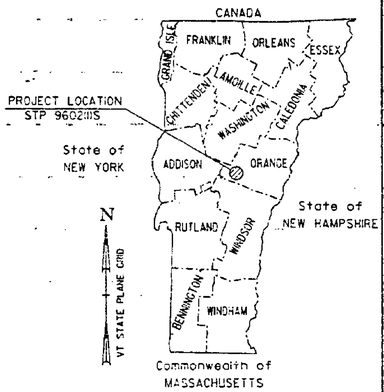
# STATE OF VERMONT
# AGENCY OF TRANSPORTATION

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| D-15 | CAST IRON GRATE WITH FRAME, TYPE D & E | 06-01-94 |
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# PROPOSED IMPROVEMENT
# TOWNS OF RANDOLPH & BRAINTREE
# COUNTY OF ORANGE
# VT ROUTE 12

BEGINNING IN RANDOLPH ON VT ROUTE 12 AT STA 4+940.00 (MM 3.070) AND EXTENDING NORTHERLY ALONG ROUTE 12, A DISTANCE OF 8.44 km (5.244 MILES) TO STA 2+505.00 (MM 1.556) AT THE BRAINTREE BROOKFIELD TOWN LINE.

LENGTH OF ROADWAY = 8 440 METERS (5.244 MILES)

LENGTH OF PROJECT = 8 440 METERS (5.244 MILES)

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES RESURFACING OF THE EXISTING HIGHWAY, WITH A LEVELING COURSE, WEARING COURSE, NEW PAVEMENT MARKINGS, GUARDRAIL, SIGNS AND INCIDENTAL ITEMS.

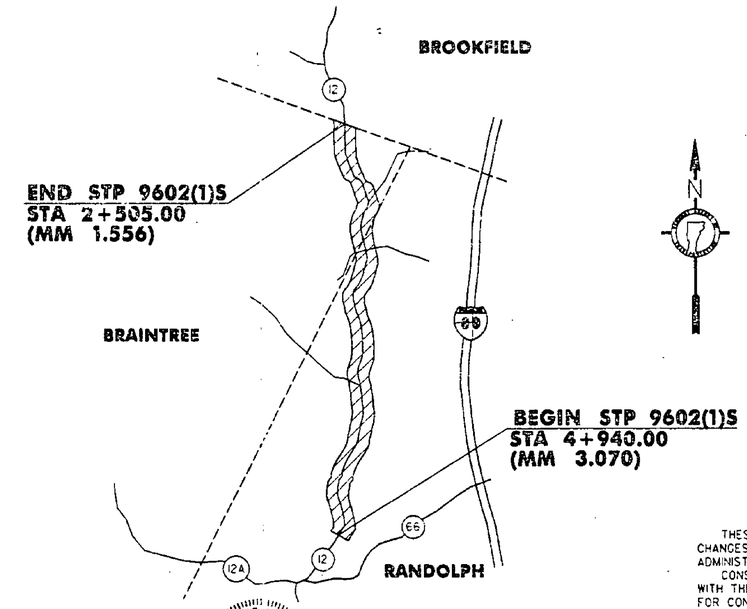
## TRAFFIC DATA

VT ROUTE 12 (RANDOLPH U.C. LIMITS TO T-42)

1996 ADT = 1500
1996 DHV = 210
2006 ADT = 1820
2006 DHV = 250
1996 - 2006 CUM. ESALS = 299,000

VT ROUTE 12 (T-42 TO BROOKFIELD T/L)

1996 ADT = 1360
1996 DHV = 190
2006 ADT = 1650
2006 DHV = 230
1996 - 2006 CUM. ESALS = 208,000




## CONTRACT PLANS

THESE PLANS DO NOT REFLECT CHANGES MADE ON THE PROJECT.

Metric

RIGHT-OF-WAY LIMITS, IF APPLICABLE, ARE PROVIDED SOLEY FOR THE CONVENIENCE OF THE STATE AND ITS CONTRACTOR DURING THE COURSE OF THIS PAVING PROJECT. ANY REFERENCES TO OFFSETS ON THESE PLANS ARE APPROXIMATE AND SHOULD NOT BE RELIED UPON FOR ANY PURPOSES.

## CONVENTIONAL SIGNS

COUNTY LINE
TOWN LINE
LIMITS OF ACCESS
POINT OF ACCESS
FENCE LINE
STONE WALL
TRAVELED WAY
GUARDRAIL
RAILROAD
SURVEY LINE
CULVERT
POWER POLE
TELEPHONE POLE
TREES
CONTROL OF ACCESS
PROPERTY LINE
R.O.W. TAKING LINE
SLOPE RIGHTS
TOP OF CUT
TOE OF SLOPE

UNLESS OTHERWISE INDICATED, THE DRAWINGS AND DETAILS OF THESE PLANS ARE NOT TO SCALE.

DATUM
VERTICAL N/A
HORIZONTAL N/A

HORIZONTAL CONTROL (STATIONS) WAS SET BY HOLDING THE ROUTE LOC STATIONING AT PROJECT CONTROL POINTS.

Date JAN 16 1997
Frank W. Whitcomb Const. Corp.
Contractor
Signature
President
Title
Secretary of Transportation's Signature

PREPARED BY:
CLD
CONSTRUCTION LOGISTICS & DEVELOPMENT INC.
CONSULTING ENGINEERS
540 COMMERCIAL STREET
MANCHESTER, NH 03101
(603) 666-8223 FAX (603) 668-8802

STATE OF VERMONT — REGISTERED PROFESSIONAL ENGINEER — No. 6539

SCALE IN Km: 0 1 2

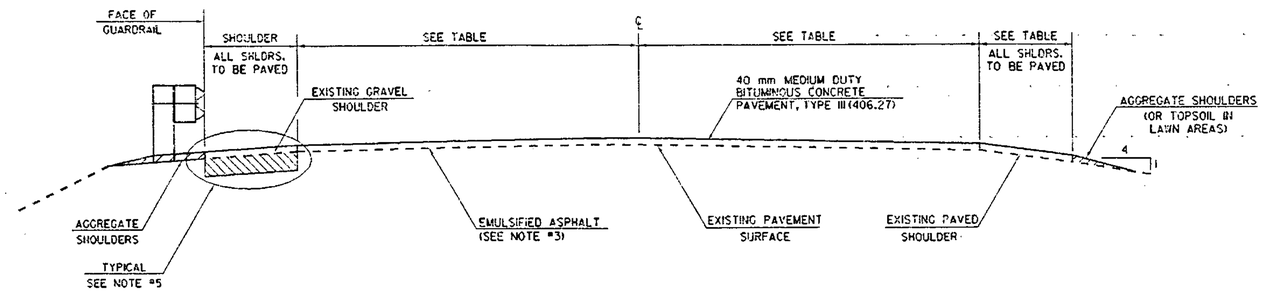
THESE PLANS ARE SUBJECT TO SUCH ENGINEERING CHANGES AS MAY BE REQUIRED BY THE FEDERAL HIGHWAY ADMINISTRATION OR THE CHIEF ENGINEER.
CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 1995, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON AUGUST 21, 1995 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

APPROVED Frank W. Whitcomb DATE 10/16/96
DIRECTOR OF CONSTRUCTION AND MAINTENANCE

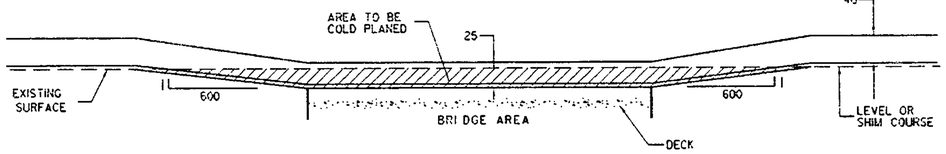
DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED _____ DATE _____
DIVISION ADMINISTRATOR

