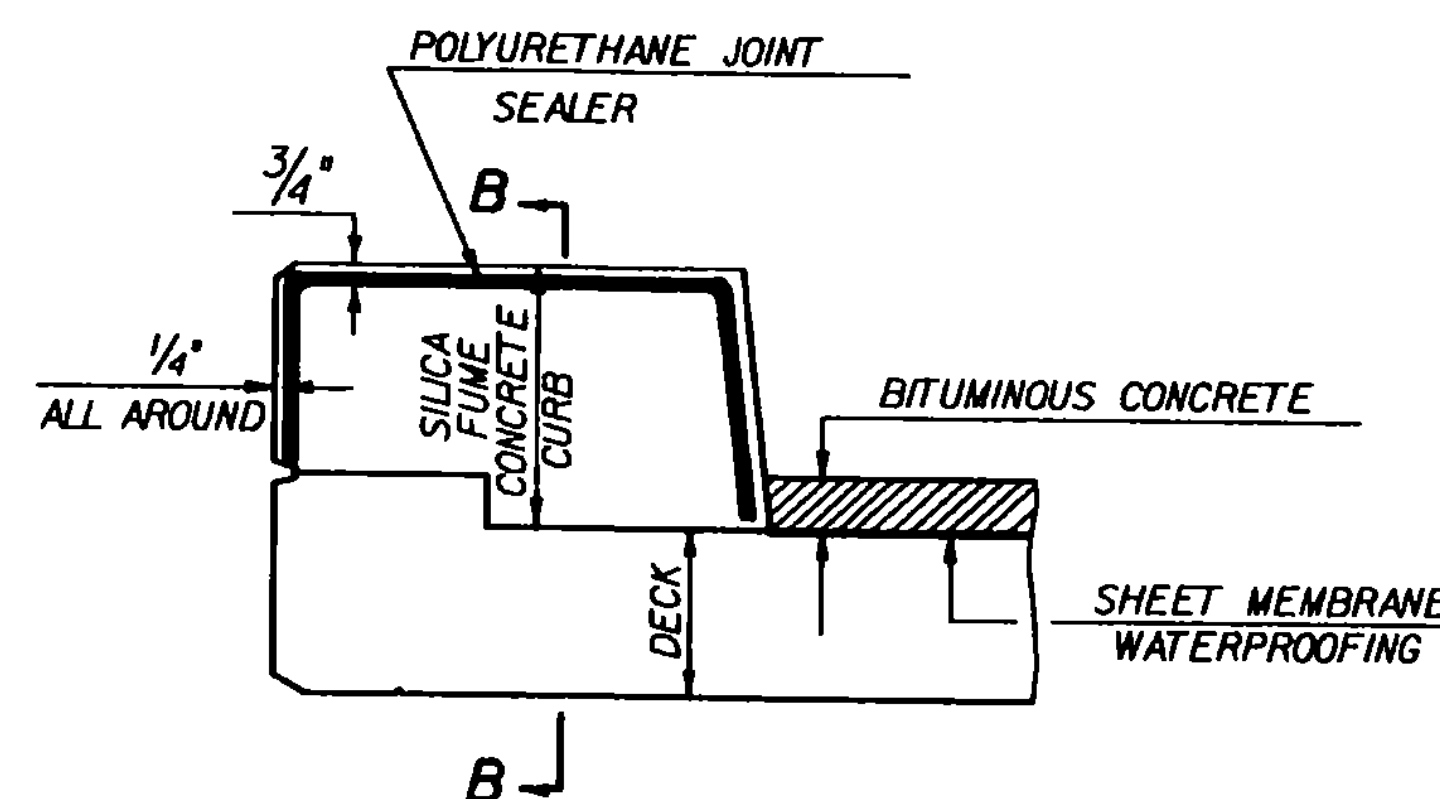
PARABOLIC DETAIL
SYMMETRICAL ABOUT C

HORIZONTAL SCALE: 1/2" = 1'-0"
VERTICAL SCALE: 1" = 1/2"

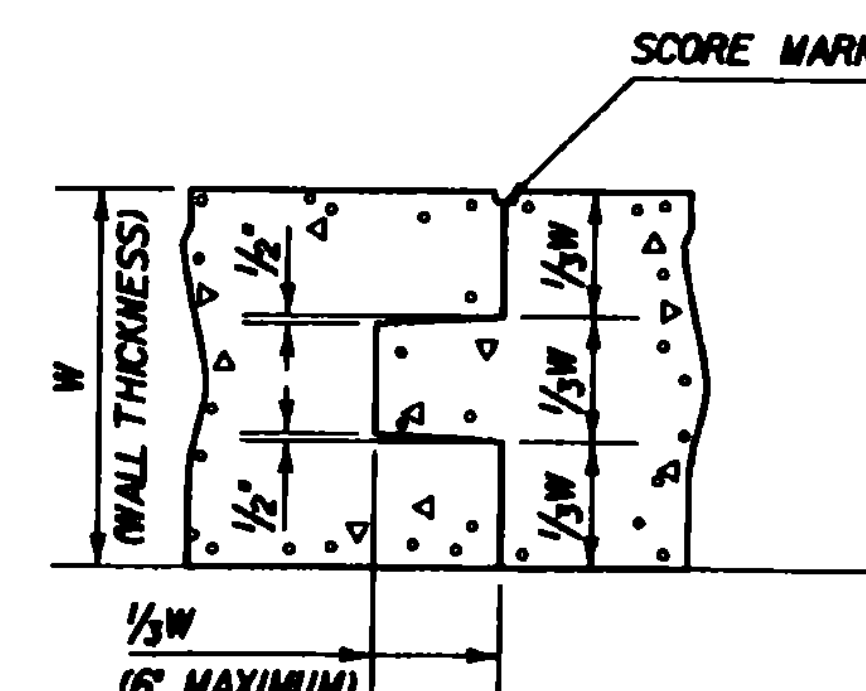
POLYURETHANE JOINT SEALER
PER SUBSECTION 524.06C
COLOR TO MATCH CONCRETE.
COST TO BE INCLUDED IN THE
UNIT PRICE BID FOR CONCRETE.



DETAIL 'B'
NTS



TYPICAL SECTION THROUGH
CONCRETE CURB CONSTRUCTION JOINT
NTS

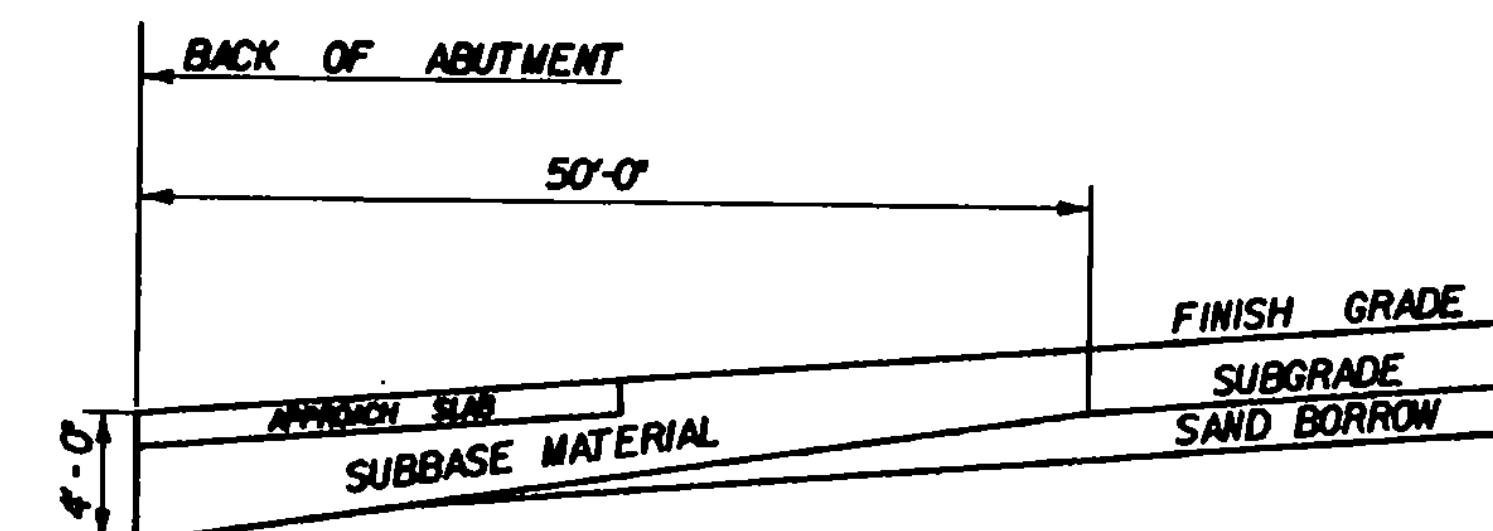


TYPICAL CONCRETE CONSTRUCTION JOINT

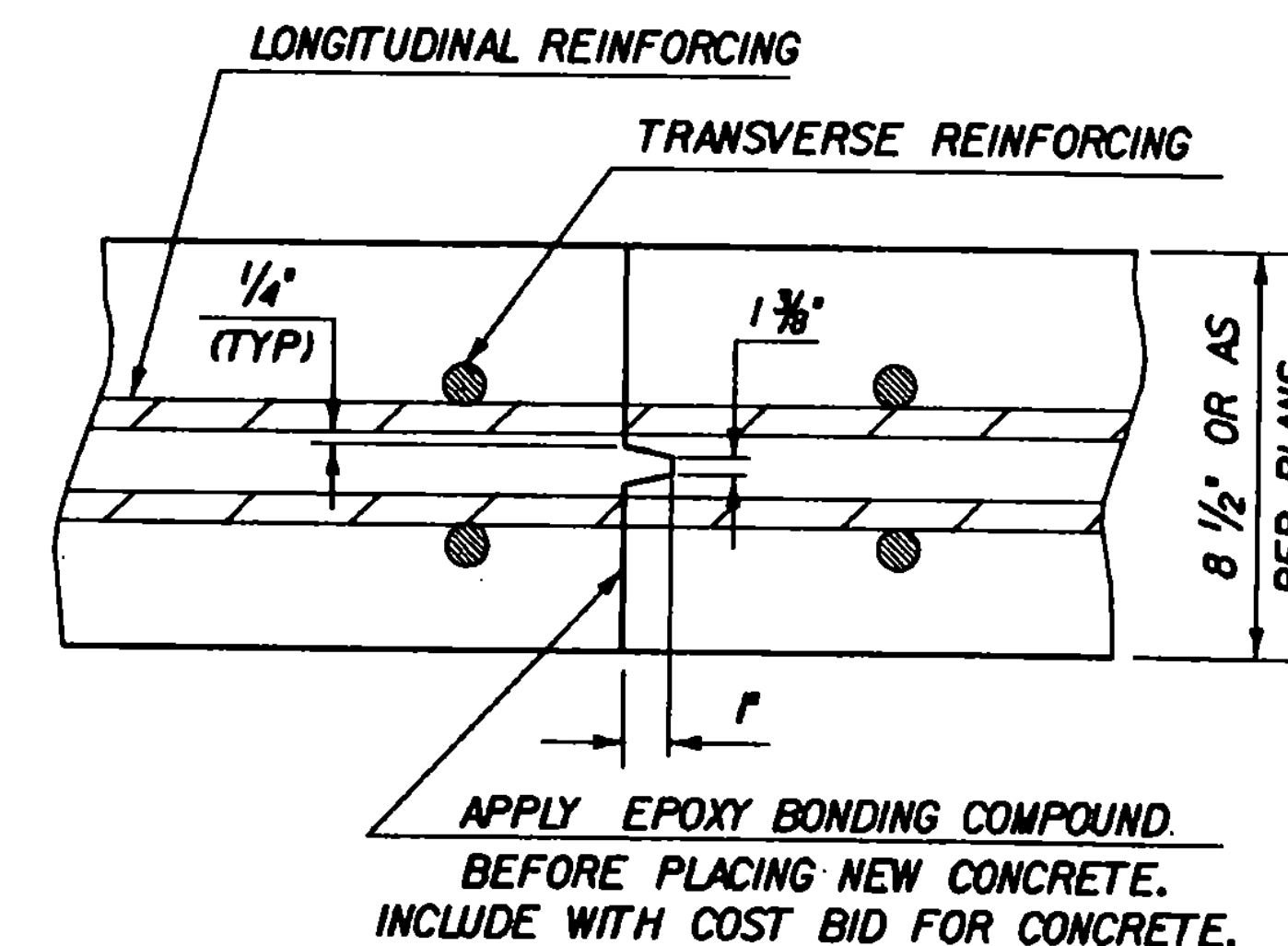
NOT TO SCALE

NOTES

1. CONSTRUCTION JOINTS THROUGH CONCRETE CURBS SHALL BE SPACED MAXIMUM 20'-0" CENTER TO CENTER AND SHALL BE 1'-6" MINIMUM FROM THE CENTER OF THE NEAREST BRIDGE RAIL POST. CONCRETE SHALL BE PLACED IN ALTERNATING SECTIONS WITH A MINIMUM OF 48 HOURS DELAY BETWEEN ADJACENT POURS.
2. LONGITUDINAL REINFORCING SHALL PASS THROUGH CONCRETE CURB CONSTRUCTION JOINTS. CURB REINFORCING STIRRUP BARS SHALL BE TURNED AS REQUIRED TO FIT FLARED ENDS.



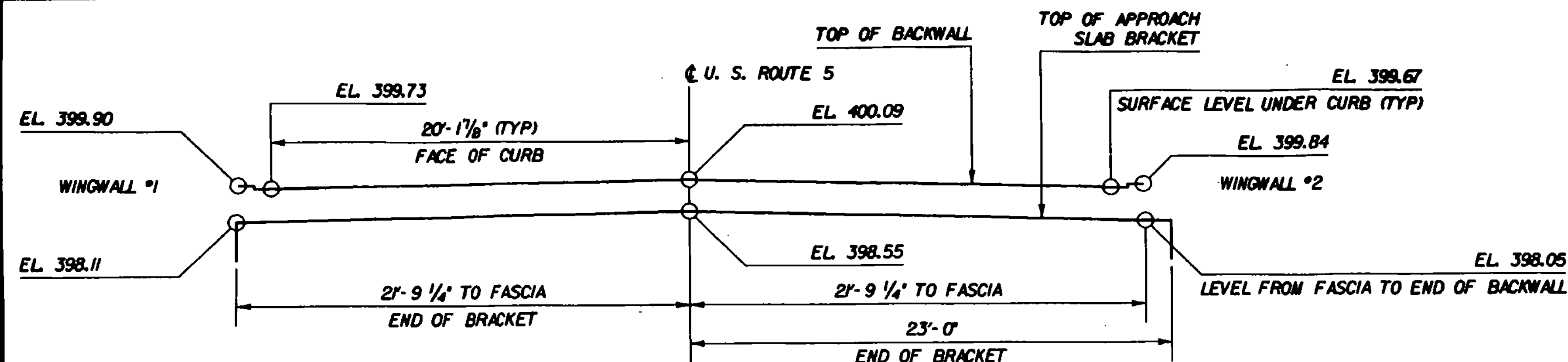
SUBBASE DETAIL AT ABUTMENTS
(ELEVATION IN CUT AND FILL
NOT TO SCALE)



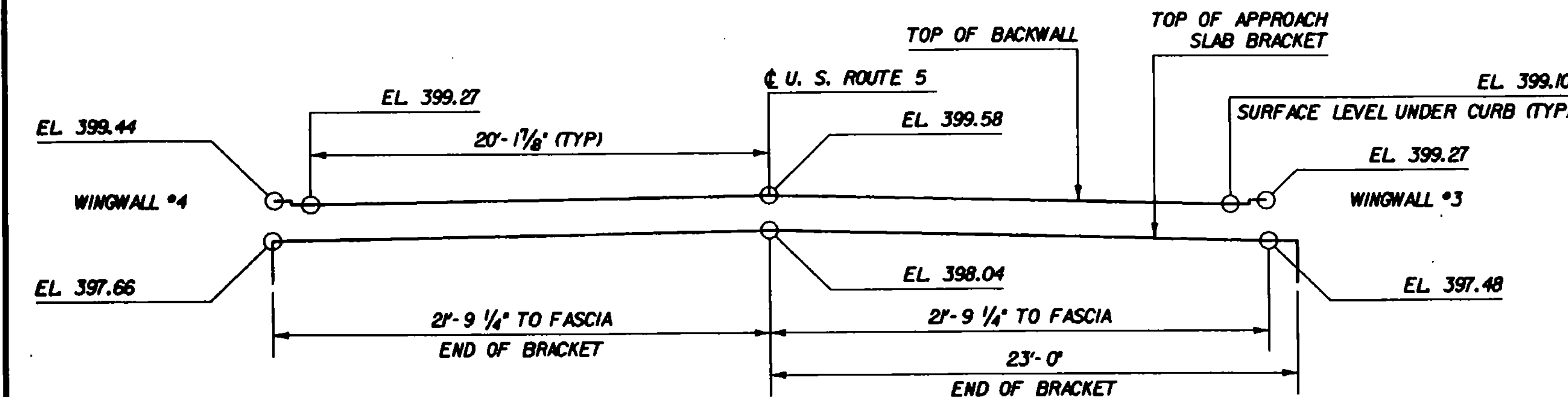
TRANSVERSE BRIDGE SLAB
CONSTRUCTION JOINT DETAILS
NOT TO SCALE

STATE OF VERMONT AGENCY OF TRANSPORTATION

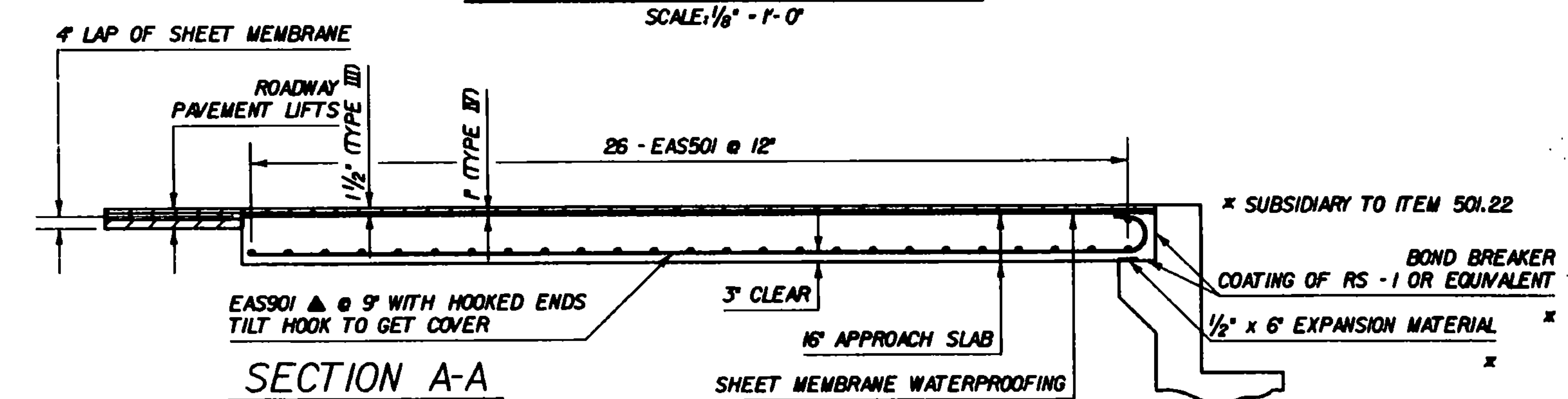
Town of	NORWICH	Bridge No.	81
Highway No.	U. S. ROUTE 5	Log Sta.	345+47
		Surv. Sta.	345+47
MISCELLANEOUS DETAILS			
U. S. ROUTE 5 OVER THE OMPOMPOOSUC RIVER			
Designed By	D. J. HOYNE	Drawn By	K. S. CLAIRMONT
Checked By	D. J. HOYNE	Date	2/92
		Bridge Design Supervisor	F. W. BOLKUM
PROJECT	NORWICH	PROJECT NO.	BHS 0113361
L&C Info.	ZH1 (30, 47) 77B069MD.DGN.1		
Bridge Sheet No.	BR107	Sheet	23 of 70



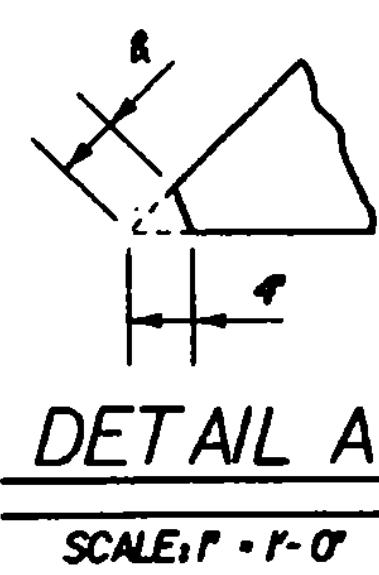
**ABUTMENT #1 BACKWALL ELEVATION
(LOOKING AT THE BACK OF THE BACKWALL)**
SCALE: 1/4" = 1'-0"



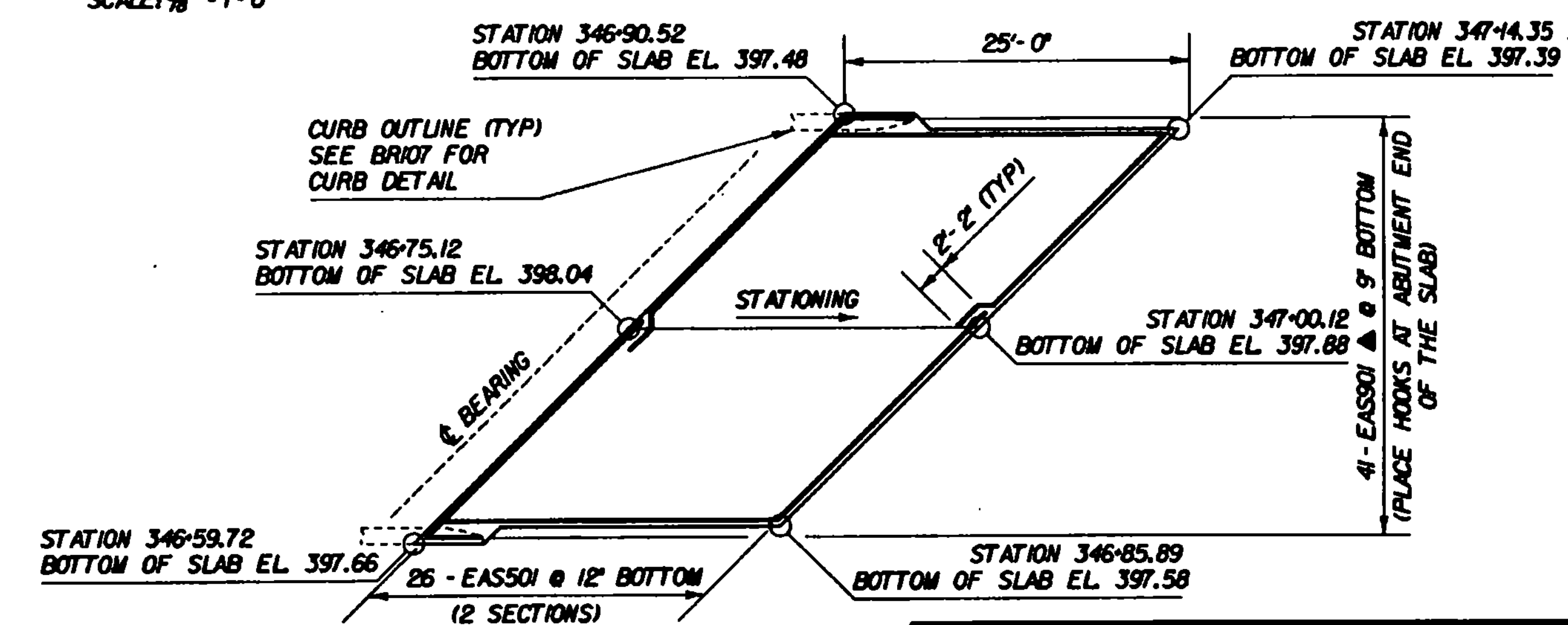
**ABUTMENT #2 BACKWALL ELEVATION
(LOOKING AT THE BACK OF THE BACKWALL)**
SCALE: 1/4" = 1'-0"



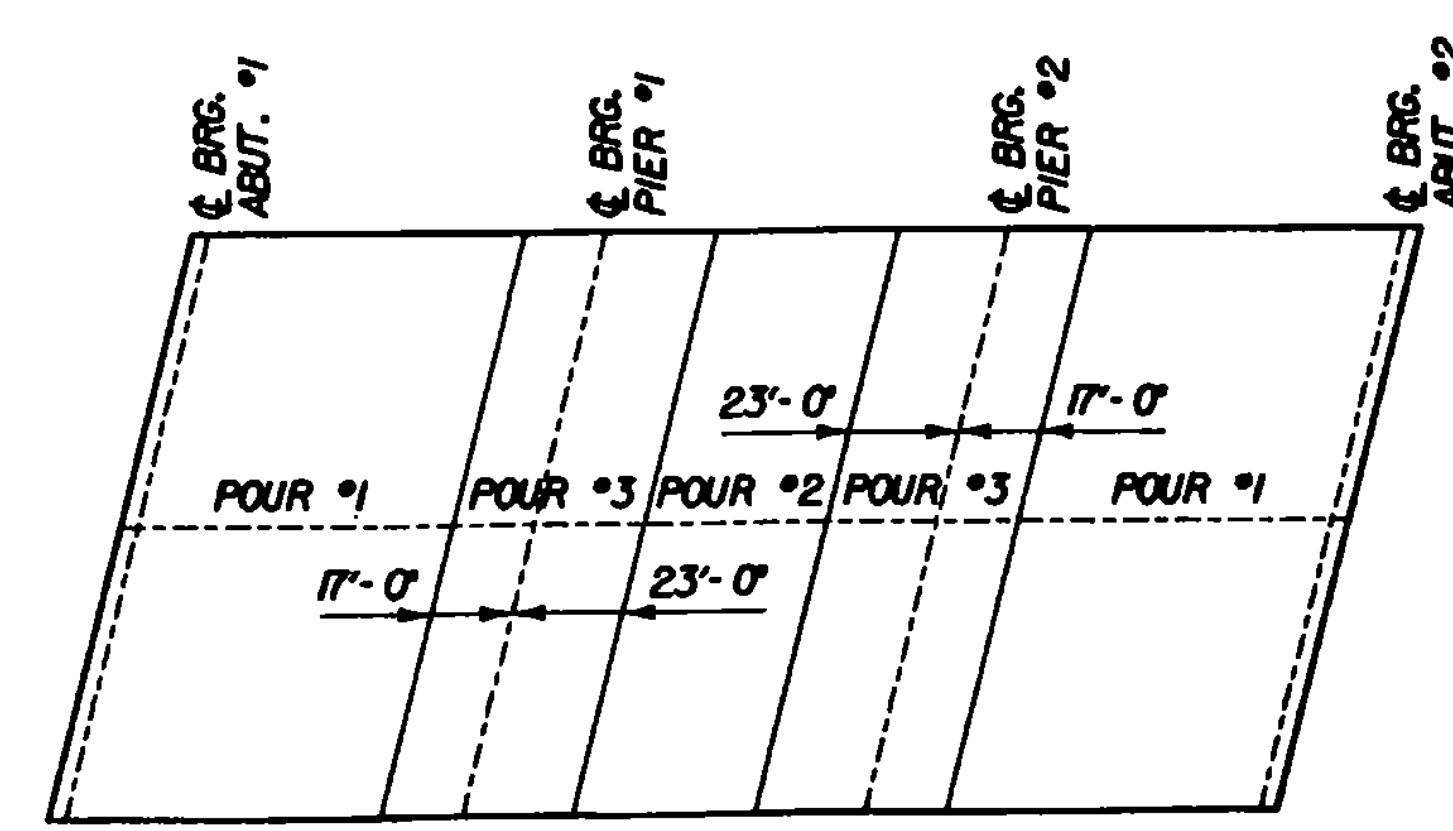
SECTION A-A
SCALE: 1/8" = 1'-0"



DETAIL A
SCALE: 1" = 1'-0"



APPROACH SLAB #2 PLAN
SCALE: 1/8" = 1'-0"



POUR SEQUENCE
HORIZONTAL SCALE: 1" = 40'-0"
VERTICAL SCALE: 1" = 10'-0"

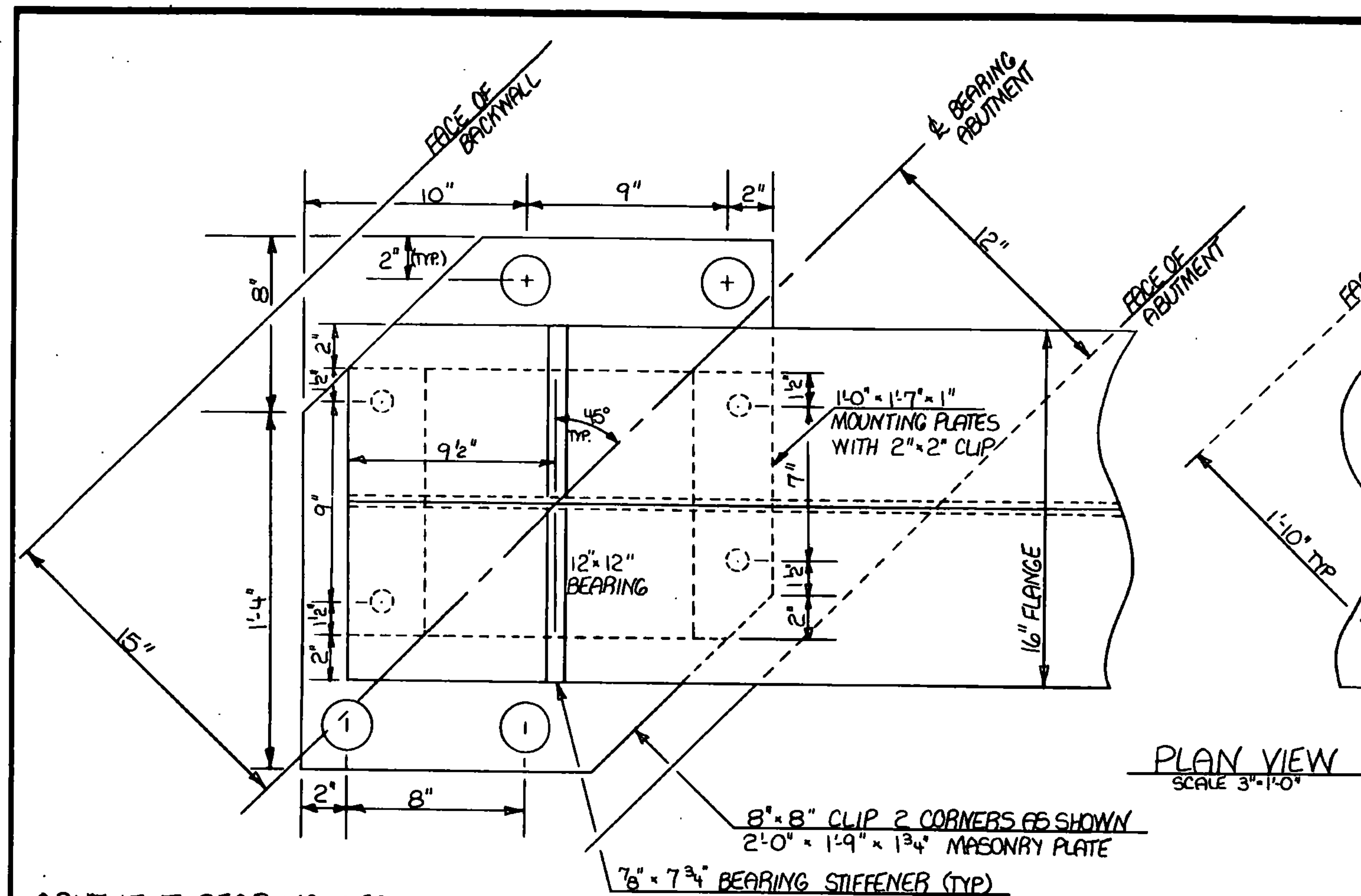
NOTES

1. ALL POURS MARKED *1 AND *2 SHALL BE COMPLETED BEFORE POURS MARKED *3 ARE STARTED.
2. IF APPROVED BY THE ENGINEER, POURS *1 AND *2 MAY BE POURED THE SAME DAY PROVIDED:
A. THE POURING SEQUENCE IS FOLLOWED.
B. THE MAXIMUM TIME SPAN OF ANY COMBINATION OF POURS IS EIGHT (8) HOURS.
C. A RETARDING ADMIXTURE IS USED SO THAT THE DECK CONCRETE WILL NOT SET UP UNTIL ALL THE POUR HAS BEEN MADE. THE RETARDING ADMIXTURE WILL BE SUBSIDIARY TO THE ITEM 501.22 CONCRETE CLASS A.
3. A MINIMUM WAITING PERIOD OF NINETY-SIX (96) HOURS IS REQUIRED FOR ANY SUBSEQUENT POURS.
4. USE BRIDGE SLAB CONSTRUCTION JOINTS BETWEEN POURS (SEE DETAIL BRIOT)
5. ALL POURS SHALL START FROM THE LOW END (ELEVATION WISE).
6. ANY POURING SEQUENCE OTHER THE INDICATED SHALL BE SUBMITTED, IN WRITING, TO THE STRUCTURES ENGINEER FOR APPROVAL.

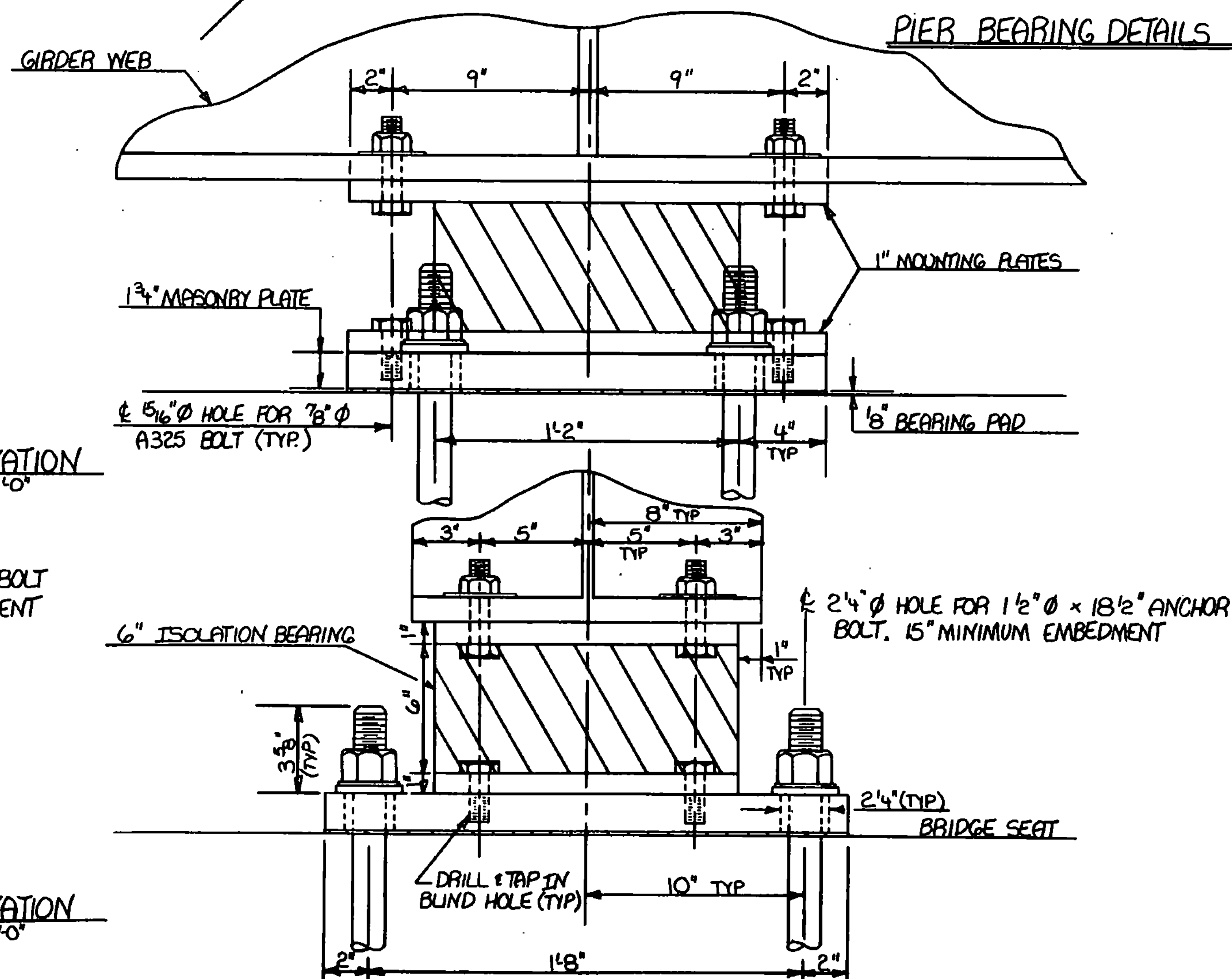
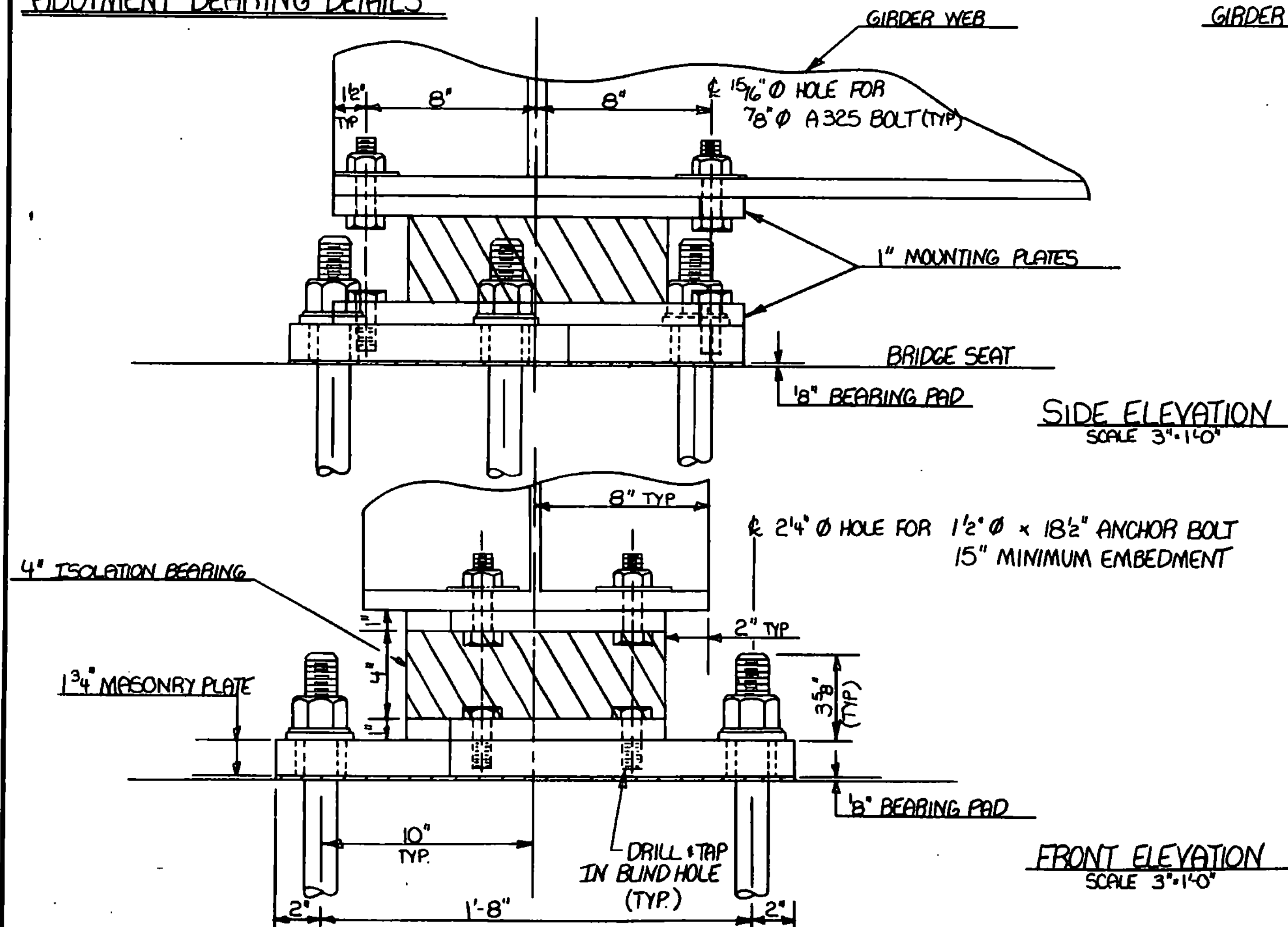
**STATE OF VERMONT
AGENCY OF TRANSPORTATION**

Town Of	NORWICH	Bridge No.	81
Highway No.	U. S. ROUTE 5	Log Sta.	345-47
		Surv. Sta.	345-47
APPROACH SLAB DETAILS			
U. S. ROUTE 5 OVER THE OMPOMPANOOSUC RIVER			
Designed By	D. J. HOYNE	Drawn By	K. S. CLAIRMONT
Checked By	D. J. HOYNE	Bridge Design Supervisor	
		Date	2/92
		F. W. Balkum	Date 4/92
PROJECT	NORWICH	PROJECT NO.	BHS 0113136
L&C. Info.	ZH1(30,47) 77B069AS.DGN.1		
Bridge Sheet No.	BRI08	Sheet	24 of 70

▲ CUT TO FIT IN FIELD



ABUTMENT BEARING DETAILS

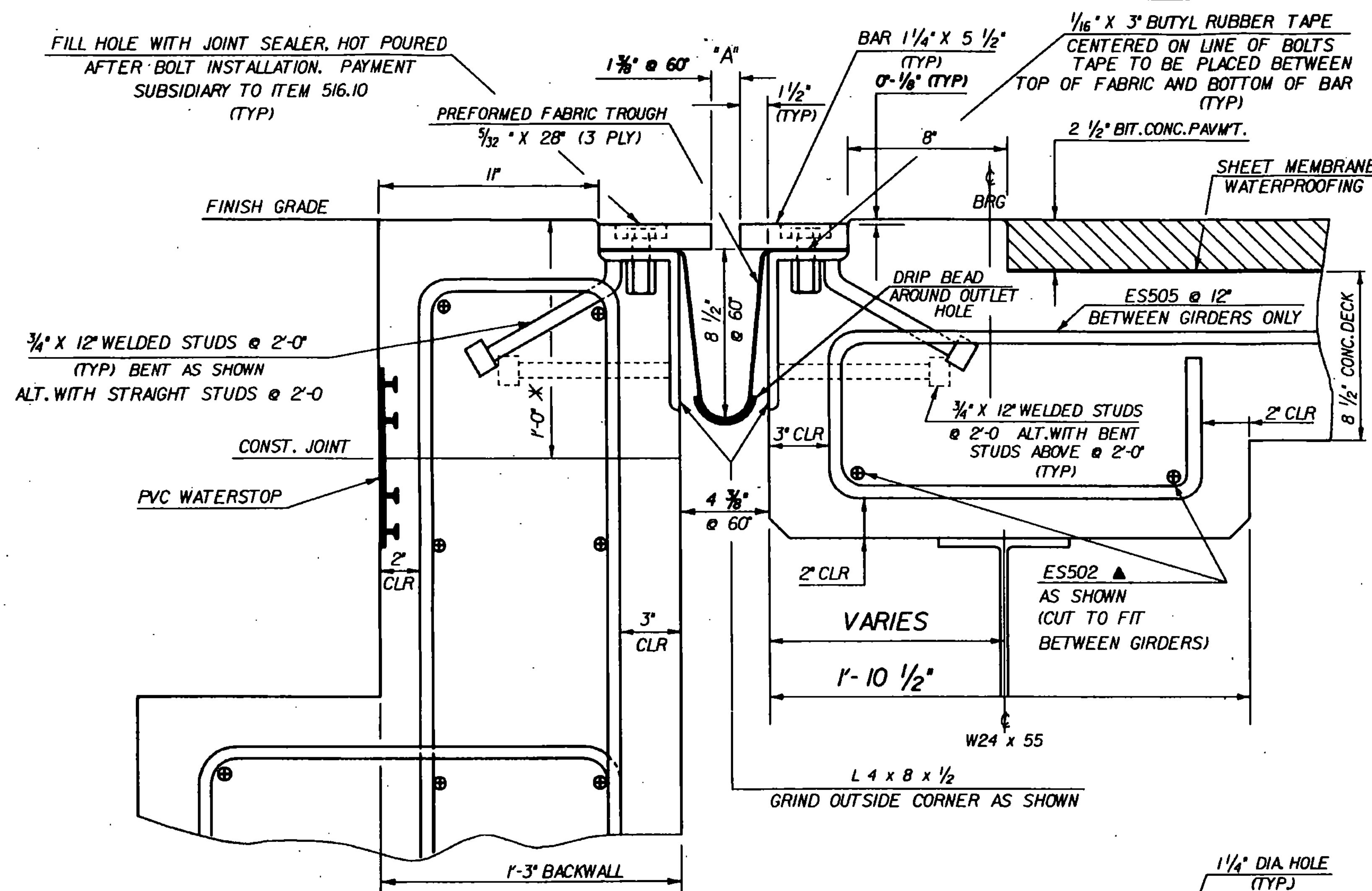


BEARING NOTES

1. ISOLATION BEARING ASSEMBLIES, INCLUDING BASE ISOLATION BEARINGS, MASONRY AND MOUNTING PLATES, ALL BOLT ASSEMBLIES AND BEARING PADS SHALL BE PAID FOR AS 531.10 "BEARING DEVICE ASSEMBLY."
2. THE BASE ISOLATION BEARING SHALL BE DESIGNED SO THAT THE MINIMUM TEMPERATURE SETTING RANGE FOR INSTALLATION WITHOUT THE NEED FOR ADJUSTMENT SHALL BE FROM 20°F TO 70°F.
3. THE DESIGN OF THE CONNECTION OF THE LOAD PLATES, IN THE BASE ISOLATION BEARINGS, TO THE MOUNTING PLATES SHALL BE DONE BY THE DESIGNER OF THE BASE ISOLATION BEARINGS.
4. ALL STEEL PLATES SHALL CONFORM TO AASHTO M-270 GRADE 50.
5. SURFACE FINISH OF MOUNTING PLATES SHALL BE ANSI 2000. THE MOUNTING PLATES SHALL BE METALIZED.
6. THE MASONRY PLATES AND ALL BOLT ASSEMBLIES SHALL BE GALVANIZED.

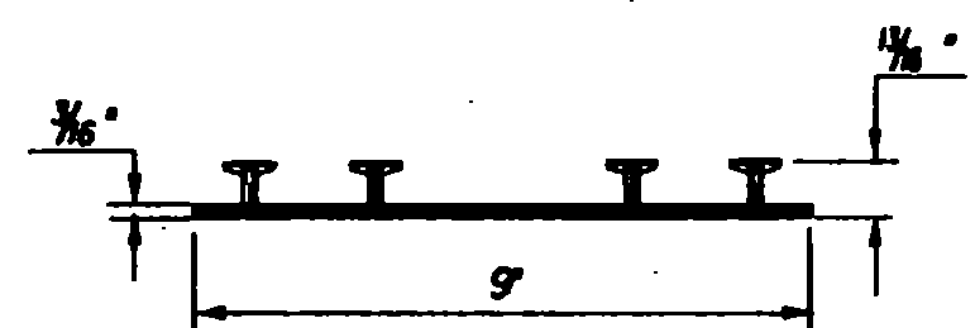
STATE OF VERMONT AGENCY OF TRANSPORTATION

Town of	NORWICH	Bridge No.	81
Highway No.	U.S. ROUTE 5	Log Sta.	345+87
		Surv. Sta.	345+87
U.S. ROUTE 5 OVER THE OMPOMPANOCUC RIVER			
ISOLATION BEARING DETAILS			
Designed By	D.J. HOYNE	Drawn By	D.J. HOYNE
Checked By	C.P. WILLIAMS	Date	2-92
		Bridge Design Supervisor	F.W. Bolkum
PROJECT	NORWICH	PROJECT NO.	BHS 0113 (36)
L&C info.			
Bridge Sheet No.	BR 109	Sheet	25 of 70



TYPICAL SECTION BETWEEN GIRDERS (NORMAL)

SCALE: 3" = 1'-0"



P.V.C. WATERSTOP FOR CONSTRUCTION JOINTS

THE COSTS FOR P.V.C. WATERSTOP SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE. OTHER CONFIGURATIONS MAY BE USED UPON APPROVAL OF THE STRUCTURES ENGINEER.

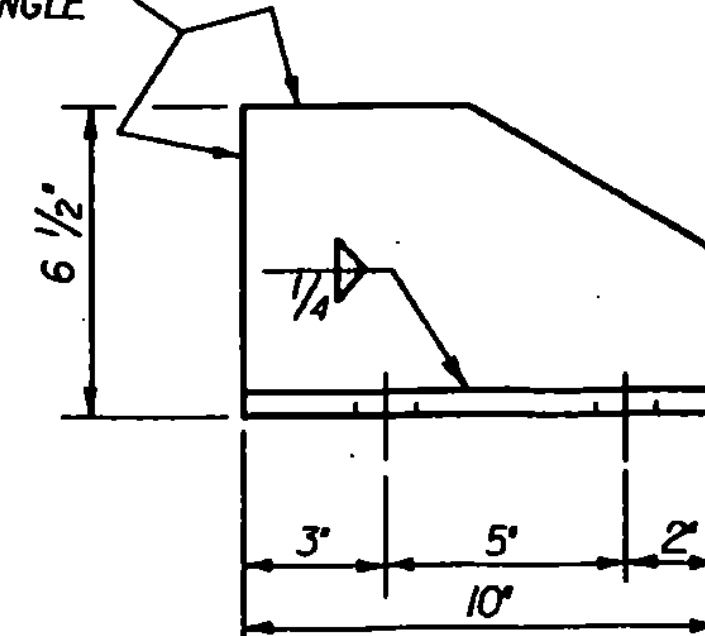
NOTES

1. THE FINAL FINISH OF THE EXPANSION DEVICE SHALL BE COVERED DURING THE PLACING OF BRIDGE DECK CONCRETE.
2. ALL STEEL COMPONENTS SHALL BE AASHTO M270 GRADE 36 GALVANIZED OR METALIZED AS PER SUBSECTION 506J5 (b) OR (c).
3. THE 1 1/4" X 5 1/2" BARS SHALL BE FURNISHED IN 2 PIECES.
4. DETAILS ON THIS SHEET ARE FOR ITEM 516J0 "BRIDGE EXPANSION JOINTS".
5. A 1" DIAMETER PLASTIC DRAIN TUBE SHALL BE INSTALLED AS SHOWN AT THE FACE OF CURB. THE UPPER END IS TO BE PLUGGED WITH STEEL WOOL AND THE LOWER END IS TO EXTEND 1'-0" BELOW THE BOTTOM OF THE ADJACENT GIRDER. THE DRAIN TUBES SHALL BE FASTENED TO THE GIRDERS USING A METHOD APPROVED BY THE ENGINEER.
6. PAYMENT FOR PVC WATERSTOP SHALL BE SUBSIDIARY TO CONCRETE, CLASS B.
7. A DRIP BEAD OF PREFORMED FABRIC MATERIAL SHALL BE CEMENTED TO THE BOTTOM OF THE FABRIC TROUGH USING AN ADHESIVE APPROVED BY THE MANUFACTURER. A DRIP BEAD SHALL BE USED AT EVERY HOPPER LOCATION.

BRACKET PLAN IN BACKWALL

SCALE: 3" = 1'-0"

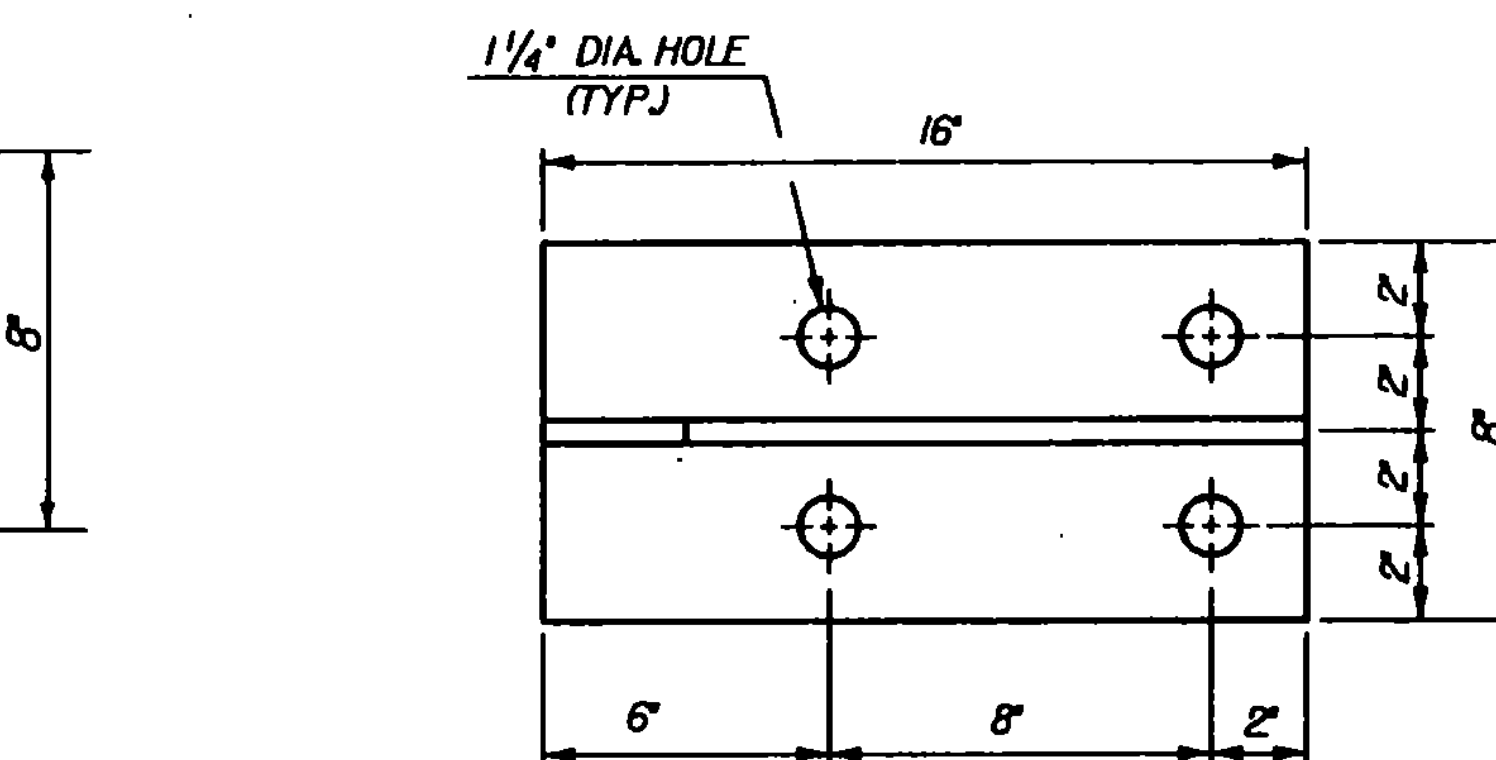
CUT & SHAPE TO FIT AGAINST 8" X 4" ANGLE



BRACKET ELEVATION IN BACKWALL

SCALE: 3" = 1'-0"

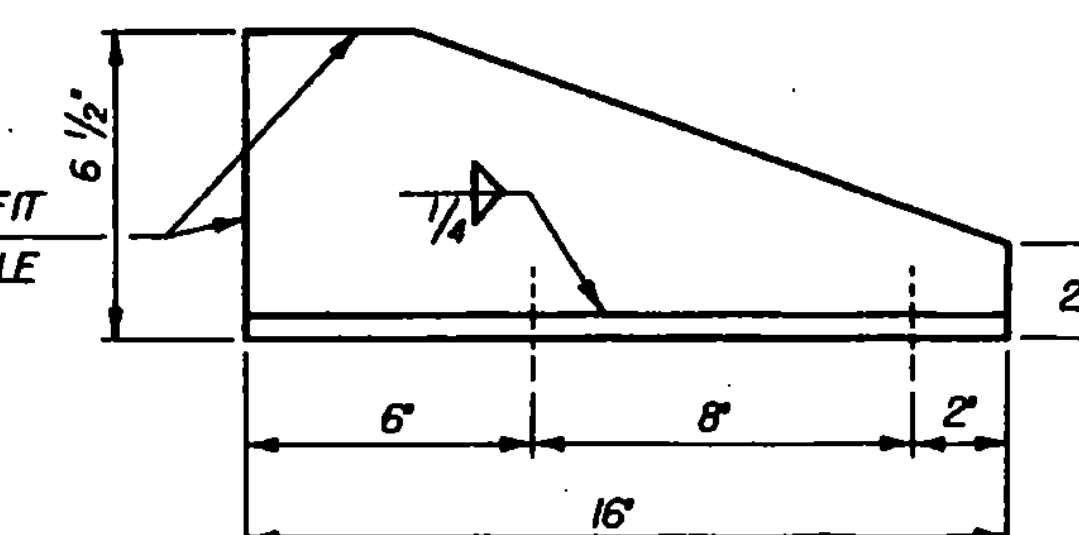
ALL PLATES 1/2"



BRACKET PLAN ON GIRDER

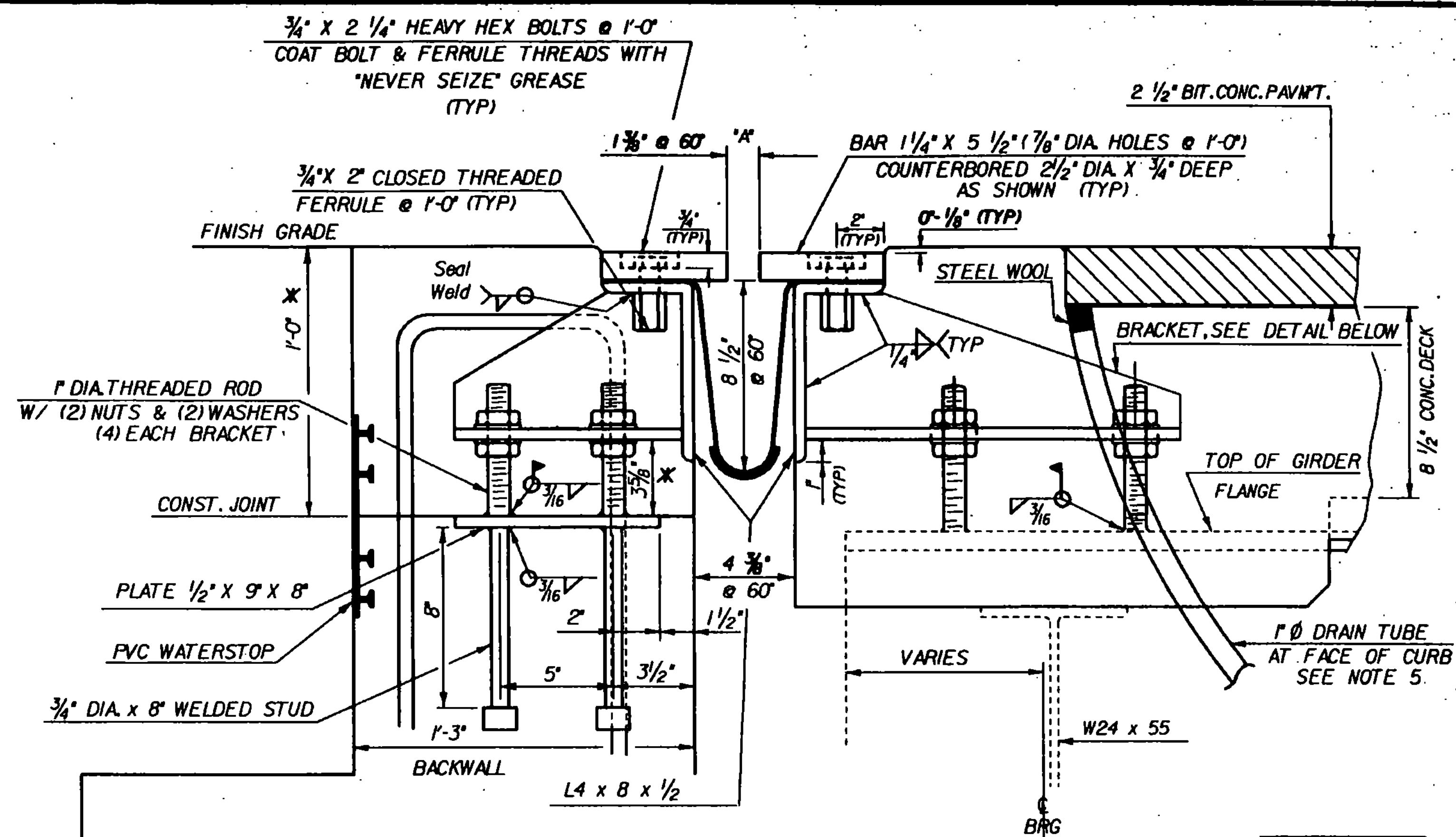
SCALE: 3" = 1'-0"

CUT & SHAPE TO FIT AGAINST 8" X 4" ANGLE



BRACKET ELEVATION ON GIRDER

SCALE: 3" = 1'-0"



TYPICAL SECTION AT GIRDERS (NORMAL)

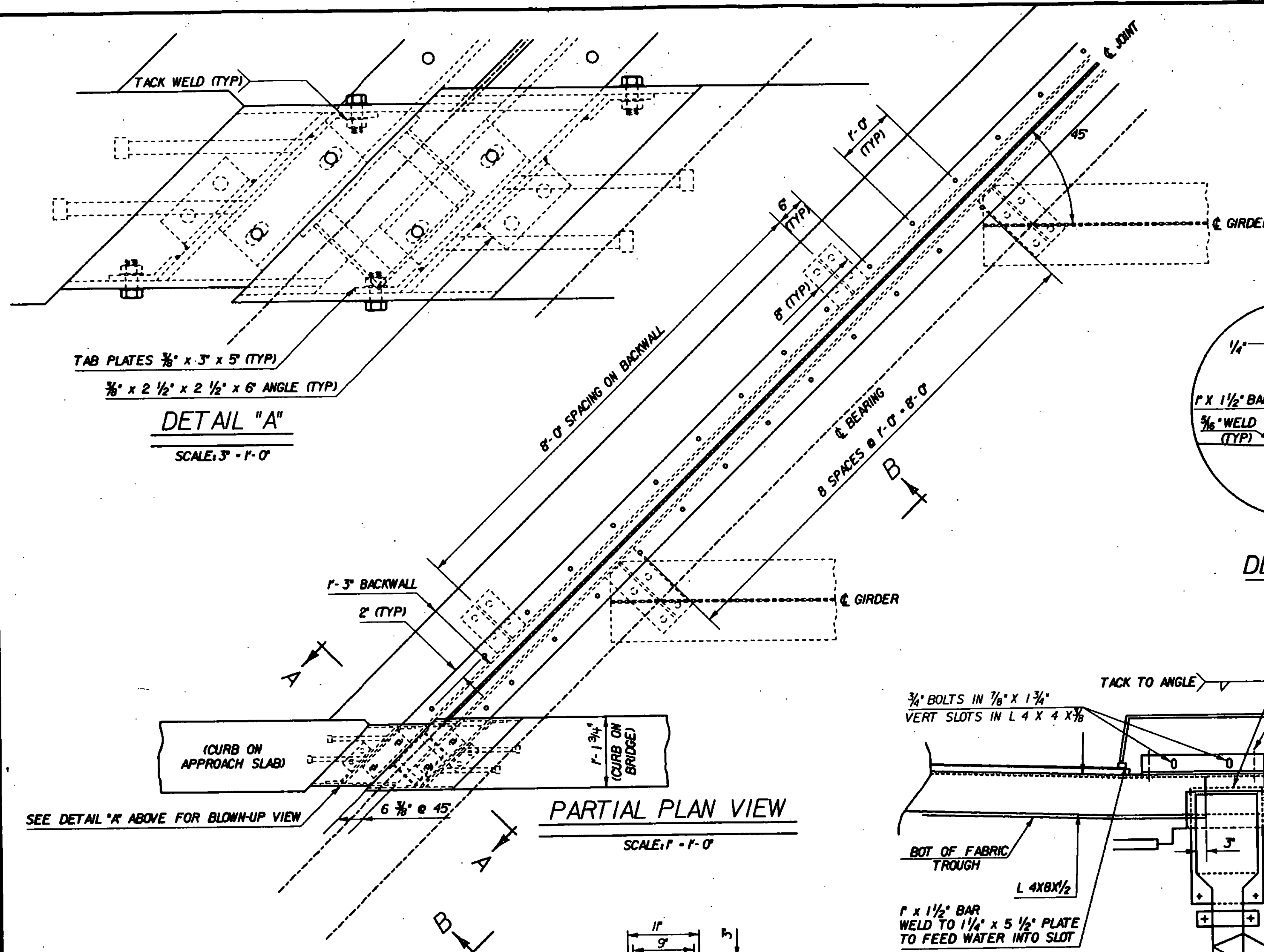
SCALE: 3" = 1'-0"

* THESE DIMENSIONS ARE THEORETICAL AND MAY CHANGE DEPENDING UPON THE OUTCOME OF THE BEAM PROFILES

TEMP	"A" DIST
0° F	1 1/8"
15° F	1 1/4"
30° F	1 1/2"
45° F	1 3/4"
60° F	1 7/8"
75° F	1 15/16"
90° F	1 15/16"
105° F	1 15/16"

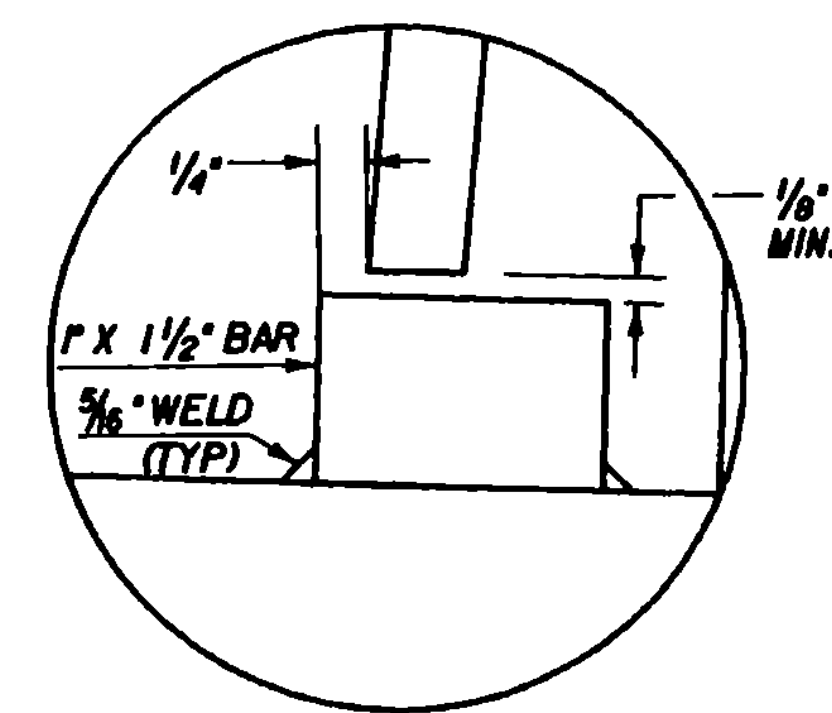
STATE OF VERMONT AGENCY OF TRANSPORTATION

Town Of	NORWICH	Bridge No.	81
Highway No.	U. S. ROUTE 5	Log Sta.	345+47
		Surv. Sta.	345+47
EXPANSION JOINT DETAILS			
U. S. ROUTE 5 OVER THE OMPOMPANOSUC RIVER			
Designed By	D. J. HOYNE	Drawn By	K. S. CLARKE
Checked By	D. J. HOYNE	Bridge Design Supervisor	
Date	2/92	F.Y.W. Balkum Date	4/92
PROJECT	NORWICH	PROJECT NO.	BHS 0131361
U.S.C. Info.	ZH11(30.47) 778069MD.DGN.1		
Bridge Sheet No.	BR10	Sheet	26 of 70

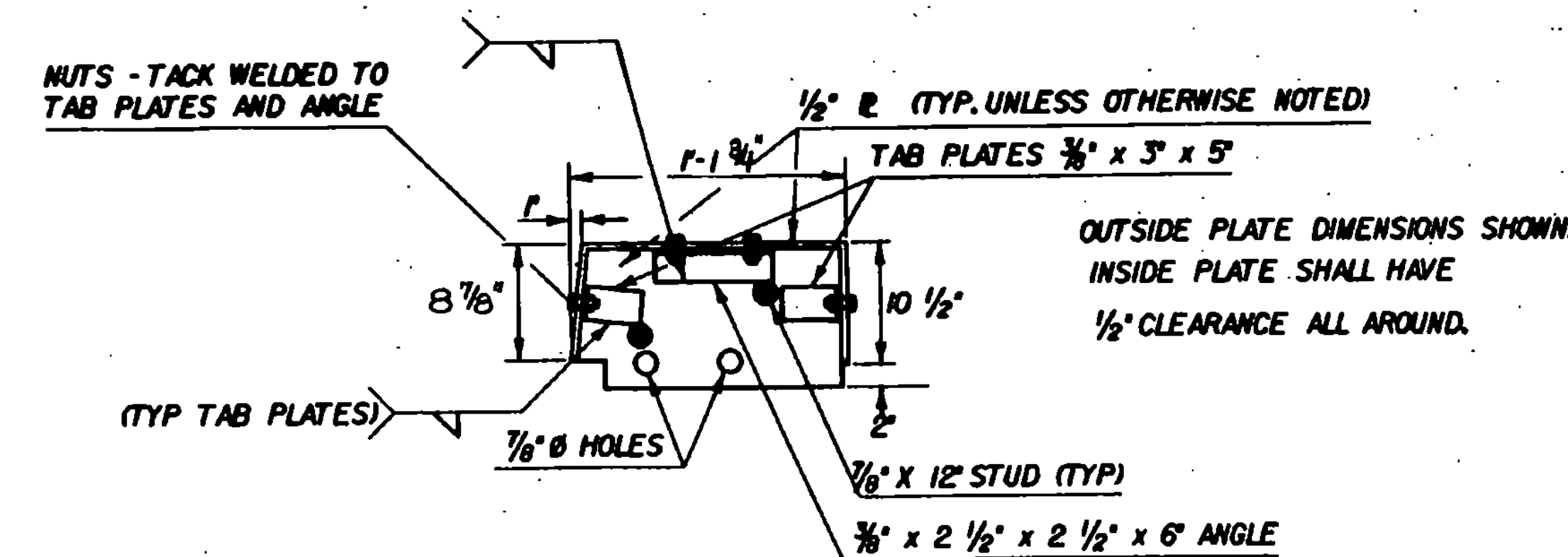


DETAIL "A"
SCALE: 3" = 1'-0"

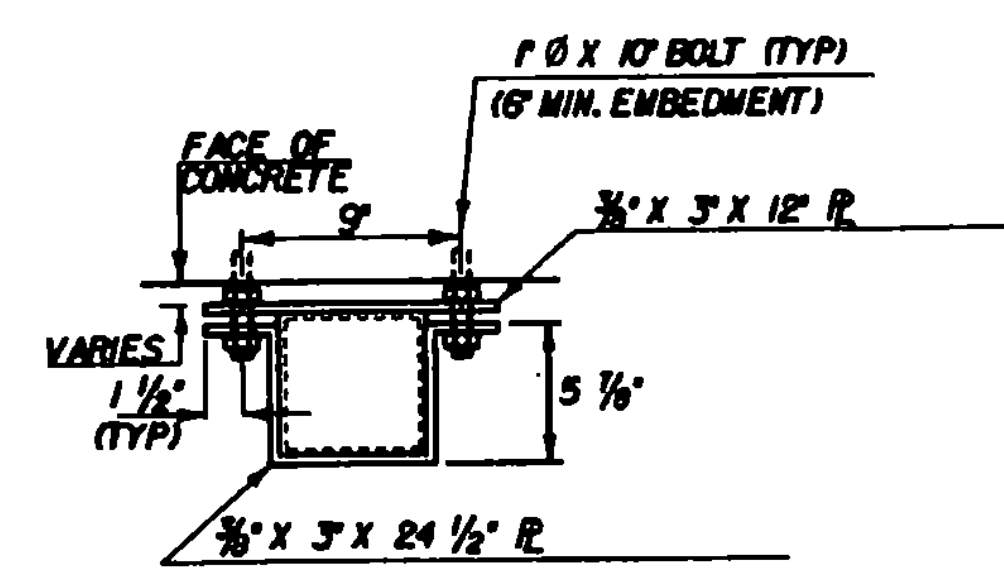
PARTIAL PLAN VIEW
SCALE: 1" = 1'-0"



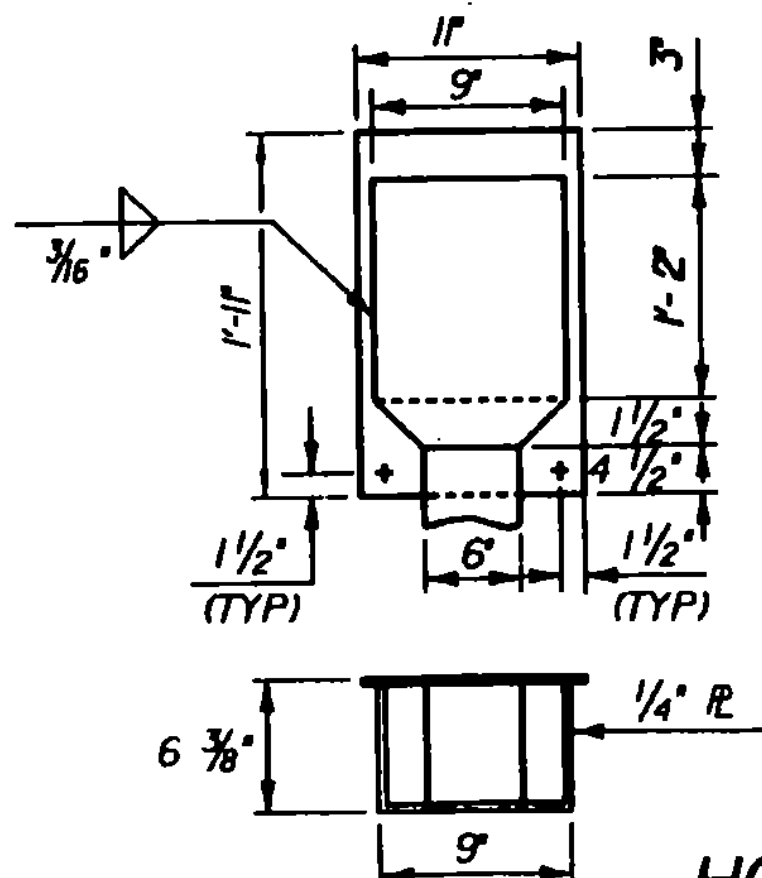
DETAIL "B"
NTS



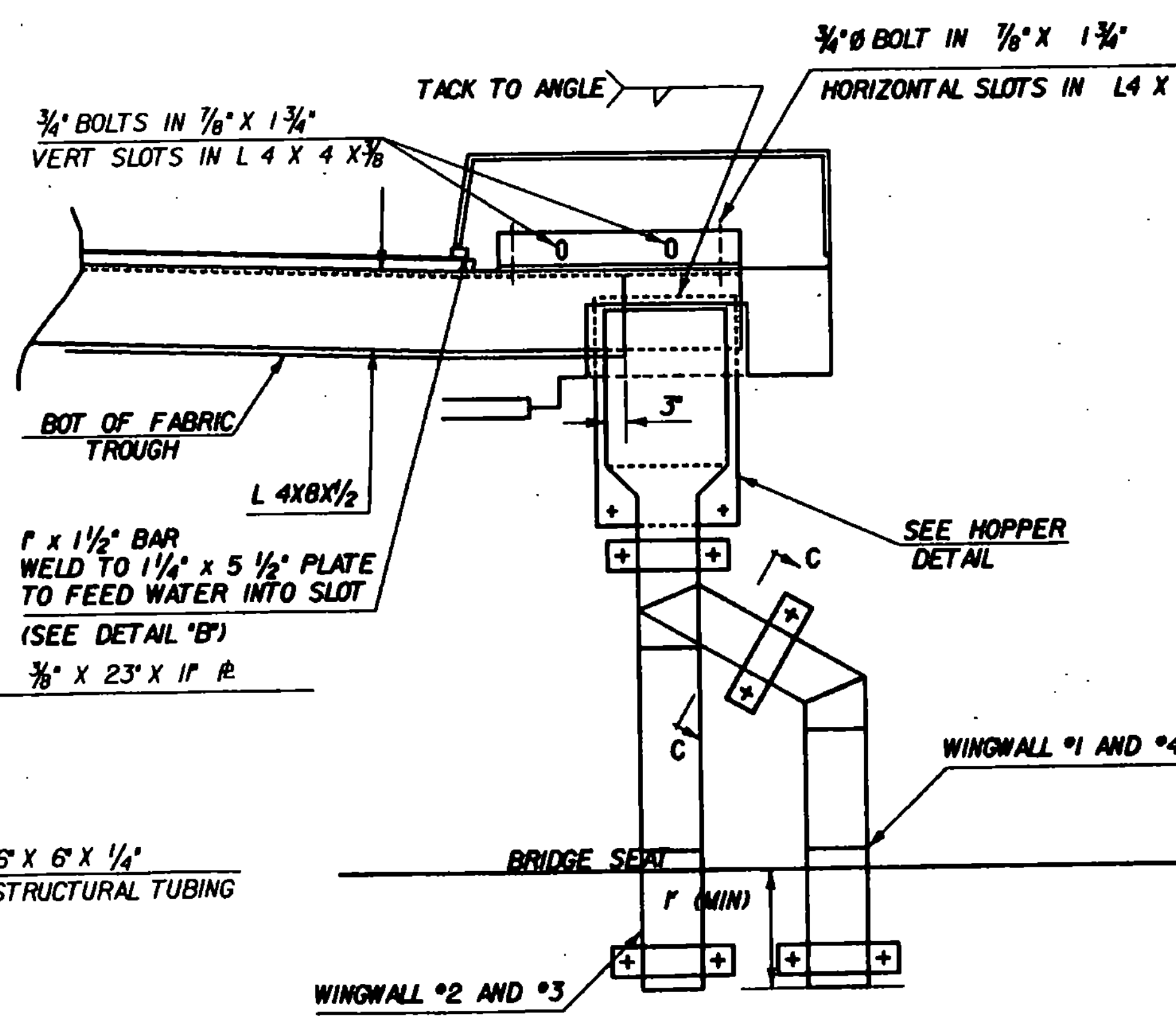
CURB PLATE DETAILS
(NORMAL TO CURB)
NOT TO SCALE



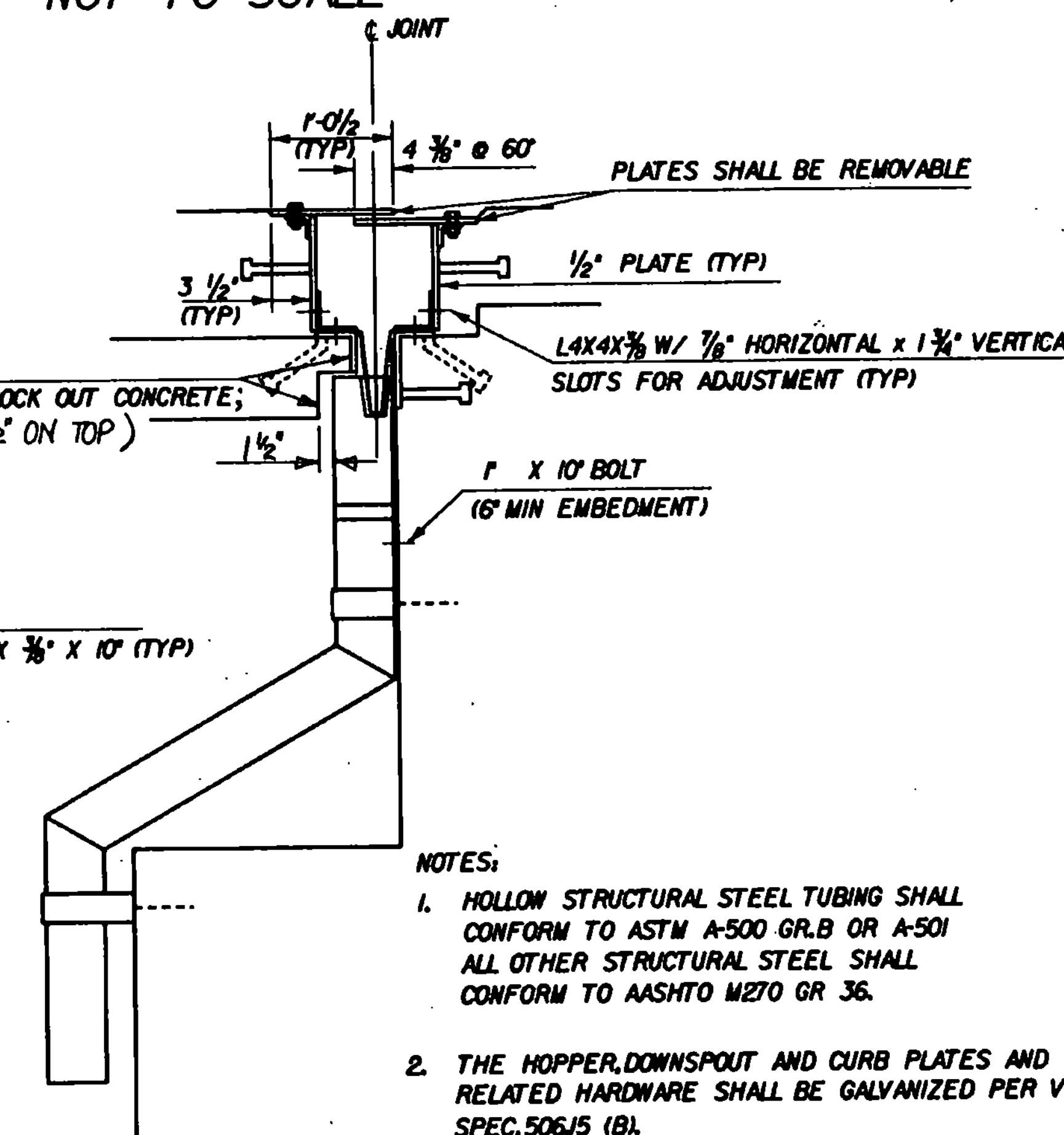
SECTION C-C
1 1/2" = 1'-0"



HOPPER DETAILS
NOT TO SCALE



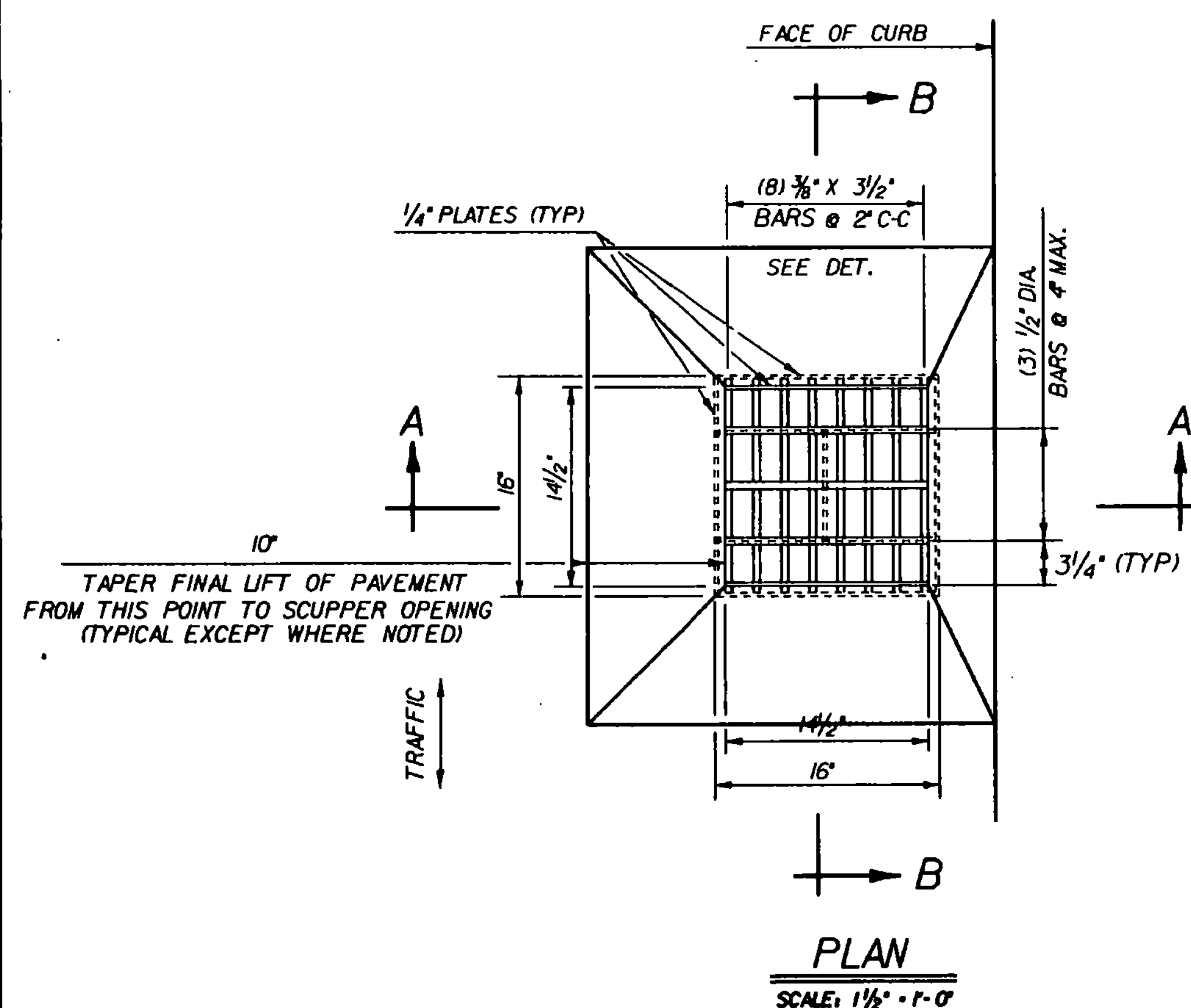
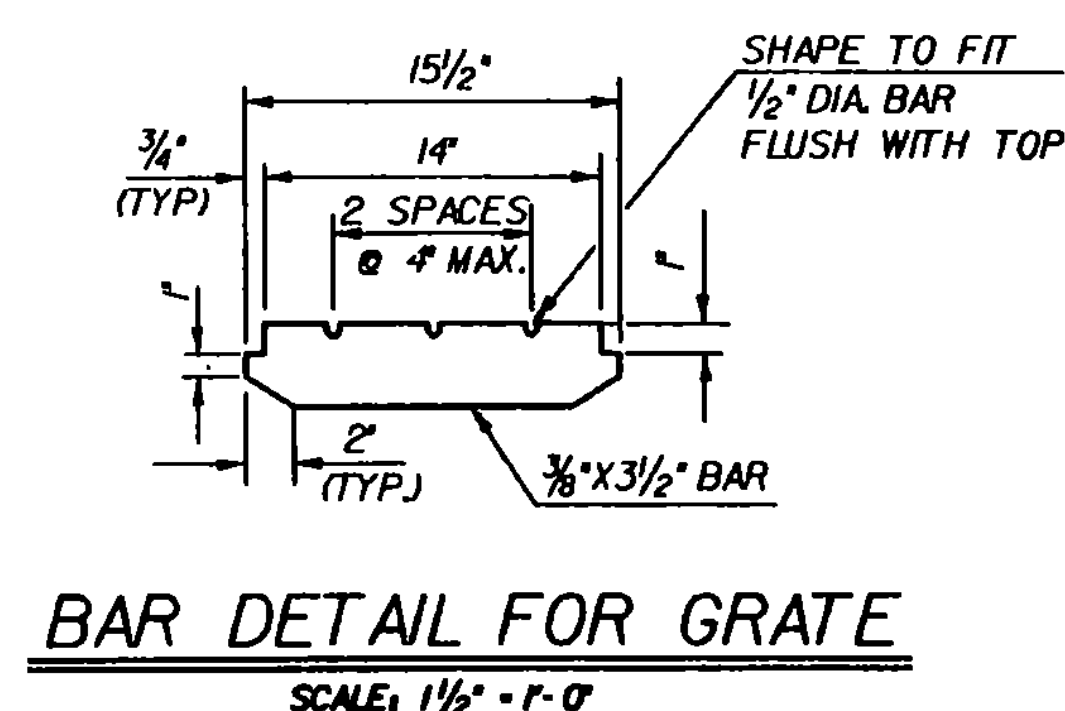
SECTION B-B @ EXP. JOINT
NOT TO SCALE



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

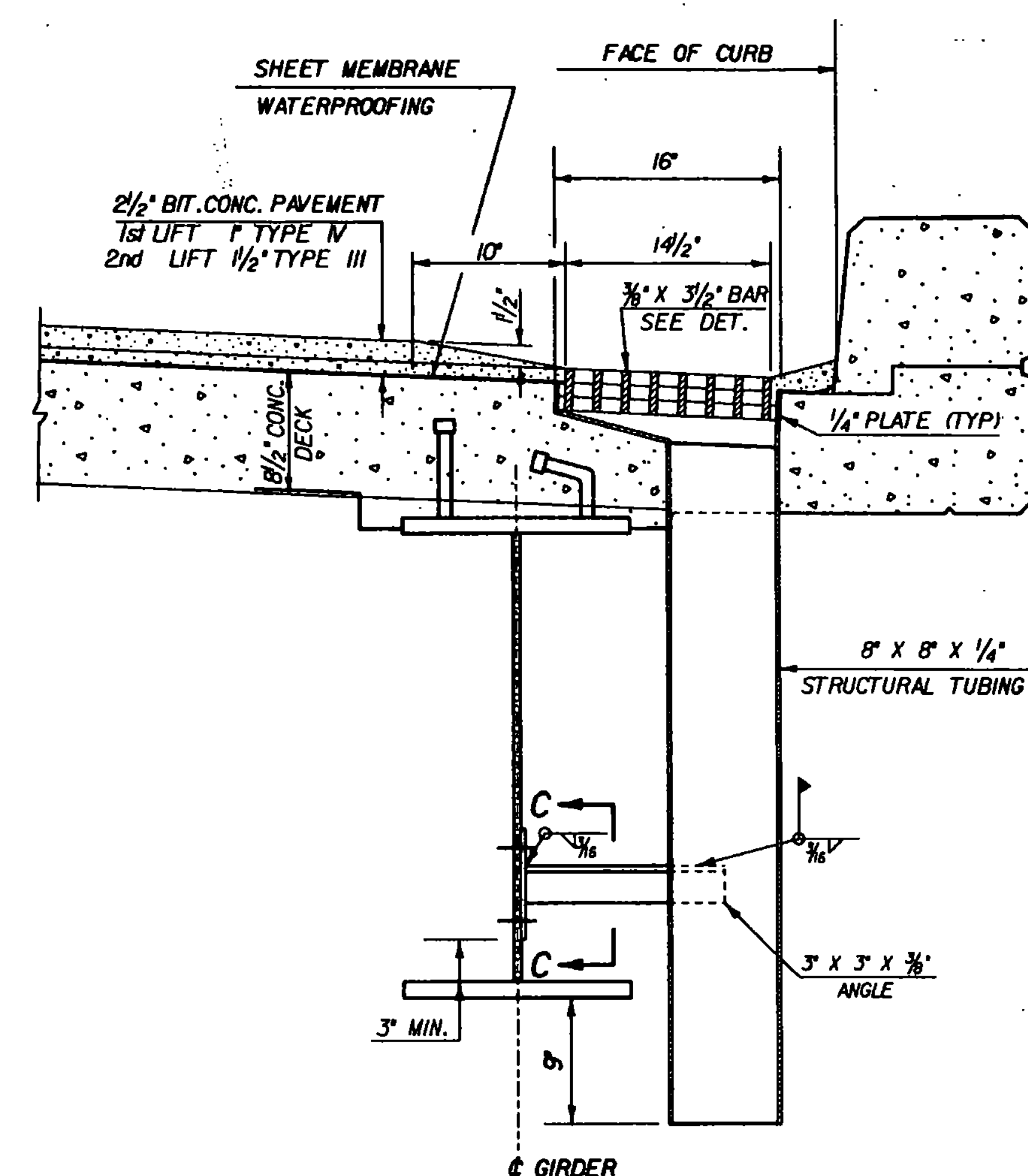
- NOTES:
1. HOLLOW STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A-500 GR. B OR A-501 ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO AASHTO M270 GR. 36.
 2. THE HOPPER, DOWNSPOUT AND CURB PLATES AND RELATED HARDWARE SHALL BE GALVANIZED PER VT SPEC. 506J5 (B).
 3. ONE HOPPER WILL BE REQUIRED @ EACH CORNER OF THE BRIDGE.

STATE OF VERMONT AGENCY OF TRANSPORTATION			
Town of	NORWICH	Bridge No.	81
Highway No.	U. S. ROUTE 5	Log Sta.	345+47
		Surv. Sta.	345+47
HOPPER AND DOWNSPOUT DETAILS			
U. S. ROUTE 5 OVER THE OMPOMPANNOOSUC RIVER			
Designed By	D. J. HOYNE	Drawn By	K. S. CLARIMONT
Checked By	D. J. HOYNE	Date	2/92
		Bridge Design Supervisor	F. Y. Bolcum
PROJECT	NORWICH	PROJECT NO.	BHS 011336
L&C. Info.	ZHI (30, 47) TTB069HD, DGN 1		
Bridge Sheet No.	BR111	Sheet	27 of 70

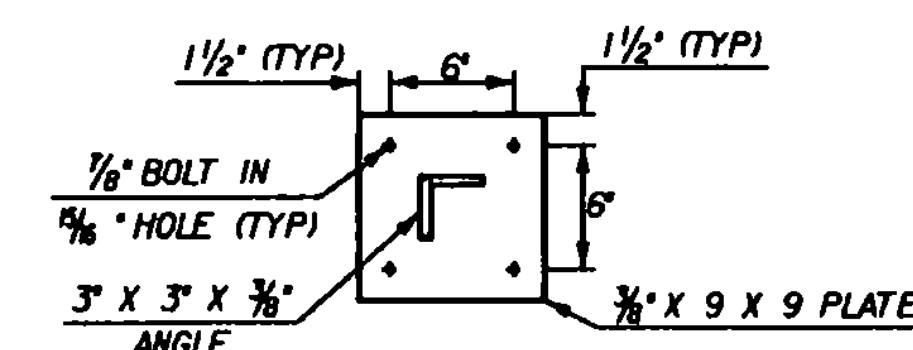


THE FOLLOWING NOTES APPLY TO ALL SCUPPERS UNLESS OTHERWISE DETAILED ON PROJECT PLANS

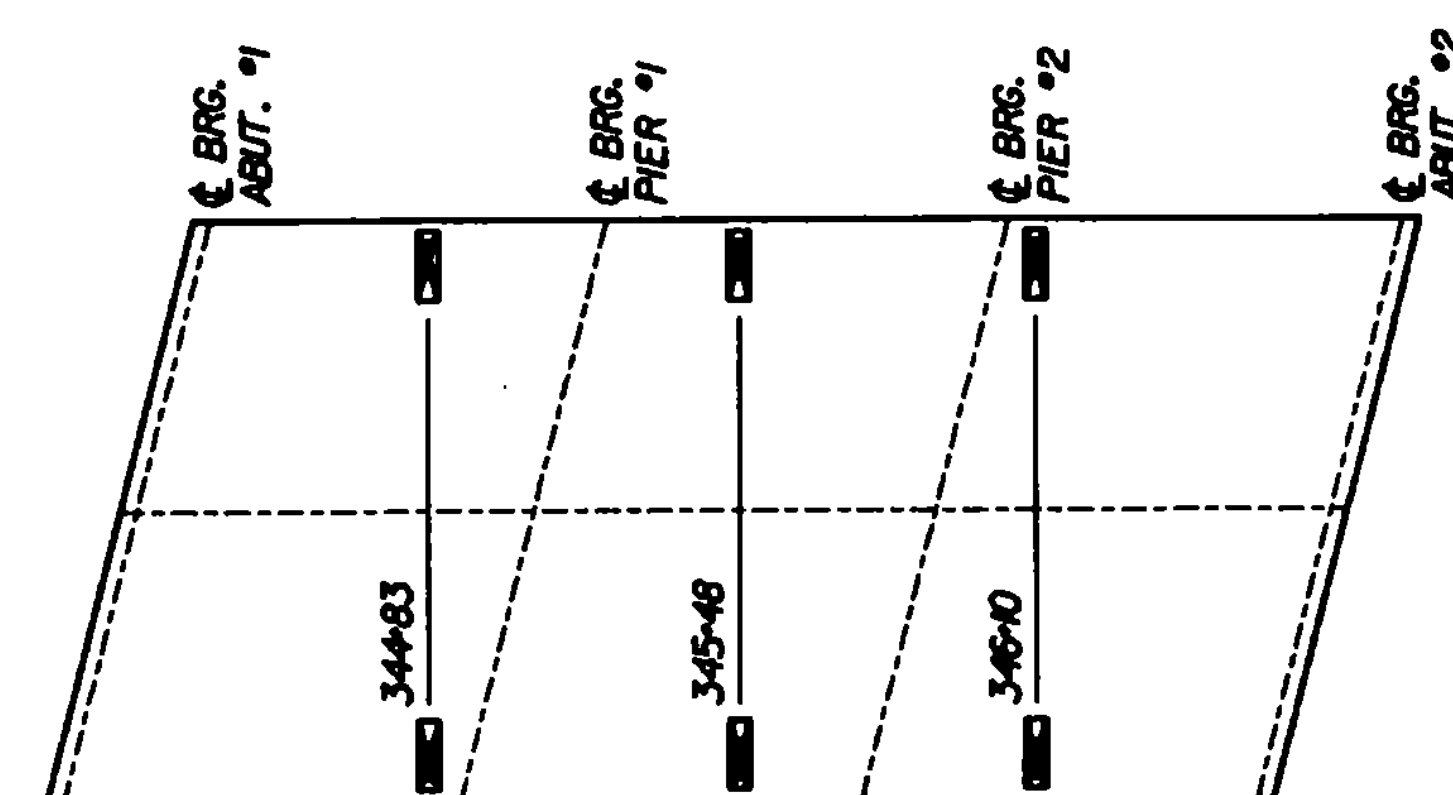
1. HOLLOW STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A-500 OR A-501.
2. ALL PLATES, BARS AND ANGLES SHALL CONFORM TO AASHTO M-270 GR. 36.
3. ALL SCUPPERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M-III AFTER FABRICATION.
4. THE TOP SURFACE OF SCUPPER SHALL BE SLOPED TO MATCH ROADWAY SLOPE AND GRADE.
5. THE BAR AND GRATE SECTION MAY BE PREFABRICATED PROVIDING THE GEOMETRY AND SECTION PROPERTIES ARE EQUIVALENT TO THE DETAILS SHOWN.
6. THE SCUPPER & ATTACHMENT SHALL BE PAID UNDER ITEM 506.55 "STRUCTURAL STEEL (PLATE GIRDER)".