PROJECT RANDOLPH-BRAINTREE
STP 9602(1)S
SHEET 1 OF 14 SHEETS

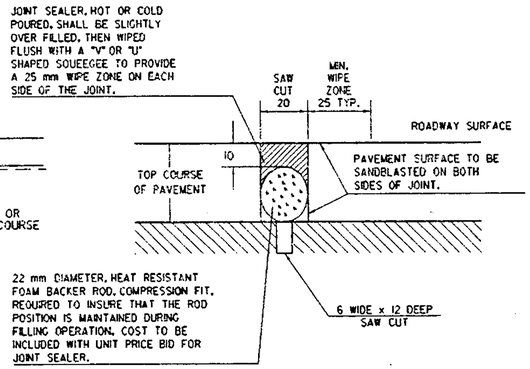



## OVERLAY TYPICAL SECTION




## BRIDGE COLD PLANE DETAIL

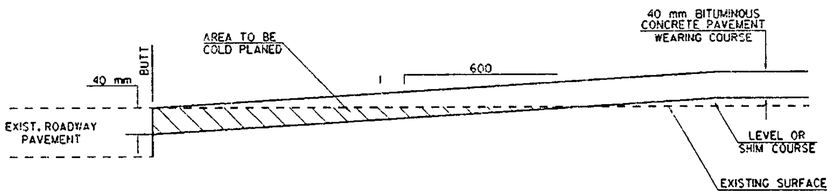
BRIDGE #47: STA 1+394 TO 1+434




## SAW CUT JOINT DETAIL

LOCATION: BRIDGE #47 (10.0 m) @ STA 1+414 (AT EXPANSION JOINT)

NOTE: JOINT IS TO BE LOCATED ACCURATELY BY STRING LINING OR BY OTHER MEANS PRIOR TO PAVING, SO THAT THE SAW CUT WILL BE MADE DIRECTLY OVER THE END OF THE CONCRETE DECK. THE JOINT SHALL BE CUT DRY IN A SINGLE PASS AND BE SEALED WITHIN 24 HOURS OR PRIOR TO EXPOSURE TO TRAFFIC. THE JOINT SHALL BE CLEANED PRIOR TO APPLYING THE JOINT SEALER - SEE VERMONT SPECIFICATION 524 AND SPECIAL PROVISIONS.




## APPROACH AREA COLD PLANING DETAIL

FULL ROADWAY WIDTH

RANDOLPH VT 12 STA 4+940 - BEGIN PROJECT
BRAINTREE VT 12 STA 2+505 - END PROJECT

## PROJECT PAVING LIMITS

| TOWN | BEGIN STATION | END STATION | LANE TYPICAL | WEARING DEPTH | BINDER DEPTH | LEVELING t/km | NOTES |
|---|---|---|---|---|---|---|---|
| VT ROUTE 12 | | | | | | | |
| RANDOLPH | 4+940 | 5+072 | 1.8-3.3-3.3-1.8 | 40 mm | | 428 | ** |
| | 5+072 | 10+875 | 0.6-3.3-3.3-0.6 | 40 mm | | 328 | ** |
| BRAINTREE | 0+000 | 1+383 | 0.6-3.3-3.3-0.6 | 40 mm | | 328 | ** |
| | 1+383 | 1+414 | 1.7-3.3-3.3-1.7 | 40 mm | | 420 | ** |
| | 1+409 | 1+419 | 1.7-3.3-3.3-1.7 | 25 mm | | 420 | BRIDGE #47: COLD PLANE 25 mm, LEVEL AND PAVE WITH 25 mm |
| | 1+419 | 2+505 | 0.6-3.3-3.3-0.6 | 40 mm | | 328 | ** |
| | | | | | | | ** LEVEL AND PAVE WITH 40 mm |

DATUM
VERTICAL
HORIZONTAL

## NOTES

1. THE PAVEMENT WEARING COURSE SHALL BE MEDIUM DUTY BITUMINOUS CONCRETE PAVEMENT TYPE III.
2. THE LEVELING COURSE SHALL BE TYPE III OR TYPE IV AS DIRECTED BY THE ENGINEER.
3. EMULSIFIED ASPHALT SHALL BE APPLIED ON ALL EXISTING PAVEMENT SURFACES, ON COLD PLANED SURFACES AND BETWEEN ALL COURSES OF PAVEMENT AT THE RATE OF 0.07 L/m² OR AS DIRECTED BY THE RESIDENT ENGINEER.
4. BITUMINOUS CONCRETE PAVEMENT TOLERANCE = 5 mm +/- (TOTAL THICKNESS EXCLUDING LEVELING COURSE).
5. EXISTING SHOULDER MATERIAL DEEMED UNSUITABLE BY THE RESIDENT ENGINEER SHALL BE EXCAVATED TO A DEPTH OF 75 mm +/- OR AS DIRECTED BY THE ENGINEER. EXCAVATED MATERIAL SHALL BE SPREAD ON THE ADJACENT SLOPES OR REMOVED FROM THE PROJECT, AS DIRECTED BY THE ENGINEER.

   EXCAVATION WILL BE PAID FOR AS ALL PURPOSE EXCAVATOR OR GRADER RENTAL.

   MATERIAL REMOVED SHALL BE REPLACED WITH SUBBASE OF CRUSHED GRAVEL (FINE GRADED).
6. COLD PLANING SHALL BE COMPLETED ACCORDING TO TYPICAL OR AS DENOTED OTHERWISE ON THE PLANS.
7. ALL DRIVES AND TOWN HIGHWAYS SHALL RECEIVE A 1m PAVED APRON AS DIRECTED BY THE ENGINEER. ANY EXCAVATION WILL BE PAID FOR UNDER ITEM 210.10. ANY NEW SUBBASE WILL BE PAID FOR UNDER ITEM 301.28. THE NEW BITUMINOUS SURFACE WILL BE PAID FOR UNDER ITEM 406.27.
8. ONE METER OF BACKING IS REQUIRED BEHIND THE FACE OF GUARDRAIL WITH 1.8 m POSTS. IF THIS CAN NOT BE OBTAINED THEN 2.5 m POSTS SHALL BE USED.
9. MARKER POSTS SHALL BE PLACED AS INDICATED OR AS DIRECTED BY THE ENGINEER.
10. ITEM 604.40, 604.412, 604.415 AND 604.418 ARE ESTIMATED QUANTITIES AND SHALL BE PERFORMED AS DIRECTED BY THE RESIDENT ENGINEER.

### RURAL AREA - SEED MIXTURE

| % MASS | kg/ha | NAME | PUR % | GERM % |
|---|---|---|---|---|
| 37.14 | 26 | CREEPING RED FESCUE | 98 | 85 |
| 37.14 | 26 | TALL FESCUE | 95 | 90 |
| 5.71 | 4 | RED TOP | 95 | 90 |
| 14.30 | 10 | BIRDSFOOT TREFOIL | 98 | 85 |
| 5.71 | 4 | ANNUAL RYE GRASS | 95 | 85 |
| 100.00 | 70 | | | |

### URBAN AREA - SEED MIXTURE

| % MASS | kg/ha | NAME | PUR % | GERM % |
|---|---|---|---|---|
| 42.22 | 38 | CREEPING RED FESCUE | 98 | 85 |
| 10.00 | 9 | PERENNIAL RYE GRASS | 95 | 90 |
| 42.22 | 38 | KENTUCKY BLUE GRASS | 85 | 85 |
| 5.56 | 5 | ANNUAL RYE GRASS | 95 | 85 |
| 100.00 | 90 | | | |

SEED MIXTURE:
SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY MASS AND SHALL BE FREE OF ALL NOXIOUS WEED SEED.

SEED:
TO BE APPLIED PER SEEDING FORMULAS OR AS DIRECTED BY THE ENGINEER.

FERTILIZER:
FORMULA 10-20-10 TO BE USED WITH SEED, APPLIED AT THE RATE OF 560 kg/ha. (HYDRO SEEDERS MAY USE 19-19-19 FORMULA)

AGRICULTURAL LIMESTONE:
TO BE APPLIED AT THE RATE OF 4500 kg/ha OR AS DIRECTED BY THE ENGINEER.

HAY MULCH:
TO BE PLACED ON EARTH SLOPES AT THE RATE OF 4500 kg/ha OR AS DIRECTED BY THE ENGINEER.

TOPSOIL:
TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

**PROJECT TYPICAL SHEET**

| | |
|---|---|
| PROJECT: RANDOLPH-BRAINTREE | PROJECT NO.: STP 9602(I)S |
| DESIGN FILE NAME: /pave/95c013/pc018.dgn | |
| IPARM FILE NAME: pc018ty.i | PLOT DATE: 8/96 |
| SURVEYED BY: CLD | SURVEY DATE: 11/95 |
| SQUAD LEADER: JAW | DRAWN BY: SJS |
| | SHEET: 2 OF 14 |

: Sheet Number: 2

STATE OF VERMONT
AGENCY OF TRANSPORTATION

# QUANTITY SHEET

Metric

## SUMMARY OF ESTIMATED QUANTITIES

| BRIDGE | ROADWAY | QUANTITIES GRAND TOTAL | UNIT | ITEMS | ITEM NUMBER | RND |
|---|---|---|---|---|---|---|
| | 1 | 1 | m3 | TRENCH EXCAVATION OF EARTH (NOT A BID ITEM) | 204.20 | EST |
| | 785 | 785 | m2 | COLD PLANING - BIT. PAVEMENT | 210.10 | 7 |
| | 800 | 800 | t | SUBBASE OF CRUSHED GRAVEL (FINE GRADED) | 301.28 | EST |
| | 1150 | 1150 | t | AGGREGATE SHOULDERS | 402.12 | 38 |
| | 4700 | 4700 | kg | EMULSIFIED ASPHALT | 404.65 | 19 |
| | 9800 | 9800 | t | MEDIUM DUTY BITUMINOUS CONCRETE PAVEMENT | 406.27 | 26 |
| | 1 | 1 | LS | PRICE ADJUSTMENT ASPHALT CEMENT (NOT A BID ITEM) | 406.50 | |
| 1 | | 1 | m3 | CONCRETE, CLASS A | 501.22 | EST |
| 100 | | 100 | kg | REINFORCING STEEL | 507.15 | EST |
| | | | | *** BEGIN OPTION ITEMS *** | | |
| 10 | | 10 | m | JOINT SEALER, HOT POURED | 524.11 | - |
| 10 | | 10 | m | JOINT SEALER, COLD POURED | 524.13 | - |
| | | | | *** END OPTION ITEMS *** | | |
| 27 | | 27 | m | REMOVAL OF EXISTING RAILING | 525.10 | 1 |
| 12 | | 12 | m | BRIDGE RAIL - H.D. STEEL BEAM/FASCIA MOUNTED | 525.41 | 0.6 |
| | 15 | 15 | m | 300 mm CSP 47 mm (67 mm x 13 mm) | 601.0005 | - |
| | 6 | 6 | EA | REHABILITATION OF DROP INLETS, CATCH BASINS OR MANHOLES, CLASS I | 604.412 | EST |
| | 6 | 6 | EA | REHABILITATION OF DROP INLETS, CATCH BASINS OR MANHOLES, CLASS II | 604.415 | EST |
| | 5 | 5 | EA | REHABILITATION OF DROP INLETS, CATCH BASINS OR MANHOLES, CLASS III | 604.418 | EST |
| | 140 | 140 | HR | POWER GRADER RENTAL | 608.15 | EST |
| | 140 | 140 | HR | ALL PURPOSE EXCAVATOR RENTAL, TYPE I | 608.25 | EST |
| | 85 | 85 | HR | POWER BROOM RENTAL | 608.30 | EST |
| | 140 | 140 | HR | TRUCK RENTAL | 608.37 | EST |
| | 140 | 140 | HR | LOADER RENTAL, TYPE I | 608.40 | EST |
| | 65 | 65 | EA | YIELDING MARKER POSTS | 619.17 | EST |
| 38 | 703 | 741 | m | STEEL BEAM GUARDRAIL | 621.20 | 7.6 |
| | 228 | 228 | m | STEEL BEAM GUARDRAIL (W/2.5 m STEEL POST) (MODIFIED) | 621.20(MOD) | 3.8 |
| 19 | | 19 | m | HEAVY DUTY STEEL BEAM GUARDRAIL | 621.21 | 1.5 |
| 2 | 15 | 17 | EA | MODIFIED ECCENTRIC LOADER TERMINAL | 621.54 | - |
| 2 | 1 | 3 | EA | ANCHOR FOR STEEL BEAM RAIL | 621.60 | - |
| 52 | 923 | 975 | m | REMOVAL AND DISP. OF GUARDRAIL | 621.80 | 9 |

## DETAILED SUMMARY OF QUANTITIES

| QUANTITIES | UNIT | ITEMS |
|---|---|---|
| | | AGGREGATE SHOULDERS |
| 372 | t | TO BACKUP EDGE OF PAVEMENT |
| 740 | t | GUARDRAIL TERMINALS |
| 38 | t | ROUNDING |
| 1150 | t | TOTAL |
| | | MEDIUM DUTY BITUMINOUS CONCRETE PAVEMENT |
| 6384 | t | VT ROUTE 12 |
| 2810 | t | LEVELING COURSE |
| 21 | t | TOWN HIGHWAYS |
| 559 | t | DRIVES |
| 26 | t | ROUNDING |
| 9800 | t | TOTAL |

## DETAILED SUMMARY OF QUANTITIES

| QUANTITIES | UNIT | ITEMS |
|---|---|---|

PROJECT : RANDOLPH-BRAINTREE
PROJECT NO.: STP 9602(I)S
DESIGN FILE NAME: /pave/95c018/pc018.dgn
IPARM FILE NAME: pc018gsl.i
SURVEYED BY: CLD
SQUAD LEADER: JAW
PLOT DATE: 8/96
SURVEY DATE: 8/95
DRAWN BY: NEL
SHEET: 3 OF 14

: Sheet Number: 3

STATE OF VERMONT
AGENCY OF TRANSPORTATION

# QUANTITY SHEET

Metric

## SUMMARY OF ESTIMATED QUANTITIES

| BRIDGE | ROADWAY | QUANTITIES GRAND TOTAL | UNIT | ITEMS | ITEM NUMBER | RND |
|---|---|---|---|---|---|---|
| | 560 | 560 | HR | UNIFORMED TRAFFIC OFFICERS | 630.10 | EST |
| | 840 | 840 | HR | FLAGGERS | 630.15 | EST |
| | 1 | 1 | LS | TESTING EQUIPMENT - CONCRETE | 631.16 | |
| | 1 | 1 | LS | TESTING EQUIPMENT - BITUMINOUS | 631.17 | |
| | 1 | 1 | LS | MOBILIZATION | 635.10 | |
| | 16800 | 16800 | m | DURABLE 100 mm WHITE LINE | 646.40 | 37 |
| | 14800 | 14800 | m | DURABLE 100 mm YELLOW LINE | 646.41 | 79 |
| | 16800 | 16800 | m | TEMPORARY 100 mm WHITE LINE | 646.60 | 37 |
| | 14800 | 14800 | m | TEMPORARY 100 mm YELLOW LINE | 646.61 | 79 |
| | 675 | 675 | EA | LINE STRIPING TARGETS | 646.76 | 12 |
| | 15 | 15 | kg | SEED | 651.15 | EST |
| | 115 | 115 | kg | FERTILIZER | 651.18 | EST |
| | 1 | 1 | t | AGRICULTURAL LIMESTONE | 651.20 | EST |
| | 1 | 1 | t | HAY MULCH | 651.25 | EST |
| | 20 | 20 | m3 | TOPSOIL | 651.35 | EST |
| | 7 | 7 | m2 | TRAFFIC SIGNS, TYPE A | 675.20 | 0.5 |
| | | | | *** BEGIN OPTION ITEMS *** | | |
| | 225 | 225 | kg | FLANGED CHANNEL SIGN POSTS | 675.30 | 9 |
| | 225 | 225 | kg | SQUARE TUBE STEEL POSTS AND ANCHORS | 675.34 | 9 |
| | | | | *** END OPTION ITEMS *** | | |
| | 11 | 11 | EA | REMOVING SIGNS | 675.50 | |

## DETAILED SUMMARY OF QUANTITIES

| QUANTITIES | UNIT | ITEMS |
|---|---|---|

## DETAILED SUMMARY OF QUANTITIES

| QUANTITIES | UNIT | ITEMS |
|---|---|---|

CHF 11/18/96

| | |
|---|---|
| PROJECT : RANDOLPH-BRAINTREE | PROJECT NO.: STP 9602(I)S |
| DESIGN FILE NAME: /pave/95c018/pc018.dgn | |
| FARM FILE NAME: pc018qs2.f | PLOT DATE: 8/96 |
| SURVEYED BY: CLD | SURVEY DATE: 8/95 |
| SQUAD LEADER: JAW | DRAWN BY: MLL |
| | SHEET: 4 OF 14 |