SECTION A - A
SCALE: 1 1/2" = 1'-0"



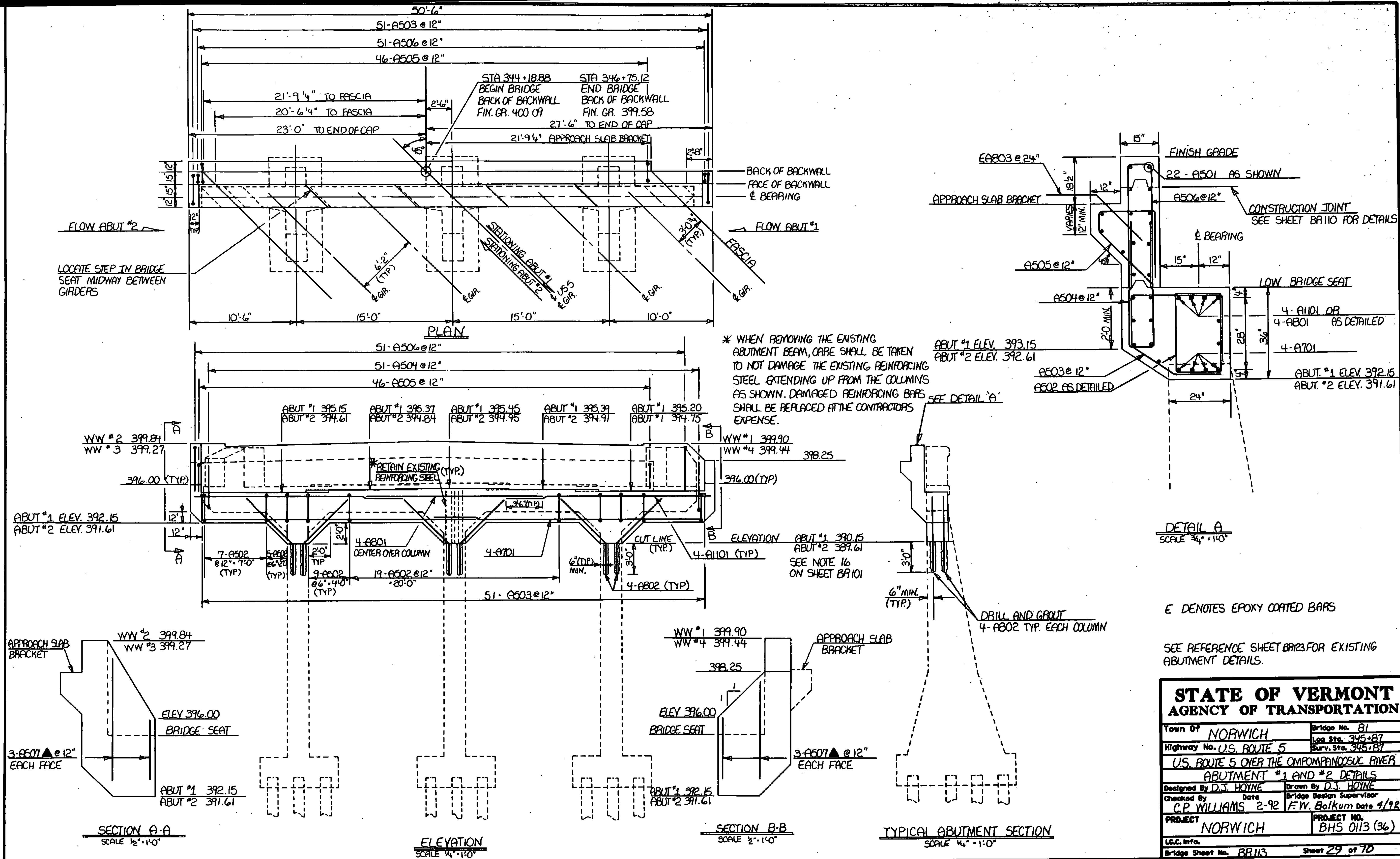
SECTION C-C
SCALE: 1 1/2" = 1'-0"



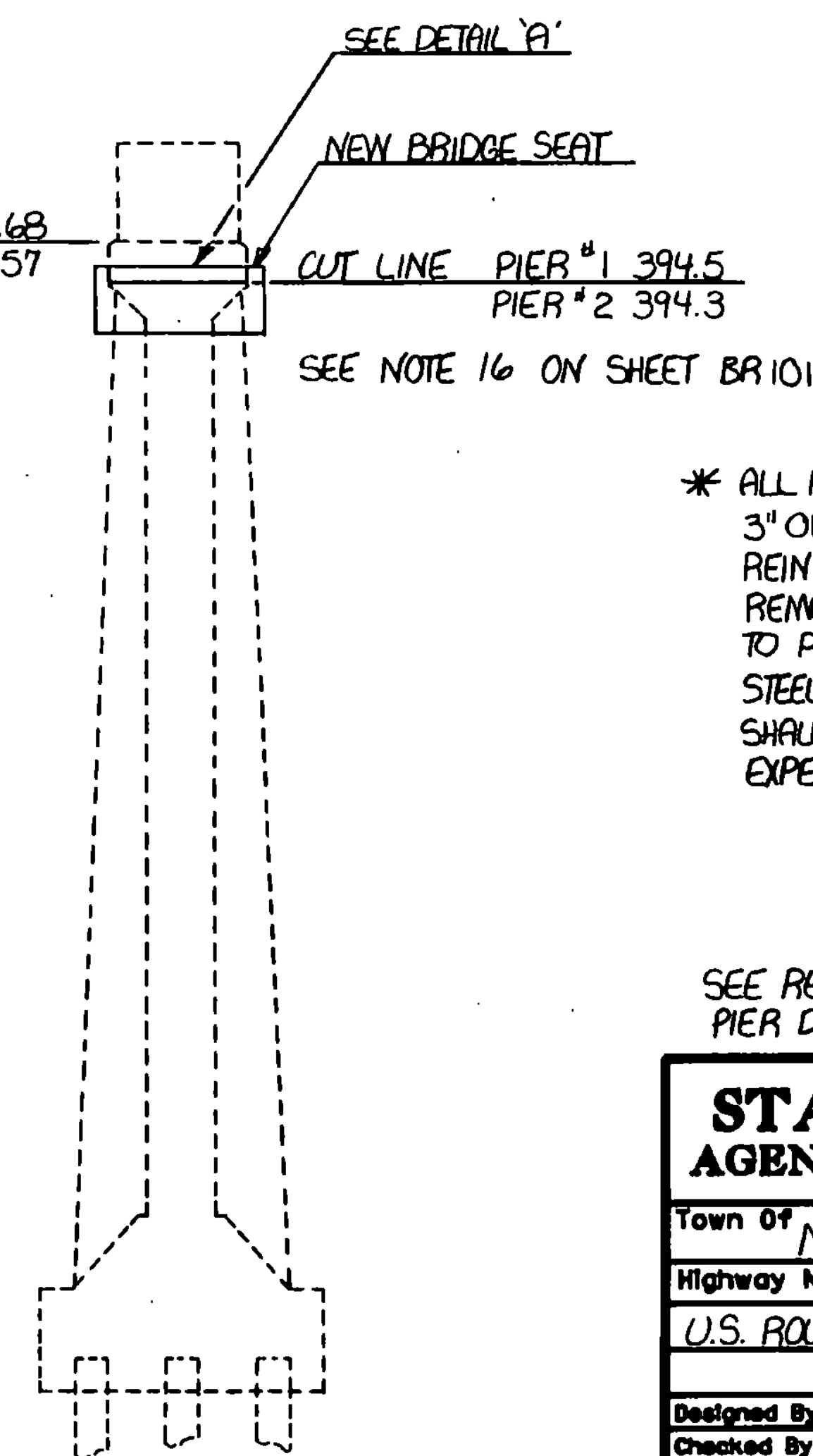
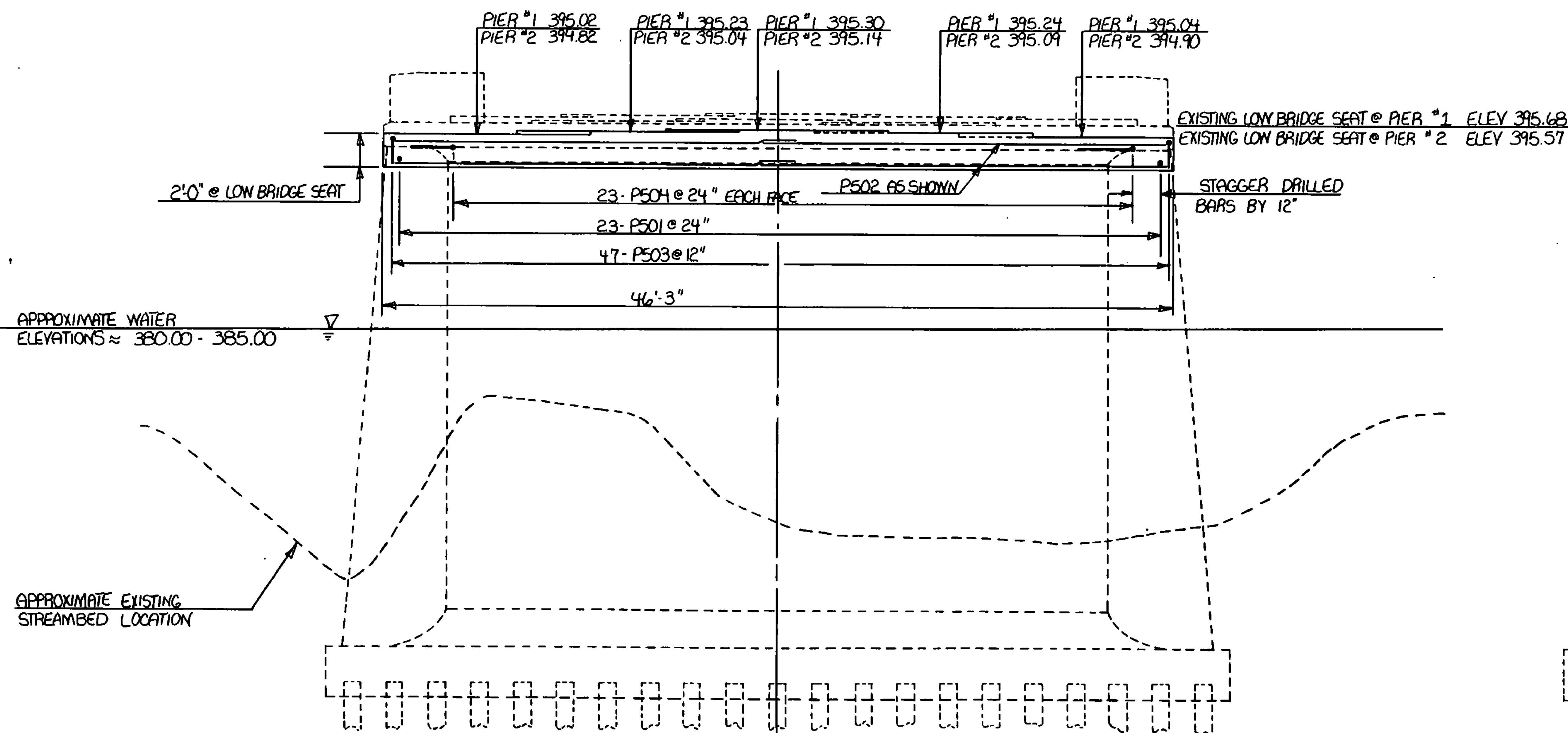
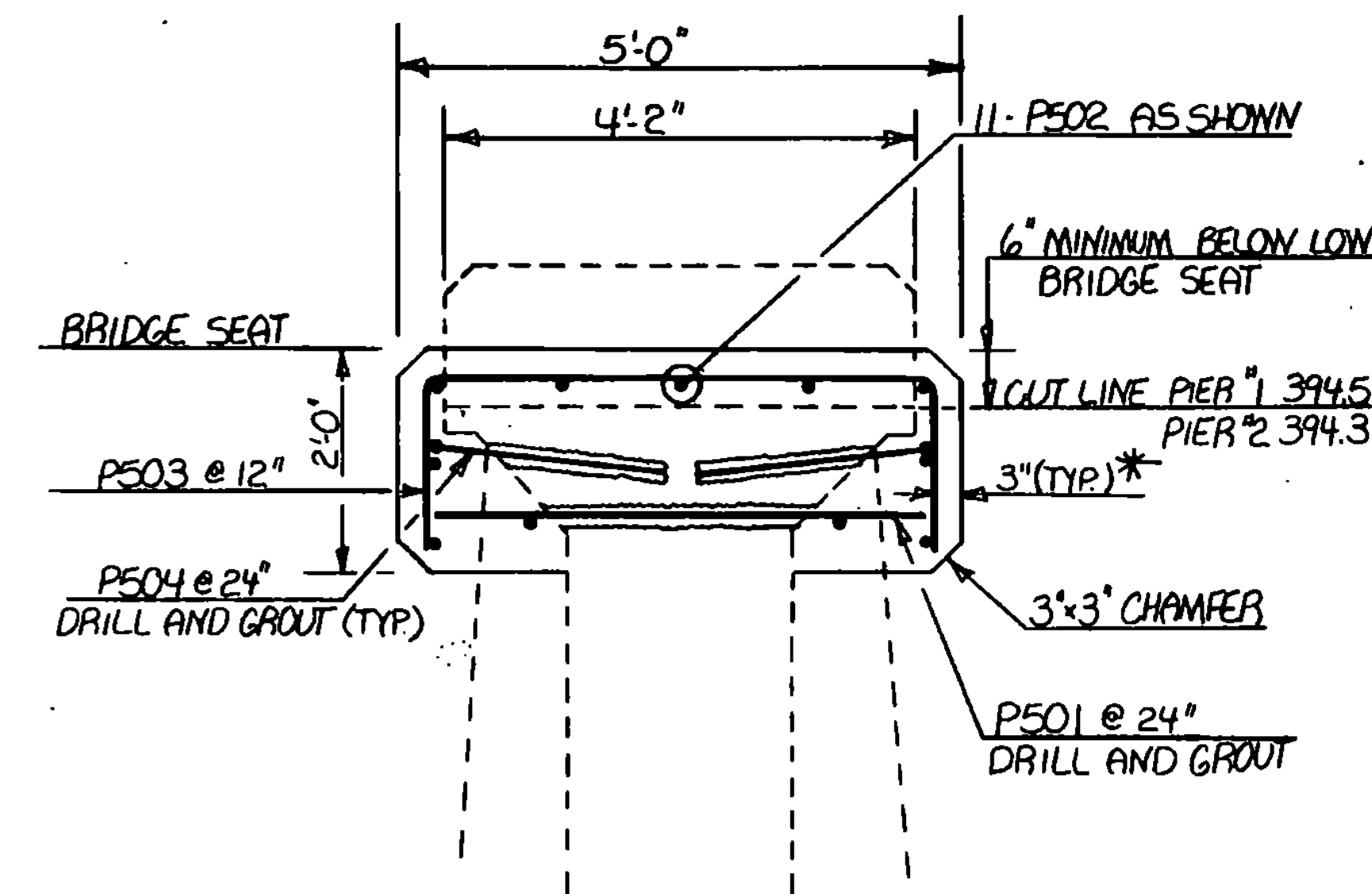
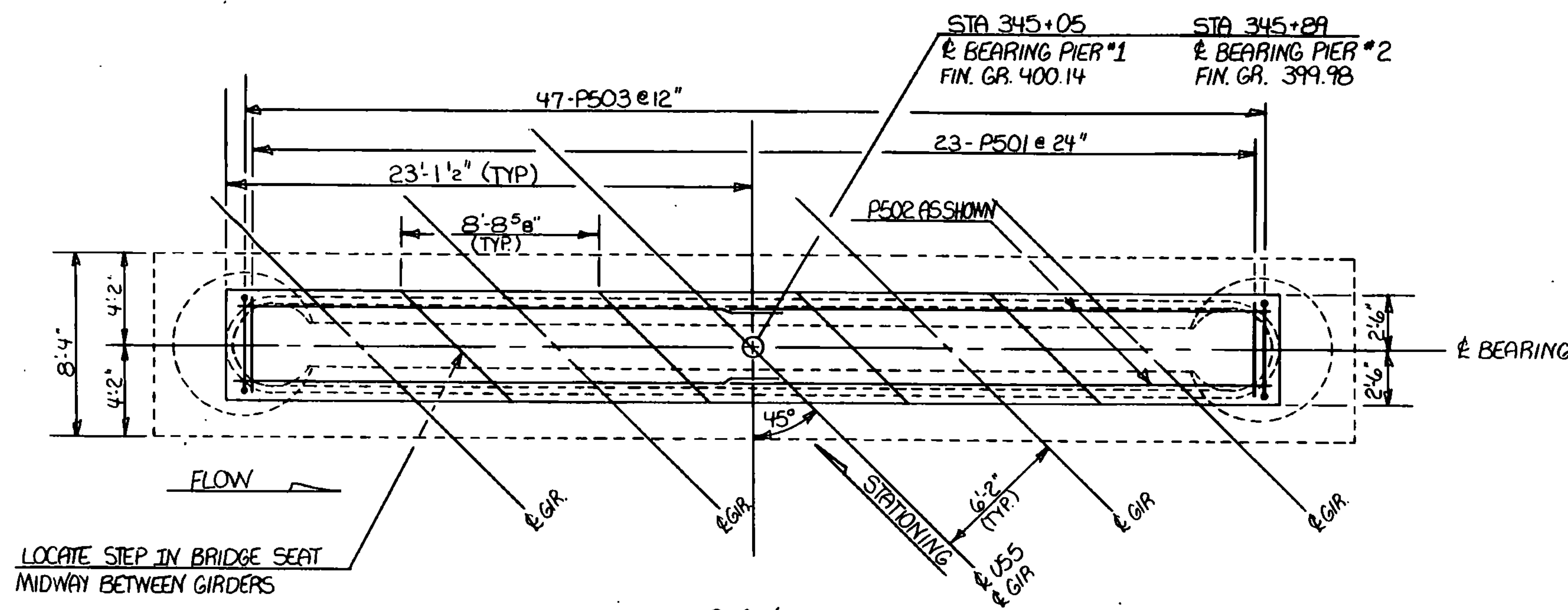
SCUPPER LOCATION
(6 REQUIRED)

HORIZONTAL SCALE: 1" = 40'-0"
VERTICAL SCALE: 1" = 10'-0"

STATE OF VERMONT AGENCY OF TRANSPORTATION	
Town Of NORWICH	Bridge No. 81 Leg. Sta. 345+47 Surv. Sta. 345+47
Highway No. U. S. ROUTE 5	
SCUPPER DELTA	
U. S. ROUTE 5 OVER THE OMPONANCOOSUC RIVER	
Designed By D. J. HOYNE	Drawn By K. S. CLAIRMONT
Checked By D. J. HOYNE	Bridge Design Supervisor
Date 2/92	File No. Bol/kum Date 4/92
PROJECT NORWICH	PROJECT NO. BHS 0113(36)
L.G.C. Info. ZHh[30,47] 77B069SD.DGN;1	
Bridge Sheet No. BR112	Sheet 28 of 70



STATE OF VERMONT AGENCY OF TRANSPORTATION			
Town Of	NORWICH	Bridge No.	81
Highway No.	U.S. ROUTE 5	Log Sta.	345+87
		Surv. Sta.	345+87
U.S. ROUTE 5 OVER THE OMPROMPNOUSUC RIVER			
ABUTMENT #1 AND #2 DETAILS			
Designed By	D.J. HOYNE	Drawn By	D.J. HOYNE
Checked By	Date	Bridge Design Supervisor	
C.P. WILLIAMS	2-92	F.W. Bolcum	Date 4/92
PROJECT	NORWICH	PROJECT NO.	BHS 0113 (36)
L&C. Info.			
Bridge Sheet No.	BR113	Sheet	29 of 70



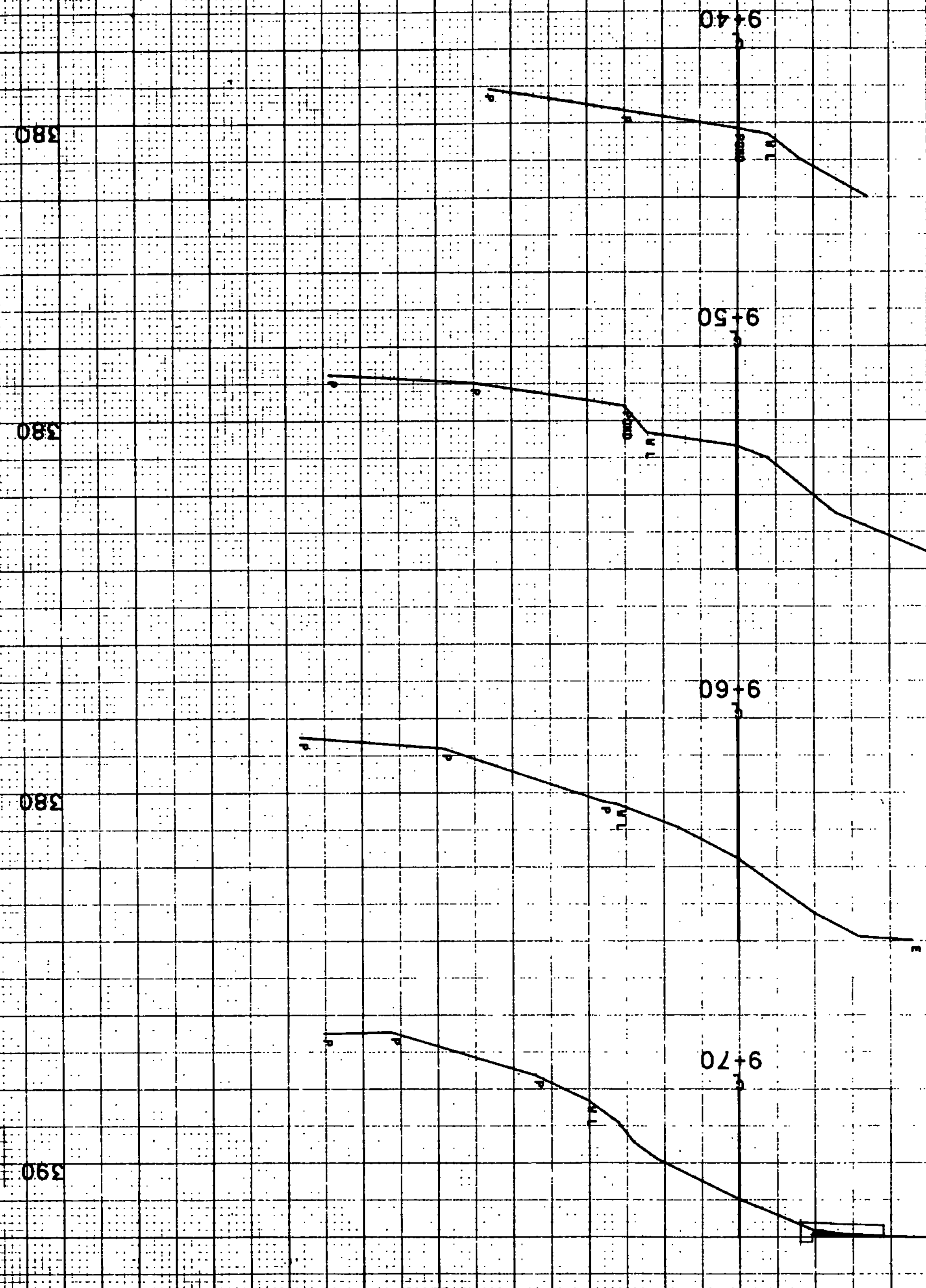
* ALL NEW REINFORCING STEEL SHALL HAVE 3" OF CLEAR COVER. ALL OF THE EXISTING REINFORCING STEEL EXPOSED DURING THE REMOVAL OF CONCRETE SHALL BE BENT SO AS TO PROVIDE 3" OF COVER. ANY REINFORCING STEEL DAMAGED BY THE REMOVAL OF CONCRETE SHALL BE REPLACED AT THE CONTRACTORS EXPENSE.

SEE REFERENCE SHEET BR 104 FOR EXISTING PIER DETAILS

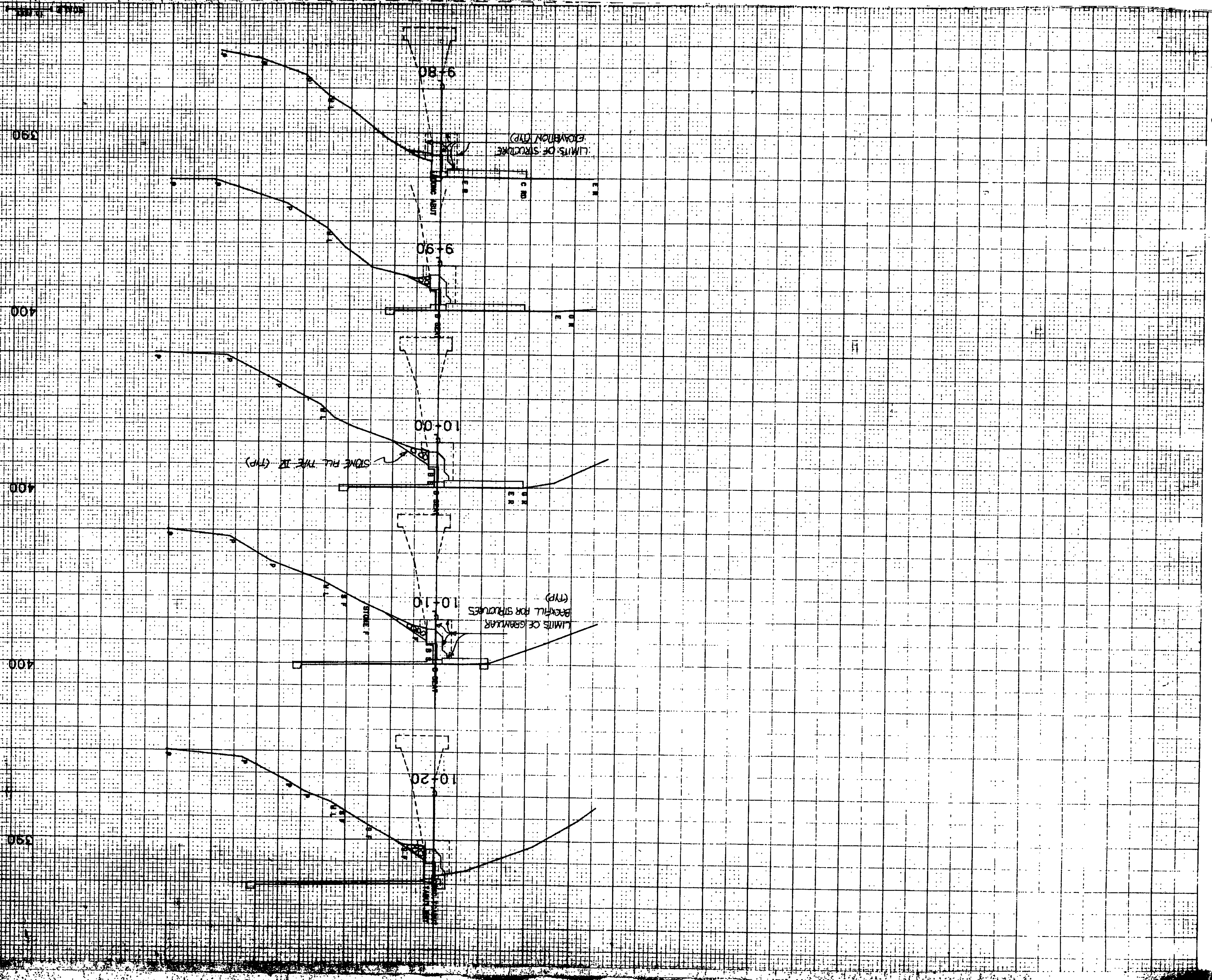
STATE OF VERMONT AGENCY OF TRANSPORTATION

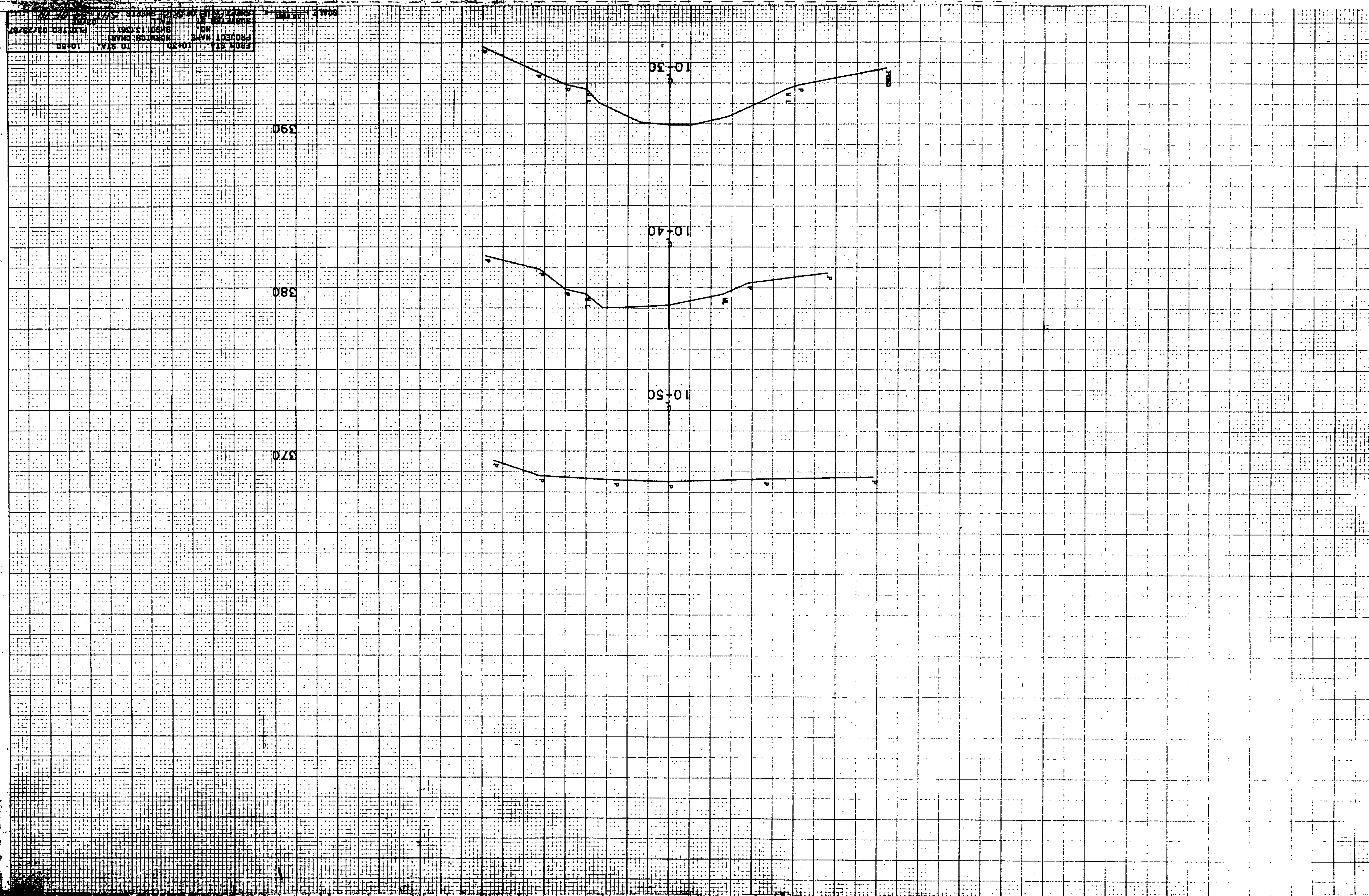
Town Of	NORWICH	Bridge No.	81
Highway No.	U.S. ROUTE 5	Log Sta.	345+87
		Surv. Sta.	345+87
U.S. ROUTE 5 OVER THE OMPOMPANOOSUC RIVER			
PIER #1 AND #2 DETAILS			
Designed By	D.J. HOYNE	Drawn By	D.J. HOYNE
Checked By	C.P. WILLIAMS	Bridge Design Supervisor	F.Y. BOLKUM
PROJECT	NORWICH	PROJECT NO.	BHS 0113 (36)
U.S.C. Info.			
Bridge Sheet No.	BR 114	Sheet	30 of 70

FROM STA. 8+40 TO STA. 8+70
PROJECT NAME: ROADWAY CHAN.
PROJECT NO.: 1000
SHEET NO.: 1000
SHEET TOTAL: 1000
DATE: 07/01/00
DRAWN BY: J. L. BROWN
CHECKED BY: J. L. BROWN
SCALE: 1" = 100'

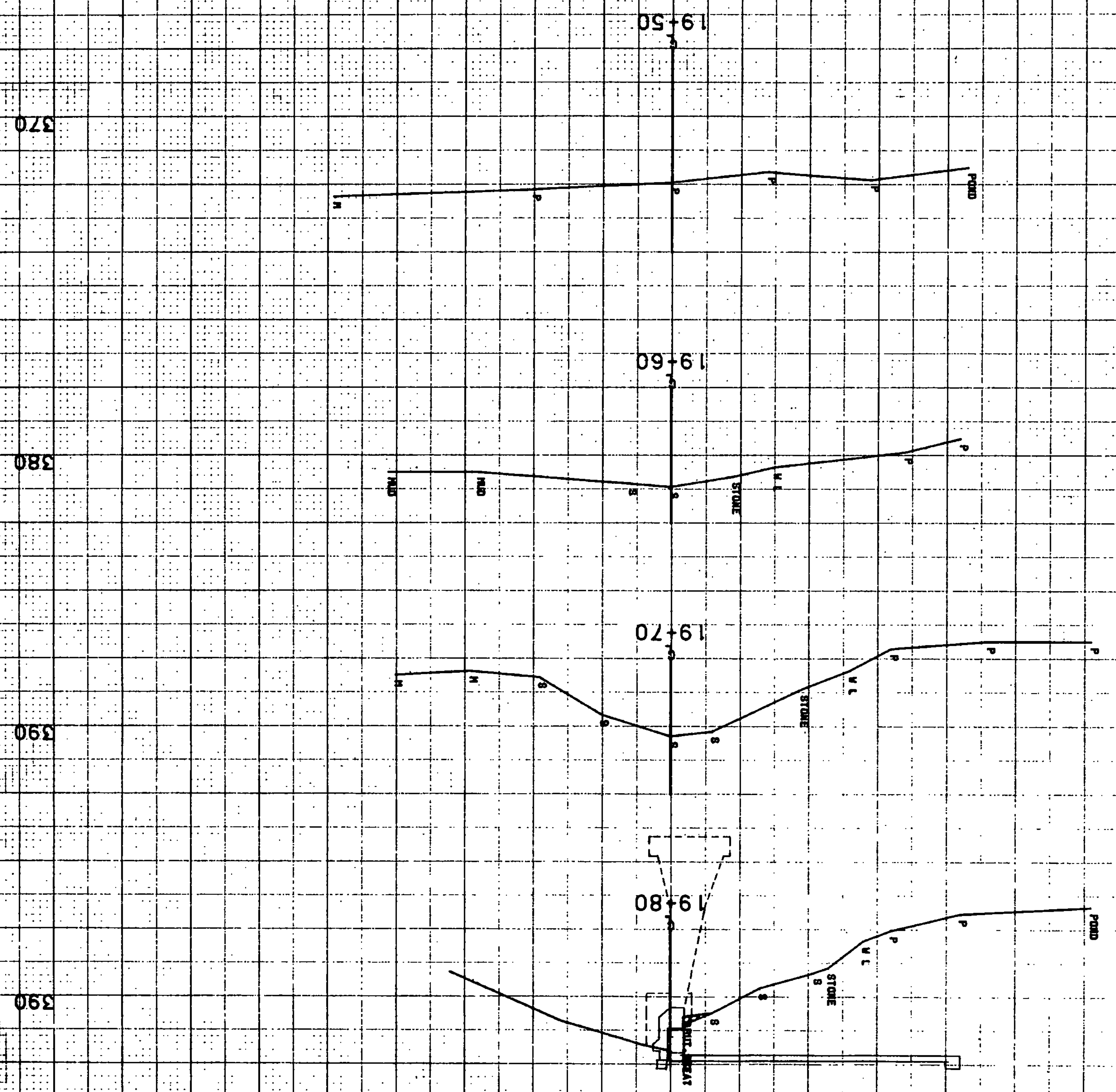


FROM STA. 9+00 TO STA. 10+00
PROJECT NAME: [illegible]
SHEET NO. 1 OF 1
DATE: 08/22/00





FROM STA. 19+50 TO STA. 19+80
PROJECT NAME: NORMAN CHANG
NO. 0801130918
PLOTED 03/23/87
SHEET NO. 1 OF 1
SCALE: 1" = 100'
DATE: 03/23/87



370

380

390

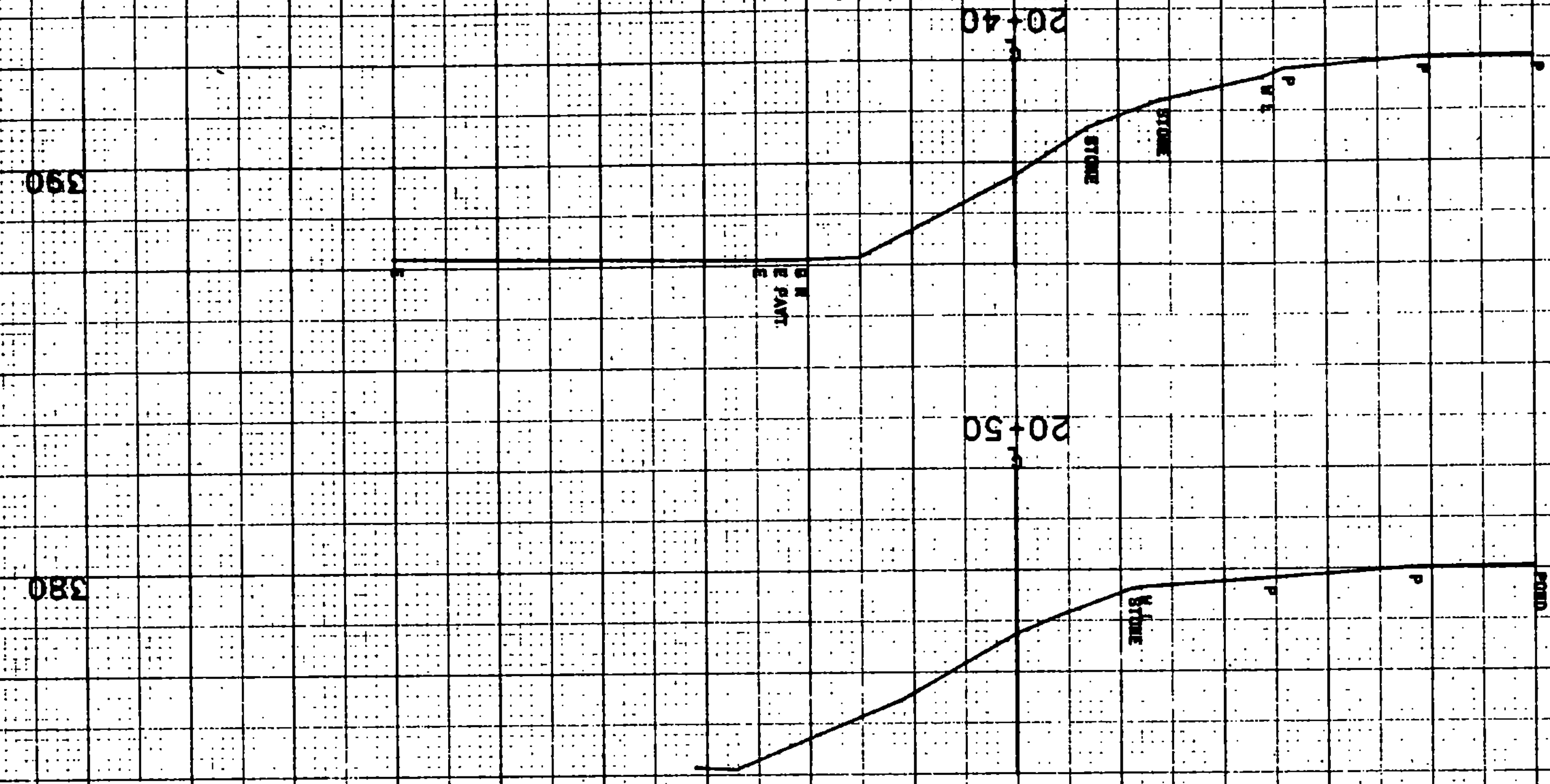
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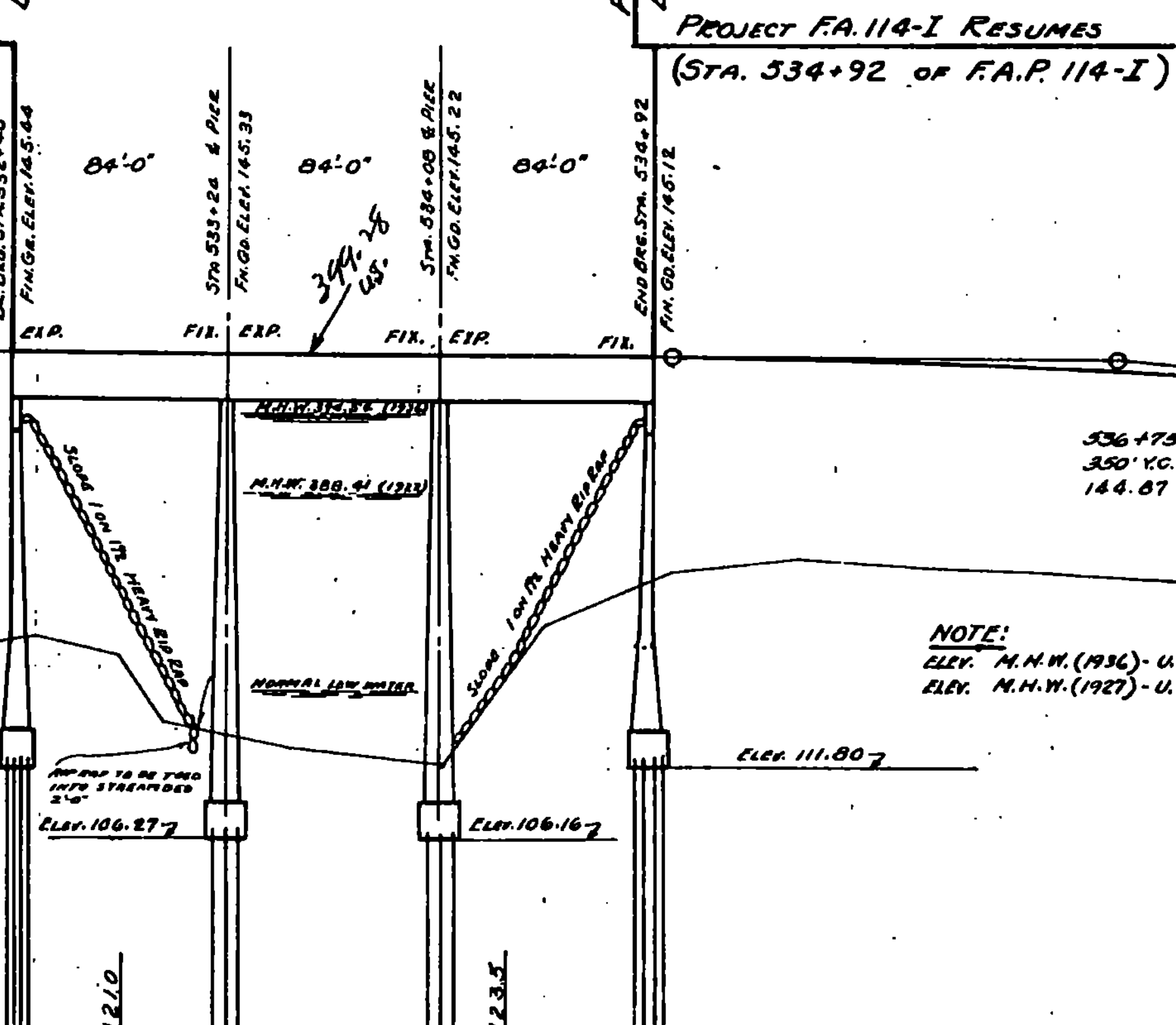
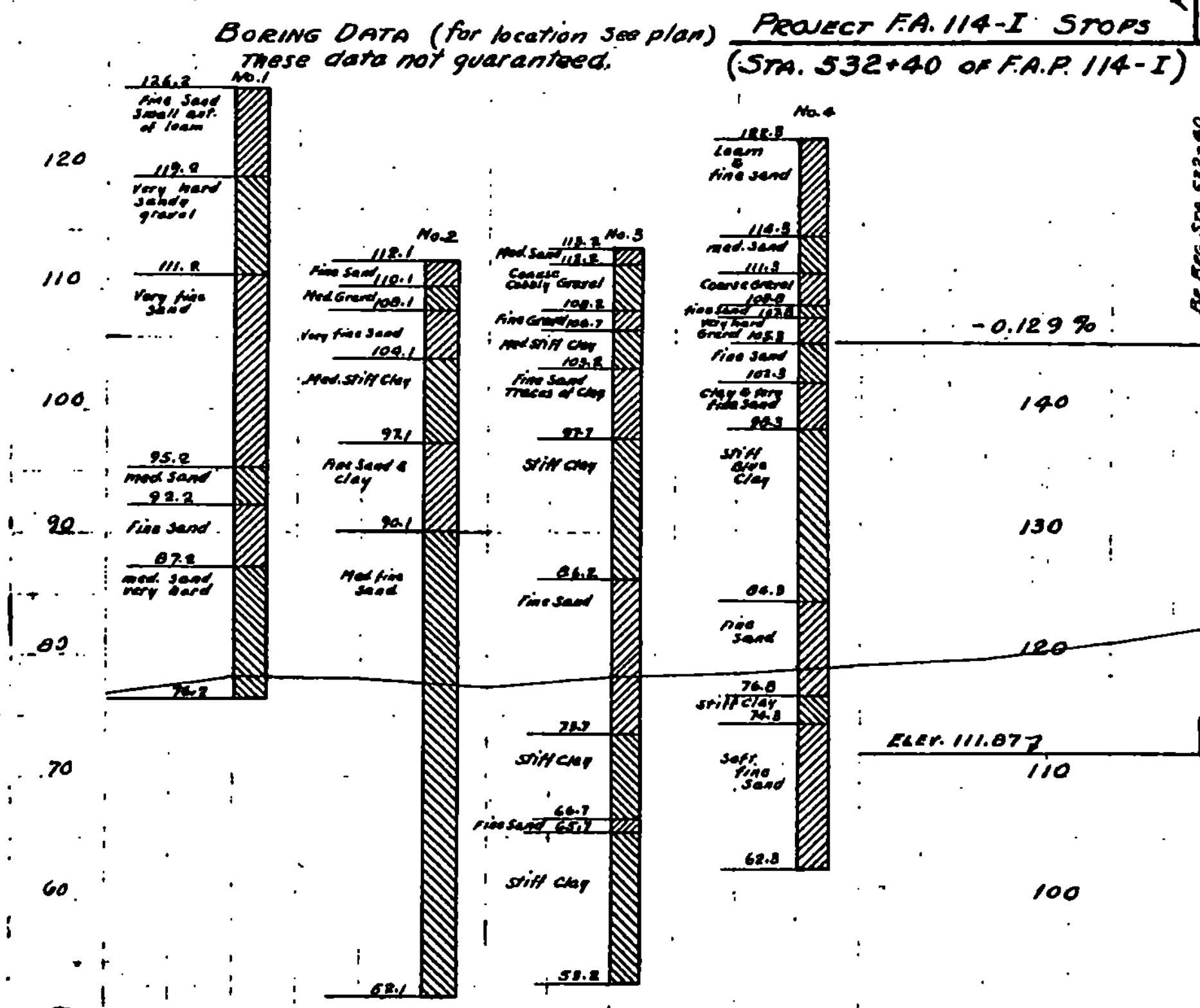
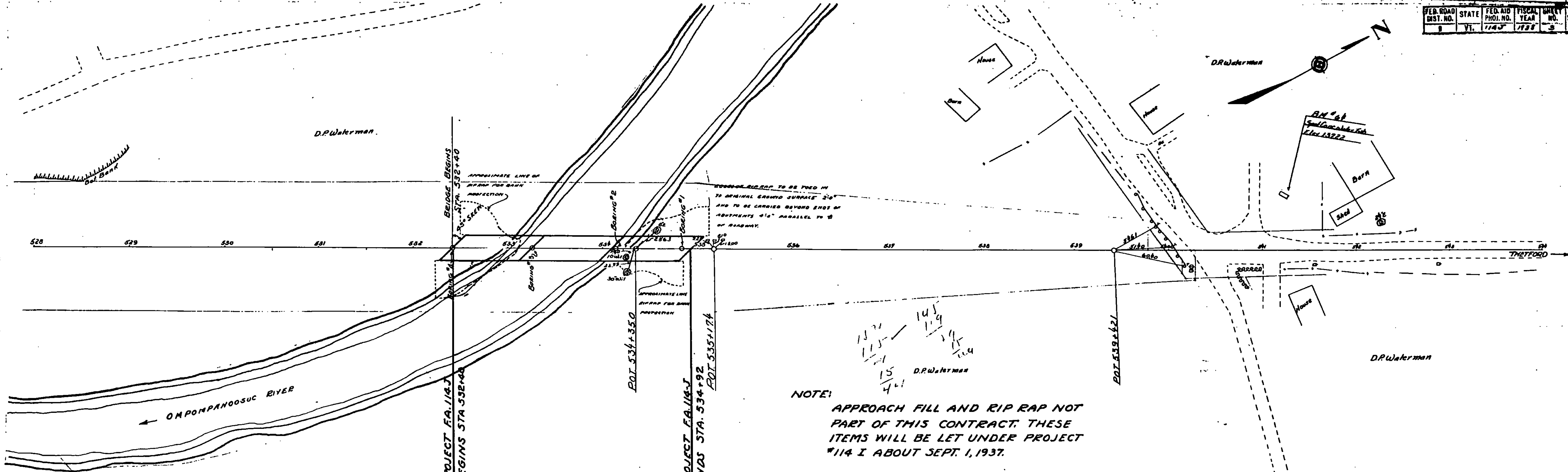


FROM STA.	19+00	TO STA.	20+30
PROJECT NAME	NORMICH CHAN2		
NO.	BNS0113.03615		
SURVEYED BY	PALL		
SHEET NO.	20	OF SHEETS	34
DATE	03/25/87	PLOTTED	03/25/87

SCALE = 1" = 12 FEET

FROM STA. 20+00 TO STA. 20+50
PROJECT NAME: MONTECH CHASE
SHEET NO. 1
DATE: 10/10/10
PLOTTER: 04/24/10
SCALE: 1" = 100'





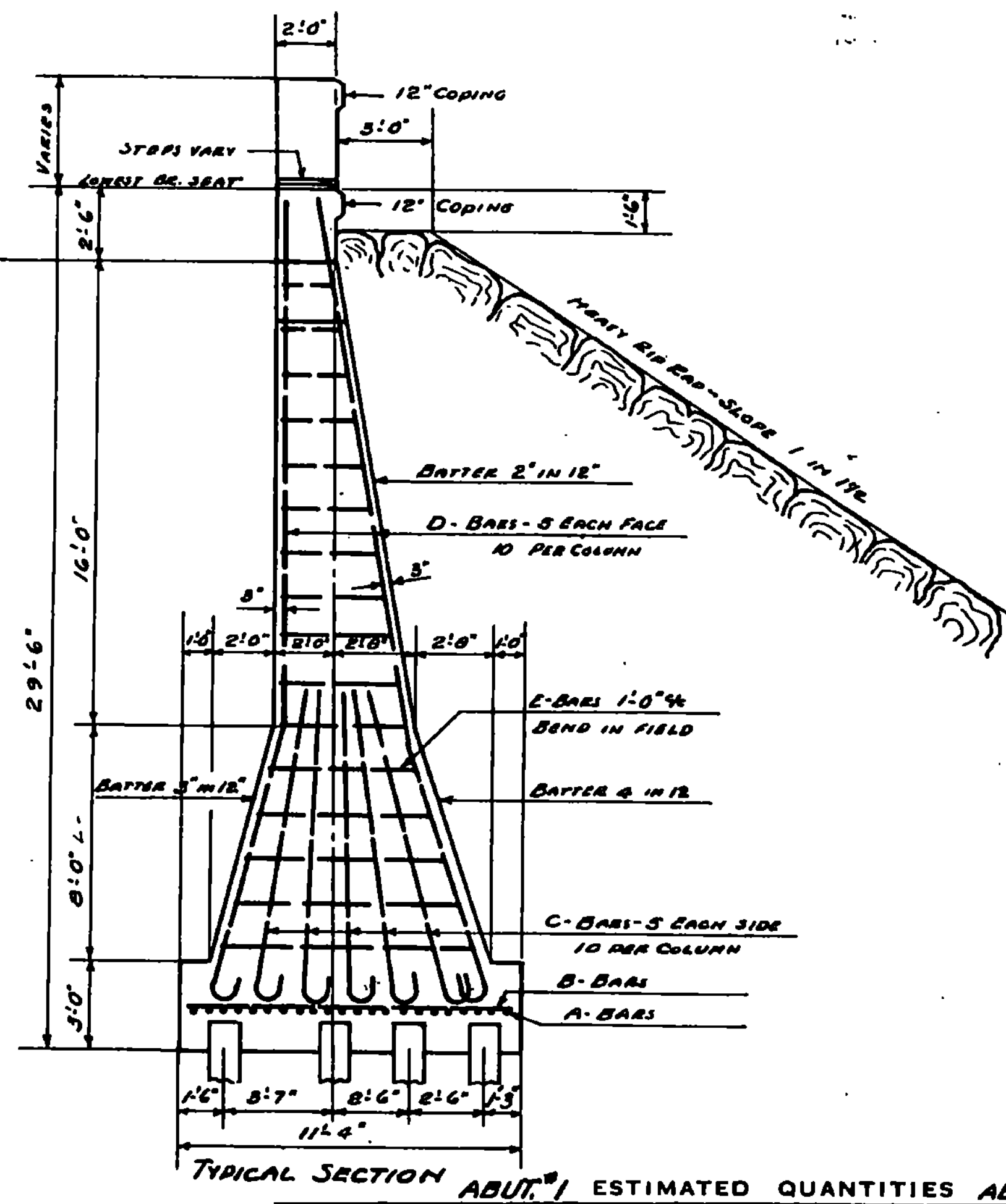
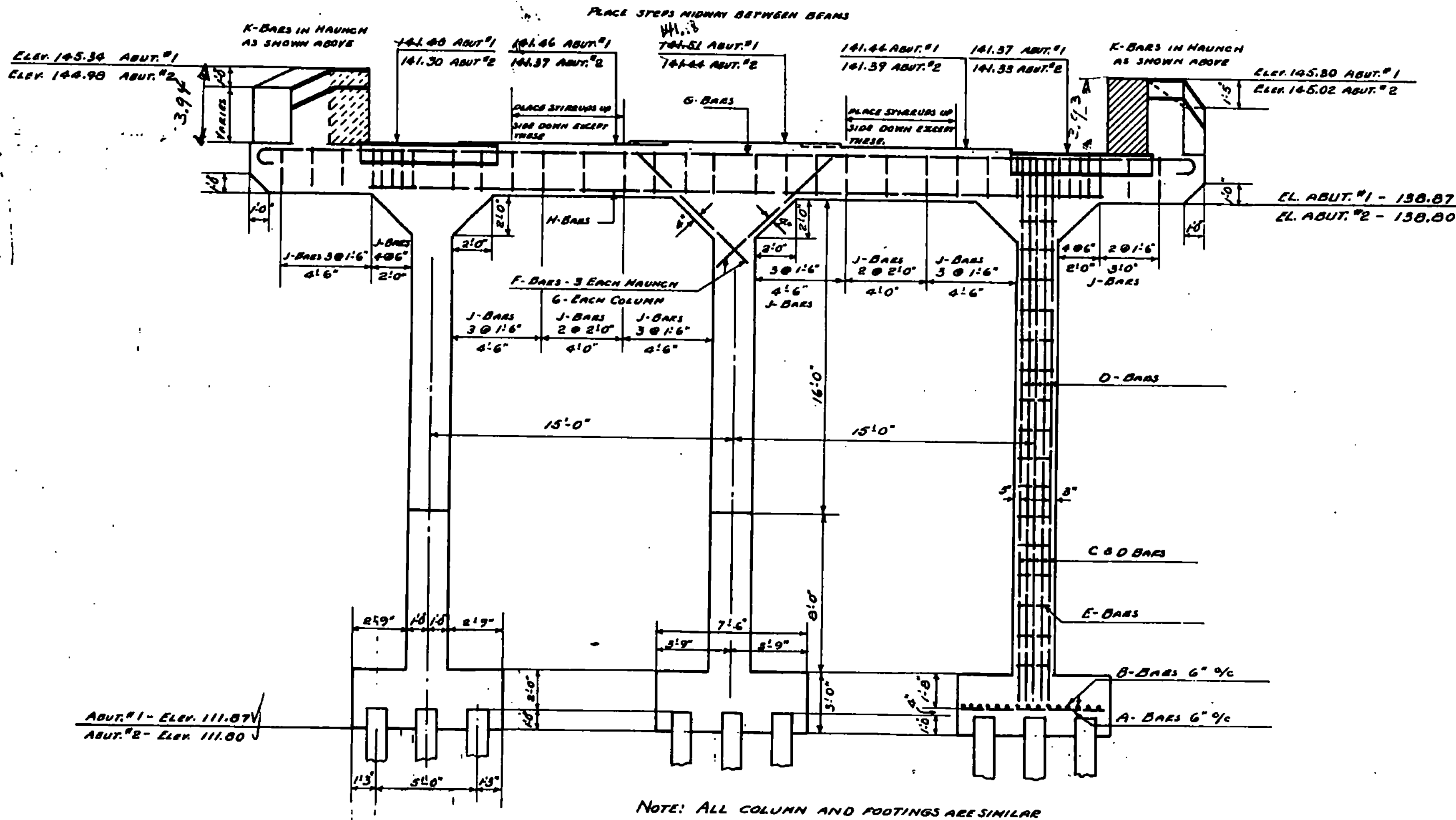
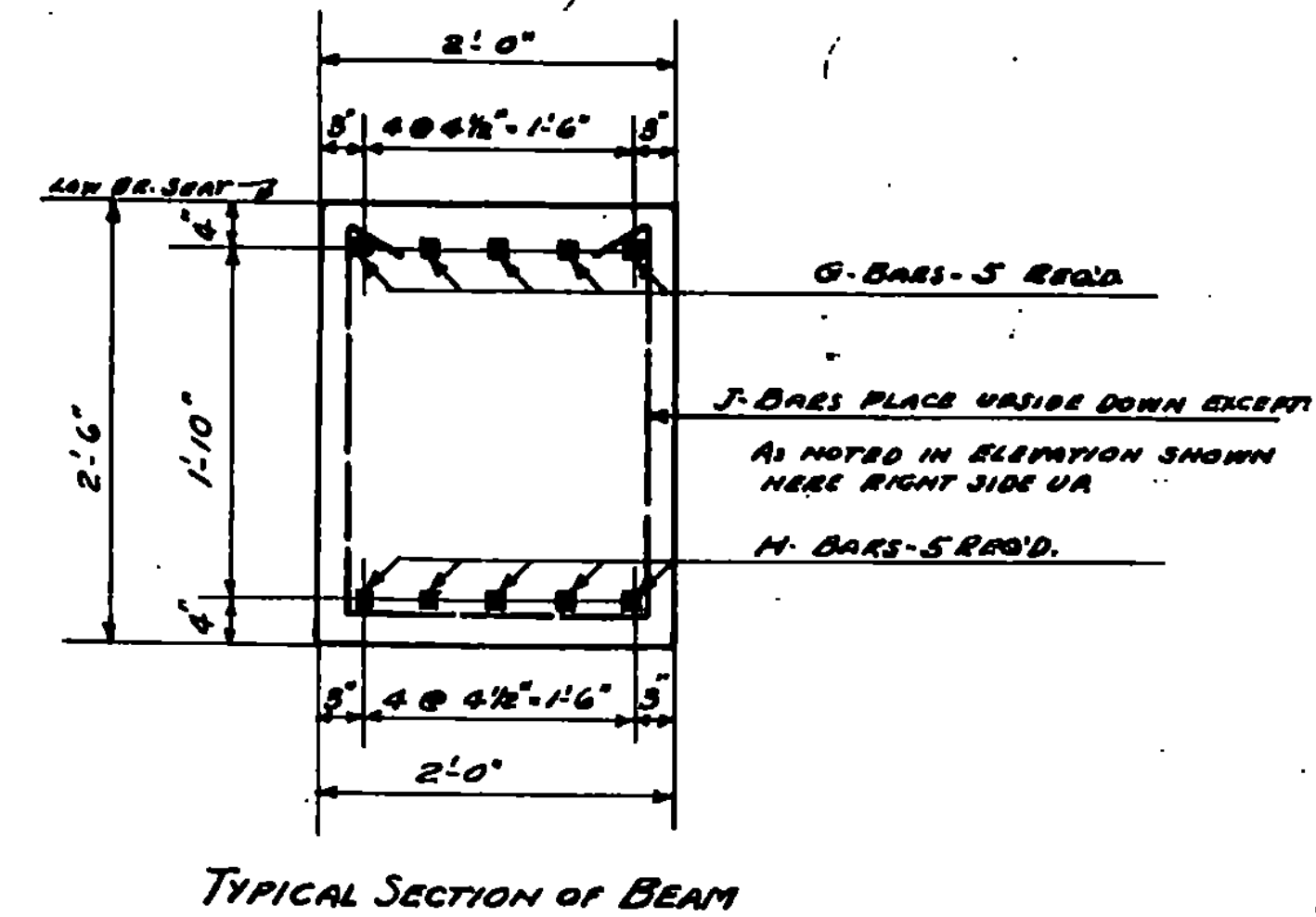
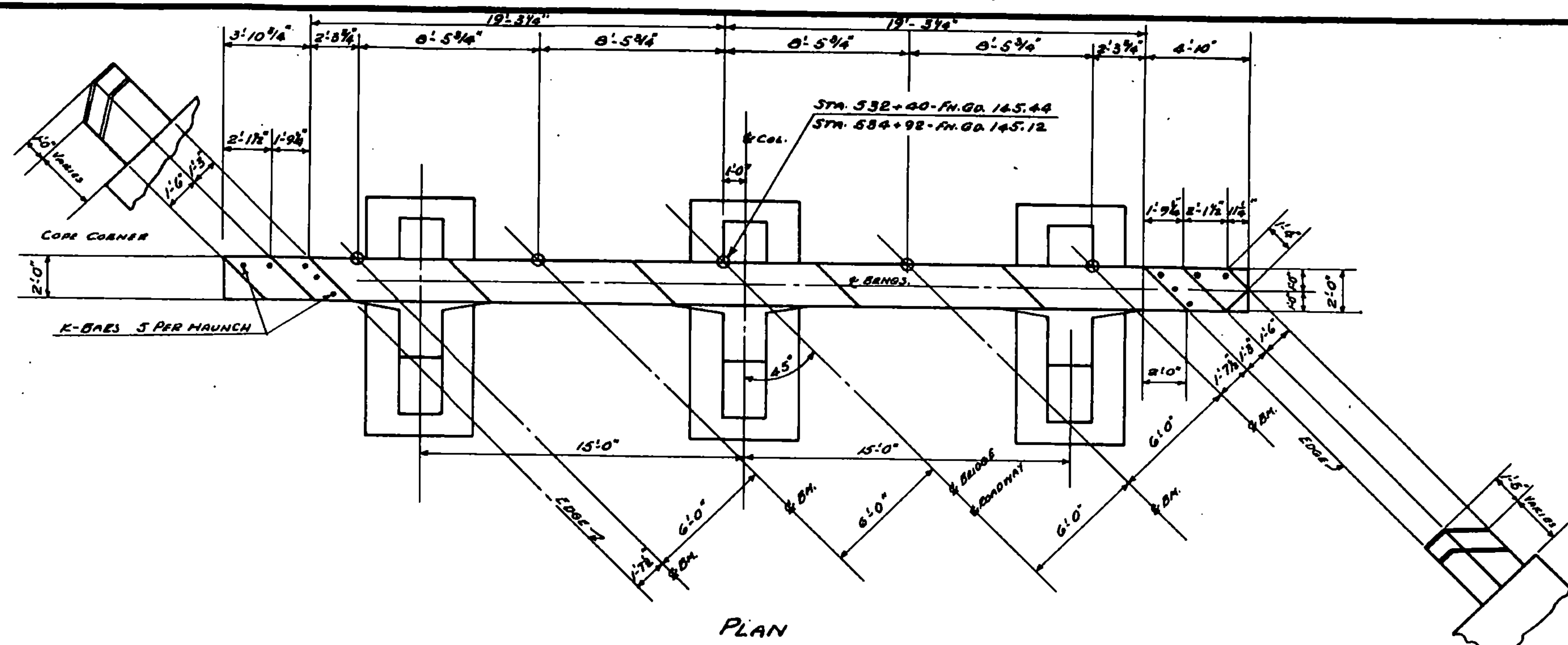
	OLD	PROPOSED
TYPE	WOOD TRUSS	I-BM
SPANS	1 @ 120'	3 @ 84'
CLINT.	22' AFE	27.5'
WATERWAY	2640.0'	3340.0'
LGTH. OVERALL	120'	252'
RDWY. WIDTH		24'

SHEETS FOR STRUCTURE
PLAN & PROFILE
PIER DETAILS
ABUTMENT DETAILS
51B 24'-45" SUPERSTRUCTURE USE 3-84' SPANS
51C 50' - RAIL (LESS CABLE & FITTINGS)
5820 DETAILS, C, E, G, I, L & GEN. NOTES
5811- BARRICADES, LIGHTS, ETC.

ITEM	QUANTITY	DESCRIPTION
16	668.00	STRUCTURE EXCAV.
41A	748.00	CONCRETE CLASS A
42	764.00	REINFORCING STEEL
43B	12.3	STEEL SUPERSTRUCTURE (32320x2)
65	5700.00	TIMBER PILING

CORRECT APR 24/37
A.O. Siler
BRIDGE ENGINEER

REFERENCE SHEET
SHEET BR 122 OF BR 124
NORWICH
BRIDGE OVER OMPOMPANOOUSUC RIVER



REINFORCING STEEL				
BAR NO.	SIZE	LYN	REIN.	DETAIL
A	3/4"	7'-0"	66	STRAIGHT
B	3/4"	10'-10"	45	STRAIGHT
C	1"	13'-0"	30	11'-3" R. 15"
D	1"	29'-3"	30	27'-6" R. 15"
E	1"	923 ft. 75 BARS	75	LENGTH VARIES 70' THRU 12'-6" TO 21'-8" BEND IN FIELD
F	3/4"	8'-0"	18	STRAIGHT
G	1 1/2"	49'-2"	5	49'-9" R. 15"
H	1"	36'-0"	5	STRAIGHT
J	5/8"	6'-4"	33	2'-1" R. 15"
K	1 1/2"	5'-6"	10	STRAIGHT

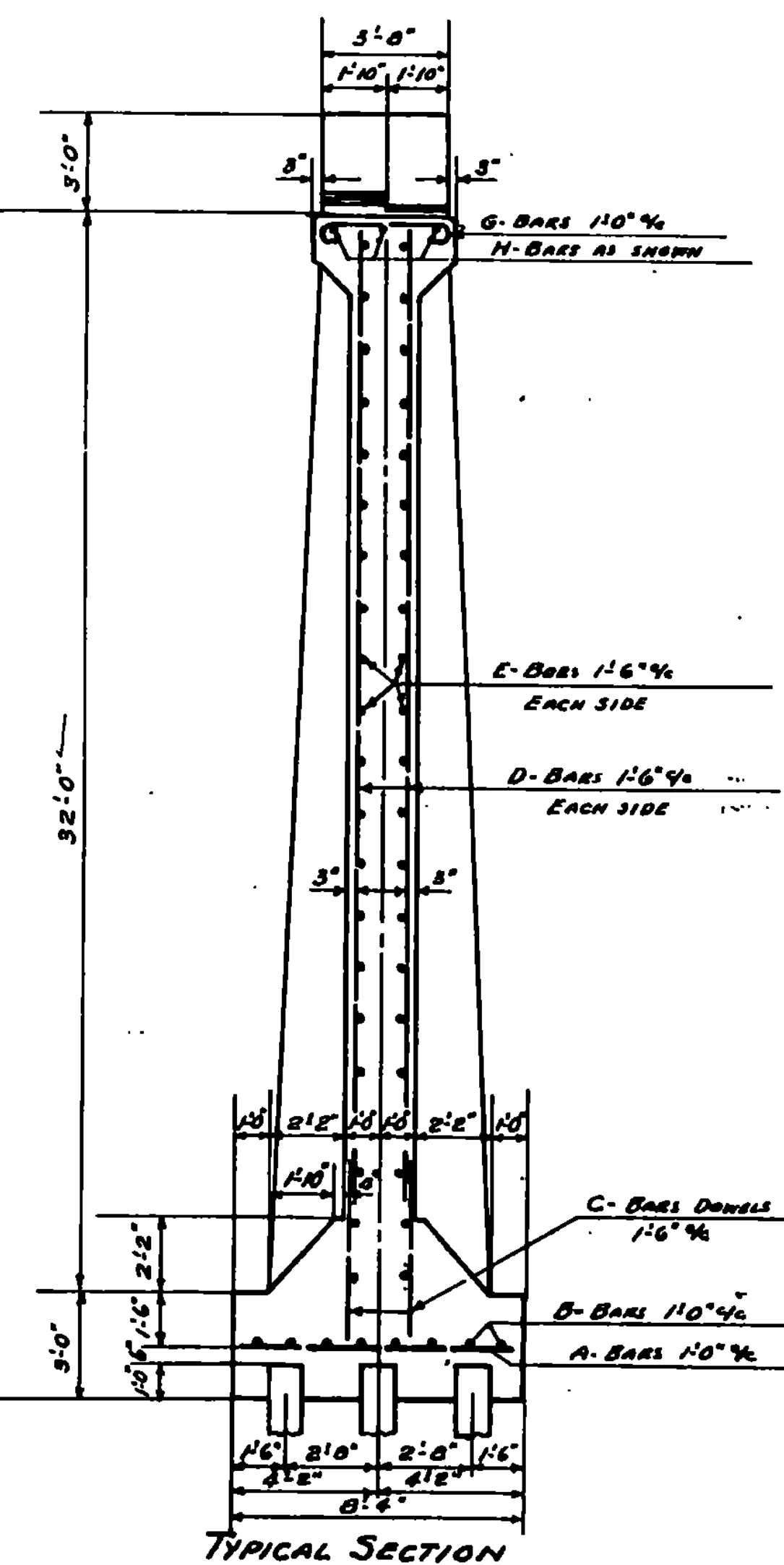
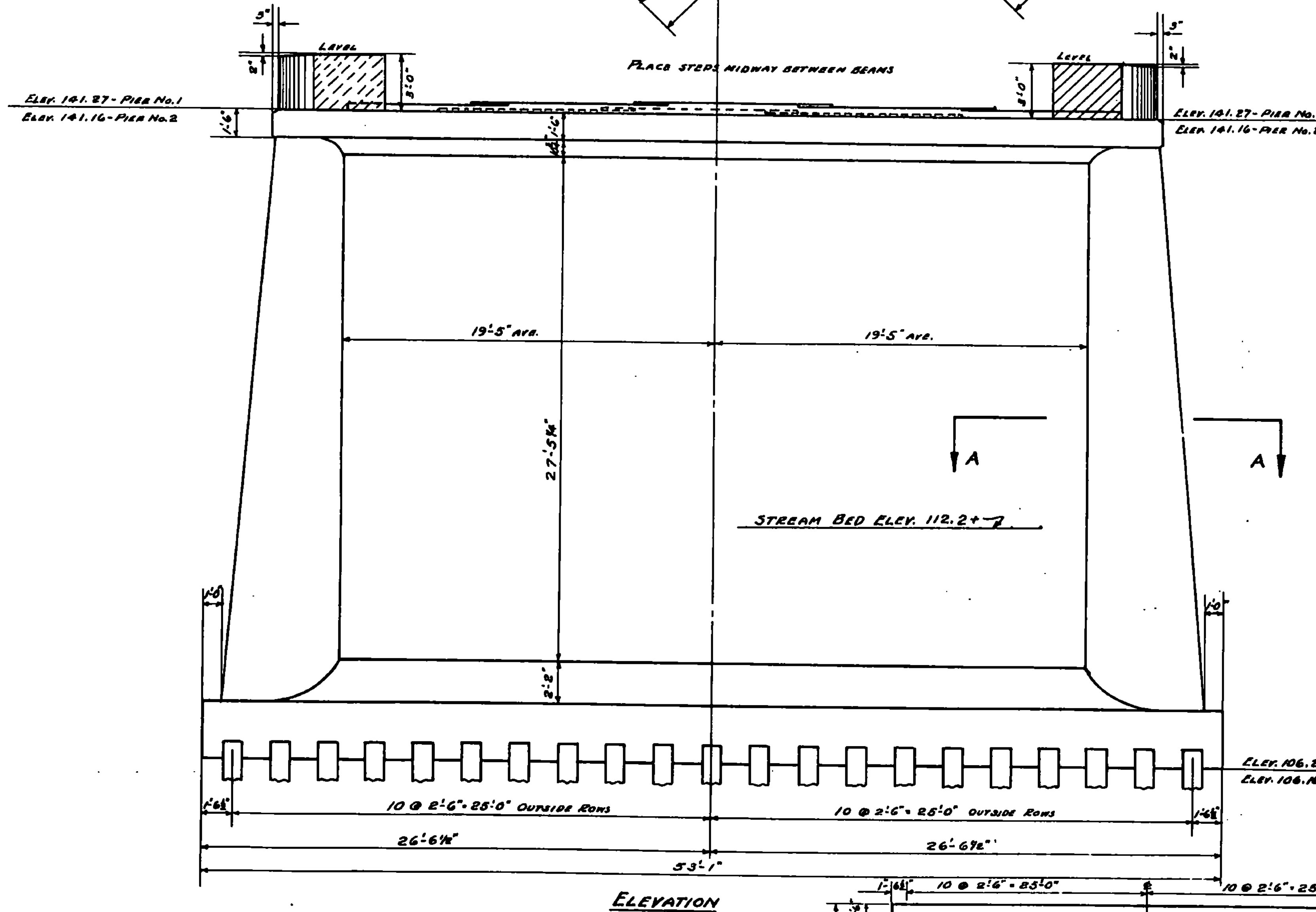
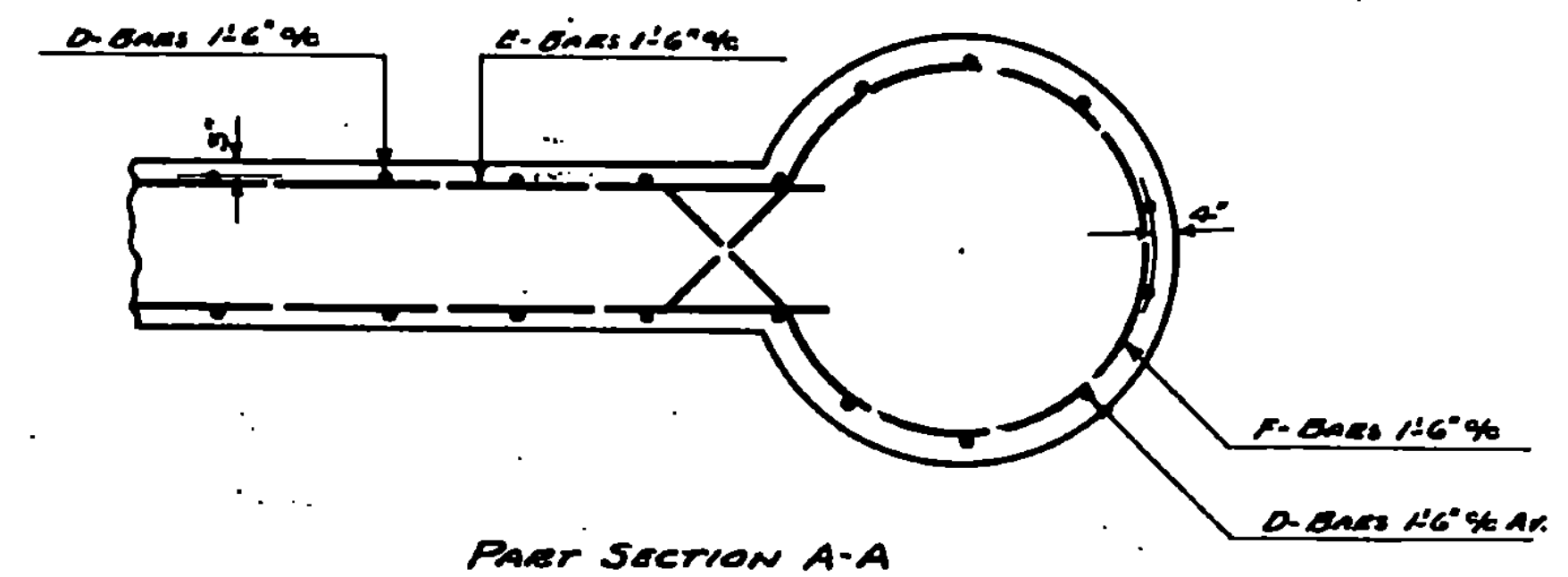
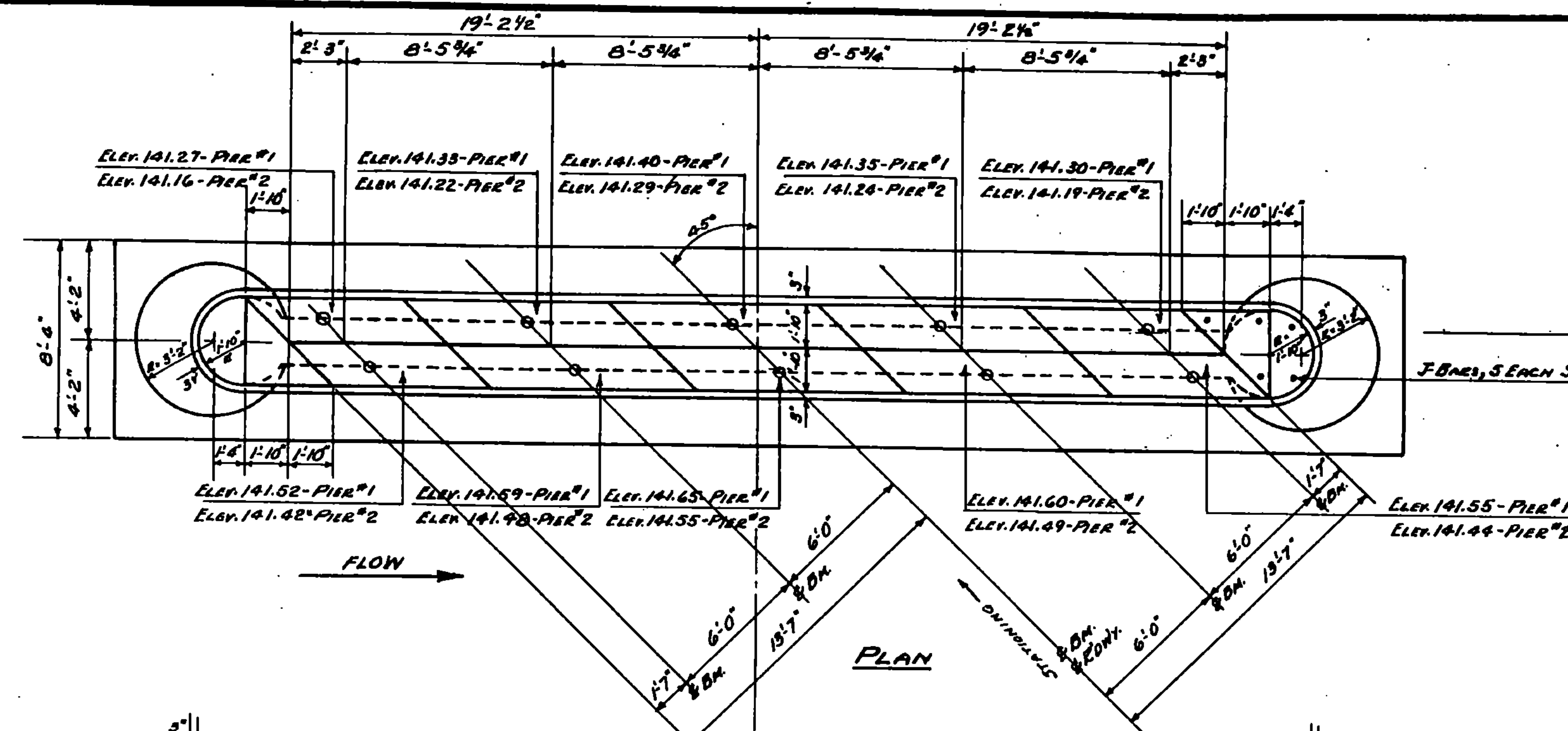
THE ABOVE STEEL SCHEDULE IS NOT GUARANTEED. SCHEDULE IS FOR ONE ABUTMENT - TWO REQUIRED. LENGTH OF PILES 33'-0" FOR ESTIMATING PURPOSES ONLY. DRIVE PILES TO 22 TON CAPACITY.

REFERENCE SHEET
SHEET BR123 OF BR124

ABUTMENT DETAILS
NORWICH, VT.
F.A.P. 114-J

ESTIMATED QUANTITIES ABUT. #2	
STE. ELEV.	138 Cu. Yds.
CONCRETE CLASS "A"	64 Cu. Yds.
REIN. STEEL	8031 LBS.
TIMBER PILING	1260 Lm. Ft.
STE. ELEV.	222 Cu. Yds.
CONCRETE CLASS "A"	64 Cu. Yds.
REIN. STEEL	8031 LBS.
TIMBER PILING	1260 Lm. Ft.

Surveyed by	M. H. D.	3/25/37
Designed by	M. H. D.	3/25/37
Drawn by	D. M. P.	3/29/37
Checked by	G. G.	3/31/37
Series R.A.P.	No. 114-J	Filed
Sheet 5 of 9 - Sheets		

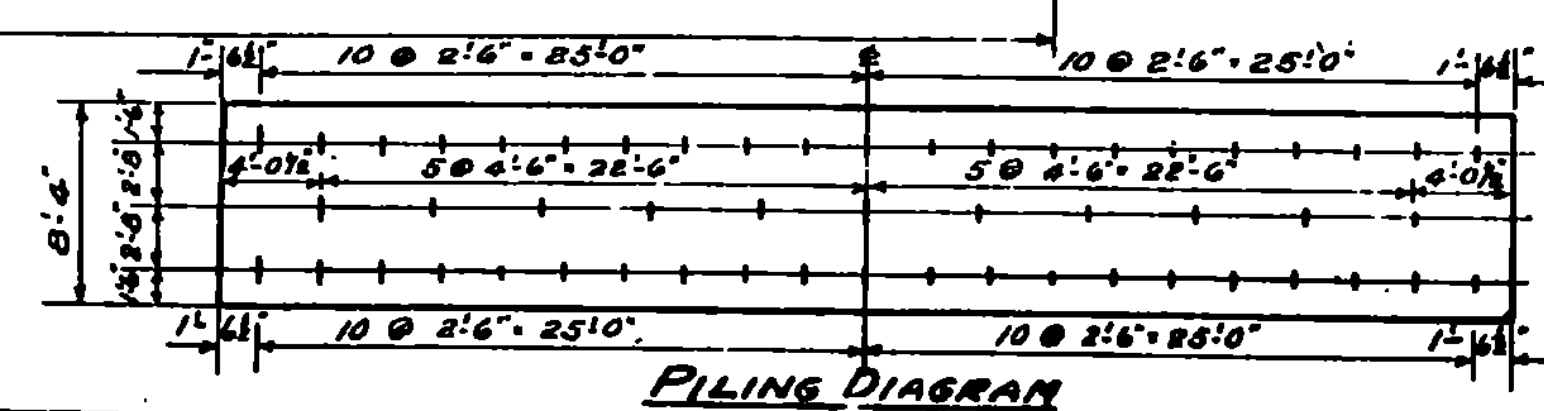


REINFORCING STEEL				
BAR NO.	SIZE	LYN.	REQD.	LENGTH
A	5/8"	8'-0"	53	STRAIGHT
B	5/8"	27'-0"	16	STRAIGHT
C	5/8"	7'-0"	72	STRAIGHT
D	5/8"	29'-6"	72	STRAIGHT
E	1/2"	39'-0"	42	STRAIGHT
F	1/2"	19'-0"	42	LENGTH VARIES 16' TO 26' AVE. LYN. 19' BENT IN FIELD.
G	5/8"	5'-3"	43	SEE DETAIL
H	1/2"	22'-0"	6	STRAIGHT
J	1/2"	5'-0"	10	STRAIGHT

THIS STEEL SCHEDULE IS NOT GUARANTEED. THE ABOVE SCHEDULE IS FOR ONE PIER, TWO REQUIRED. DRIVE PILES TO 10 TON CAPACITY. LENGTH OF PILES 30 FT. FOR ESTIMATING PURPOSES ONLY.

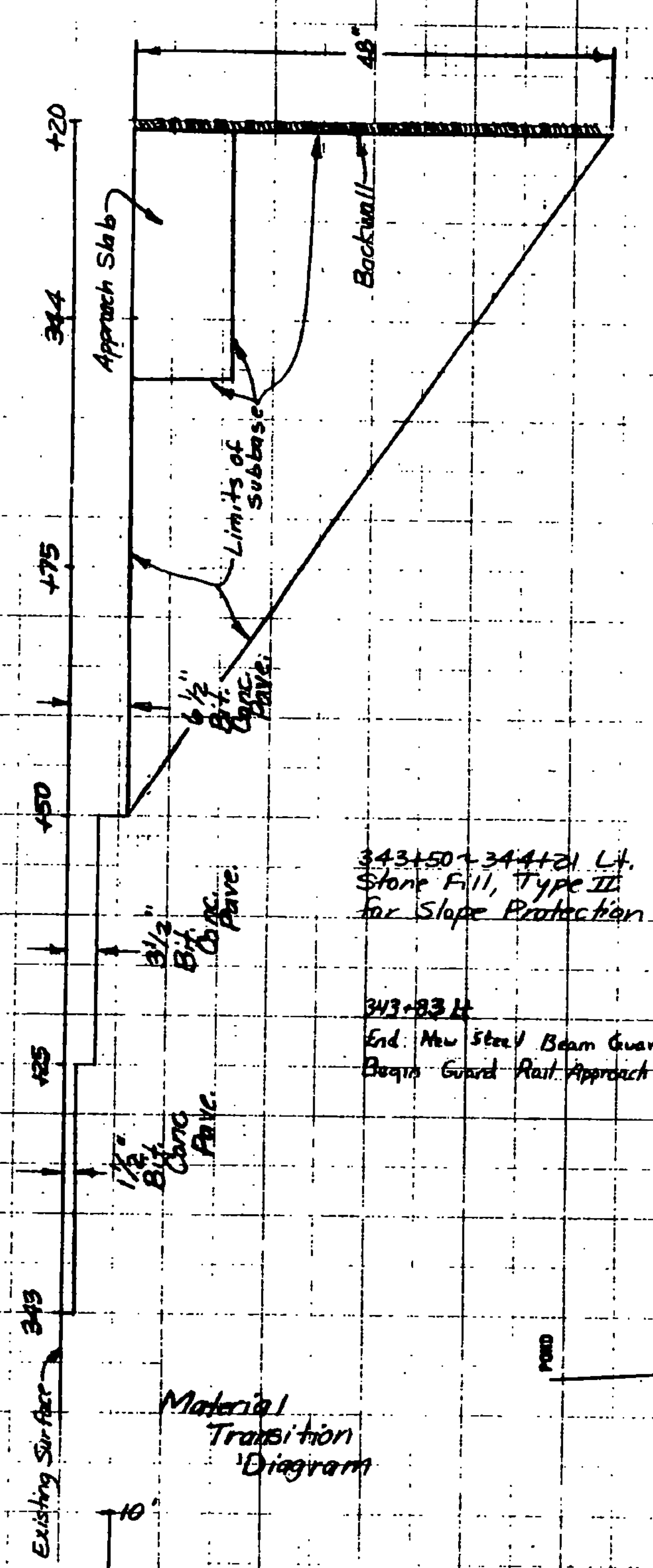
REFERENCE SHEET
SHEET BR 124 OF BR 124

PIER DETAILS
NORWICH, VT.
F.A.P. 114-J



PIER #1		PIER #2	
STRUCTURE EXCAV.	177 Cu.Yds.	STRUCTURE EXCAV.	129 Cu.Yds.
CONCRETE CLASS 'A'	206 Cu.Yds.	CONCRETE CLASS 'A'	206 Cu.Yds.
REINFORCING STEEL	5618 LBS.	REINFORCING STEEL	5618 LBS.
TIMBER PILING	1390 Lm.Ft.	TIMBER PILING	1390 Lm.Ft.

Surveyed by		
Designed by	W.H.D.	3/23/57
Drawn by	W.H.D.	3/23/57
Traced by	D.H.R.	3/26/57
Checked by	G.C.	3/29/57
Series F.A.P.	No. 114-J	Filed



343+83.4
End: New Steel Beam Guard Rail
Begin Guard Rail Approach Section Type I

343 + 28 ft
Begin Removal and Disposal of Guard Rail
Begin New Steel Beam Guard Rail

GMP
155
66
NET

344+00
End Approach Construction
Main Project BHS 0113 (36)

12" Grubbing Material (Typ.)

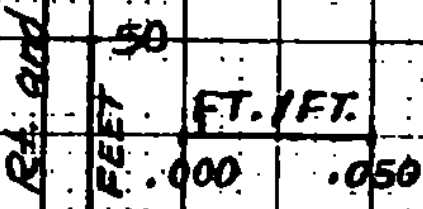
343+00
Begin Approach
Construction
~~343+00 ~ 343+500~~
Cold Planing Bituminous Pavement

347 + 08 R/L
End Guard Rail Approach
Section Type I
End Removal and Disposal
of Guard Rail

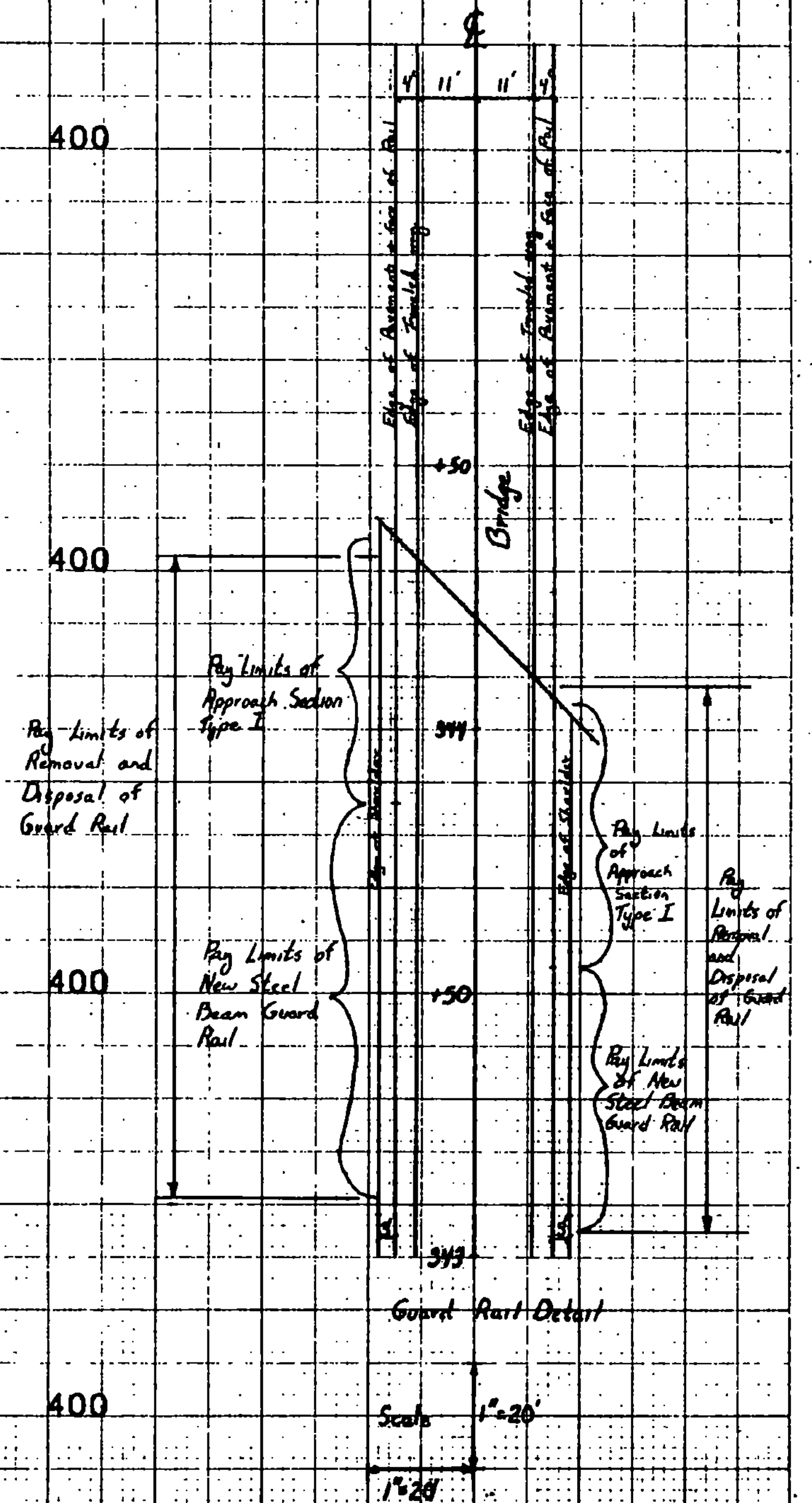
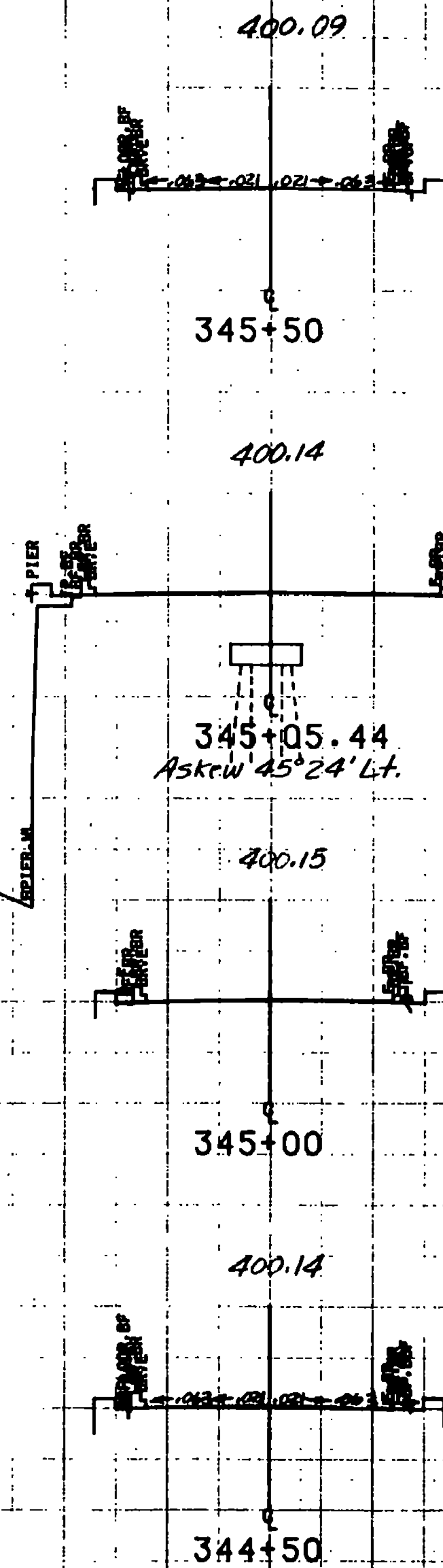
343450 ~ 344421 R/L
Stone Fill, Type III
for Slope Protection

343483 RA
End New St. Brown Guard Rail
Bryn Mawr Rail Approach
Section One I

Roadway and Shoulder Banking Detail

[illegible]

FROM STA. 343+00 TO STA. 344+20.85
PROJECT NAME: NORMON MAIN
RD.: BRSD13 (B&S)
DESIGNED BY: FALL
PLOTTED 03/25/87
SCALE: 1"=50'
SHEETS: 10



FROM STA.	344+50	TO STA.	345+50
PROJECT NAME	NORMICH MAIN		
NO.	BHS0113 (5813)		
SURVEYED BY	FALL		
SHEET	44	OF	70 SHEETS
		PLOTTED	03/25/87
			03/87

SCALE 1"=20'

1 and Disposal of Guard Rail

MAD

H

E 350

E 350

E 350

392.59

E 350

E 350

E 350

$$.346 + 7512$$

346+62 R6

399.94

399.97

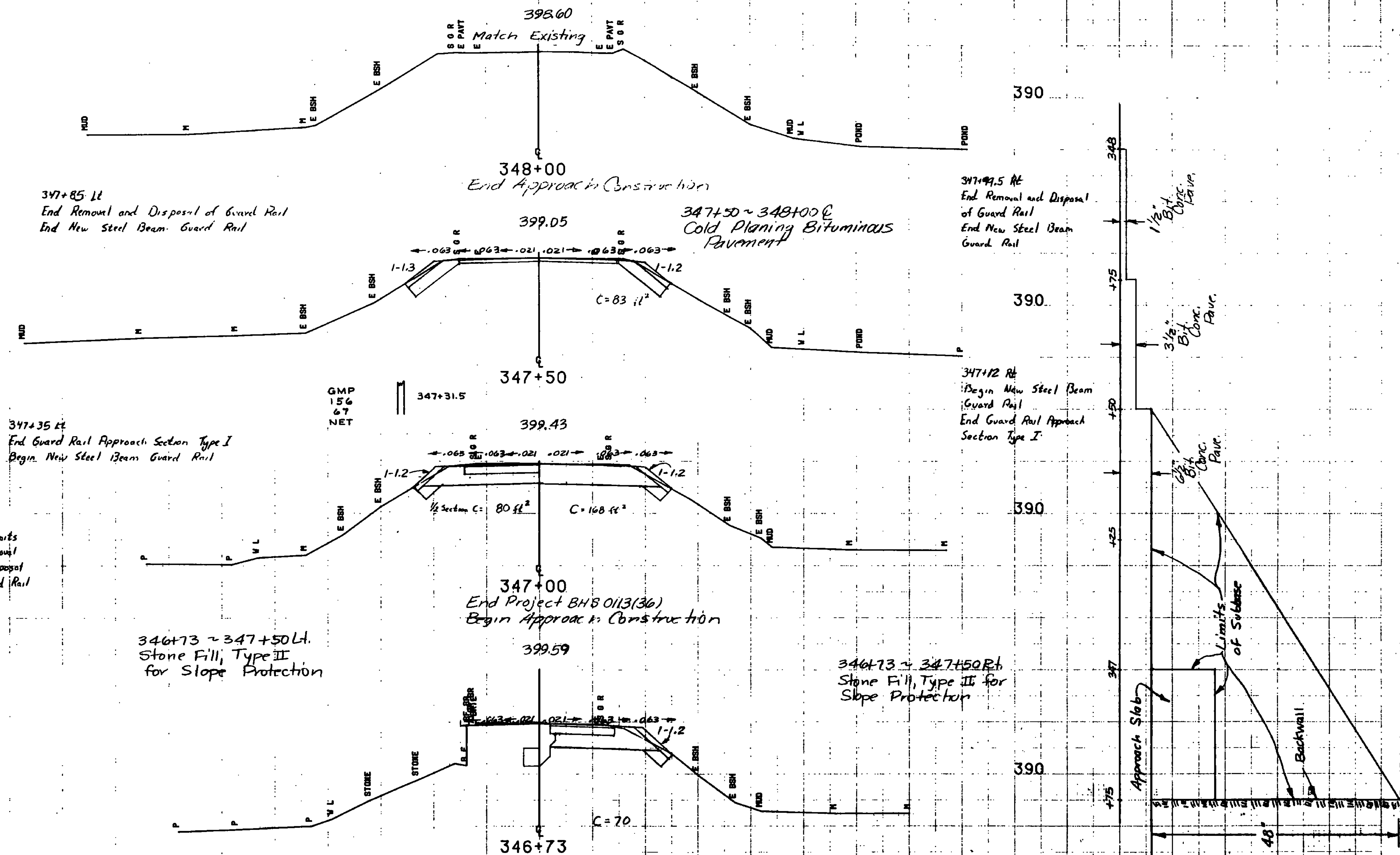
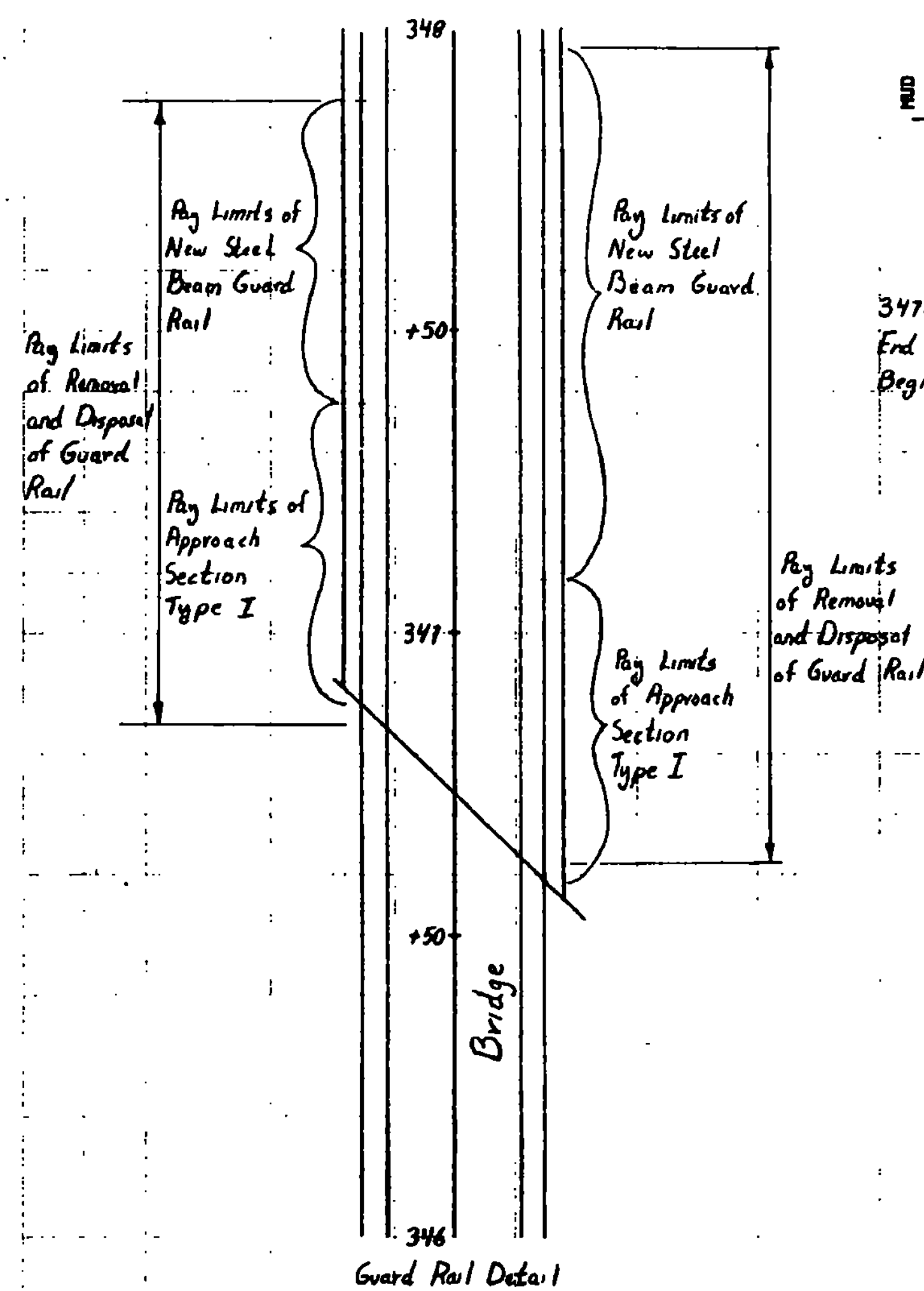
063 021 063

0.063 0.021

345.88.88

FROM STA.	345+88.88	TO STA.	346+73
PROJECT NAME	NORMICH MAIN		PLOTTED 03/25/87
NO.	BMS0113 (56) #		
SURVEYED BY	FALL		03/87
SHEET	45 OF 70	SHEETS	

FROM STA.	345+88.88	TO STA.	346+73
PROJECT NAME	NORMICH MAIN		PLOTTED 03/25/87
NO.	BMS0113 (56) #		
SURVEYED BY	FALL		03/87
SHEET	45 OF 70	SHEETS	



FROM STA.	346+73	TO STA.	348+00
PROJECT NAME	NORWICH MAIN		
NO.	BH80113 (36)		
SURVEYED BY	FALL		
SHEET	46 OF 70	SHEETS	
		PLOTTED	03/25/87
			03/87

SCALE 10 FEET

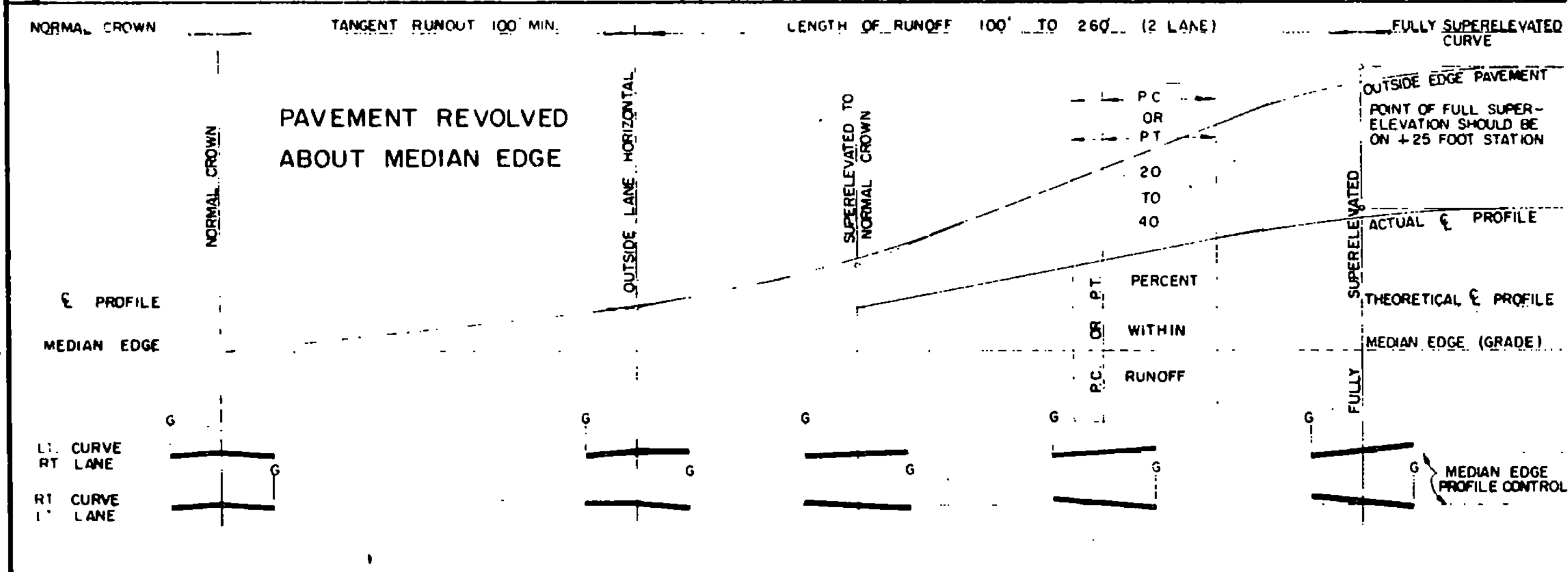
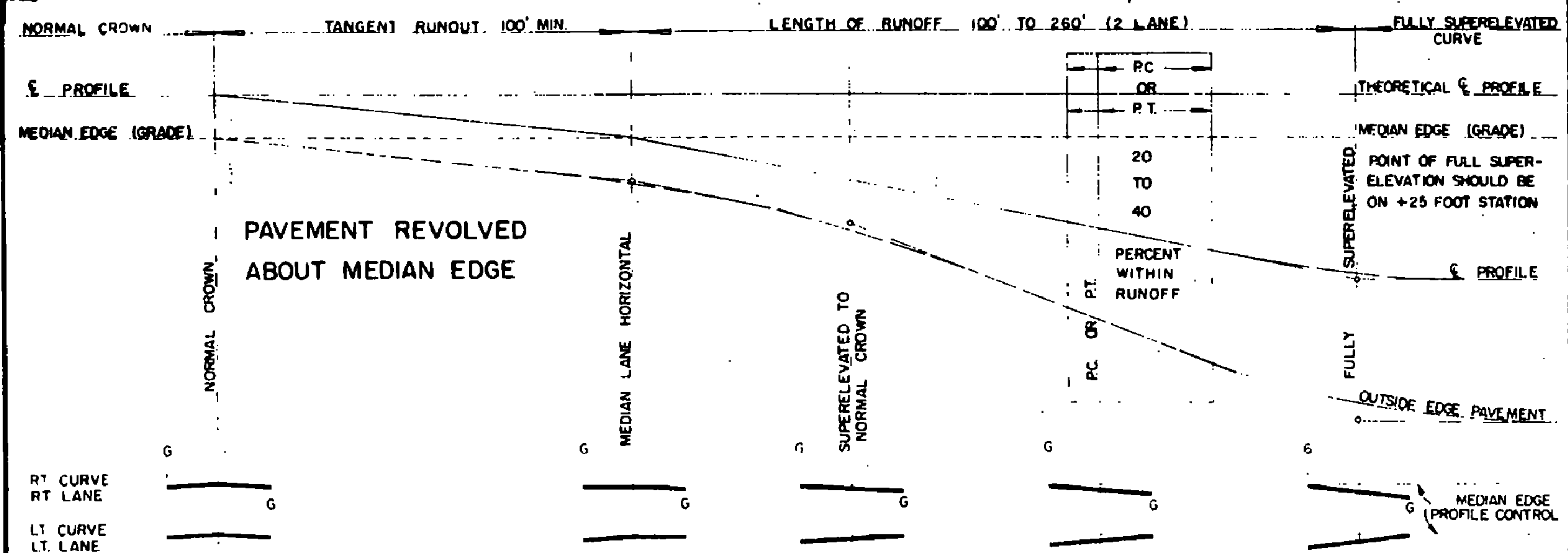
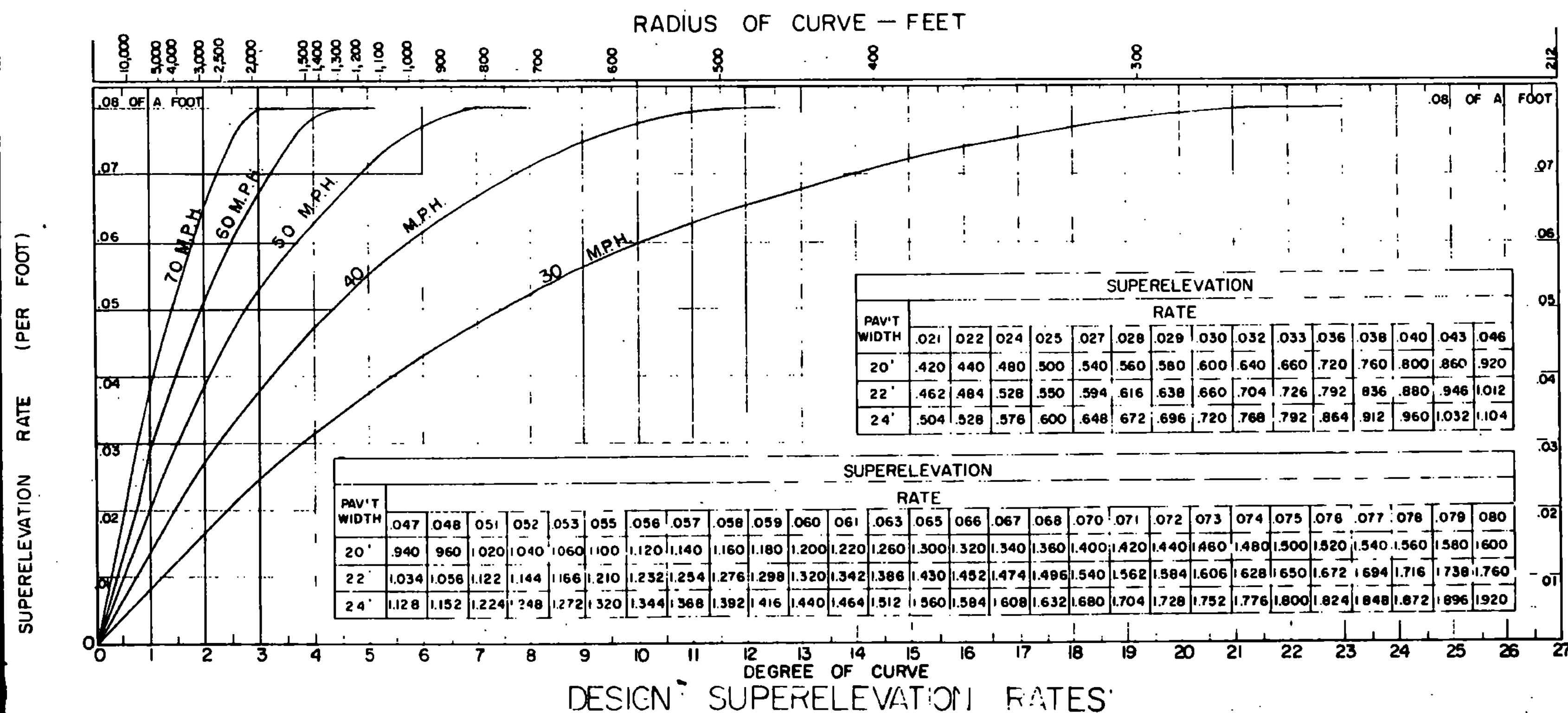
DEGREE OF CURVE	RADIUS	V = 40 M.P.H.				V = 50 M.P.H.				V = 60 M.P.H.				V = 65 M.P.H.				V = 70 M.P.H.			
		L - FEET		L - FEET		L - FEET		L - FEET		L - FEET		L - FEET		L - FEET		L - FEET		L - FEET		L - FEET	
		2 LANE	4 LANE	2 LANE	4 LANE	2 LANE	4 LANE	2 LANE	4 LANE	2 LANE	4 LANE	2 LANE	4 LANE	2 LANE	4 LANE	2 LANE	4 LANE	2 LANE	4 LANE	2 LANE	4 LANE
0° 15'	22918'	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0
0° 30'	11459'	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0	0	NC	0
0° 45'	7639'	NC	0	0	NC	0	0	RC	150	150	.022	175	175	.025	190	190	.028	200	200		
1° 00'	5730'	NC	0	0	NC	125	125	.021	150	150	.029	175	175	.032	190	190	.038	200	200		
1° 30'	3820'	NC	100	100	.021	125	125	.030	150	150	.041	175	175	.046	190	200	.051	200	240		
2° 00'	2865'	RC	100	100	.027	125	125	.038	150	150	.051	175	210	.058	190	250	.065	200	290		
2° 30'	2292'	.021	100	100	.033	125	125	.046	150	170	.061	175	240	.068	190	300	.075	220	330		
3° 00'	1910'	.025	100	100	.038	125	125	.053	150	190	.068	180	270	.075	210	320	.080	230	350		
3° 30'	1637'	.028	100	100	.043	125	140	.058	150	210	.074	200	300	.079	220	330					
4° 00'	1432'	.031	100	100	.047	125	150	.063	150	230	.078	210	310								
5° 00'	1146'	.038	100	100	.055	125	170	.071	170	260											
6° 00'	955'	.043	100	120	.062	130	190	.077	180	280											
7° 00'	819'	.048	100	130	.067	140	210														
8° 00'	716'	.058	100	140	.071	150	220														
9° 00'	637'	.056	100	150	.075	160	240														
10° 00'	573'	.060	110	160	.078	160	240														
11° 00'	521'	.063	110	170	.079	170	250														
12° 00'	477'	.065	120	180	.080	170	250														
13° 00'	441'	.068	120	180																	
14° 00'	409'	.070	130	190																	
16° 00'	358'	.074	130	200																	
18° 00'	318'	.077	140	210																	
20° 00'	286'	.079	140	210																	
22° 00'	260'	.080	140	220																	

$$e_{max} = 0.08$$

V - ASSUMED DESIGN SPEED
e - RATE OF SUPERELEVATION
L - MINIMUM LENGTH OF RUNOFF OF SPIRAL CURVE
NC - NORMAL CROWN SECTION
RC - REMOVE ADVERSE CROWN, SUPERELEVATE AT NORMAL CROWN SLOPE
SPIRALS DESIRABLE BUT NOT AS ESSENTIAL ABOVE HEAVY LINE
LENGTHS ROUNDED IN MULTIPLES OF 25 OR 50 FEET PERMIT SIMPLER CALCULATIONS
LENGTH OF RUNOFF FOR A 4 LANE HIGHWAY IS BASED ON A ROADWAY WITH 16 FEET OR LESS MEDIAN

BANKING FOR CURVES NOT LISTED IN TABLES MAY BE DETERMINED FROM GRAPH.

DESIGN VALUES FOR RATE OF SUPERELEVATION AND MINIMUM LENGTH OF RUNOFF

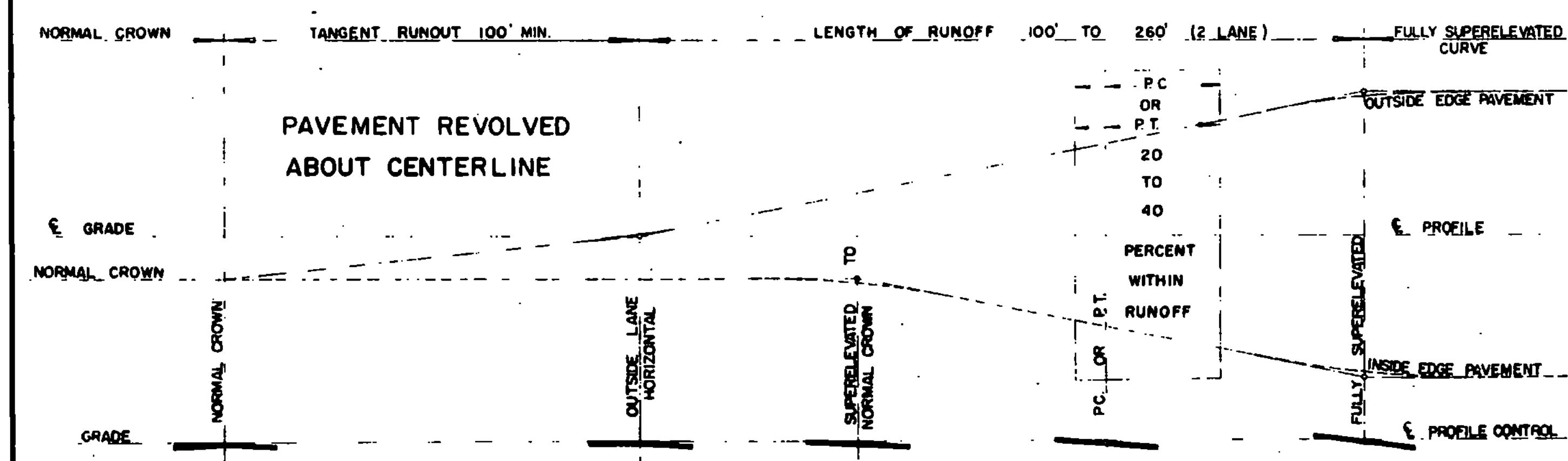


TANGENT RUNOUT CONSISTS OF MAKING THE LANE OR LANES ON THE OUTSIDE OF THE CURVE, HORIZONTAL WITH THE CENTERLINE, USING 100' MIN. WHERE THE NORMAL CROWN IS APPROXIMATELY 1/4 INCH PER FOOT.

LENGTH OF RUNOFF FROM 60 TO 80 PERCENT OF THE LENGTH OF RUNOFF PREFERABLY SHOULD BE LOCATED ON THE TANGENT AT CURVES.

CURVES WITH SPIRALS THE LENGTH OF THE SPIRAL AND THE LENGTH OF RUNOFF ARE THE SAME IN DISTANCE. BREAKS IN PROFILES FOR PAVEMENT EDGES SHOULD BE ROUNDED IN FINAL DESIGN BY INSERTION OF VERTICAL CURVES. THE MINIMUM VERTICAL CURVE LENGTH IN FEET CAN BE USED NUMERICALLY EQUAL TO THE DESIGN SPEED IN M.P.H.

DENOTES WHERE GRADE IS CARRIED



REVISIONS AND CORRECTIONS

OCT. 25, 1985 - REVISED TO CONFORM TO A.A.S.T.O. POLICY OF GEOMETRIC DESIGN, 1964

APPROVED

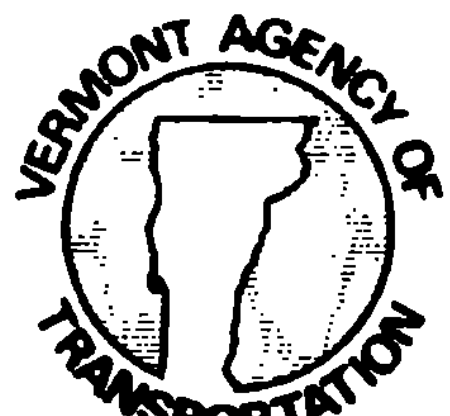
DATE

CHIEF ENGINEER

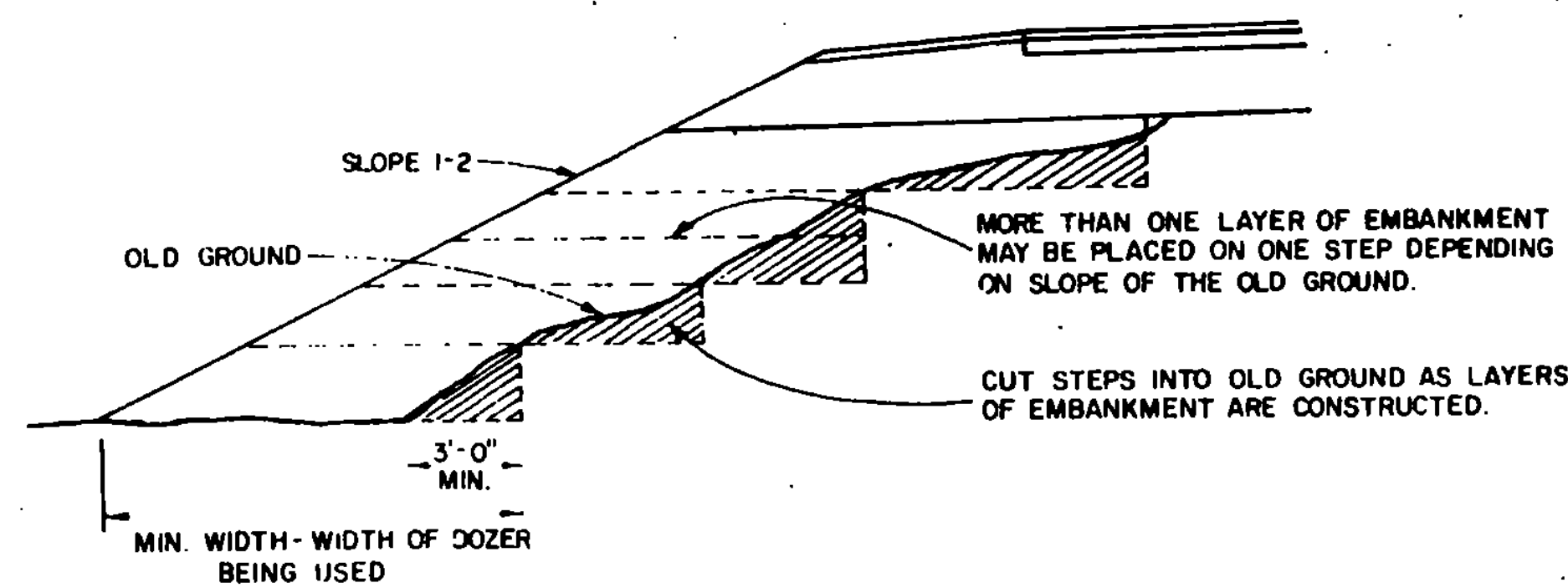
ASST. CHIEF ENGINEER

HIGHWAY ENGINEER

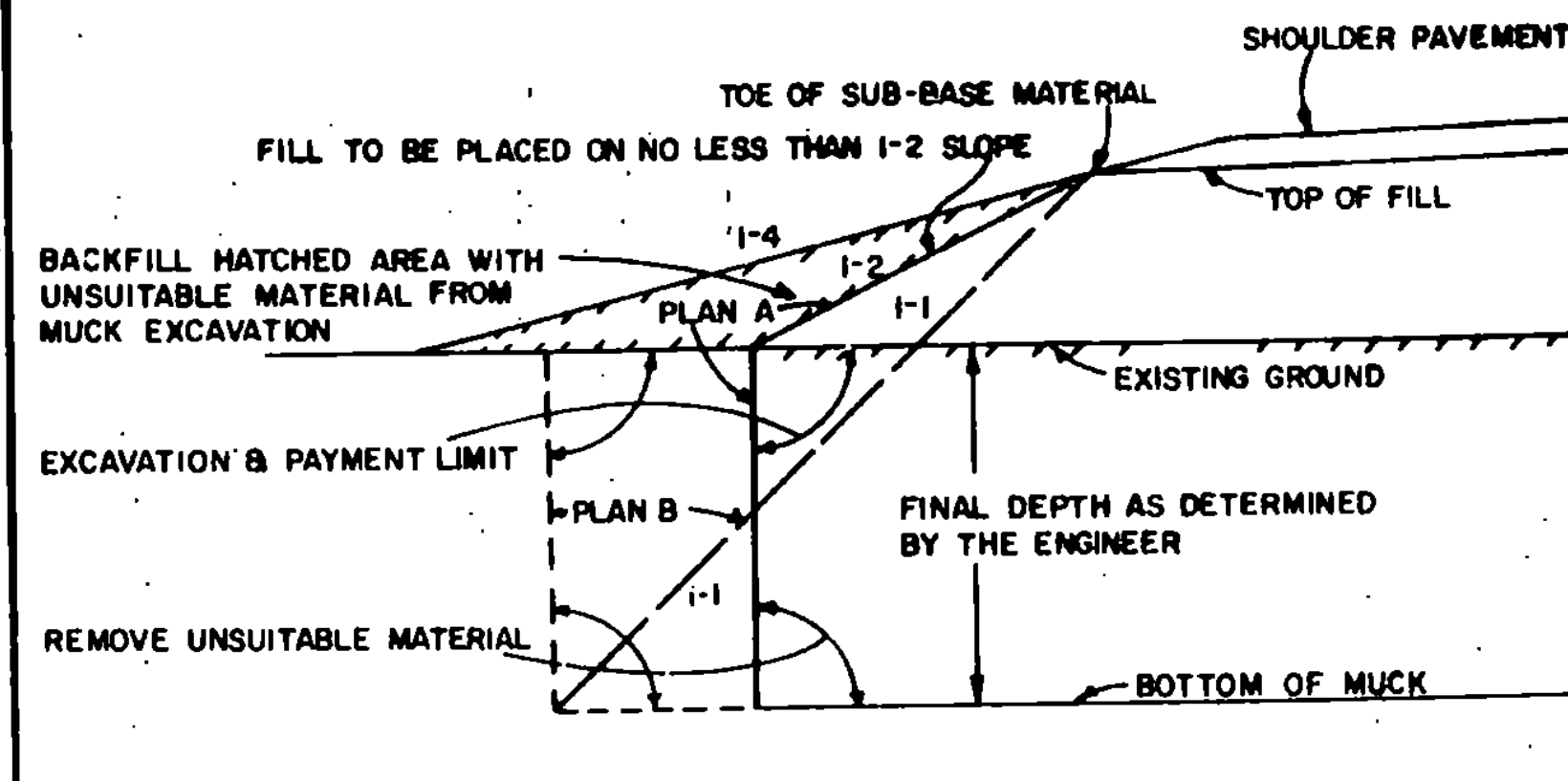
BANKING TABLES



STANDARD B-1



METHOD FOR CONSTRUCTING AN EMBANKMENT ON EARTH SLOPE

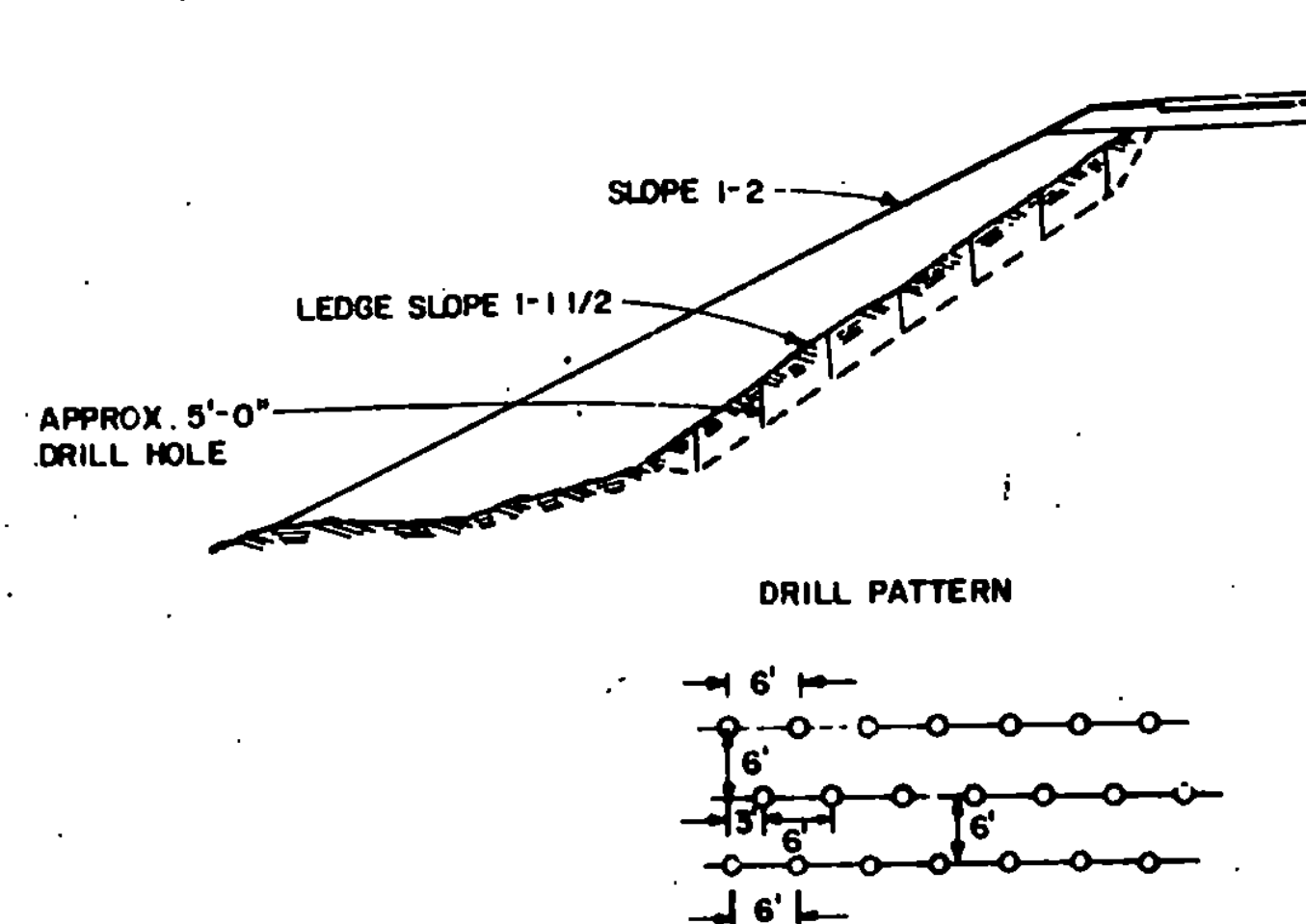


GENERAL NOTES:
THE MUCK OR UNSUITABLE MATERIAL SHALL BE EXCAVATED TO THE NEAT LINES SHOWN ON THE PLANS OR AS DETERMINED BY THE ENGINEER.

EXCAVATION AND PAYMENT LIMIT WILL BE DETERMINED FROM EITHER PLAN "A" OR PLAN "B", WHICHEVER PRODUCES THE GREATER WIDTH IN A GIVEN MUCK AREA.

BACKFILL MATERIAL MUST MEET THE REQUIREMENTS SET FORTH UNDER MUCK EXCAVATION, SECTION 203

TYPICAL NEAT PAY LINES FOR MUCK EXCAVATION

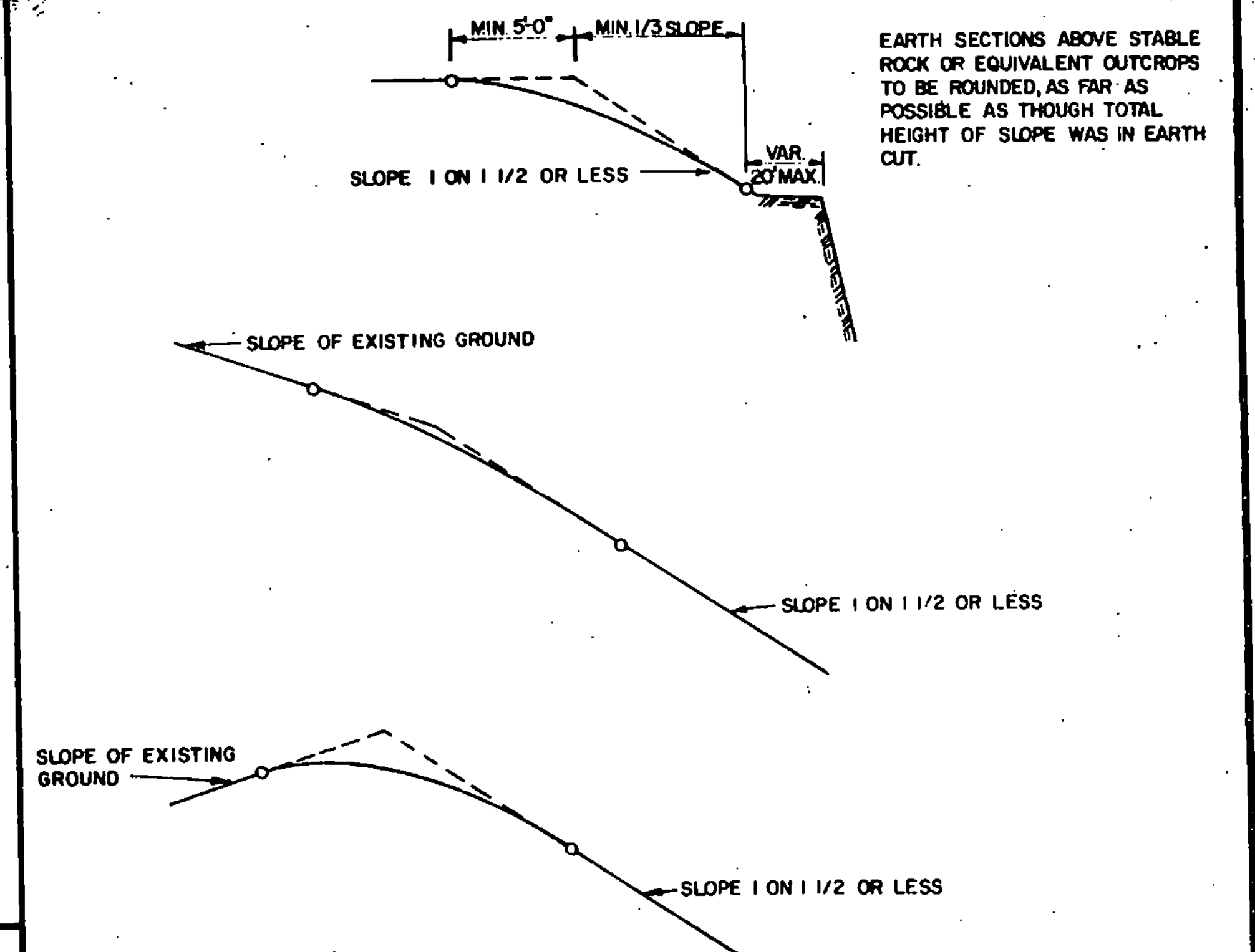


DRILLING AND BLASTING OF SOLID ROCK.

PROCEDURE TO BE FOLLOWED WHEN LEDGE SLOPE ON OLD GROUND IS BETWEEN A 1 ON 1 AND A 1 ON 5 SLOPE.

ALL HOLES TO BE APPROXIMATELY 5'-0" DEEP. HOLES TO BE IN ROWS, SPACED AND STAGGERED AS SHOWN IN DRILL PATTERN, OR AS DIRECTED BY THE ENGINEER, SEE SECTION 205.

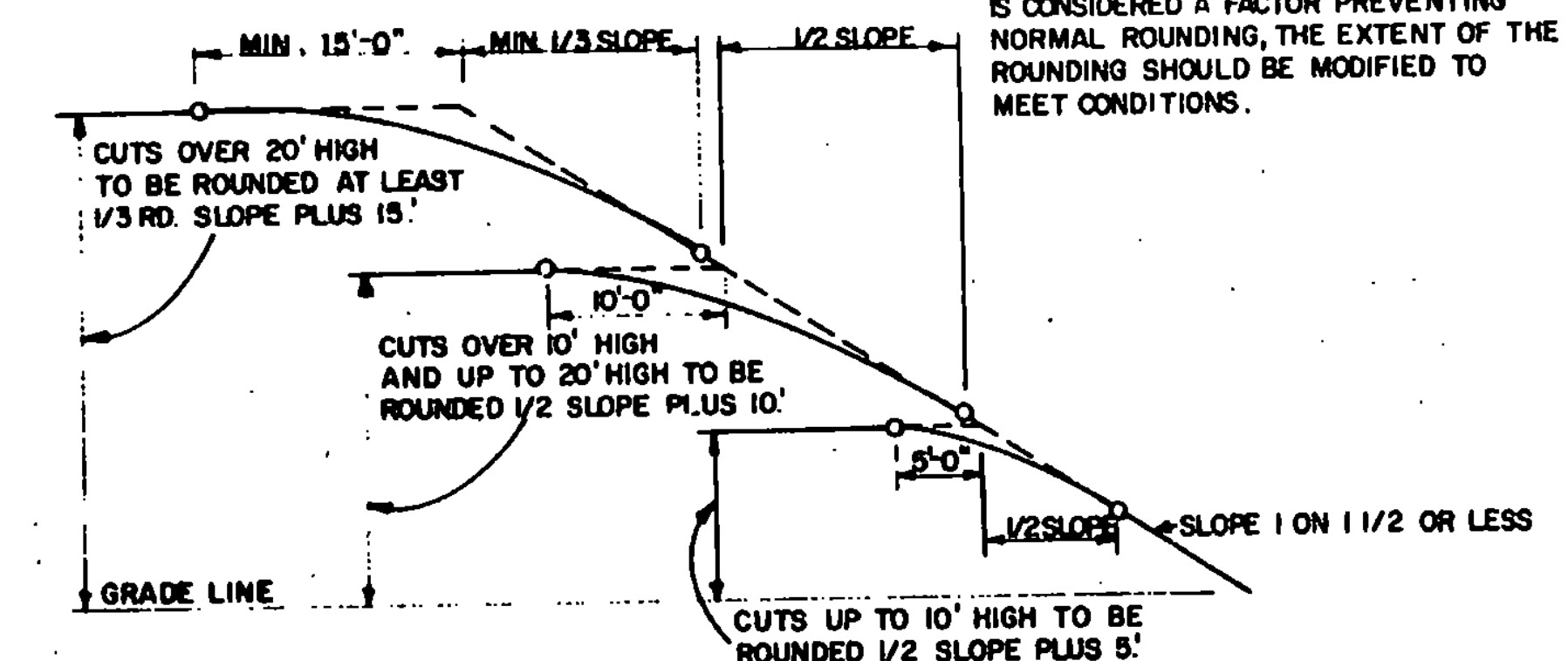
A METHOD FOR PREPARING LEDGE SLOPE BEFORE CONSTRUCTING AN EMBANKMENT



SLOPES TO BE ROUNDED AS SHOWN IN ORDER TO ALLOW FOR PERSPECTIVE FORESHORTENING AS SEEN FROM THE ROAD AND SO THAT FINISHED SLOPES WILL BETTER SUPPORT VEGETATIVE COVER.

ROUNDING TO MERGE WITH EXISTING GROUND SURFACE SO THAT NO HARD GRADE LINE WILL REMAIN WITHIN THE LINE OF SIGHT.

WHEN STEEPNESS OF EXISTING GROUND OR PRESENCE OF EXISTING VEGETATION IS CONSIDERED A FACTOR PREVENTING NORMAL ROUNDING, THE EXTENT OF THE ROUNDING SHOULD BE MODIFIED TO MEET CONDITIONS.



TYPICAL SLOPE ROUNDING

REVISIONS AND CORRECTIONS

APPROVED:

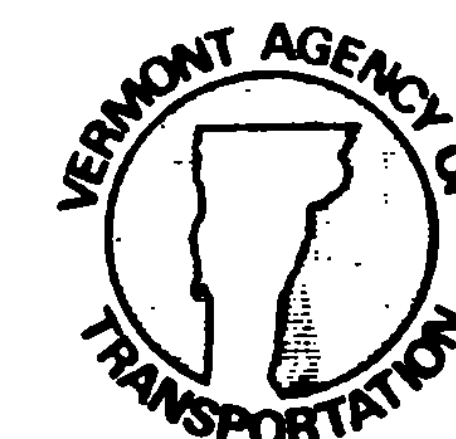
DATE Dec 6, 1971

R. W. Arnold
CHIEF ENGINEER

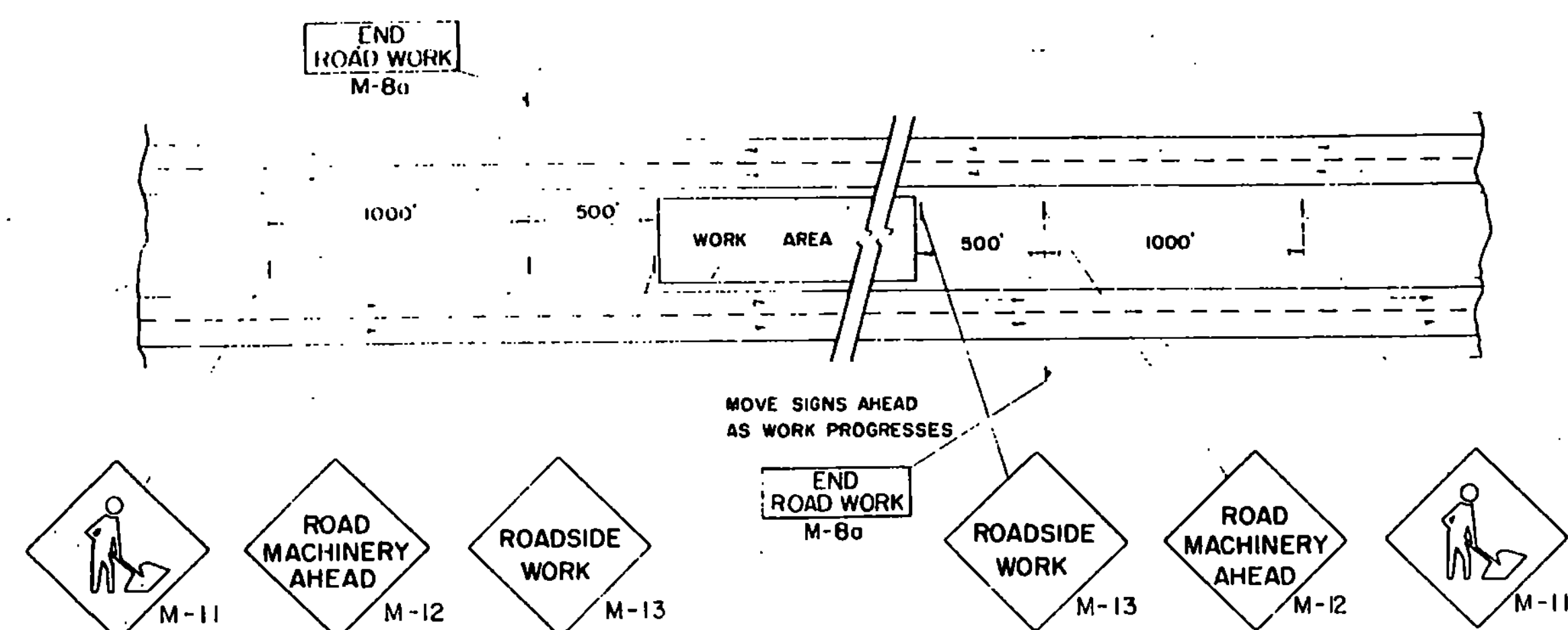
E. J. Stinchey
ASS. CHIEF ENGINEER

L. M. Lane
HIGHWAY ENGINEER

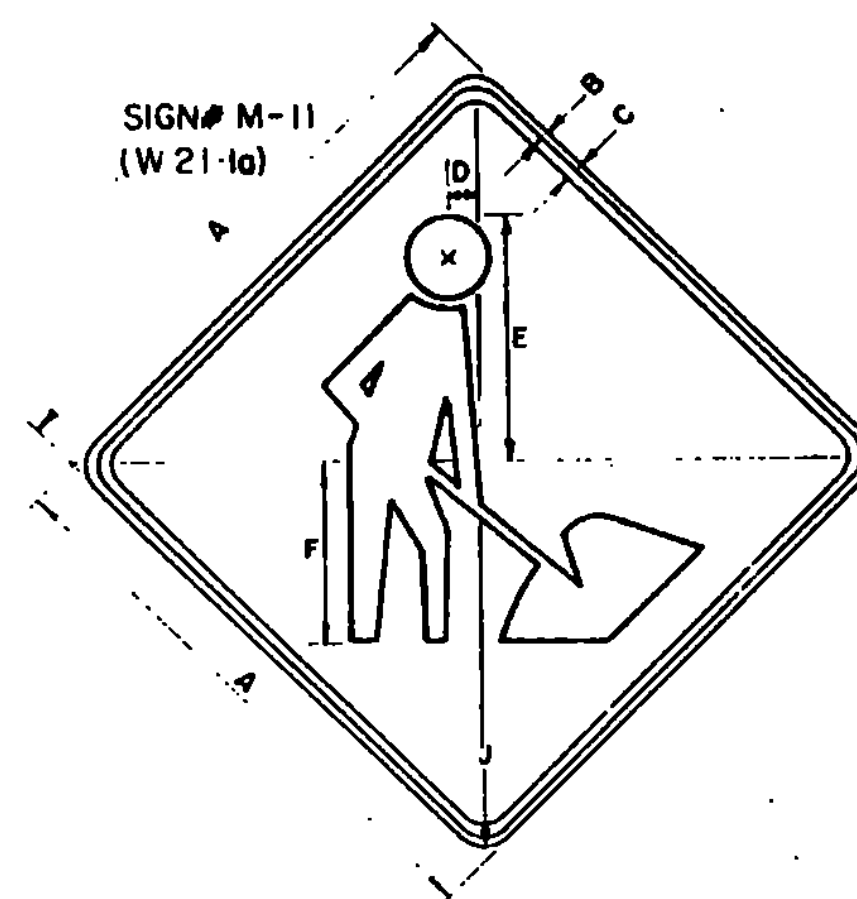
EMBANKMENT ON EARTH SLOPE EMBANKMENT ON ROCK SLOPE MUCK EXCAVATION TYPICAL SLOPE ROUNDING



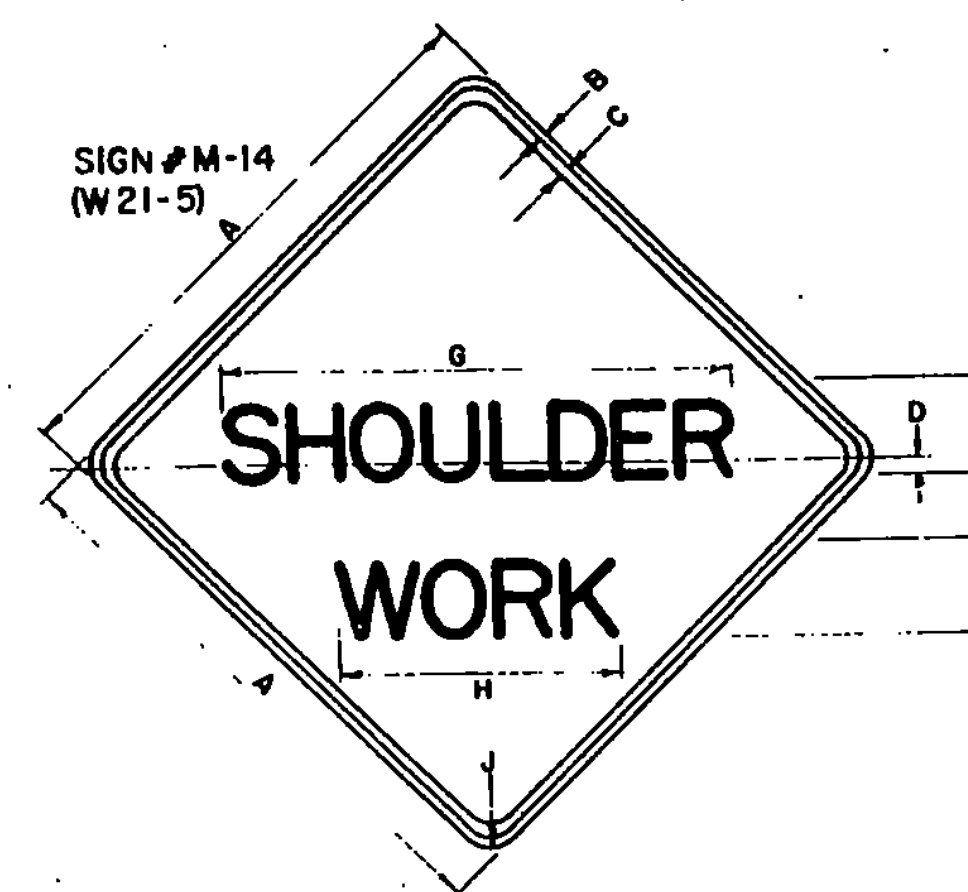
STANDARD
B-5



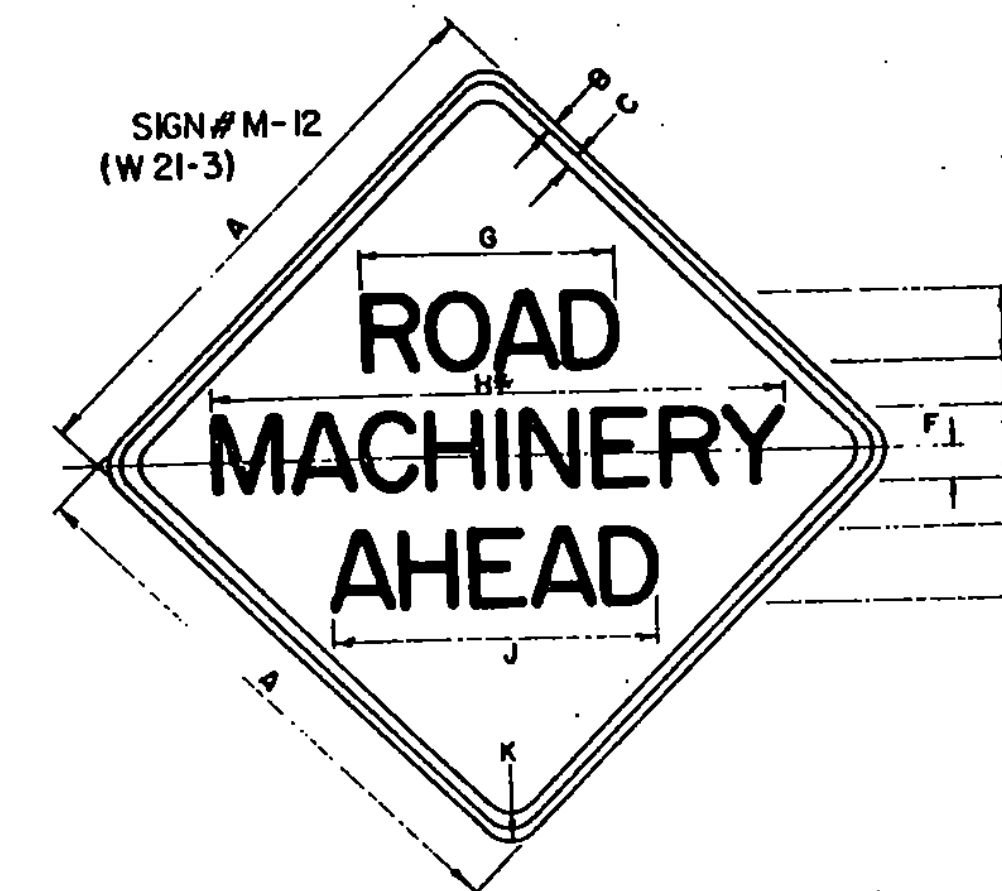
4-LANE DIVIDED HIGHWAY
MEDIAN MAINTENANCE



SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	
2 LANE	36	5/8	7/8	2-1/4	16-7/8	12			2-1/4	
4 LANE	48	3/4	1 1/4	3	22 3/4	16			3	

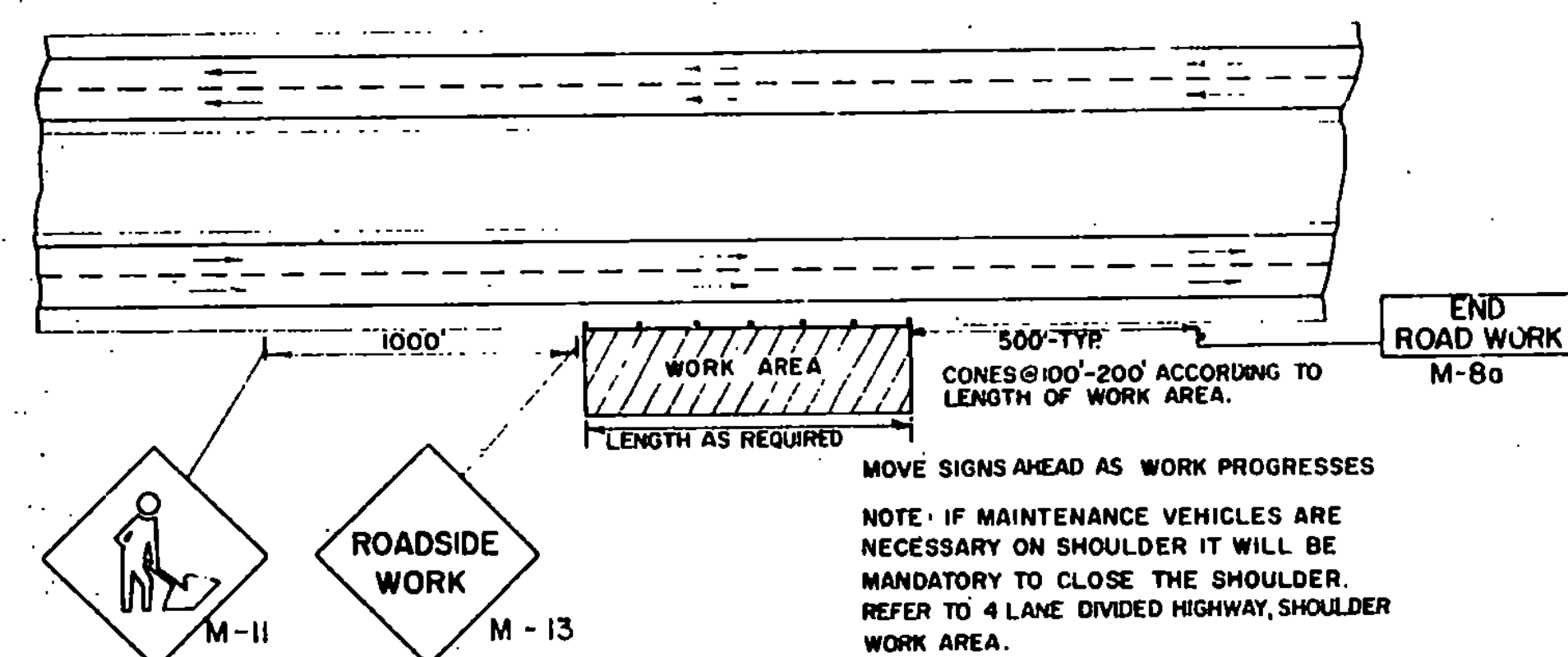


SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	
2 LANE	36	5/8	7/8	1	5-D	3 1/2	3 1/2	17	2 1/4	
4 LANE	48	3/4	1 1/4	1	7-C	4	3 1/2	20	3	

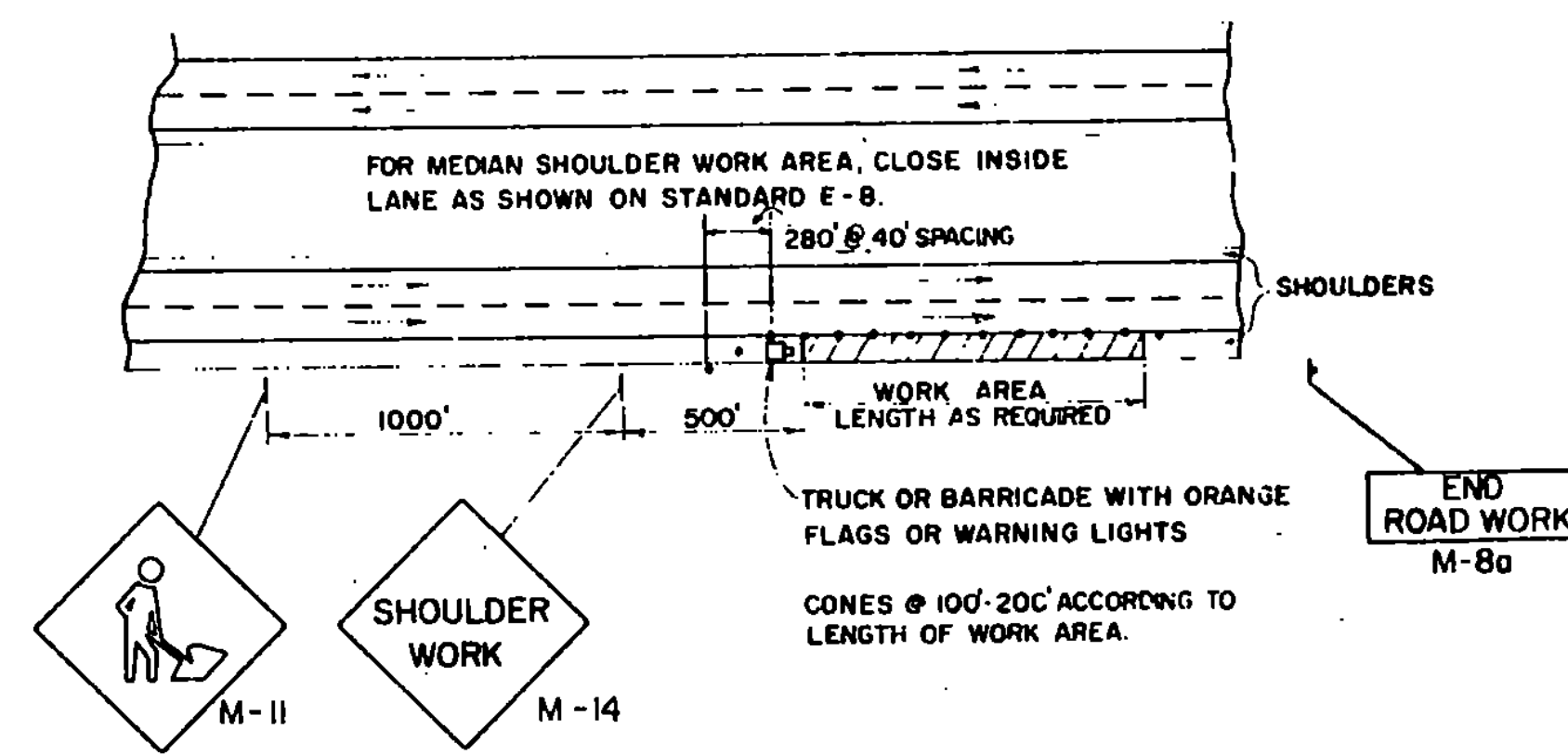


*REDUCE SPACING BY 40%

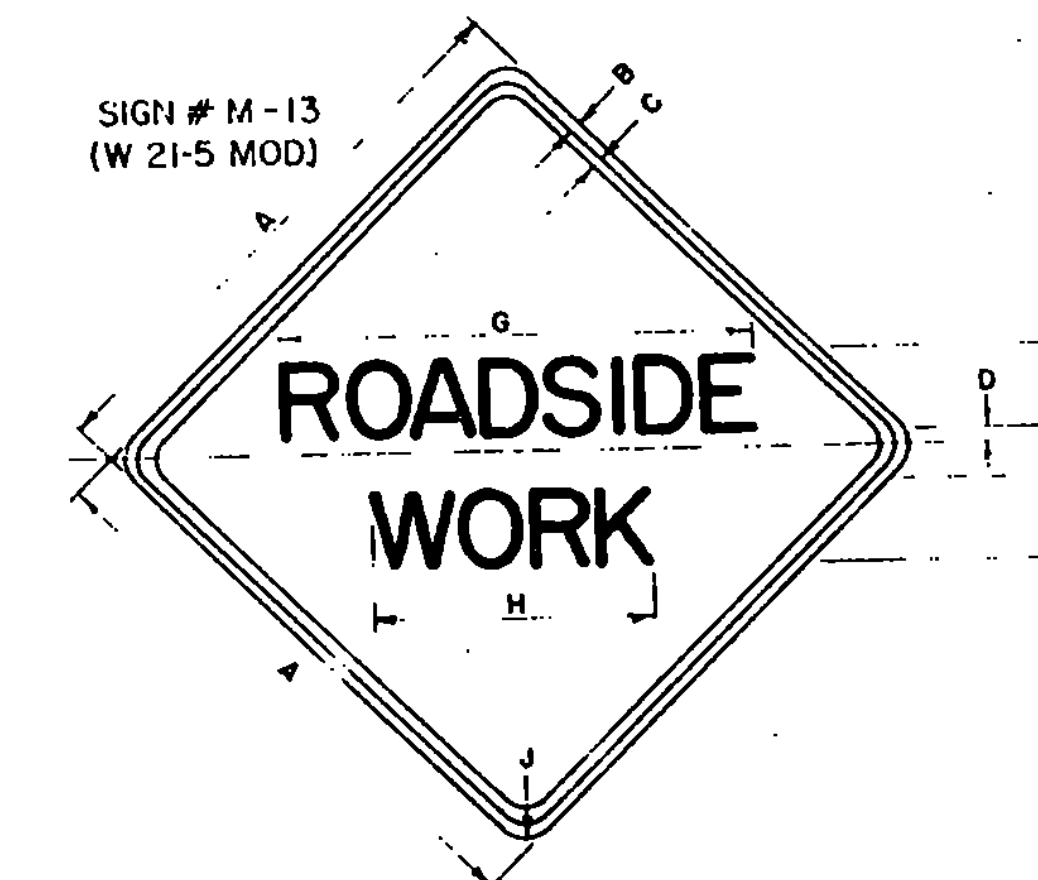
SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	K
2 LANE	36	5/8	7/8	5-D	4	2-1/2	17-1/4	3 1/2	2 1/4	
4 LANE	48	3/4	1 1/4	7-D	5	3-1/2	24 1/8	4 1/2	3 1/4	3



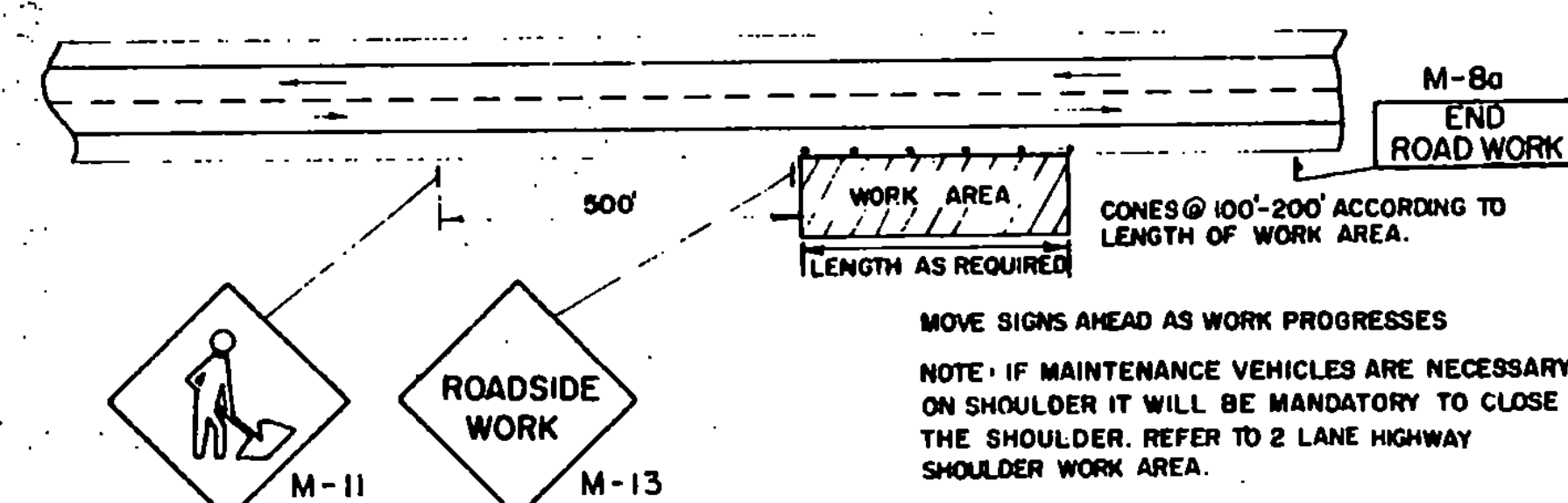
4-LANE DIVIDED HIGHWAY
MAINTENANCE OUTSIDE RIGHT SHOULDER



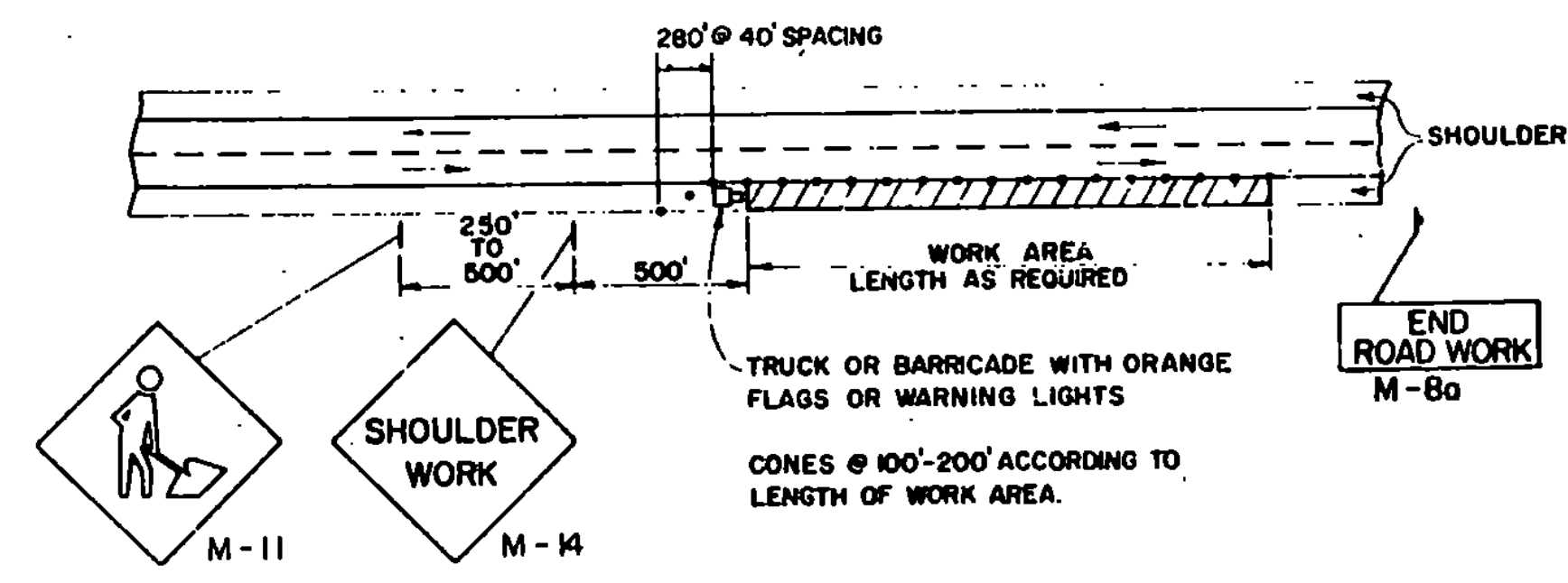
4-LANE DIVIDED HIGHWAY
SHOULDER WORK AREA



SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	J	
2 LANE	36	5/8	7/8	1 1/2	5-D	3 1/2	3 1/2	17	2 1/4	
4 LANE	48	3/4	1 1/4	1	7-C	4	3 1/2	20	3	

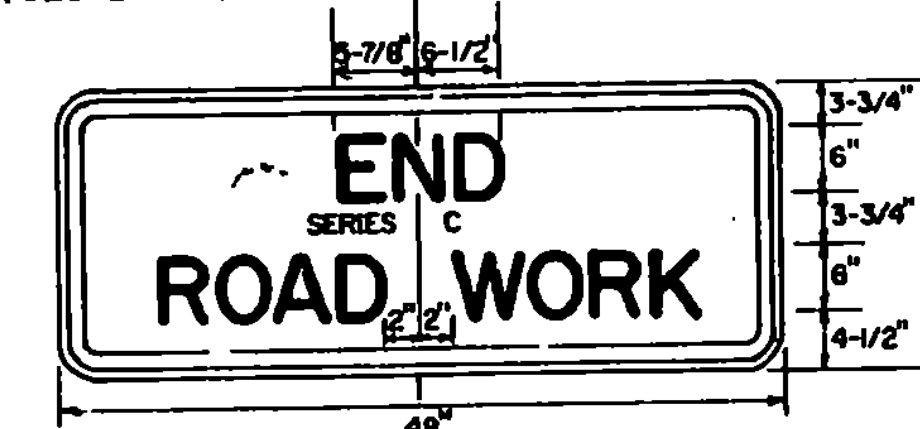


2-LANE HIGHWAY
MAINTENANCE OUTSIDE SHOULDER



2-LANE HIGHWAY
SHOULDER WORK AREA

SIGN # M-8a
(G20-2 MOD.)



Reflectorization
All reflective material shall consist of encapsulated lens reflective sheeting. The text and borders may be screened, lettering film, or hand painted.

Colors
The warning signs shown on this sheet shall have a black text and border on a reflectorized orange background. The orange shall conform with the standard colors adopted by the American Association of State Highway and Transportation Officials and approved by the U.S. Dept. of Transportation, Federal Highway Administration.

Text Design
Letters, spacing, and text dimensions shall conform with the standard alphabets and design prescribed in the Manual on Uniform Traffic Control Devices.

Specifications
Warning signs shall meet the standard state specifications for traffic signs.

Sign Base Material
The sign base material used for the warning signs shown on this sheet may be of any of the following, with minimum thickness as noted:

(1) Flat Sheet Aluminum	0.100	0.125	inches
(2) High Density Overlayed Plywood	5/8	3/4	inches
(3) Galvanized Sheet Steel	14	12	gauge

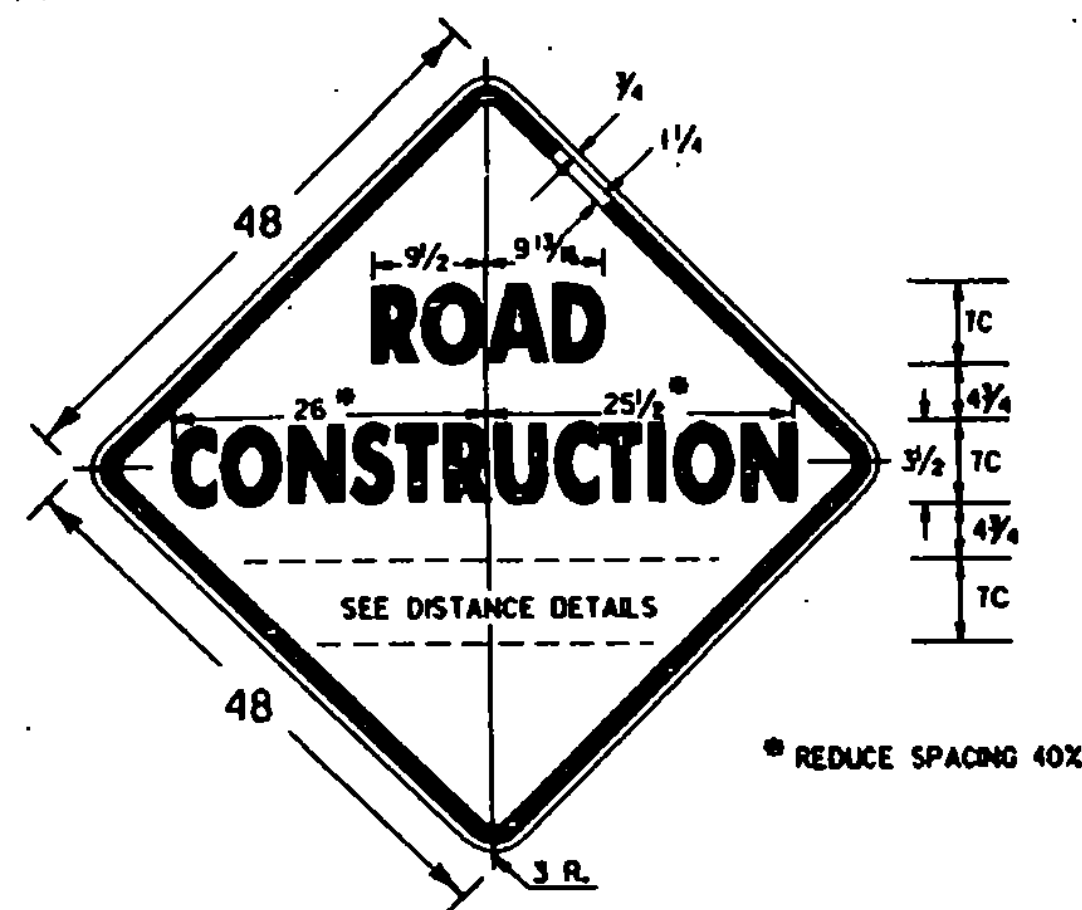
REVISIONS & CORRECTIONS
FEB. 29, 1972: REVISED PER DIRECTION OF THE FEDERAL HIGHWAY ADMINISTRATION.
MAY 14, 1974 - REFLECTIVE MATERIAL CHANGE.
JUNE 8, 1977 - REFLECTIVE MATERIAL NOTE CHANGED.
AUG. 10, 1977 - PERSON WORKING SIGN CHANGED TO SYMBOL.
DEC. 9, 1981 - MINOR SIGN DIMENSION CHANGES.
FEB. 3, 1986 - UPDATED TO 1986 SPECIFICATIONS

APPROVED

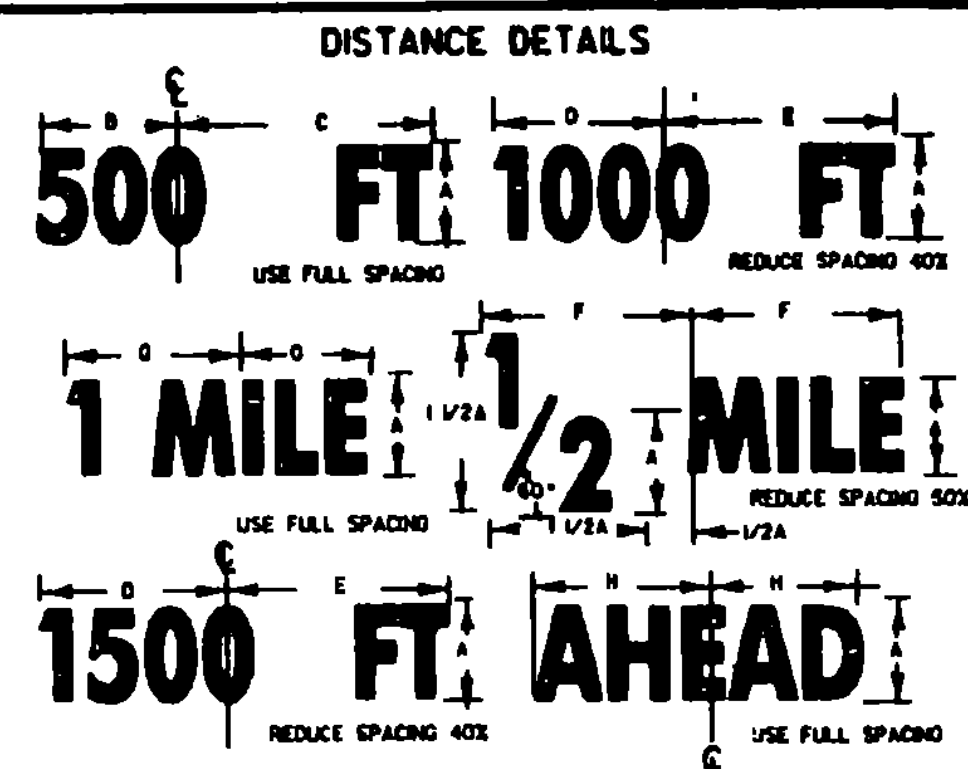
DATE Jan 26, 1972
P. H. Arnold
CHIEF ENGINEER
E. H. Oshinsky
ASST. CHIEF ENGINEER
G. M. Lane
HIGHWAY ENGINEER

TRAFFIC SIGNS TYPICAL MINOR MAINTENANCE OPERATION APPROACH SIGNS

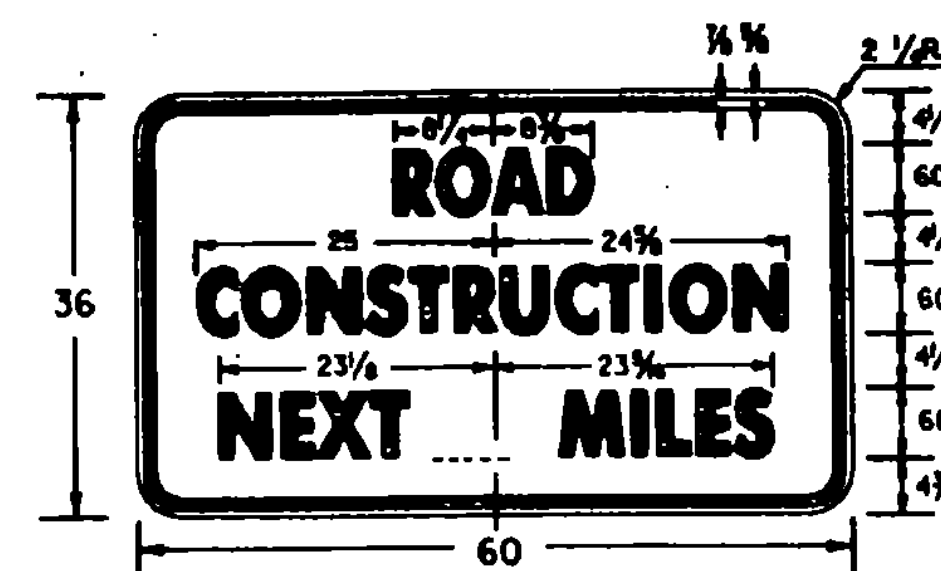
E-10



WHEN APPROPRIATE, EXISTING "BRIDGE CONSTRUCTION..." SIGNS MAY BE USED UNTIL THE EXISTING SIGNS NEED REPLACEMENT. NEW SIGNS SHALL SHOW REFERENCE TO "ROAD CONSTRUCTION". SIGN TEXT SHALL BE CONSISTENT THROUGHOUT THE PROJECT.

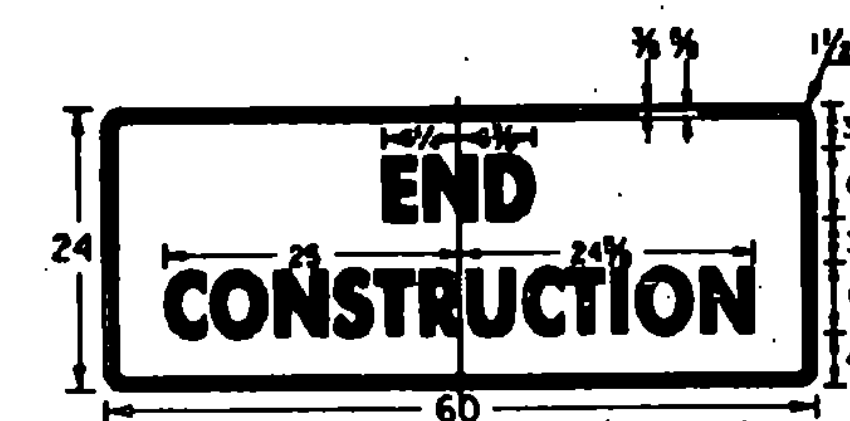


DIMENSIONS (INCHES)							
A	B	C	D	E	F	G	H
50	10 3/4	10 3/4	15	11 1/4	11 1/4	9 1/2	10 3/4
6C	10 3/4	10 3/4	11 1/4	12	12 1/2	9 1/8	10 3/4
7C	12	12 3/4	13 3/4	14	14 3/4	10 3/8	12 1/4
8D	16 1/4	17 1/4	17	18	18	14 3/8	17 3/8



THIS SIGN TO BE USED WHEN PROJECT LENGTH EXCEEDS 2 MILES OR AS REQUESTED BY THE RESIDENT ENGINEER. SHOW MILEAGE TO NEAREST 1/4 MILE USING FRACTIONS, NOT DECIMALS. HAND LETTERING OF MILEAGE WILL NOT BE ALLOWED.

ALL DIMENSIONS SHOWN IN INCHES



NOTES

THE APPROACH CONSTRUCTION SIGNS SHOWN ON THIS SHEET ARE INTENDED FOR USE IN PROVIDING ADVANCE WARNING AND INFORMATION ON CONSTRUCTION PROJECTS OVER WHICH TRAFFIC WILL BE MAINTAINED. WHEN ADDITIONAL APPROACH SIGNS OR OTHER TYPES OF ADVANCE SIGNING OR CONTROL ARE NECESSARY, THE PLANS AND/OR THE SPECIFICATIONS FOR THAT PROJECT WILL GIVE THE DETAILS OF THE SIGNS AND DEVICES REQUIRED. FOR ON-PROJECT CONSTRUCTION SIGNS, REFER TO APPROPRIATE STANDARD SHEETS.

APPLICATION OF STANDARDS SINCE IT IS NOT POSSIBLE TO PRESCRIBE DETAILED STANDARDS OF APPLICATION FOR ALL OF THE SITUATIONS THAT MAY CONCEIVABLY ARISE ON A CONSTRUCTION PROJECT, REFERENCE SHALL BE MADE TO THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" FOR THE PRINCIPLES, PROCEDURES, AND STANDARDS THAT WILL BE REQUIRED IN CONNECTION WITH ADVANCED WARNING AND ON-PROJECT CONSTRUCTION SIGNS AND BARRICADES. THE SIGNS SHOWN IN E-101 AND E-102 REPRESENT A SAMPLE OF THOSE MORE COMMONLY USED.

LOCATION CONSTRUCTION APPROACH SIGNS SHALL BE LOCATED AS DETAILED ON THIS SHEET OR AS OTHERWISE SHOWN ON THE PLANS. THEY SHALL APPEAR AT EACH END OF THE HIGHWAY UNDER CONSTRUCTION AND ON ALL INTERSECTING PUBLIC HIGHWAYS. THE EXACT PLACEMENT OF ANY SIGN WILL DEPEND UPON THE ALIGNMENT INTENDED TO INDICATE THE SEQUENCE TO BE FOLLOWED, AND THE APPROXIMATE SPACING TO BE OBSERVED. THE ENGINEER SHALL DETERMINE THE EXACT LOCATIONS.

DESIGN THE DESIGN OF THE SIGNS SHALL CONFORM WITH THE DETAILS SHOWN ON THIS SHEET AND WITH THE STANDARDS PRESCRIBED IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

MATERIALS THE SIGN BASE MATERIAL USED FOR THE WARNING SIGNS ON THIS SHEET MAY BE ANY OF THE FOLLOWING, WITH MINIMUM THICKNESS AS NOTED.

FLAT SHEET ALUMINUM	0.125 INCHES
HIGH DENSITY OVERLAYED PLYWOOD	3/4 INCHES
GALVANIZED SHEET STEEL	12 GAUGE

REFLECTORIZATION ALL REFLECTORIZED MATERIAL SHALL CONSIST OF ENCAPSULATED LENS REFLECTIVE SHEETING.

COLORS THE COLORS SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION. COLORS SHOWN ON THIS SHEET CONSIST OF BLACK TEXT AND BORDER ON A REFLECTORIZED ORANGE BACKGROUND.

INSTALLATION THE SIGNS SHALL BE ERECTED BEFORE THE START OF ANY WORK AND SHALL BE COVERED UNTIL WORK COMMENCES, DURING PERIODS OF INACTIVITY, OR UPON COMPLETION OF THE WORK. SIGNS MAY BE REMOVED UPON COMPLETION OF THE WORK AT THE DISCRETION OF THE ENGINEER. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER ON POSTS SET SECURELY IN THE GROUND. THE BOTTOM OF A SIGN SHALL BE AT LEAST 6 FEET ABOVE ROAD LEVEL, AND THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST 6 FEET OUTSIDE THE SHOULDER POINT OR 2 FEET OUTSIDE GUARD RAIL, CURBING, OR SIDEWALK. THE INSTALLATION OF SIGNS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER. IN URBAN AREAS, THE BOTTOM OF THE SIGN SHALL BE AT LEAST 7 FEET ABOVE THE SIDEWALK.

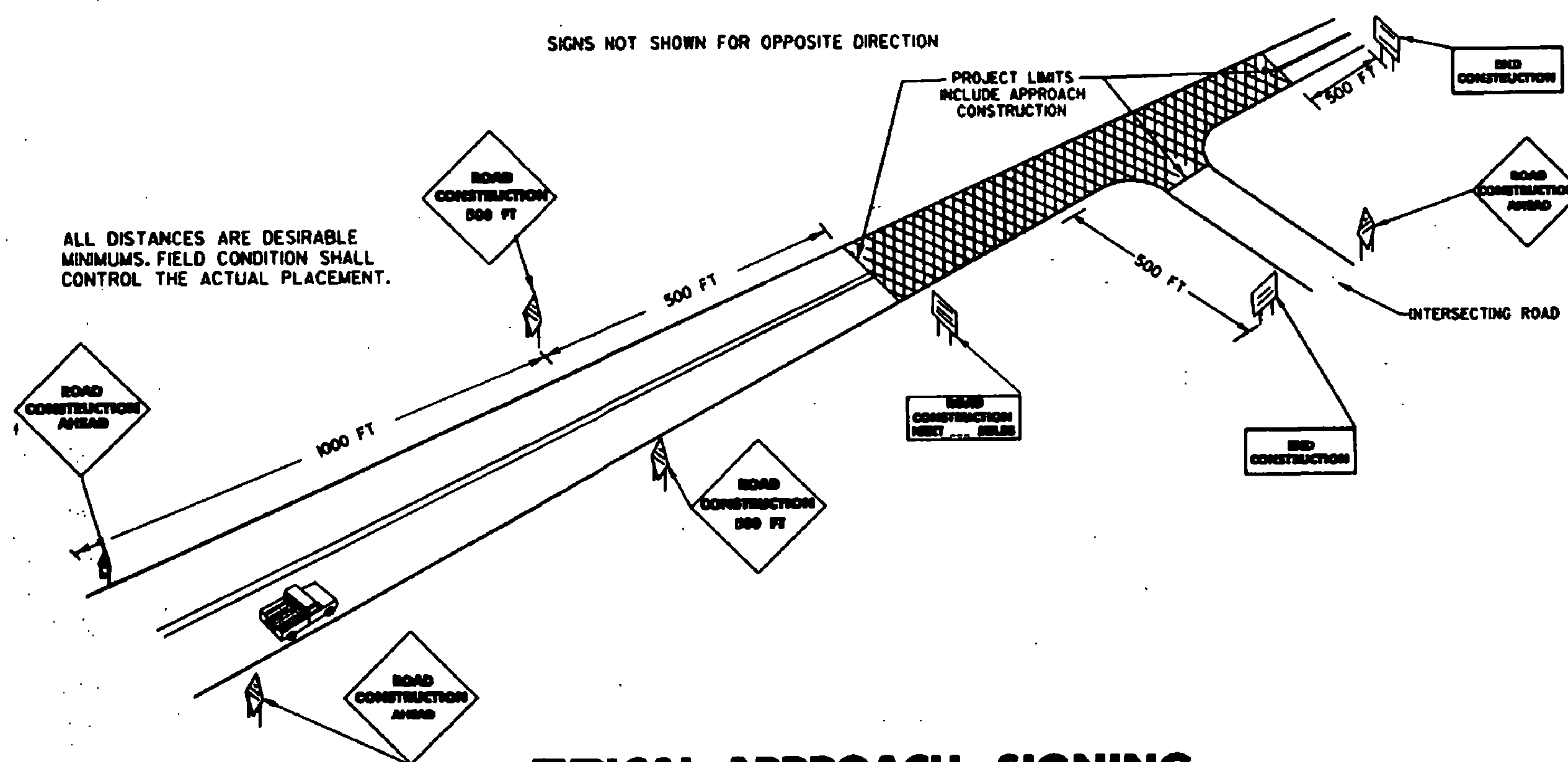
MAINTENANCE SIGNS SHALL BE MAINTAINED IN A CLEAN AND LEGIBLE CONDITION SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. THEY SHALL BE KEPT PLUMB AND LEVEL, AND ALWAYS PRESENT A NEAT APPEARANCE. DAMAGED, DEFACED, OR DIRTY SIGNS SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER.

GENERAL THE COST OF FURNISHING, ERECTING, MAINTAINING AND REMOVING ALL CONSTRUCTION APPROACH SIGNS WILL BE CONSIDERED SUBSIDIARY WORK PERTAINING TO THE PROJECT AS A WHOLE AND SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR VARIOUS ITEMS INVOLVED IN THE CONTRACT. DURING ALL PHASES OF CONSTRUCTION THE REQUIREMENTS SET FORTH IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" SHALL BE MET. WHEN THE PROJECT IS CLOSED DOWN FOR TEMPORARY PERIODS THE SIGNS SHALL BE COVERED IN A WORKMANLIKE MANNER.

SIGN COVERS SIGN COVERS SHALL CONSIST OF A PANEL PAINTED FLAT BLACK, THE SAME SIZE AS THE SIGN IT COVERS. THE PANEL SHALL BE OF WOOD, PLYWOOD, HARDBOARD OR ANY MATERIAL SATISFACTORY TO THE ENGINEER. NO MATERIAL WILL BE APPROVED THAT WILL DETERIORATE BY EXPOSURE TO THE WEATHER DURING THE PROJECT. MOUNTING OF THE PANEL SHALL BE DONE IN SUCH A WAY AS NOT TO DAMAGE THE SIGN FACE MATERIAL.

CONTRACTORS SHALL COORDINATE THEIR SIGNING ACTIVITIES WITH OTHER CONTRACTORS WITHIN THE PROJECT LIMITS, AS DIRECTED BY THE REGIONAL CONSTRUCTION ENGINEER.

SIGNS NOT SHOWN FOR OPPOSITE DIRECTION



TYPICAL APPROACH SIGNING

SIGN POSTS

WHERE CONSTRUCTION SIGN INSTALLATIONS ARE NOT PROTECTED BY GUARD RAIL OR OTHER APPROVED TRAFFIC BARRIERS, THE POSTS ON WHICH THE SIGNS ARE MOUNTED SHALL BE YIELDING METAL POSTS AS DESIGNATED IN THE E SERIES OF STANDARD DRAWINGS OR YIELDING WOODEN POSTS IN ACCORDANCE WITH THE FOLLOWING REQUIREMENTS.

WOODEN POSTS ARE ACCEPTABLE FOR USE WITH CONSTRUCTION SIGNS PROVIDED THE POSTS HAVE A UNIFORM CROSS-SECTION AND IF, IN AN 8 FOOT WIDE VEHICULAR PATH, THERE IS OR ARE:

1. A SINGLE POST WITH AN ELASTIC SECTION MODULUS NO GREATER THAN 24 IN. (A FULL DIMENSION 4" X 6" POST).
2. TWO POSTS, EACH WITH AN ELASTIC SECTION MODULUS NO GREATER THAN 18 IN. (FULL DIMENSION 3" X 6" OR 4" X 5" POSTS).
3. THREE POSTS, EACH WITH AN ELASTIC SECTION MODULUS NO GREATER THAN 14 IN. (FULL DIMENSION 3" X 5" OR 4" X 4" POSTS).

THE FORMULA FOR DETERMINING THE ELASTIC SECTION MODULUS (S) IS:

$$S = \frac{B D^3}{6}$$

WHERE B = THE SMALLER DIMENSION IN INCHES IF THE TIMBER IS RECTANGULAR IN CROSS-SECTION

D = THE LARGER DIMENSION IN INCHES IF THE TIMBER IS RECTANGULAR IN CROSS-SECTION

OR B = D IN INCHES IF THE TIMBER IS SQUARE IN CROSS-SECTION AND THE RESULT IS EXPRESSED IN INCHES CUBED.

WOODEN POSTS MAY BE CONSTRUCTED UP TO THE MAXIMUM SIZES LISTED BY LAMINATING SMALLER SECTIONS. WEAKENED TIMBER POSTS WILL NOT BE PERMITTED. NO CROSS-BRACING OR BRACING TO KEEP THE POSTS PLUMB WILL BE PERMITTED. CONCRETE FOUNDATION COLLARS OR SOIL BEARING PLATES ARE NOT ACCEPTABLE FOR USE. POST EMBEDMENT DEPTH SHALL BE 3' - 6'.