: Sheet Number: 4

| LOCATION | | | CURBED SIDEWALKS | | | | | DROP INLETS | | | | GUARDRAIL | | | | | | | | | | | | PIPE | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STATION | STATION | POS. | 203.15 COMM. EXCAV. | 203.16 SOLID ROCK EXCAV. | 301.28 SUBBASE OF CR. GRAVEL | 616.21 VERT. GRANITE CURB | 618.10 PORT. CEM. CONCRETE SIDEWALK 125 mm | 604.40 CHANGE ELEV. D.I. | 604.412 REHAB. D.I. CLASS I | 604.415 REHAB. D.I. CLASS II | 604.418 REHAB. D.I. CLASS III | 616.35 TIMBER CURB | 621.20 STEEL BEAM G.R. | 621.20(1)(b)01 2.5 m POST BEAM G.R. | 621.21 H.D. BEAM G.R. | 621.54 M.E.L.T. | 621.53 TERM. CONN. | 621.60 ANCHOR FOR G.R. | 621.75 REMOVE RESET G.R. | 621.80 REMOVE & DISP. G.R. | 621.81 REMOVE & DISP. G.P. | 676.10 STEEL POST DELIN. | 604.0005 CSP D | CSP L | CSP TH/CL | REMARKS |
| VT. RTE. 12, RANDOLPH | | | m3 | m3 | t | m | m2 | EA | EA | EA | EA | m | m | m | m | EA | EA | EA | m | m | EA | EA | mm | m | | |
| 4+940 | 10+875 | LT&RT | | | | | | | 4 | 4 | 3 | | | | | | | | | | | | | | | FOR LOCATIONS & GRATE TYPES, SEE LAYOUT SHEETS. GRATE INCLUDED UNDER EACH ITEM |
| 6+146 | 6+199 | LT | | | | | | | | | | | 53.2 | | | 2 | | | | 50 | | | | | | MELT @ STA 6+146, MELT @ STA 6+199 |
| 6+299 | 6+417 | LT | | | | | | | | | | | | 117.8 | | 2 | | | | 126 | | | | | | MELT @ STA 6+299, MELT @ STA 6+417 |
| 6+947 | 7+008 | LT | | | | | | | | | | | 60.8 | | | 2 | | | | 33 | | | 300 | 15 | 1:7 | MELT @ STA 6+947; MELT @ STA 7+008 |
| 7+619 | 7+714 | LT | | | | | | | | | | | 95 | | | 2 | | | | 100 | | | | | | MELT @ STA 7+619, MELT @ STA 7+714 |
| 7+907 | 7+949 | LT | | | | | | | | | | | 41.8 | | | 1 | | 1 | | 47 | | | | | | MELT @ STA 7+907, ANCHOR @ STA 7+949, INSTALL 1-5 m RADIUS PANEL. SEE STANDARD DETAILS ON SHEET G-1d |
| 8+747 | 8+857 | LT | | | | | | | | | | | 110.2 | | | 2 | | | | 90 | | | | | | MELT @ STA 8+747, MELT @ STA 8+857 |
| 9+751 | 10+093 | LT | | | | | | | | | | | 342 | | | 2 | | | | 352 | | | | | | MELT @ STA 9+751, MELT @ STA 10+093 |
| 10+143 | 10+249 | LT | | | | | | | | | | | | 106.4 | | 2 | | | | 107 | | | | | | MELT @ STA 10+143, MELT @ STA 10+249 |
| VT. RTE. 12, BRAINTREE | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0+000 | 2+505 | LT&RT | | | | | | | 2 | 2 | 2 | | | | | | | | | | | | | | | FOR LOCATIONS & GRATE TYPES, SEE LAYOUT SHEETS. GRATE INCLUDED UNDER EACH ITEM |
| SHEET TOTALS | | | | | | | | | 6 | 6 | 5 | | 703 | 224.2 | - | 15 | | 1 | | 914 | | | | 15 | | |
| BRIDGE SHEET #12 TOTALS | | | | | | | | | - | - | - | | 30.4 | - | 17.5 | 2 | | 2 | | 52 | | | | - | | |
| SUBTOTALS | | | | | | | | | 6 | 6 | 5 | | 733.4 | 224.2 | 17.5 | 17 | | 3 | | 966 | | | | 15 | | |
| ROUNDING | | | | | | | | | 0 | 0 | 0 | | 7.6 | 3.8 | 1.5 | 0 | | 0 | | 9 | | | | 0 | | |
| PROJECT TOTALS | | | | | | | | | 6 | 6 | 5 | | 741 | 228 | 19 | 17 | | 3 | | 975 | | | | 15 | | |

Metric

ITEM DETAIL SHEET

PROJECT : RANDOLPH-BRAINTREE

PROJECT NO. : STP 9602(11)S

DESIGN FILE NAME: /pave/95c018/pc018.dgn

IPARM FILE NAME: pc018id.i

PLOT DATE: 8/96

SURVEYED BY: CLD

SURVEY DATE: 8/95

SQUAD LEADER: JAW

DRAWN BY: NLL

SHEET: 5 OF 14

: Sheet Number: 5

Metric

# VT ROUTE 12
# STA 4+940
# BEGIN PROJECT STP 9602(1)S

TEMPORARY AND DURABLE 100 mm YELLOW LINE

STA 4+940 TO 5+731 SOLID LT & RT
STA 5+731 TO 5+919 DASHED LT, SOLID RT
STA 5+919 TO 6+000 SOLID LT & RT
(WITH CENTER LINE BREAKS FOR TOWN HIGHWAYS)

TEMPORARY AND DURABLE 100 mm WHITE LINE

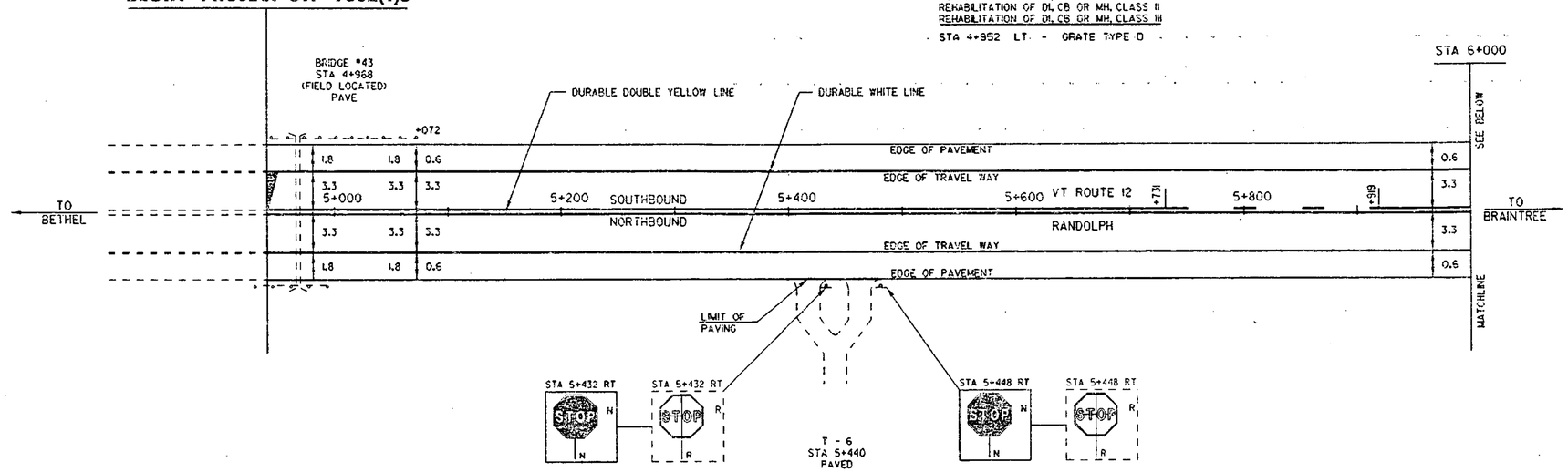
STA 4+940 TO 6+000 SOLID LT & RT
(WITH EDGELINE BREAKS FOR TOWN HIGHWAYS)

REHABILITATION OF DI, CB OR MH, CLASS I
REHABILITATION OF DI, CB OR MH, CLASS II
REHABILITATION OF DI, CB OR MH, CLASS III

STA 4+952 LT. - GRATE TYPE D

REMOVING SIGNS

AS NOTED 2.




TEMPORARY AND DURABLE 100 mm YELLOW LINE

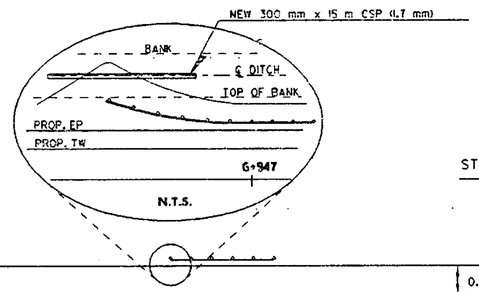
STA 6+000 TO 7+021 SOLID LT & RT
STA 7+021 TO 7+200 SOLID LT, DASHED RT
(WITH CENTER LINE BREAKS FOR TOWN HIGHWAYS)

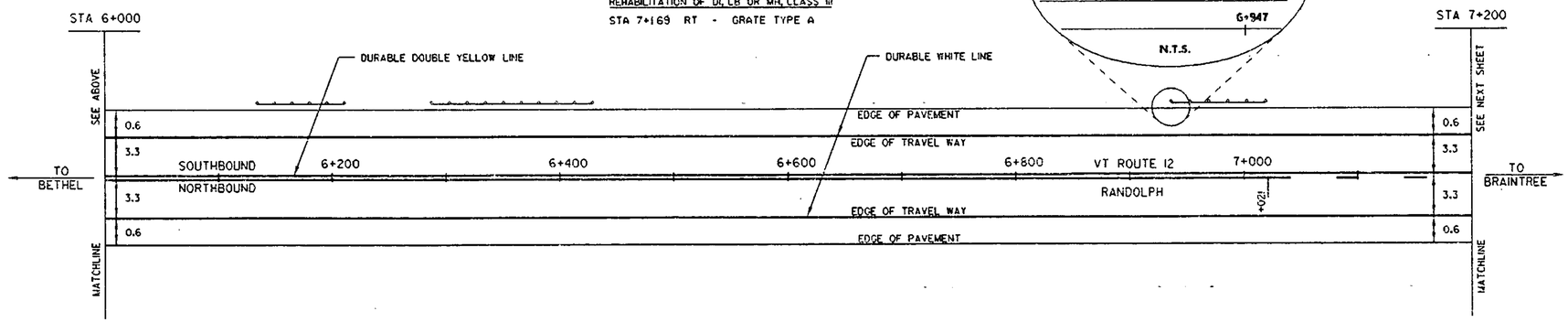
TEMPORARY AND DURABLE 100 mm WHITE LINE

STA 6+00 TO 7+200 SOLID LT & RT
(WITH EDGELINE BREAKS FOR TOWN HIGHWAYS)

REHABILITATION OF DI, CB OR MH, CLASS I
REHABILITATION OF DI, CB OR MH, CLASS II
REHABILITATION OF DI, CB OR MH, CLASS III

STA 7+169 RT - GRATE TYPE A




STEEL BEAM GUARDRAIL

STA 6+146 TO 6+199 LT
STA 6+947 TO 7+008 LT

2.5 m POST STEEL BEAM GUARDRAIL

STA 6+299 TO 6+417 LT

MODIFIED ECCENTRIC LOADER TERMINAL

STA 6+146 LT
STA 6+199 LT
STA 6+299 LT
STA 6+417 LT
STA 6+947 LT
STA 7+008 LT

REMOVAL AND DISPOSAL OF GUARDRAIL

STA 6+142 TO 6+201 LT
STA 6+295 TO 6+421 LT
STA 6+978 TO 7+012 LT

LEGEND

R = REMOVE EXISTING
N = NEW
B-B = BACK TO BACK
= NEW RAIL
= EXIST RAIL

NOT TO SCALE

DATUM
VERTICAL N/A
HORIZONTAL N/A

**PAVING PROJECT LAYOUT**

| | |
|---|---|
| PROJECT : RANDOLPH-BRAINTREE | PROJECT NO. : STP 9602(1)S |
| DESIGN FILE NAME: /pave/95c018/pc018.dgn | |
| IPARM FILE NAME: pc018101.i | PLOT DATE: 8/96 |
| SURVEYED BY: CLD | SURVEY DATE: 11/95 |
| SQUAD LEADER: JAW | DRAWN BY: NJL |
| | SHEET: 5 OF 14 |

: Sheet Number: 6

Metric

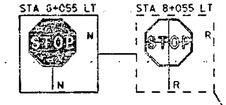
TEMPORARY AND DURABLE 100 mm YELLOW LINE

STA 7+200 TO 7+219 SOLID LT & DASHED RT
STA 7+219 TO 7+461 DASHED
STA 7+461 TO 7+677 DASHED LT, SOLID RT
STA 7+677 TO 8+400 SOLID LT & RT
(WITH CENTER LINE BREAKS FOR TOWN HIGHWAYS)

TEMPORARY AND DURABLE 100 mm WHITE LINE

STA 7+200 TO 8+400 SOLID LT & RT
(WITH EDGELINE BREAKS FOR TOWN HIGHWAYS)

STA 8+055 LT

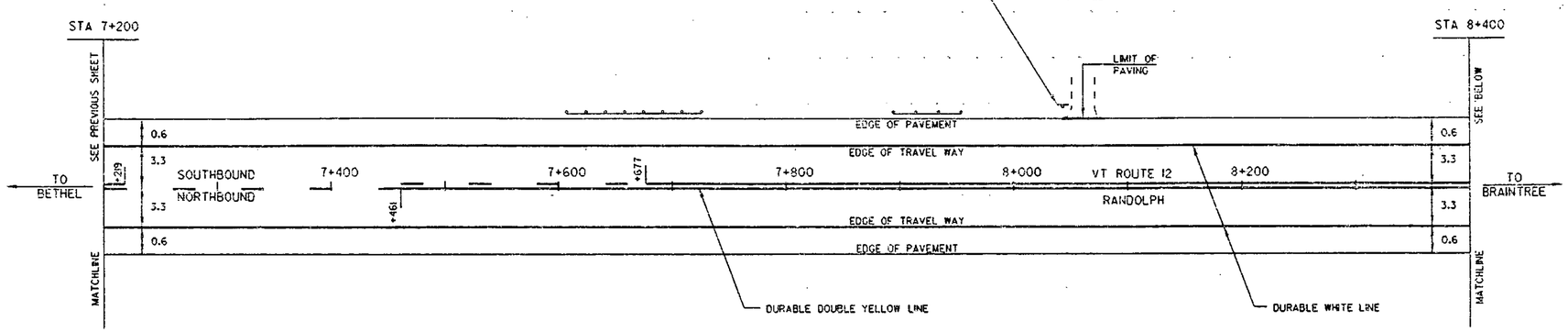



STA 8+055 LT




REMOVING SIGNS AS NOTED !

PETH RD
STA 8+061
GRAVEL




STEEL BEAM GUARDRAIL

STA 7+619 TO 7+714 LT
STA 7+907 TO 7+949 LT

MODIFIED ECCENTRIC LOADER TERMINAL

STA 7+619 LT
STA 7+714 LT
STA 7+907 LT

REMOVAL AND DISPOSAL OF GUARDRAIL

STA 7+615 TO 7+715 LT
STA 7+902 TO 7+949 LT

ANCHOR FOR STEEL BEAM RAIL

STA 7+949 LT

REHABILITATION OF DI, CB OR MH, CLASS I
REHABILITATION OF DI, CB OR MH, CLASS II
REHABILITATION OF DI, CB OR MH, CLASS III

STA 7+317 RT - GRATE TYPE A
STA 7+991 RT - GRATE TYPE A

TEMPORARY AND DURABLE 100 mm YELLOW LINE

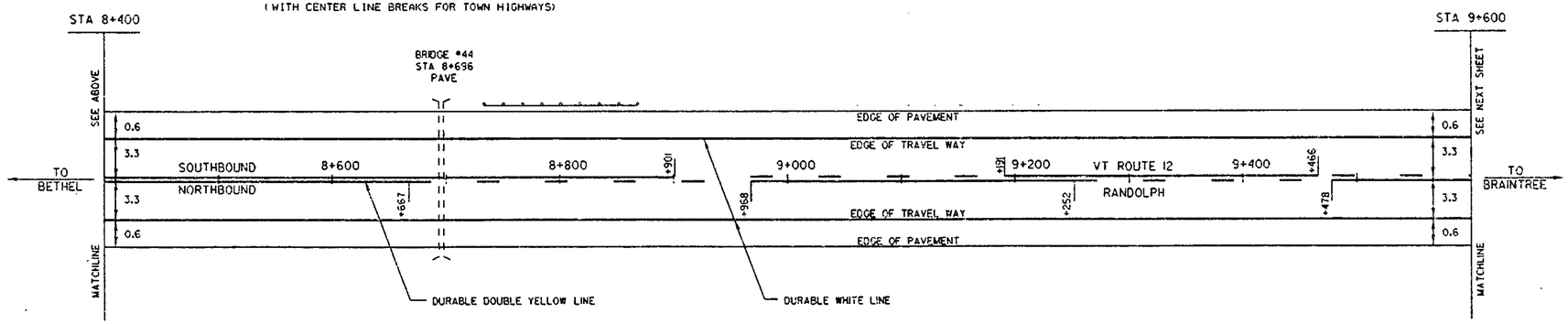
STA 8+400 TO 8+667 SOLID LT & RT
STA 8+667 TO 8+901 SOLID LT, DASHED RT
STA 8+901 TO 8+963 DASHED
STA 8+968 TO 9+191 DASHED LT, SOLID RT
STA 9+191 TO 9+252 SOLID LT & RT
STA 9+252 TO 9+466 SOLID LT, DASHED RT
STA 9+466 TO 9+478 DASHED
STA 9+478 TO 9+600 DASHED LT, SOLID RT
(WITH CENTER LINE BREAKS FOR TOWN HIGHWAYS)