REVISIONS AND CORRECTIONS

MAY 26, 1989 - SIGN POST NOTES ADDED

APPROVED

SEPT. 10, 1987
DATE

David B. Kelley
CHIEF ENGINEER

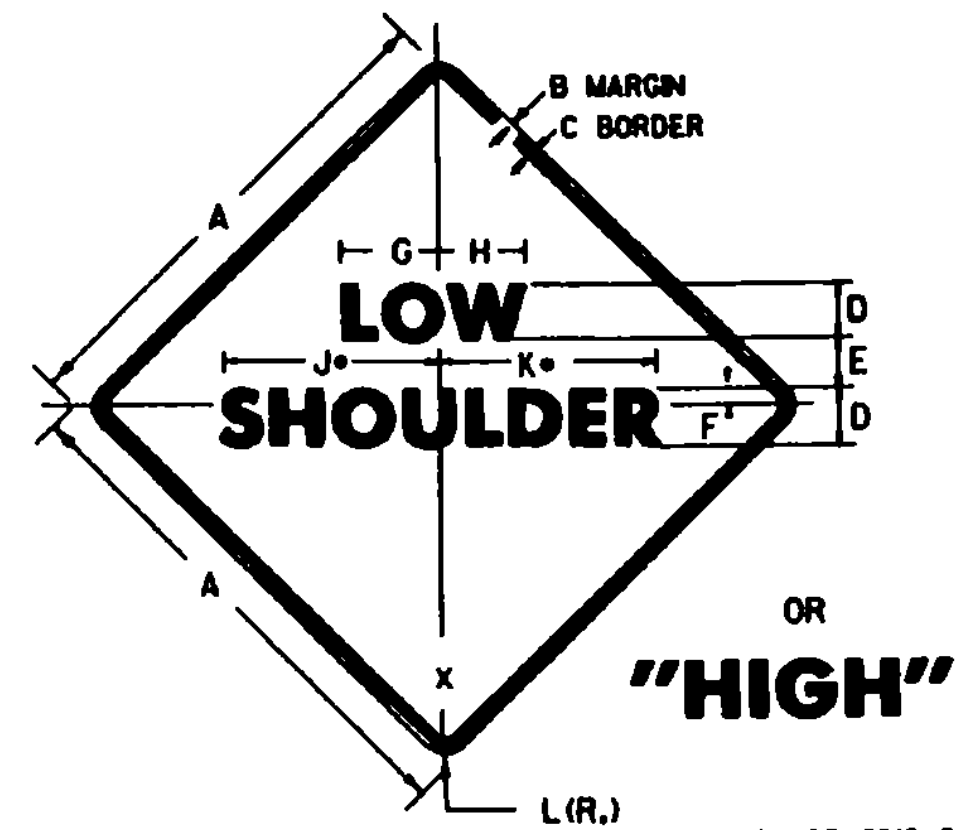
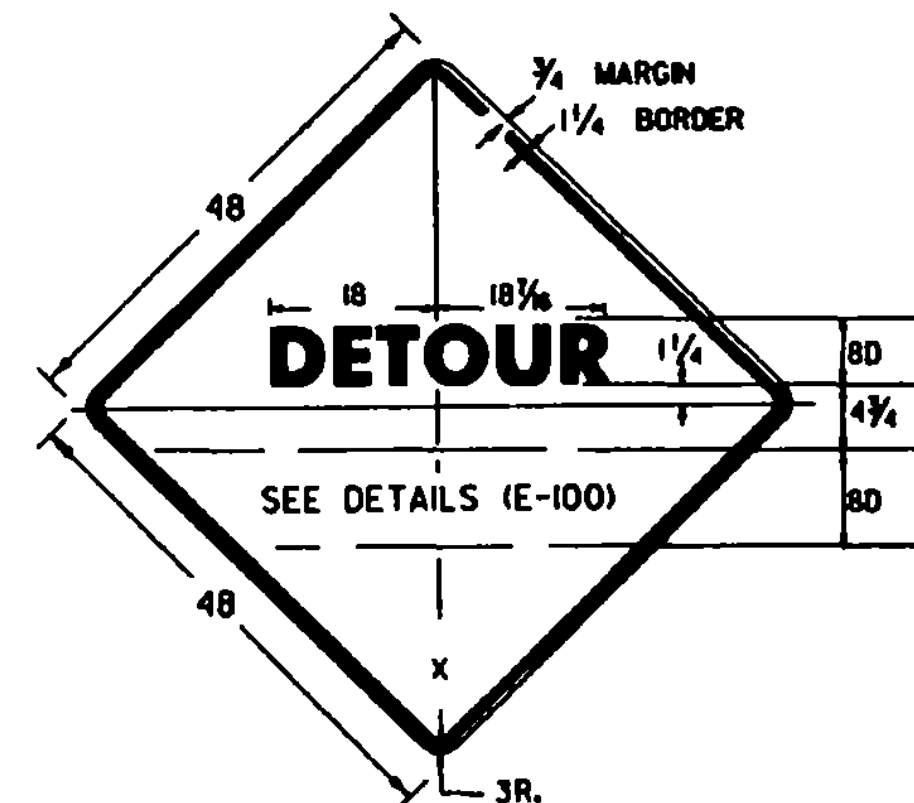
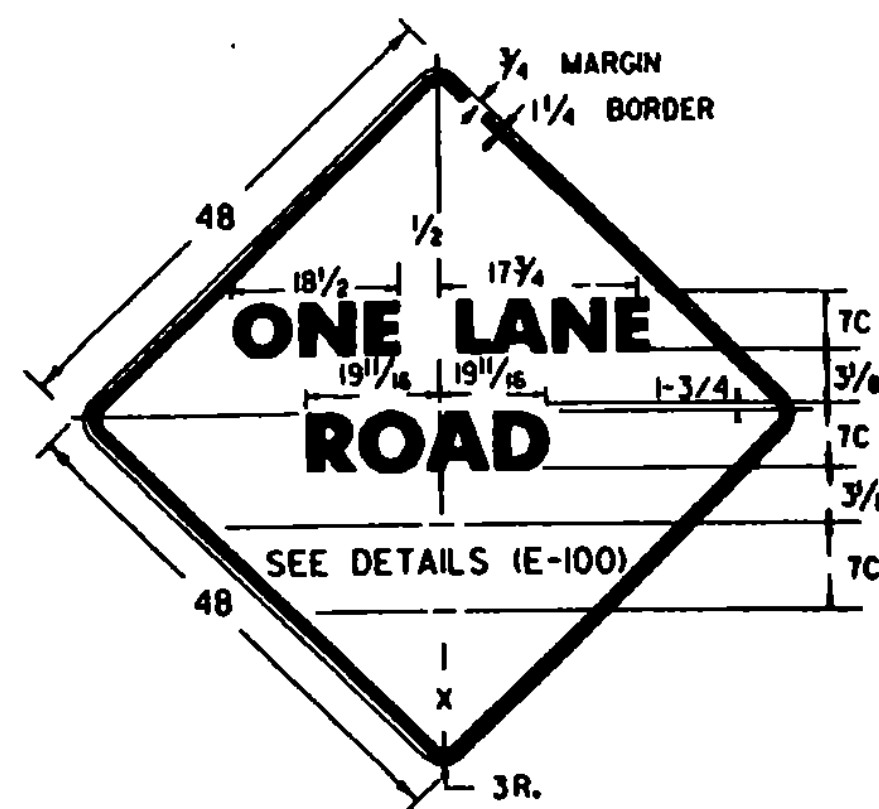
Arthur J. Jones
DIRECTOR OF PLANNING
AND PRE-CONSTRUCTION

Gordon R. MacArthur
TRAFFIC AND SAFETY ENGINEER

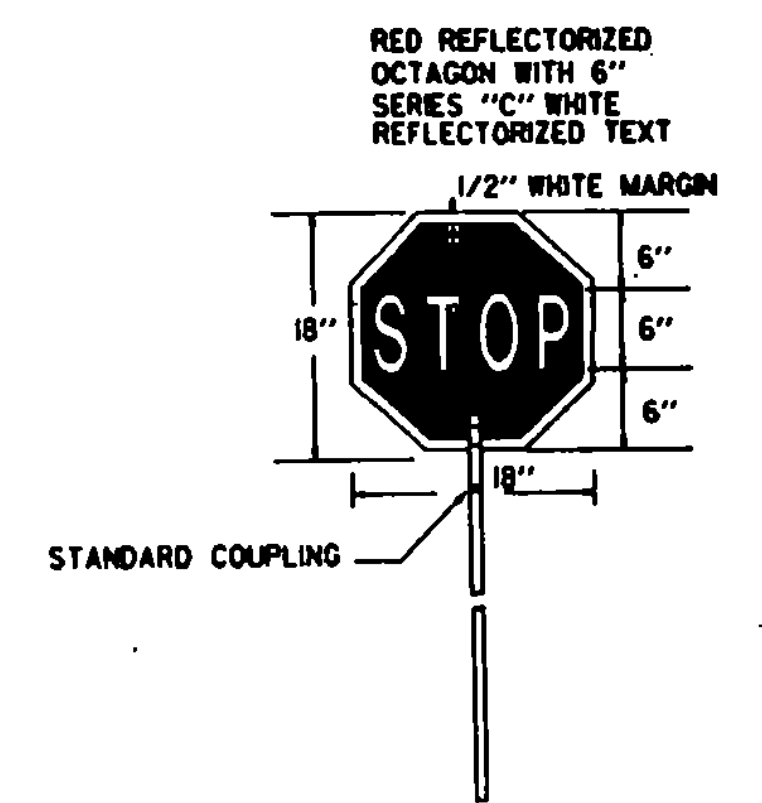
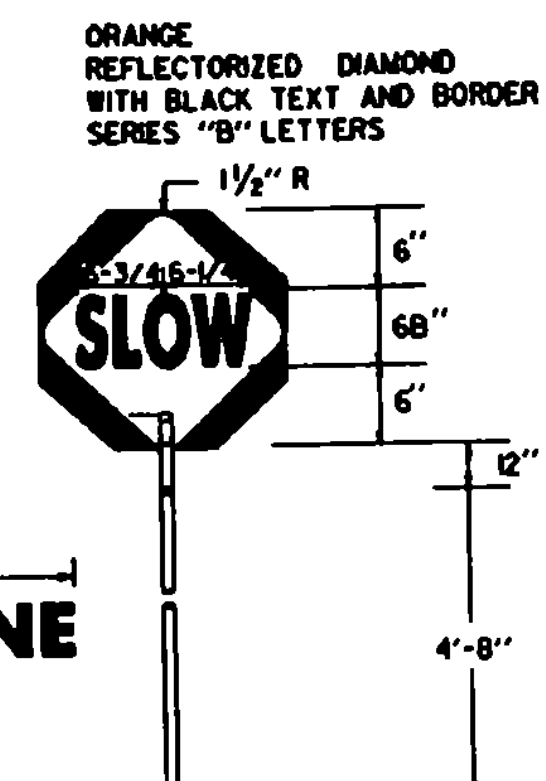
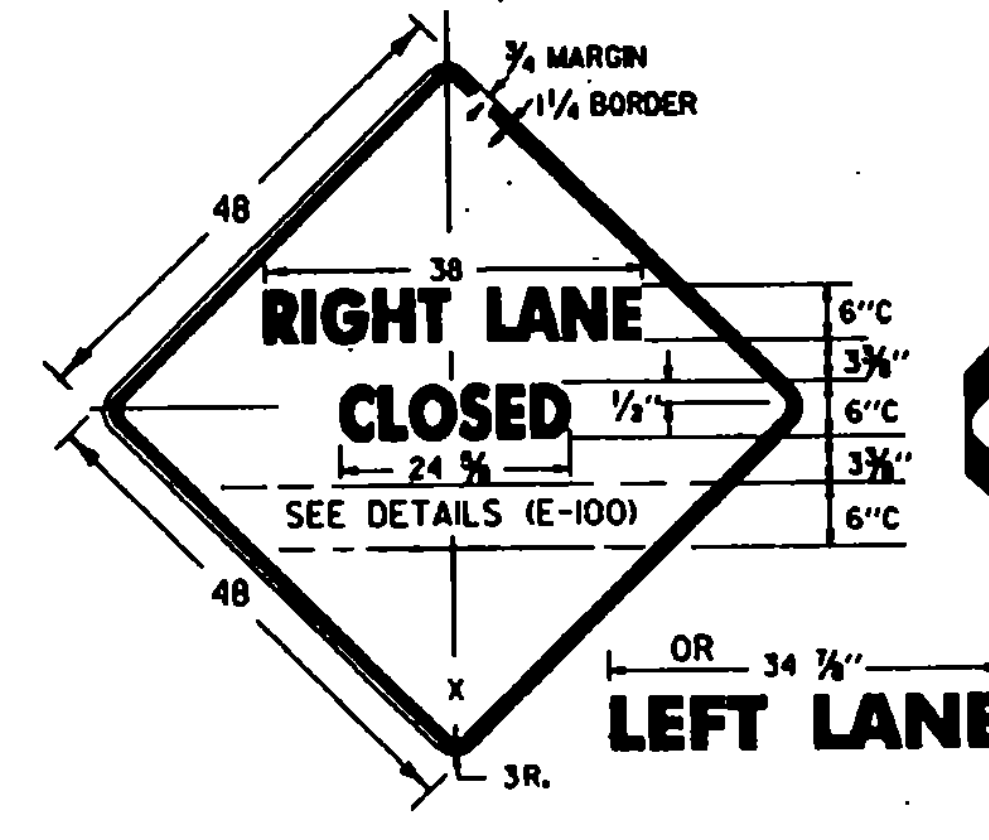
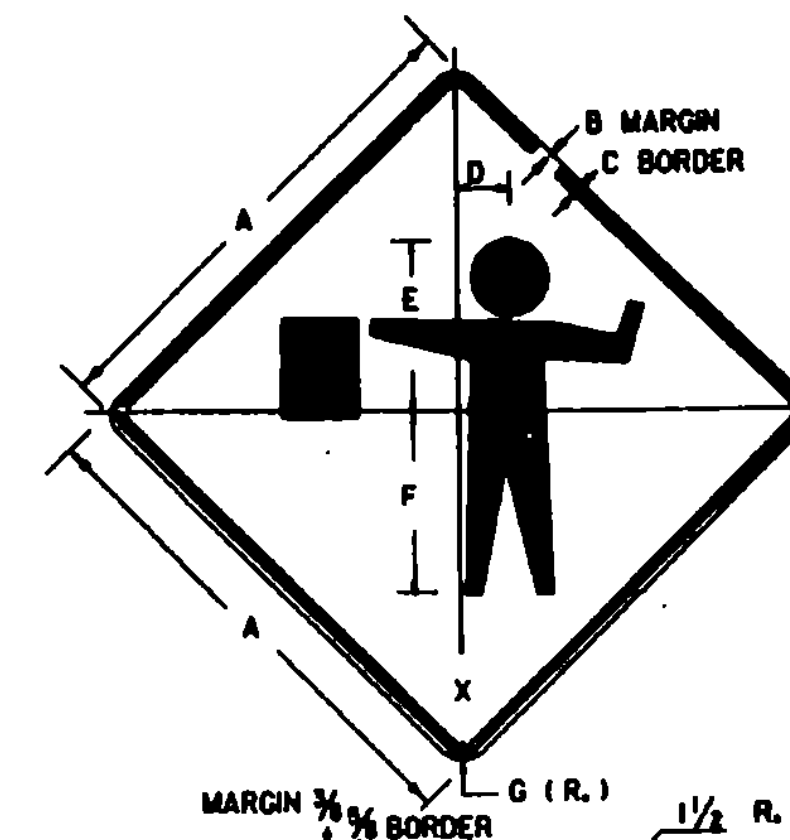
CONSTRUCTION APPROACH SIGNS



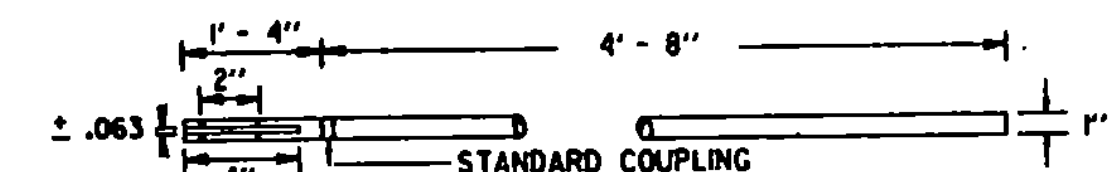
STANDARD
E-100



DIMENSIONS (INCHES)											
SIGN	A	B	C	D	E	F	G	H	J	K	L
STD.	30	1/2	1/4	5/8	3	1/4	5-3/16	5-5/8	13-11/16	13-1/16	1-7/8
FWY.	48	3/4	1-1/4	8/8	5	1/2	8-1/4	9	21-7/8	20-7/8	3



SIGN DETAIL

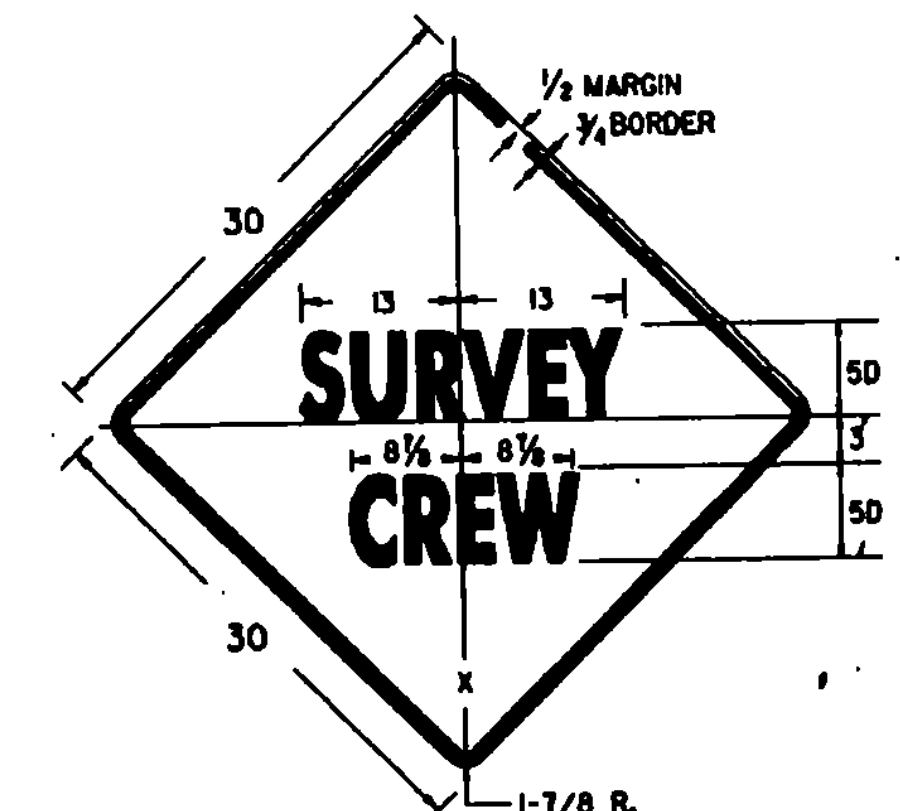


STAFF DETAIL

MATERIALS
THE SIGN MATERIALS SHALL BE 0.063" ALUMINUM WITH COLORS AS INDICATED ON DETAILS.
THE STAFF SHALL BE RIGID ALUMINUM CONDUIT OR TUBING WITH A WALL THICKNESS OF 0.025".

MOUNTING
THE STAFF SHALL BE MOUNTED WITH EITHER TWO 1/4" DIAMETER ALUMINUM BOLTS OR TWO 1/4" DIAMETER ALUMINUM RIVETS.

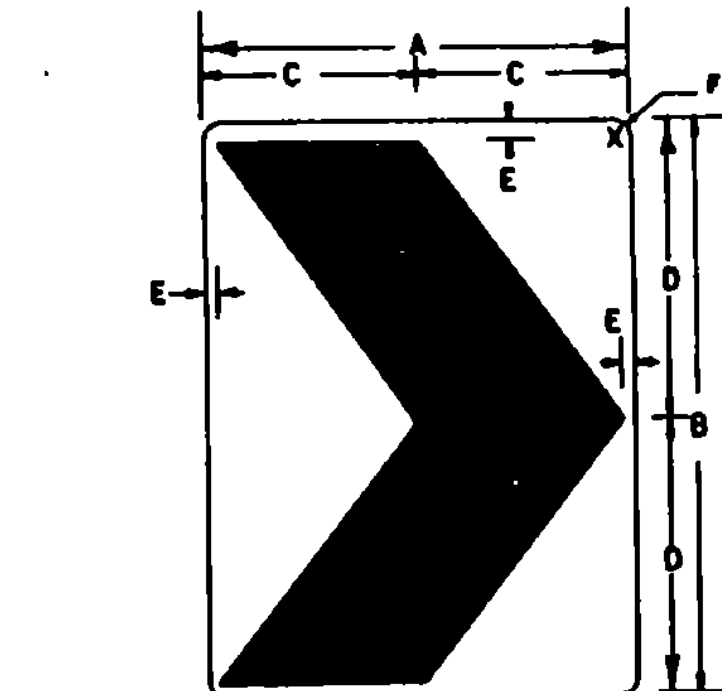
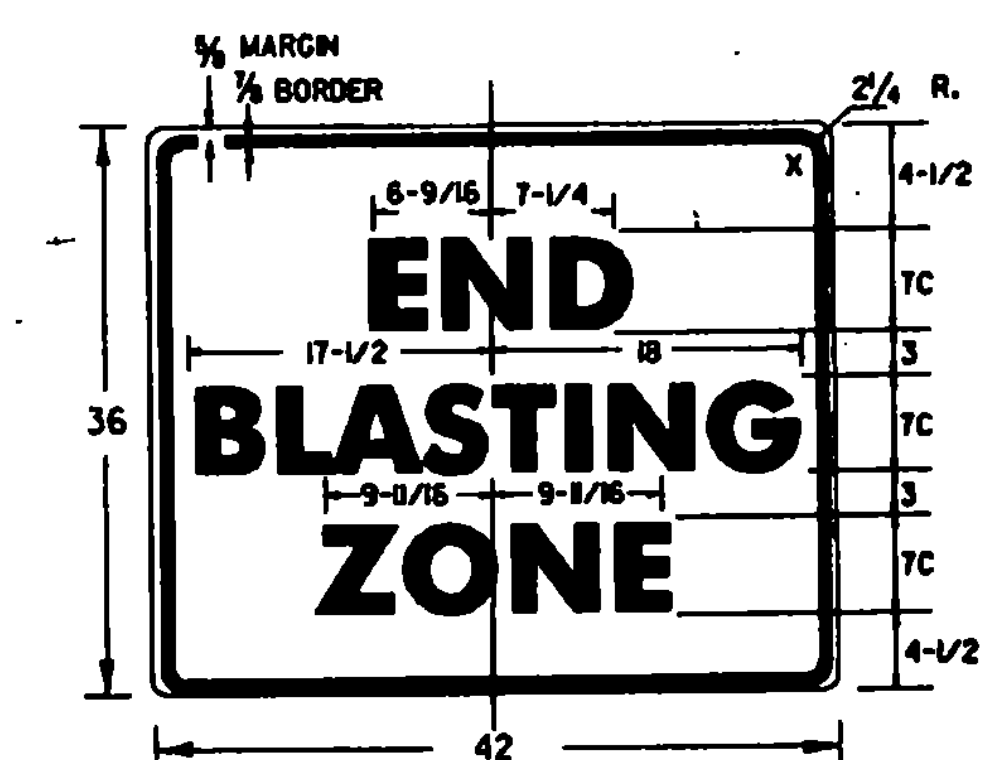
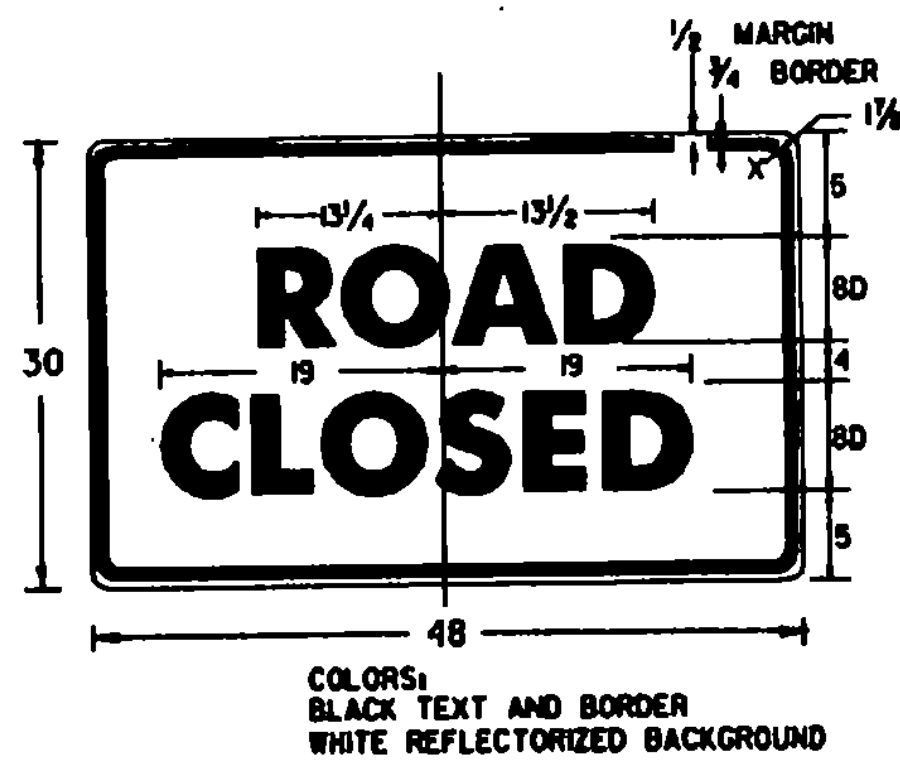
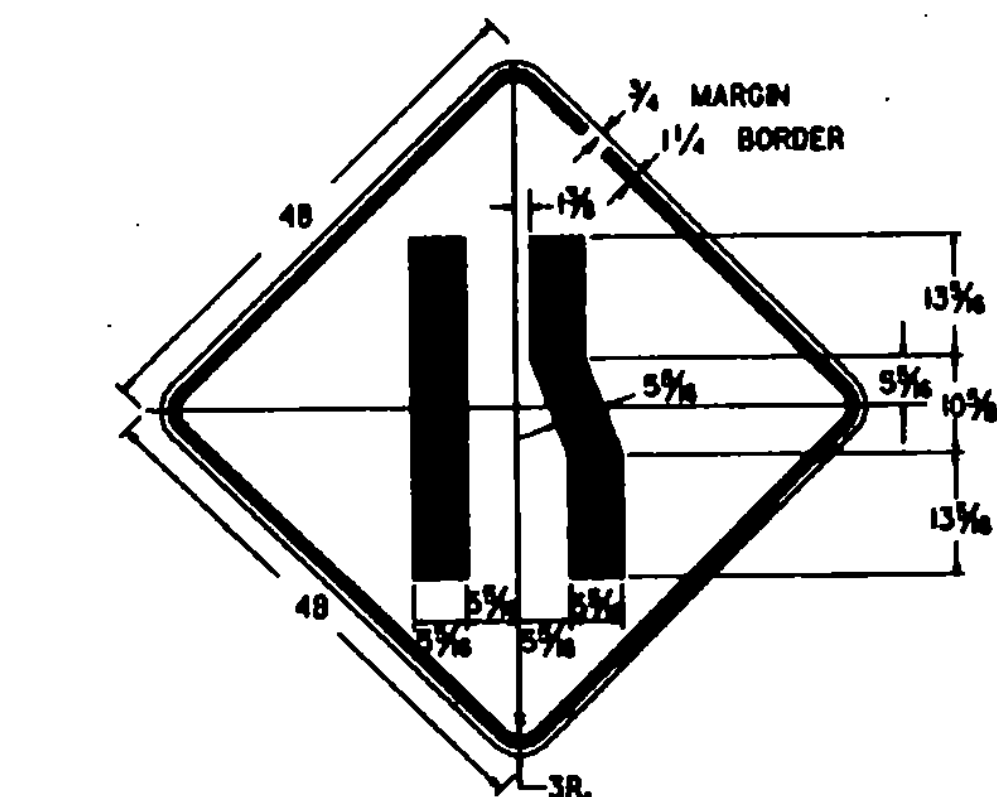
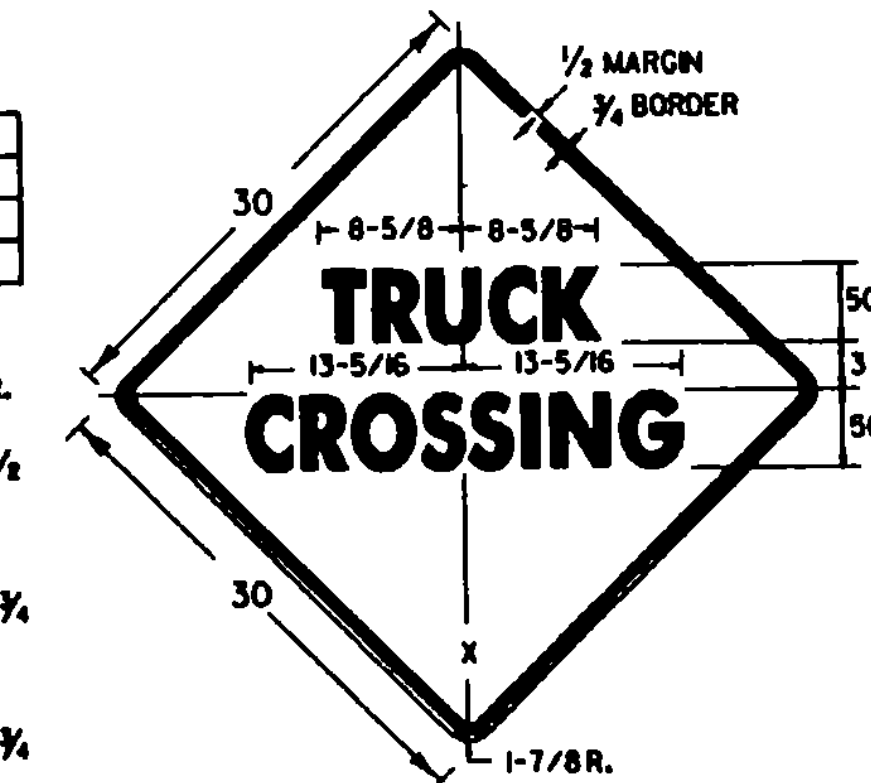
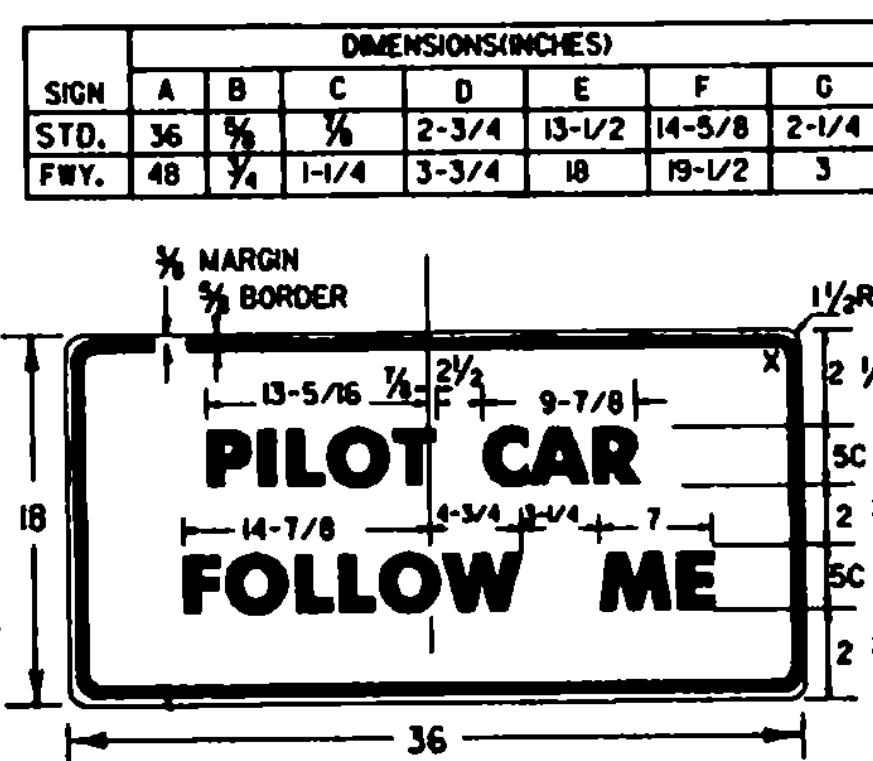
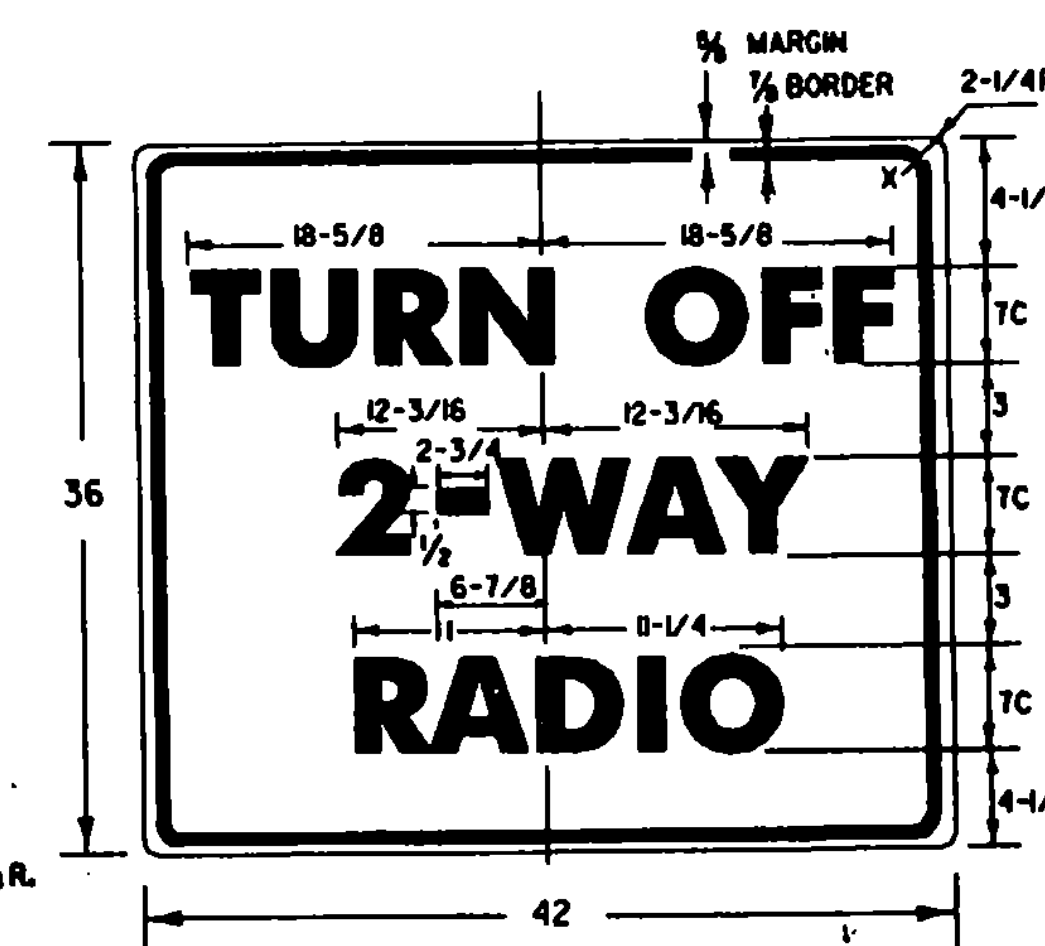
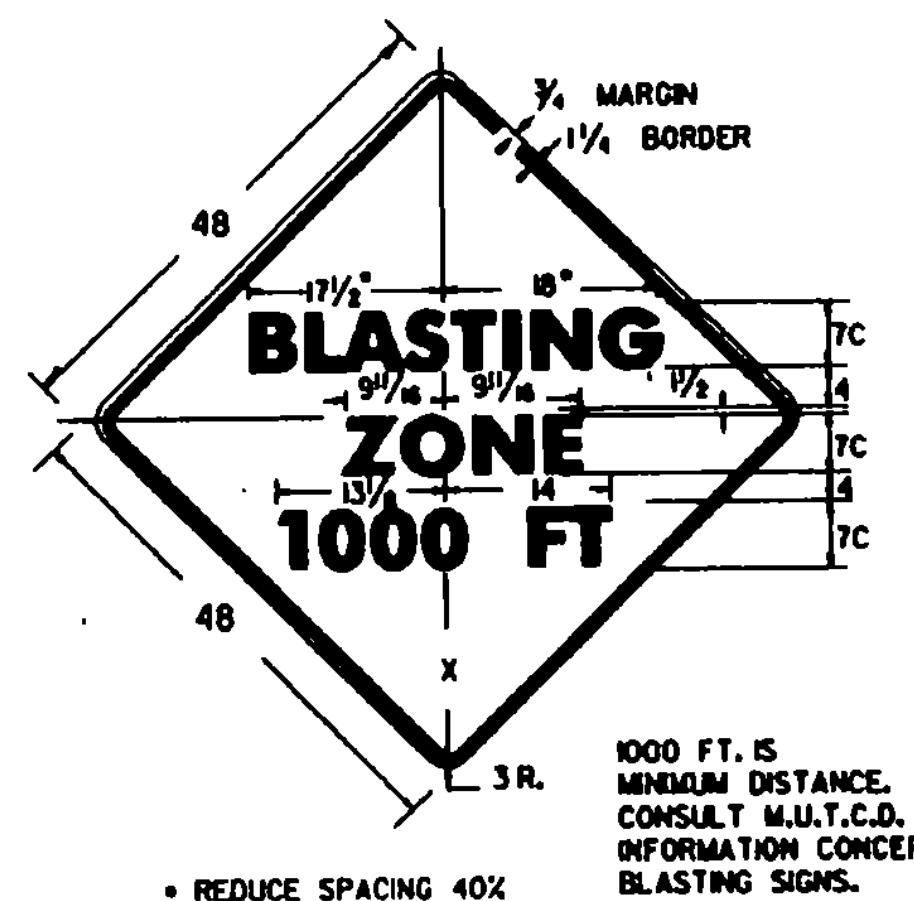
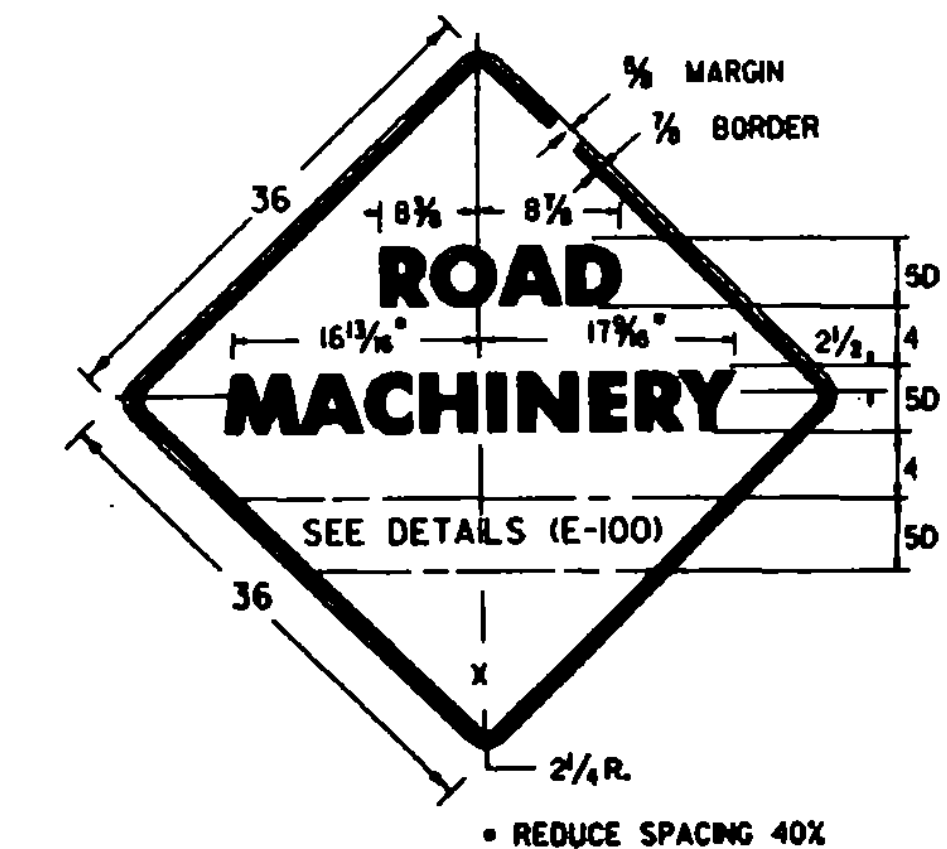
SIGN PADDLE FOR FLAGPERSON



(ALL DIMENSIONS ARE IN INCHES)

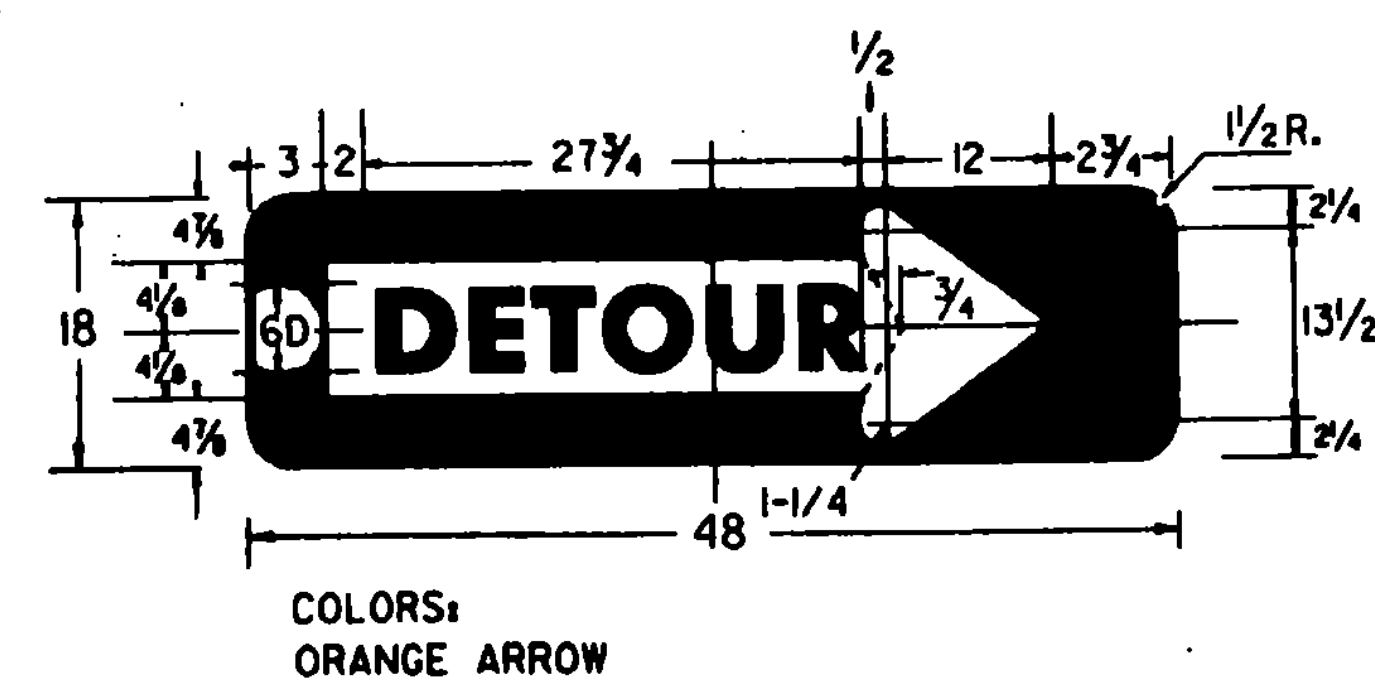
NOTES

SEE STANDARD SHEET E-100 FOR NOTES AND TEXT DETAILS
COLORS FOR SIGNS SHOWN ON THIS SHEET SHALL BE BLACK TEXT, BORDER AND SYMBOLS ON A REFLECTORIZED (ENCAPSULATED LENS) ORANGE BACKGROUND, UNLESS OTHERWISE NOTED. THE EXCEPTIONS ARE THE CHEVRON, ROAD CLOSED, AND PADDLE SIGNS. SIGN DETAILS INDICATE THE APPROPRIATE COLOR.
EXISTING "BRIDGE" SIGNS MAY BE USED UNTIL THE SIGN NEEDS REPLACEMENT. NEW SIGNS SHALL SHOW REFERENCE TO "ROAD" CONSTRUCTION, HOWEVER, SIGN TEXT SHALL BE CONSISTENT THROUGHOUT THE PROJECT.
SIGNS USED ONLY FOR DAYTIME MAINTENANCE OPERATIONS DO NOT NEED TO BE REFLECTORIZED, HOWEVER, THESE SIGNS SHALL BE LABELED "DAYTIME USE ONLY" ON THE BACK OF THE SIGN PANEL WITH 3" SERIES C LETTERS.



DIMENSIONS (INCHES)						
SIGN	A	B	C	D	E	F
STD.	18	24	9	12	1/4	1-1/2
SPECIAL	24	30	12	15	1/4	1-1/2
EXPWY.	30	36	15	18	1	1-7/8
FRWY.	36	48	18	24	1-1/8	2-1/4

COLORS
CHEVRON - BLACK
BACKGROUND - YELLOW (REFL.)



COLORS:
ORANGE ARROW

REVISIONS AND CORRECTIONS

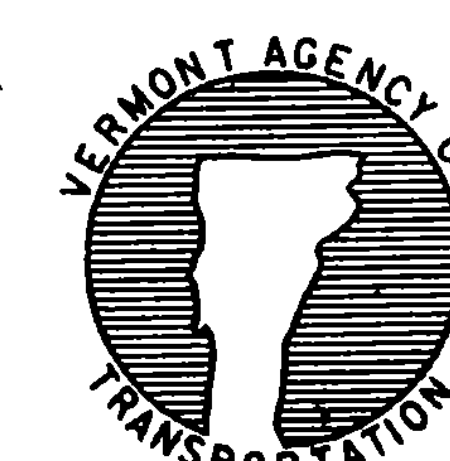
APPROVED

OCT. 30, 1987

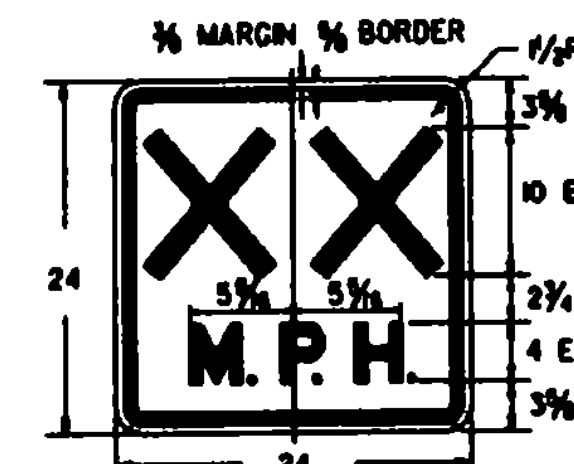
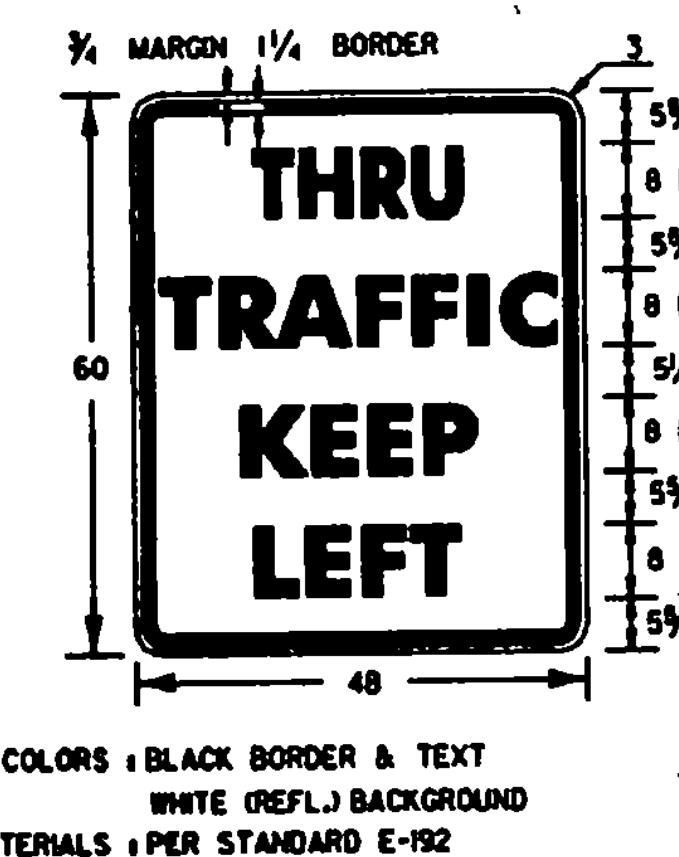
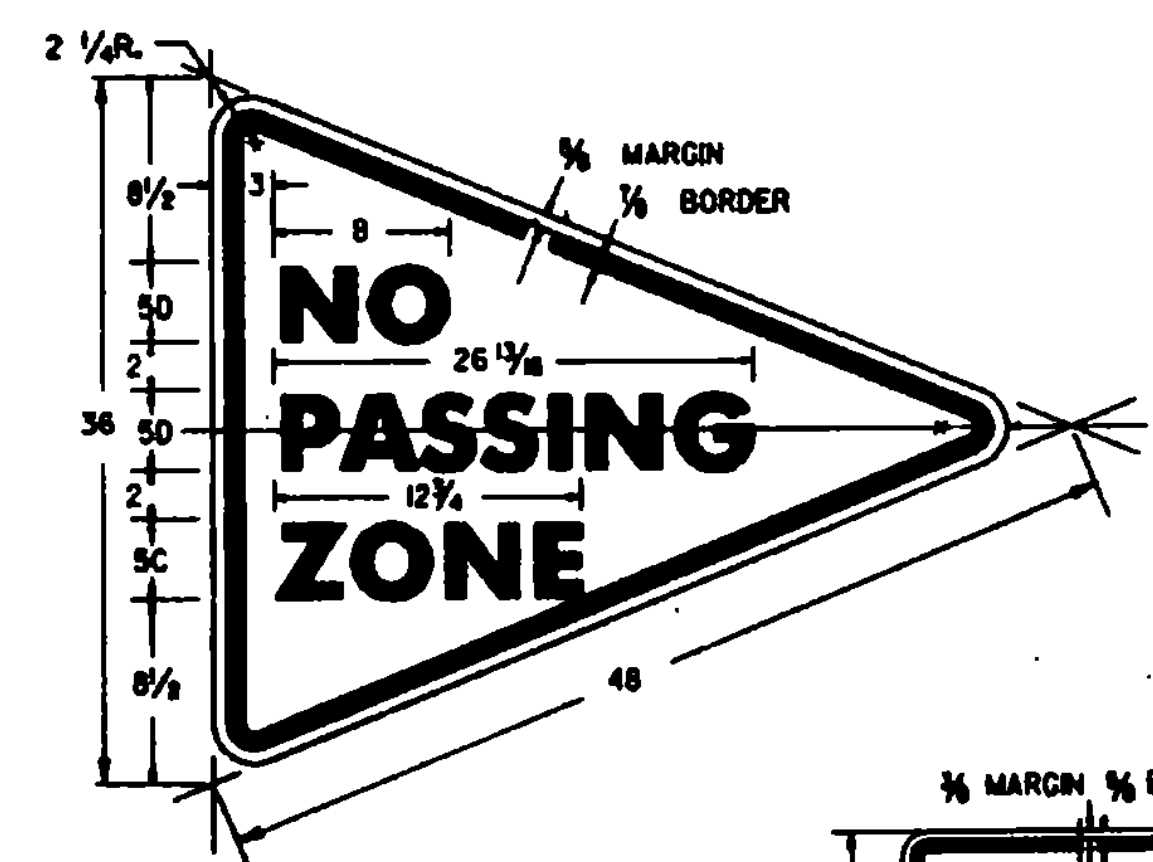
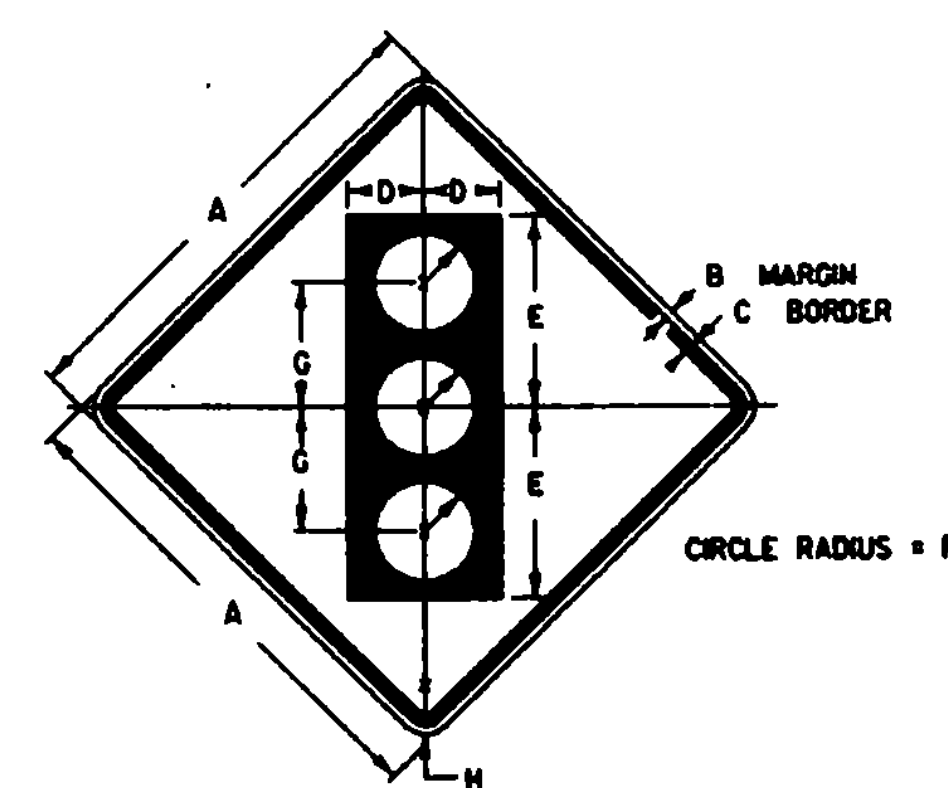
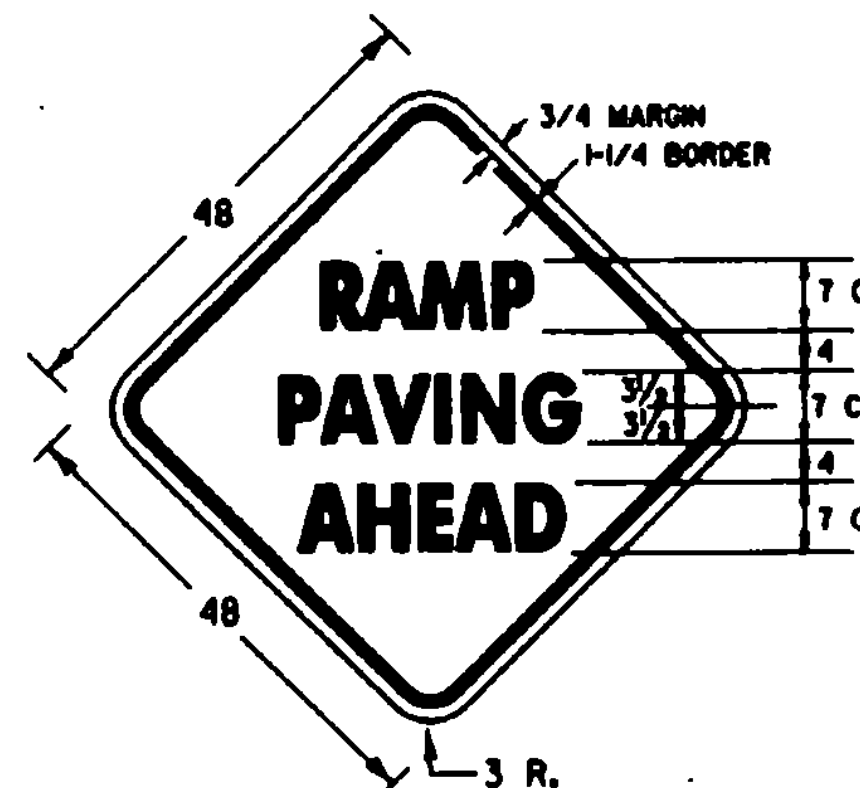
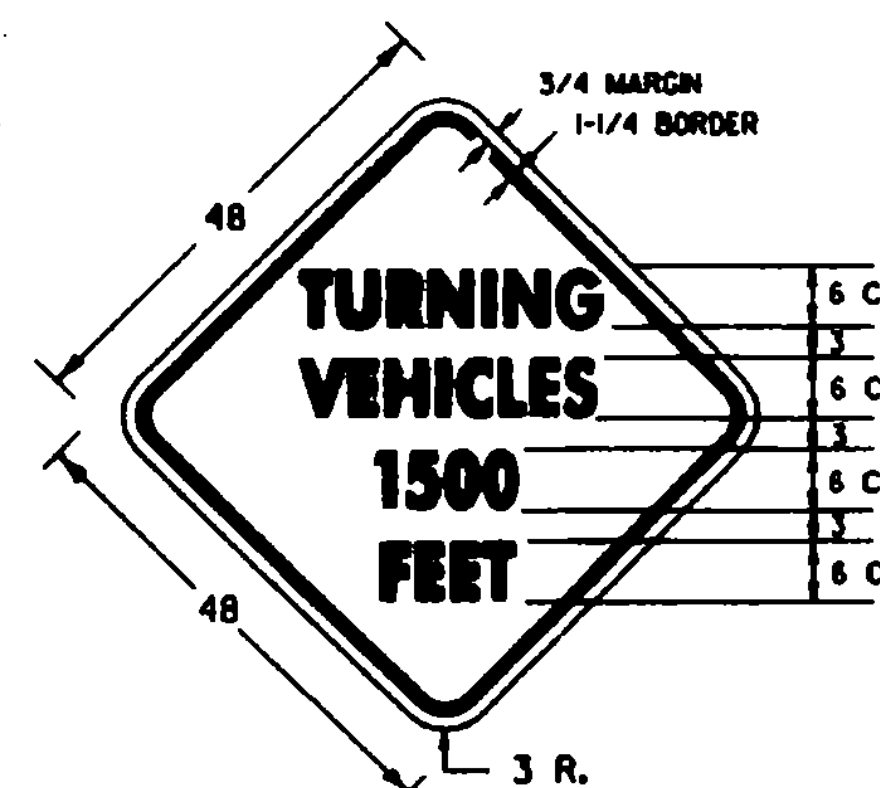
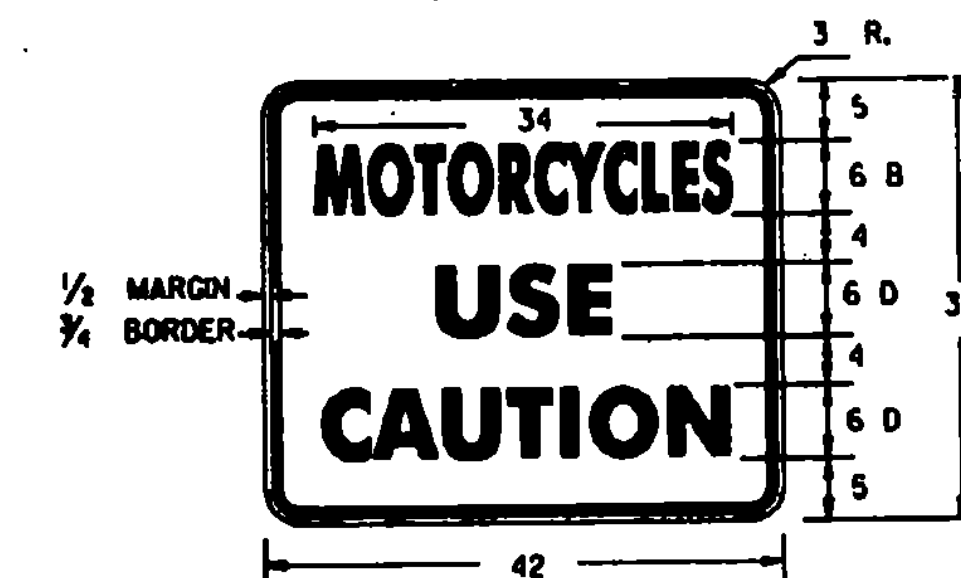
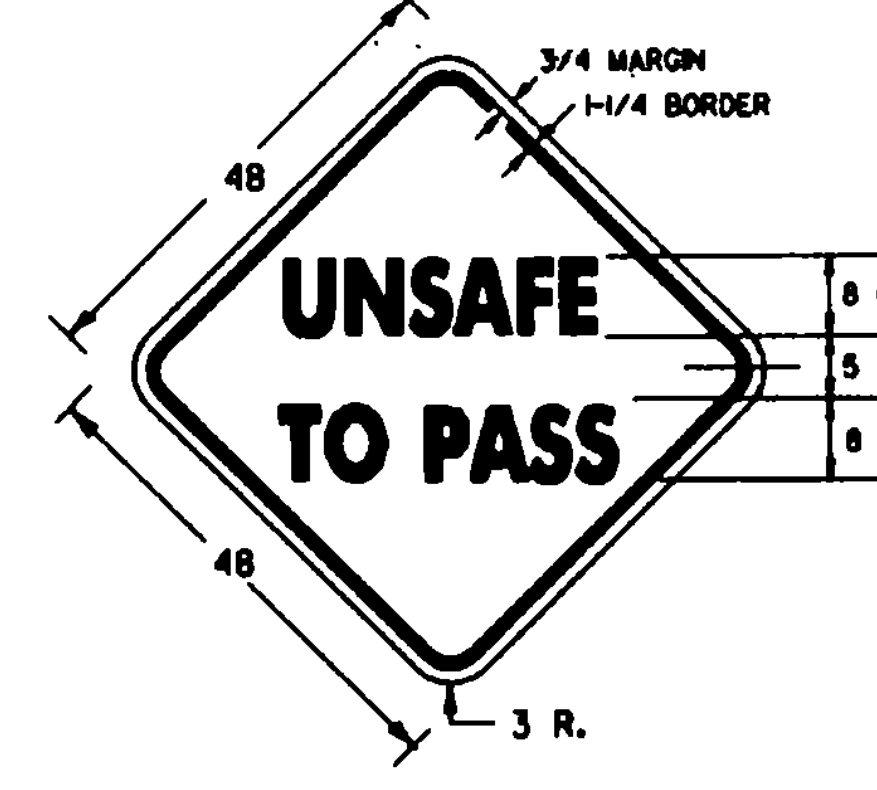
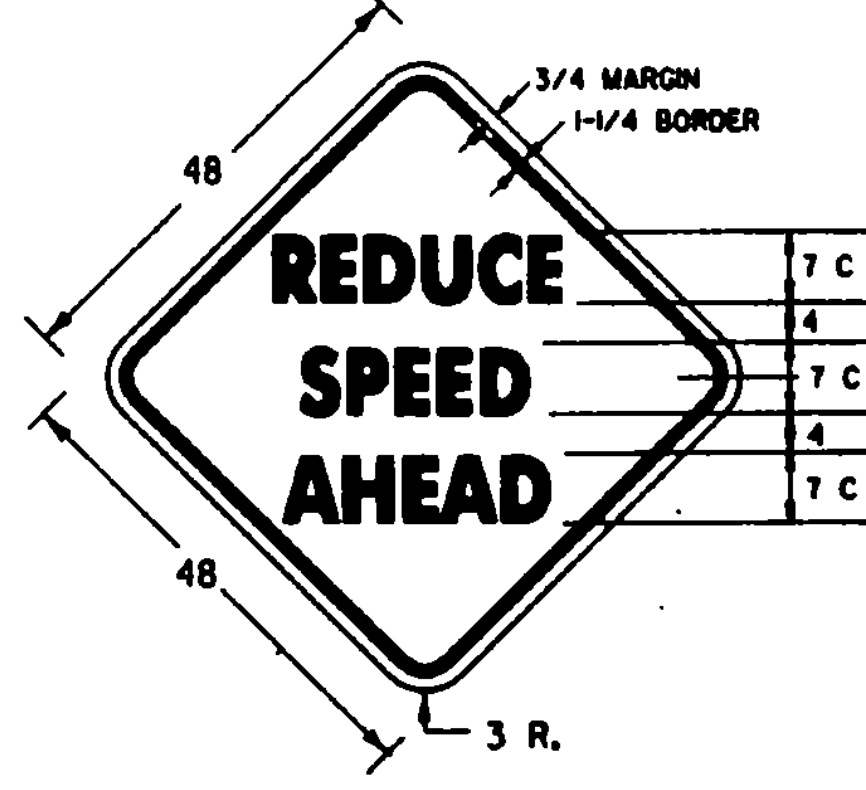
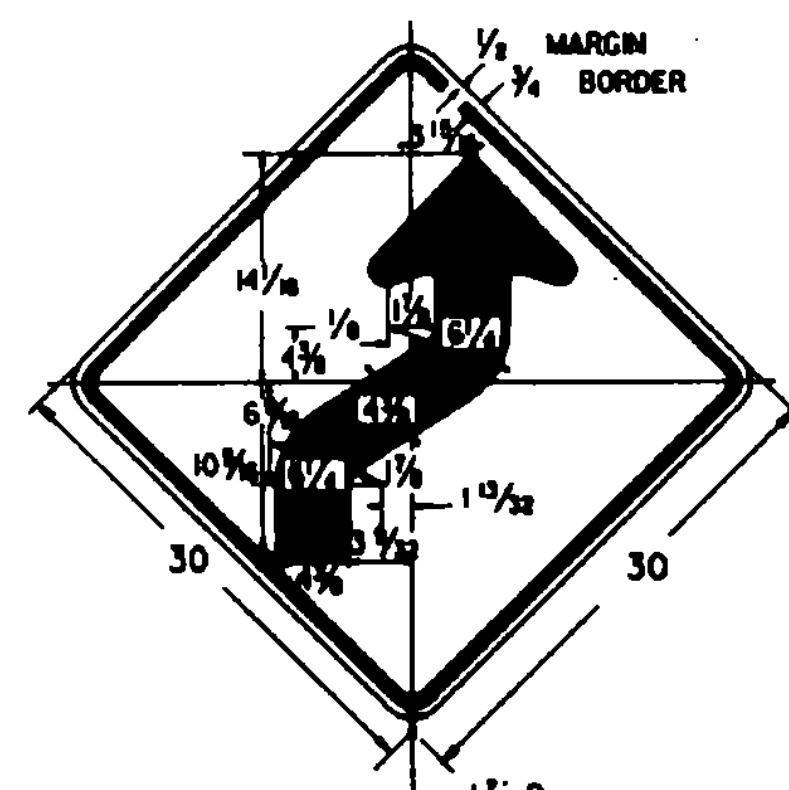
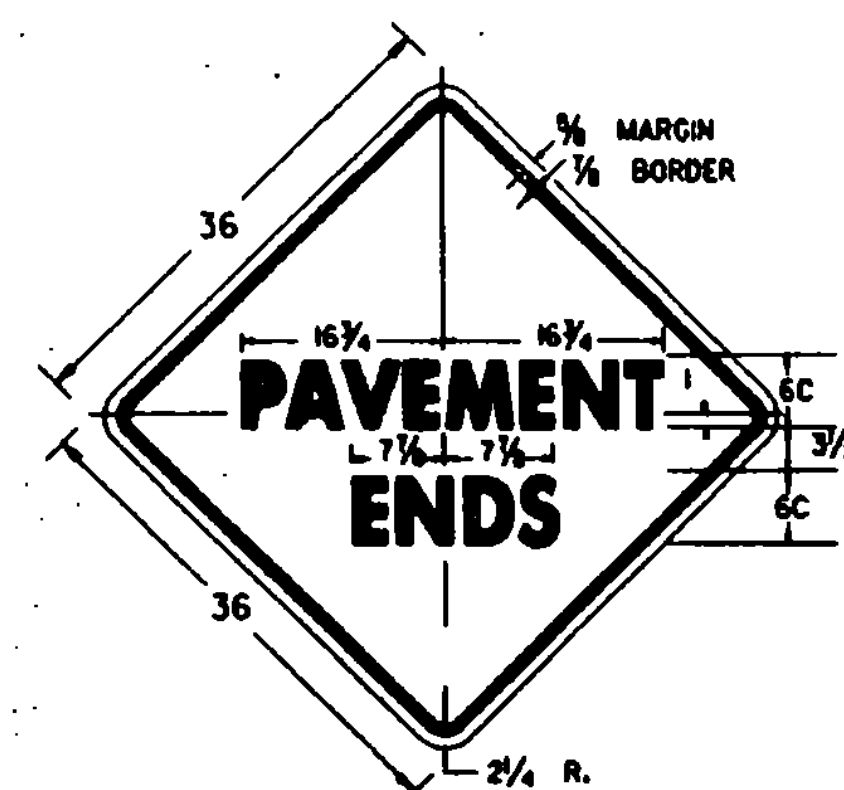
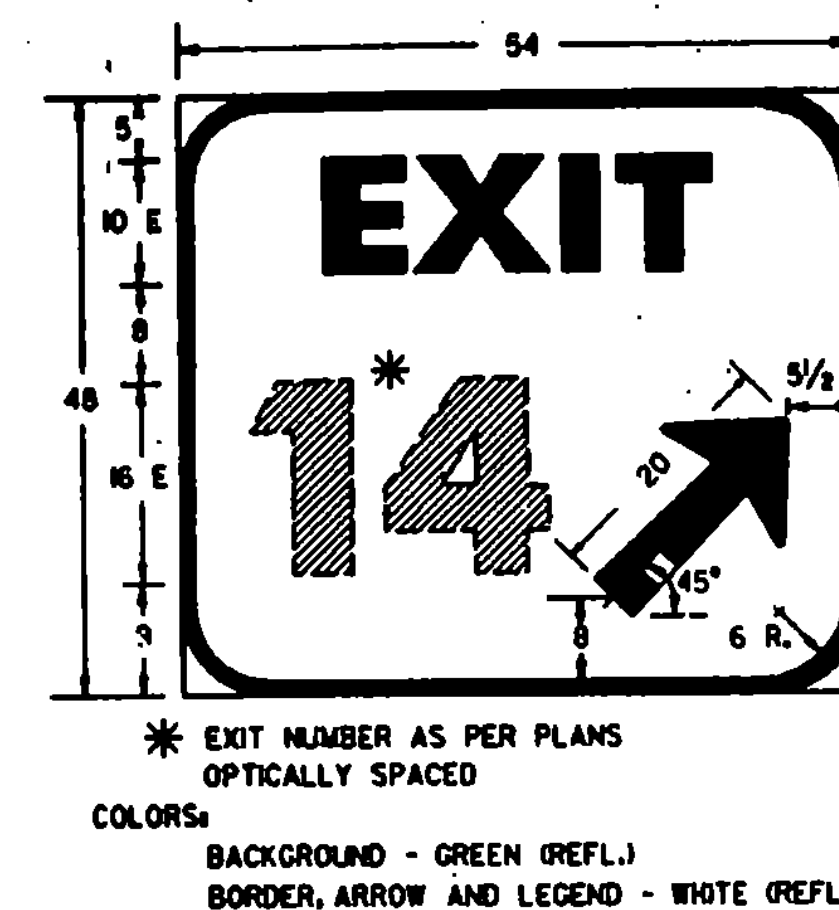
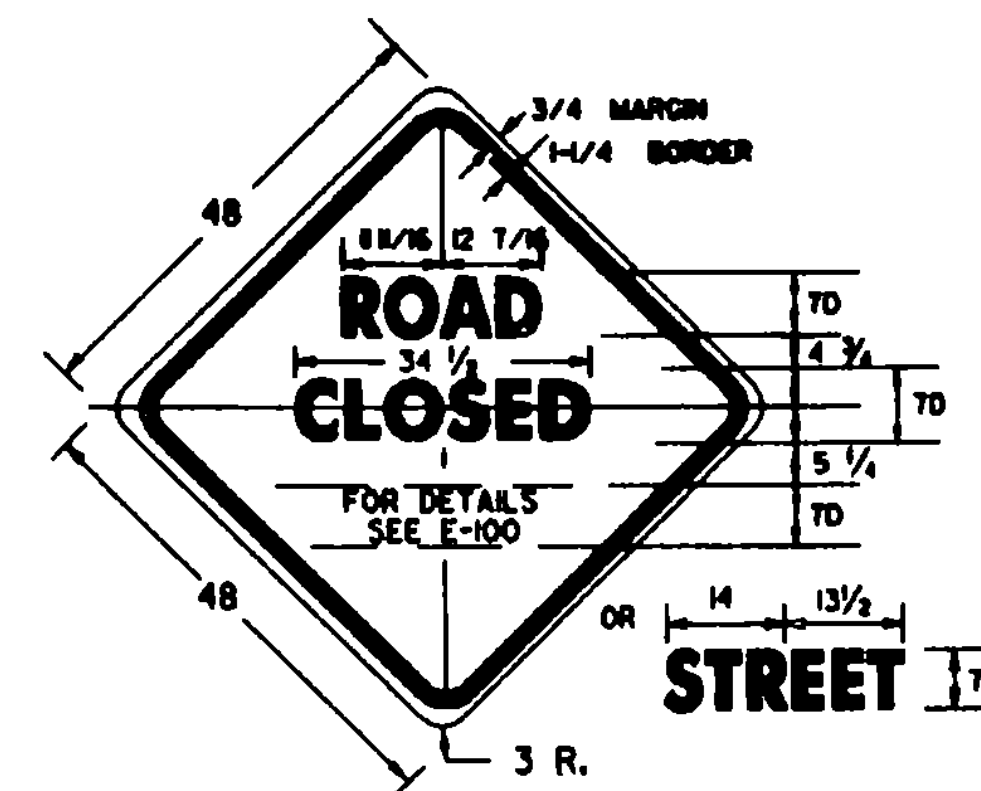
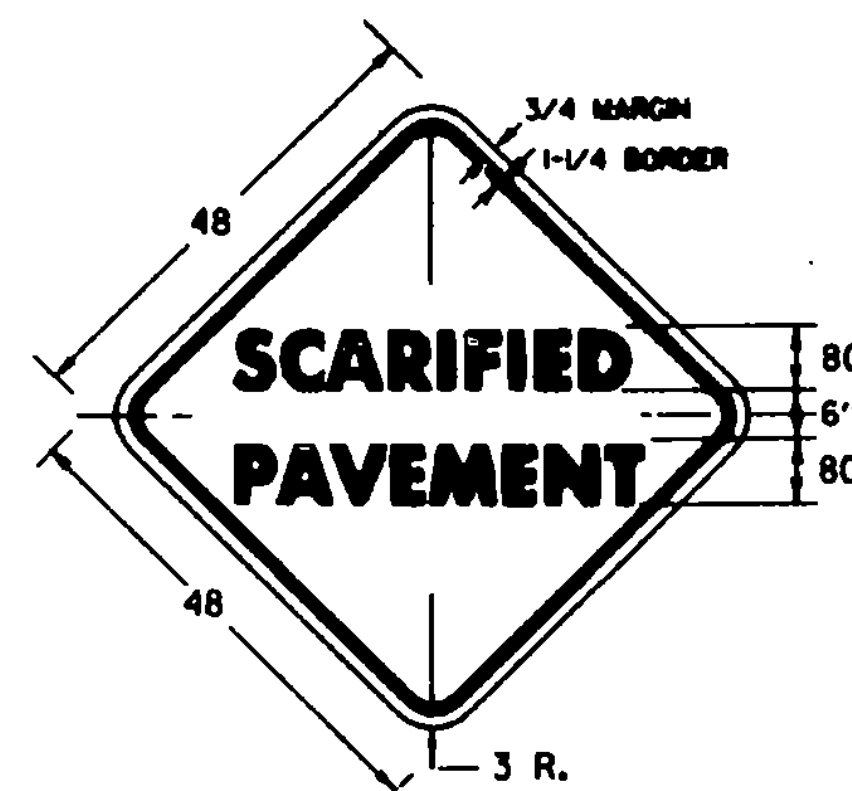
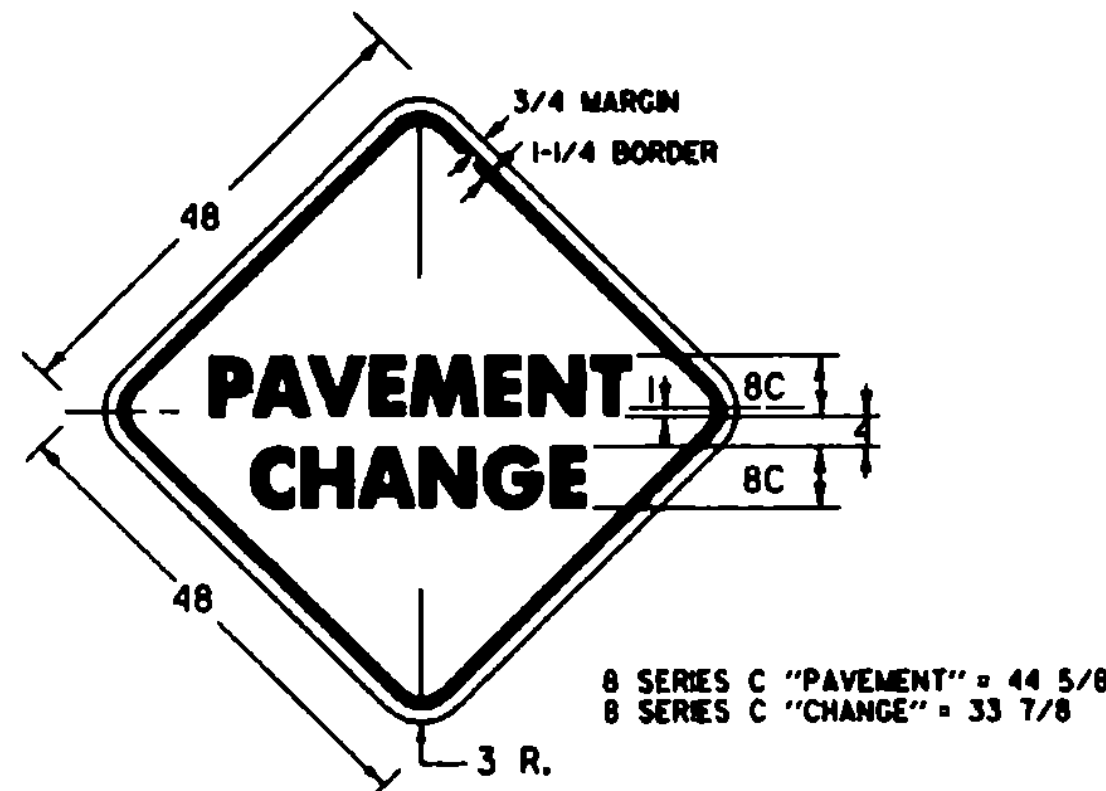
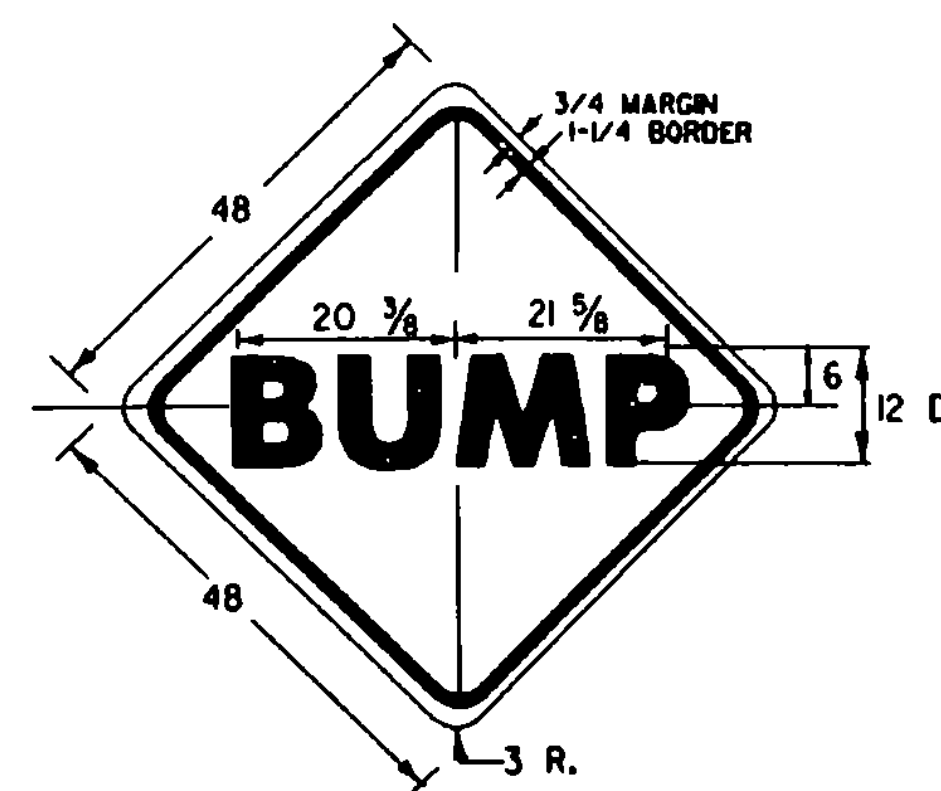
DATE

David S. Kelley
CHIEF ENGINEER
Arthur J. Goss
DIRECTOR OF PLANNING
AND PRE-CONSTRUCTION
Stephen B. MacArthur
TRAFFIC AND SAFETY ENGINEER

CONSTRUCTION SIGN DETAILS



STANDARD
E-101



SIGN	DIMENSIONS (INCHES)							
	A	B	C	D	E	F	G	H
STD. & MIN.	36	3/4	3/4	5 3/4	15 3/4	4 1/4	10	2 1/4
SPECIAL	48	3/4	1 1/4	7 1/2	20	5	12 1/2	3

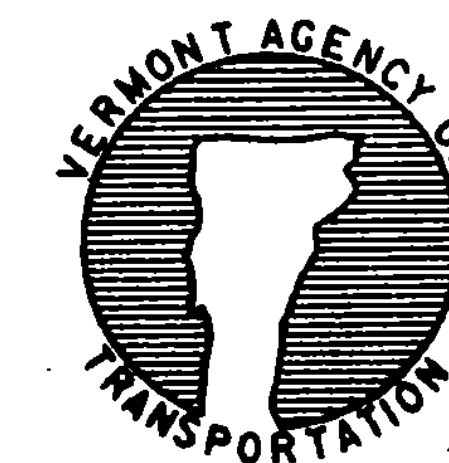
COLORS
SYMBOL & LEGEND - BLACK (NON-REFL.)
TOP CIRCLE RED (REFL.)
BOTTOM CIRCLE GREEN (REFL.)
BACKGROUND - ORANGE (REFL.)

NOTES
SEE STANDARD SHEET E-100 FOR NOTES AND TEXT DETAILS
COLORS FOR SIGNS SHOWN ON THIS SHEET SHALL BE BLACK TEXT, BORDER AND SYMBOLS ON A REFLECTORIZED (ENCAPSULATED LENS) ORANGE BACKGROUND, UNLESS OTHERWISE NOTED.
SIGNS USED ONLY FOR DAYTIME MAINTENANCE OPERATIONS DO NOT NEED TO BE REFLECTORIZED, HOWEVER, THESE SIGNS SHALL BE LABELED "DAYTIME USE ONLY" ON THE BACK OF THE SIGN PANEL WITH 3" SERIES C LETTERS.

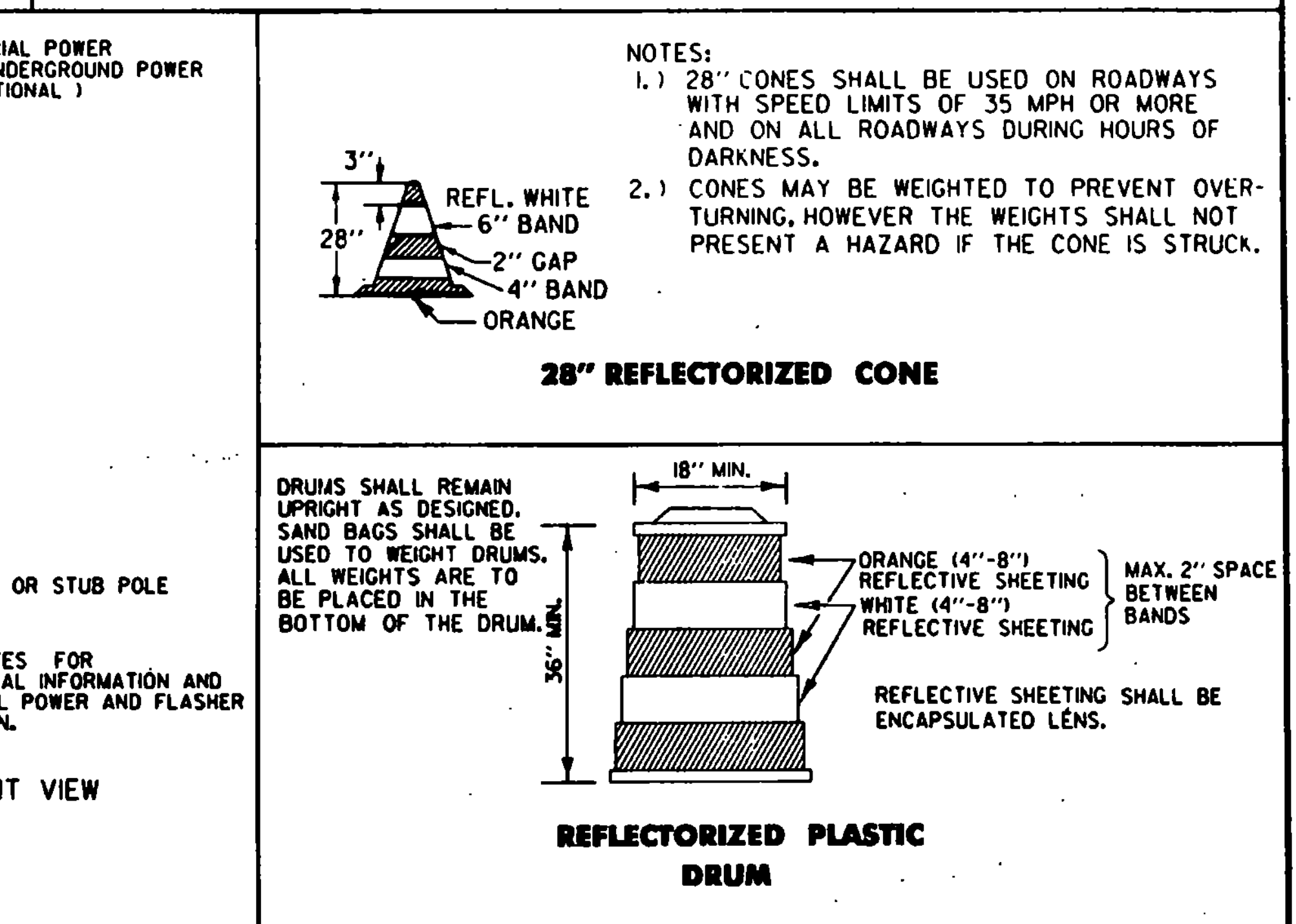
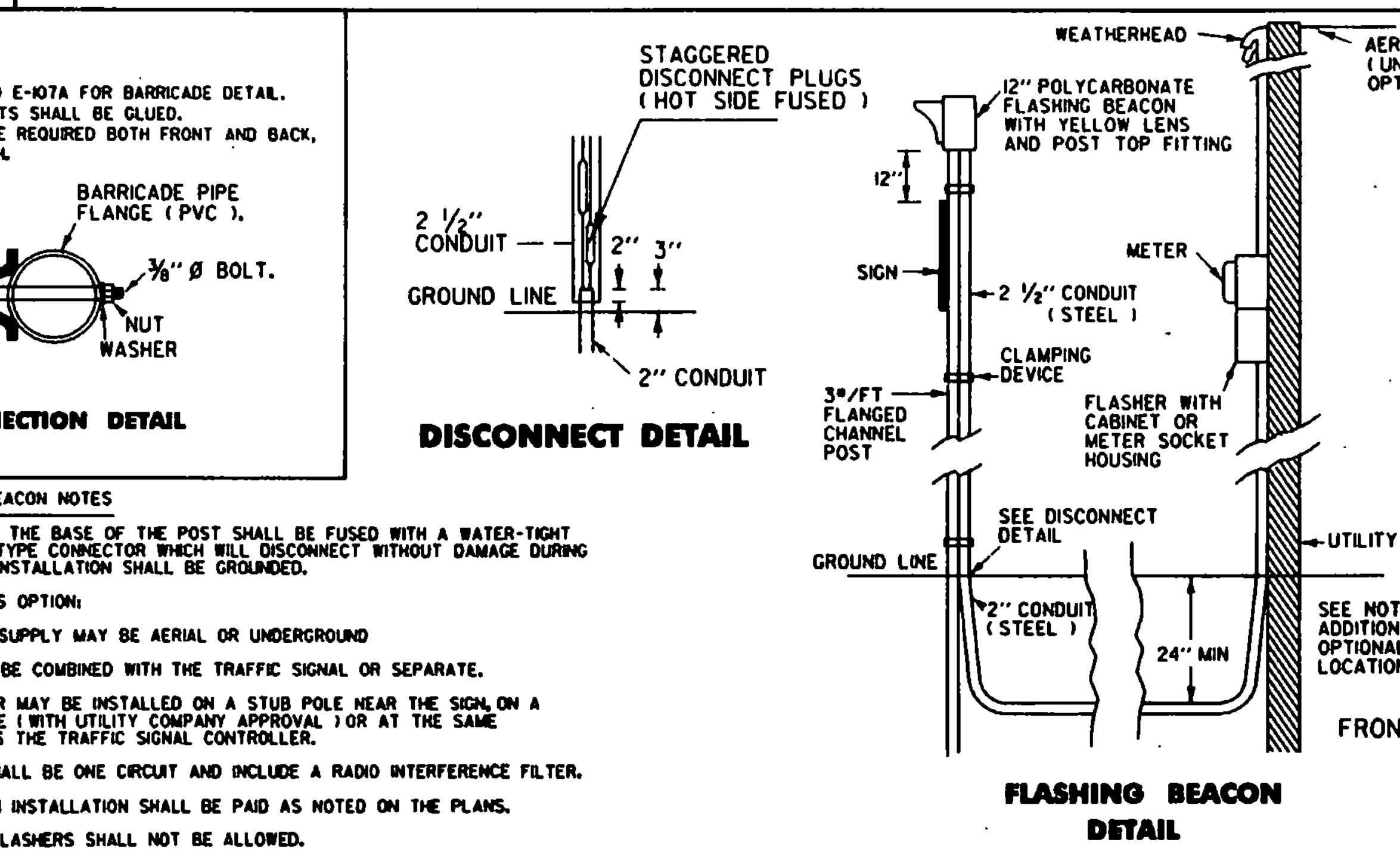
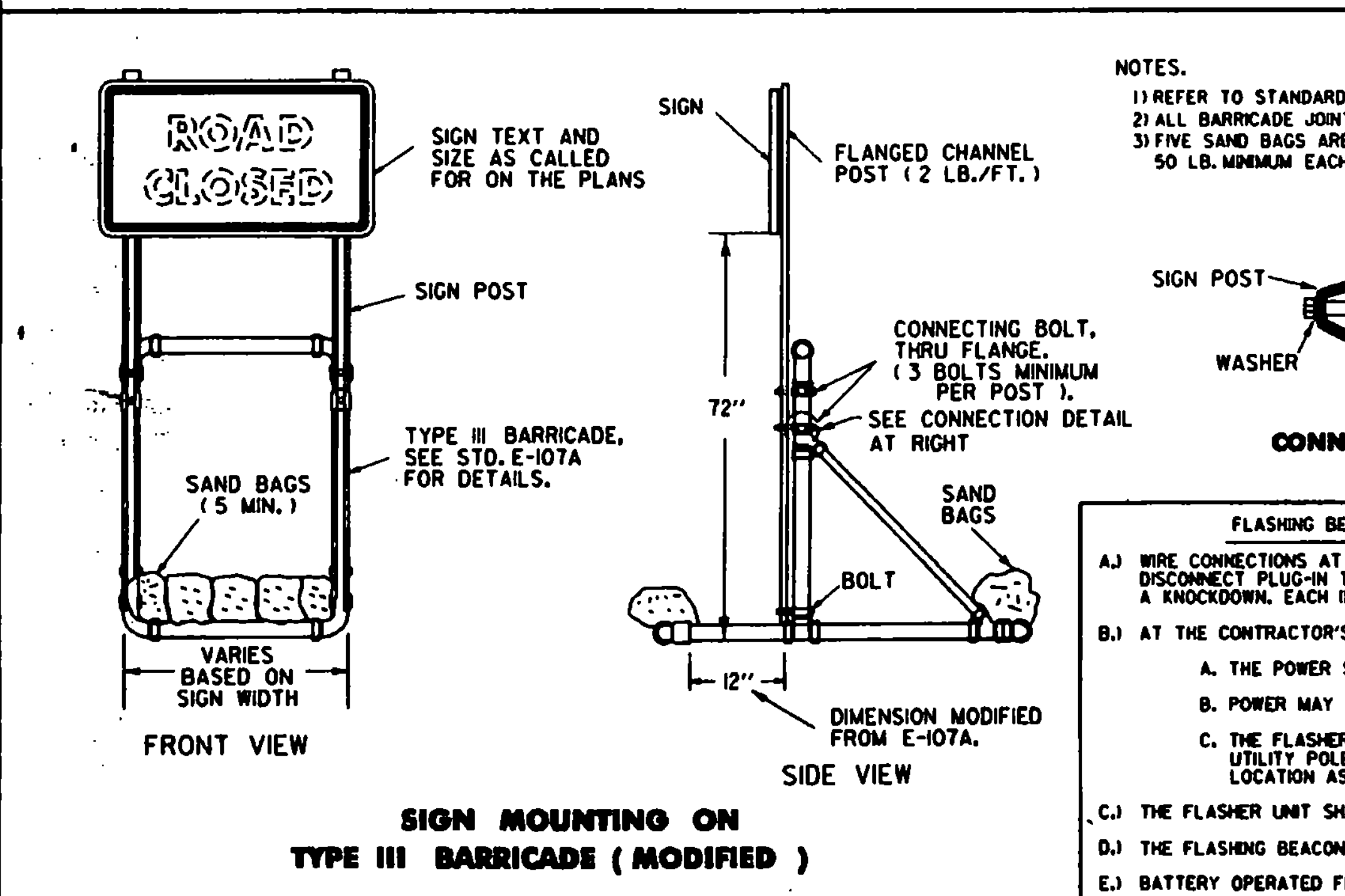
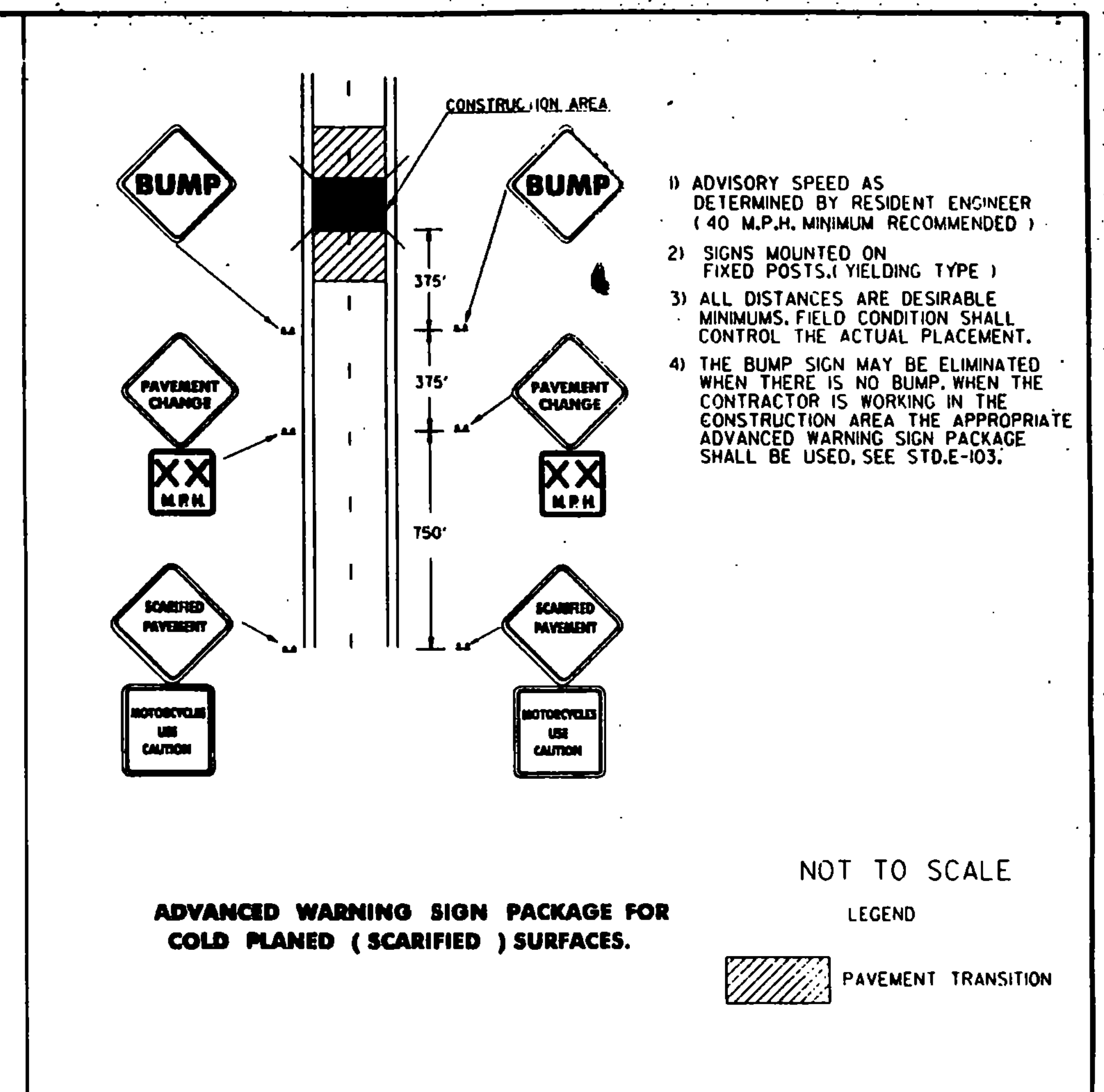
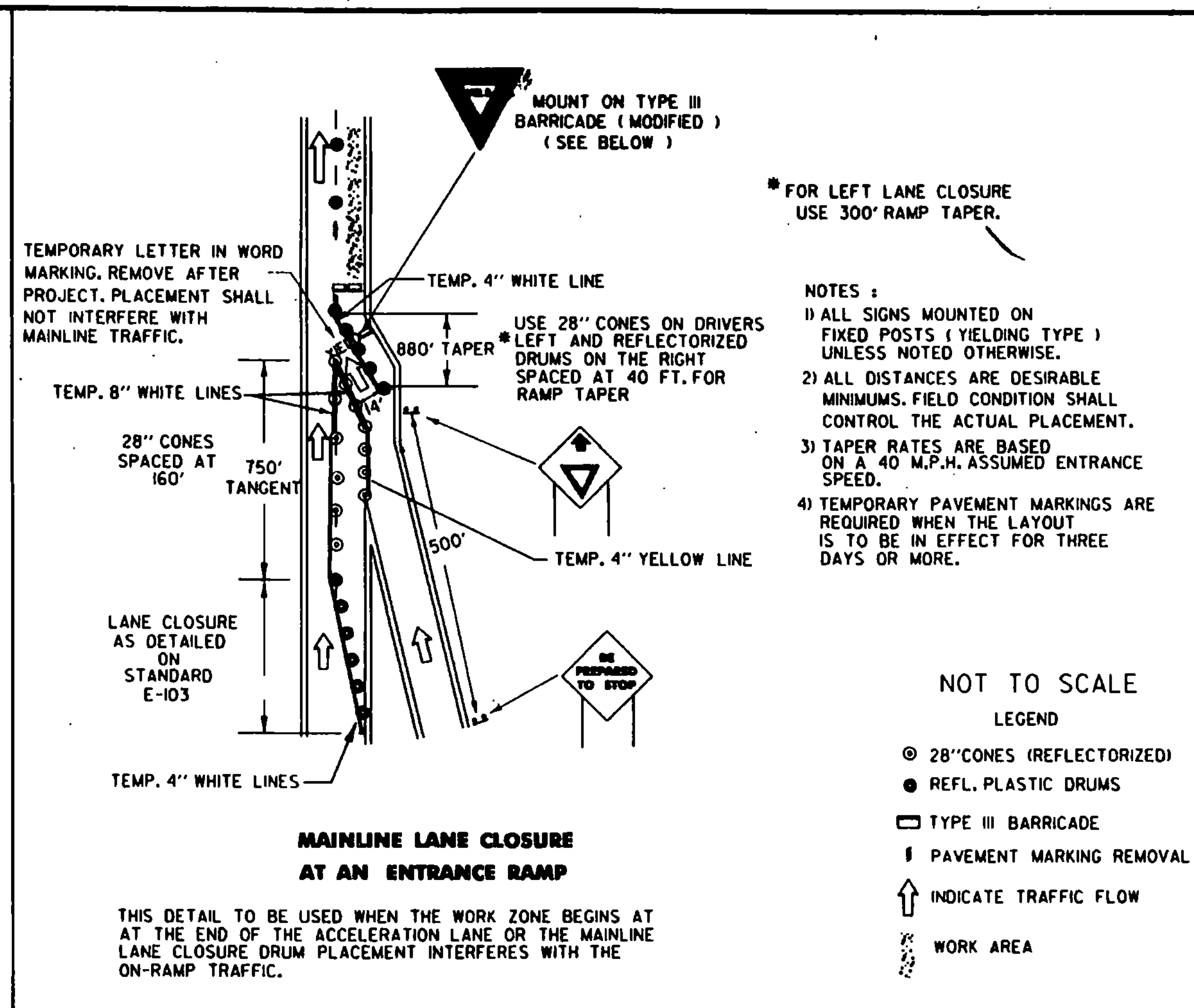
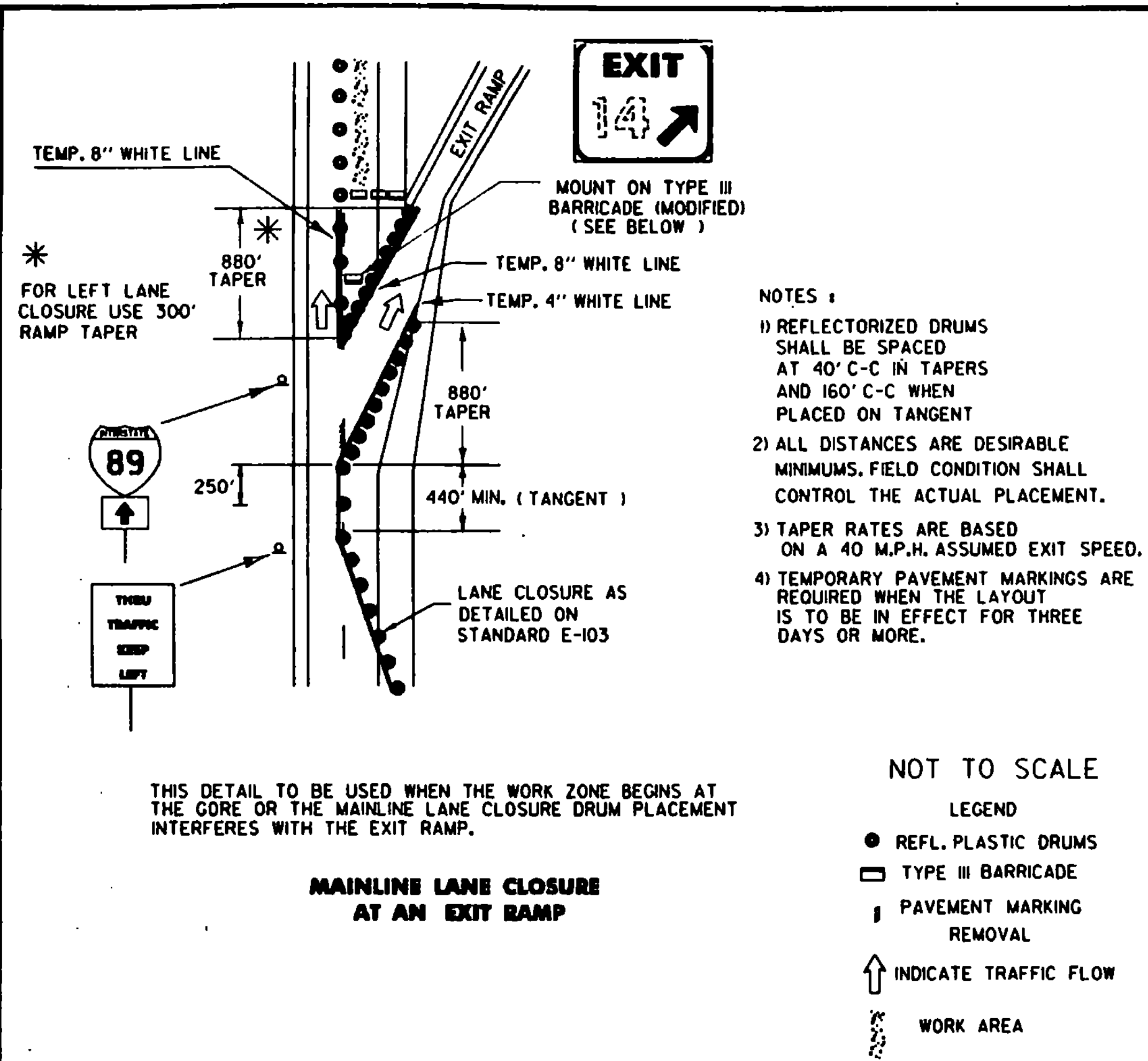
REVISIONS AND CORRECTIONS
JAN. 23, - 1989 DEL. MOTORCYCLE SYMBOL SIGN
AND SPEED SIGN, ADDED TWO SIGNS

APPROVED
OCT. 30, 1987
DATE
David C. Kelley
CHIEF ENGINEER
Arthur J. Jones
DIRECTOR OF PLANNING
AND PRE-CONSTRUCTION
Gordon B. MacArthur
TRAFFIC AND SAFETY ENGINEER

CONSTRUCTION SIGN DETAILS



STANDARD
E-102



REVISIONS AND CORRECTIONS

JAN. 23, 1989 REVISED EXIT SIGN - CLARIFIED EXIT TAPER

APPROVED

APRIL 22, 1988 DATE

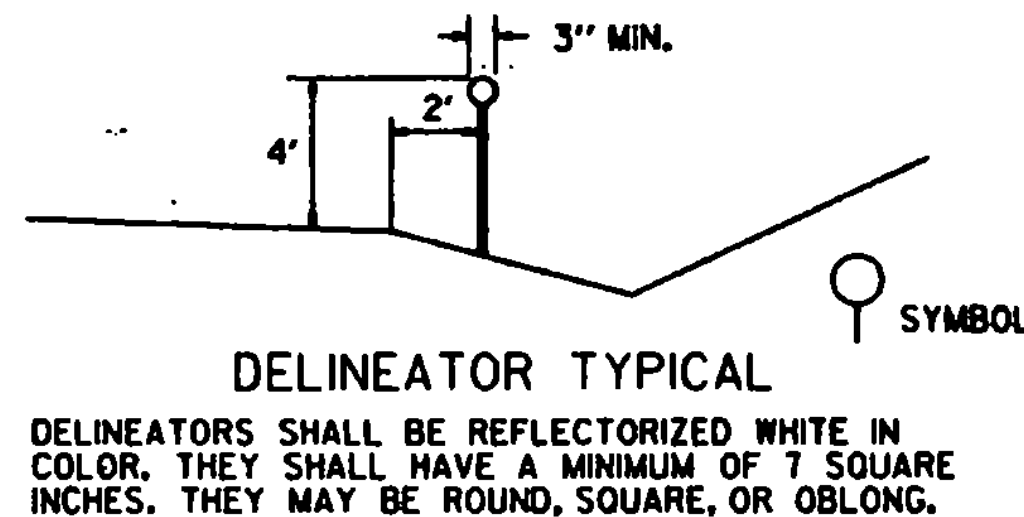
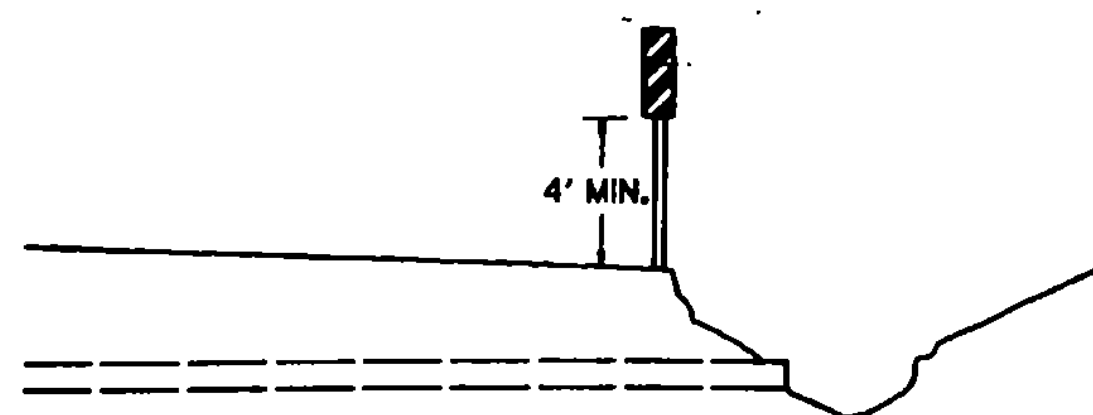
David R. Kelley CHIEF ENGINEER

Arthur J. [Signature] DIRECTOR OF PLANNING AND PRE-CONSTRUCTION

Gordon B. MacArthur TRAFFIC AND SAFETY ENGINEER

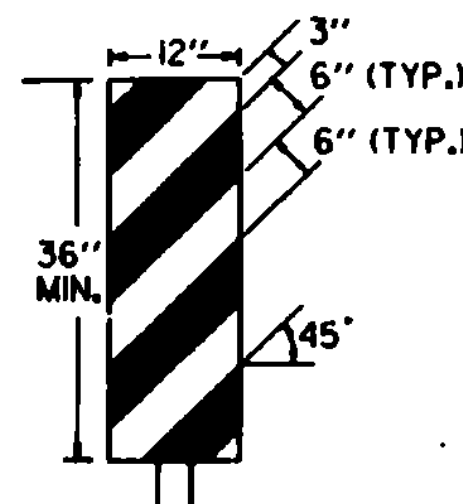
TRAFFIC CONTROL MISCELLANEOUS DETAILS

STANDARD E-106



DELINEATOR TYPICAL

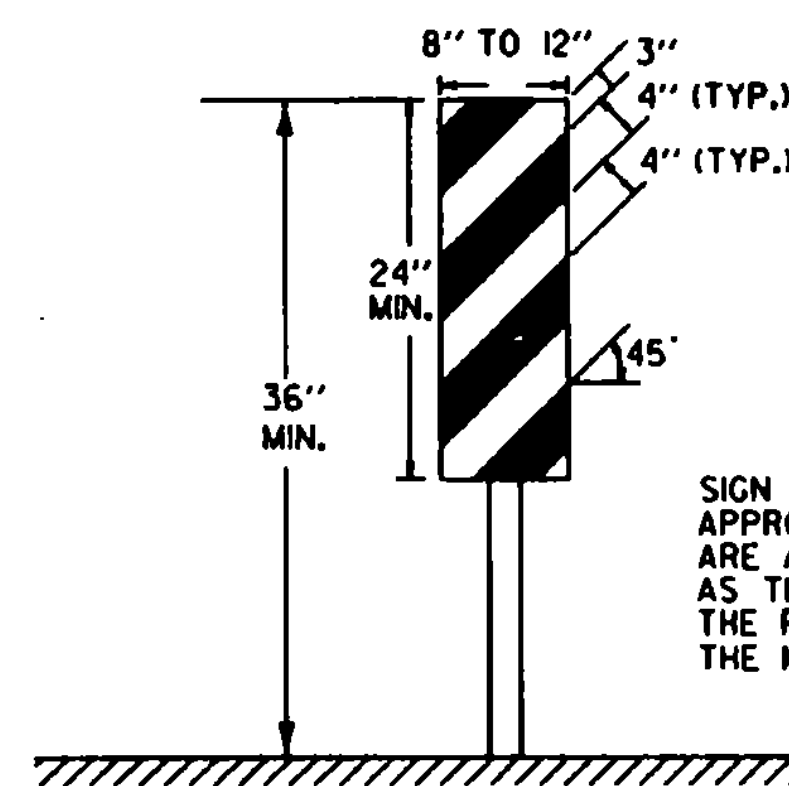
DELINEATORS SHALL BE REFLECTORIZED WHITE IN COLOR. THEY SHALL HAVE A MINIMUM OF 7 SQUARE INCHES. THEY MAY BE ROUND, SQUARE, OR OBLONG.



OBJECT MARKER TYPICAL

OBJECTS ADJACENT TO THE ROADWAY SHALL REQUIRE AN OBJECT MARKER TO MARK THE OBSTRUCTION. IN SOME CASES THERE MAY NOT BE A PHYSICAL OBJECT INVOLVED BUT OTHER ROADSIDE CONDITIONS SUCH AS NARROW SHOULDER DROP-OFFS, GORES, D.I. EXCAVATIONS, OR ABRUPT CHANGES IN THE ROADWAY ALIGNMENT MAY MAKE IT UNDESIRABLE FOR A DRIVER TO LEAVE THE ROADWAY. THE INSIDE EDGE OF THE OBJECT MARKER SHALL BE IN LINE WITH THE INNER EDGE OF THE OBSTRUCTION, WHENEVER POSSIBLE.

OBJECT MARKERS SHALL HAVE ALTERNATING REFLECTORIZED BLACK STRIPES, (SLOPING DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS).

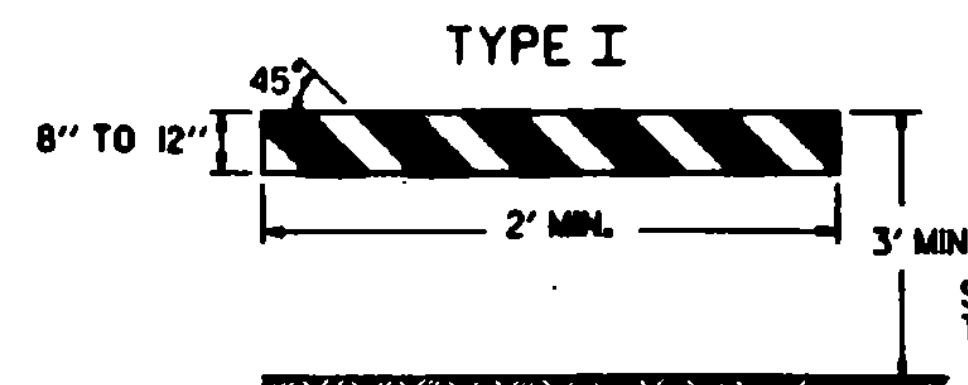


VERTICAL PANEL

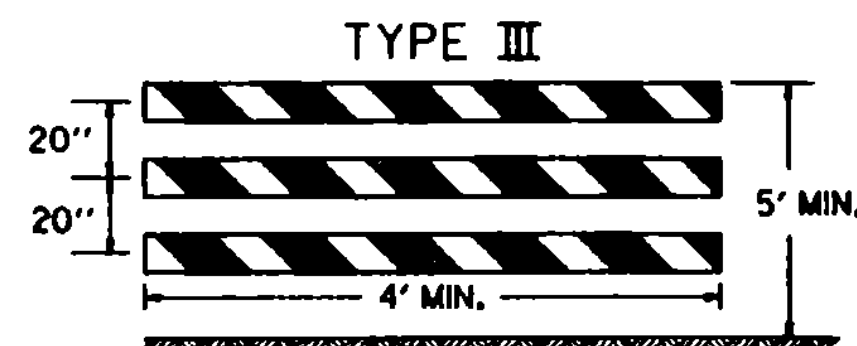
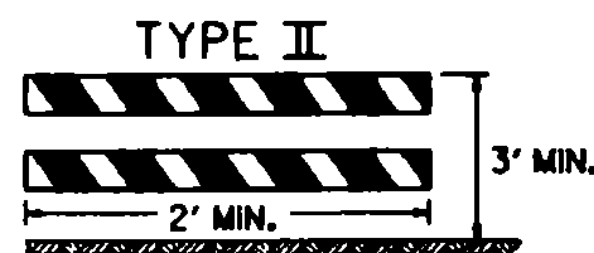
VERTICAL PANELS SHALL HAVE ALTERNATING ORANGE AND WHITE REFLECTORIZED STRIPES (SLOPING DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS). THESE DEVICES MAY BE USED FOR TRAFFIC SEPARATION OR SHOULDER BARRICADING WHERE SPACE IS AT A MINIMUM.

DELINEATOR AND OBJECT MARKER DETAILS FOR CONSTRUCTION AREAS WHERE TRAFFIC IS MAINTAINED

DETOUR DESIGN SPEED MPH	RADIUS FT	DELINEATOR SPACING - "S" FT
25	150	30
30	250	40
40	450	60
50	760	75



STRIPING IS SHOWN WITH TRAFFIC PASSING TO THE RIGHT.



A TYPE III (MODIFIED) BARRICADE SHALL CONSIST OF TYPE II RAILS MOUNTED ON A BREAKAWAY BARRICADE AS SHOWN ON STANDARD SHEET E-107A.

BARRICADE CHARACTERISTICS			
	I	II	III
WIDTH OF RAIL	8" MIN	8" MIN	8" MIN
LENGTH OF RAIL	12" MAX	12" MAX	12" MAX
WIDTH OF STRIPES*	6"	6"	6"
HEIGHT	3' MIN.	3' MIN.	5' MIN.
TYPE OF FRAME	LIGHT 'A' FRAME NO STAY BRACE	LIGHT 'A' FRAME NO STAY BRACE	SEE E-107A
FLEXIBILITY	PORTABLE	PORTABLE	PORTABLE
ANGLE OF STRIPES	45°	45°	45°
COLOR OF STRIPES	ORANGE AND WHITE	ORANGE AND WHITE	ORANGE AND WHITE

* FOR RAILS LESS THAN 3 FEET LONG 4" WIDE STRIPES SHALL BE USED.

BARRIER CHARACTERISTICS

1. SIGNS AND DELINEATION SHOWN FOR ONE DIRECTION OF TRAFFIC ONLY.
2. CONTRACTOR IS RESPONSIBLE FOR PAVEMENT MARKING AND SHALL REMOVE ANY CONFLICTING OR CONFUSING EXISTING MARKINGS.
3. ADDITIONAL SIGNING MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER.
4. UNPAVED DETOURS REQUIRE PAVEMENT MARKINGS FOR TRANSITIONS ON EXISTING PAVEMENT.

BARRICADES

APPLICATION NOTES

TYPE I BARRICADES ARE TO BE USED ON CONVENTIONAL ROADS OR URBAN STREETS AND ARTERIALS TO MARK A SPECIFIC HAZARD.

TYPE II BARRICADES ARE TO BE USED ON EXPRESSWAYS AND FREEWAYS, SERVING THE SAME FUNCTIONS AS THE TYPE I BARRICADES.

TYPE III BARRICADES (SEE STANDARD E-107A) SHALL ONLY BE USED WHEN A ROAD SECTION IS CLOSED TO TRAFFIC AND ARE TO BE ERECTED AT THE POINT OF CLOSURE.

MATERIALS

THE BARRICADES SHOWN ON THIS SHEET NORMALLY WILL BE OF LIGHTWEIGHT MATERIAL. IF WOOD IS USED THE FOLLOWING CONDITIONS SHALL APPLY:

1. WOODEN BARRICADES (TYPES I AND II)

- A. SHALL NOT BE USED TO CHANNELIZE OR DELINEATE WORK AREAS WITHIN THE CLEAR ZONE OF ANY HIGHWAY WHERE OPERATING SPEEDS IN EXCESS OF 20 MILES PER HOUR ARE EXPECTED UNLESS INSTALLED FOR PEDESTRIAN CONTROL BEHIND APPROVED POSITIVE BARRIERS.
 - B. MAY BE USED IF OPERATING SPEEDS OF 20 M.P.H. OR LESS ARE EXPECTED.
2. TYPE III WOODEN BARRICADES SHALL NOT BE USED.

DESIGN

THE DESIGN OF THE BARRICADES SHALL CONFORM WITH THE DETAILS SHOWN ON THIS SHEET AND THE MARKINGS ON THE BARRICADES SHALL BE ALTERNATE ORANGE AND WHITE STRIPES, (SLOPING DOWNWARD AT AN ANGLE OF 45° IN THE DIRECTION TRAFFIC IS TO PASS)

COLORS

THE BARRICADE PANELS SHOWN ON THIS SHEET SHALL HAVE ALTERNATING REFLECTORIZED WHITE AND ORANGE STRIPES. THE ORANGE SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION. THE BARRICADE COMPONENTS SHALL BE WHITE UNLESS UNPAINTED METAL OR ALUMINUM IS USED.

REFLECTORIZATION

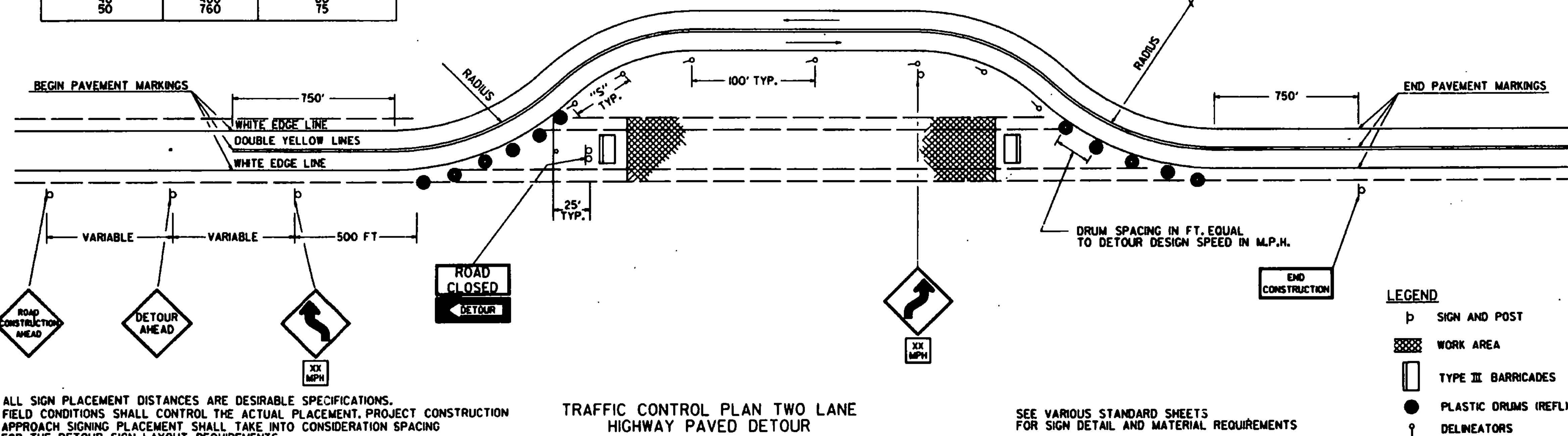
THE BARRICADE PANELS SHALL BE REFLECTORIZED WITH REFLECTIVE SHEETING.

LOCATION

THE BARRICADES SHOWN ON THIS SHEET WILL BE LOCATED BY THE ENGINEER IN THE FIELD OR AS SHOWN ON THE PLANS. THE LOCATION OF THE BARRICADES SHALL FOLLOW THE PROCEDURES SET FORTH IN "THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", OR AS OTHERWISE NOTED.

MAINTENANCE

BARRICADES SHALL BE MAINTAINED IN CLEAN CONDITION, SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. DAMAGED, DEFACED, OR DIRTY BARRICADES SHALL BE REPAIRED, CLEANED, OR REPLACED AS ORDERED BY THE ENGINEER.



ALL SIGN PLACEMENT DISTANCES ARE DESIRABLE SPECIFICATIONS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT. PROJECT CONSTRUCTION APPROACH SIGNING PLACEMENT SHALL TAKE INTO CONSIDERATION SPACING FOR THE DETOUR SIGN LAYOUT REQUIREMENTS.

TRAFFIC CONTROL PLAN TWO LANE HIGHWAY PAVED DETOUR

SEE VARIOUS STANDARD SHEETS FOR SIGN DETAIL AND MATERIAL REQUIREMENTS

REVISIONS AND CORRECTIONS
APRIL 29, 1988 - FHWA REVIEW COMMENTS

APPROVED

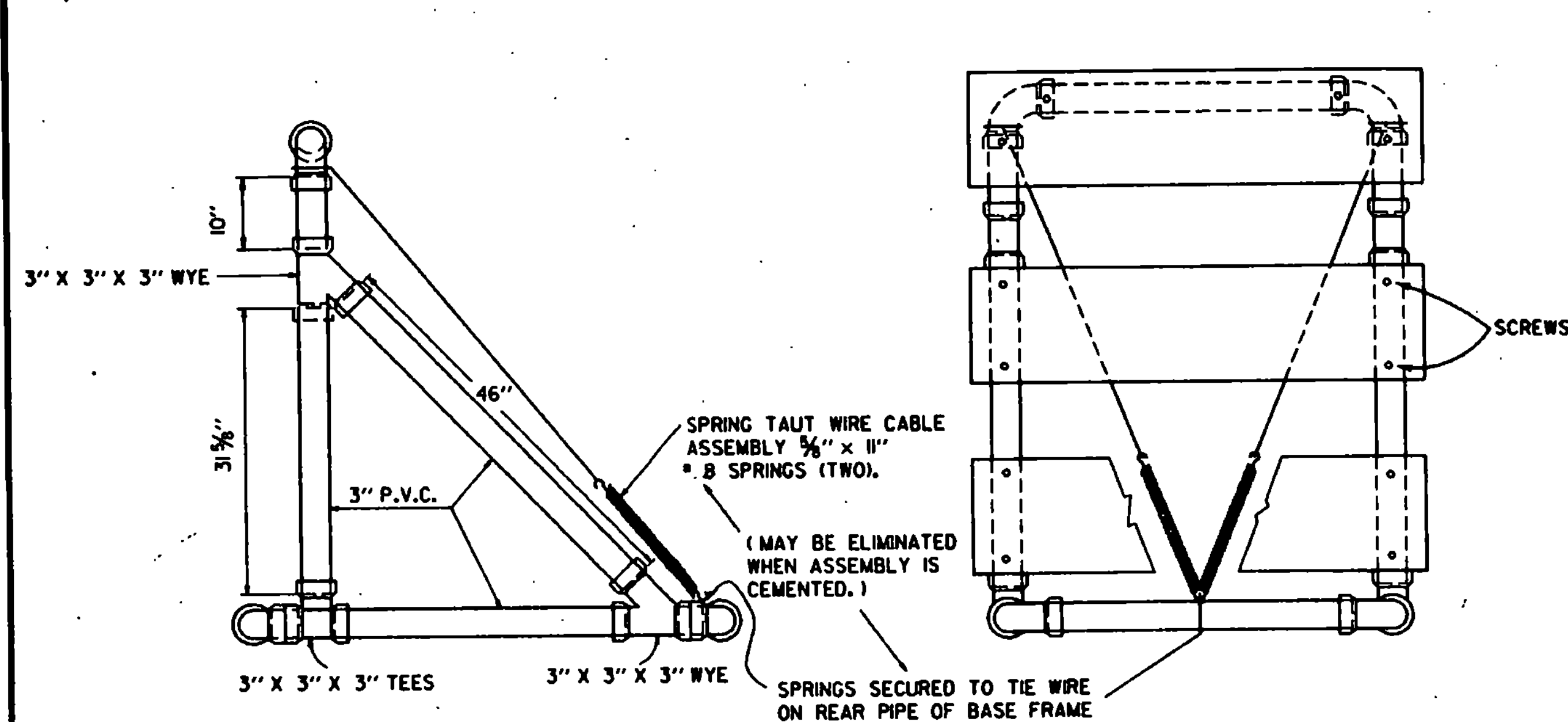
SEPT. 10, 1987
DATE

David R. Kelley
CHIEF ENGINEER
Arthur J. Jones
DIRECTOR OF PLANNING
AND PRE-CONSTRUCTION
Gordon B. MacArthur
TRAFFIC AND SAFETY ENGINEER

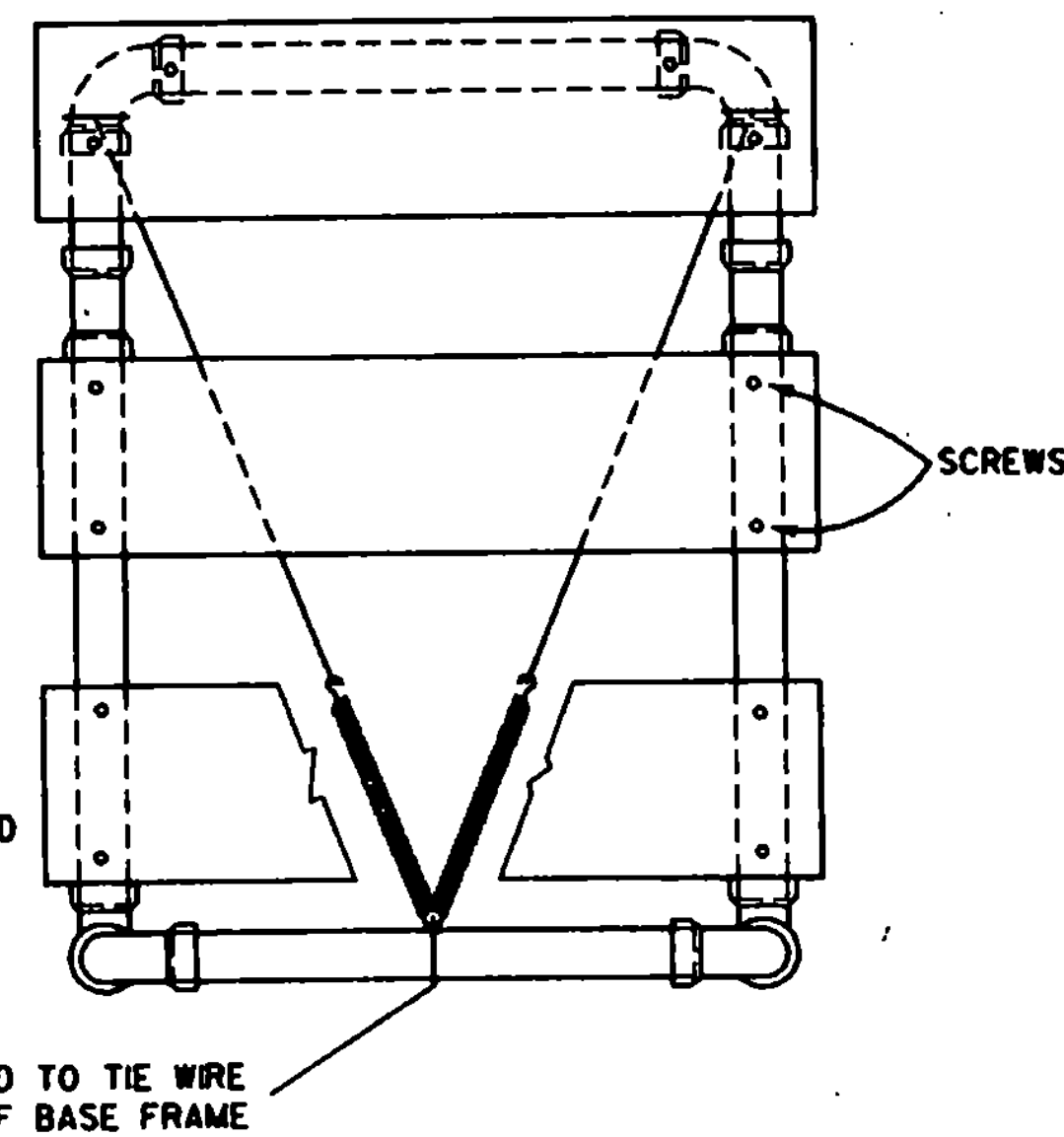
DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS



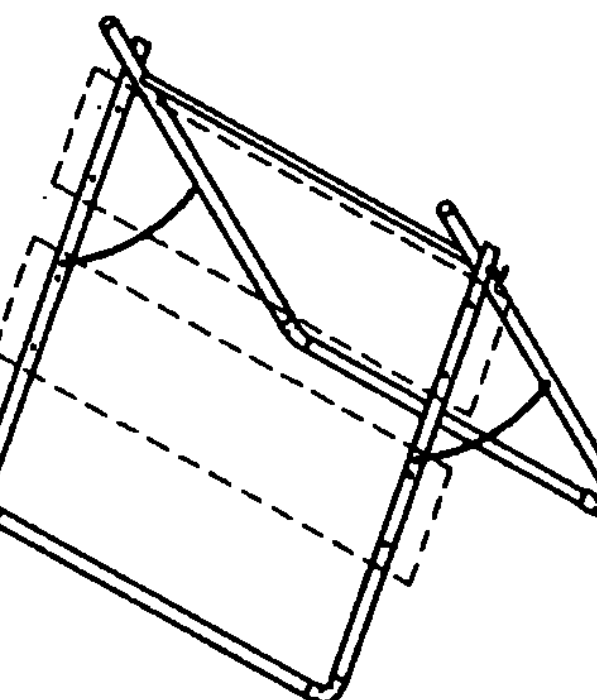
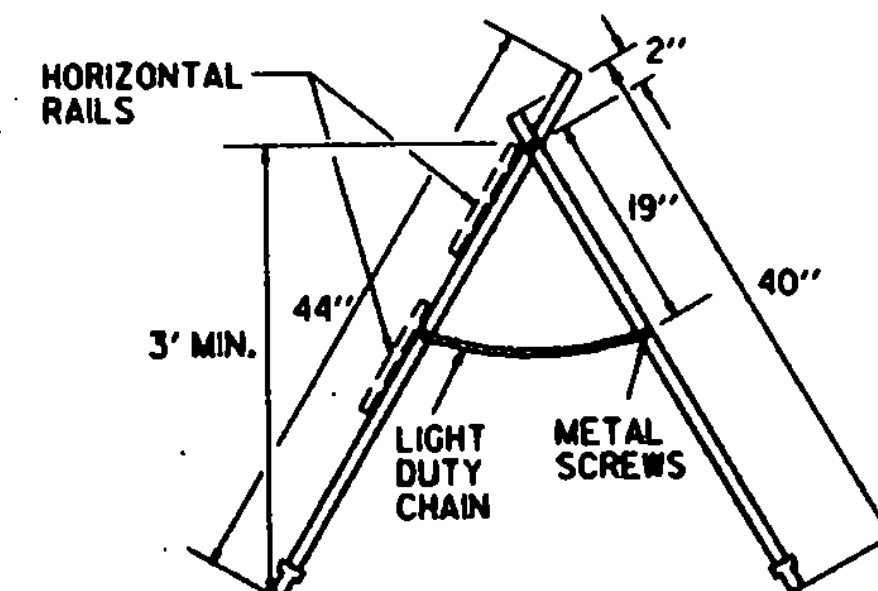
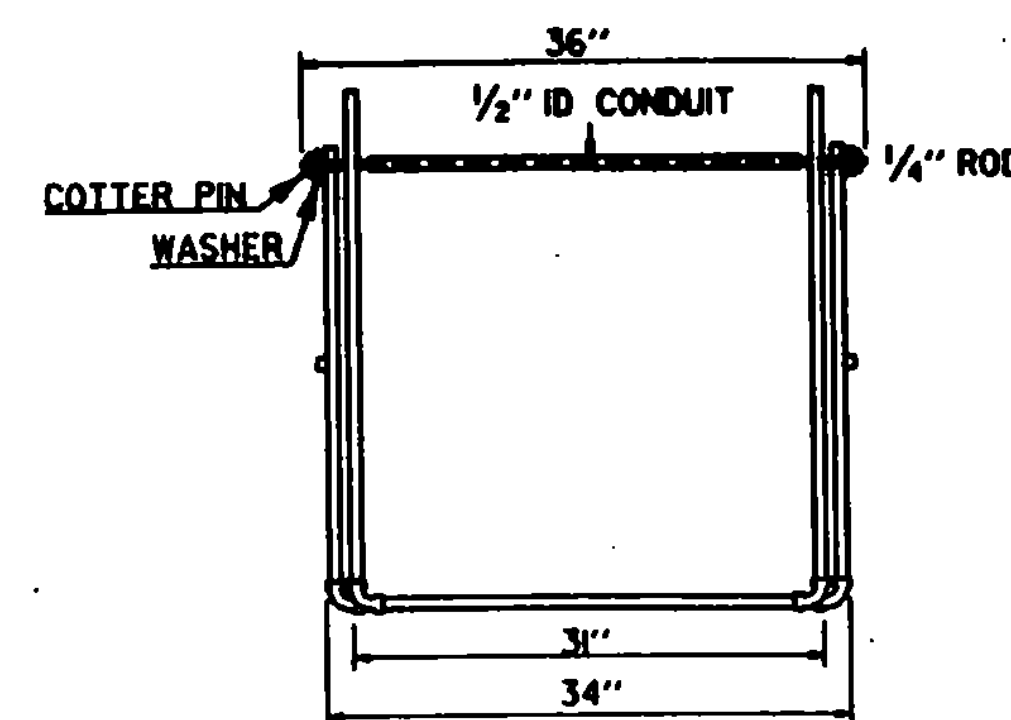
STANDARD
E-107



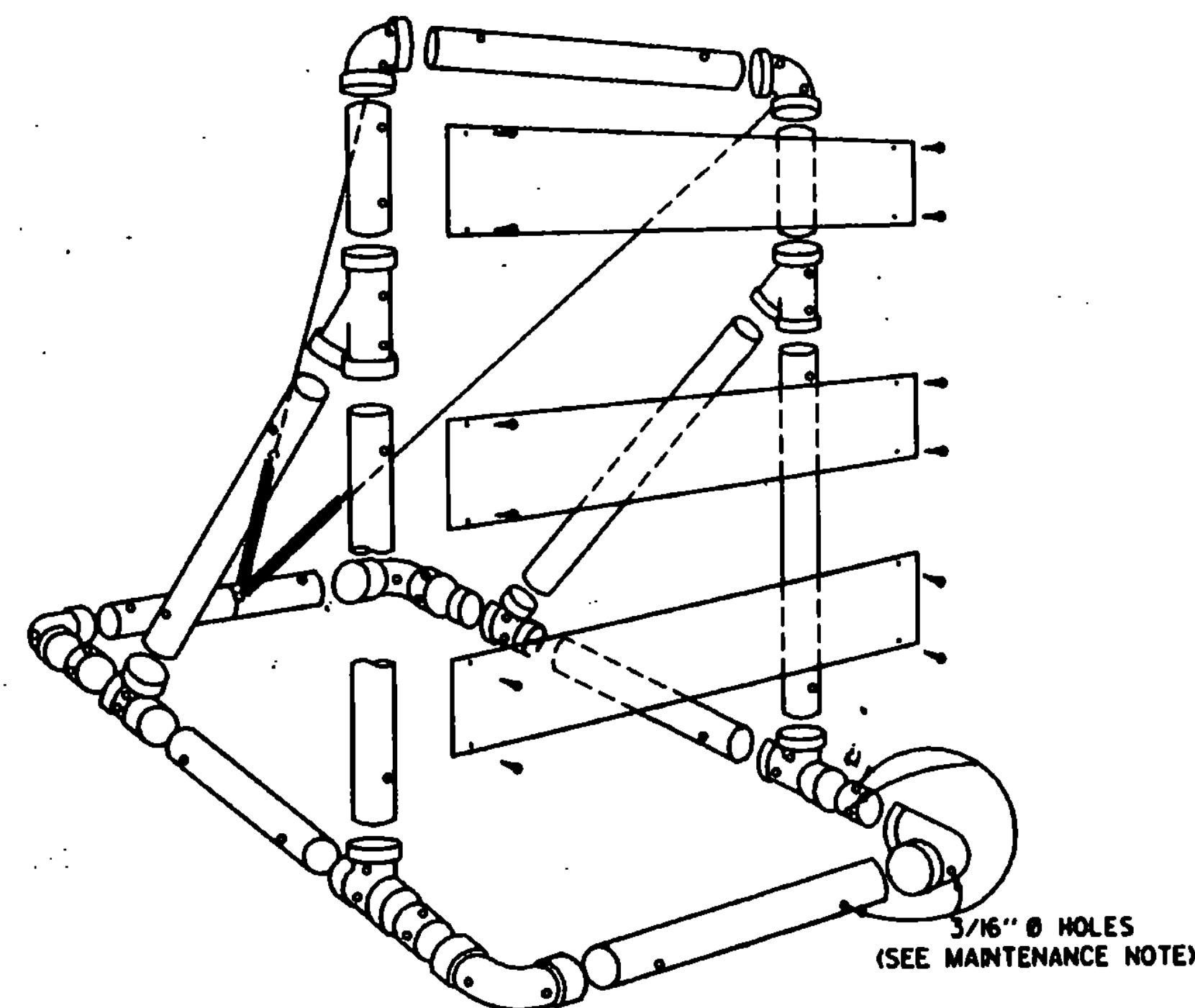
SIDE VIEW
TYPE III BARRICADE



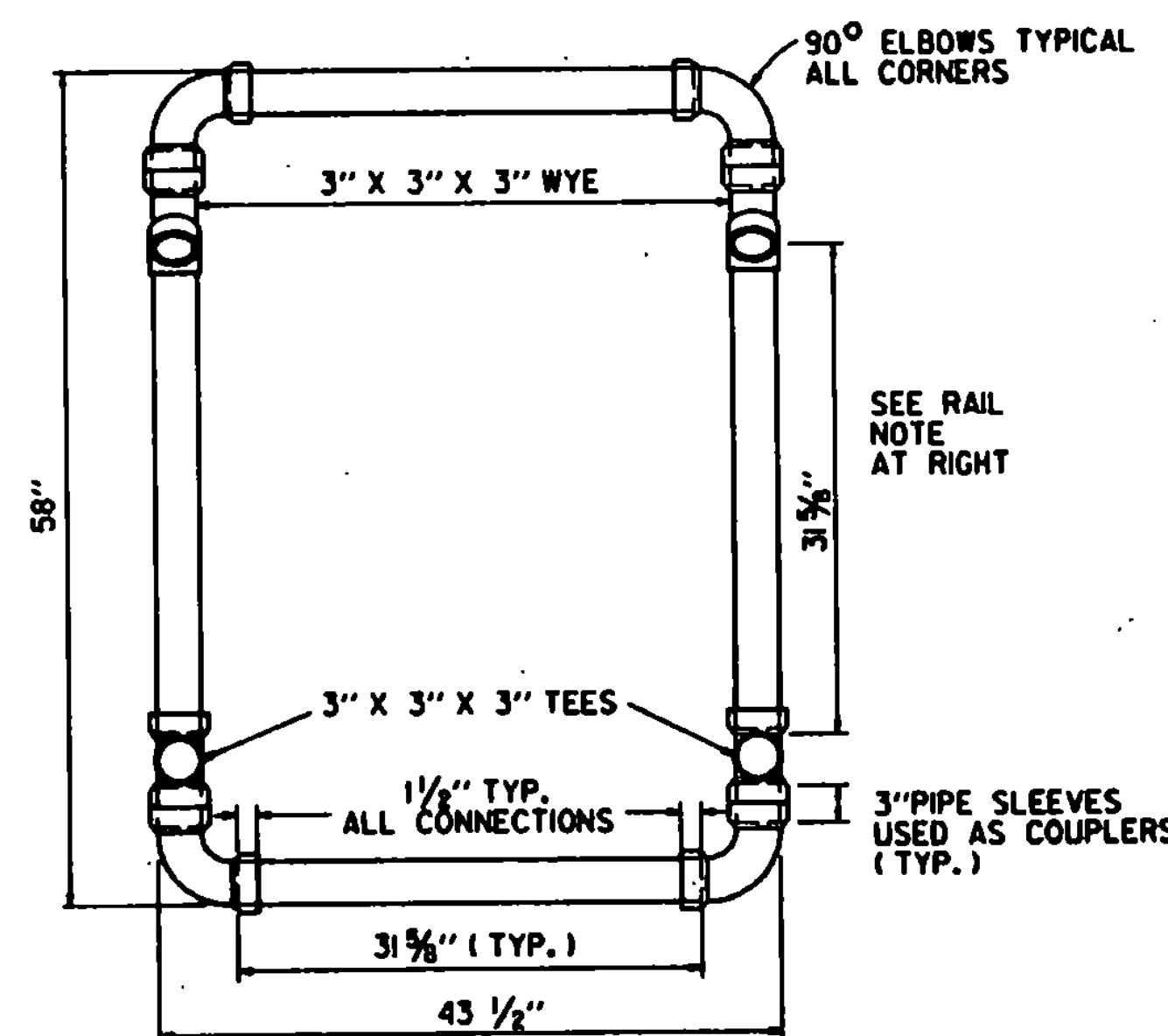
FRONT VIEW
TYPE III BARRICADE



TYPE I AND II BARRICADE DETAIL



TYPE III BARRICADE ASSEMBLY
EXPLODED VIEW



TYPE III BARRICADE
TOP VIEW OF
BASE

MATERIALS FOR TYPE I AND II BARRICADES

20' - 1" PVC
4 - 1" PVC 90° ELBOWS
30' - 1/2" ID THINWALL CONDUIT
36" - 1/2" STEEL ROD
4 - 1" WASHERS
24" - LIGHT DUTY CHAIN
METAL SCREWS (AS REQUIRED)
2 - 3/4" COTTER PINS

MATERIALS FOR TYPE III BARRICADE

30' - 3" I.D. PVC PIPE
6 - 3" 90° ELBOWS
2 - 3" TEES
4 - 3" WYES
2 - 3" x 48" x 0.025" BARRICADE RAILS
2 - 1/2" x 11" x 8 SPRING (IF ASSEMBLY IS NOT CEMENTED)
12 - 1/2" x 14 PAN HEAD METAL SCREWS
15 LF - 14 BLACK ANNEALED TIE WIRE (IF ASSEMBLY IS NOT CEMENTED)

MATERIALS

THE PIPE, WYES, TEES AND ELBOWS USED TO CONSTRUCT BARRICADES SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D 224 FOR P.V.C. 120 OR 1220 SDR-21, PRESSURE RATING 200 P.S.I. THE WYES, TEES AND ELBOWS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D 2466, TYPE II, GRADE I. ALL JOINTS SHALL BE SLIP-FIT AND MAY BE LIGHTLY CEMENTED. THE BARRICADE RAILS SHALL BE FABRICATED FROM 0.025" ANODIZED ALUMINUM AND SHALL HAVE REFLECTORIZED ALTERNATING ORANGE AND WHITE STRIPS (SLOPING DOWNWARD AT AN ANGLE OF 45 DEGREES IN THE DIRECTION TRAFFIC IS TO PASS).

MAINTENANCE

BARRICADES SHALL BE MAINTAINED IN CLEAN CONDITION SATISFACTORY TO THE ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO APPROACHING TRAFFIC AT ALL TIMES. DAMAGED, DEFACED, OR DIRTY BARRICADES SHALL BE REPAIRED, CLEANED OR REPLACED AS ORDERED BY THE ENGINEER. THE P.V.C. PIPE AND FITTINGS SHALL BE WHITE IN COLOR. AT LEAST TWO (2) HOLES SHALL BE DRILLED (3/8") IN EACH SECTION OF PIPE AND FITTINGS IF THE ASSEMBLY IS NOT CEMENTED.

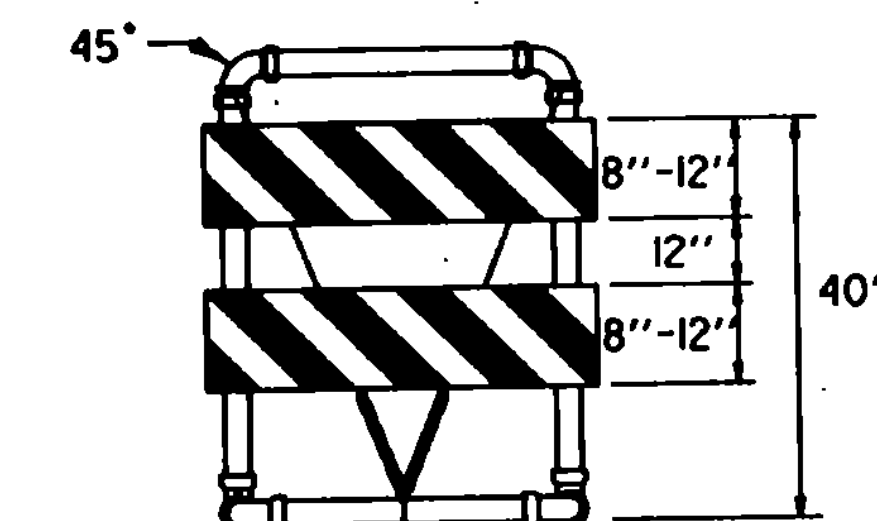
BARRICADES SHALL BE STABILIZED WITH SAND BAGS OF MINIMUM WEIGHT WHICH WILL NOT CONSTITUTE A HAZARD IF THE BARRICADE IS HIT. THESE SHALL BE PLACED ONLY ON THE FRONT AND REAR PIPES OF THE BASE FRAME OF THE BARRICADE. SAND BAG STABILIZERS SHALL BE SO PLACED AS NOT TO BE A HAZARD TO VEHICLES PASSING ON EITHER SIDE. IF BARRICADE REPLACEMENT COSTS CAN BE CONSIDERED NEGLIGIBLE, GLUED JOINTS MAY PROVIDE ADDITIONAL STABILITY TO THE INSTALLATION.

TYPE I BARRICADES SHALL UTILIZE ONE HORIZONTAL RAIL.

TYPE II BARRICADES SHALL CONSIST OF AN ADDITIONAL HORIZONTAL RAIL MOUNTED BELOW THE OTHER.

TYPE III BARRICADES (MODIFIED) SHALL CONSIST OF THE BREAKAWAY 3" PVC DESIGN SHOWN ON THIS SHEET WITH THE TWO RAIL LAYOUT DETAILED BELOW.

SEE STD E-107 FOR ADDITIONAL INFORMATION.



TYPE III (MODIFIED) BARRICADE
(STRIPING DOWN WHERE TRAFFIC PASSES ON RIGHT).

SEE STANDARD E-107 FOR RAIL DETAILS.
RAILS ATTACHED WITH 1" NO. 14 PAN HEAD METAL SCREWS.

REVISIONS AND CORRECTIONS

APPROVED

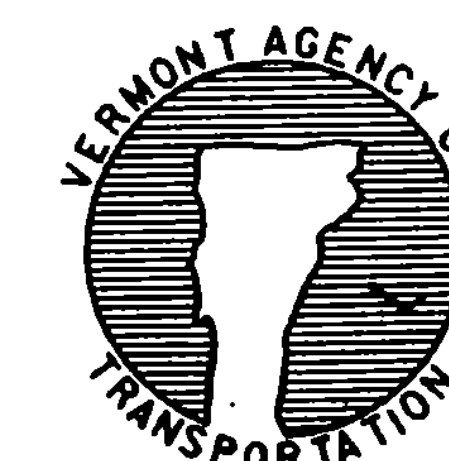
SEPT. 10, 1987
DATE

Daniel W. Kelley
CHIEF ENGINEER

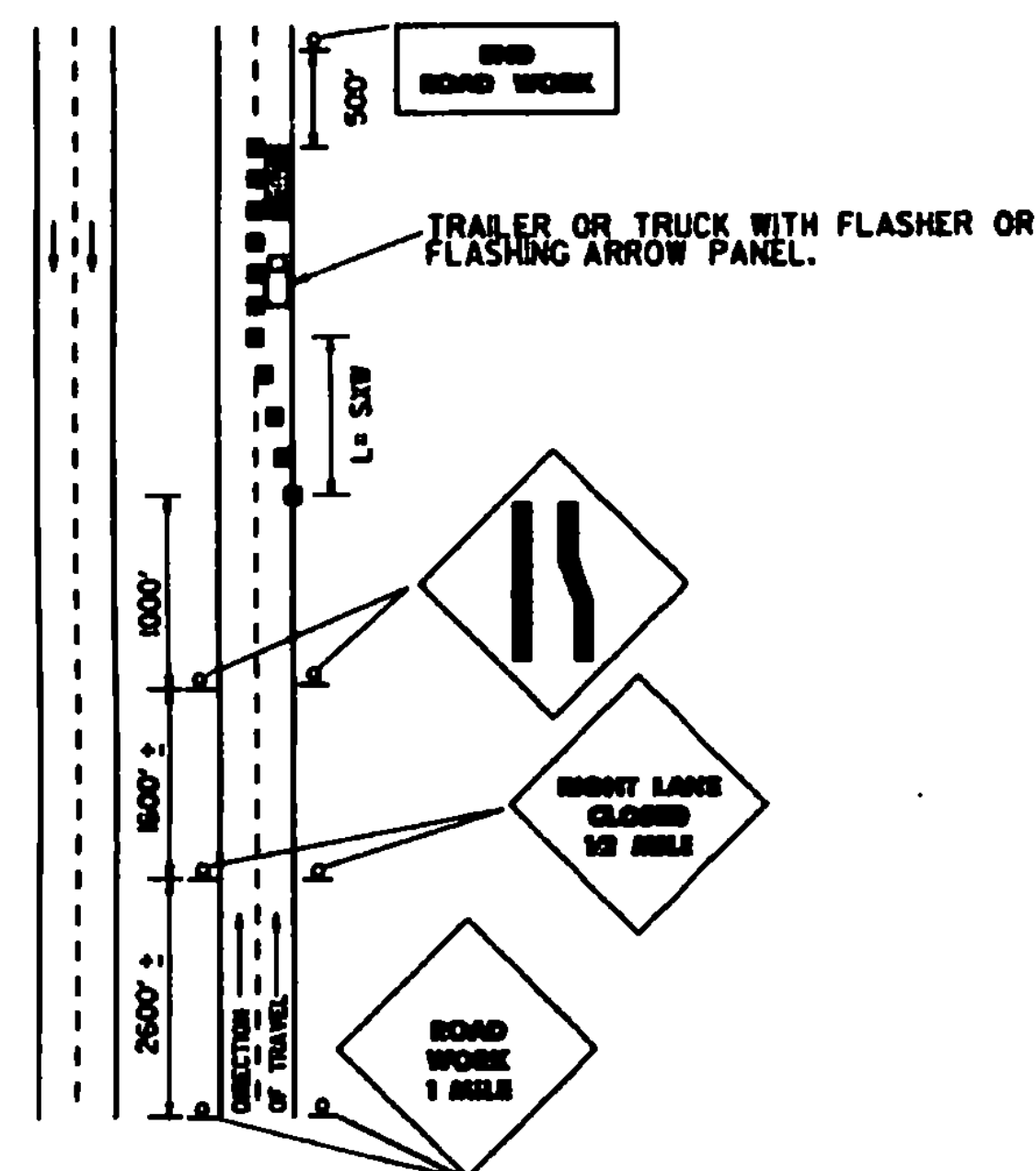
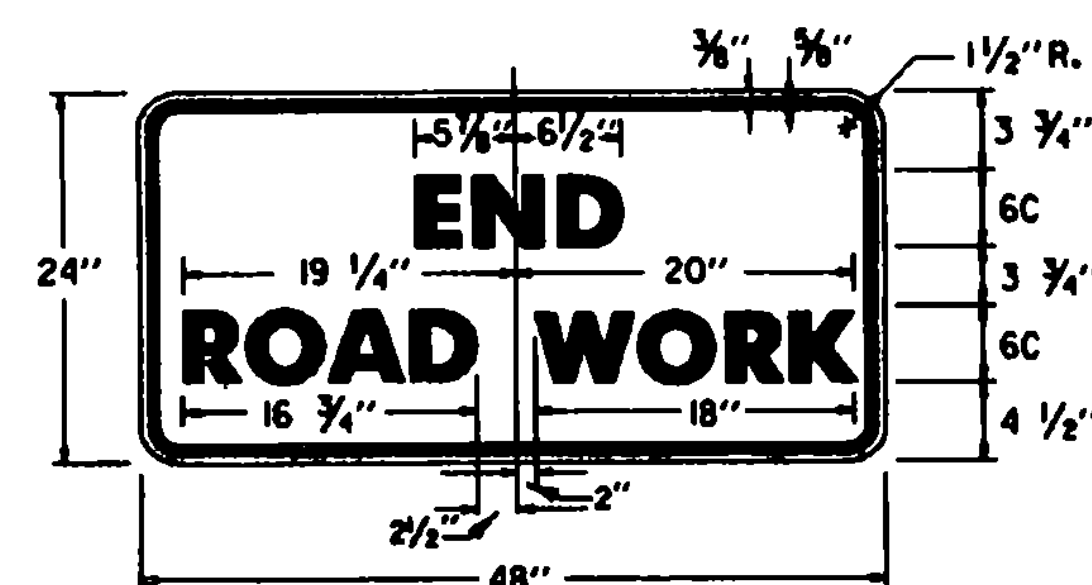
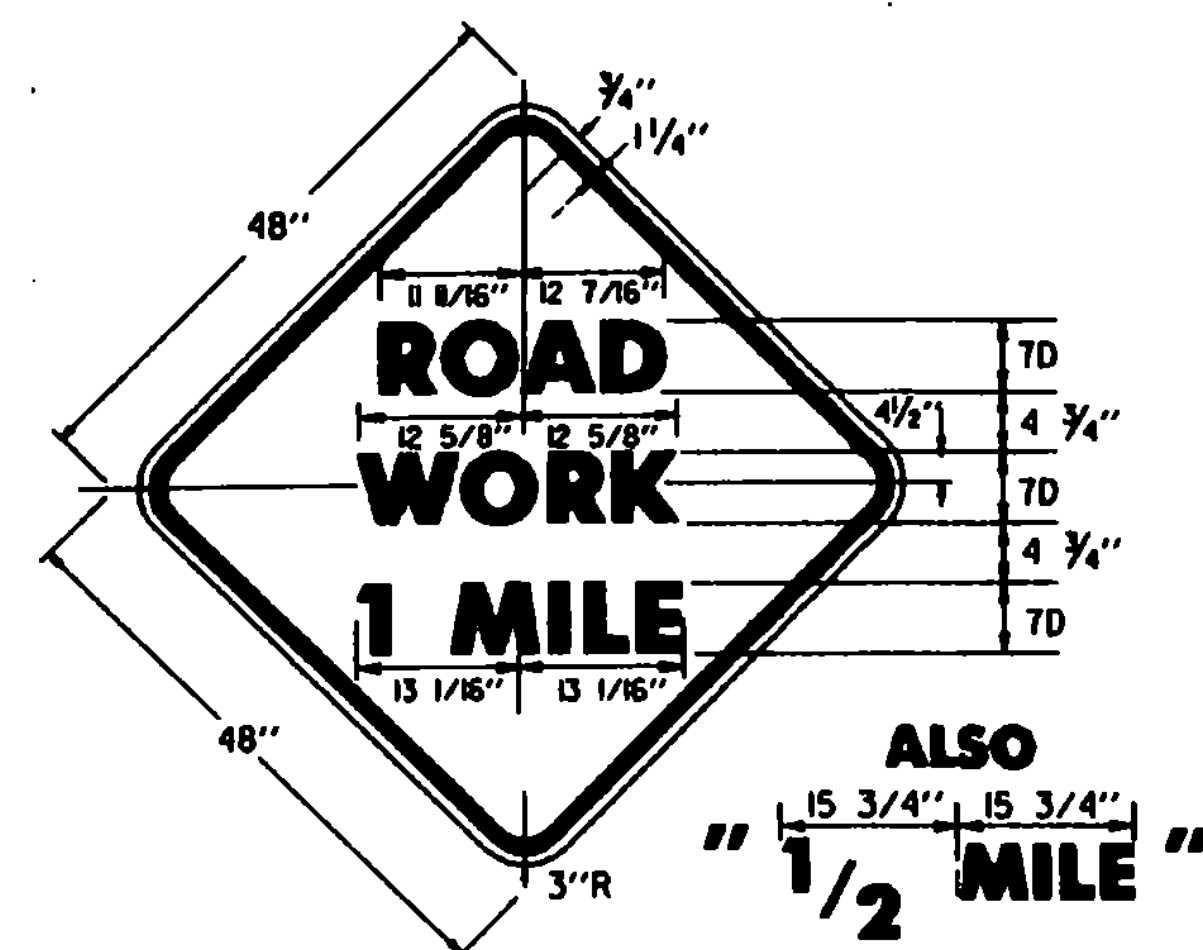
Arthur J. Ryan
DIRECTOR OF PLANNING
AND PRE-CONSTRUCTION

Gordon B. MacArthur
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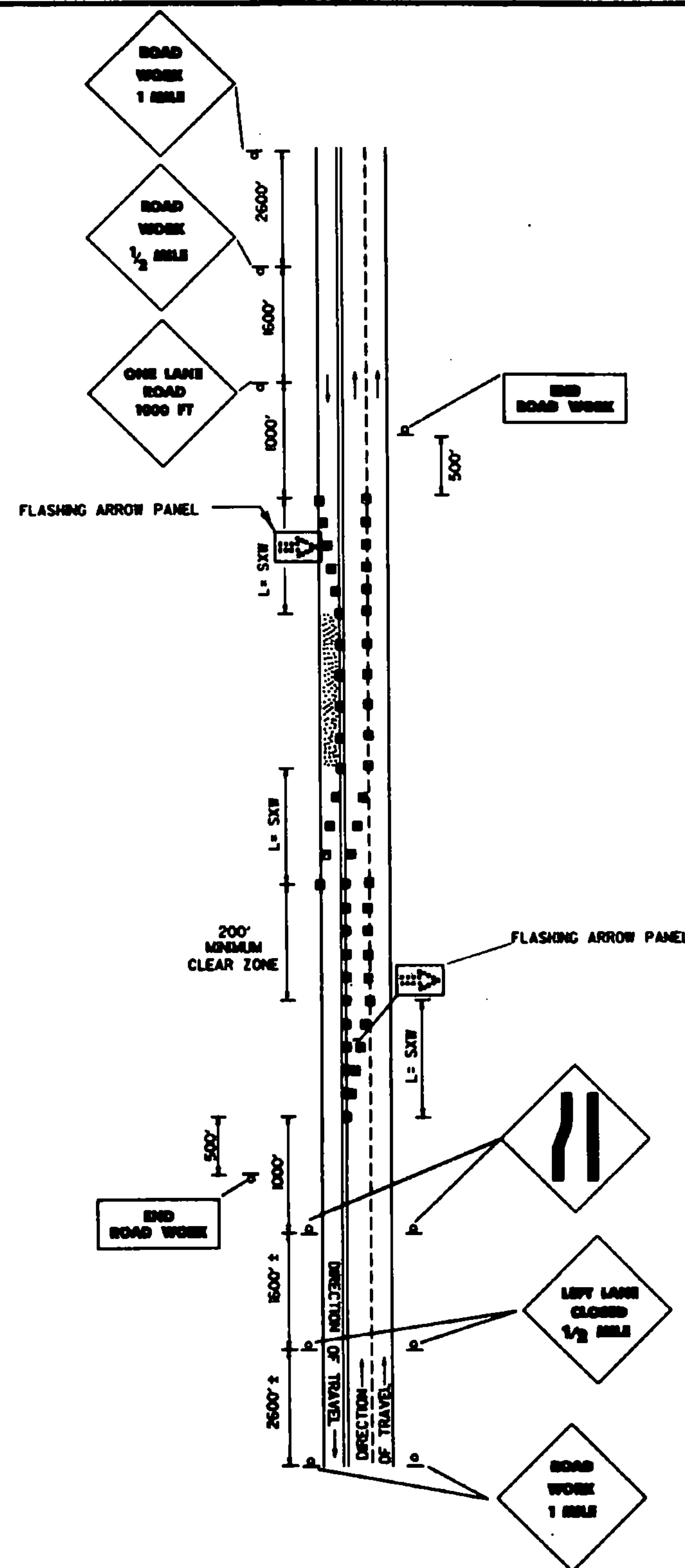
BREAKAWAY BARRICADE DETAILS



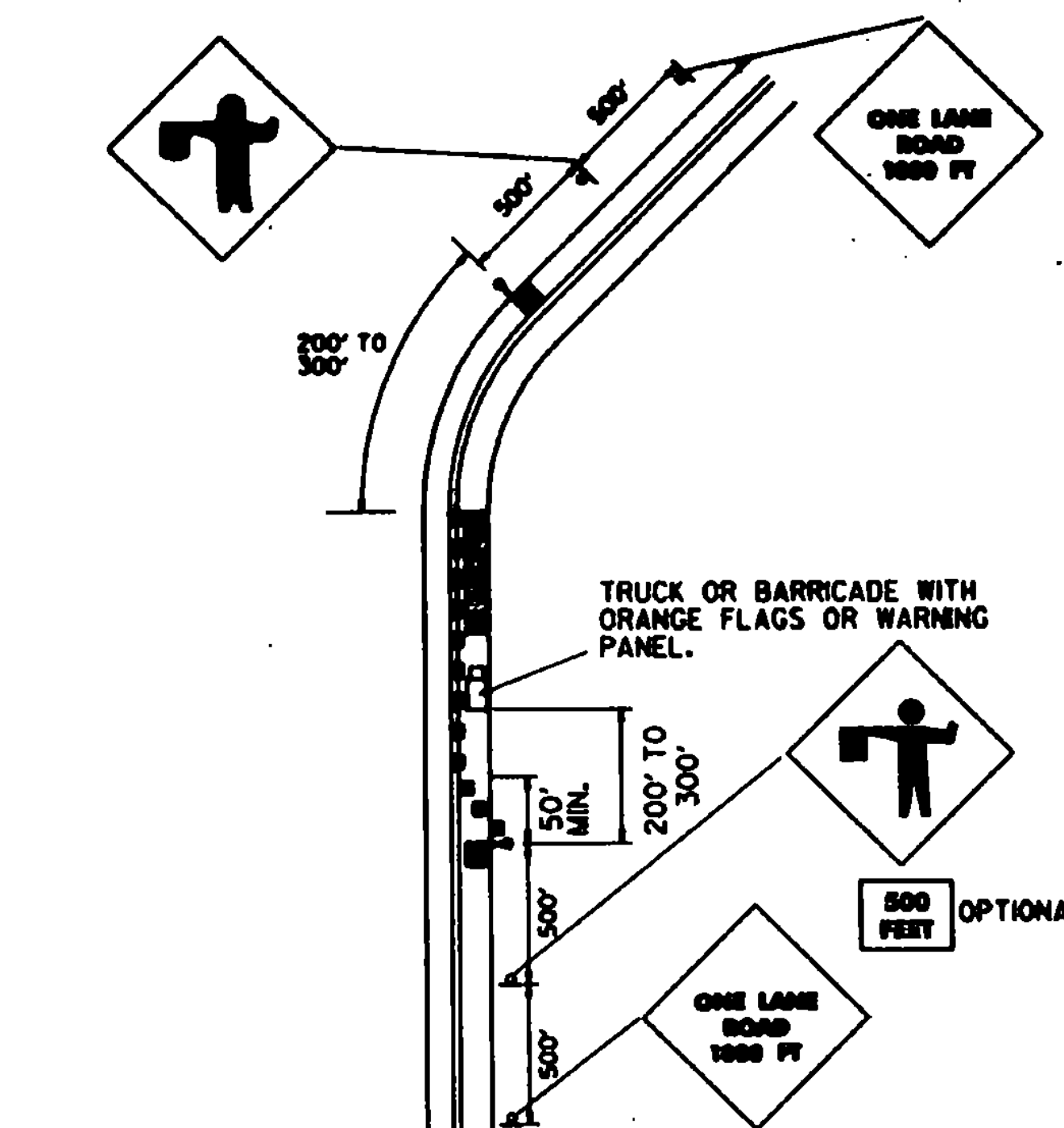
STANDARD
E-107a



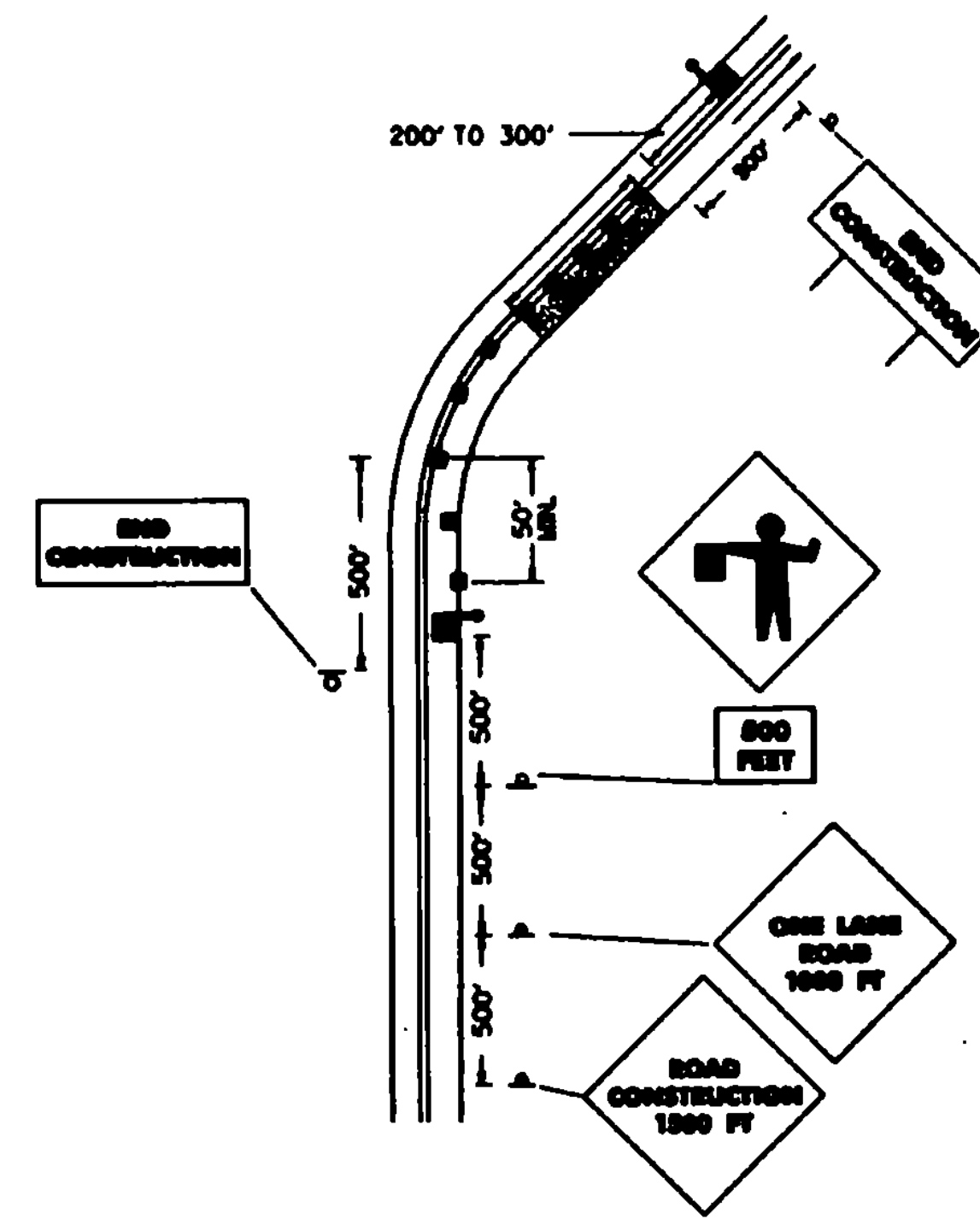
TYPICAL APPLICATION - DAYTIME MAINTENANCE OPERATIONS OF SHORT DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF ROADWAY IS CLOSED.



TYPICAL APPLICATION - DAYTIME MAINTENANCE OPERATION OF SHORT DURATION ON A 3 LANE ROADWAY WHERE CENTER LANE IS USED FOR OPPOSING TRAFFIC



TYPICAL APPLICATION - DAYTIME MAINTENANCE OPERATIONS OF SHORT DURATION ON A 2-LANE ROADWAY WHERE FLAGGING IS PROVIDED.



TYPICAL APPLICATIONS OF TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.

NOTES:

REFLECTORIZATION

ALL SIGNS USED DURING THE HOURS OF DARKNESS SHALL BE REFLECTORIZED. CONES USED FOR TRAFFIC CONTROL AT NIGHT SHALL HAVE A MINIMUM 6" WIDE WHITE REFLECTORIZED BAND PLACED A MAXIMUM OF 3" FROM THE TOP.

COLORS

THE WARNING SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT, BORDER, AND SYMBOLS ON AN ORANGE BACKGROUND. THE TEXT AND BORDERS MAY BE SCREENED, LETTERING FILM, OR HAND PAINTED. THE ORANGE SHALL CONFORM WITH THE STANDARD COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

TEXT DESIGN

LETTERS, DIGITS, SPACING, AND TEXT DIMENSIONS SHALL CONFORM WITH THE "STANDARD ALPHABETS FOR HIGHWAY SIGNS" AS REFERENCED IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

SPECIFICATIONS

WARNING SIGNS SHALL MEET THE STANDARD STATE SPECIFICATIONS FOR TRAFFIC SIGNS.

SIGN BASE MATERIAL

THE SIGN BASE MATERIAL USED FOR THE WARNING SIGNS ON THIS SHEET MAY BE OF ANY OF THE FOLLOWING, WITH MINIMUM THICKNESS AS NOTED:

FLAT SHEET ALUMINUM	0.025 INCHES
HIGH DENSITY OVERLAYED PLYWOOD	3/4 INCHES
GALVANIZED SHEET STEEL	12 GAGE

- SIGNS WITH "ROAD CONSTRUCTION 1500 FT" AND "END CONSTRUCTION" TEXT SHALL BE USED WHEN THE WORK IS NOT COMPLETE AND A HAZARD REMAINS OVERNIGHT.
- FLAGPERSON SHALL USE THE SIGN PADDLE DETAIL ON STANDARD SHEET E-101.
- ALL SIGNS SHALL BE COVERED OR REMOVED AT THE END OF THE WORKING DAY UNLESS REQUIRED FOR THE PROTECTION AND SAFETY OF THE TRAVELING PUBLIC.
- INSTALLATION: SIGNS AND BARRICADES SHALL BE IN PLACE PRIOR TO THE START OF THE MAINTENANCE OPERATION TO WHICH THEY APPLY AND SHALL BE REMOVED PROMPTLY WHEN THE NEED NO LONGER EXISTS. EACH SIGN SHALL BE ERECTED IN A NEAT AND WORKMANLIKE MANNER ON WOOD OR METAL POSTS SET SECURELY IN THE GROUND, OR ON PORTABLE SUPPORTS FOR TEMPORARY USE, OR ON BARRICADES WHEN APPROPRIATE. AS A GENERAL RULE, ROADSIDE SIGNS SHALL BE 5 FEET ABOVE ROAD LEVEL WITH THE NEAREST EDGE AT LEAST 6 FEET OUTSIDE THE OUTER EDGE OF THE SHOULDER POINT. THE INSTALLATION OF SIGNS AND BARRICADES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
- ALTHOUGH LISTED AS A MAINTENANCE OPERATION STANDARD SIGN SHEET, THE APPROACH SIGNS SHOWN SHALL BE USED BY CONTRACTORS WHEN WORKING WITHIN OR OUTSIDE PROJECT LIMITS.
- ALL DISTANCES ARE DESIRABLE SPECIFICATIONS. FIELD CONDITION SHALL CONTROL THE ACTUAL PLACEMENT.
- SIGN DETAILS NOT SHOWN ON THIS SHEET CAN BE FOUND ON STANDARD SHEETS E-100, E-101, AND E-102.
- TAPER FORMULA

$$L = \frac{WS^2}{60}$$
 FOR SPEEDS OF 45 OR MORE.

$$L = \frac{WS^2}{60}$$
 FOR SPEEDS OF 40 OR LESS.
 WHERE:
 L=MINIMUM LENGTH OF TAPER.
 S=NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85 PERCENTILE SPEED.
 W=WIDTH OF OFFSET.
- THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT IN M.P.H..
- IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGPERSON MAY BE USED.
- CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.

KEY:

- FLAGPERSON
- CHANNELIZING DEVICES (CONES OR DRUMS)
- FLASHING ARROW PANEL
- WORK AREA

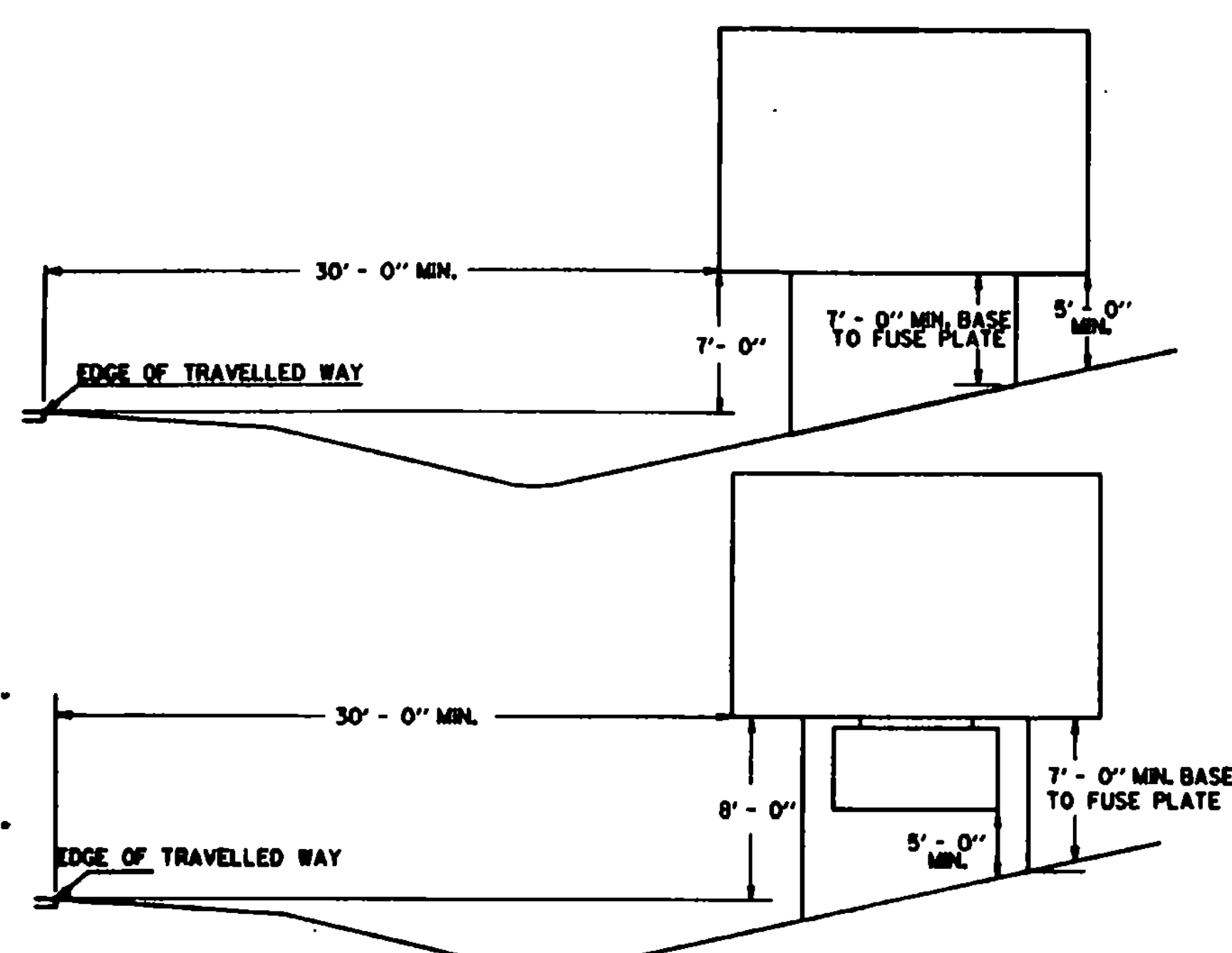
REVISIONS AND CORRECTIONS
MARCH 1, 1988 - FHWA REVIEW COMMENTS

APPROVED
SEPT. 10, 1987
DATE
David W. Kelley
CHIEF ENGINEER
Arthur J. Kelly
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Gordon B. MacArthur
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MAJOR MAINTENANCE OPERATION LANE CLOSURE



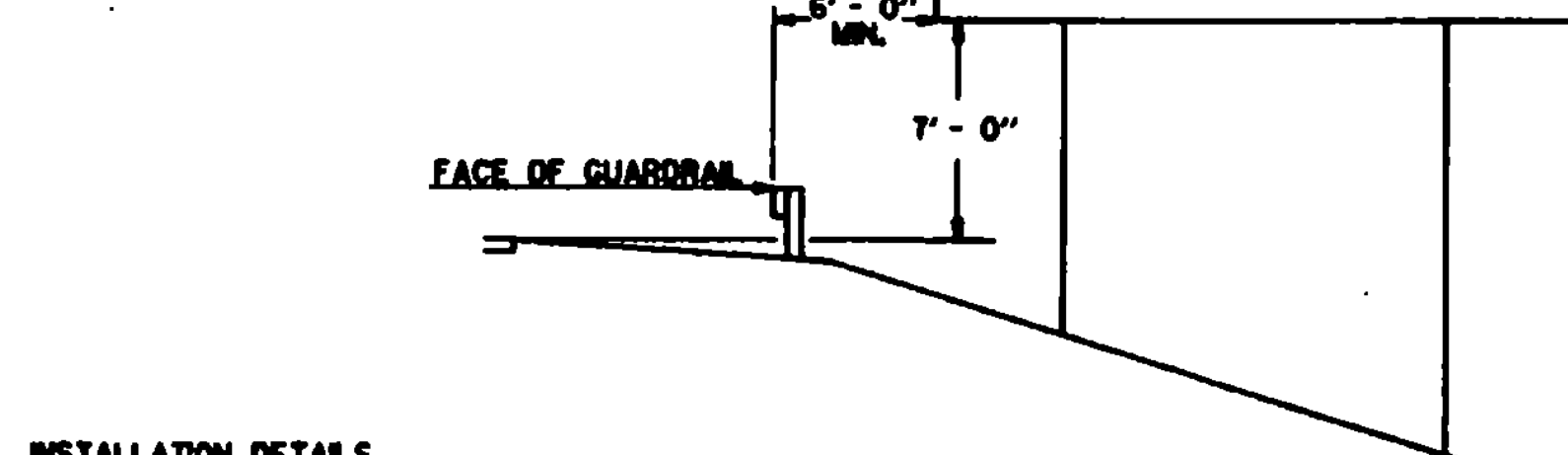
STANDARD
E-110



"GUARDRAIL DEFLECTION CHART"

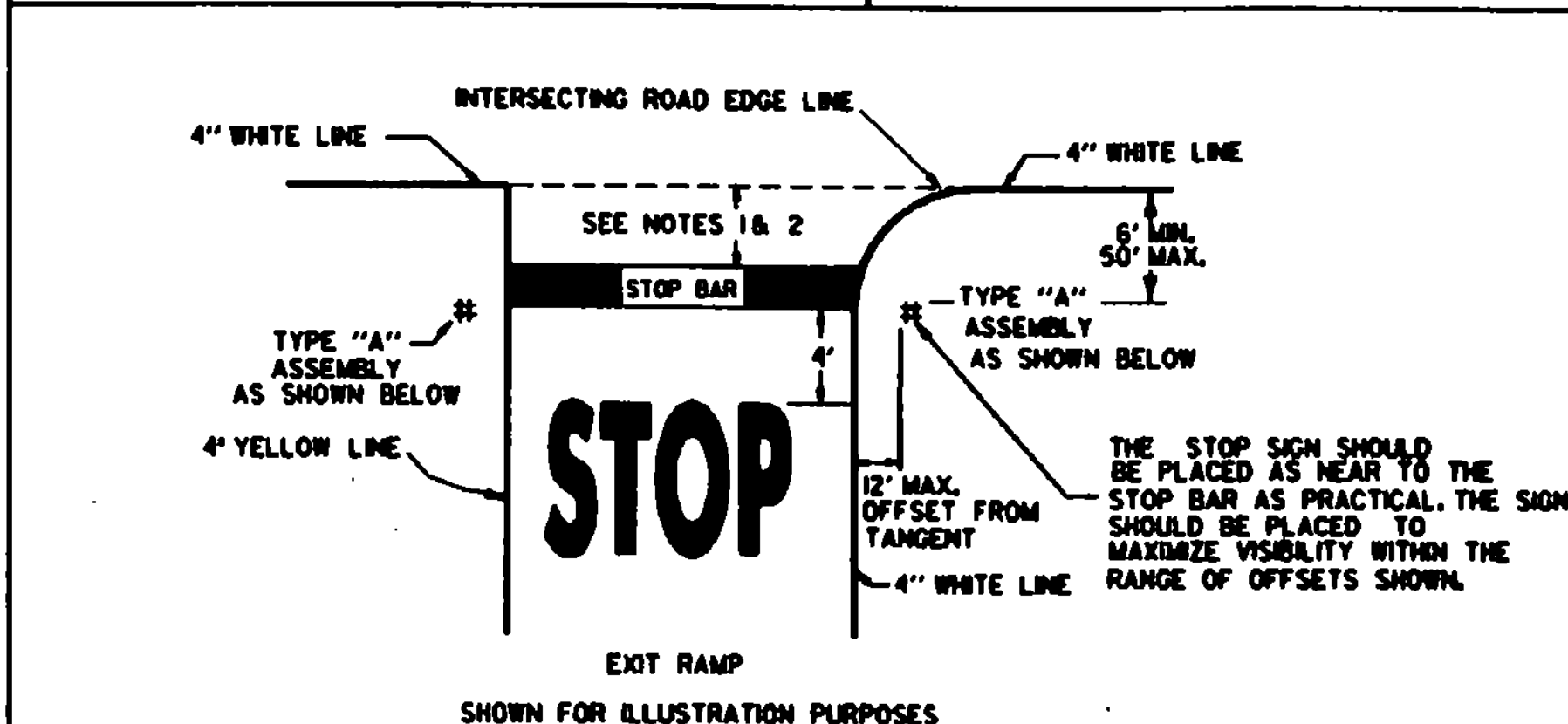
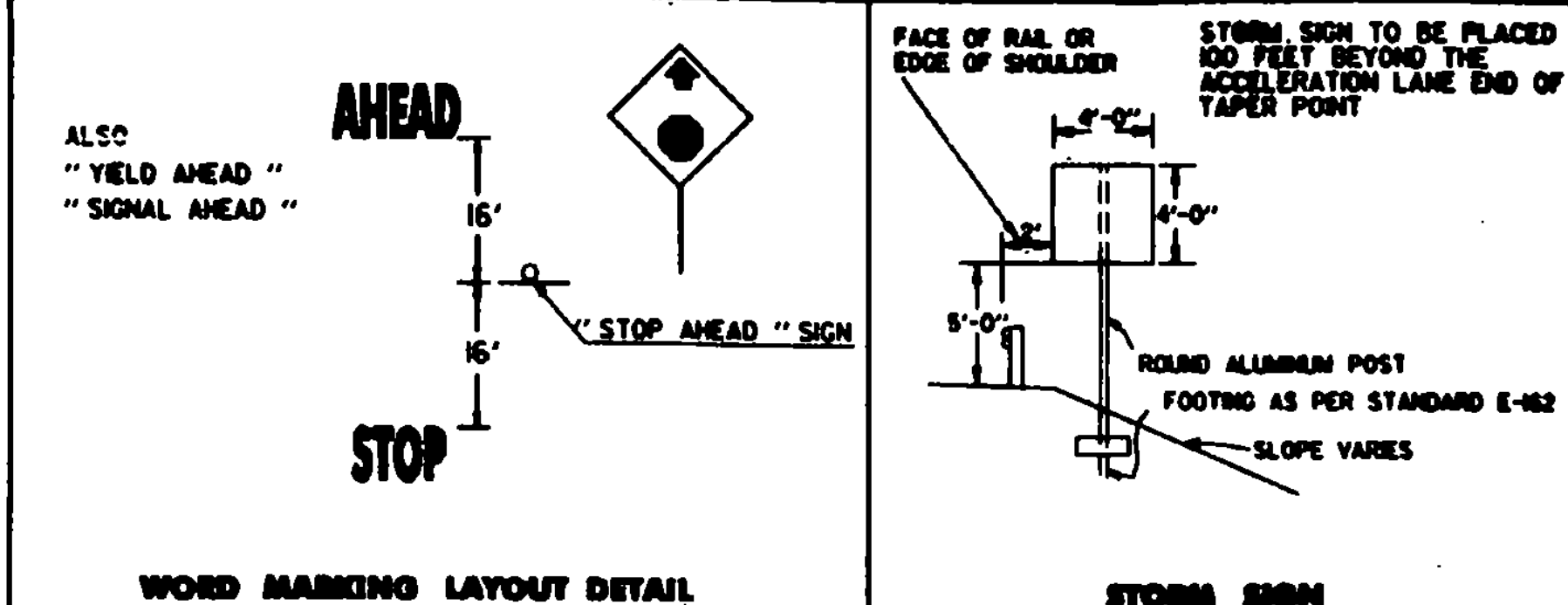
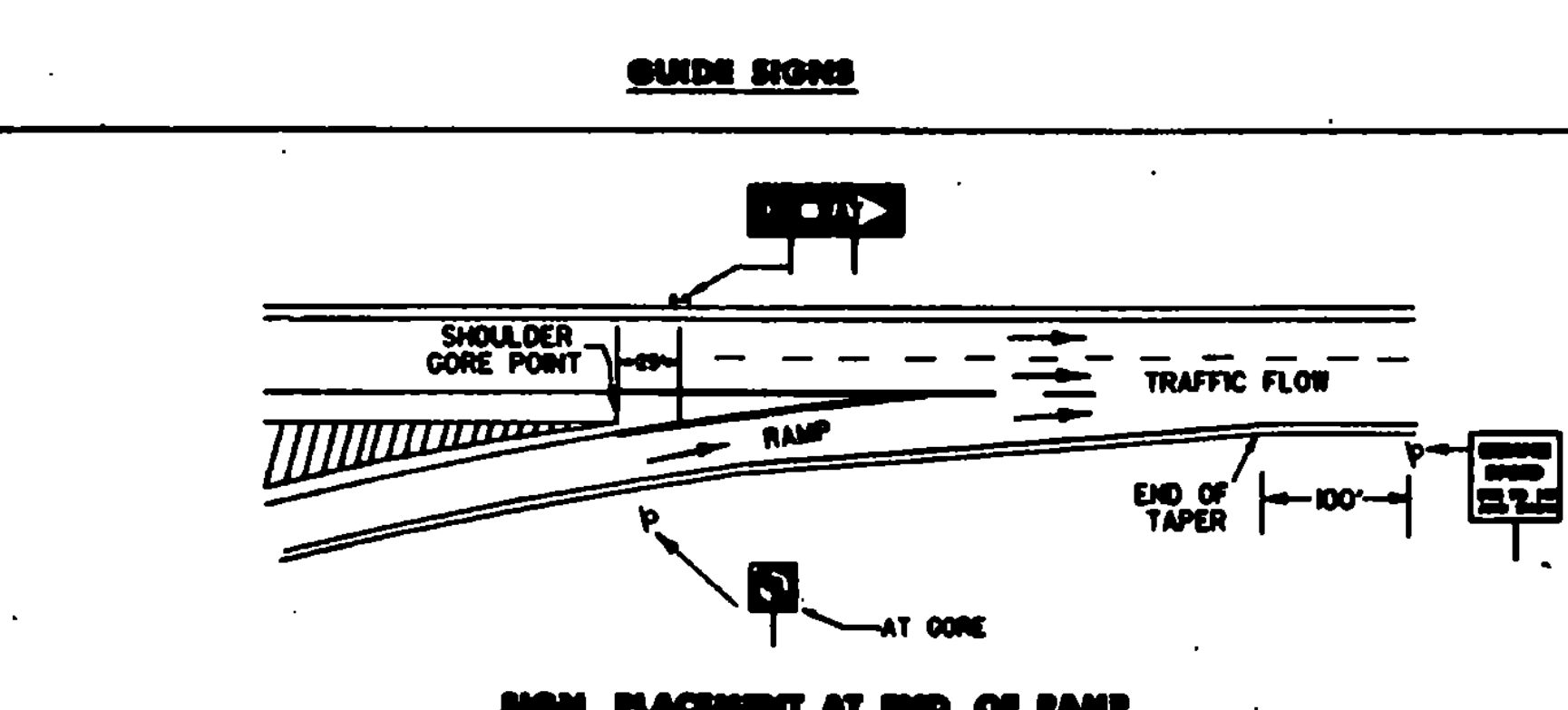
TYPE	DEFLECTION
Three Cable w/Ly. Steel Posts	12 ft.
Three Cable w/Hvy. Steel Posts	12 ft.
W-Beam w/Ly. Steel Posts	8 ft.
W-Beam w/Hvy. Steel Posts	5 ft.
W-Beam w/Wood Posts	4 ft.
Two-Rail w/Hvy. Steel Posts	4 ft.
Two-Rail w/Hvy. Steel Posts	2 ft.

WHEN PLACED BEHIND GUARDRAIL AND BEYOND THE DEFLECTION DISTANCE FOR THAT PARTICULAR RAIL, SIGN POSTS DO NOT HAVE TO BE PLACED ON YIELDING SUPPORTS. SIGN POSTS SHALL BE PLACED ON YIELDING SUPPORTS WHEN THEY CAN BE STRUCK BY AN ENRANT VEHICLE LEAVING THE ROADWAY AT AN ENCROACHMENT ANGLE OF APPROXIMATELY 15 DEGREES OR LESS.