TEMPORARY AND DURABLE 100 mm WHITE LINE

STA 8+400 TO 9+600 SOLID LT & RT
(WITH EDGELINE BREAKS FOR TOWN HIGHWAYS)

REHABILITATION OF DI, CB OR MH, CLASS I
REHABILITATION OF DI, CB OR MH, CLASS II
REHABILITATION OF DI, CB OR MH, CLASS III

STA 8+807 RT - GRATE TYPE A




STEEL BEAM GUARDRAIL

STA 8+747 TO 8+857 LT

MODIFIED ECCENTRIC LOADER TERMINAL

STA 8+747 LT
STA 8+857 LT

REMOVAL AND DISPOSAL OF GUARDRAIL

STA 8+771 TO 8+861 LT

LEGEND

R = REMOVE EXISTING
N = NEW
B-B = BACK TO BACK
= NEW RAIL

DATUM
VERTICAL N/A
HORIZONTAL N/A

NOT TO SCALE

**PAVING PROJECT LAYOUT**

| | |
|---|---|
| PROJECT : RANDOLPH-BRAINTREE | PROJECT NO. : STP 9602(1)S |
| DESIGN FILE NAME: /pave/95c018/pc018.dgn | |
| PARM FILE NAME: pc018102.1 | PLOT DATE: 8/96 |
| SURVEYED BY: CLD | SURVEY DATE: 11/95 |
| SQUAD LEADER: JAW | DRAWN BY: NLL |
| | SHEET: 7 OF 14 |

: Sheet Number: 7

Metric

**TEMPORARY AND DURABLE 100 mm YELLOW LINE**

STA 9+600 TO 9+736 DASHED LT, SOLID RT
STA 9+736 TO 10+875 SOLID LT & RT
(WITH CENTER LINE BREAKS FOR TOWN HIGHWAYS)

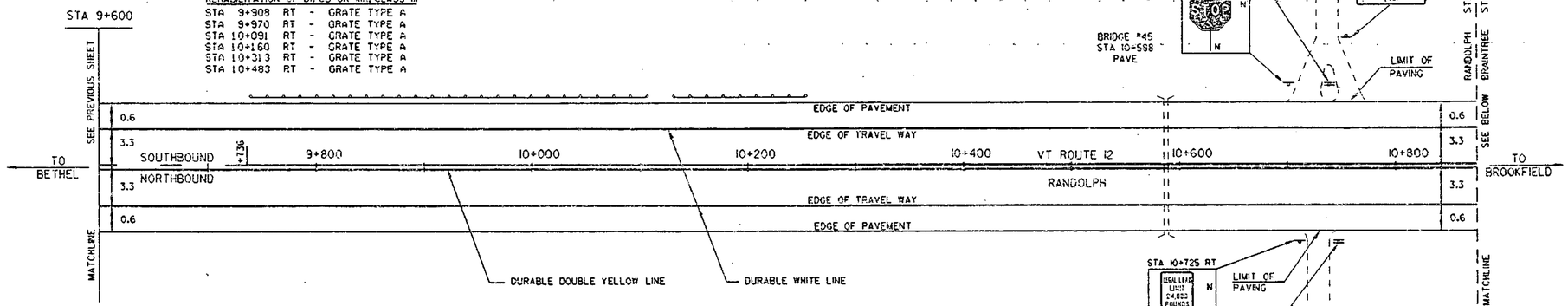
**TEMPORARY AND DURABLE 100 mm WHITE LINE**

STA 9+600 TO 10+875 SOLID LT & RT
(WITH EDGELINE BREAKS FOR TOWN HIGHWAYS)

REMOVING SIGNS
AS NOTED 4.

**REHABILITATION OF DI, CB OR MH, CLASS I**
**REHABILITATION OF DI, CB OR MH, CLASS II**
**REHABILITATION OF DI, CB OR MH, CLASS III**

STA 9+909 RT - GRATE TYPE A
STA 9+970 RT - GRATE TYPE A
STA 10+091 RT - GRATE TYPE A
STA 10+160 RT - GRATE TYPE A
STA 10+313 RT - GRATE TYPE A
STA 10+483 RT - GRATE TYPE A




**STEEL BEAM GUARDRAIL**

STA 9+751 TO 10+093 LT

**2.5 m POST STEEL BEAM GUARDRAIL**

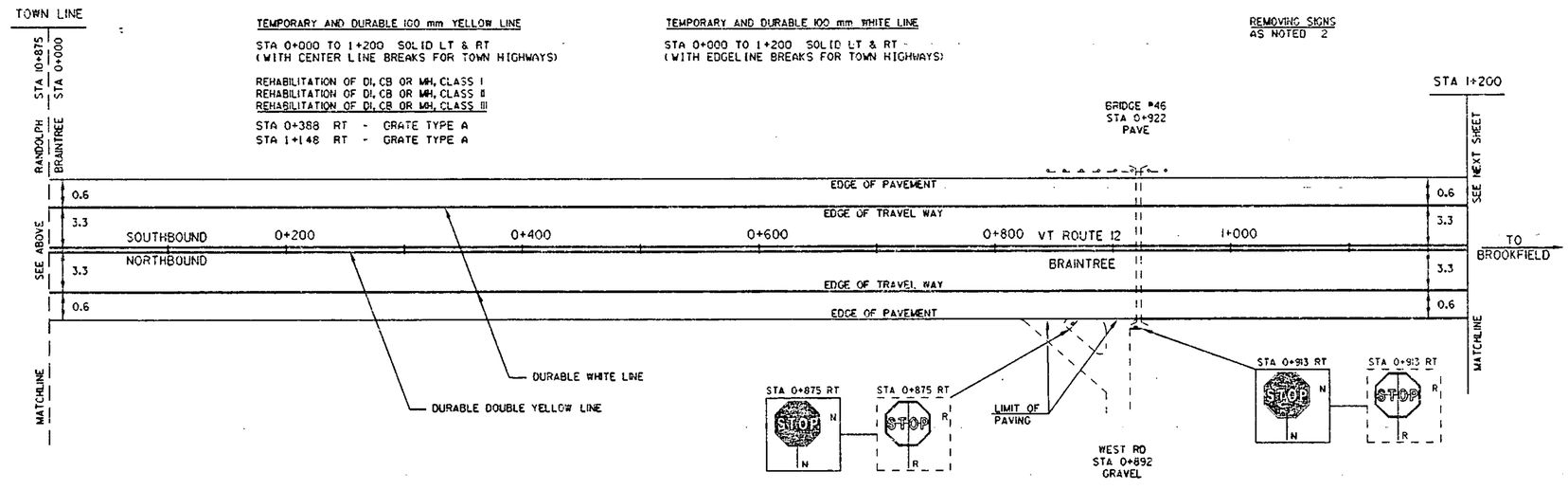
STA 10+143 TO 10+249 LT

**MODIFIED ECCENTRIC LOADER TERMINAL**

STA 9+751 LT
STA 10+093 LT
STA 10+143 LT
STA 10+249 LT

**REMOVAL AND DISPOSAL OF GUARDRAIL**

STA 9+747 TO 10+099 LT
STA 10+139 TO 10+246 LT




**TEMPORARY AND DURABLE 100 mm YELLOW LINE**

STA 0+000 TO 1+200 SOLID LT & RT
(WITH CENTER LINE BREAKS FOR TOWN HIGHWAYS)

**TEMPORARY AND DURABLE 100 mm WHITE LINE**

STA 0+000 TO 1+200 SOLID LT & RT
(WITH EDGELINE BREAKS FOR TOWN HIGHWAYS)

REMOVING SIGNS
AS NOTED 2

**REHABILITATION OF DI, CB OR MH, CLASS I**
**REHABILITATION OF DI, CB OR MH, CLASS II**
**REHABILITATION OF DI, CB OR MH, CLASS III**

STA 0+388 RT - GRATE TYPE A
STA 1+148 RT - GRATE TYPE A

LEGEND

R = REMOVE EXISTING
N = NEW
B-B = BACK TO BACK
= NEW RAIL
= EXIST RAIL

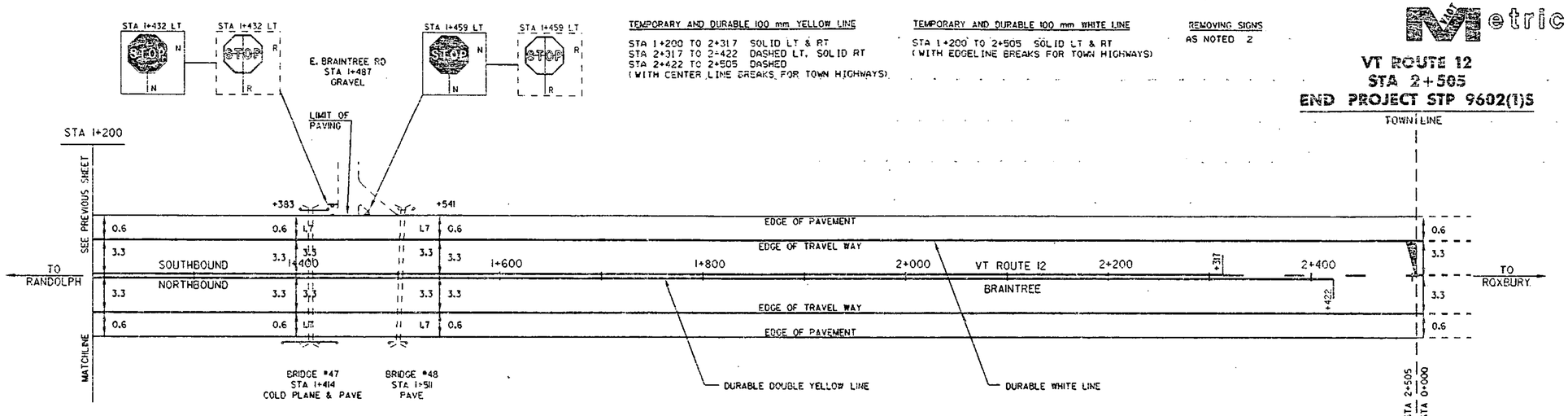
NOT TO SCALE

DATUM
VERTICAL N/A
HORIZONTAL N/A

**PAVING PROJECT LAYOUT**

PROJECT : RANDOLPH-BRAINTREE
PROJECT NO.: STP 9602(11)S
DESIGN FILE NAME: /pave/95c018/pc018.dgn
PARM FILE NAME: pc018103.l
PLOT DATE: 8/96
SURVEYED BY: CLD
SURVEY DATE: 11/95
SQUAD LEADER: JAW
DRAWN BY: NLL
SHEET: 8 OF 14

: Sheet Number: 8




TEMPORARY AND DURABLE 100 mm YELLOW LINE

STA 1+200 TO 2+317 SOLID LT & RT
STA 2+317 TO 2+422 DASHED LT, SOLID RT
STA 2+422 TO 2+505 DASHED
(WITH CENTER LINE BREAKS FOR TOWN HIGHWAYS)

TEMPORARY AND DURABLE 100 mm WHITE LINE

STA 1+200 TO 2+505 SOLID LT & RT
(WITH EDGELINE BREAKS FOR TOWN HIGHWAYS)

REMOVING SIGNS

AS NOTED 2

Metric

# VT ROUTE 12
# STA 2+505
# END PROJECT STP 9602(1)S

BRIDGE RAIL - HD STEEL BEAM/FASCIA MOUNTED

STA 1+408 TO 1+420 LT

HD STEEL BEAM GUARDRAIL

STA 1+404 TO 1+408 LT
STA 1+420 TO 1+431 LT

STEEL BEAM GUARDRAIL

STA 1+398 TO 1+428 RT

ANCHOR FOR STEEL BEAM RAIL

STA 1+404 LT
STA 1+431 LT

MODIFIED ECCENTRIC LOADER TERMINAL

STA 1+398 RT
STA 1+428 RT

REMOVAL AND DISPOSAL OF GUARDRAIL

STA 1+386 TO 1+438 RT

REMOVAL AND DISPOSAL OF BRIDGE RAIL

STA 1+403 TO 1+429 LT

REHABILITATION OF DI, CB OR MH, CLASS I
REHABILITATION OF DI, CB OR MH, CLASS II
REHABILITATION OF DI, CB OR MH, CLASS III

STA 1+257 RT - GRATE TYPE A
STA 1+299 RT - GRATE TYPE D
STA 1+332 RT - GRATE TYPE D
STA 2+056 LT - GRATE TYPE A

DATUM
VERTICAL N/A
HORIZONTAL N/A

NOT TO SCALE

LEGEND
R = REMOVE EXISTING
N = NEW
B-B = BACK TO BACK
= NEW RAIL
= EXIST RAIL

PAVING PROJECT LAYOUT

PROJECT : RANDOLPH-BRAINTREE
PROJECT NO.: STP 9602(1)S
DESIGN FILE NAME: /pave/95c018/pc018.dgn
IPARM FILE NAME: pc018104.I
PLOT DATE: 8/96
SURVEYED BY: CLD
SURVEY DATE: 11/95
SQUAD LEADER: JAW
DRAWN BY: NLE
SHEET: 9 OF 14

: Sheet Number: 9

**STATE OF VERMONT**
**AGENCY OF TRANSPORTATION**

# TRAFFIC SIGN SUMMARY SHEET

Metric

| KILOMETER MARKER, STATION, OR SIGN NUMBER | SIGN LEGEND | SIGN DIMENSIONS EA | WIDTH (mm) | HEIGHT (mm) | NEW & SALVAGED SIGNS "A" | "B" | SALV SIGN | SALV TIS | EXIST POST RETAIN | SALVAGE | NEW SIGN POSTS NO. OF POSTS | FLANGED CHANNEL kg/m 1.7 | 3.0 | 4.5 | SQUARE STEEL (mm) kg/m 44 | 50 | 63 | ANCHOR | SLEEVE | TUBULAR ALUMINUM Ø (mm) kg/m 75 | 100 | 100 MOD | TUBULAR STEEL Ø (mm) FOUNDATION | kg/m 75 | 89 | 100 | 125 | W-SHAPE STEEL FTG. SIZE 600 mm | 750 mm | MASS | POST SIZE | SIGN FRAME REQUIRED | REMARKS | SIGN DETAIL DETAIL ON SHEET NUMBER | STD. SHEET NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | 1.7 | 3.0 | 4.5 | 3.4 | 3.9 | 5.0 | | | 1.9 | 2.5 | 2.5 | | 11.3 | 13.4 | 16.1 | 21.7 | | | | | | | | |
| RANDOLPH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| STA 10+725 RT | LEGAL LOAD LIMIT 24,000 POUNDS | 1 | 600 | 750 | 0.45 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-141 |
| STA 10+730 LT | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| STA 10+734 RT | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| | LEGAL LOAD LIMIT 24,000 POUNDS | 1 | 600 | 750 | 0.45 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-141 |
| BRAINTREE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STA 0+875 RT | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| STA 0+913 RT | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| | STOP | 1 | 750 | 750 | 0.56 | | | | | | 1 | | | X | | X | | X | | | | | | | | | | | | | | | | E-143 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **TOTALS** | | | | | M² 6.50 | M² | EA. | M² | | | | kg 216 | | | kg 216 | | | | | kg | | | EA. | kg | | | | EA. | EA. | kg | | | | | | |

FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE."