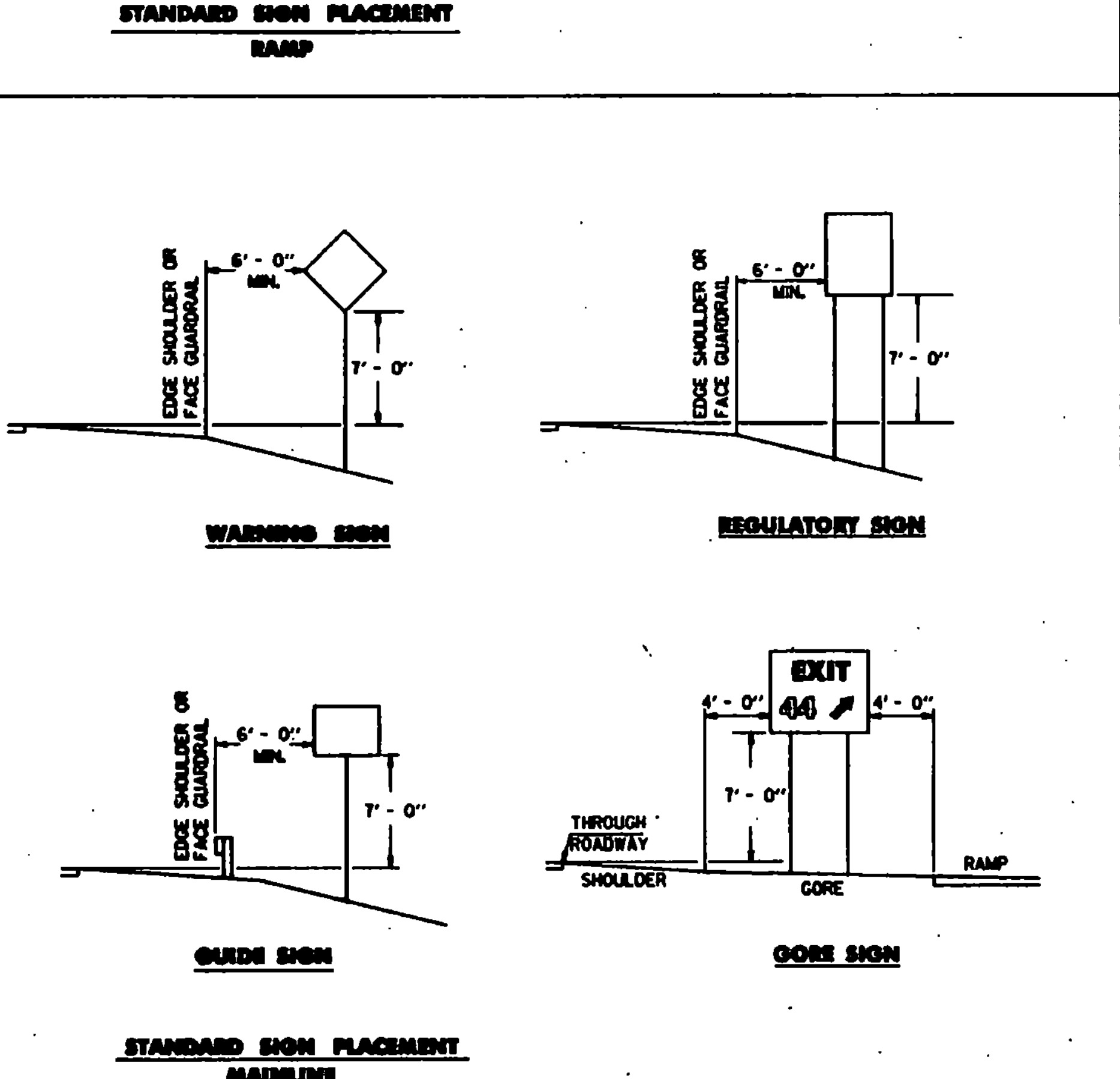
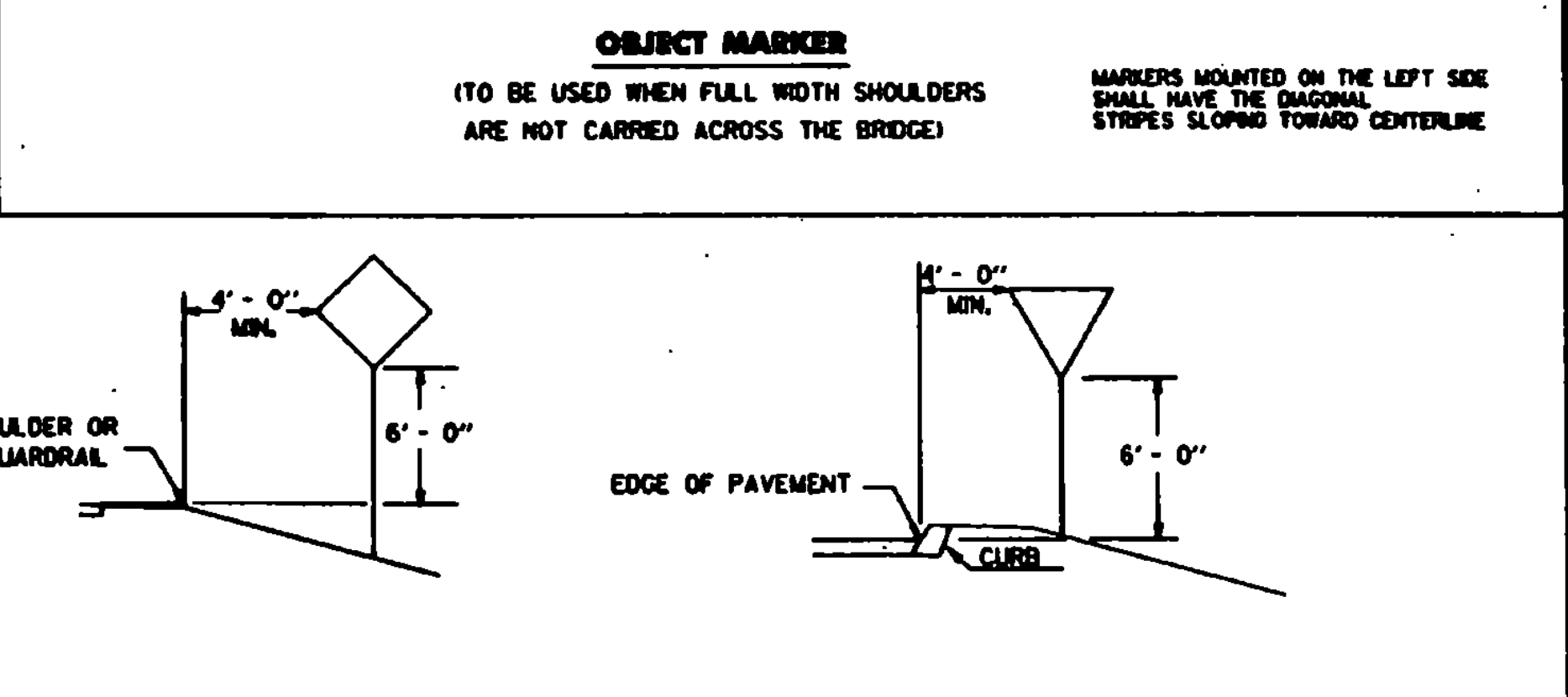
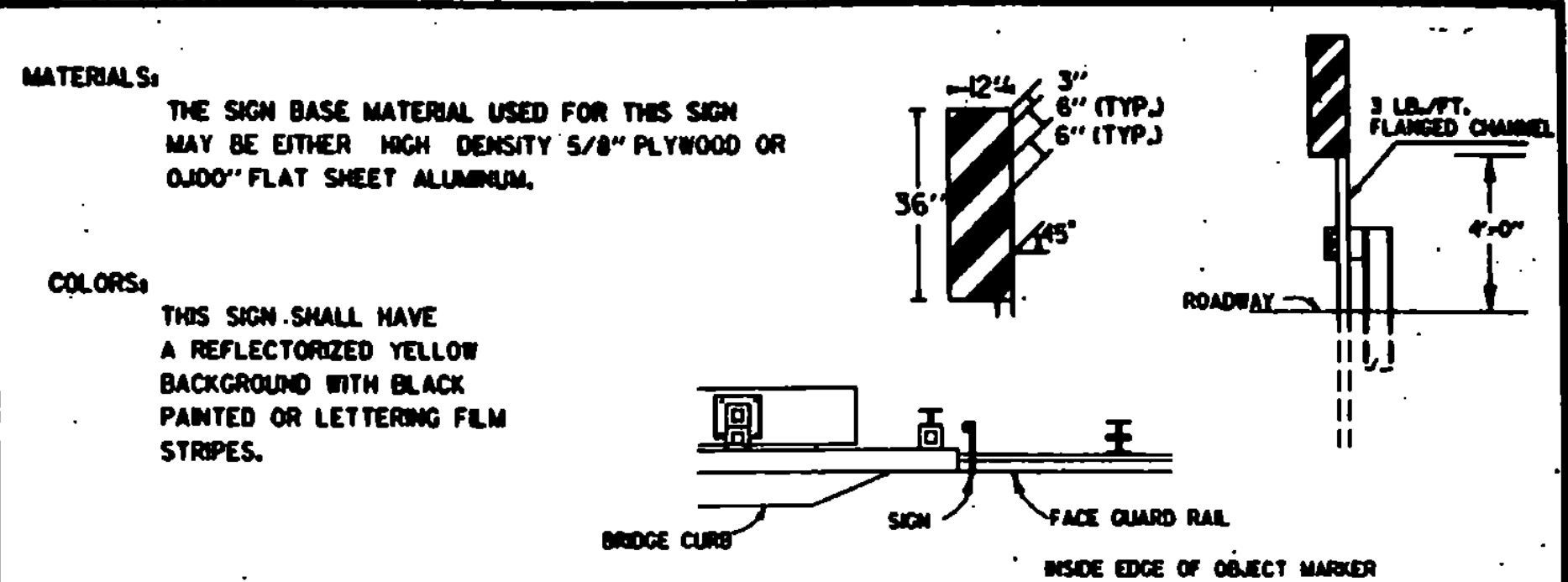
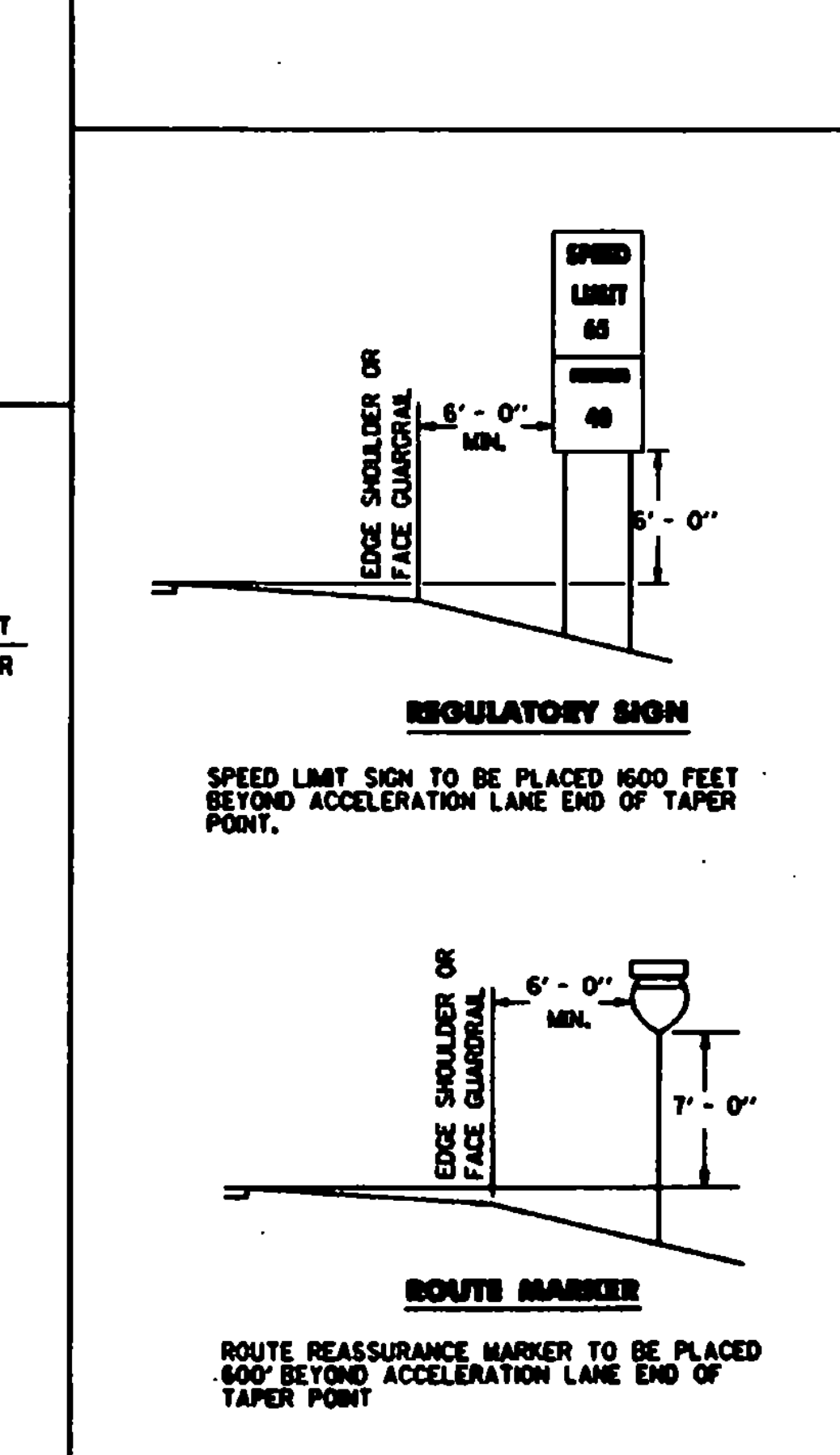
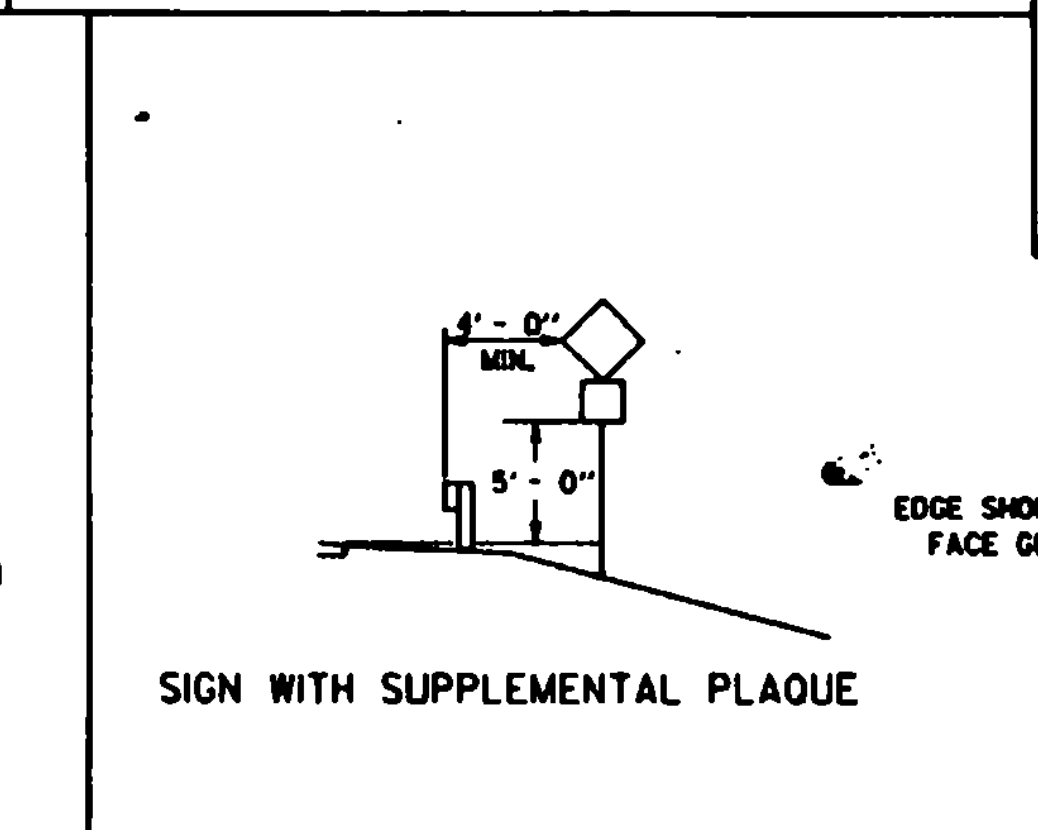
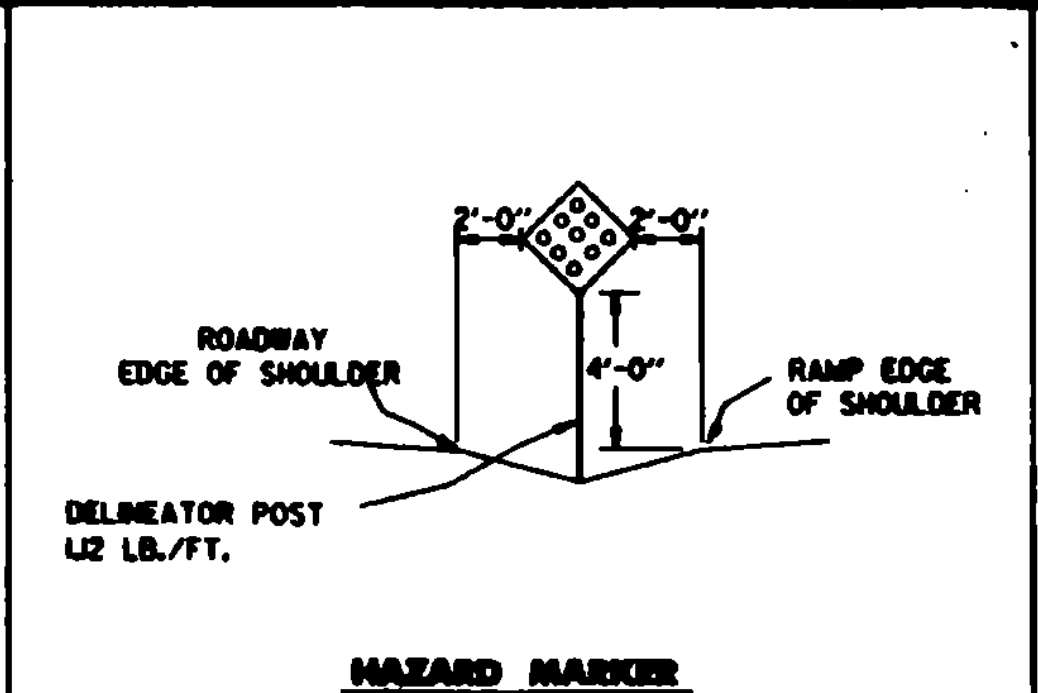
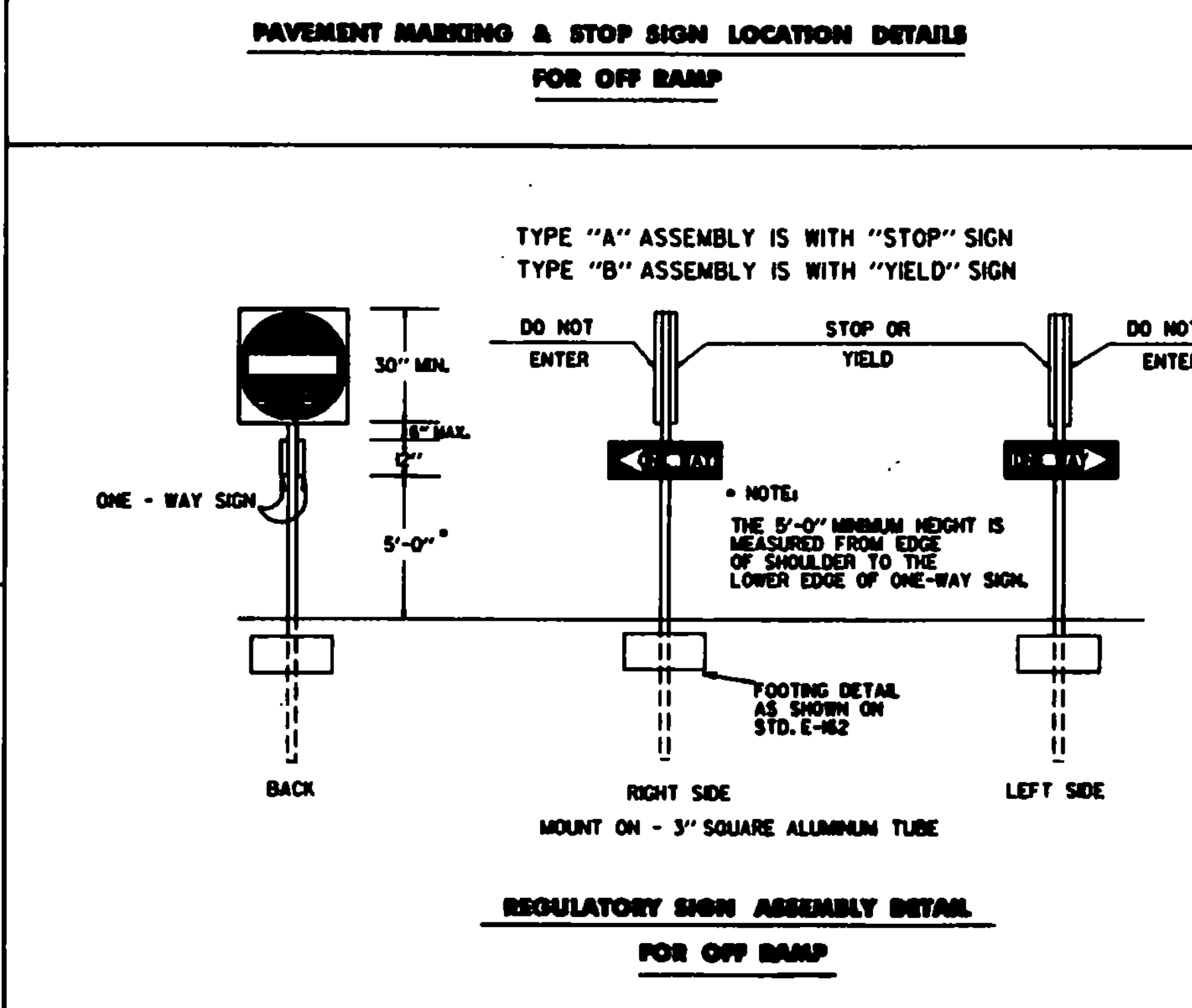
INSTALLATION DETAILS

NORMALLY SIGNS SHOULD BE MOUNTED AT 93° TO THE DIRECTION OF TRAFFIC, ON CURVED ALIGNMENT THE ANGLE OF PLACEMENT SHOULD BE DETERMINED BY THE PATH OF APPROACHING TRAFFIC RATHER THAN BY THE ROADSIDE EDGE AT THE POINT WHERE THE SIGN IS LOCATED. WHEN INSTALLING OVERHEAD SIGNS, CANT THE SIGN FROM THE TOP TOWARD APPROACHING TRAFFIC AT A THREE DEGREE TILT ANGLE.



NOTES:

1. THE STOP BAR SHOULD BE PLACED AT THE DESIRED STOPPING POINT. IN NO CASE MORE THAN 30' OR LESS THAN 4' FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY.
2. AT A SIGNALIZED INTERSECTION, DELETE WORDING "STOP" AND THE STOP SIGN AND PLACE STOP BAR A MINIMUM OF 40' FROM THE NEAREST SIGNAL HEAD FOR THE APPROACH.
3. EXCLUDE STOP BAR WHEN ONLY YIELD SITUATION.

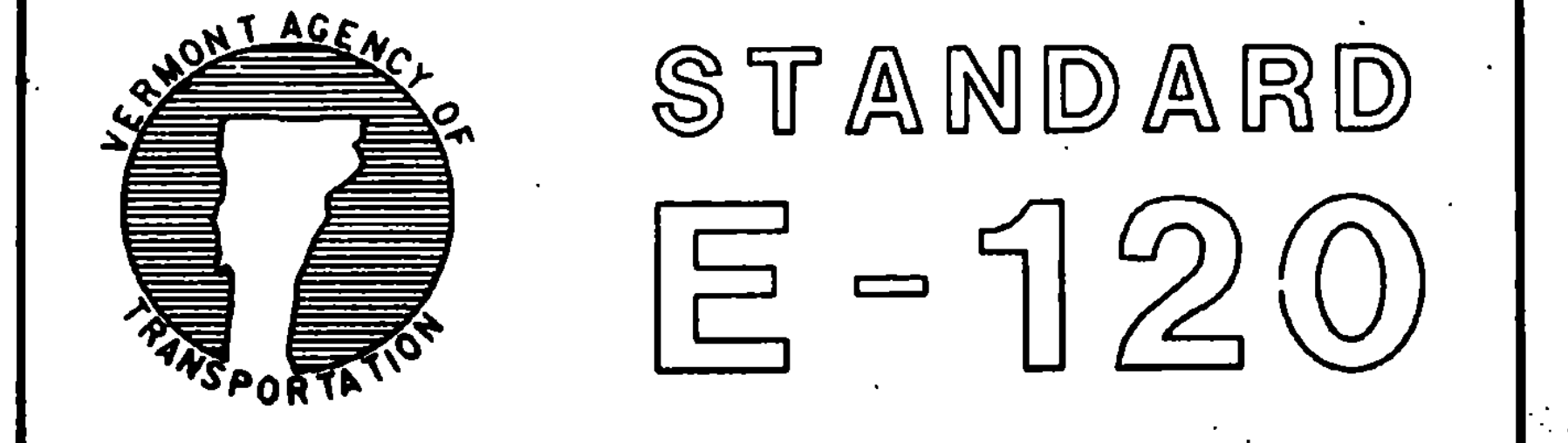


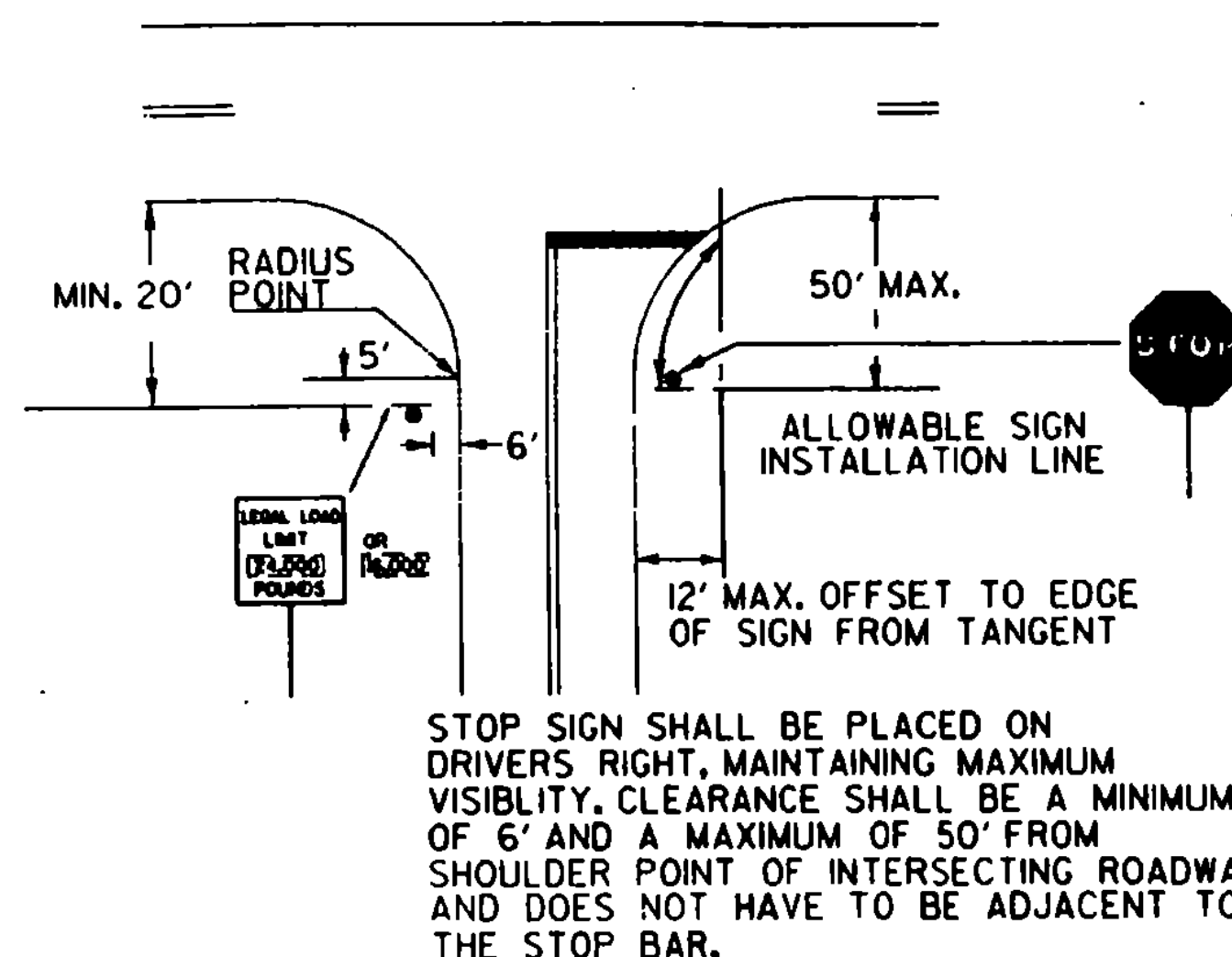
REVISIONS AND CORRECTIONS
JUNE 21, 1989 - FHWA - CHANGE TO 7' FUSE PLATE CLEARANCE

APPROVED

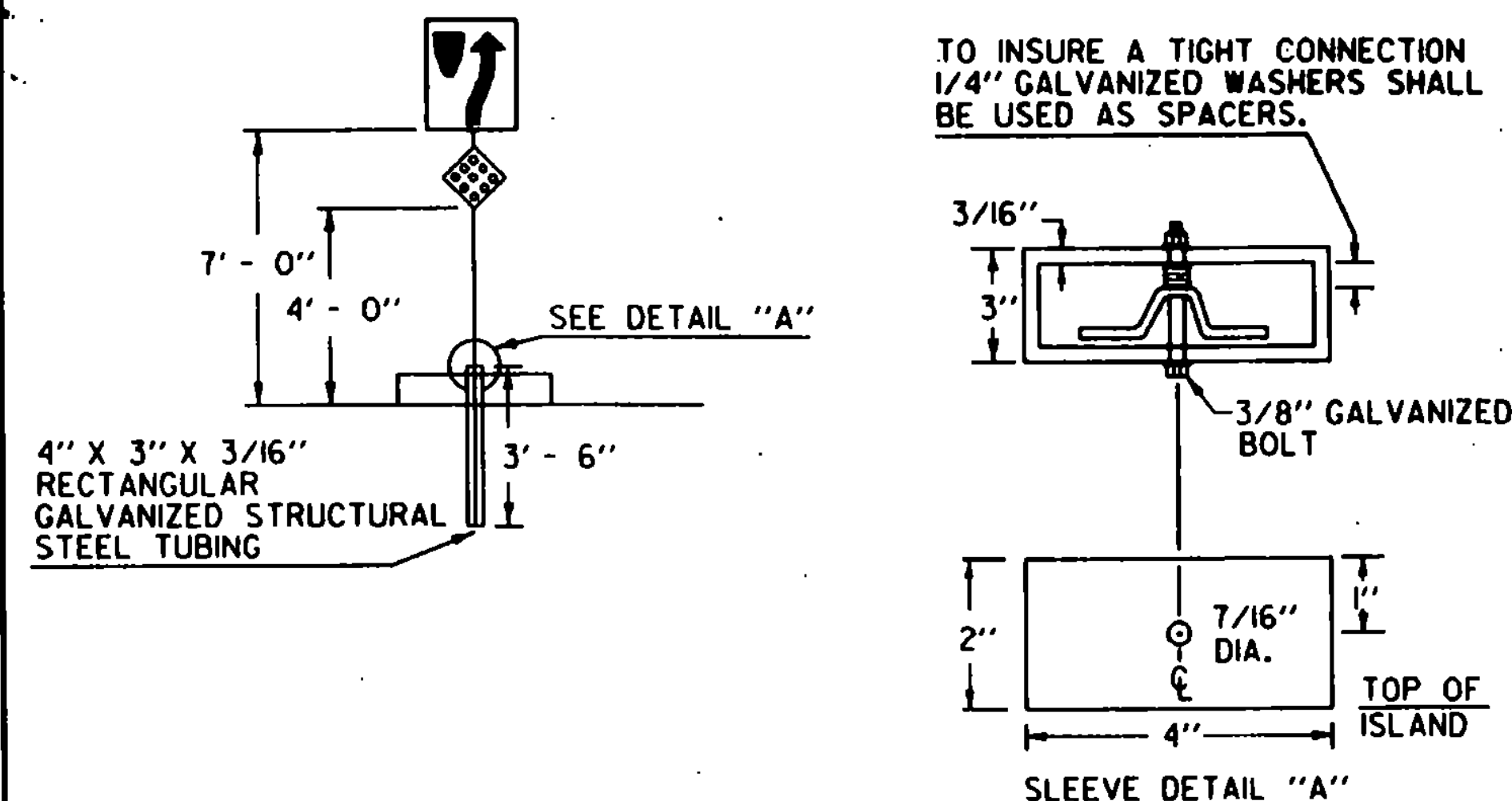
APRIL 1, 1988
DATE
Sandy B. Kelley
CHIEF ENGINEER
Arthur J. Brown
DIRECTOR OF PLANNING
AND PRECONSTRUCTION
Gordon B. MacArthur
TRAFFIC AND SAFETY ENGINEER

STANDARD SIGN PLACEMENT EXPRESSWAY AND FREEWAY



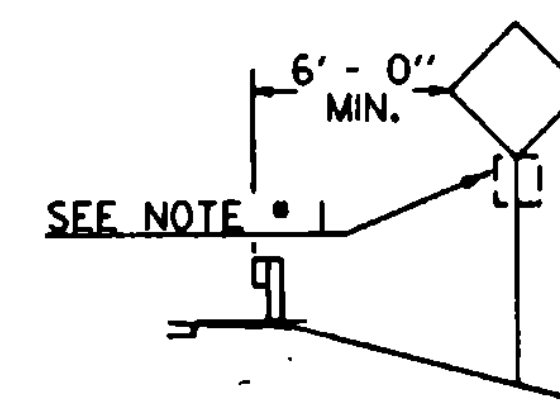
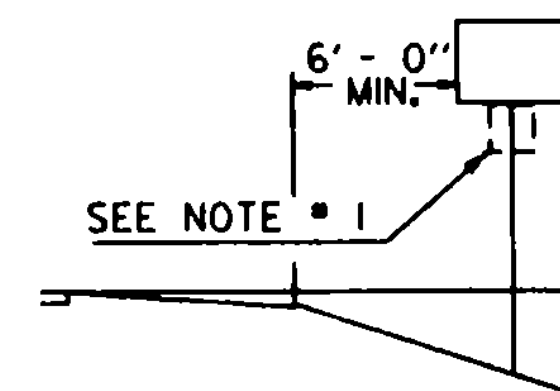
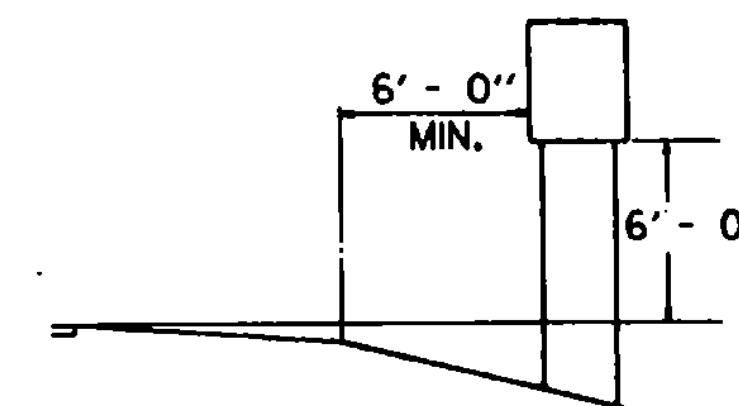


LEGAL LOAD LIMIT AND STOP SIGNS AT INTERSECTIONS

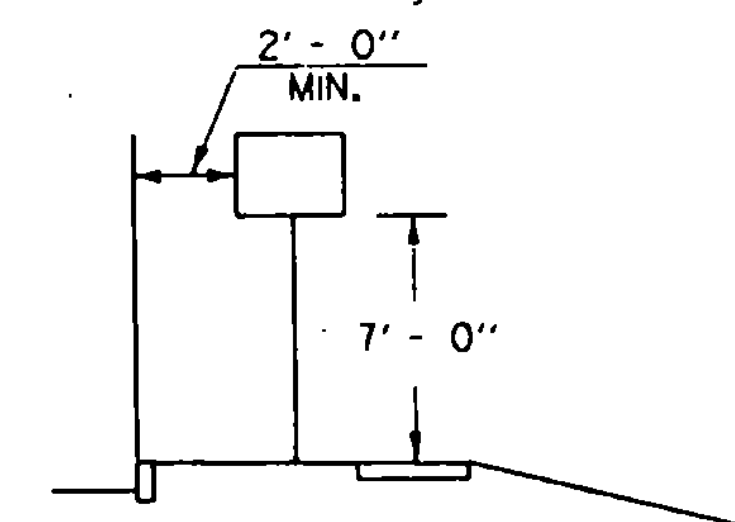
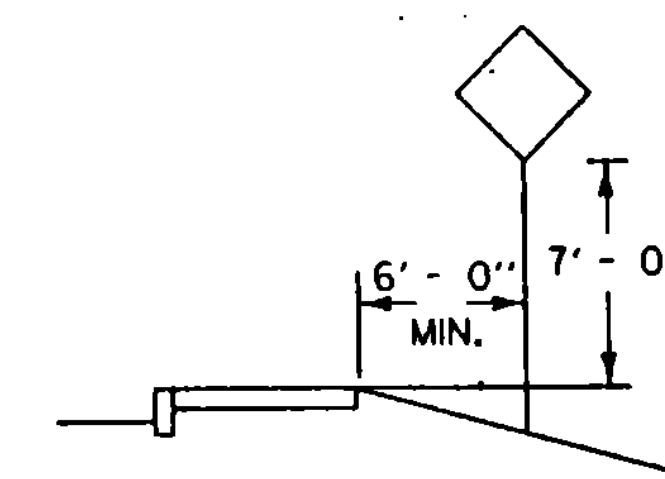


WARNING SIGNS ON ISLAND IN THE LINE OF TRAFFIC

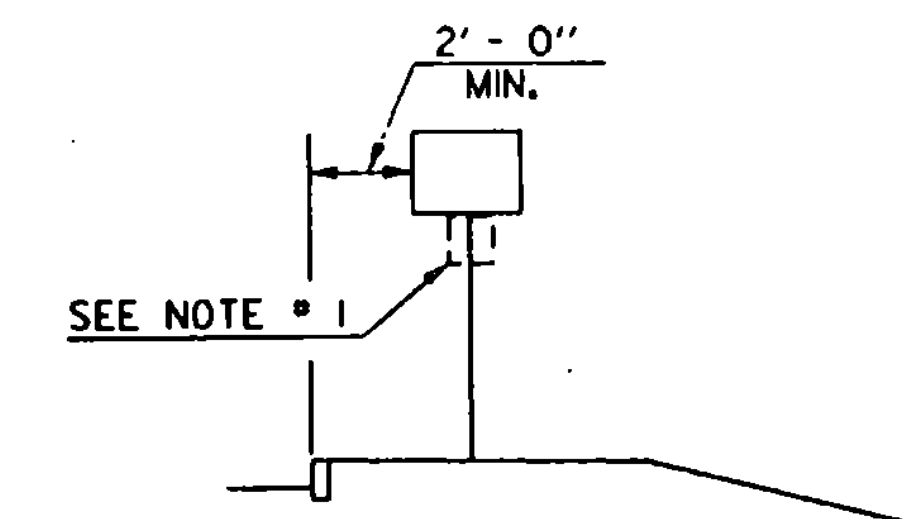
INCREASE VERTICAL CLEARANCE TO 7' IN AREAS OF FREQUENT ROADSIDE PARKING OR PEDESTRIAN ACTIVITY



RURAL



IF SUFFICIENT CLEARANCE IS NOT AVAILABLE BETWEEN CURB AND SIDEWALK MOUNT SIGN BEHIND SIDEWALK AS SHOWN AT TOP. CHECK FOR ADEQUATE R.O.W..



URBAN

$$\text{SIGN AREA (FT}^2\text{)} \times \text{H (FT)} = \text{SV (SELECTION VALUE)}$$

POST SELECTION CHART

POST REFERENCE: PROPER MOUNTING OF SIGNS ON APPROPRIATE SIZE POSTS IS COVERED IN DETAIL ON STANDARD E - 160 FOR FLANGED CHANNEL POSTS AND STANDARD E - 162 FOR TUBULAR ALUMINUM POSTS. FOR CONVENIENCE POST SELECTION TABLES ARE ALSO SHOWN AT LEFT.

WHEN SV VALUES EXCEED THOSE SHOWN ON THE TABLES THE TOTAL SV MAY BE DIVIDED BY TWO AND THAT VALUE USED TO SELECT AN APPROPRIATE SIZE AND MATERIAL FOR A TWO POST INSTALLATION. HOWEVER, TWO POST ASSEMBLIES WHICH REQUIRE UNUSUALLY LONG POSTS, EITHER BECAUSE OF STEEP SLOPES OR TOTAL HEIGHT OF THE SIGN OR SIGNS DISPLAYED, SHOULD ALWAYS BE MOUNTED ON ALUMINUM TUBES TO TAKE ADVANTAGE OF THE GREATER EMBEDMENT DEPTH.

POST SIZE	SV
2 LB./FT. (ONE POST INSTALLATION)	32
2 LB./FT. (TWO POST INSTALLATION)	62
2.5 LB./FT.	77
3 LB./FT.	107

SINGLE 2 LB. AND 2.5 LB. PER FOOT POSTS SHALL ONLY BE USED IN URBAN AREAS.

FLANGED CHANNEL STEEL SIGN POSTS

POST SIZE	SV (FT.)
3" DIA.	257
3" SQUARE TUBE	350
4" DIA.	477

• USE ON SINGLE POST INSTALLATIONS ONLY

TUBULAR ALUMINUM SIGN POSTS

NOTES:

1. IN BOTH RURAL AND URBAN LOCATIONS, IF A SECONDARY SIGN IS MOUNTED BELOW ANOTHER SIGN, THE MINIMUM CLEARANCE MAY BE REDUCED BY ONE FOOT.
2. IN RURAL AREAS WITH NO OR MINIMAL SHOULDER, THE LATERAL CLEARANCE TO THE EDGE OF A SIGN SHOULD BE A MINIMUM OF 12' FROM THE EDGE OF THE TRAVELED WAY.
3. ALSO SEE OTHER STANDARD SHEETS FOR MOUNTING CLEARANCE AND SPACING OF DESTINATION AND ROUTE MARKER ASSEMBLIES AND TOWN LINE SIGNS.

REVISIONS AND CORRECTIONS

APPROVED

JAN. 23, 1989
DATE

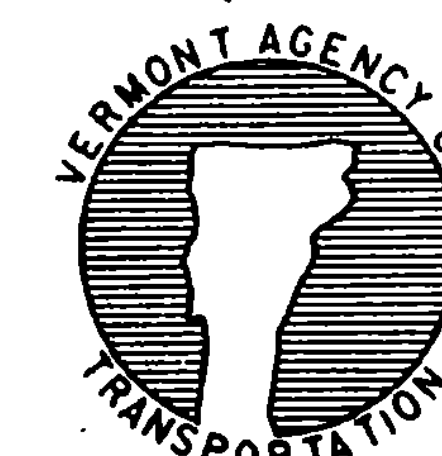
David R. Kelley
CHIEF ENGINEER

Arthur J. Lewis
DIRECTOR OF PLANNING
AND PRE-CONSTRUCTION

Stephen B. MacArthur
TRAFFIC AND SAFETY ENGINEER

APPROVED FOR THIS PROJECT
AND/OR DESIGN IMPLEMENTATION
FHWA FINAL APPROVAL PENDING.

STANDARD SIGN PLACEMENT CONVENTIONAL ROAD



**STANDARD
E-121**

DESIGN SAMPLES

1" RADIUS (TYP.)
VAR. 24" - 42"
URBAN

1" RADIUS (TYP.)
VAR. 24" - 42"
RURAL

MATERIALS
THE SIGN BASE MATERIALS USED FOR THE STREET SIGNS MAY BE EITHER OF THE FOLLOWING:
A - EXTRUDED ALUMINUM BLADES WITH REFLECTIVE SHEETING
B - FLAT ALUMINUM BLADES WITH REFLECTIVE SHEETING

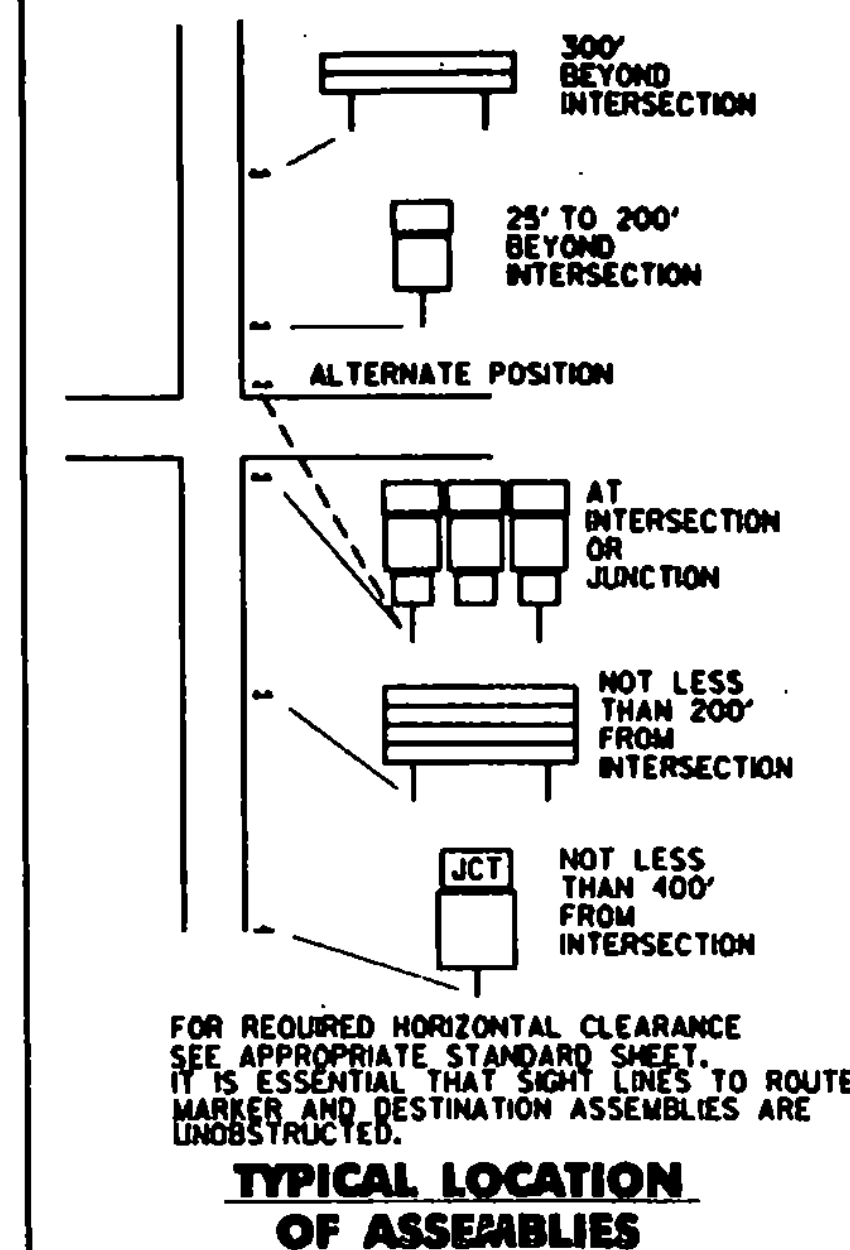
COLORS
THE SIGNS SHALL HAVE A REFLECTORIZED WHITE OR SILVER TEXT (STICK ON REFLECTIVE LETTERS) ON A REFLECTORIZED GREEN BACKGROUND. THE COLORS SHALL CONFORM WITH THOSE FOUND IN STANDARD COLOR TOLERANCE CHARTS AS APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

LETTERING
LETTERS AND DIGITS SHALL CONFORM WITH THE STANDARD ALPHABETS FOR HIGHWAY SIGNS PRINTED BY THE FEDERAL HIGHWAY ADMINISTRATION.

SPECIFICATIONS
THE SIGN SHALL MEET THE VERMONT STATE SPECIFICATIONS FOR "TRAFFIC SIGNS". THE MATERIAL FOR THE BLADES SHALL BE EITHER EXTRUDED ALUMINUM WITH A 0.25 INCH FLANGE THICKNESS AND A 0.090 INCH WEBB (MIN.) OR FLAT SHEET ALUMINUM WITH A MINIMUM THICKNESS OF 0.025 INCH. THE PREFERRED MOUNTING METHOD FOR STREET SIGNS IS POST TOP MOUNTING BRACKETS. HARDWARE FOR MOUNTING SIGNS TO POST SHALL BE SUBSIDIARY TO OTHER ITEMS. MOUNTING METHOD WILL BE AS SHOWN ON THE PLANS. MINIMUM VERTICAL CLEARANCE IS 8 FEET TO THE BOTTOM OF THE SIGN. FOR POST TOP MOUNTINGS, SIGNS SHALL HAVE TEXT ON BOTH SIDES.

SIZES ARE AS FOLLOWS
RURAL AREAS - USE A 9 INCH HIGH BLADE IN LENGTHS OF 24", 30", 36" OR 42".
USE SERIES "B" LETTERING (MINIMUM) WITH 6 INCH HIGH LETTERS FOR STREET NAME, 4 INCH OTHER.
URBAN AREAS - USE A 6 INCH HIGH BLADE IN LENGTHS OF 24", 30", 36" OR 42".
USE SERIES "B" LETTERING (MINIMUM) WITH 4 INCH HIGH LETTERS FOR STREET NAME, 3 INCH OTHER.

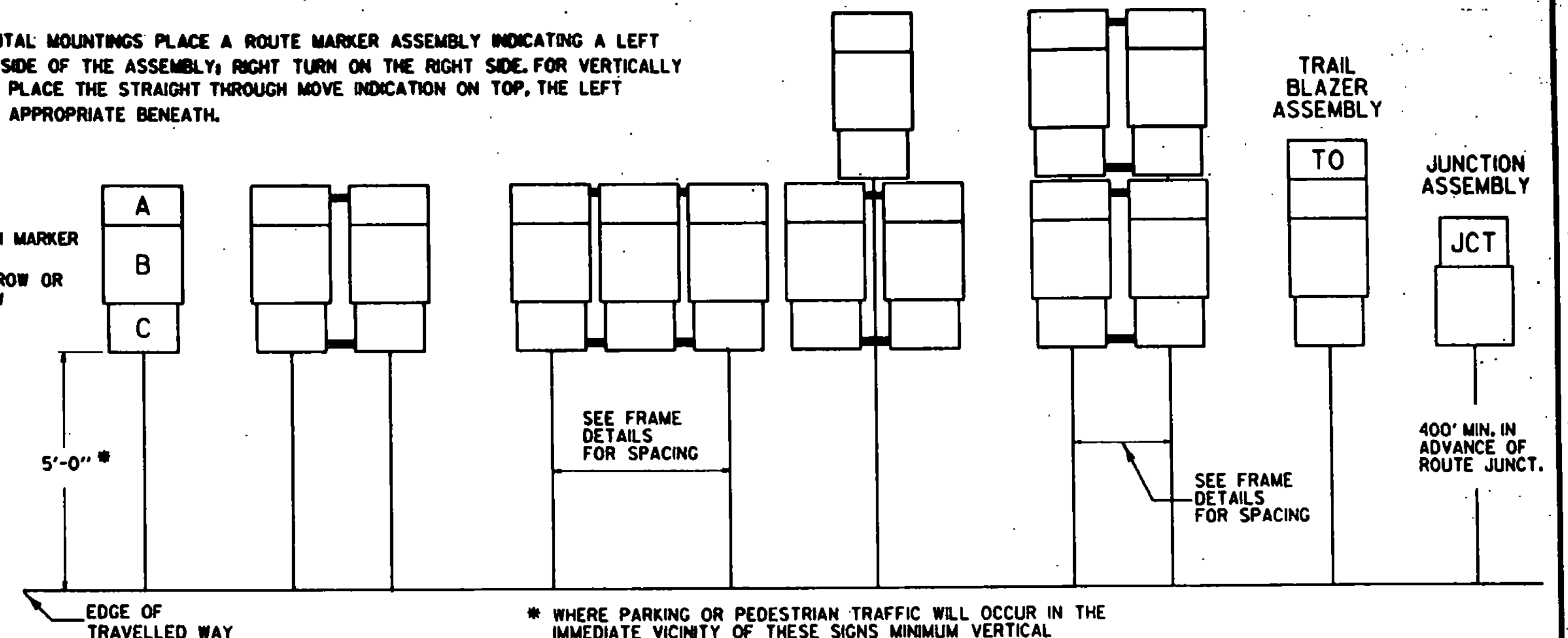
STREET SIGNS



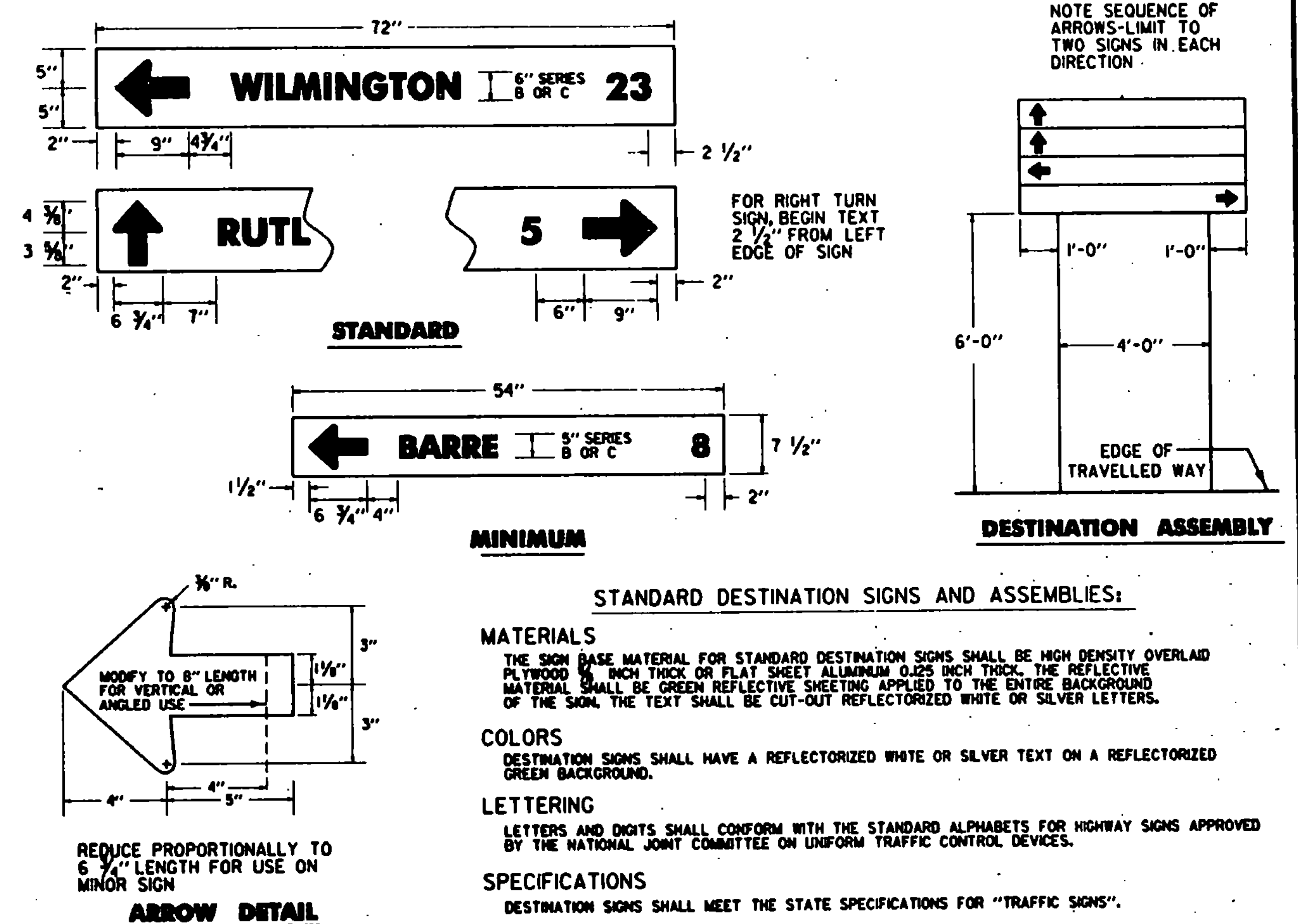
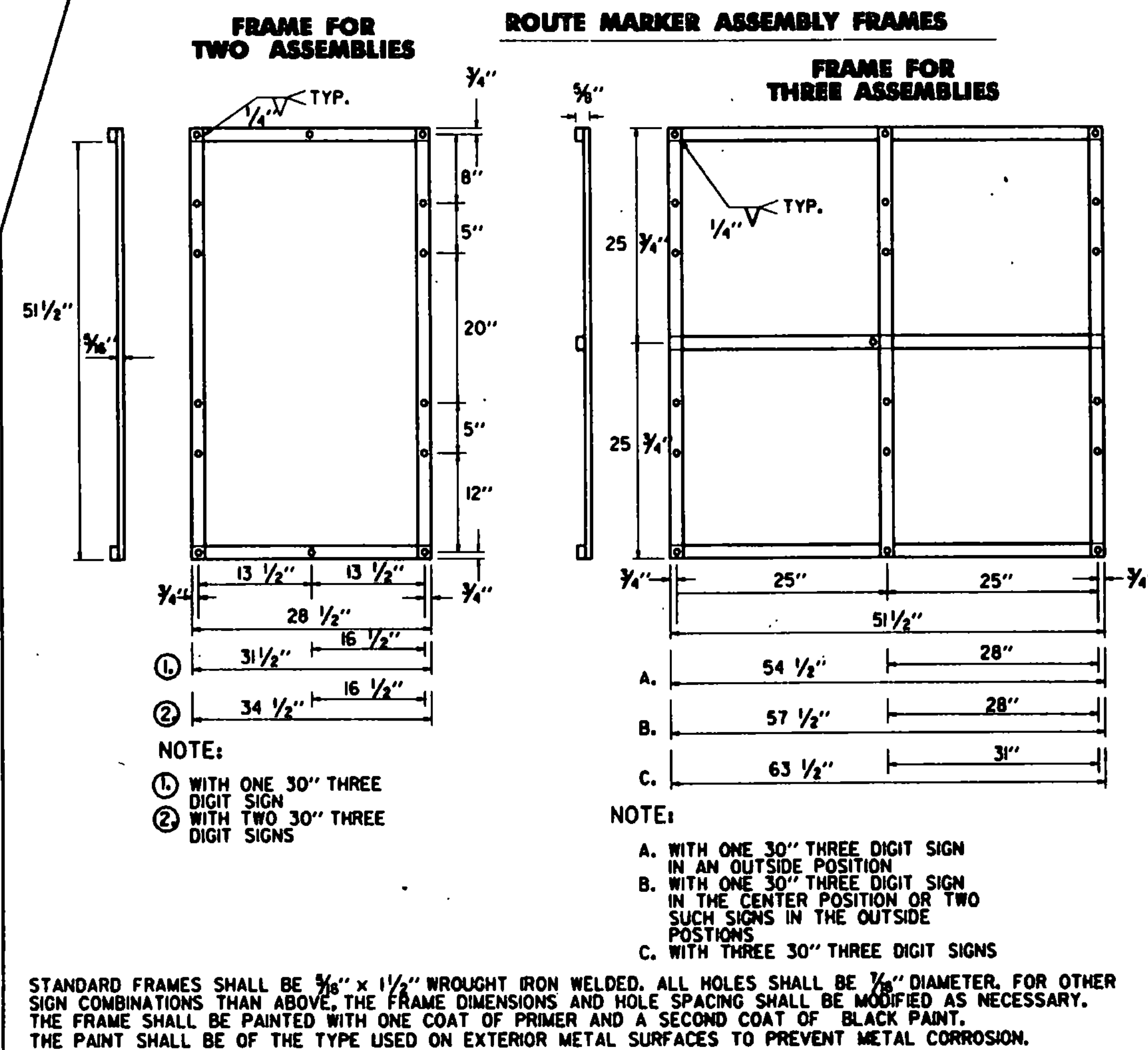
INSTALLATION SEQUENCE:

IN MULTIPLE HORIZONTAL MOUNTINGS PLACE A ROUTE MARKER ASSEMBLY INDICATING A LEFT TURN ON THE LEFT SIDE OF THE ASSEMBLY, RIGHT TURN ON THE RIGHT SIDE. FOR VERTICALLY STACKED MOUNTINGS PLACE THE STRAIGHT THROUGH MOVE INDICATION ON TOP, THE LEFT OR RIGHT TURNS AS APPROPRIATE BENEATH.

- A - CARDINAL DIRECTION MARKER
- B - ROUTE NUMBER
- C - ADVANCE TURN ARROW OR DIRECTIONAL ARROW



STANDARD MOUNTING OF ROUTE MARKER ASSEMBLIES, AND DESTINATION ASSEMBLIES



REVISIONS AND CORRECTIONS
JAN. 23, 1989 - DELETED TOWN LINE INFO

APPROVED

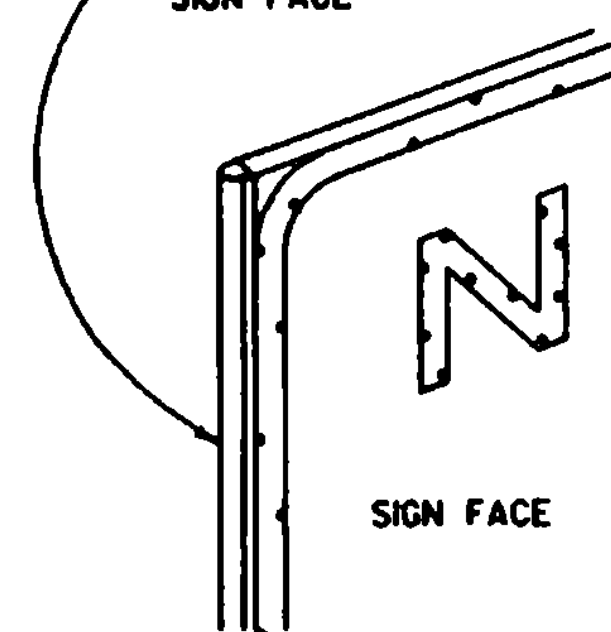
APRIL 1, 1988
DATE
David O. Kelly
CHIEF ENGINEER
Arthur J. Kelly
DIRECTOR OF PLANNING
AND PRECONSTRUCTION
Gordon B. MacArthur
TRAFFIC AND SAFETY ENGINEER

GUIDE SIGN PLACEMENT MISCELLANEOUS DETAILS



STANDARD
E-123

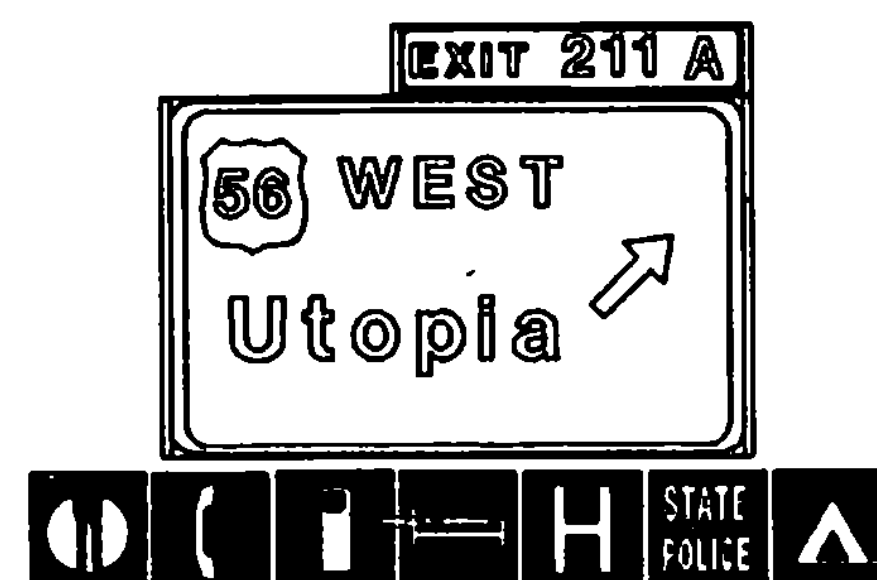
EDGE MOLDING ASTM
B221 ALLOY T6 B.E.
FINISH COLOR TO MATCH
SIGN FACE



SIGN FACE

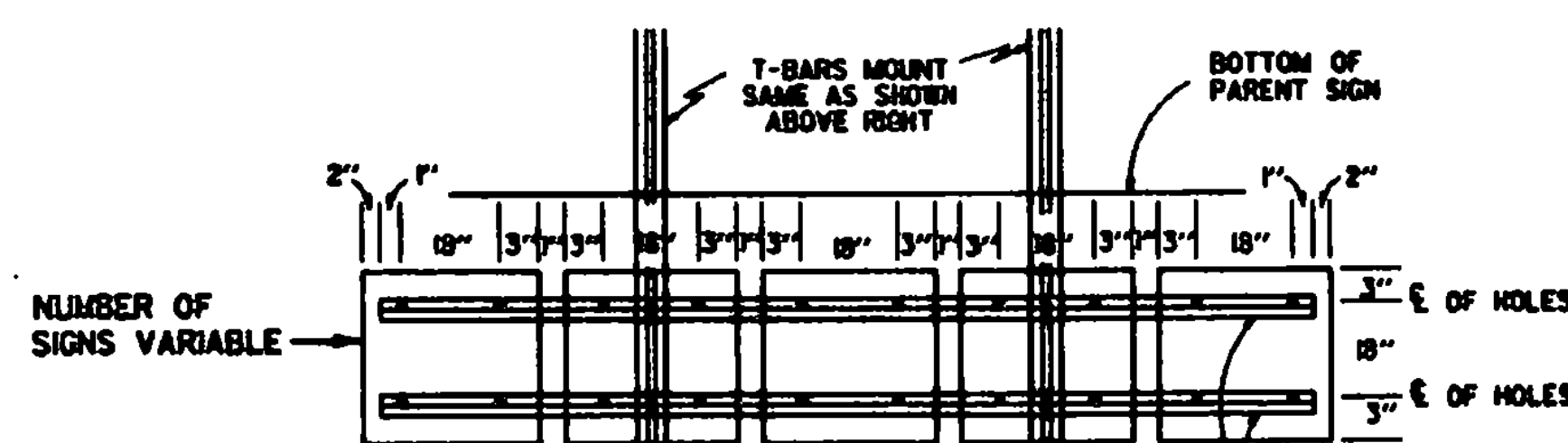
BORDER EVEN WITH SIGN
EDGE AT TOP AND BOTTOM
AND BUTTS EDGE MOLDING
ON SIDES.

INDIVIDUAL LETTERS, DIGITS, SYMBOLS, AND BORDERS
FOR THE SIGN SHALL BE SHAPED FROM 0.032 INCH SHEET
ALUMINUM CONFORMING TO THE REQUIREMENTS OF ASTM
B 209, ALLOY 3003-H-12. LEGEND AND BORDER TO BE
ATTACHED TO THE SIGN FACE WITH 1/8" RIVETS.

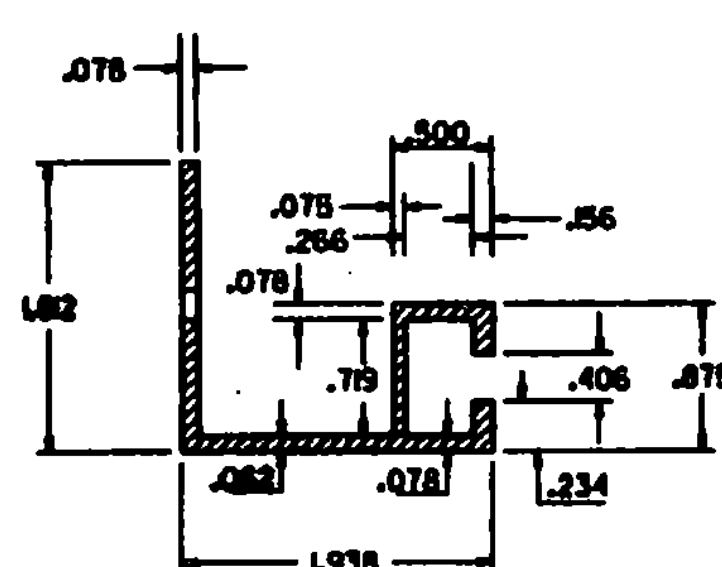


SERVICE SIGN MOUNTING DETAILS

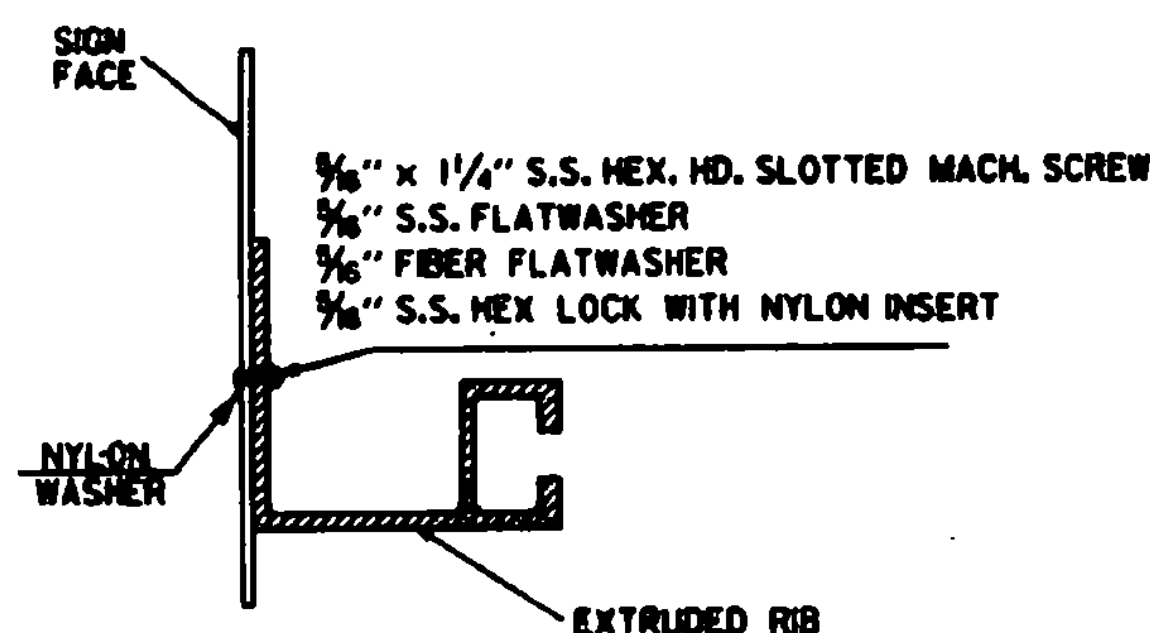
WHEN USED, THE SERVICE SIGNS SHALL APPEAR IN THE SAME SEQUENCE AS
SHOWN ABOVE. THE PARENT SIGN SHOWN IS ONLY AN EXAMPLE. THE SIGNS
SHALL BE INSTALLED ON THE SIGN SHOWN ON THE PLANS. THE SERVICE SIGNS
SHALL BE MOUNTED TO THE PARENT SIGN WITH TEE BARS AND EXTRUDED ALUMINUM
RIBS. OTHER METHODS OF INSTALLATION MAY BE SUBMITTED TO THE TRAFFIC
DESIGN SECTION FOR APPROVAL. IN NO CASE SHALL ANY SUPPORT BE ATTACHED
TO THE W-SHAPED STEEL SIGN SUPPORT BELOW THE FUSE PLATE.



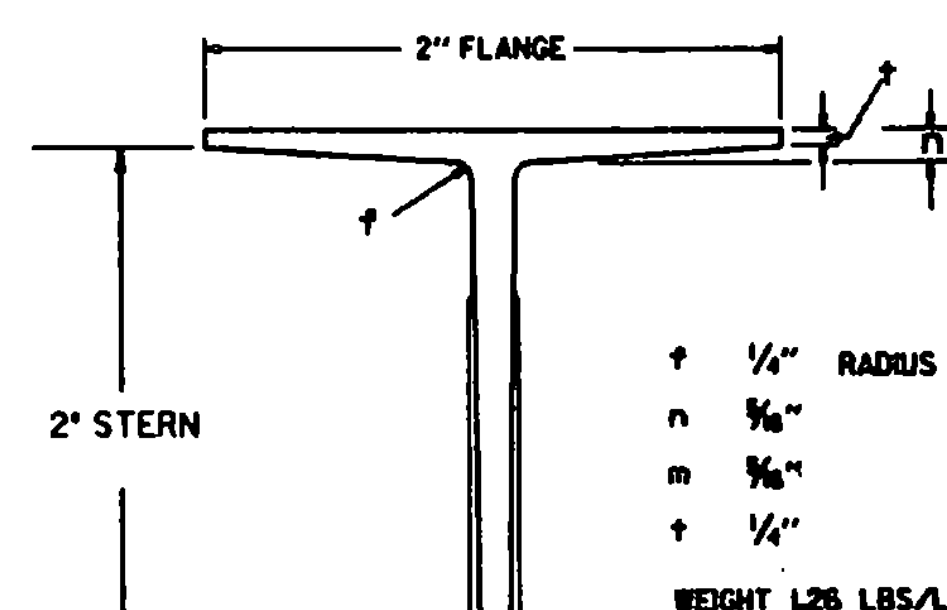
TYPICAL T-BAR ASSEMBLY FOR MOUNTING SERVICES SYMBOLS (24" x 24" UNITS SHOWN)



DETAIL EXTRUDED ALUMINUM RIB ALUM. ALLOY 6063-T6



EXTRUDED ALUMINUM PANEL SIGN CLIP

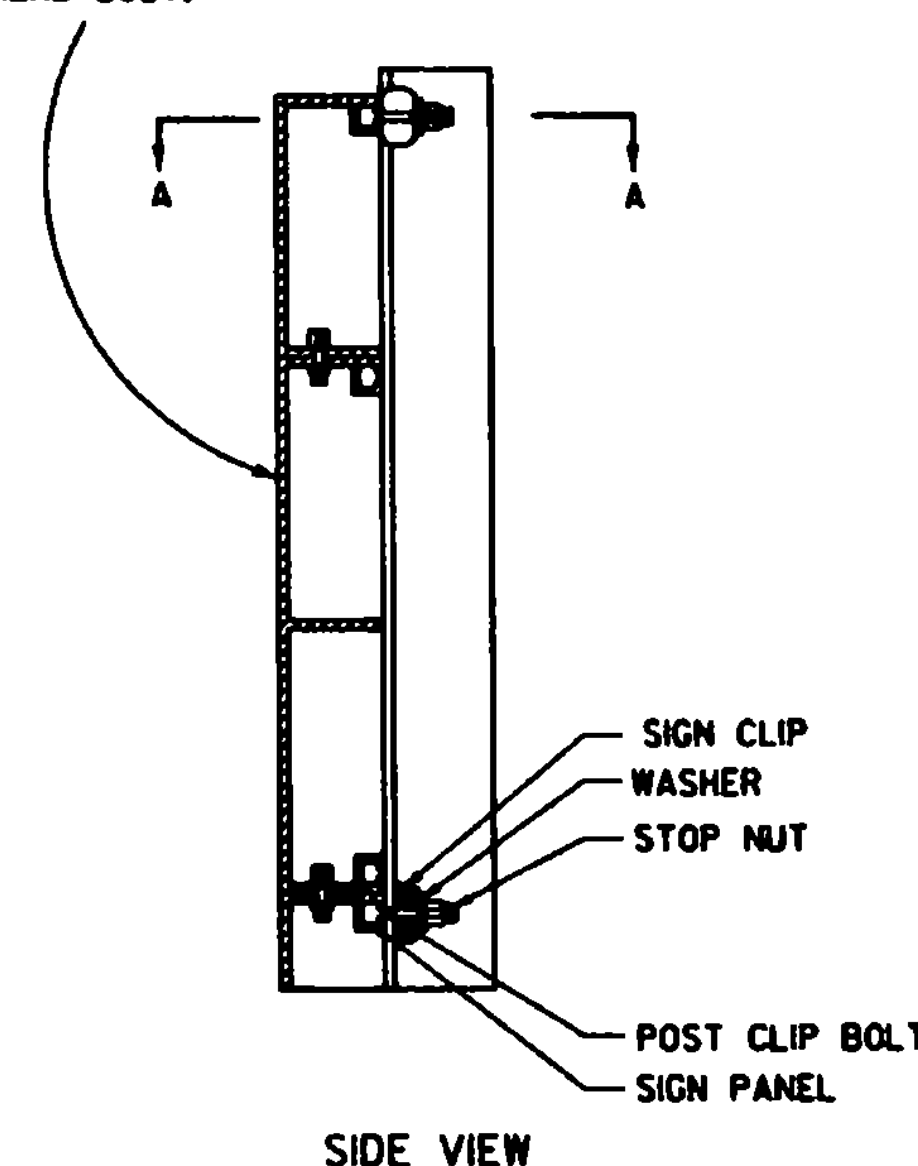


TEE BAR



SECTION A-A

12" x 6" EXTRUDED ALUMINUM SIGN PANELS
6063-T6. 6" x 6" PANEL PLACED ON TOP WHEN
REQUIRED. PANELS BOLTED TOGETHER ON 24"
CENTERS WITH 3/8" x 1" STAINLESS STEEL HEX
HEAD BOLT.

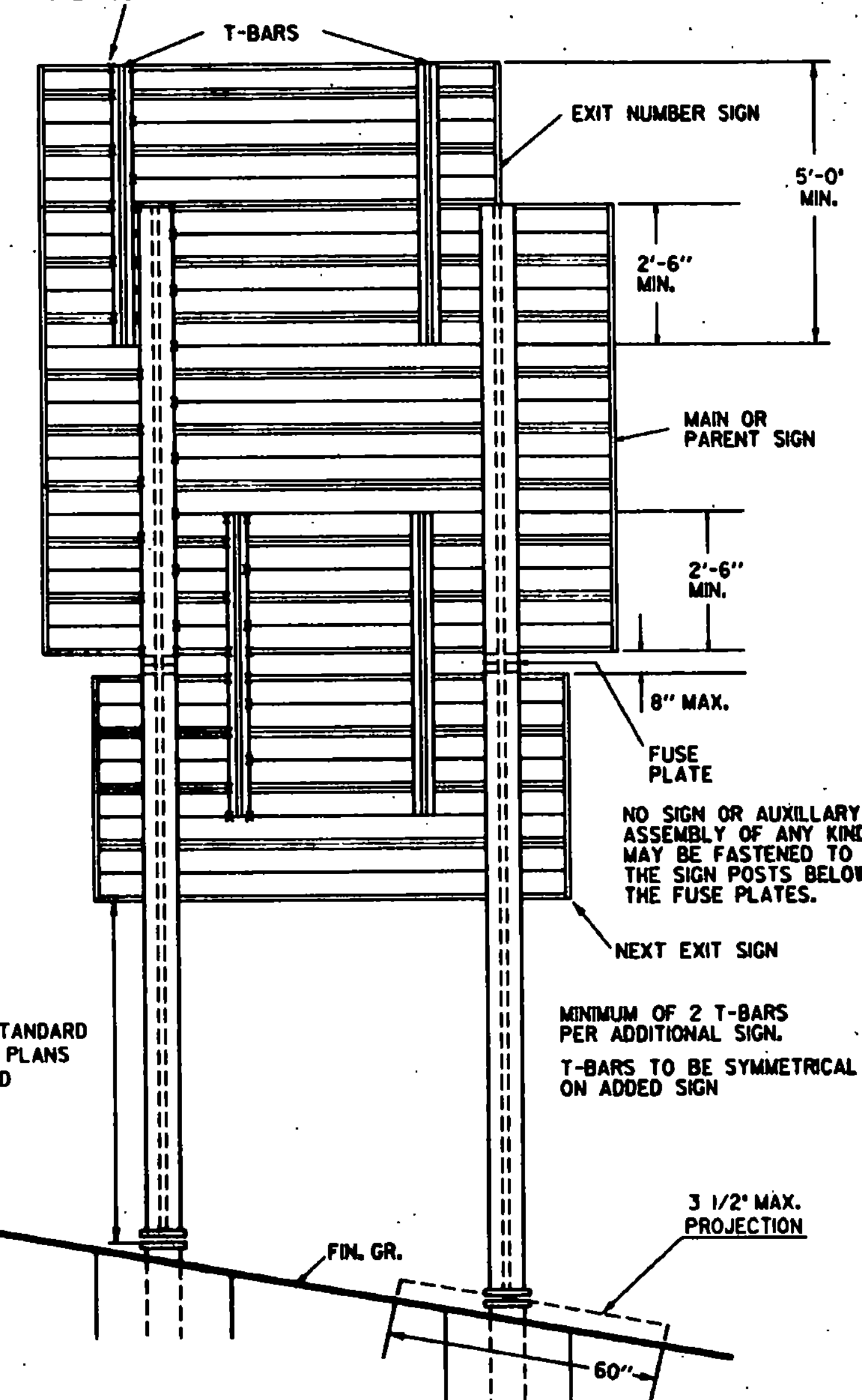


SIGN MOUNTING DETAIL

NOTES

1. THE ALUMINUM TEE BAR SHALL BE OF 6063-T6 ALLOY.
2. EXTRUDED ALUMINUM PANEL SIGN CLIP SHALL BE 356-T6 ALLOY FABRICATED TO GIVE PROPER CLAMPING ON ALL FLANGES (TAPERED OR PARALLEL) FROM 1/8" TO 19/32" IN THICKNESS. A FLAT WASHER SHALL BE USED UNDER THE NUT.
3. BOLTS, NUTS AND WASHERS SHALL BE STAINLESS STEEL. BOLTS SHALL BE 1/2" DIAMETER, 2 INCHES IN LENGTH WITH A HEAD CAPABLE OF BEING INSERTED INTO EXTRUDED ALUMINUM SIGN PANEL SLOTS. NUTS SHALL BE OF A LOCK NUT DESIGN, THREADS MATCHING BOLT. THE WASHER SHALL HAVE A 1/4" I.D. x 3/4" O.D. x .061 THICKNESS.

X - DENOTES SIGN CLIP LOCATION
(ONE POST AND T-BAR TYPICAL SHOWN)



TYPICAL SIGN INSTALLATION ON W-SHAPED STEEL POSTS WITH T-BAR EXTENSIONS

SEE APPROPRIATE STANDARD
SHEET OR PROJECT PLANS
FOR HORIZONTAL AND
VERTICAL OFFSETS.

MINIMUM OF 2 T-BARS
PER ADDITIONAL SIGN.
T-BARS TO BE SYMMETRICAL
ON ADDED SIGN

NO SIGN OR AUXILIARY
ASSEMBLY OF ANY KIND
MAY BE FASTENED TO
THE SIGN POSTS BELOW
THE FUSE PLATES.

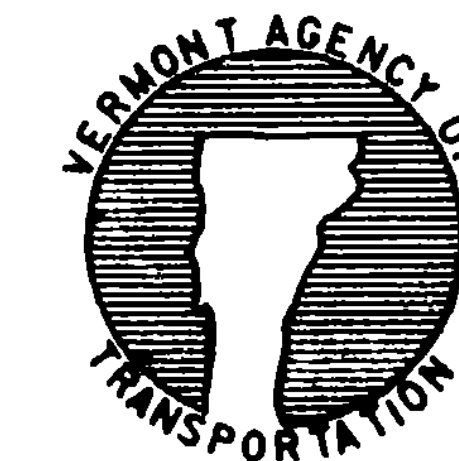
REVISIONS AND CORRECTIONS
MARCH 1, 1988 - MAJOR REVISIONS

APPROVED

SEPT. 10, 1987

DATE
David N. Kelley
CHIEF ENGINEER
Director of Planning
and Preconstruction
Gordon B. MacArthur
TRAFFIC AND SAFETY ENGINEER

TYPE "B" GUIDE SIGN ATTACHMENT DETAILS



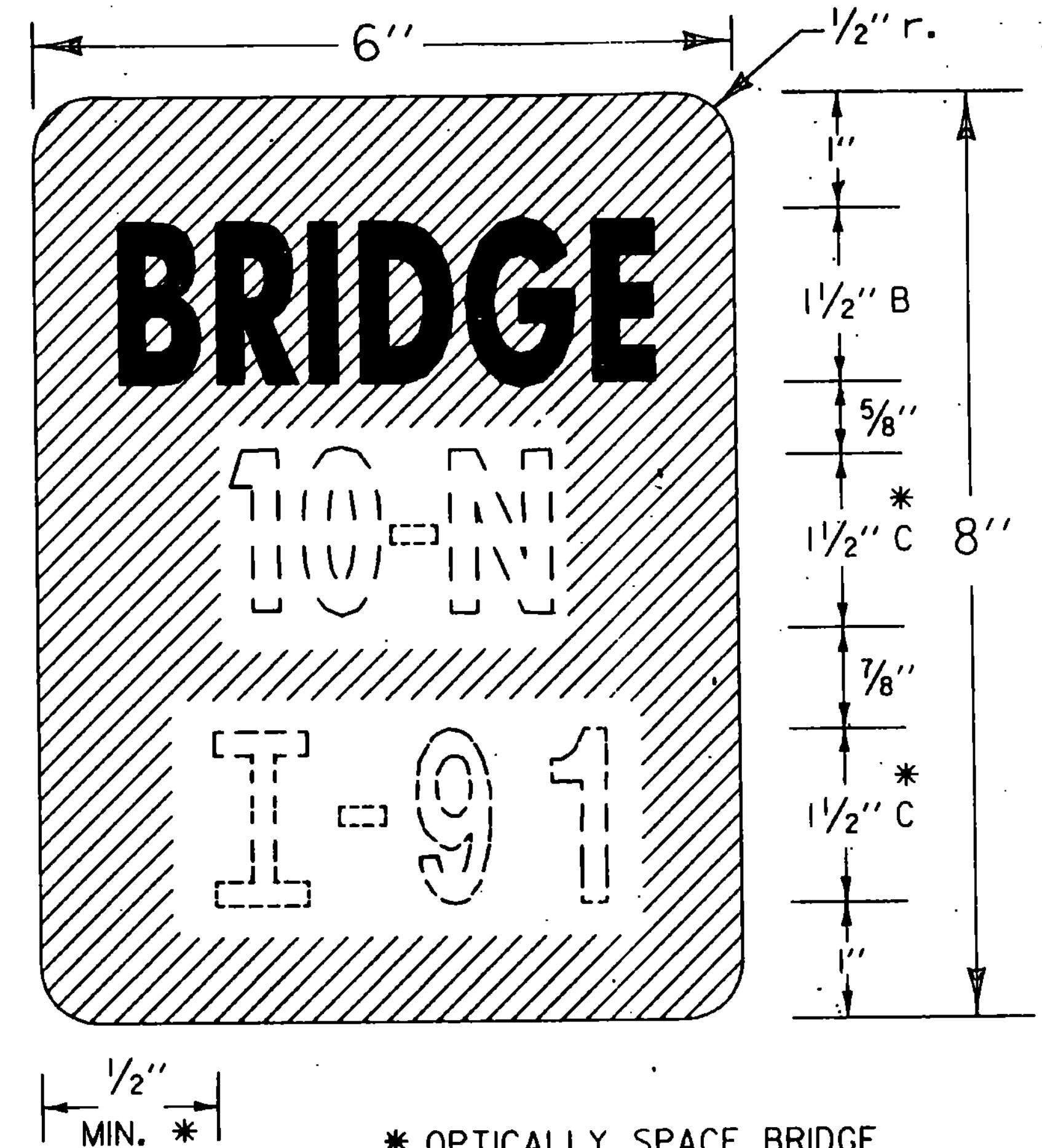
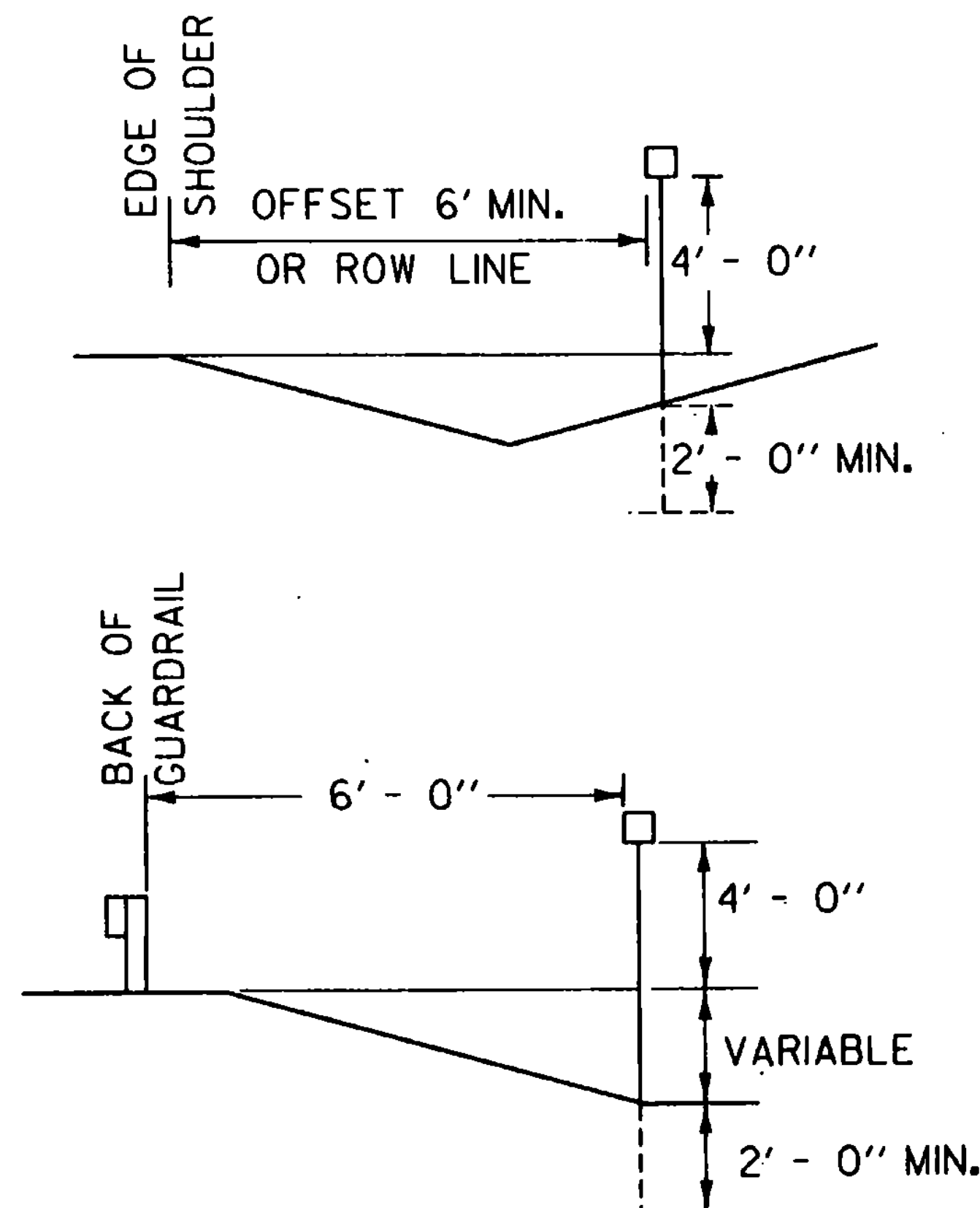
STANDARD
E-130

I-91

2"

HYPHENATED WORD DETAIL

ROUTE NUMBERS SHALL
APPEAR : FOR EXAMPLE AS :
I-91, US 5 , VT 22



* OPTICALLY SPACE BRIDGE
AND ROUTE NUMBERS.
SERIES B LETTERS MAY
BE USED TO MAINTAIN
VISUAL INTEGRITY.

NOTES

GENERAL:

DOTTED LINES AND NUMERALS INDICATE TEXT THAT VARIES.

PAYMENT:

MILEMARKERS SHALL BE PAID AS TRAFFIC SIGNS, TYPE "A", AND POSTS PAID AS FLANGED CHANNEL STEEL SIGN POSTS.

MATERIAL:

THE SIGN BASE MATERIAL SHALL BE 0.04 \" FLAT SHEET ALUMINUM .

COLORS:

THE SIGN SHALL HAVE A REFLECTORIZED WHITE TEXT ON A REFLECTORIZED GREEN BACKGROUND. THE COLORS SHALL CONFORM WITH THOSE FOUND IN STANDARD COLOR TOLERANCE CHARTS AS APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

LETTERING:

LETTERS AND DIGITS SHALL CONFORM WITH THE STANDARD ALPHABETS FOR HIGHWAY SIGNS AS PRINTED BY THE FEDERAL HIGHWAY ADMINISTRATION.

POSTS:

FLANGED CHANNEL STEEL 2 \"/FT. POSTS SHALL BE USED WHEN MILEMARKERS ARE INSTALLED BEHIND GUARDRAIL OR WHEN THE POST LENGTH EXCEEDS 7 FEET. FOR LENGTHS OF 7 FEET OR LESS, A 1.12 \"/FT. STEEL SIGN POST SHALL BE USED.

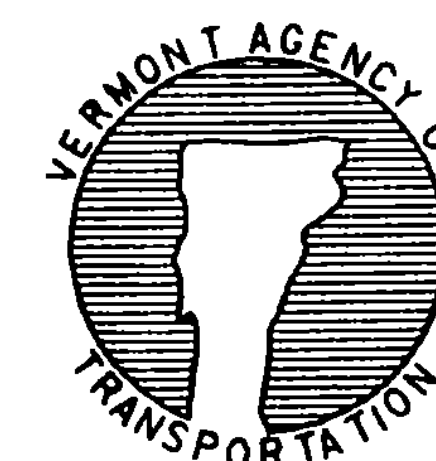
REVISIONS AND CORRECTIONS

APPROVED

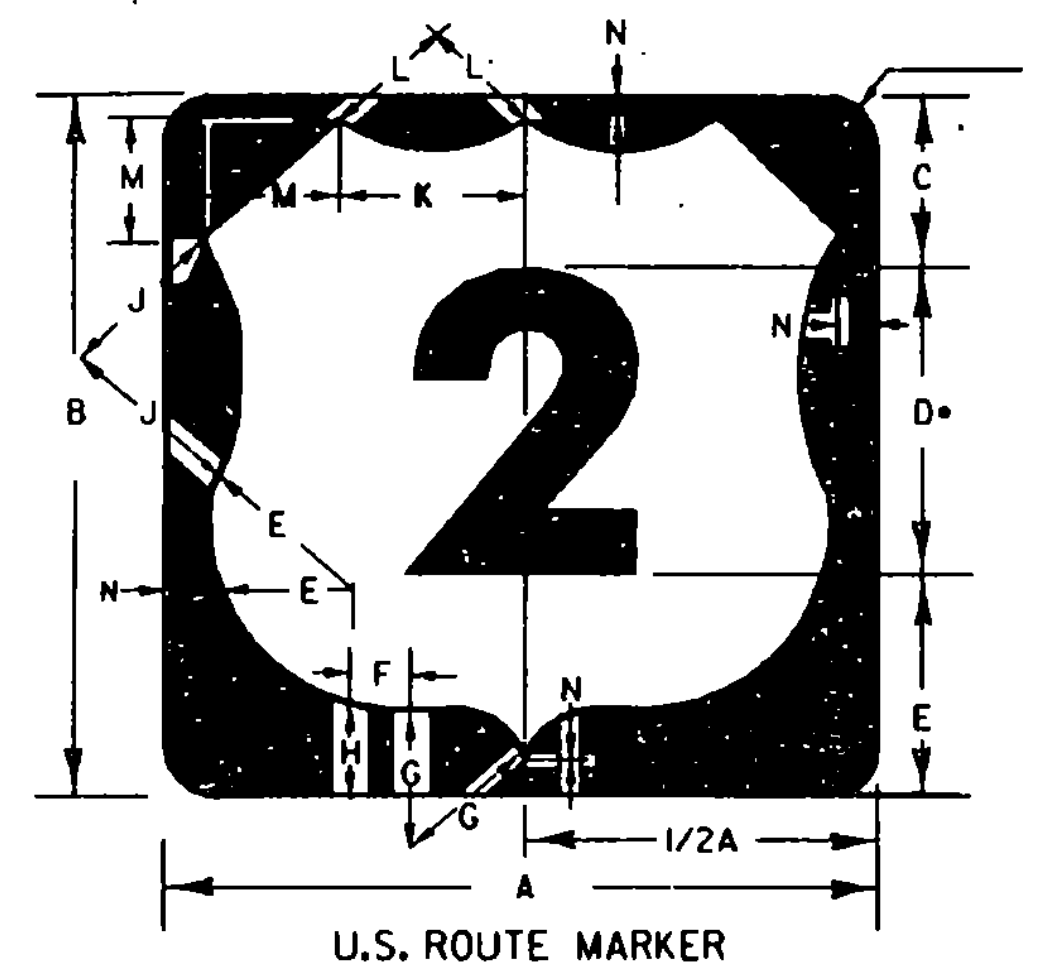
12/18/89
DATE

David B. Kelley
CHIEF ENGINEER
Arthur J. Ross
DIRECTOR OF PLANNING
Stephen B. MacArthur
TRAFFIC AND SAFETY ENGINEER

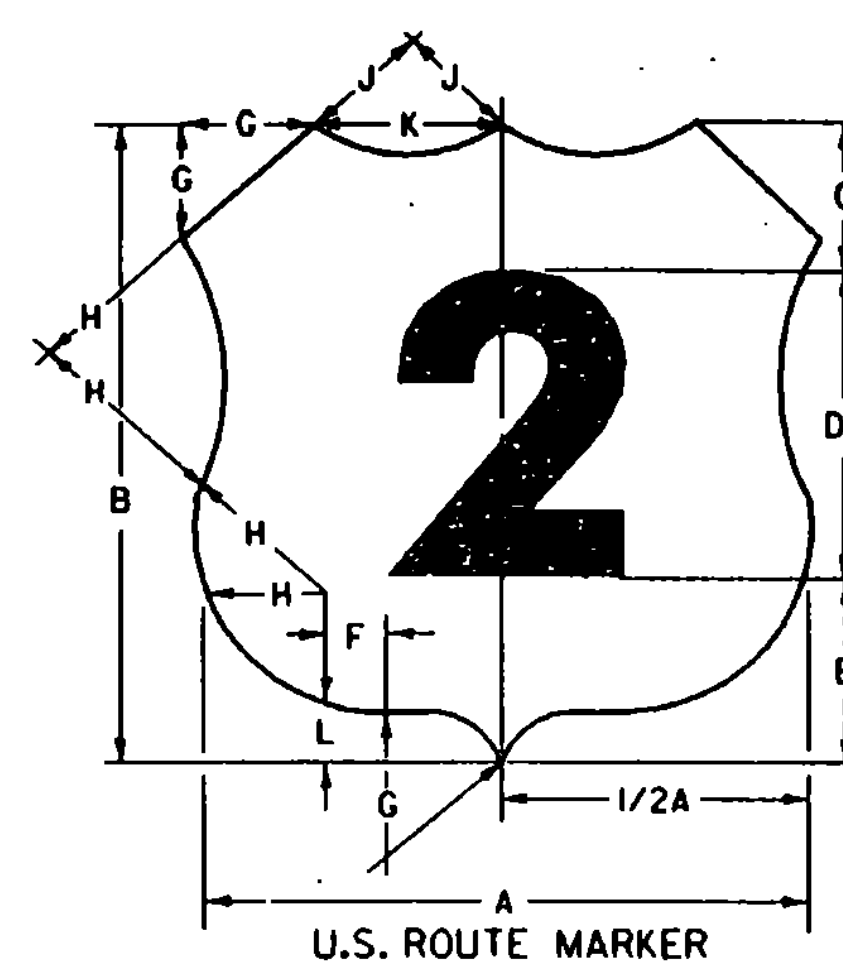
BRIDGE NUMBER PLAQUE



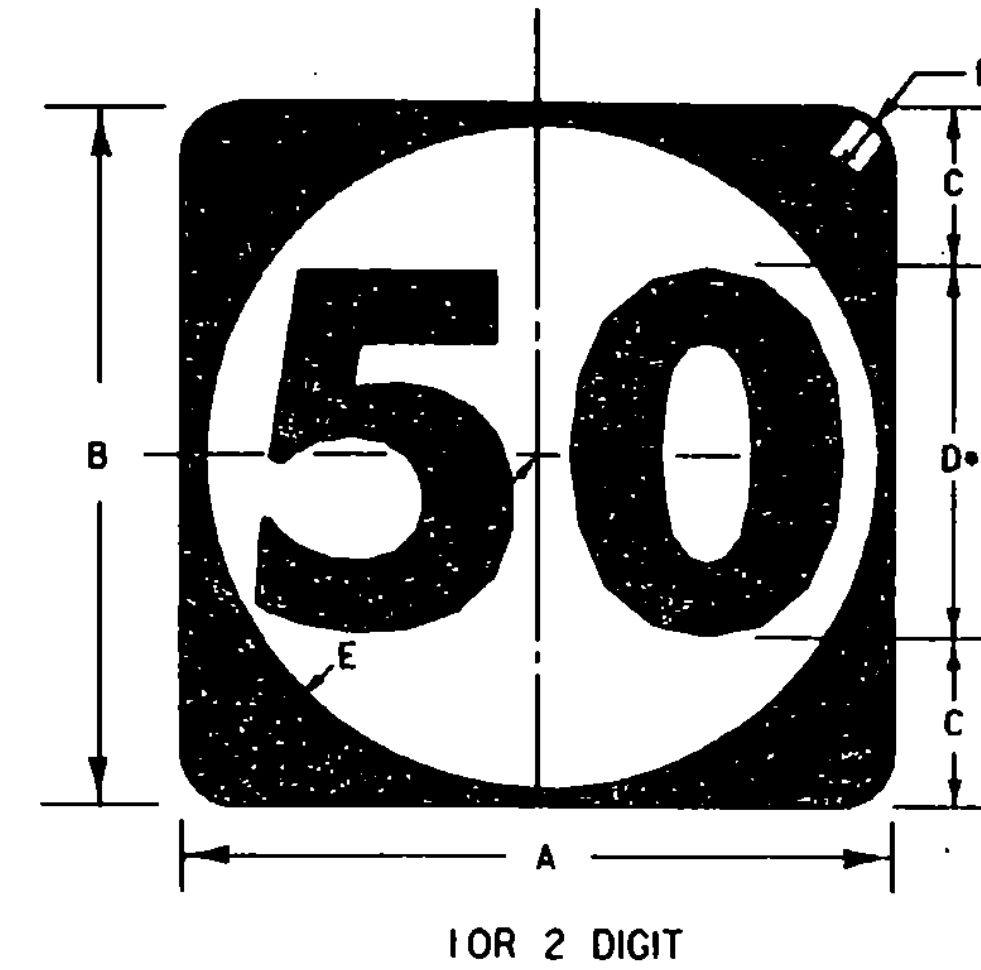
STANDARD E-134



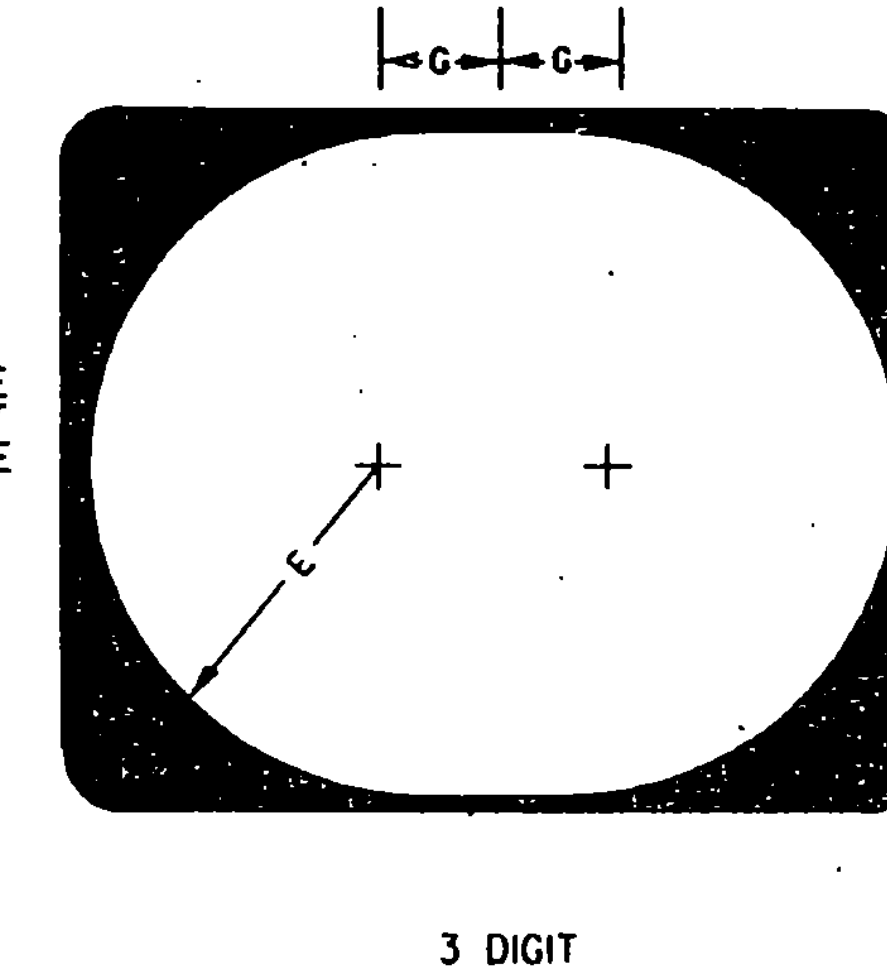
U.S. ROUTE MARKER



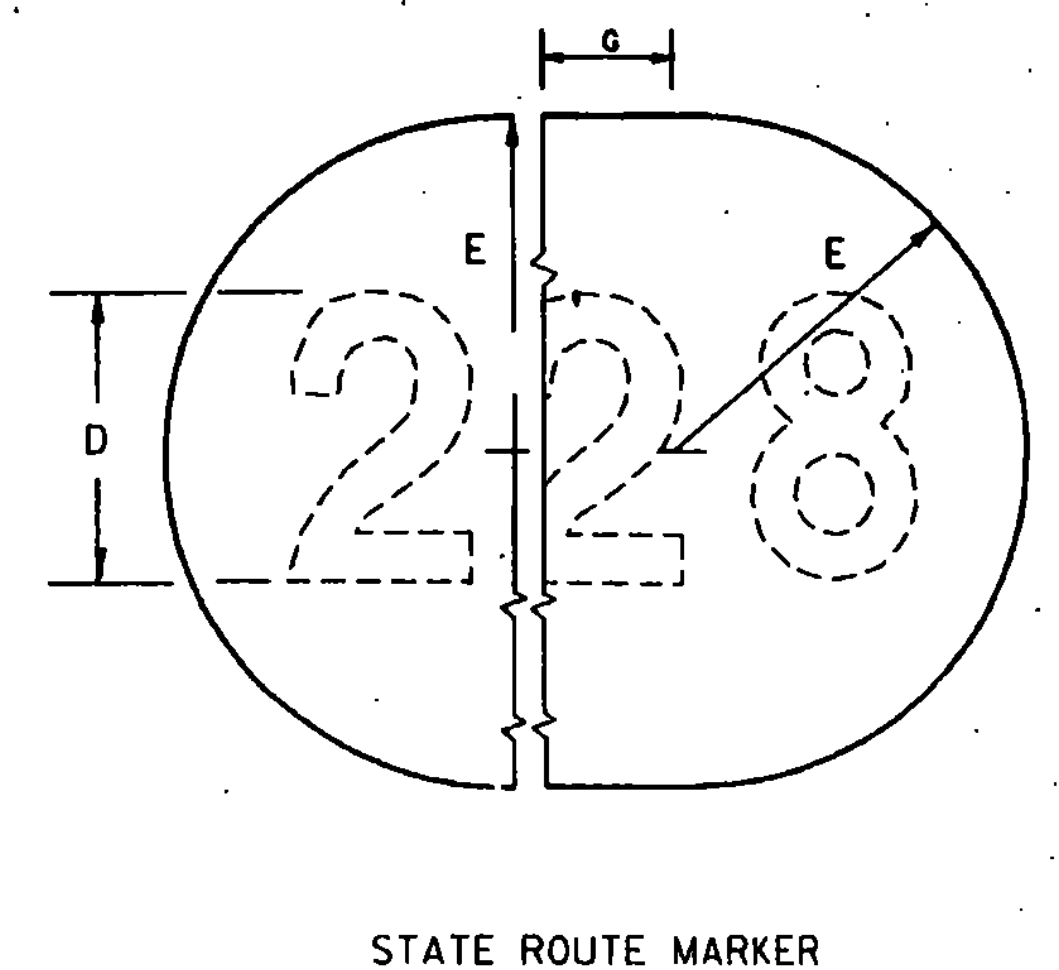
U.S. ROUTE MARKER
FOR GUIDE SIGN USE



1 OR 2 DIGIT
STATE ROUTE MARKERS



3 DIGIT
STATE ROUTE MARKER
(SEE DIMENSION CHART FOR 1 OR 2 DIGIT SIGNS)



STATE ROUTE MARKER
FOR GUIDE SIGN USE

SIGN	DIMENSIONS (INCHES)														
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	
1-DIGIT	24	24	5-1/2	120	6-1/2	1	5-1/2	2-1/2	7-1/2	7	5-1/2	4-1/2	1/2	1-1/2	
1-DIGIT	36	36	8-1/4	180	9-3/4	1-1/2	8-1/4	3-3/4	11-1/4	10-1/2	8-1/4	6-1/2	3/4	2-1/4	
3-DIGIT	30	24	5-1/2	120	6-1/2	4	5-1/2	2-1/2	7-1/2	10	9-1/2	4-1/2	1/2	1-1/2	
3-DIGIT	45	36	8-1/4	180	9-3/4	5-1/2	8-1/4	3-3/4	11-1/4	15	14-1/4	6-1/2	3/4	2-1/4	

COLORS
TEXT AND BORDER - BLACK (NON REFL.)
BACKGROUND - WHITE (REFL.)

SIGN	DIMENSIONS (INCHES)											
	A	B	C	D	E	F	G	H	J	K	L	
L2-digits	24	24	5-1/2	120	6-1/2	1	5	7	5	7	2	
L2-digits	36	36	8-1/4	180	9-3/4	1-1/2	7-1/2	10-1/2	7-1/2	10-1/2	3	
3-digits	30	24	5-1/2	120	6-1/2	4	5	7	9	10	2	
3-digits	45	36	8-1/4	180	9-3/4	5-1/2	7-1/2	10-1/2	13-1/2	15	3	

COLORS
TEXT - BLACK (NON REFL.)
BACKGROUND - WHITE (REFL.)

SIGN	DIMENSIONS (INCHES)						
	A	B	C	D	E	F	G
1,2-DIGIT	24	24	6	120	11	1-1/2	-
1,2-DIGIT	36	36	9	180	16-1/2	2-1/4	-
3-DIGIT	30	24	6	120	11	1-1/2	3
3-DIGIT	45	36	9	180	16-1/2	2-1/4	4-1/2

COLORS
TEXT AND BORDER - BLACK (NON REFL.)
BACKGROUND - WHITE (REFL.)

SIGN	DIMENSIONS (INCHES)		
	D	E	G
1,2-DIGIT	120	12	-
1,2-DIGIT	180	18	-
3-DIGIT	120	12	3
3-DIGIT	180	18	4-1/2

DESIGNS
THE DESIGNS OF STATE ROUTE MARKERS AND AUXILIARY MARKERS SHALL CONFORM WITH THE REQUIREMENTS SET FORTH IN THE "MANUAL ON TRAFFIC CONTROL DEVICES" PREPARED BY THE NATIONAL JOINT COMMITTEE ON TRAFFIC CONTROL DEVICES.

MATERIALS
THE SIGN BASE MATERIAL MAY BE ANY OF THE FOLLOWING, WITH THE MINIMUM THICKNESSES AS NOTED:

FLAT SHEET ALUMINUM
LESS THAN 24" x 24" 0.060"
24" x 24", 24" x 30" 0.080"
GALVANIZED FLAT SHEET STEEL
LESS THAN 24" x 24" 18 GAGE
24" x 24", 24" x 30" 16 GAGE

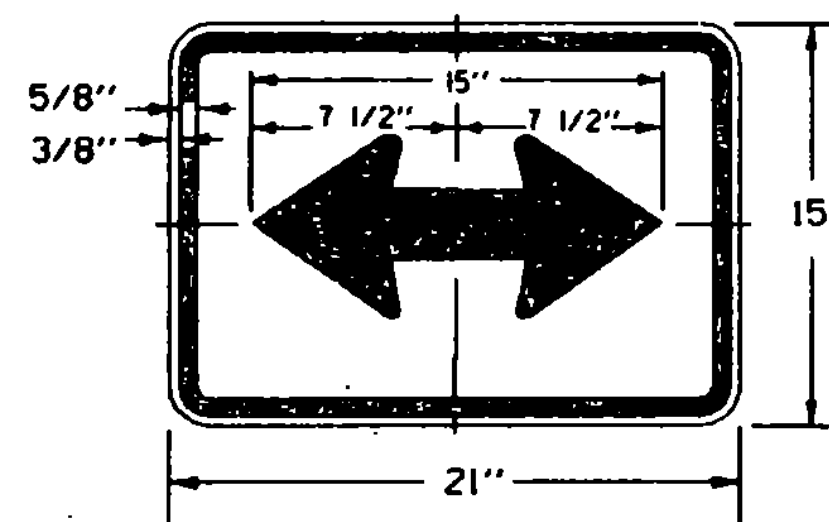
U.S. AND STATE ROUTE MARKERS TO BE MOUNTED ON INTERSTATE GUIDE SIGNS SHALL BE A MINIMUM THICKNESS AS FOR SIGNS LESS THAN 24" x 24".

THE REFLECTIVE MATERIAL SHALL BE WHITE REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND. THE TEXTS MAY BE LETTERING FILM, SILK SCREENED, OR HAND PAINTED.

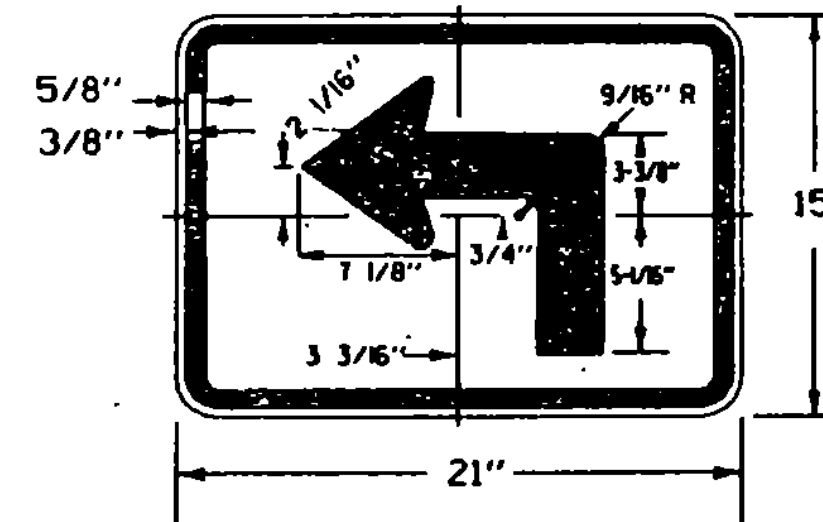
COLORS
U.S. AND STATE ROUTE MARKERS SHALL HAVE BLACK TEXT ON REFLECTORIZED WHITE BACKGROUNDS.

LETTERING
LETTERS AND DIGITS SHALL CONFORM WITH THE STANDARD ALPHABETS FOR HIGHWAY SIGNS APPROVED BY THE NATIONAL JOINT COMMITTEE ON UNIFORM TRAFFIC CONTROL DEVICES.

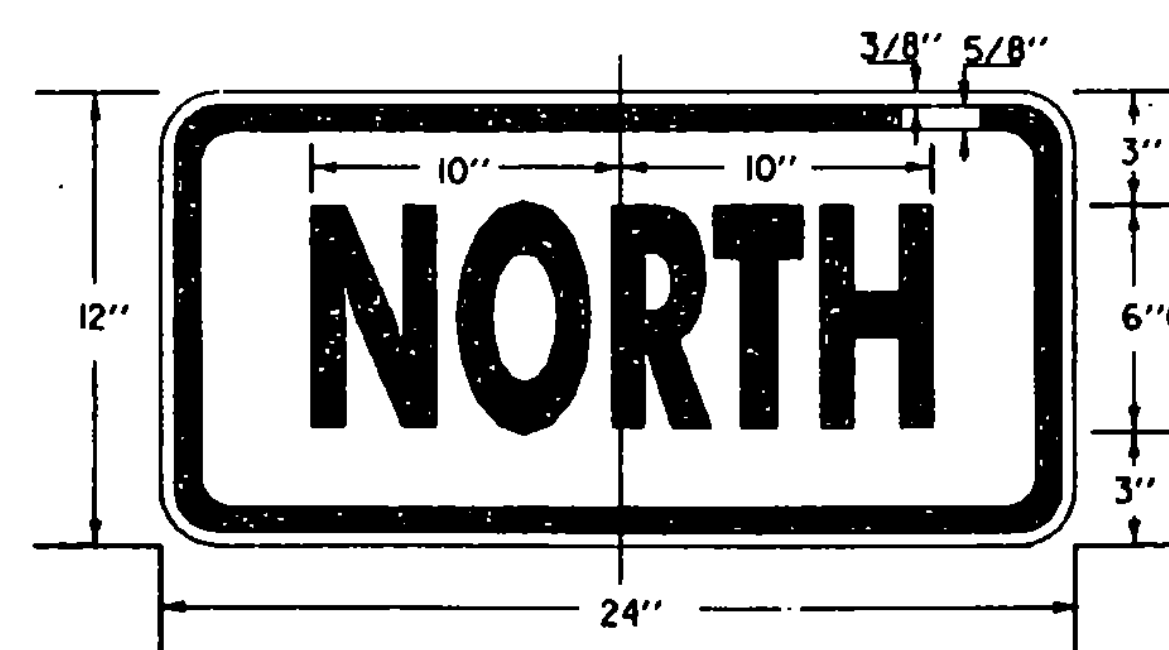
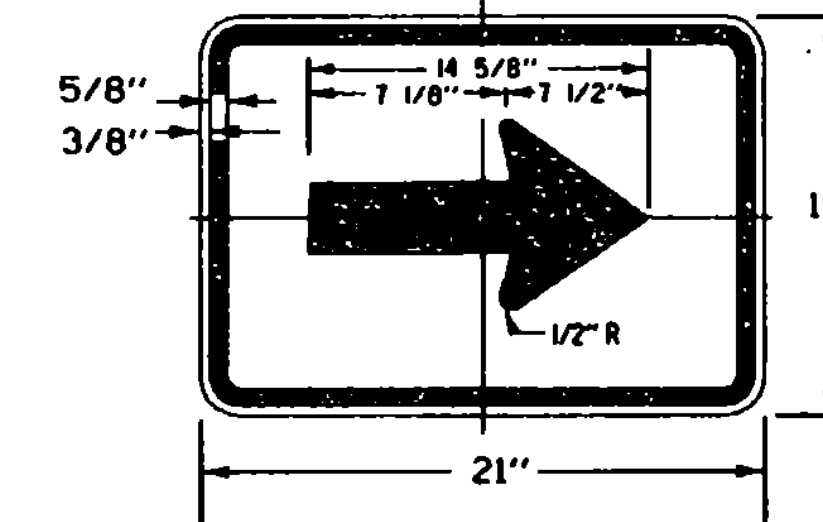
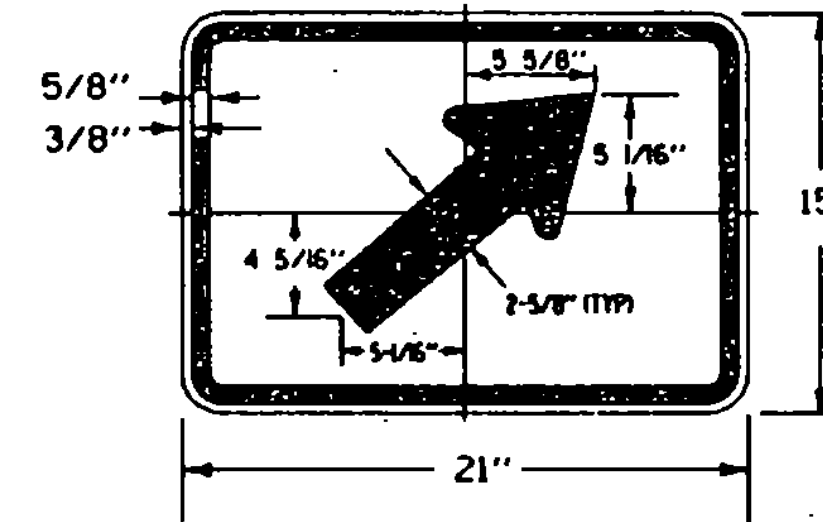
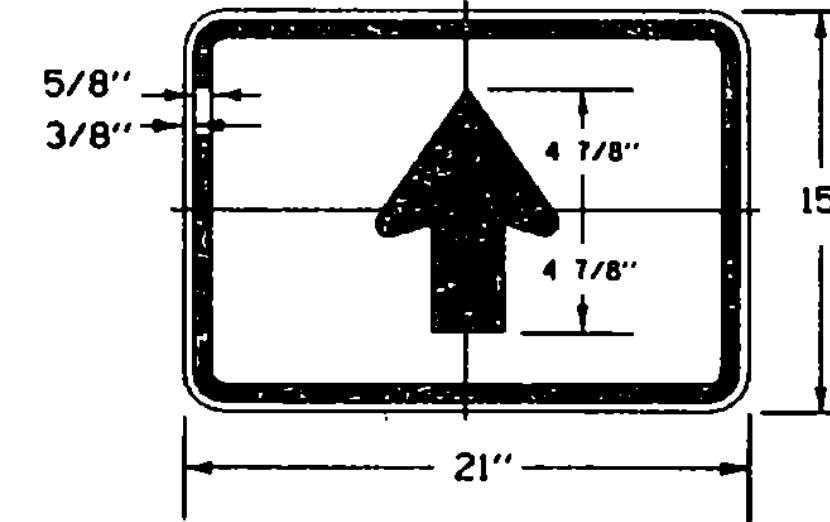
SPECIFICATIONS
U.S. AND STATE ROUTE MARKERS AND AUXILIARY ROUTE MARKERS SHALL MEET THE STANDARD STATE SPECIFICATIONS FOR TRAFFIC SIGNS.



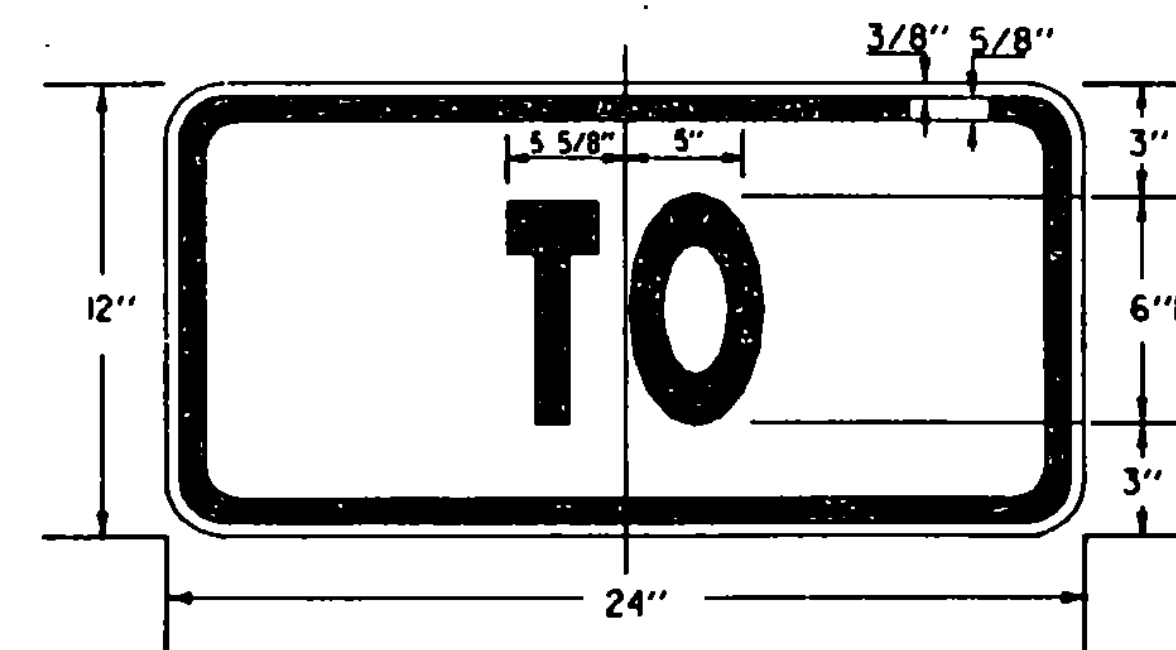
ALSO "SOUTH", "EAST", AND "WEST"



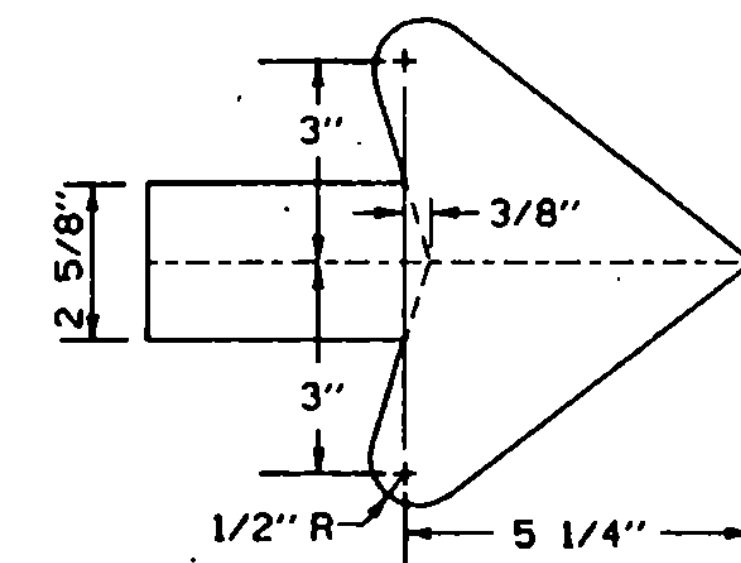
DIRECTION ARROW OR ADVANCE TURN ARROWS



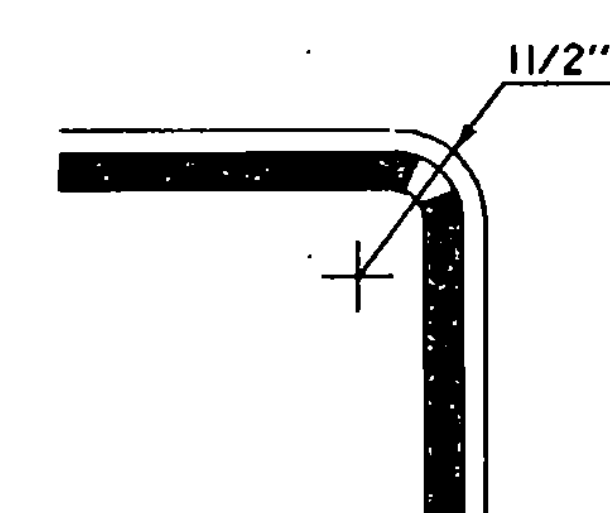
CARDINAL DIRECTION MARKER



TRAILBLAZER



ARROW DETAILS



TYPICAL RADIUS DETAIL

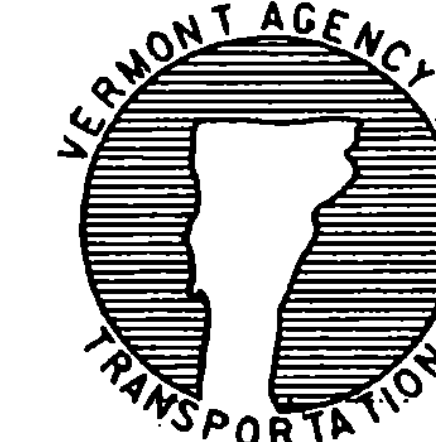
REVISIONS AND CORRECTIONS
APRIL 29, 1988 - FHWA COMMENTS

APPROVED

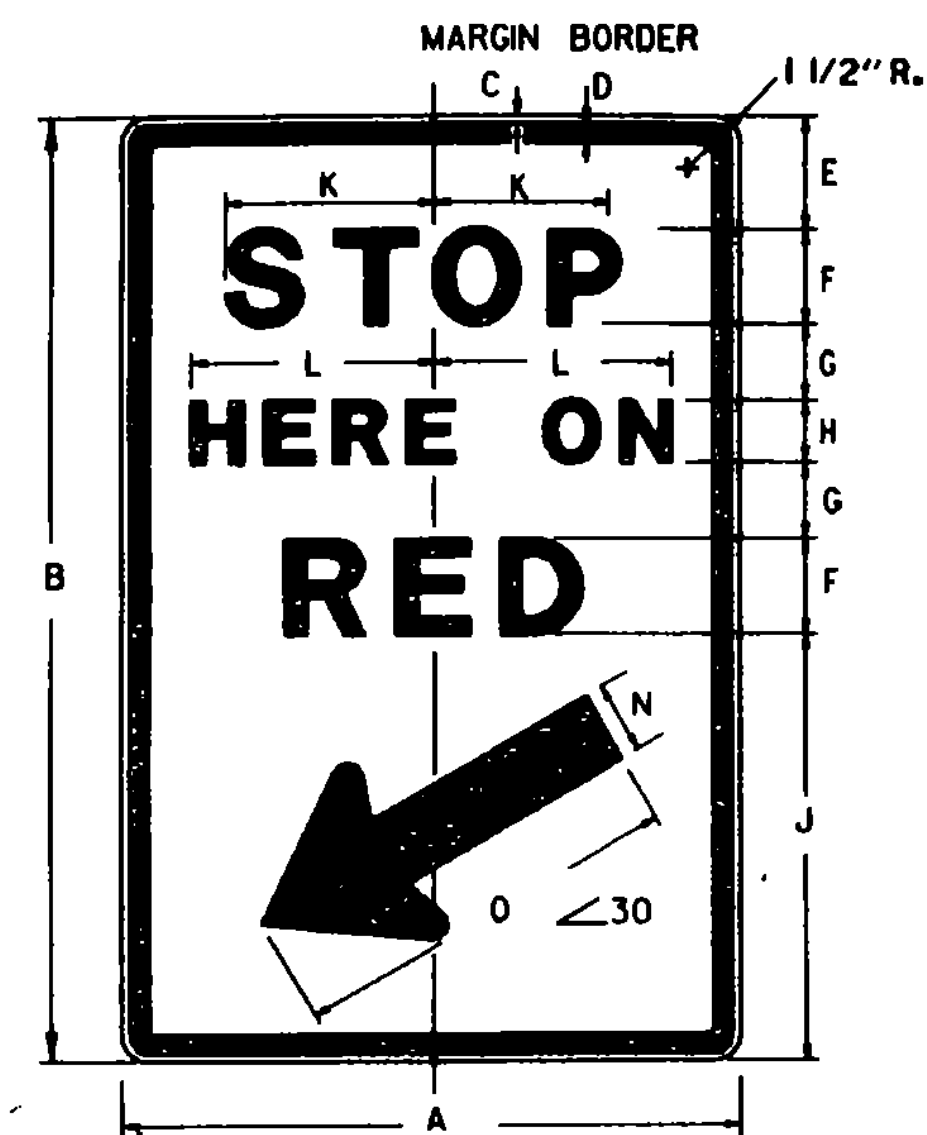
SEPT. 10, 1987
DATE

David W. Kelley
CHIEF ENGINEER
Arthur J. Hall
DIRECTOR OF PLANNING
AND PRE-CONSTRUCTION
Gordon B. MacArthur
TRAFFIC AND SAFETY ENGINEER

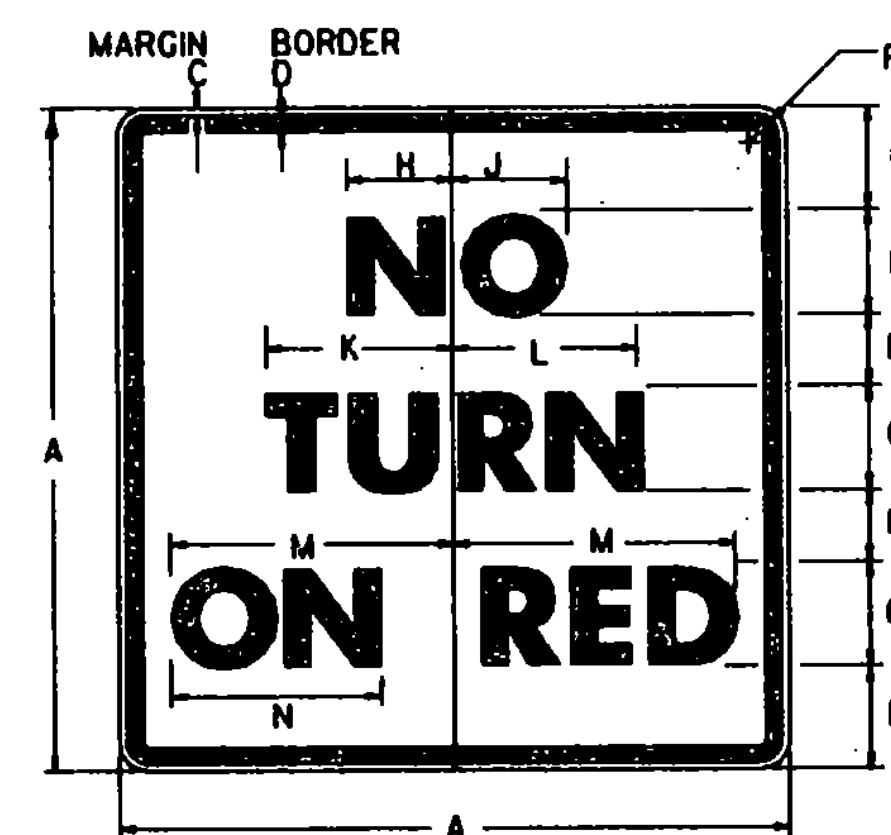
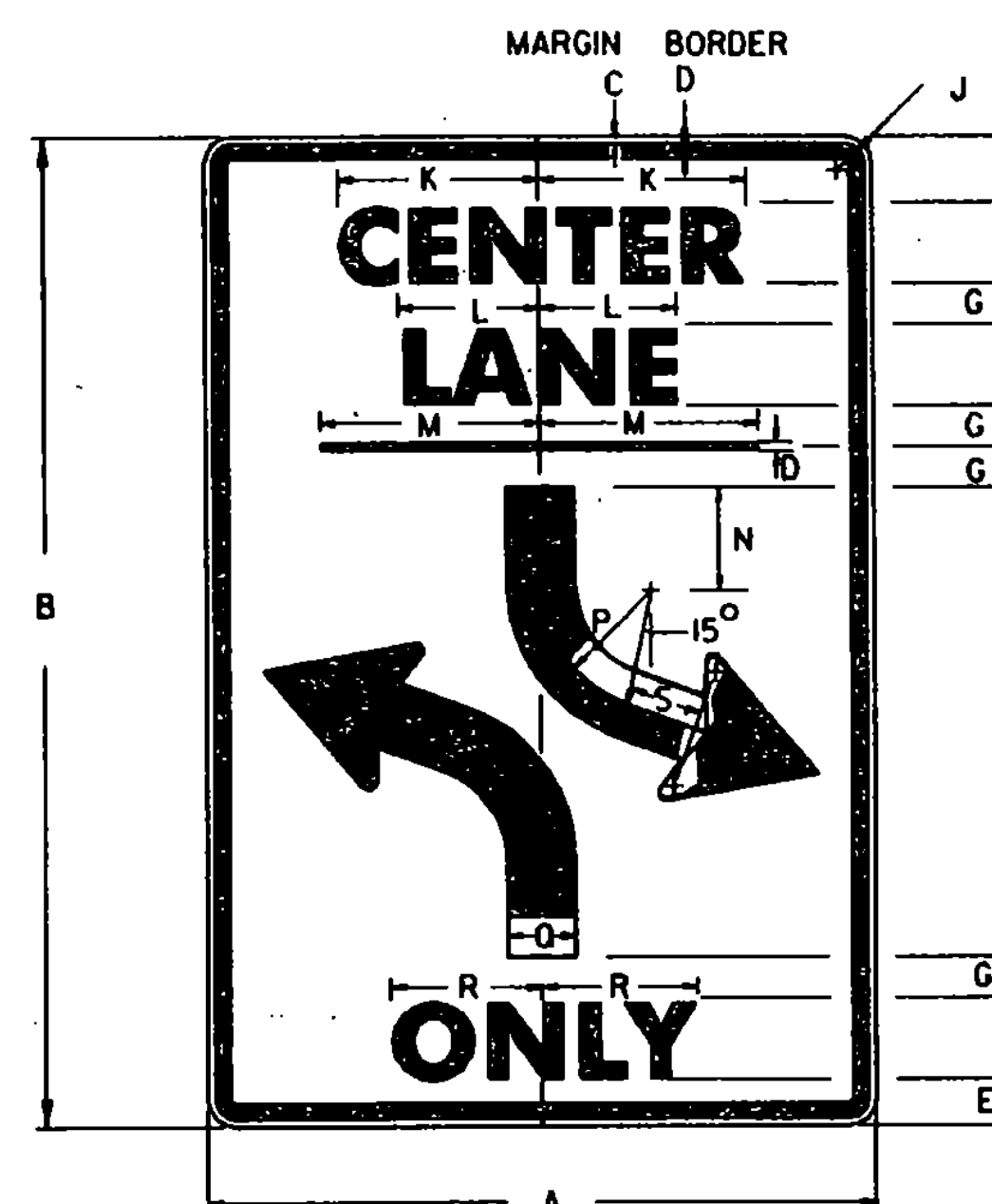
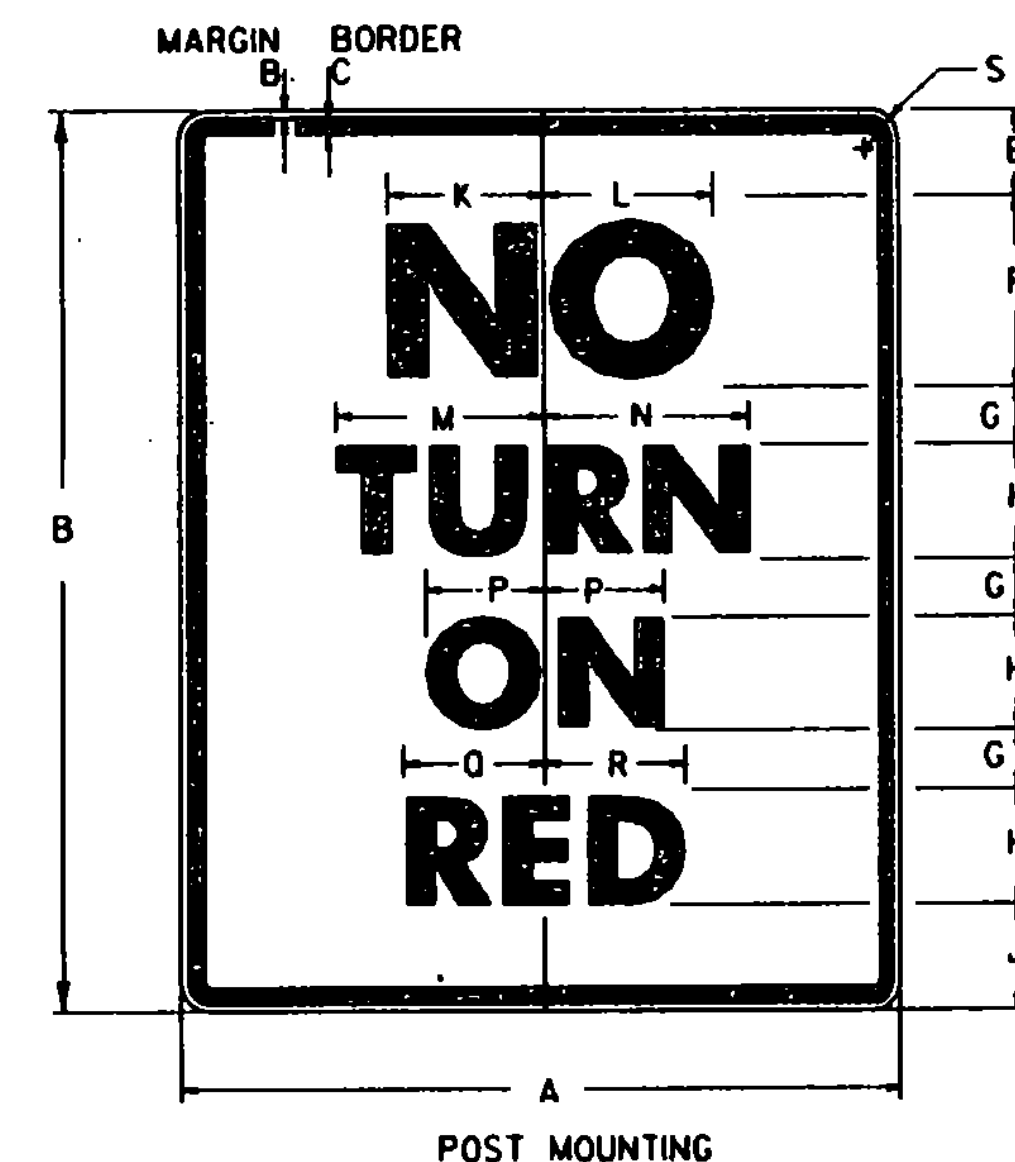
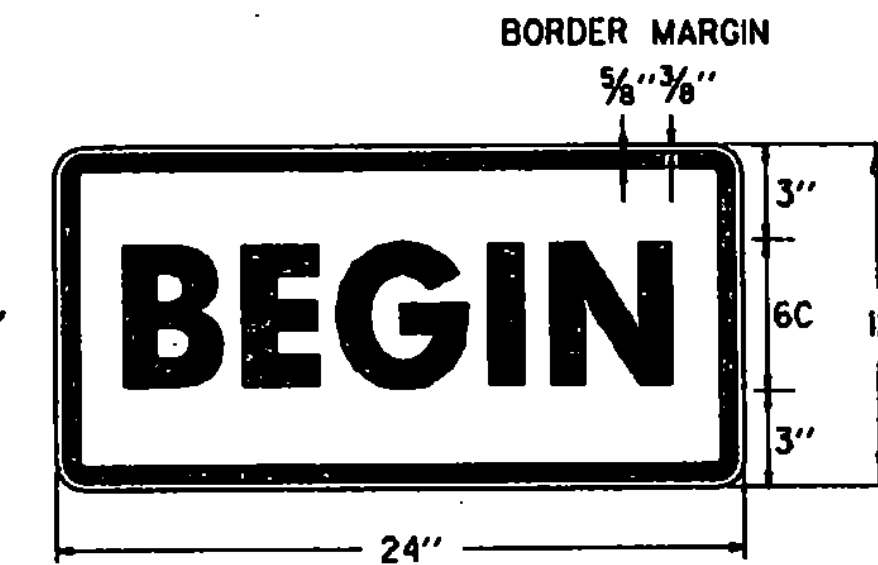
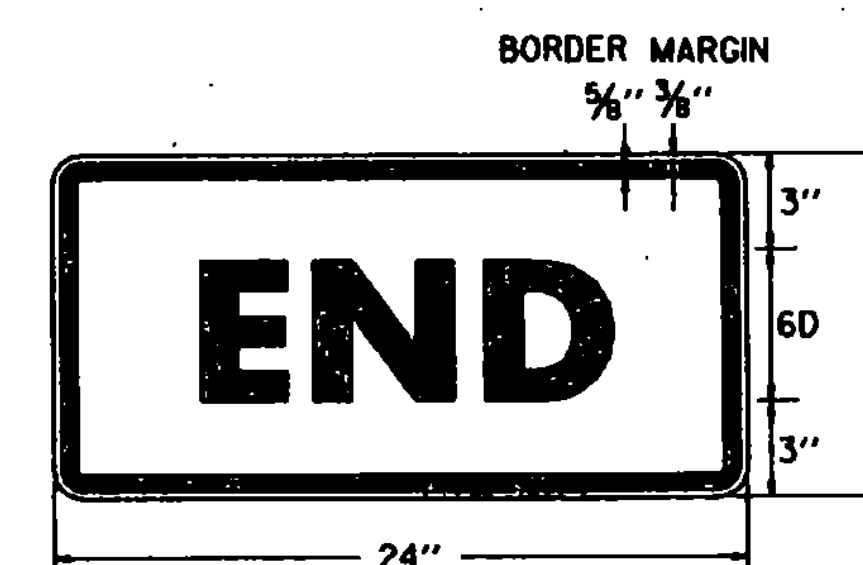
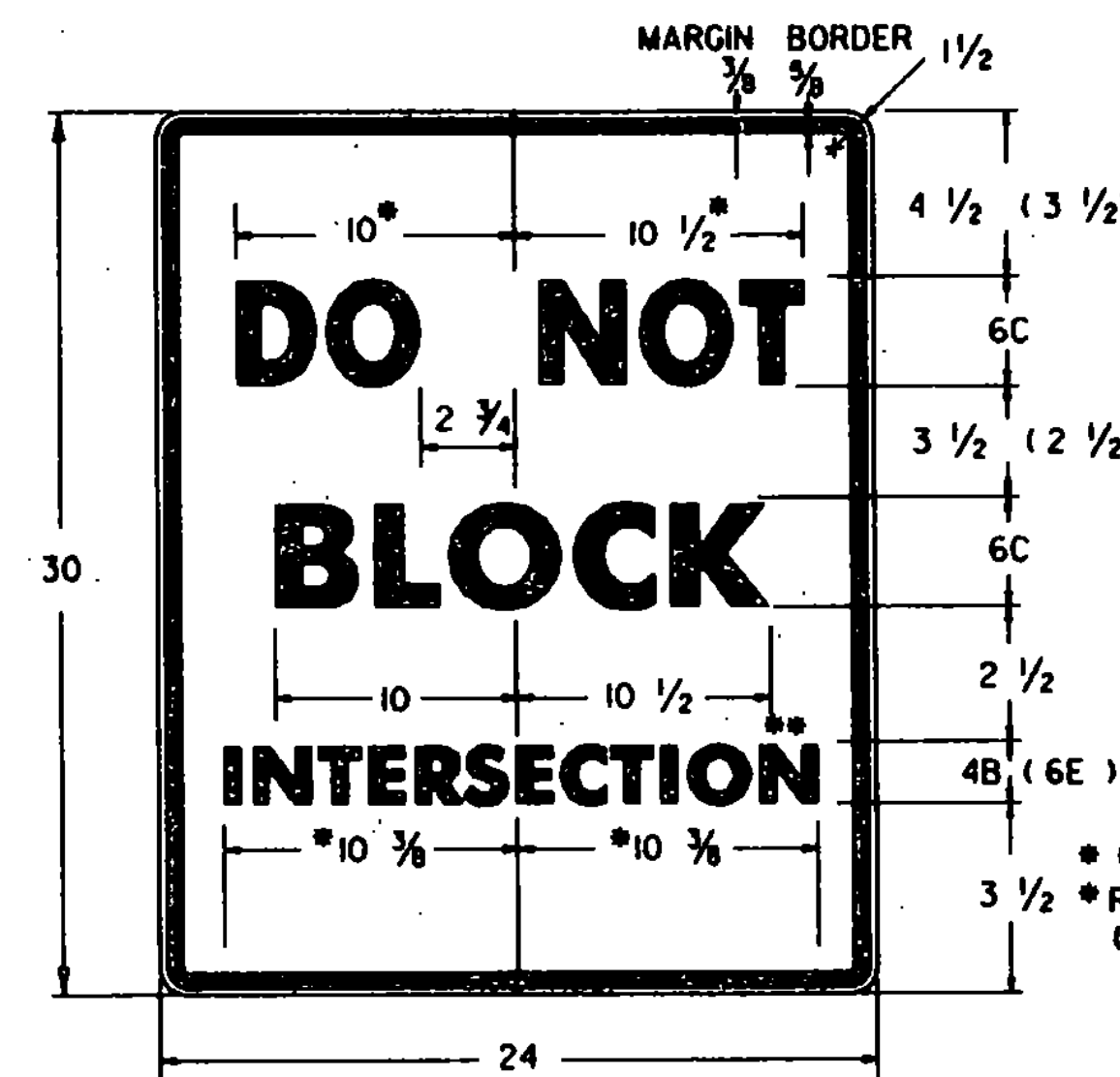
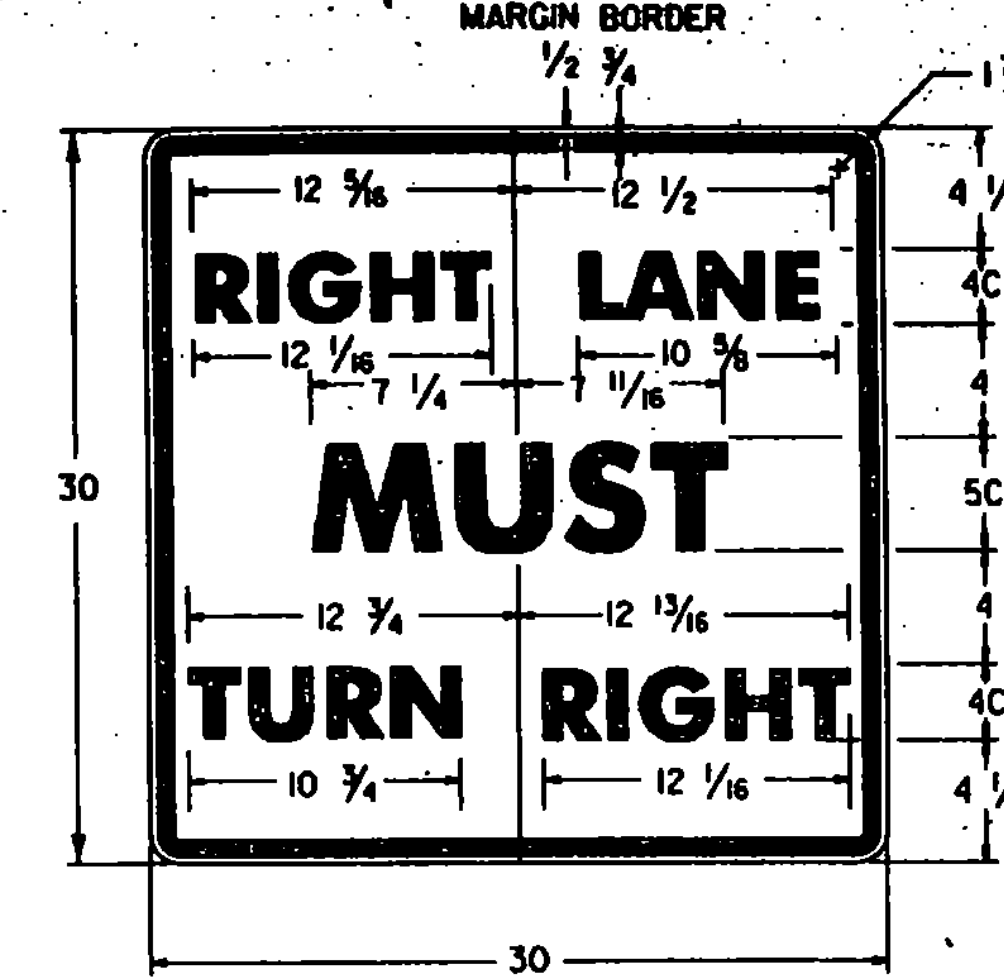
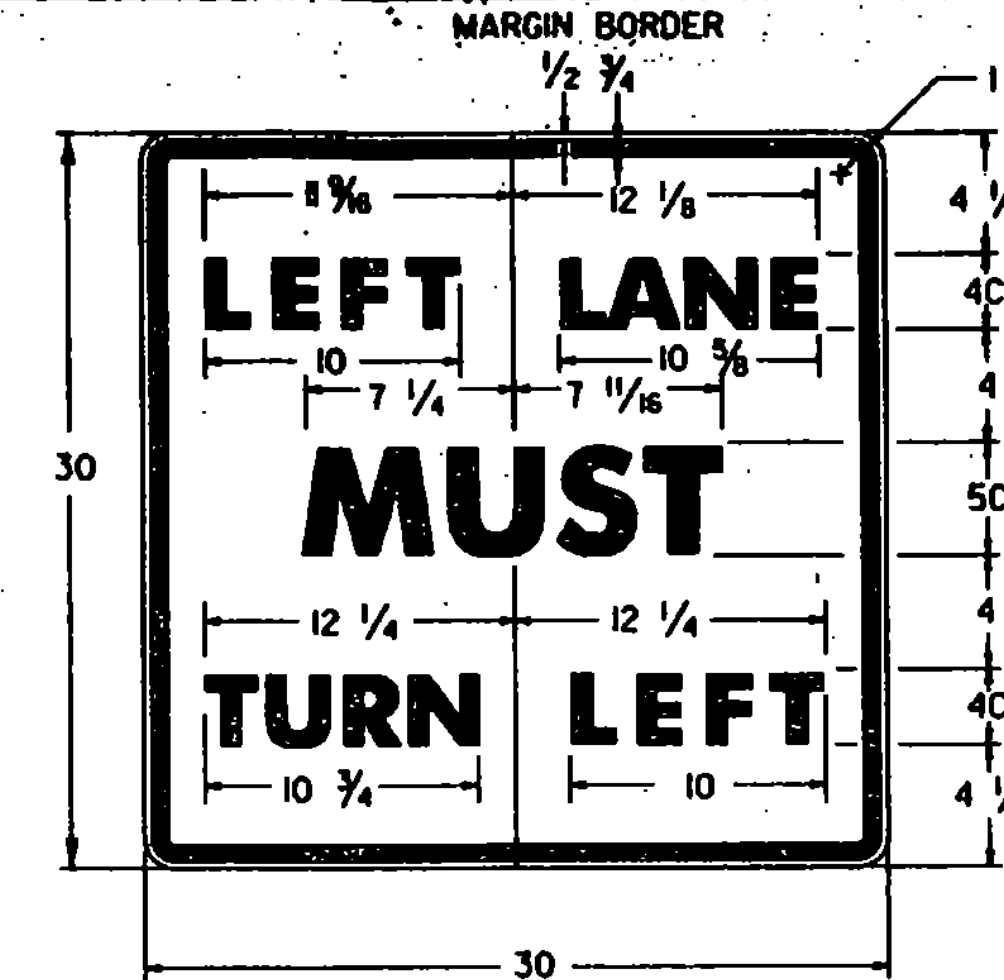
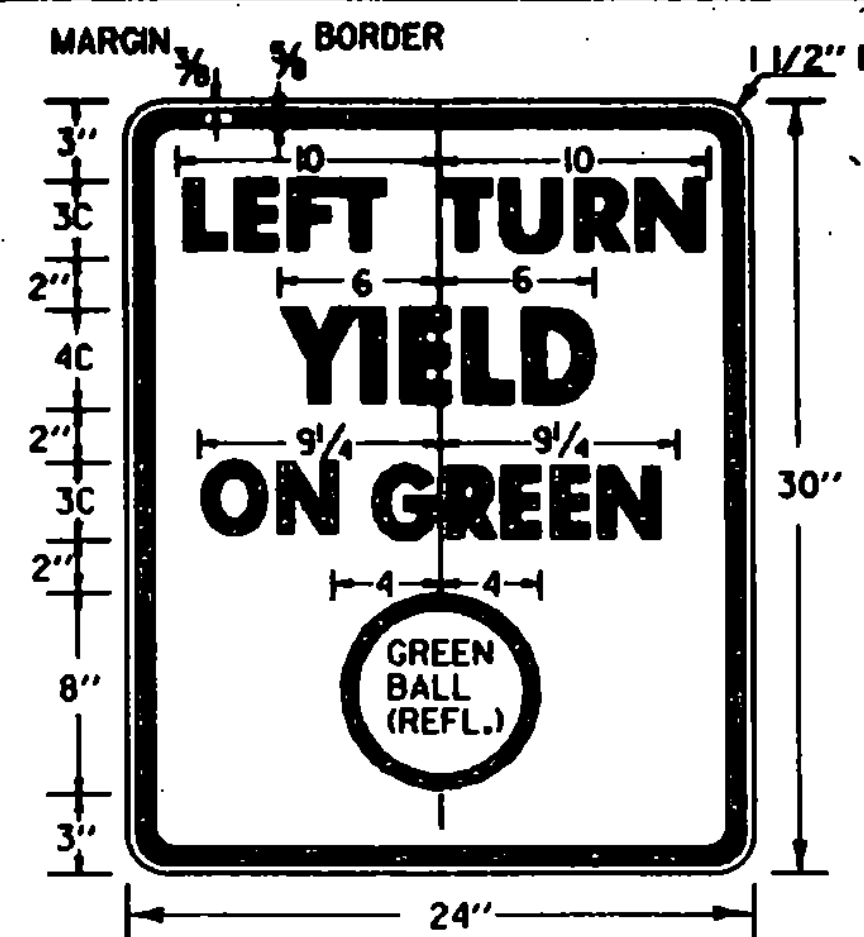
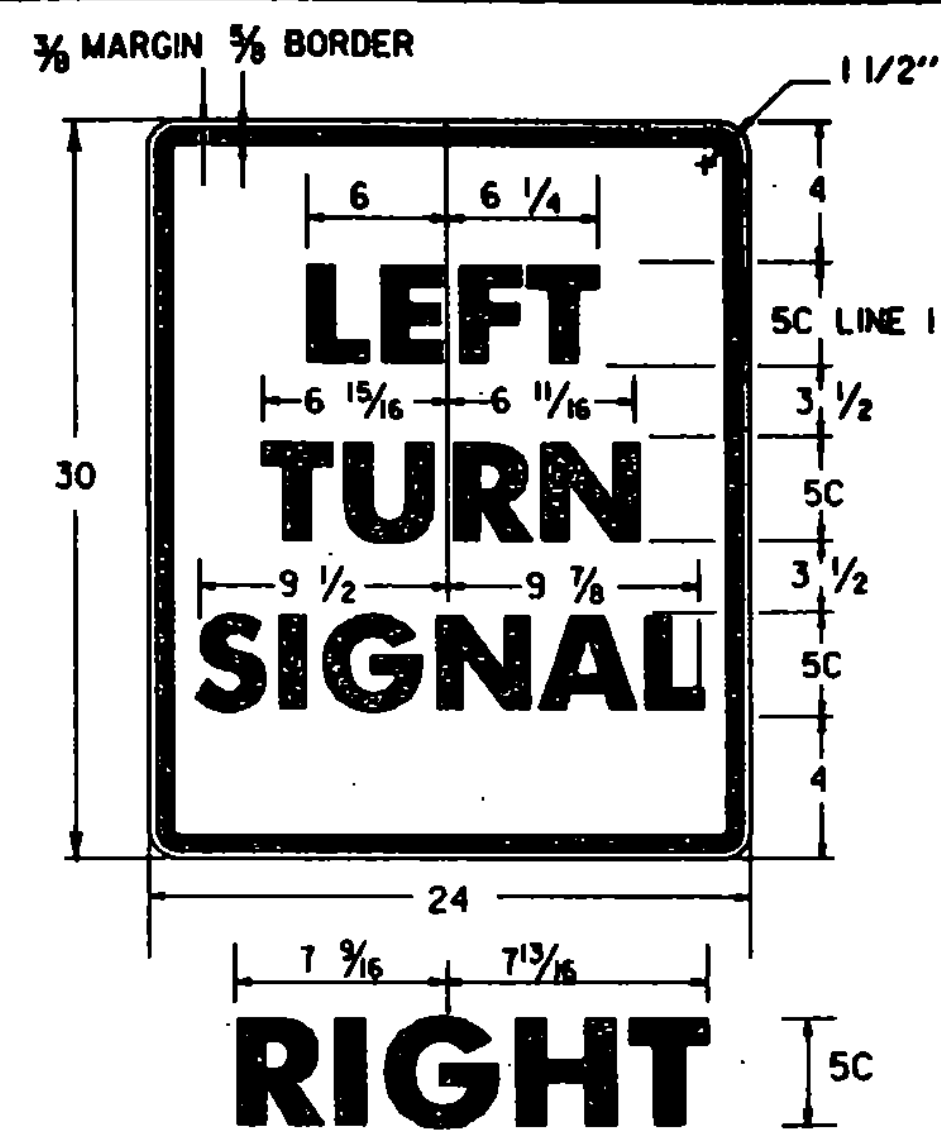
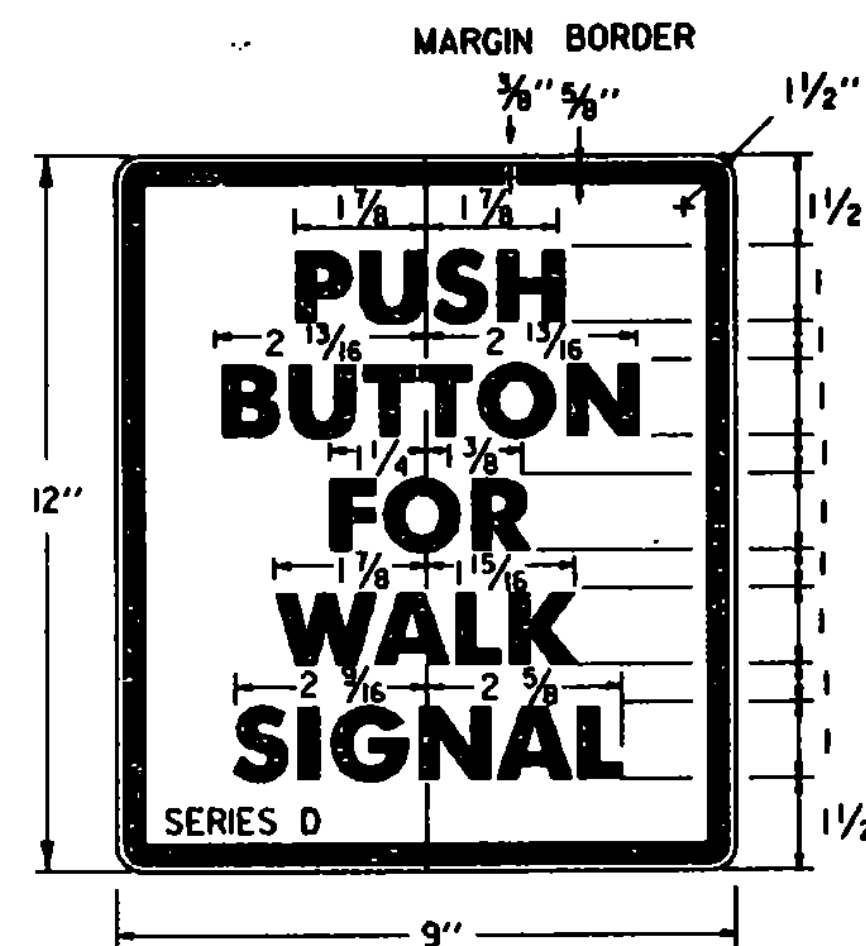
U.S. AND STATE ROUTE MARKER SIGN DETAILS



STANDARD
E-136



SIGN	A	B	C	D	E	F	G	H
STD.	24	36	3/8	5/8	4	5D	2 1/2	3D
SPECIAL	36	48	5/8	7/8	6	6D	4	4D
	J	K	L	M	N	O		
STD.	14	4 1/8	8 3/8	6	2 3/8	14 3/8		
SPECIAL	18	7 3/4	9 1/2	7 1/8	2 3/4	6		



**** DRIVE**
 *REDUCE SPACING 50 %
 (1) INDICATES DIMENSIONS FOR
 "DO NOT BLOCK DRIVE" SIGN

COLORS:
 THE REGULATORY SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT ON REFLECTORIZED WHITE BACKGROUND, UNLESS OTHERWISE NOTED. THE COLORS SHALL CONFORM WITH THE COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

MATERIALS:
 THE SIGN BASE MATERIALS USED FOR THE REGULATORY SIGNS SHOWN ON THIS SHEET MAY BE ANY OF THE FOLLOWING, OF THE MINIMUM THICKNESS NOTED.

24" x 12"		
24" x 24"		
24" x 30"		
24" x 36"		
36" x 36"		
36" x 48"		
9" x 12"	0.060"	0.080"
18" x 18"	1/2"	3/4"
18 GAGE	16 GAGE	14 GAGE

FLAT SHEET ALUMINUM
 HIGH DENSITY OVERLAID PLYWOOD
 GALVANIZED FLAT SHEET STEEL

THE REFLECTIVE MATERIAL FOR GROUND MOUNTED SIGNS SHALL BE FLAT TOP WHITE REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND OF THE SIGN. WHEN MOUNTED OVERHEAD, ALL SIGNS SHALL HAVE ENCAPSULATED LENS REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND OF THE SIGN. THE TEXT OF THE SIGNS MAY BE LETTERING FILM, SILK SCREENED OR HAND PAINTED. WHEN HAND PAINTED, POOR WORKMANSHIP SHALL BE CAUSE FOR REJECTION.

TEXT DESIGN:
 LETTERS, DIGITS, ARROWS, SPACINGS AND TEXT DIMENSIONS SHALL CONFORM WITH THE STANDARD ALPHABETS AND DESIGNS PRESCRIBED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

SPECIFICATIONS:
 REGULATORY SIGNS SHALL MEET THE VERMONT STANDARD SPECIFICATIONS FOR "TRAFFIC SIGNS".

REVISIONS AND CORRECTIONS

APRIL 25, 1988 - FHWA COMMENTS

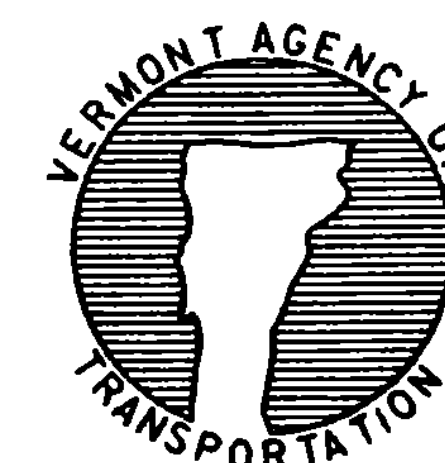
APPROVED

OCT. 30, 1987
 DATE

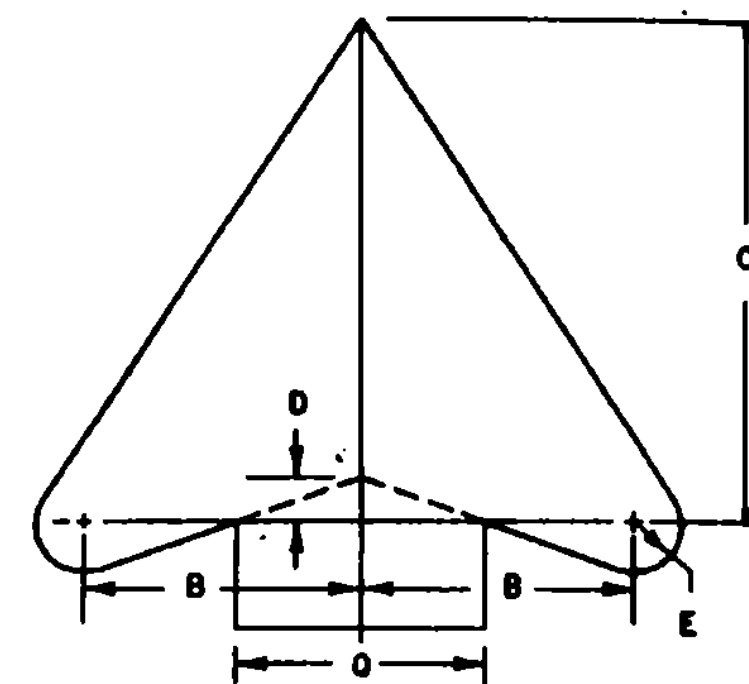
CHIEF ENGINEER

Gordon R. MacArthur
 DIRECTOR OF PLANNING
 AND PRE-CONSTRUCTION
 TRAFFIC AND SAFETY ENGINEER

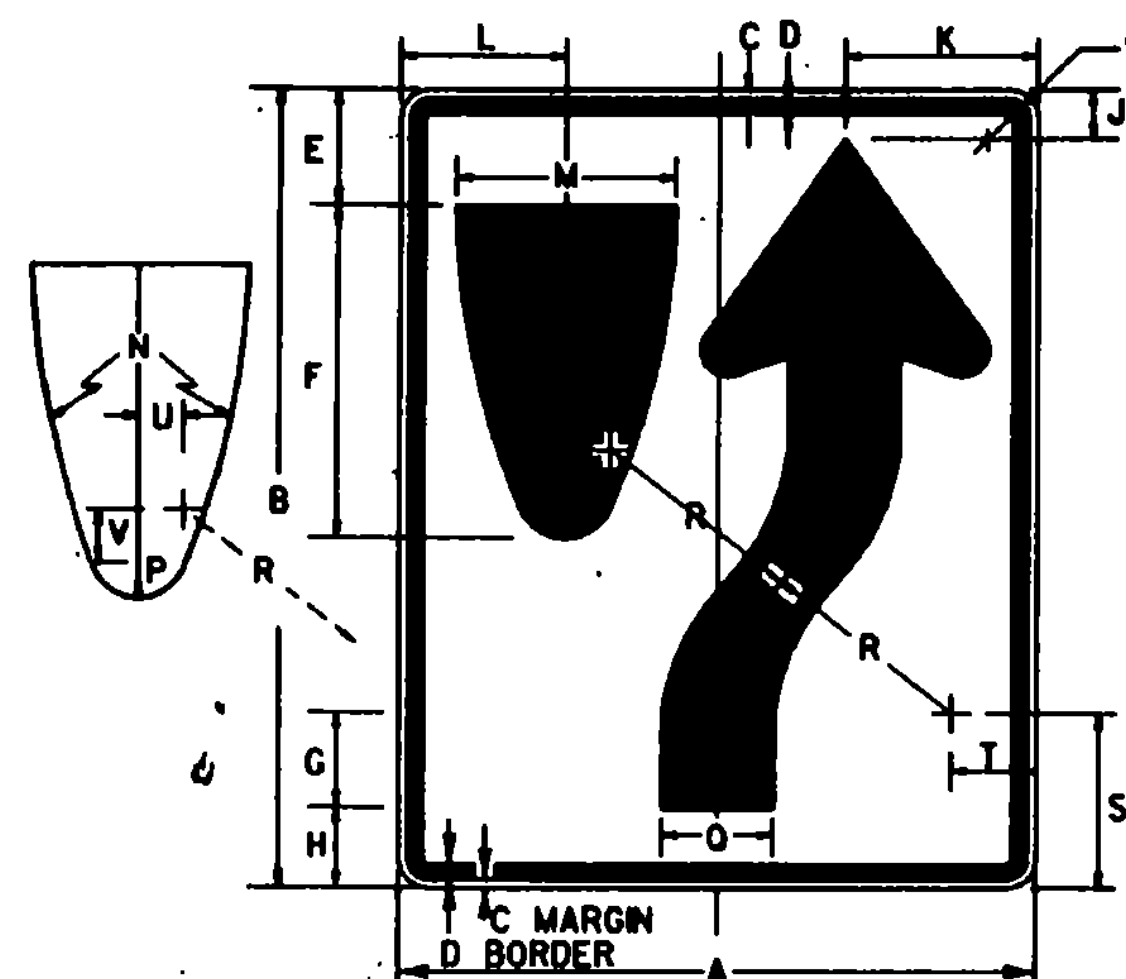
REGULATORY SIGN DETAILS



STANDARD
E-140



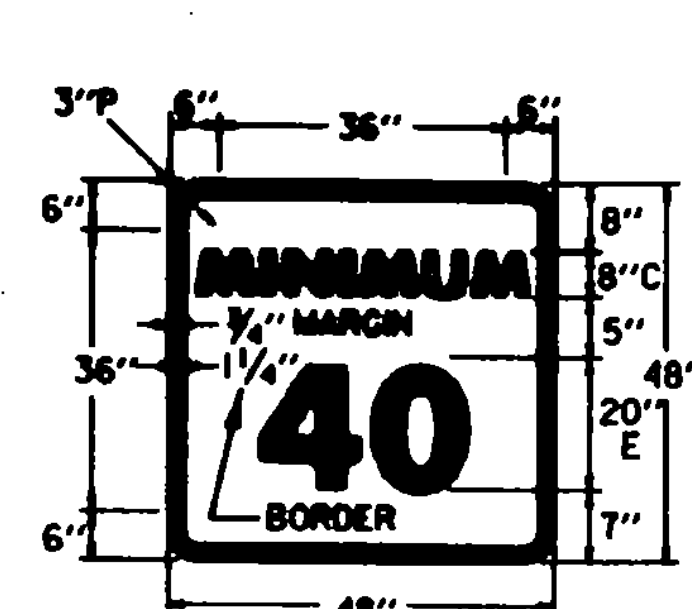
ARROW HEAD	DIMENSIONS (INCHES)				
SIZE	B	C	D	E	F
MINIMUM	18x24	3 1/2	6 1/8	1 1/8	1 1/8
STANDARD	24x30	4 1/2	8 1/8	1 1/8	1 1/8
EXPRESSWAY	36x48	6 1/2	12 1/8	1 1/8	1 1/8
FREEWAY	48x60	9 1/2	16 1/4	1 1/4	1 1/8



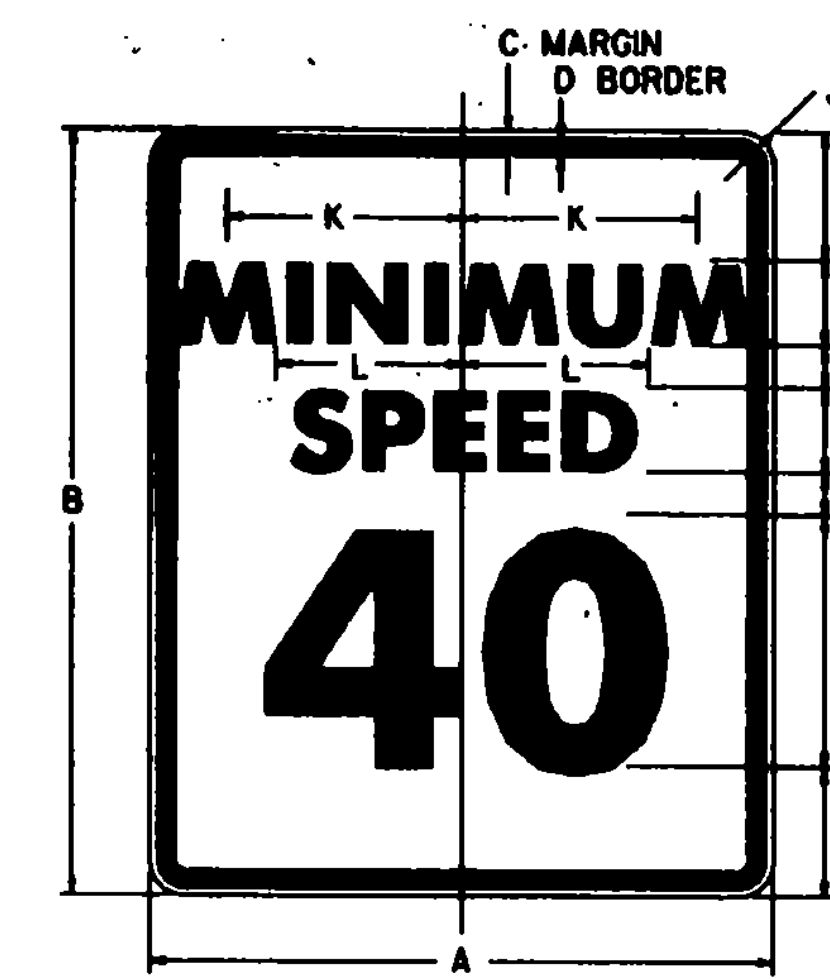
SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
MIN	18	24	3/8	5/8	3/8	9/8	1 1/8	2 1/4	1 1/8	5 1/2	
STD	24	30	3/8	5/8	4 1/4	12 1/2	2 1/2	3	1 1/8	7 3/8	
EXPWY	36	48	3/8	5/8	6 1/4	18 1/4	3 1/4	4 1/2	2 1/8	11 1/8	
FWY	48	60	3/4	1 1/4	9	25	5	6	3 3/4	14 13/16	
	L	M	N	P	Q	R	S	T	U	V	W
MIN	4 1/16	6	22 1/2	1 1/2	3	6 3/4	4 1/8	2 1/4	1 1/8	1 1/8	1 1/2
STD	6 1/4	8	30	2	4	9 5/8	3	1 1/8	2 13/16	1 1/2	
EXPWY	9 3/8	12	45	3	6	13 1/2	8 1/4	4 1/2	2	2 3/4	2 1/4
FWY	12 1/2	16	60	4	8	18	11	6	2 11/16	5	3

SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
MIN	18	24	3/8	5/8	3	3E	2	8E	1 1/2	7 3/8	5 1/2
STD	24	30	3/8	5/8	4	4E	2	10E	1 1/2	9 3/8	7 3/8
EXPWY	36	48	3/8	5/8	6	6E	5	14E	2 1/4	14 3/8	11
FWY	48	60	3/4	1 1/4	8	8E	4	20E	3	19 1/8	14 3/8

* OPTICALLY SPACE NUMERALS ABOUT VERTICAL CENTERLINE.

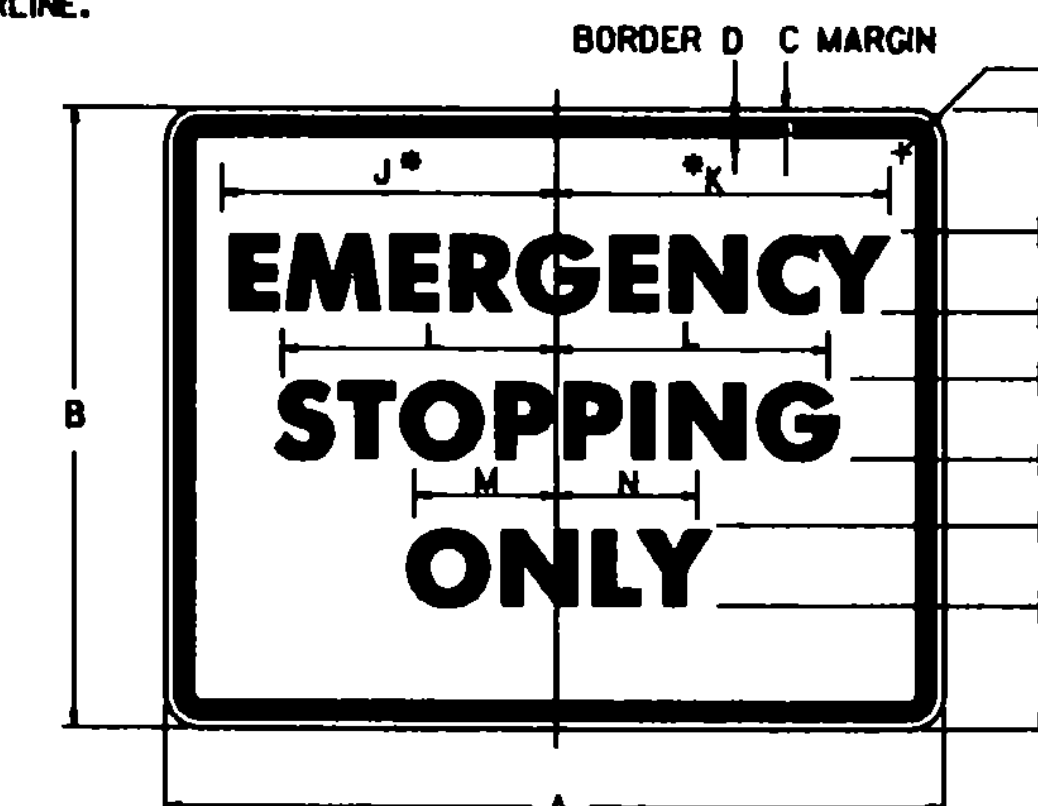


TO BE USED WITH "SPEED LIMIT 65 OR 55" SIGN-FWY ONLY.



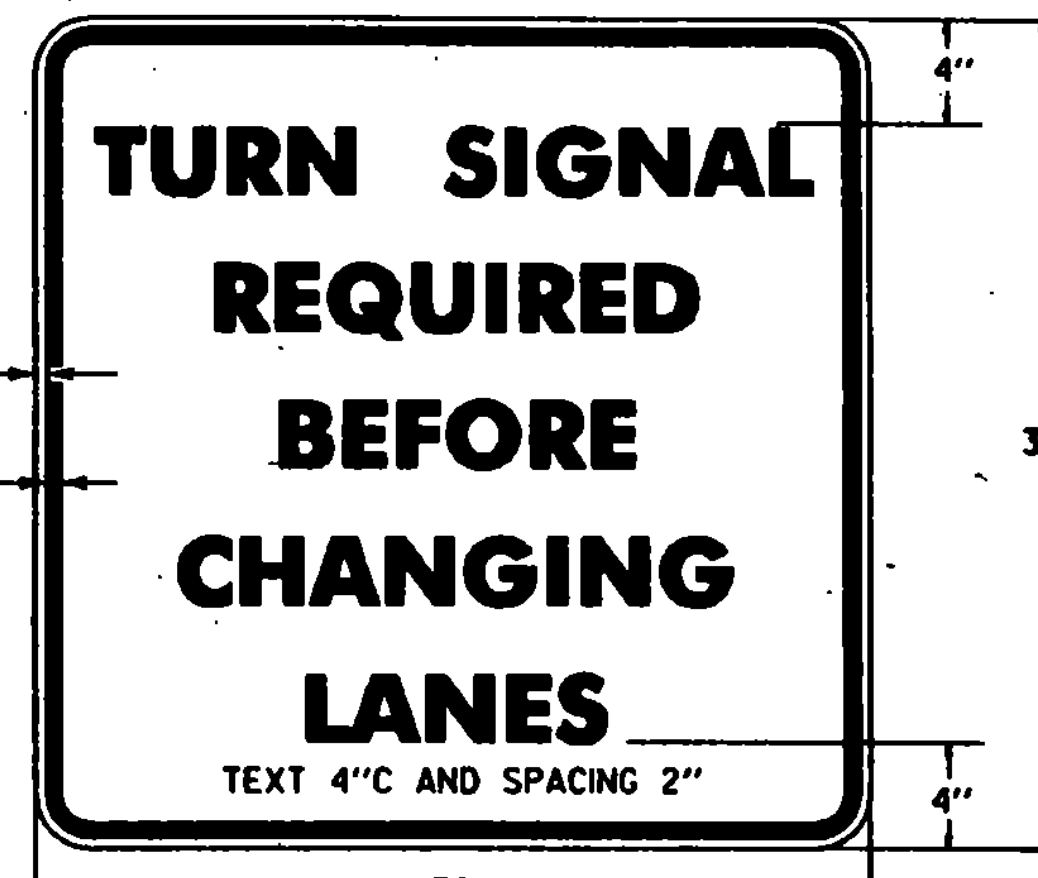
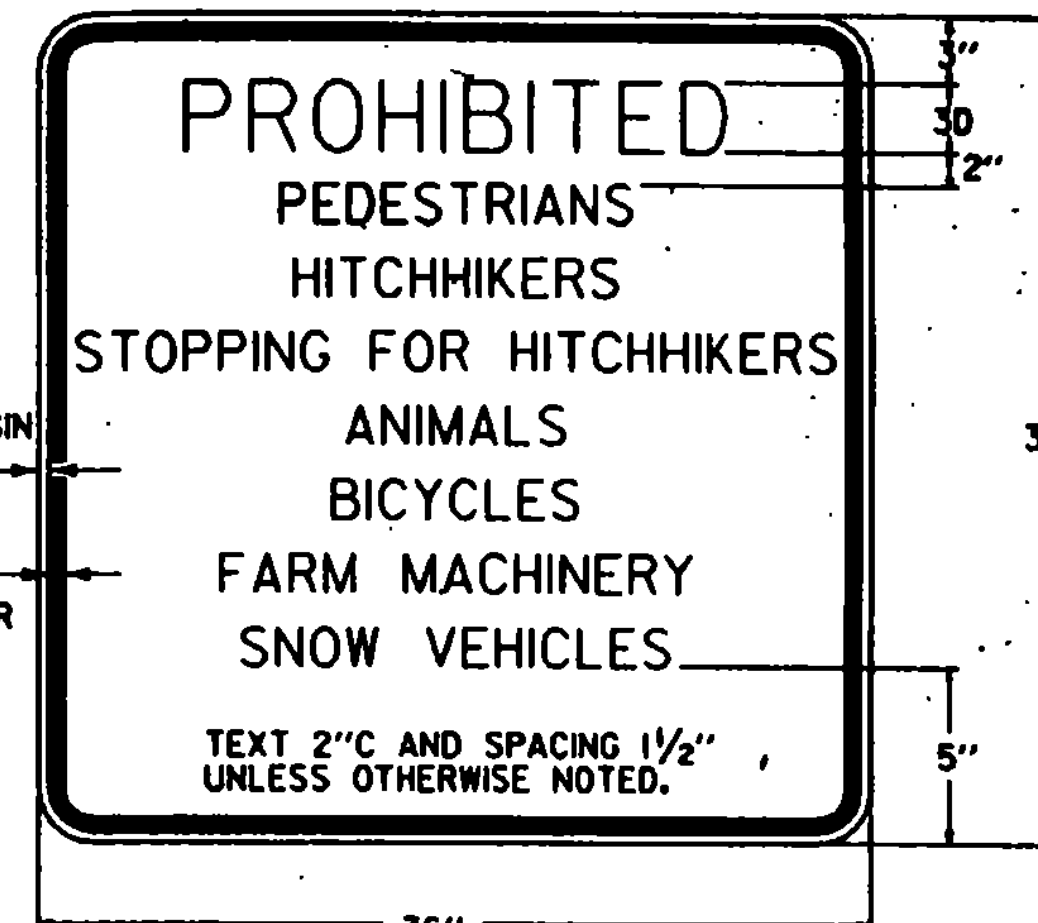
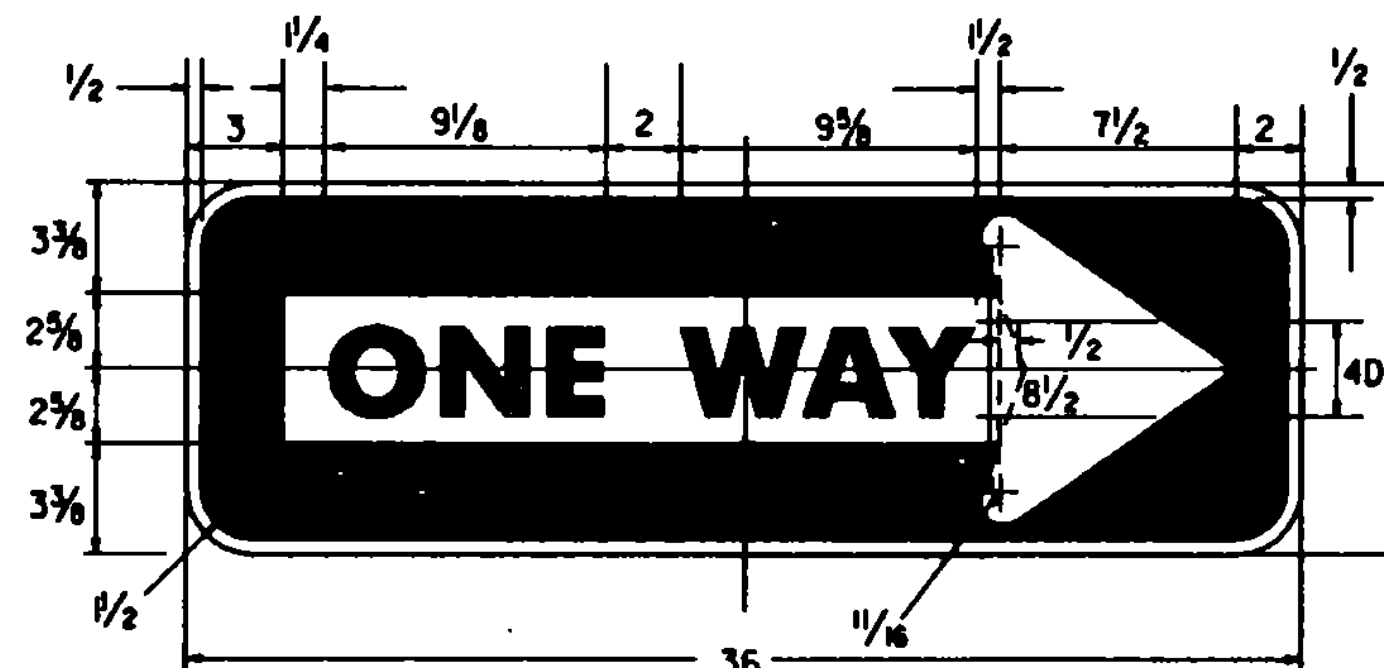
SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
MIN & STD	24	30	3/8	5/8	4	4C	2	10D	1 1/2	9 3/8	6 3/8
EXPWY	36	48	3/8	5/8	6	6C	5	14D	2 1/4	13 3/4	10 3/8
FWY	48	60	3/4	1 1/4	8	8C	6	16D	3	18 3/8	13 3/8

* OPTICALLY SPACE NUMERALS ABOUT VERTICAL CENTERLINE.



SIGN	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	L
EXPWY.	30	24	3/8	5/8	3 1/2	4C	2 1/2	4D	12 1/2	13	12 3/4
FWY.	48	36	3/8	5/8	5	6D	4	6D	20 3/8	21 1/8	19 1/8

* FOR FWY SIZE, REDUCE SPACING 50 %



COLORS:
THE REGULATORY SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT ON REFLECTORIZED WHITE BACKGROUND. THE COLORS SHALL CONFORM WITH THE COLORS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS AND APPROVED BY THE DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION.

MATERIALS:
THE SIGN BASE MATERIALS USED FOR THE REGULATORY SIGNS SHOWN ON THIS SHEET MAY BE ANY OF THE FOLLOWING OF THE MINIMUM THICKNESS NOTED.

	36" x 12"	36" x 36"	36" x 48"	48" x 36"	48" x 48"	48" x 60"
FLAT SHEET ALUMINUM	0.060"	0.060"	0.060"	0.060"	0.060"	0.060"
HIGH DENSITY OVERLAP PLYWOOD	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"
GALVANIZED FLAT SHEET STEEL	18 GAGE	16 GAGE	14 GAGE	14 GAGE	14 GAGE	14 GAGE

THE REFLECTIVE MATERIAL FOR GROUND MOUNTED SIGNS SHALL BE FLAT TOP WHITE REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND OF THE SIGN.
THE TEXT OF THE SIGNS MAY BE LETTERING FILM, SILK SCREENED OR HAND PAINTED. WHEN HAND PAINTED, POOR WORKMANSHIP SHALL BE CAUSE FOR REJECTION.

SPECIFICATIONS:
REGULATORY SIGNS SHALL MEET THE VERMONT STANDARD SPECIFICATIONS FOR "TRAFFIC SIGNS".

TEXT DESIGN:
LETTERS, DIGITS, ARROWS, SPACINGS, AND TEXT DIMENSIONS SHALL CONFORM WITH THE STANDARD ALPHABETS AND DESIGNS PRESCRIBED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

REVISIONS AND CORRECTIONS

APPROVED

OCT. 30, 1987
DATE

David B. Kelley
CHIEF ENGINEER
Arthur J. Goss
DIRECTOR OF PLANNING
AND PRE-CONSTRUCTION
Stephen A. McArthur
TRAFFIC AND SAFETY ENGINEER

REGULATORY SIGN DETAILS



STANDARD
E-142

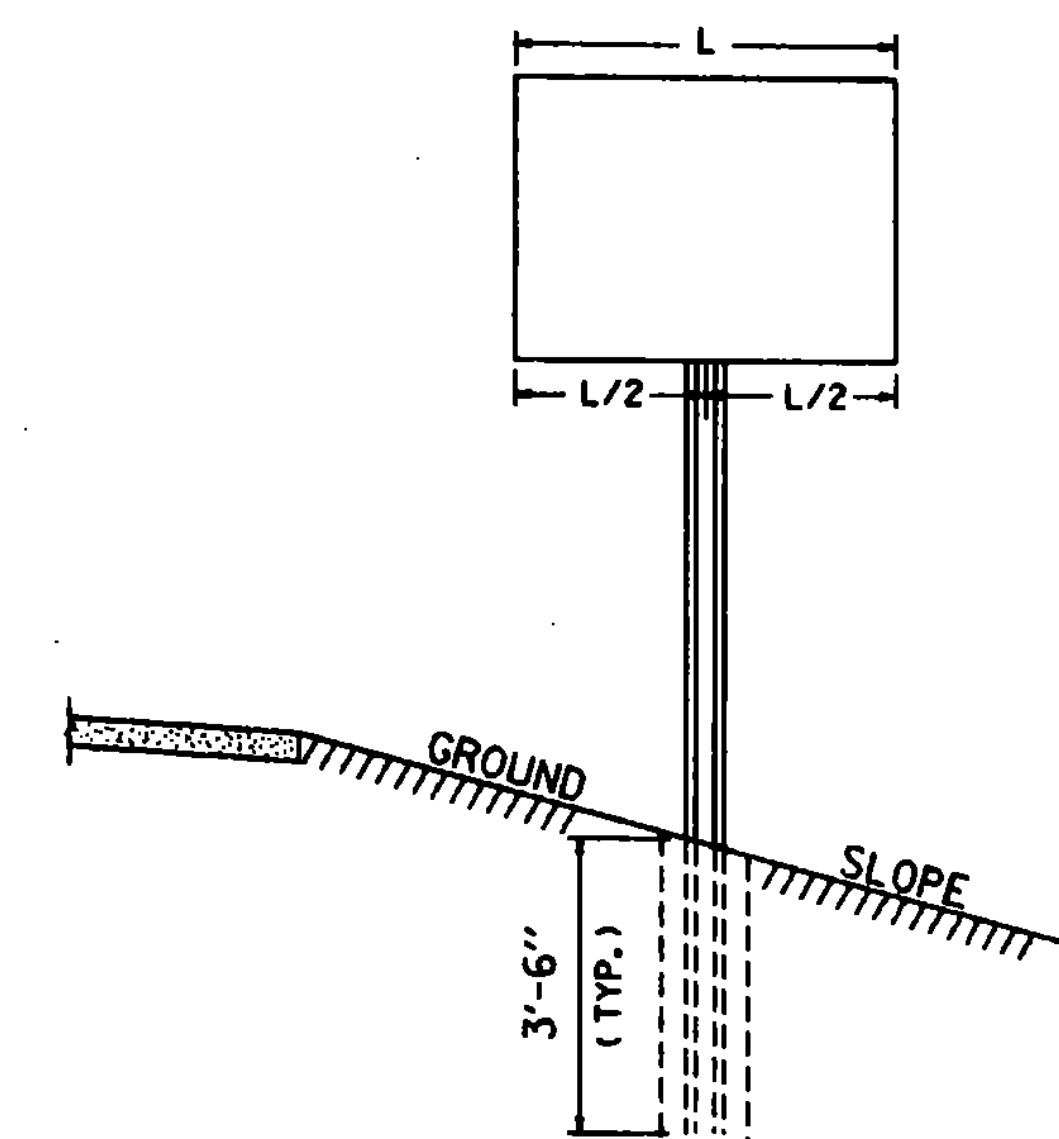
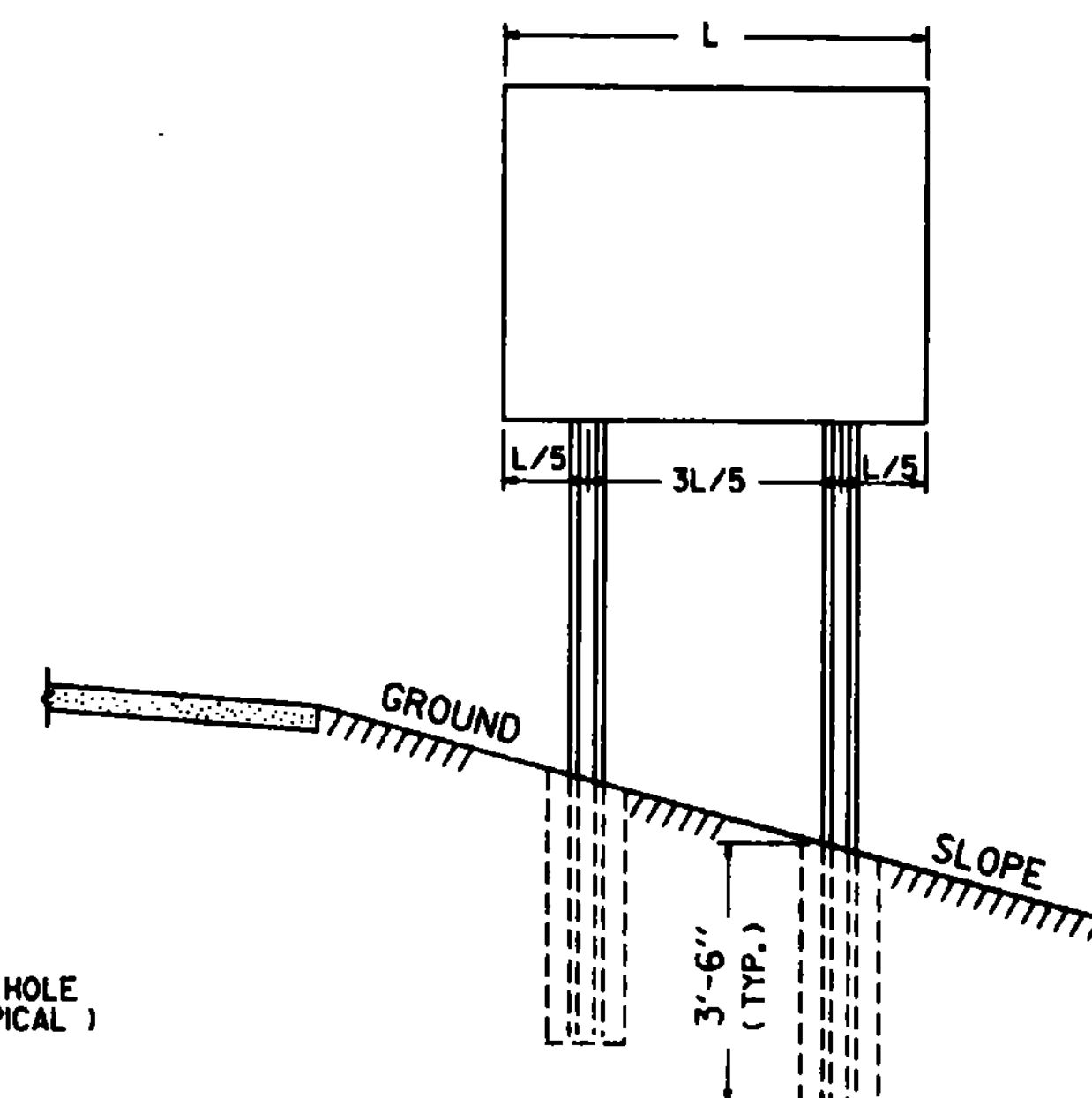
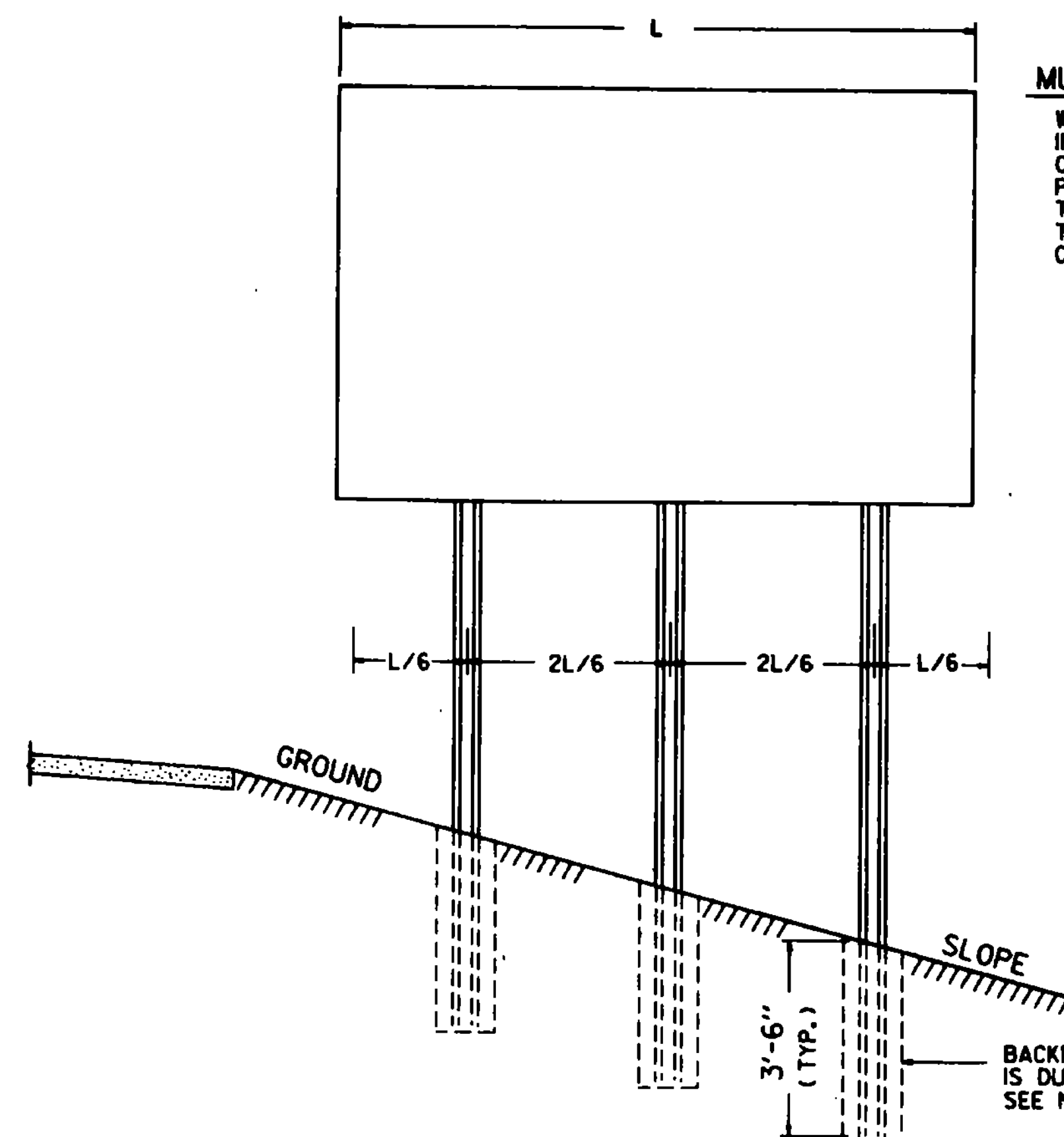
GENERAL NOTES

CONSTRUCTION METHODS - POSTS MAY BE DRIVEN OR SET IN A DUG HOLE AND BACKFILLED. IF DRIVEN, A DRIVING CAP SHALL BE USED. THE DUG HOLE INSTALLATION SHALL BE USED IN AREAS OF POOR SOIL CONDITIONS OR AS DIRECTED BY THE ENGINEER. BACKFILL SHALL BE COMPACTED AS DIRECTED BY THE ENGINEER.

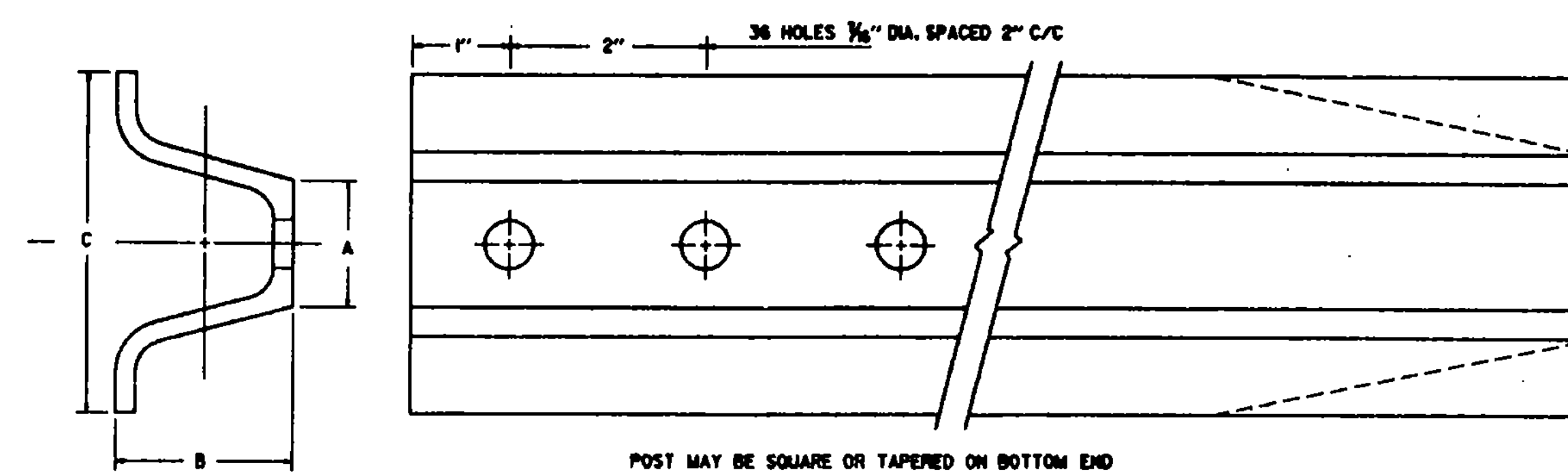
SIGN CLEARANCES - HORIZONTAL AND VERTICAL SIGN CLEARANCES SHALL BE AS SHOWN ON THE PLANS OR THE APPROPRIATE STANDARD SHEET.

MULTI-POST INSTALLATIONS

WHEN SIGN POSTS ARE INSTALLED WITH A POST SPACING OF LESS THAN 8 FEET, POST SIZES MUST BE SELECTED TO INSURE THAT WHEN ACTING TOGETHER THE POSTS DO NOT CREATE A HAZARD.



POST SPACING DETAILS



SINGULAR 2 LB AND 2.5 LB PER FOOT POSTS SHALL ONLY BE USED IN URBAN AREAS.

POST SELECTION CHART		
SIGN AREA (FT ²) x H (FT) (SV (SELECTION VALUE))		
POST SIZE	SV	DESIGN CRITERIA
2 LB/FT. (ONE POST INSTALLATION)	32	WIND SPEED = 60 MPH (10-YEAR MEAN RECURRENCE INTERVAL) WIND PRESSURE = 12 PSF STEEL MIN YIELD F _y = 50,000 PSI ALLOWABLE STRESS = (1.4) 0.55 F _y
2 LB/FT. (TWO POST INSTALLATION)	62	
2.5 LB/FT.	77	
3 LB/FT.	107	

POST SIZE POUNDS PER LINEAR FOOT	DIMENSIONS			PLASTIC SECTION MODULUS, Z
	A	B	C	
2	1 9/32"	1 3/64"	3 1/16"	0.26 IN. ³
2 1/2	1 9/32"	1 3/64"	3 1/16"	0.40 IN. ³
3	1 5/16"	1 7/8"	3 1/2"	0.53 IN. ³

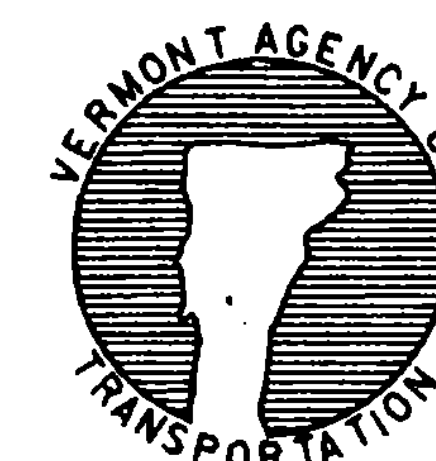
SIMILAR DIMENSIONS ARE ACCEPTABLE, HOWEVER PLASTIC SECTION MODULUS VALUES SHALL NOT BE EXCEEDED.

REVISIONS AND CORRECTIONS
MARCH 1, 1988 - FHWA REVIEW COMMENTS

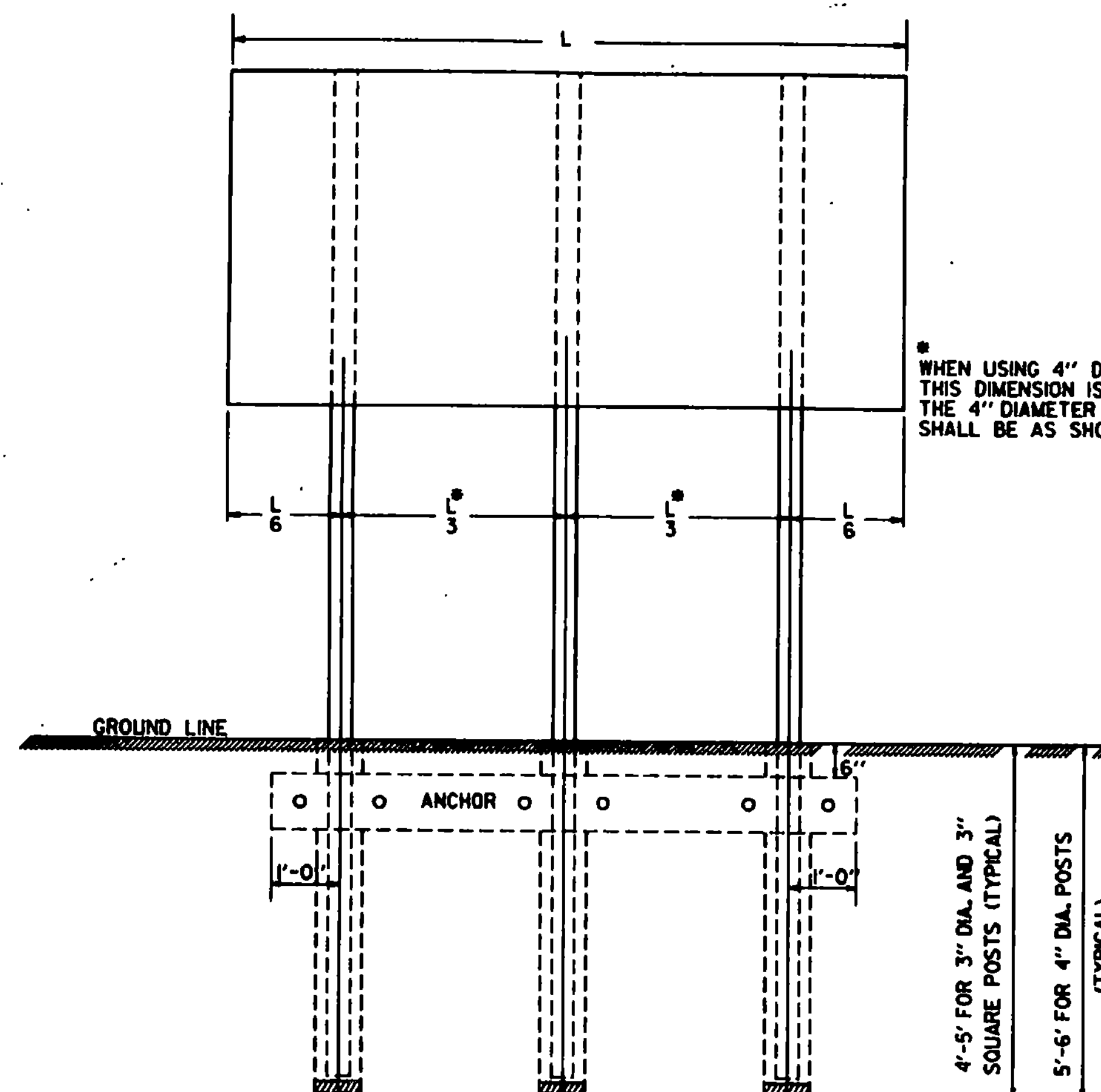
APPROVED

SEPT. 10, 1987
DATE
David W. Kelley
CHIEF ENGINEER
Arthur J. MacArthur
DIRECTOR OF PLANNING
AND PRECONSTRUCTION
Gordon B. MacArthur
TRAFFIC AND SAFETY ENGINEER

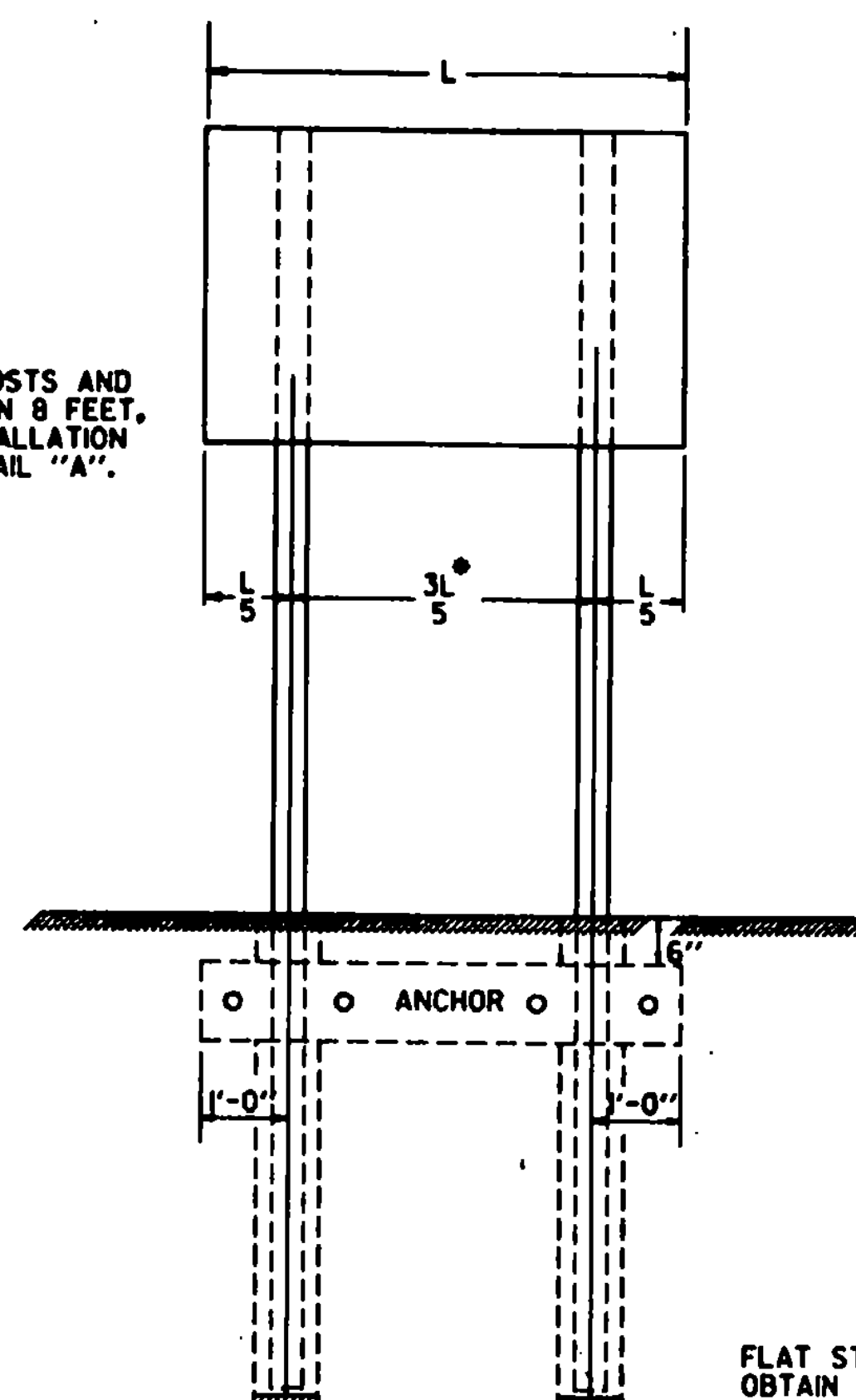
FLANGED CHANNEL STEEL SIGN POST



STANDARD
E-160

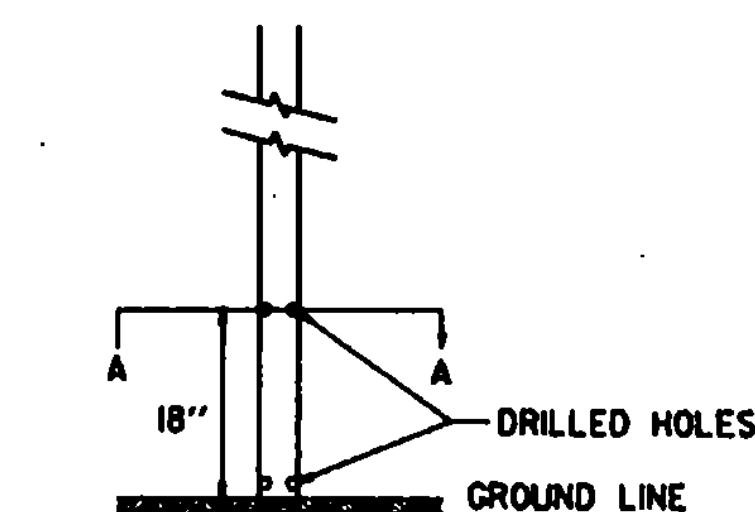
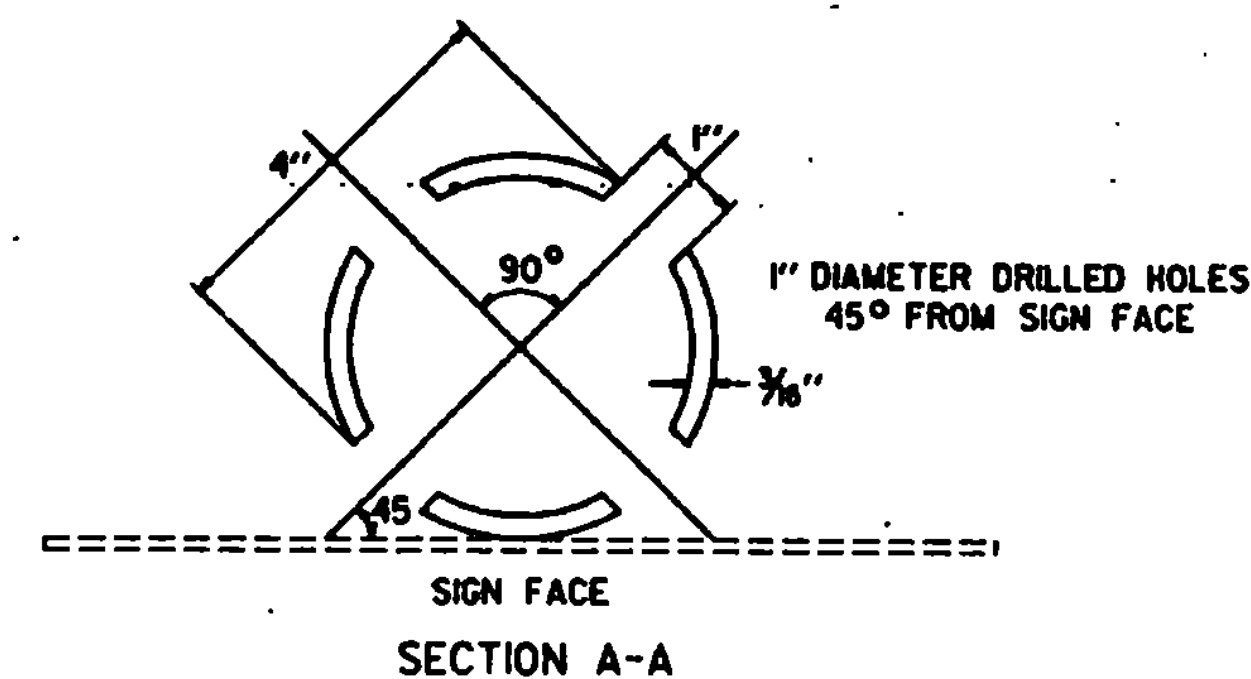
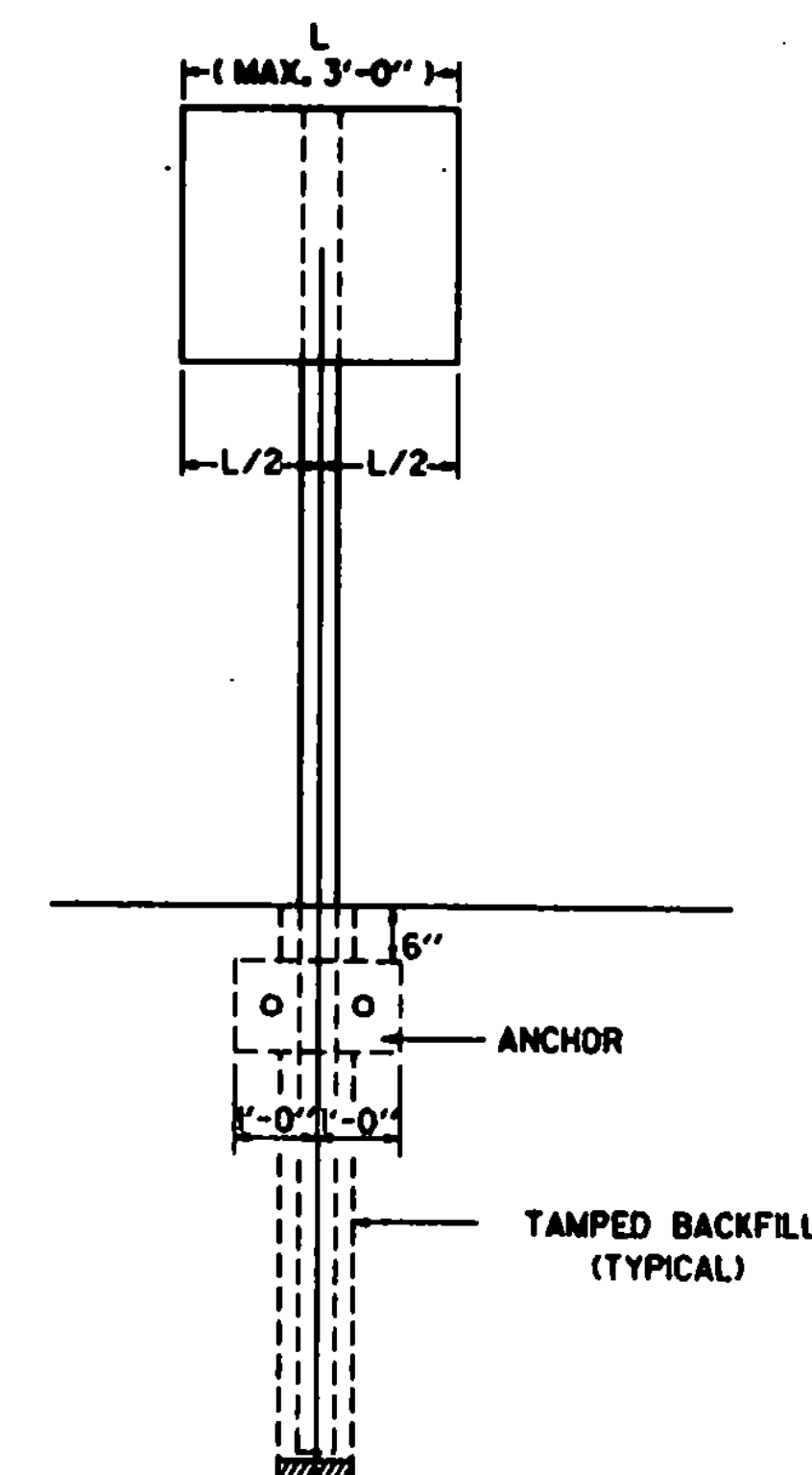


WHEN USING 4" DIAMETER POSTS AND THIS DIMENSION IS LESS THAN 8 FEET, THE 4" DIAMETER POST INSTALLATION SHALL BE AS SHOWN IN DETAIL "A".

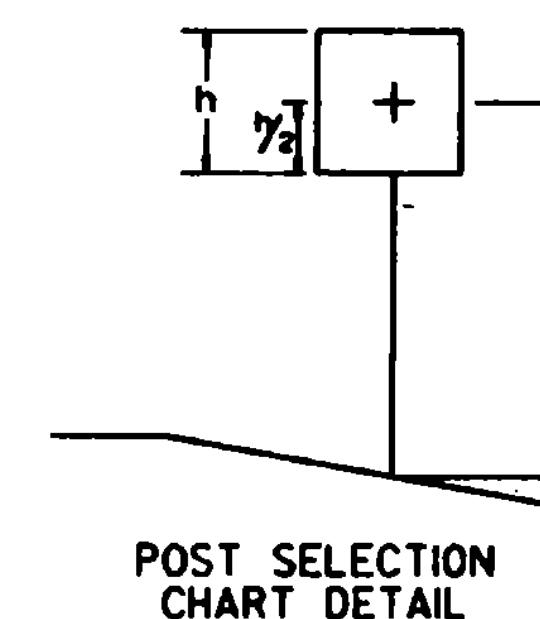


FLAT STONE TO OBTAIN MORE BEARING AREA DURING THE INSTALLATION PHASE

IN AREAS WHERE LEDGE ROCK IS ENCOUNTERED POSTS WILL BE SET AND GROUTED 24" DEEP IN THE LEDGE UNLESS THE POSTS PENETRATE THE GROUND 4'.



DETAIL A
4" DIAMETER POST
(MODIFIED)



POSTS THE POSTS FOR THESE INSTALLATIONS SHALL BE EXTRUDED TUBULAR POSTS OF ALUMINUM ALLOY 6061-T6.

HARDWARE THE ASSEMBLY HARDWARE USED TO FASTEN A SIGN TO THE POSTS SHALL BE ALUMINUM OR STAINLESS STEEL OF A STANDARD COMMERCIAL DESIGN.

ANCHORS USE TWO (2) PIECES OF 2" x 12" ROUGH PLANK. PLANKS, UNLESS OTHERWISE NOTED, SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SECTION 728.02

ERECTION ALL POSTS SHALL BE PLUMB AND LOCATED AS SPECIFIED BY DRAWINGS OR BY THE ENGINEER IN THE FIELD. LOCKNUTS ON 3/4" x 16 ALUMINUM POST BOLT CLIPS SHALL BE TORQUED TO 225 INCH POUNDS USING DRY, CLEAN, UNLUBRICATED THREADS. WHERE ALUMINUM SURFACES ARE TO BE PLACED IN CONTACT WITH WOOD, THEY SHALL BE GIVEN A THICK COAT OF AN ALKALI-RESISTANT BITUMINOUS PAINT MEETING THE REQUIREMENTS OF MILITARY SPECIFICATION MIL-P-6883, WHICH SHALL BE DRY BEFORE INSTALLATION.

THE HOLE SHALL BE CAREFULLY DUG AND THE POST SET TO THE DEPTH SPECIFIED ABOVE. POST SHALL NOT BE DRIVEN. THE BACKFILL MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF APPROVED GRAVEL OR SHALL BE A MATERIAL APPROVED BY THE ENGINEER. COMPACTION OF THE BACKFILL WILL BE DONE AS DIRECTED BY THE ENGINEER.

POST WEIGHTS		
POST DIAMETER	WALL THICKNESS	WEIGHT PER FT.
3" ROUND	3/8"	1.9 LBS
4" ROUND	3/8"	2.6 LBS
3" SQUARE	3/8"	2.5 LBS

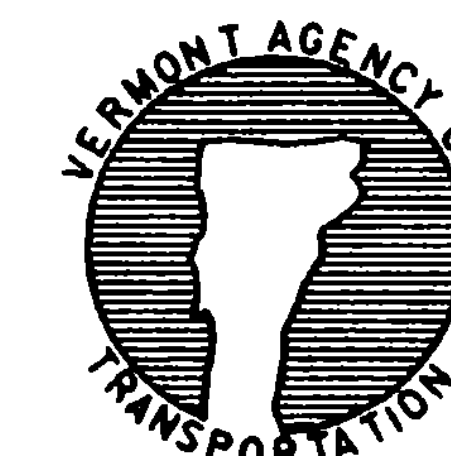
POST SELECTION CHART		
SIGN AREA (FT ²) x H (FT.) = SV (SELECTION VALUE)		
POST SIZE	SV (FT. ³)	DESIGN CRITERIA
3" DIA.	257	WIND VELOCITY = 60 MPH (10 YEAR MEAN RECURRENCE INTERVAL) WIND PRESSURE = 12 PSF, ALUMINUM F _y = 24,000 PSI, ALLOWABLE STRESS = 1.4 (24,000) PSI
4" DIA. (MODIFIED)	315	
3" SQUARE TUBE	350	
4" DIA.	477	

USE ON SINGLE POST INSTALLATIONS ONLY

REVISIONS AND CORRECTIONS
MARCH 1, 1988 FHWA REVIEW COMMENTS

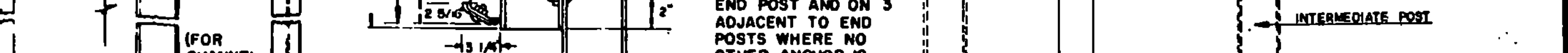
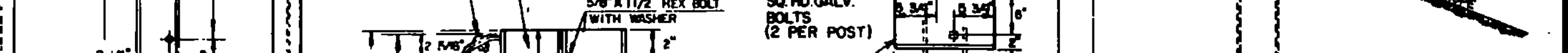
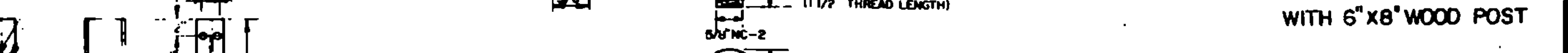
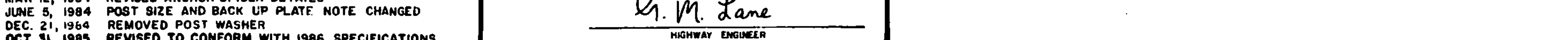
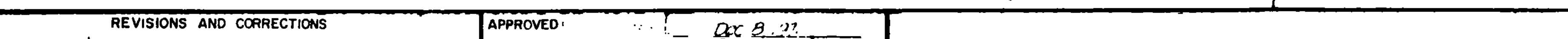
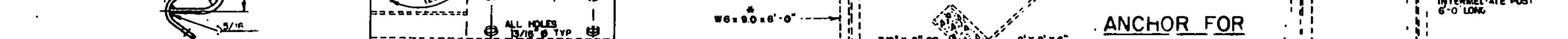
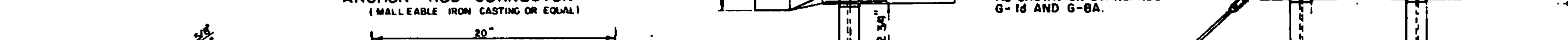
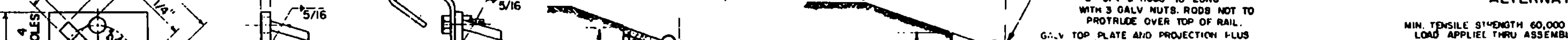
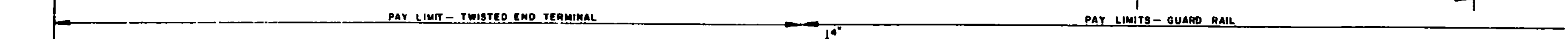
APPROVED
SEPT. 10, 1987
DATE
David W. Kelley
CHIEF ENGINEER
Arthur J. Ryan
DIRECTOR OF PLANNING
AND PRE-CONSTRUCTION
Gordon B. MacArthur
TRAFFIC AND SAFETY ENGINEER

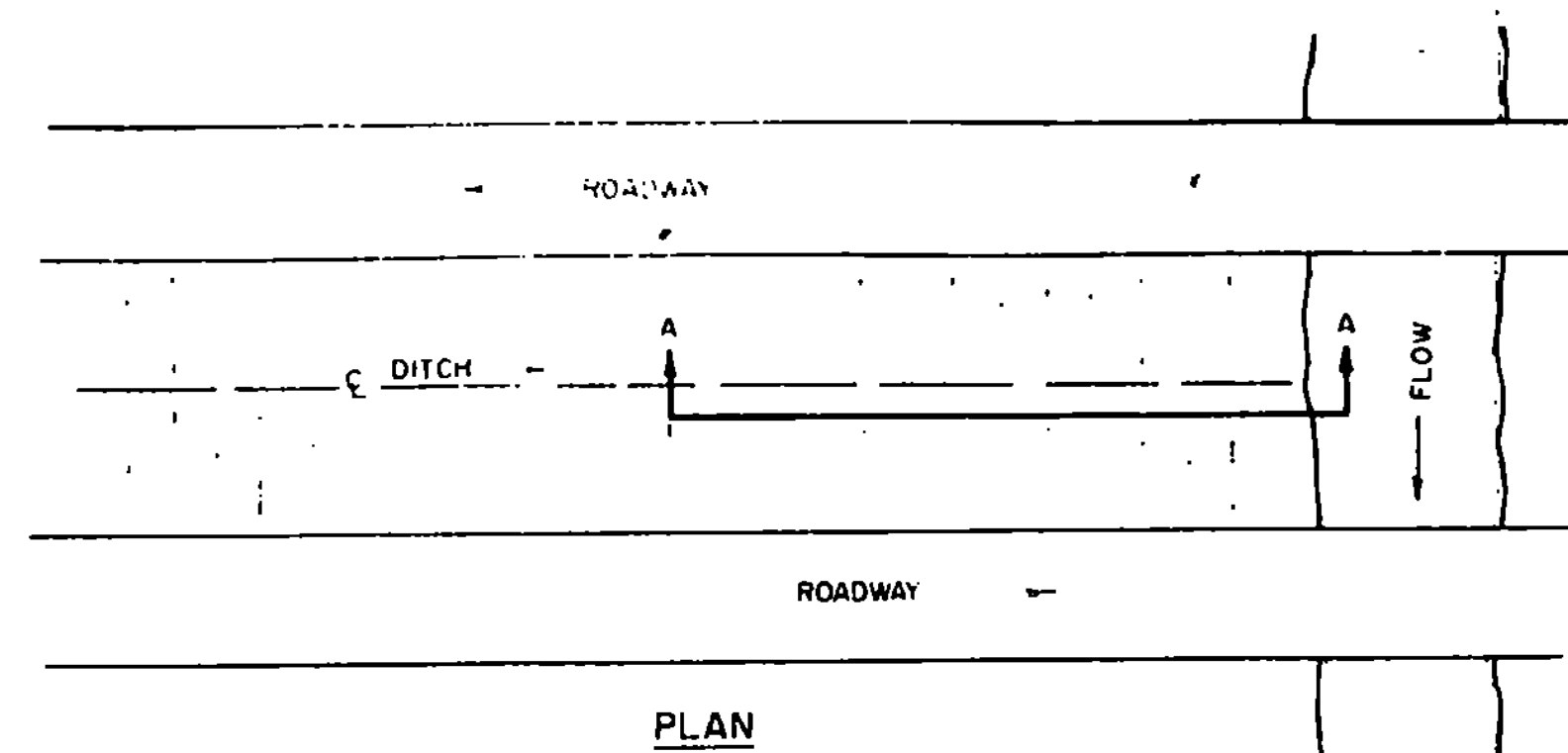
TUBULAR ALUMINUM SIGN POST



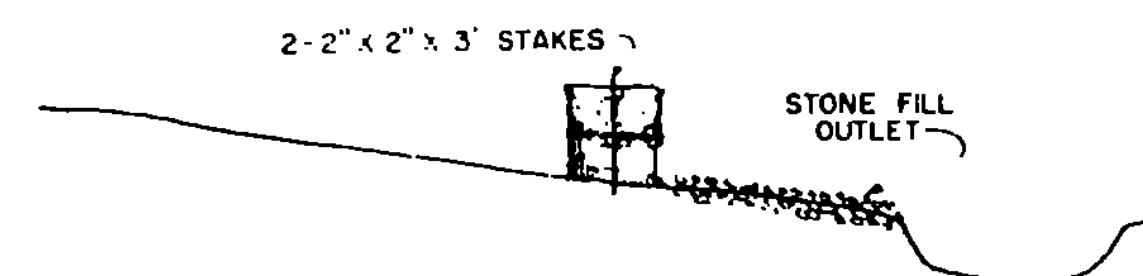
STANDARD
E-162

STRENGTH - THE RAIL ELEMENT SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF THE ABOVE
THE POST CONNECTION SHALL WITHSTAND A 5000 POUND SIDE PULL IN EITHER DIRECTION.
STANDARD STEEL BEAM TO BE 12 GAUGE AND THE HEAVY DUTY TO BE 10 GAUGE.





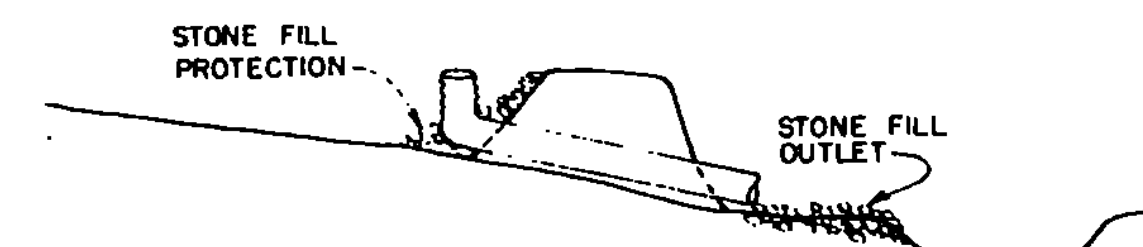
1. BALED HAY



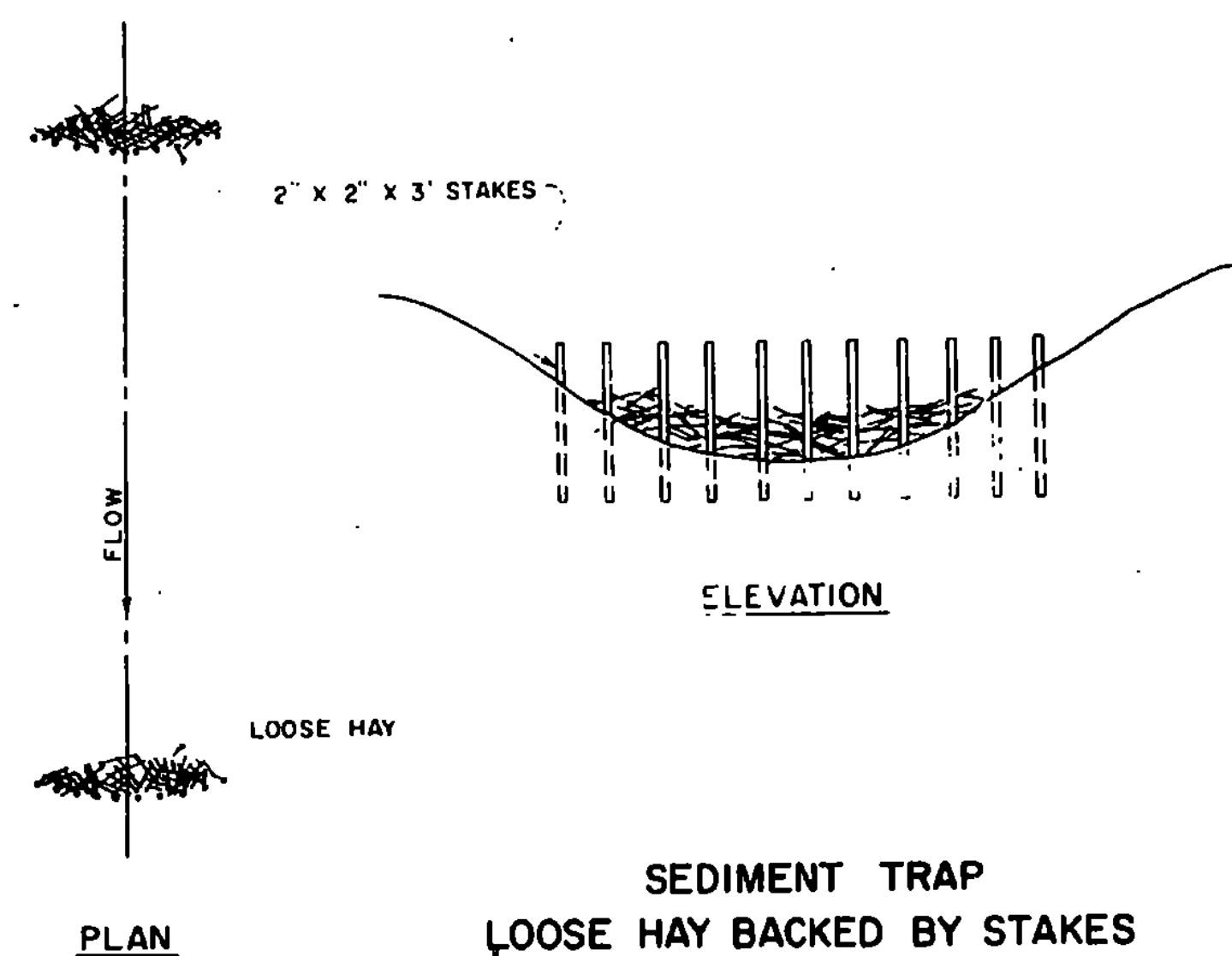
2. TEMPORARY BERM WITH PIPE



3. TEMPORARY BERM WITH PIPE & RISER

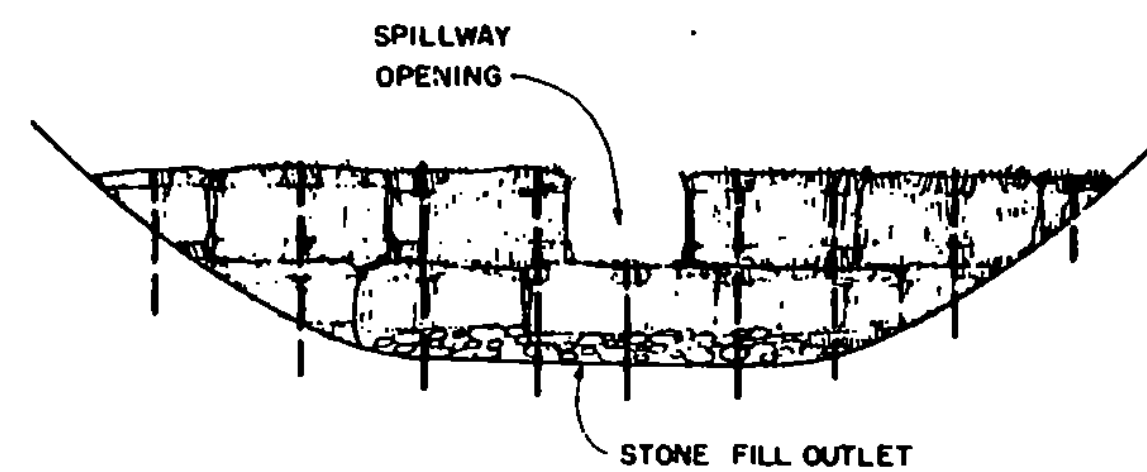


SECTIONS A-A
PROTECTION AT STREAM CROSSING
MEDIAN AND SIDE DITCHES

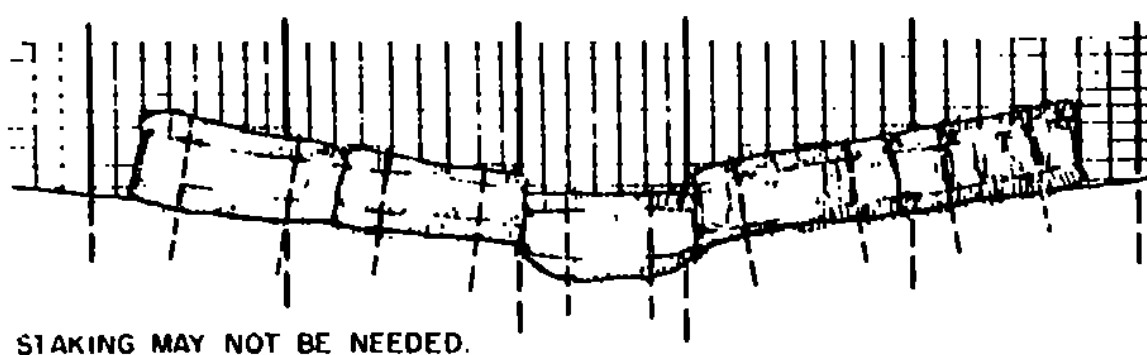


SEDIMENT TRAP
LOOSE HAY BACKED BY STAKES

1. STAKED BALED HAY



2. BALED HAY BACKED BY FENCE



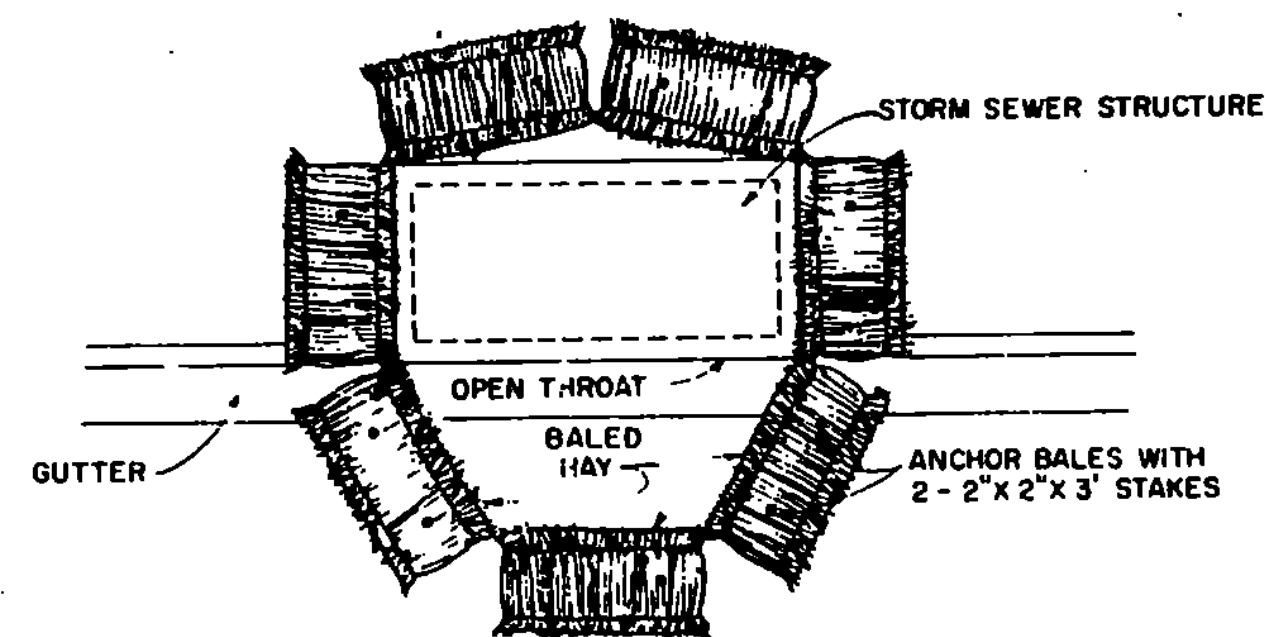
3. GRADED STONE FILL



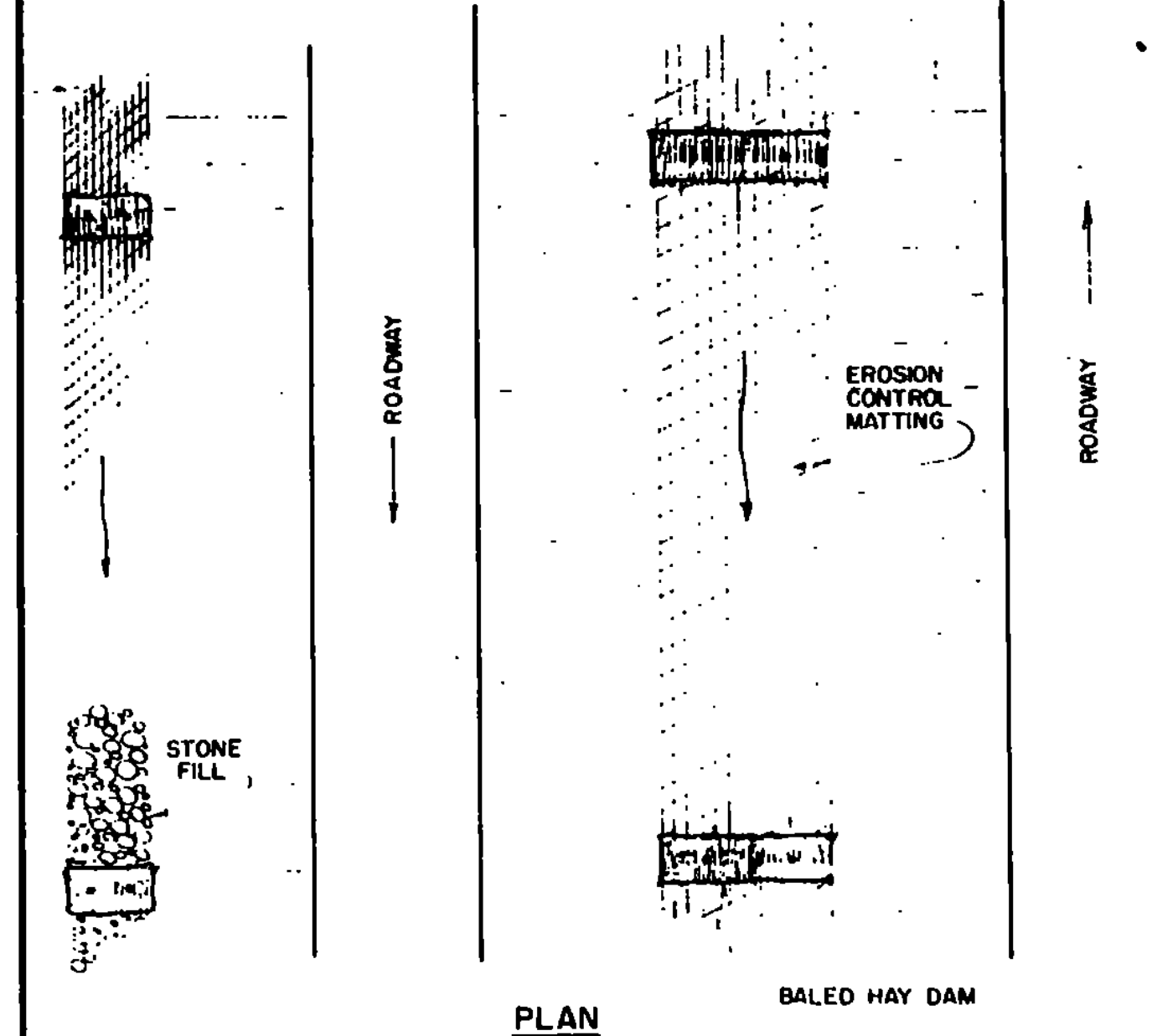
ELEVATIONS

TYPES OF TEMPORARY DAMS

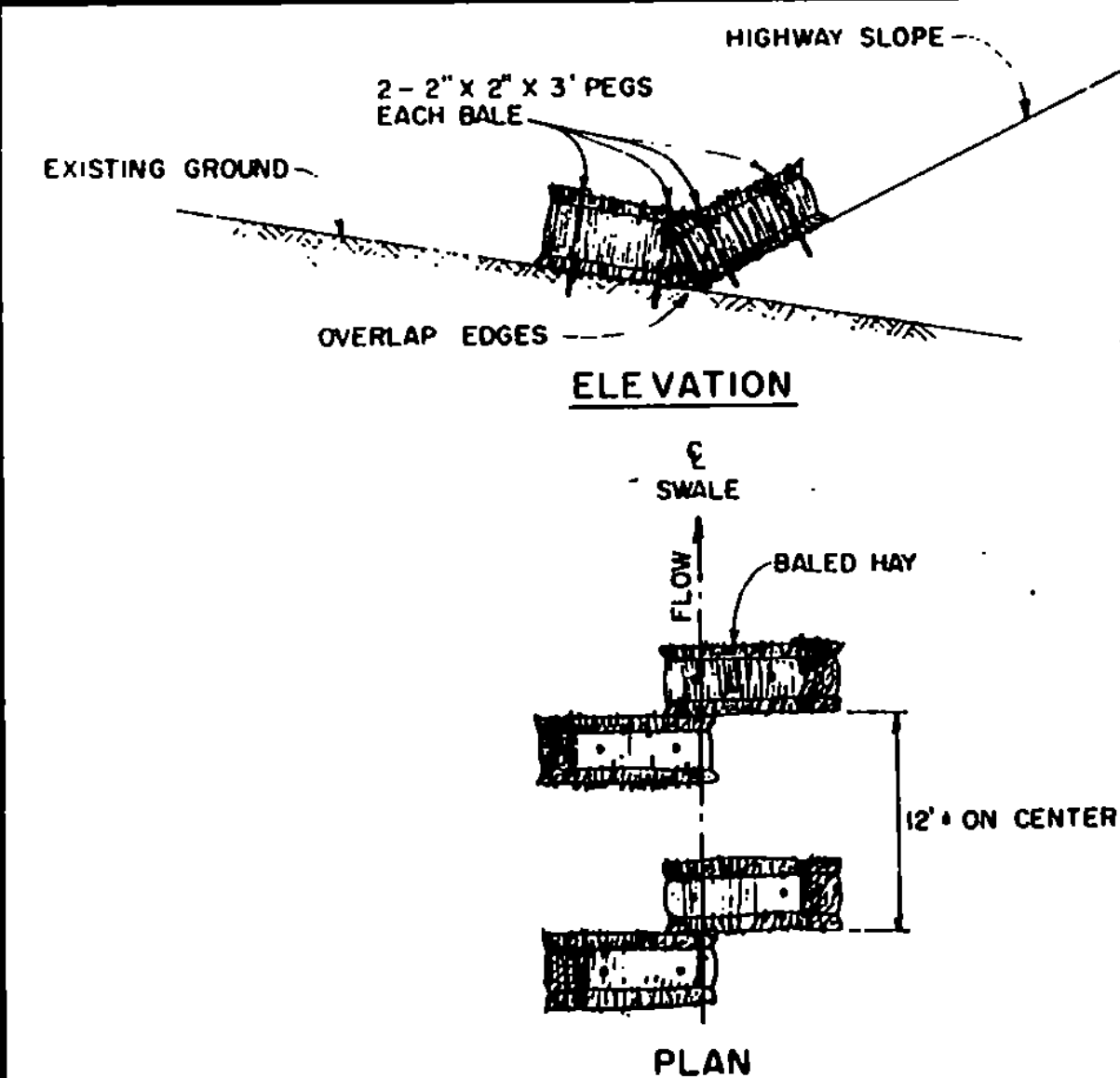
DAM SHOULD EXTEND FAR ENOUGH UP DITCH SIDE SLOPES TO EFFECTIVELY POND THE RUNOFF AND PREVENT EROSION AND WASHOUT.



INLET PROTECTION
TEMPORARY BARRIER - HAY BALES

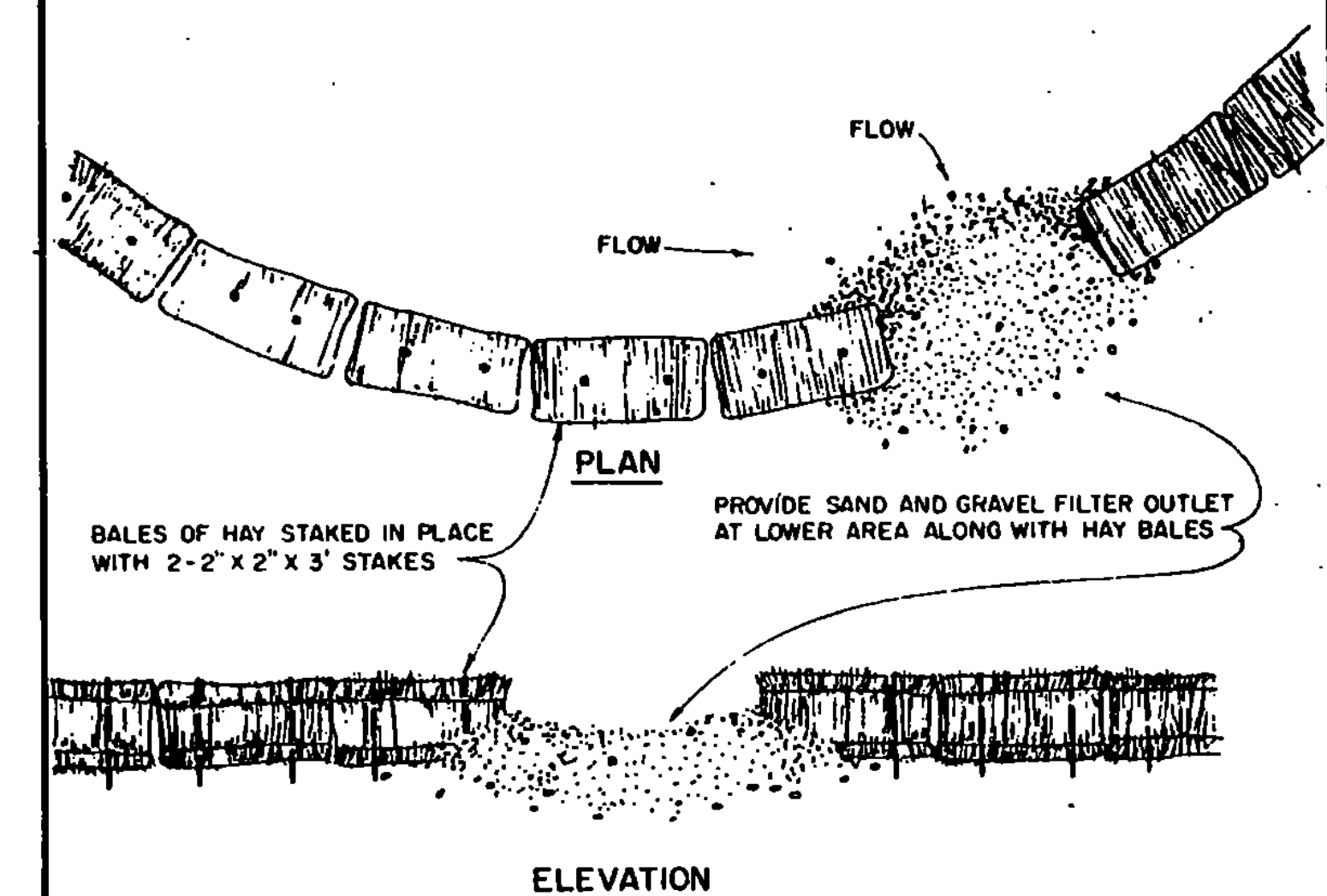


BALED HAY DAMS USED IN DITCHES

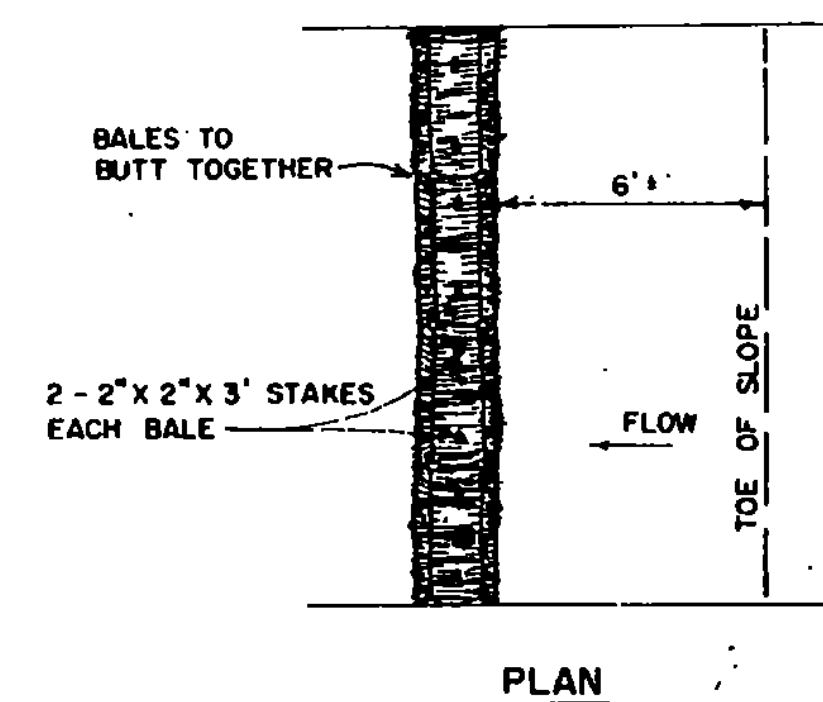
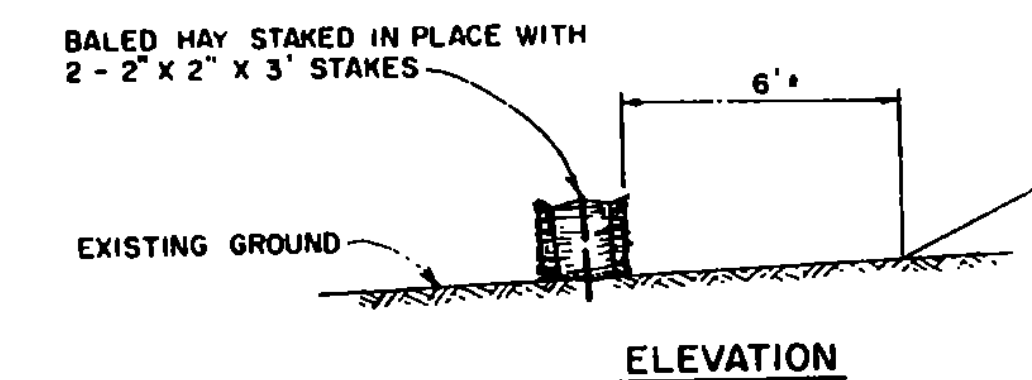


TO BE USED IN LOCATIONS WHERE THE EXISTING GROUND SLOPES IN TOWARD THE EMBANKMENT.
BALES WILL BE ALLOWED TO ROT IN PLACE.

BALED HAY EROSION CHECKS



BALED HAY DAMS ALONG TOE OF SLOPE



TO BE USED WHERE THE EXISTING GROUND SLOPES AWAY FROM THE HIGHWAY EMBANKMENT.

BALED HAY EROSION CHECKS

CORRECTIONS & REVISIONS

APPROVED:

July 5, 1972

DATE

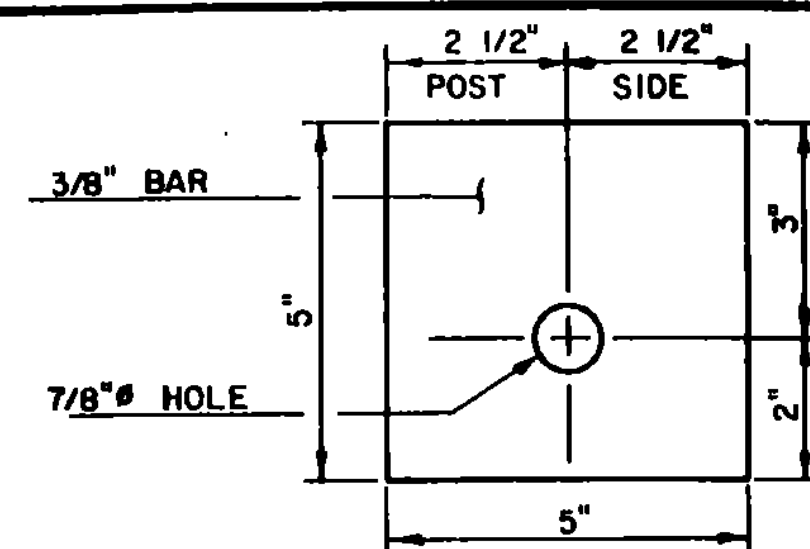
R. H. Curren
CHIEF ENGINEER

ASST. CHIEF ENGINEER

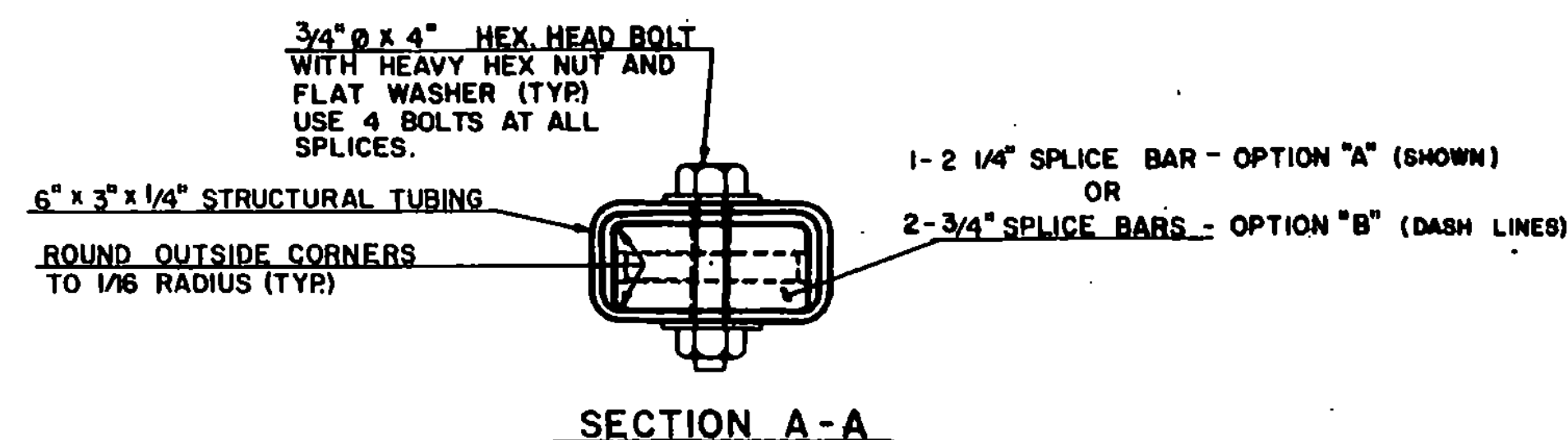
G. W. Lane
HIGHWAY ENGINEER

TEMPORARY EROSION CONTROL DETAILS

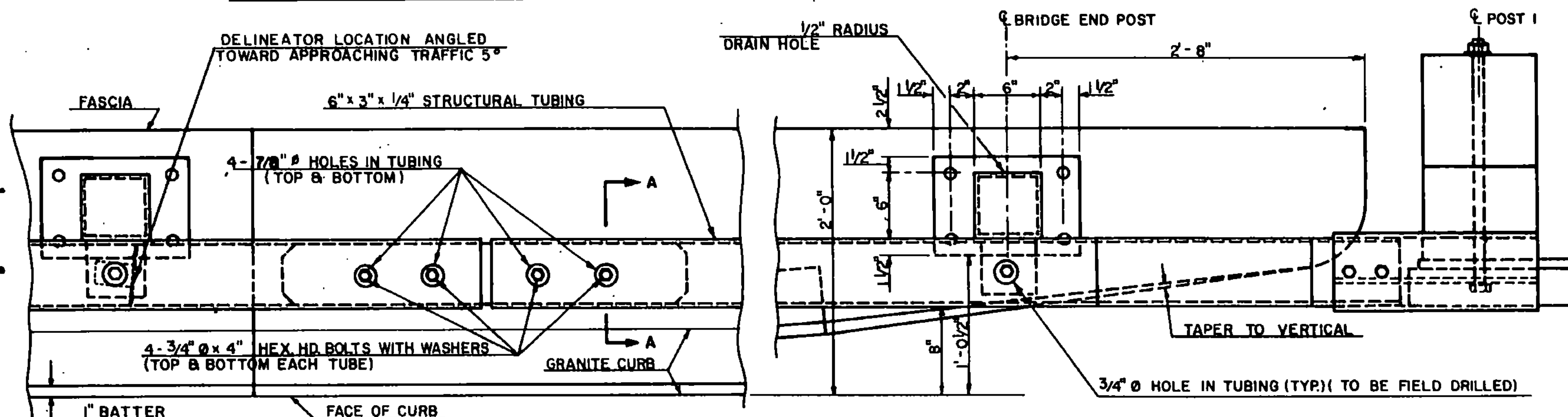
T-2



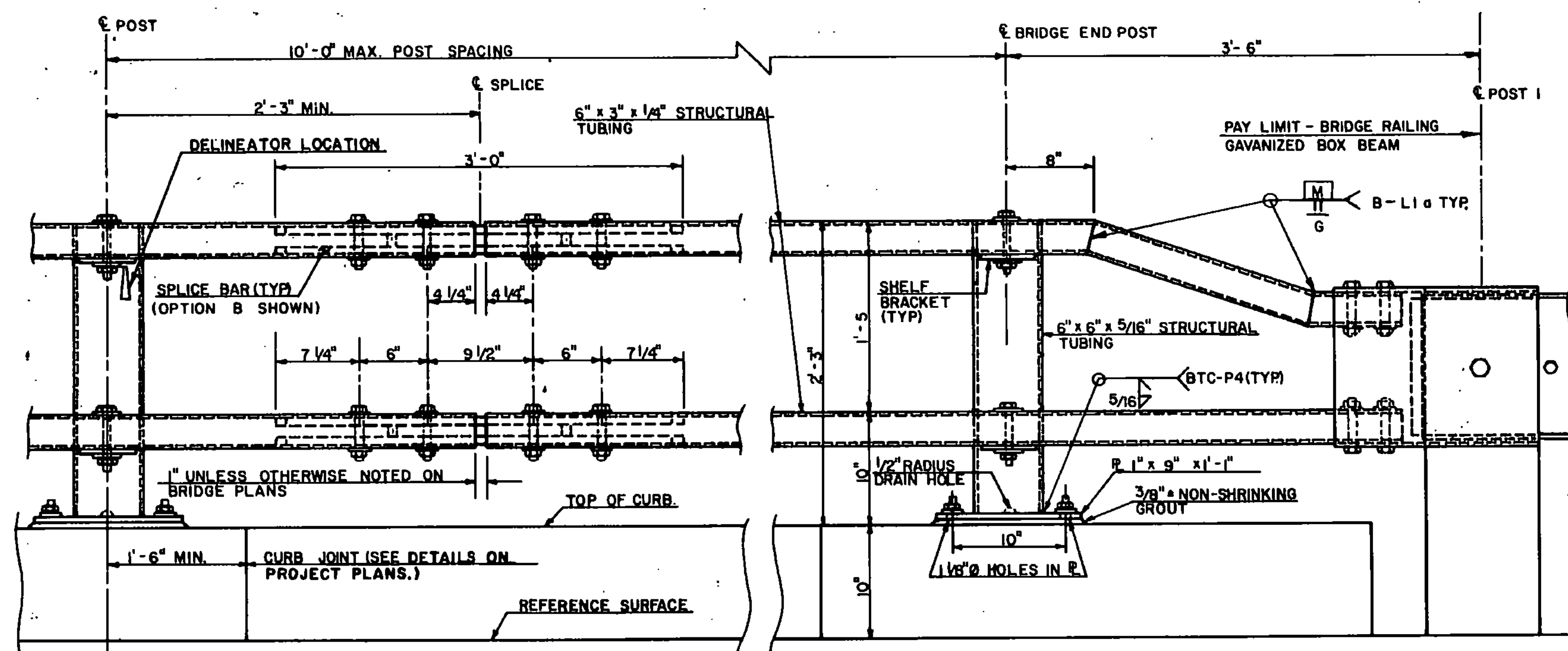
SHELF BRACKET DETAIL



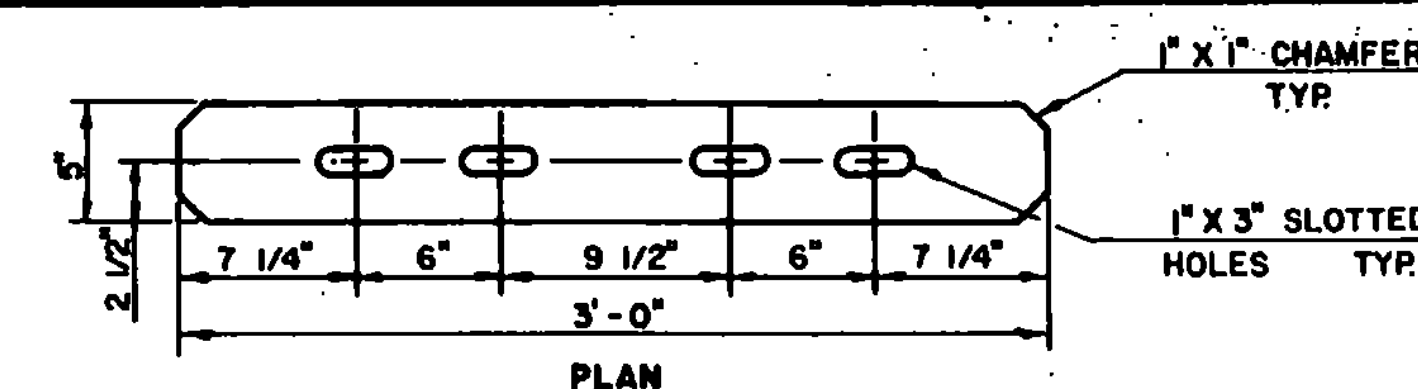
SECTION A-A



PLAN OF BOX BEAM BRIDGE RAIL

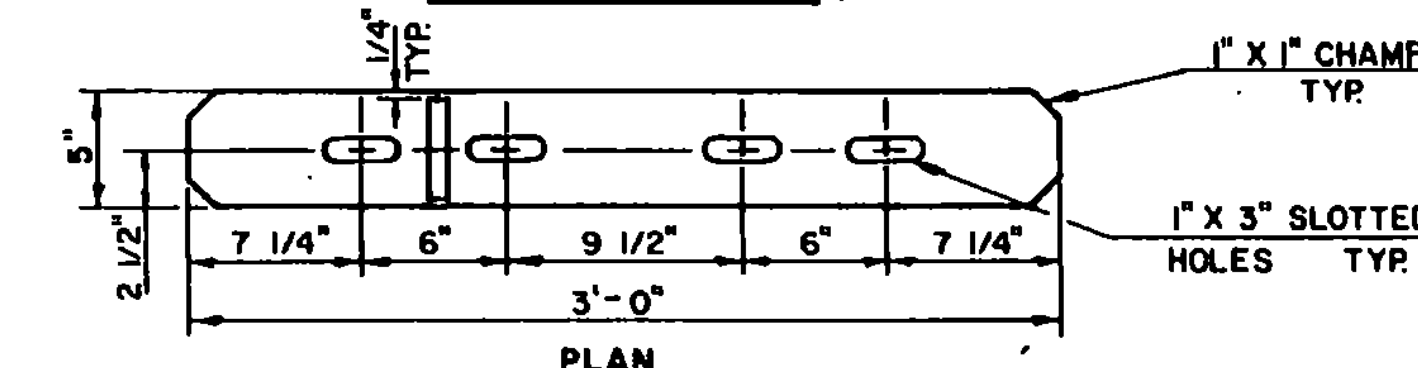


ELEVATION OF BOX BEAM BRIDGE RAIL



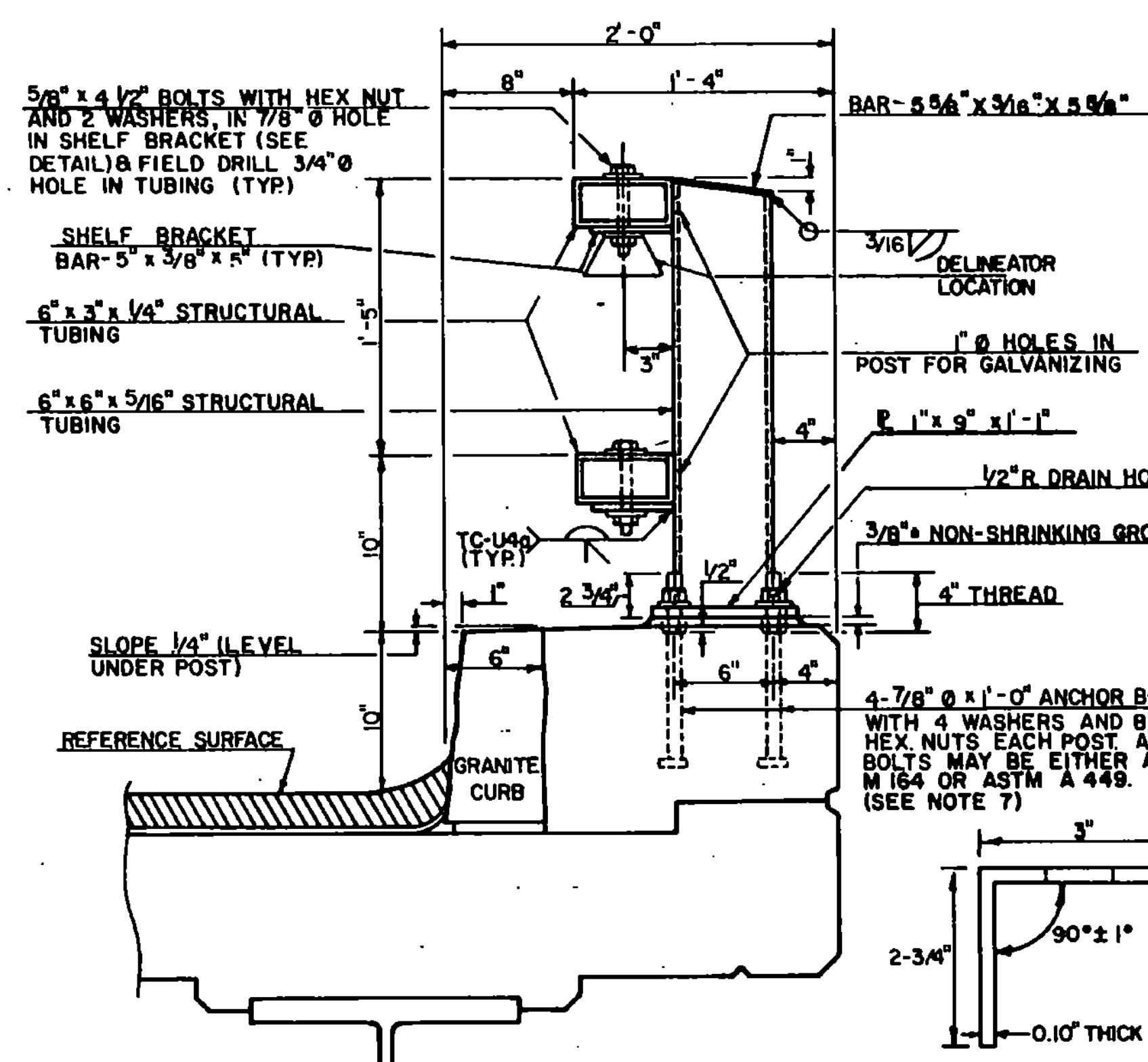
ELEVATION

SPLICE BAR (OPTION "A")



ELEVATION

SPLICE BAR (OPTION "B")



TYPICAL SECTION OF BOX BEAM BRIDGE RAIL

NOTES

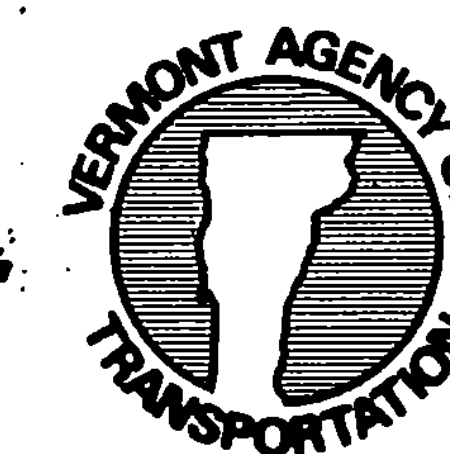
1. RAILING IS DESIGNED IN ACCORDANCE WITH THE 1989 AASHTO SPECIFICATIONS.
2. ALL PLATES, BARS, AND ANGLES SHALL BE ASTM A 36 STEEL, UNLESS OTHERWISE SPECIFIED. ALL BOLTS SHALL BE ASTM A 307. STRUCTURAL STEEL TUBING SHALL BE ASTM A 500 COLD-FORMED GRADE B AS MODIFIED IN SECTION 732.03(a).
3. ALL BOX BEAM BRIDGE RAILING, COMPONENTS, ANCHOR BOLTS AND ATTACHMENT HARDWARE SHALL BE GALVANIZED TO ASTM A 123 AFTER FABRICATION.
4. THE FABRICATOR SHALL SUBMIT SHOP DRAWINGS, INCLUDING WELDING PROCEDURES, TO THE STRUCTURES DIVISION FOR APPROVAL IN ACCORDANCE WITH THE PROVISIONS OF SECTION 506.04 - SHOP DRAWINGS. ALL WELDING SHALL CONFORM WITH SECTION 506.10.
5. PROCEDURE QUALIFICATION FOR ALL WELDS SHALL BE PERFORMED AND APPROVED PRIOR TO FABRICATION. WELDER QUALIFICATION WILL BE REQUIRED FOR EACH PROCEDURE. PROCEDURE AND WELDER QUALIFICATION ACCEPTANCE SHALL BE APPROVED BY RADIOGRAPHIC TESTING.
6. THE RAIL SYSTEM SHALL BE CONTINUOUS WITH EACH TUBE SECTION ATTACHED TO A MINIMUM OF TWO POSTS. ALL JOINTS SHALL BE SPliced AS DETAILED, WITH ALL SPlice CONNECTIONS IN THE SAME PANEL LOCATED ONE DIRECTLY ABOVE THE OTHER.
7. ALL POSTS SHALL BE SET NORMAL TO GRADE. NUTS PLACED IN CONCRETE ARE TO BE ROTATED WITHIN 24 HOURS AFTER CONCRETE IS PLACED TO BREAK BOND BETWEEN NUT AND CONCRETE. NUTS SHALL THEN BE USED TO ALIGN THE POSTS BOTH HORIZONTALLY AND VERTICALLY. AFTER FINAL POSITION HAS BEEN APPROVED, ALL VOIDS BETWEEN THE BASE PLATE AND CONCRETE SURFACE SHALL BE GROUTED WITH NON-SHRINK GROUT CONFORMING WITH SECTION 707.03, MORTAR, TYPE IV.
8. ANCHOR BOLTS SHALL BE PRECAST IN THE CURB SECTION, AND CONFORM WITH THE REQUIREMENTS OF SECTION 714.07.
9. FOR RADII LESS THAN 950 FEET, THE BEAM RAIL SHALL BE SHOP BENT TO FIT THE APPLICABLE CURVE.
10. RAILING JOINT SPICES SHALL BE PROVIDED FOR ALL SUPERSTRUCTURE JOINTS. THE RAIL JOINT OPENING SHALL BE 1 INCH OR CAPABLE OF PROVIDING THE MOVEMENT SPECIFIED. SPlice PLATE DETAILS SHALL BE MODIFIED AS REQUIRED FOR JOINTS REQUIRING MORE THAN 2 INCHES OF TOTAL MOVEMENT.
11. REFER TO PROJECT PLANS FOR CURB DETAILS.
12. REFER TO STANDARD SB-R4B-82 FOR GUARD RAIL APPROACH SECTION - TYPE I & TYPE II DETAILS.
13. DELINEATORS SHALL BE MOUNTED AS SHOWN ON DETAILS. PAYMENT SHALL BE SUBSIDIARY TO OTHER ITEMS.
14. WALL THICKNESS OF THE 6 inch x 6 inch STRUCTURAL TUBING FOR THE RAIL POST SHALL BE 5/16 INCH MINIMUM, 3/8 INCH, OR 1/2 INCH. THICKNESS TUBING MAY BE SUBSTITUTED AT THE OPTION OF THE FABRICATOR.

THIS REFLECTORIZED ALUMINUM DELINEATOR IS TO BE ERECTED EVERY 30 FEET OR CLOSEST POST. DELINEATOR SHALL MEET SPECIFICATION REQUIREMENTS FOR ASTM B209 ALLOY 5052-H32.

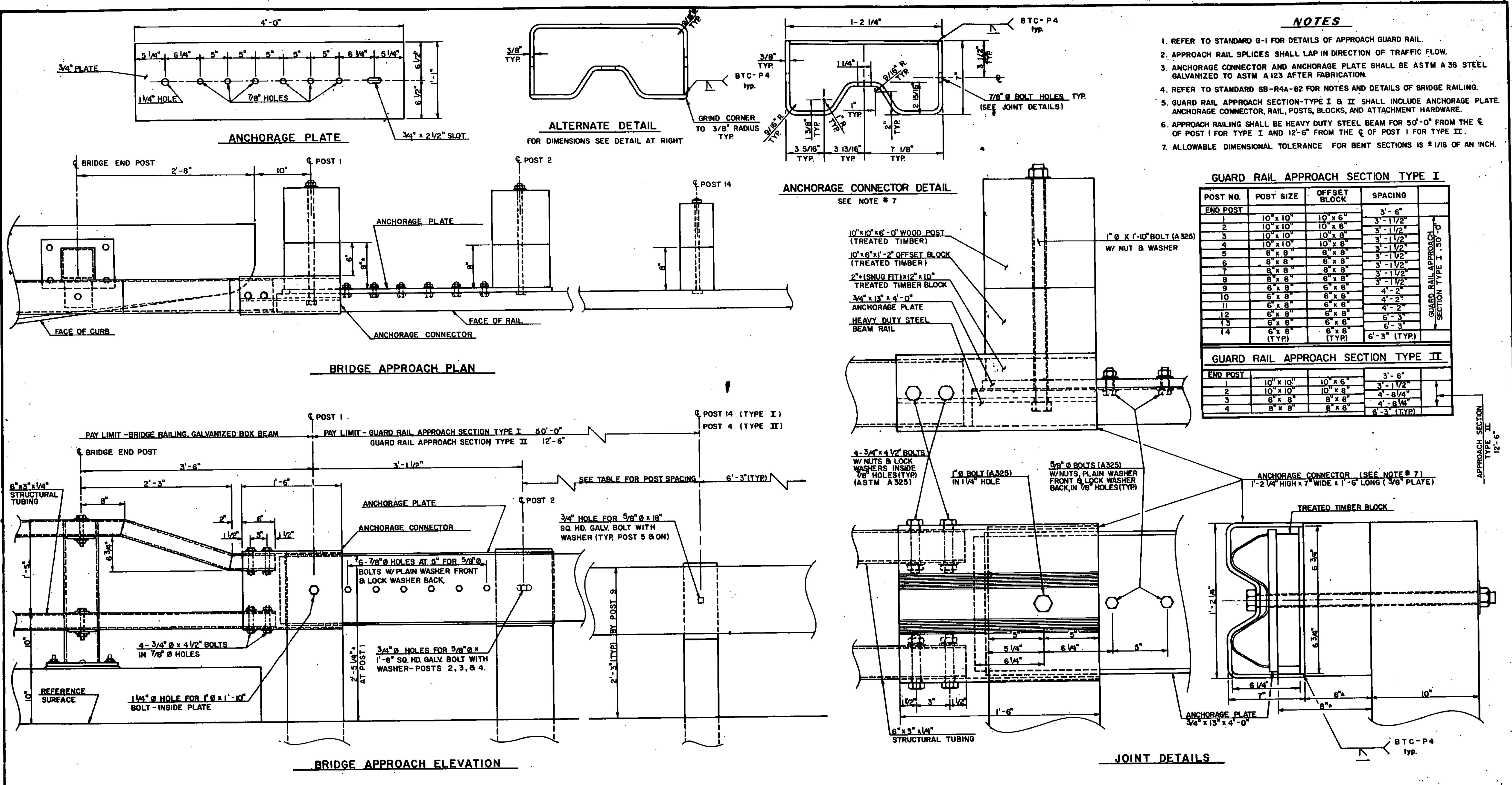
REVISIONS AND CORRECTIONS
1. REVISION DELINEATORS ADDED D.A.R. 8-18-82
2. REVISION CHANGED LOCATION OF DELINEATORS D.A.R. 8-22-83
3. REVISED NOTE #12 TO INCLUDE TYPE II AND REVISED ANCHORAGE CONNECTOR AND SPlice BAR. R.HAUPT 9/7/83
4. REVISED HOLE DIMENSION IN SHELF BRACKET, ADD DIMENSION TO POST NO. 1, AND ADD NOTE NO. 14. R.S.M. 12-13-84
5. REVISED WELD FOR TOP RAIL. 3-28-88. M.C.C.
6. REVISED POST CAP. 12-13-88. R.P.G.
7. REVISED FOR 1986 SPECIFICATIONS. 9-19-88. R.P.G.

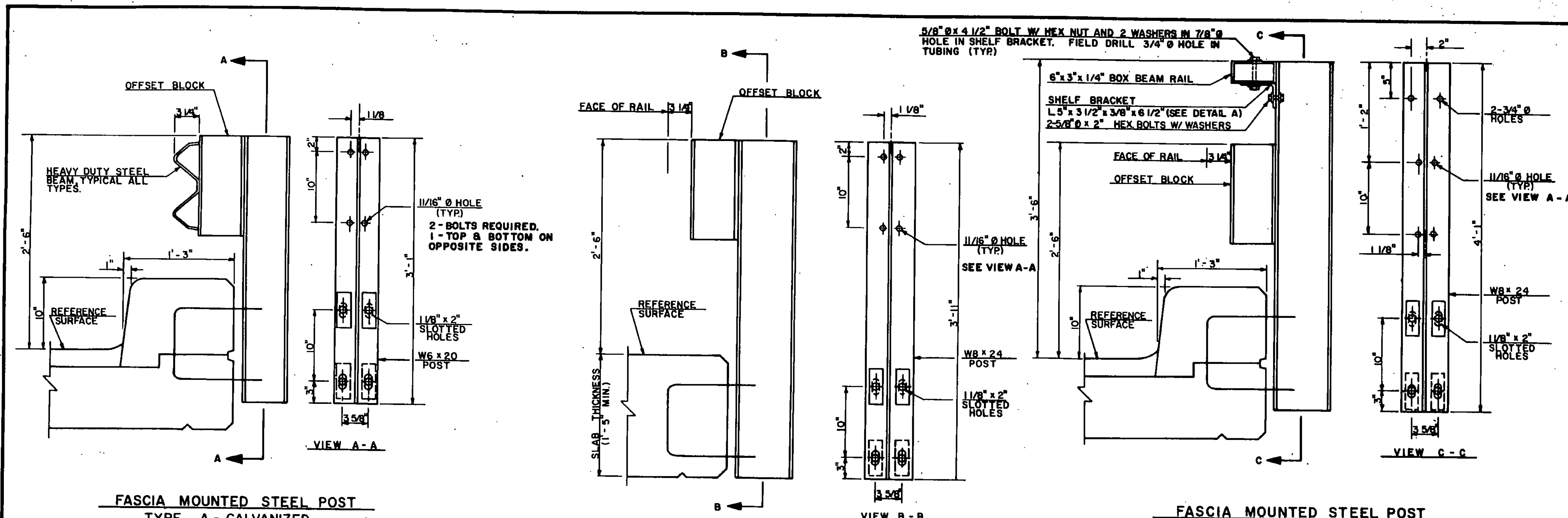
APPROVED: DECEMBER 28, 1981
DATE
CHIEF OF DESIGN
STRUCTURES ENGINEER
DIRECTOR OF ENGINEERING AND CONSTRUCTION

BRIDGE RAILING GALVANIZED BOX BEAM



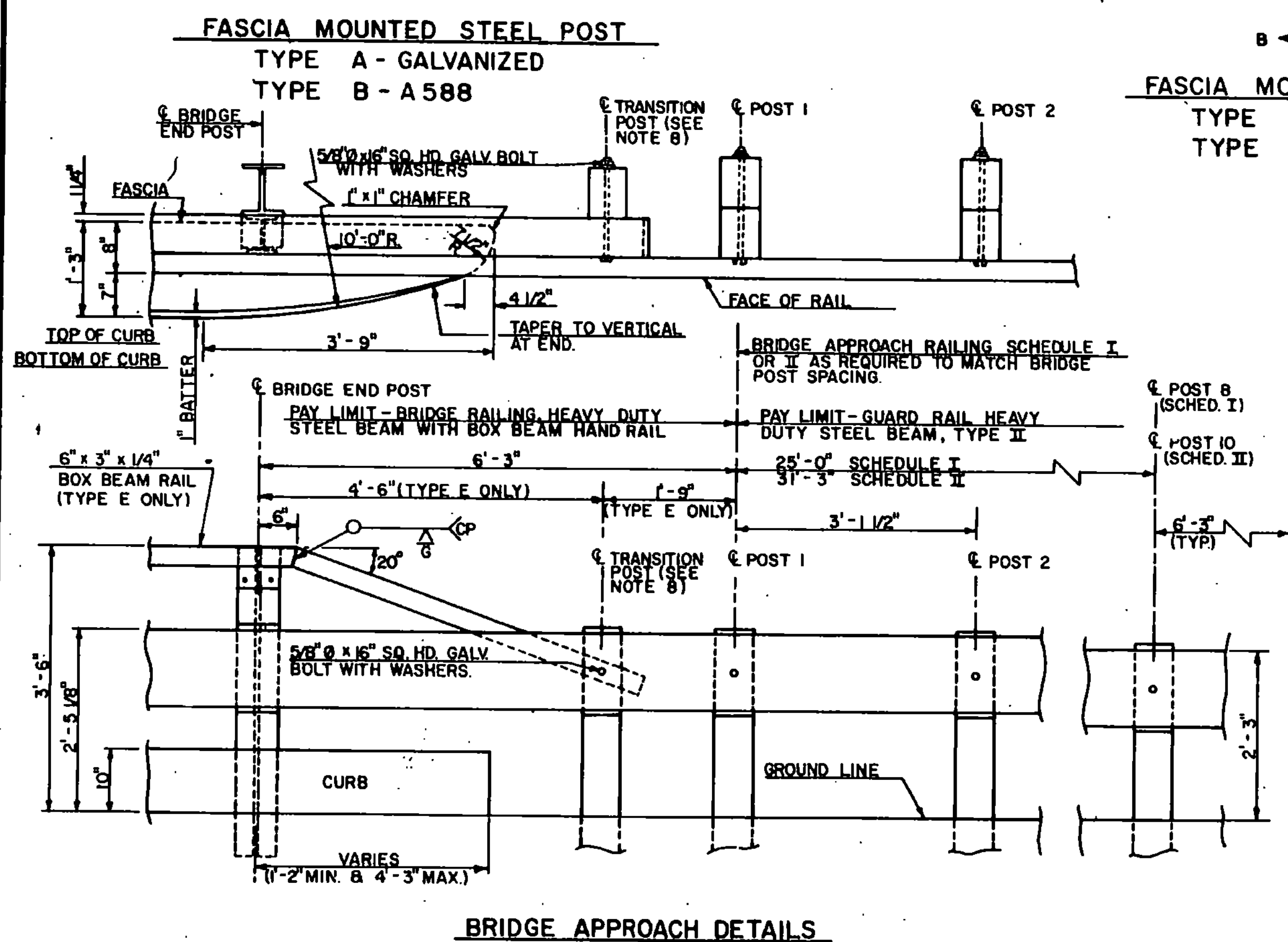
STANDARD
SB-R4A-82





NOTES

- SEE STANDARD DRAWING G-1 & G-1d FOR ADDITIONAL DETAILS OF STEEL BEAM GUARD RAIL AND STANDARD SB-R4d-82 FOR ADDITIONAL DETAILS OF BOX BEAM RAIL.
- ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND CONFORM WITH SECTION 714.16.
- BRIDGE RAIL TYPES A, C, & E: HEAVY DUTY STEEL BEAM RAIL SHALL BE AASHTO M 180, CLASS B-TYPE 2. POSTS, BRACKETS AND PLATE WASHER SHALL BE ASTM A 36 STEEL. BOLTS SHALL BE ASTM A 307. ALL MATERIAL SHALL BE GALVANIZED AFTER FABRICATION TO ASTM A123.
- BRIDGE RAIL TYPE B & D: HEAVY DUTY STEEL BEAM RAIL SHALL BE AASHTO M 180, CLASS B-TYPE 4. POSTS, BRACKETS & PLATE WASHER SHALL BE ASTM A 588 STEEL. BOLTS SHALL BE ASTM A 325 TYPE III.
- ALL POSTS SHALL BE SET NORMAL TO GRADE.
- BRIDGE APPROACH RAIL HEIGHT SHALL BE TRANSITIONED TO NORMAL ROADWAY RAIL HEIGHT IN 25 FEET.
- APPROACH RAILING SHALL BE HEAVY DUTY STEEL BEAM FOR 50 FEET FROM THE END OF THE BRIDGE.
- FOR THE TYPE A, B, C, OR D BRIDGE RAILING, THE TRANSITION POST SHALL HAVE AN OFFSET BLOCK AND BE LOCATED AS CLOSE AS PRACTICAL TO THE MID-POINT BETWEEN THE BRIDGE END POST AND APPROACH RAIL POST 1.
- SPLICES SHALL LAP IN DIRECTION OF TRAFFIC FLOW.
- SEE STANDARD SHEET G-1 FOR DELINEATOR DETAILS AND PLACEMENT.
- ERECT DELINEATOR ON EVERY FIFTH POST OR APPROXIMATELY 30 FEET APART. PAYMENT SHALL BE SUBSIDIARY TO OTHER ITEMS.



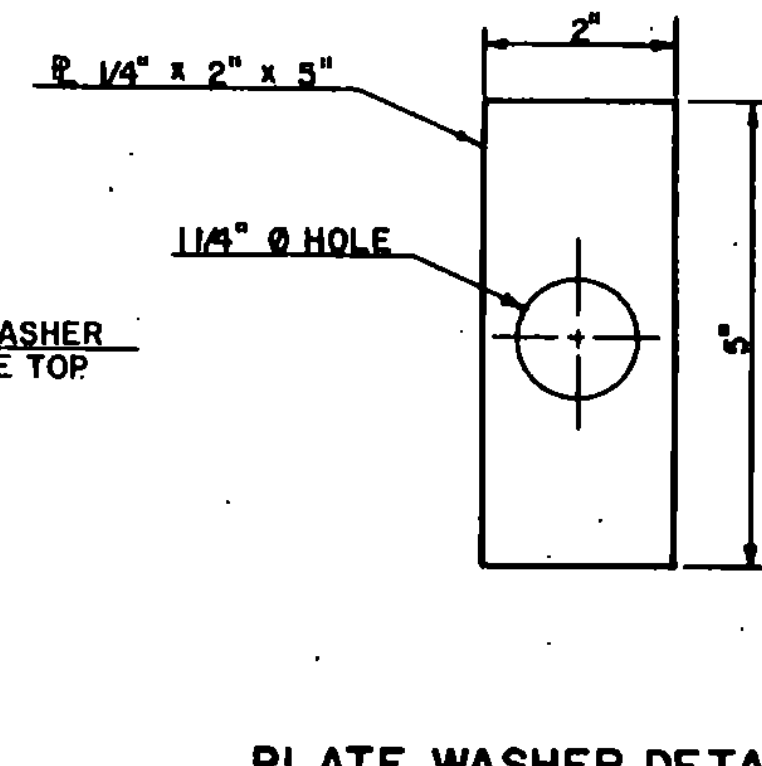
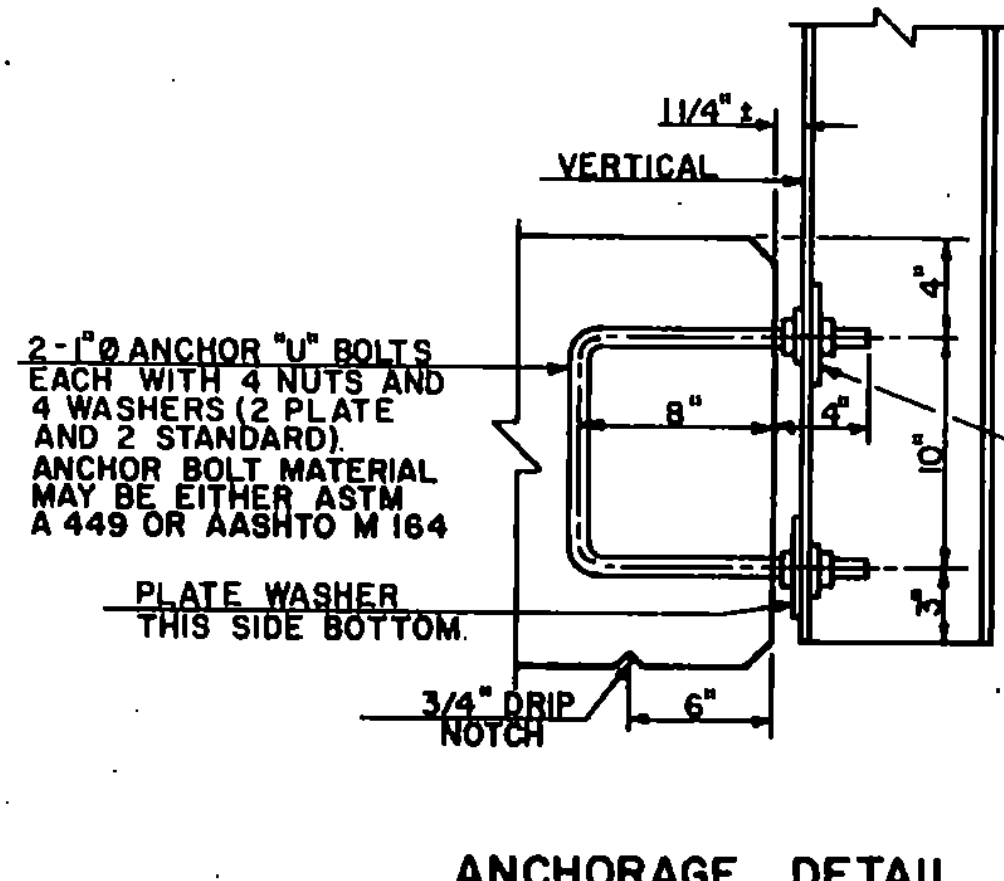
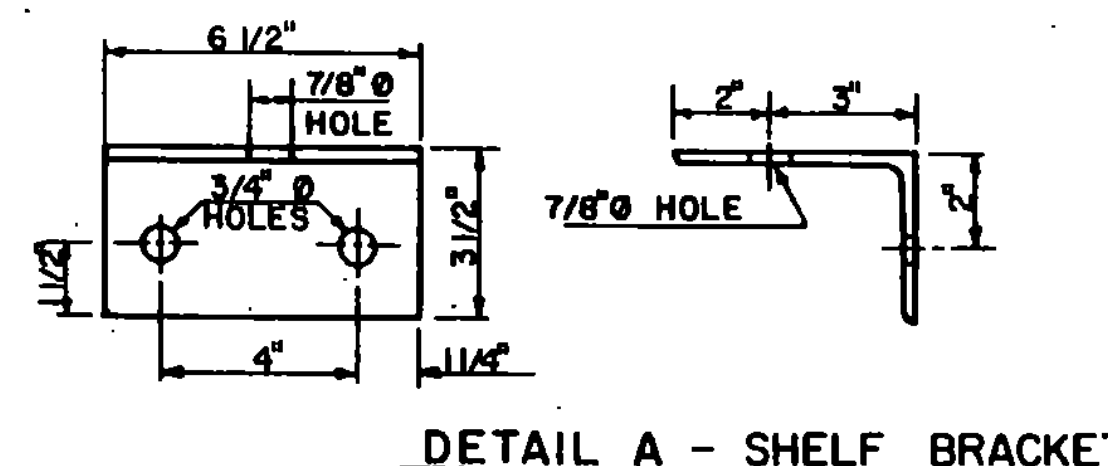
FASCIA MOUNTED STEEL POST
TYPE C - GALVANIZED
TYPE D - A588

FASCIA MOUNTED STEEL POST
WITH BOX BEAM HAND RAIL
TYPE E - GALVANIZED

BRIDGE APPROACH RAILING
WHEN A RAIL PANEL SPLICE OCCURS AT POST NO. 1 USE SCHEDULE I FOR APPROACH RAILING. WHEN A RAIL PANEL SPLICE OCCURS AT BRIDGE END POST USE SCHEDULE II FOR APPROACH RAILING.

POST NO.	SPACING	PAYMENT FACTOR
1	3'-1 1/2"	
2	3'-1 1/2"	1.4 x 12'-6"
3	3'-1 1/2"	
4	3'-1 1/2"	
5	4'-2"	
6	4'-2"	1.2 x 12'-6"
7	4'-2"	
8	4'-2"	
9	6'-3" (TYR)	1.0 (TYR)

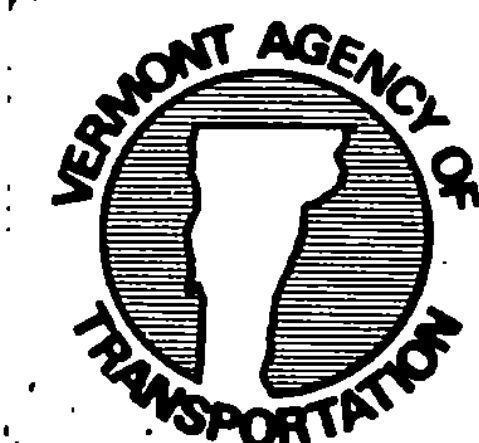
POST NO.	SPACING	PAYMENT FACTOR
1	3'-1 1/2"	
2	3'-1 1/2"	1.4 x 18'-9"
3	3'-1 1/2"	
4	3'-1 1/2"	
5	3'-1 1/2"	
6	3'-1 1/2"	
7	4'-2"	
8	4'-2"	1.2 x 12'-6"
9	4'-2"	
10	4'-2"	
11	6'-3" (TYR)	1.0 (TYR)



REVISIONS AND CORRECTIONS
REVISION DELINEATORS ADDED D.A.R. 6-18-82
REVISION, BOLTS THRU BOX BEAM RAIL R.S.H. 12-13-84
REVISION, CHANGED BOLT HOLE THROUGH SHELF BRACKET R.S.H. 12-13-84
CLARIFIED OFFSET BLOCK BOLT INSTALLATION R.P.G. 11-13-91.

APPROVED:
DATE: DECEMBER 28, 1981
CHIEF OF DESIGN
STRUCTURES ENGINEER
DIRECTOR OF ENGINEERING AND CONSTRUCTION

BRIDGE RAILING HEAVY DUTY STEEL BEAM (TYPE A, TYPE B, TYPE C, AND TYPE D) BRIDGE RAILING HEAVY DUTY STEEL BEAM WITH BOX BEAM HAND RAIL (TYPE E)



STANDARD
SB-R6-82