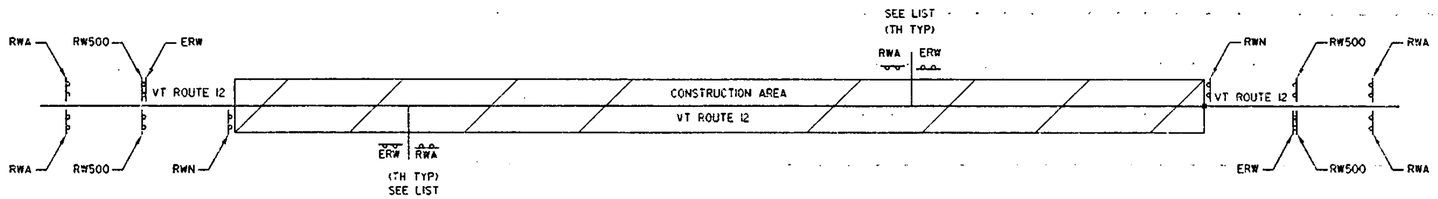
| | |
|---|---|
| PROJECT: RANDOLPH-BRAINTREE | PROJECT NO.: STP 9602(11)S |
| DESIGN FILE NAME: | /pgve/95c048/pc018.dgn |
| PARM FILE NAME: | /pc018ts.l |
| SURVEYED BY: | CLD |
| SQUAD LEADER: | JAW |
| PLOT DATE: | 8/96 |
| SURVEY DATE: | 11/96 |
| DRAWN BY: | NLL |
| SHEET: | 10 OF 14 |

: Sheet Number:

Metric

# CONSTRUCTION APPROACH SIGNING

SEE STANDARD E-100 FOR SIGN PLACEMENT




LIST OF TOWN HIGHWAYS
FOR CONSTRUCTION SIGNS

| TOWN / HIGHWAY NAME | ROAD WORK AHEAD | END ROAD WORK | OTHER |
|---|---|---|---|
| TH-6 | 1 | 1 | |
| PETH RD | 1 | 1 | |
| HOWARD HILL RD | 1 | 1 | |
| TH-23 | 1 | 1 | |
| WEST RD | 1 | 1 | |
| E. BRAINTREE RD | 1 | 1 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| TOTAL | 6 | 6 | |

LEGEND

RWA = ROAD WORK AHEAD
RW500 = ROAD WORK 500
RWN = ROAD WORK NEXT 5¼ MILES
ERW = END ROAD WORK

NOTE:
WHEN DIRECTED BY THE RESIDENT ENGINEER, "DEAD END" SIDE ROADS WILL NOT REQUIRE CONSTRUCTION SIGNING.

NOT TO SCALE

DATUM
VERTICAL
HORIZONTAL

**CONSTRUCTION APPROACH SIGNING**

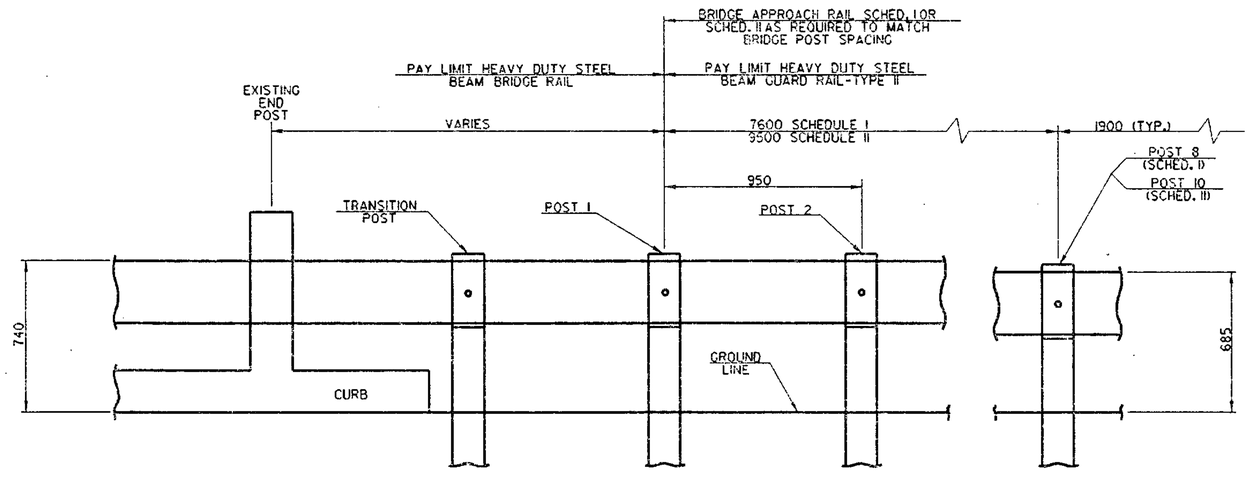
CHF 11/18/96

| | |
|---|---|
| PROJECT : RANDOLPH-BRAINTREE | PROJECT NO.: STP 9602(I)S |
| DESIGN FILE NAME: /pav/95c018/pc018.dgn | |
| PARM FILE NAME: pc018cs.i | PLOT DATE: 8/96 |
| SURVEYED BY: CLD | SURVEY DATE: 11/95 |
| SQUAD LEADER: JAW | DRAWN BY: NKL |
| | SHEET: 11 OF 14 |

: Sheet Number: 11

# BRIDGE QUANTITY SHEET

| STATION | POS. | BRIDGE NO. | OFFSET BLOCK | 525.10 | 525.41 | 525.41 MOD 1 | 621.20 | 621.21 | 621.54 | 621.60 | 621.80 | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRAINTREE | | | | | | | | | | | | |
| STA 1+398 - 1+428 | RT | 47 | 200 | | | | 30.4 | | 2 | | 52 | MELT @ 1+398 RT, MELT @ 1+428 RT |
| STA 1+404 - 1+431 | LT | 47 | 200 | 26 | 11.4 | | - | 17.5 | | 2 | | ANCHORS @ 1+404 & 1+431 LT, INSTALL 2-5 m RADIUS PANELS, SEE STANDARDS G-10 AND G-16 |
| SUBTOTALS | | | | 26 | 11.4 | | 30.4 | 17.5 | 2 | 2 | 52 | |
| ROUNDING | | | | 1 | 0.6 | | - | - | - | - | - | |
| TOTALS | | | | 27 | 12 | | 30.4 | 17.5 | 2 | 2 | 52 | |




BRIDGE APPROACH RAILING

## NOTES

1. BRIDGE RAIL SHALL BE HEAVY DUTY STEEL BEAM RAIL.
2. BRIDGE APPROACH RAIL HEIGHT SHALL BE TRANSITIONED TO NORMAL ROADWAY RAIL HEIGHT IN 7.6 METERS.
3. APPROACH RAILING SHALL BE HEAVY DUTY STEEL BEAM FOR 7.6 METERS FROM THE ENDS OF THE BRIDGE.
4. FOR 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.
5. SPLICES SHALL LAP IN DIRECTION OF TRAFFIC FLOW.
6. SEE STANDARD SHEET G-1 FOR DELINEATOR DETAILS AND PLACEMENT.
7. ERECT DELINEATORS ON EVERY FIFTH POST OR APPROXIMATELY 9 METERS APART. PAYMENT SHALL BE SUBSIDIARY TO OTHER ITEMS.
8. JOINT SEALER, HOT POURED, OR JOINT SEALER, COLD POURED, SHALL BE INSTALLED ONLY AT BRIDGE EXPANSION JOINTS ON ANY BRIDGE GREATER THAN 9 METERS IN LENGTH AS DIRECTED BY THE RESIDENT ENGINEER. AN ESTIMATED QUANTITY HAS BEEN INCLUDED FOR THIS PROVISION.
9. AN ESTIMATED QUANTITY OF ITEM 501.22 CONCRETE CLASS A AND ITEM 507.15 REINFORCING STEEL HAVE BEEN ADDED TO REPAIR DAMAGED BRIDGE POSTS IF NECCESSARY. REMOVAL OF EXISTING DAMAGED POSTS WILL BE AS DIRECTED BY THE ENGINEER AND WILL BE CONSIDERED SUBSIDIARY TO ITEM 501.22 AND 507.15.

| | |
|---|---|
| ITEM 501.22 CONCRETE CLASS A | 1m3 (EST.) |
| ITEM 507.15 REINFORCING STEEL | 100 kg (EST.) |

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.

SCHEDULE I

| POST NO. | SPACING | PAYMENT FACTOR |
|---|---|---|
| 1 | 950 | 1.4 x 3800 |
| 2 | 950 | |
| 3 | 950 | |
| 4 | 950 | |
| 5 | 1270 | 1.2 x 3800 |
| 6 | 1270 | |
| 7 | 1270 | |
| 8 | 1900 (TYP.) | 1.0 (TYP.) |
| 9 | | |

SCHEDULE II

| POST NO. | SPACING | PAYMENT FACTOR |
|---|---|---|
| 1 | 950 | 1.4 X 5700 |
| 2 | 950 | |
| 3 | 950 | |
| 4 | 950 | |
| 5 | 950 | |
| 6 | 950 | |
| 7 | 1270 | 1.2 x 3800 |
| 8 | 1270 | |
| 9 | 1270 | |
| 10 | 1900 (TYP.) | 1.0 (TYP.) |
| 11 | | |

*NOTE: ALL DIMENSIONS IN MILLIMETERS EXCEPT AS INDICATED*

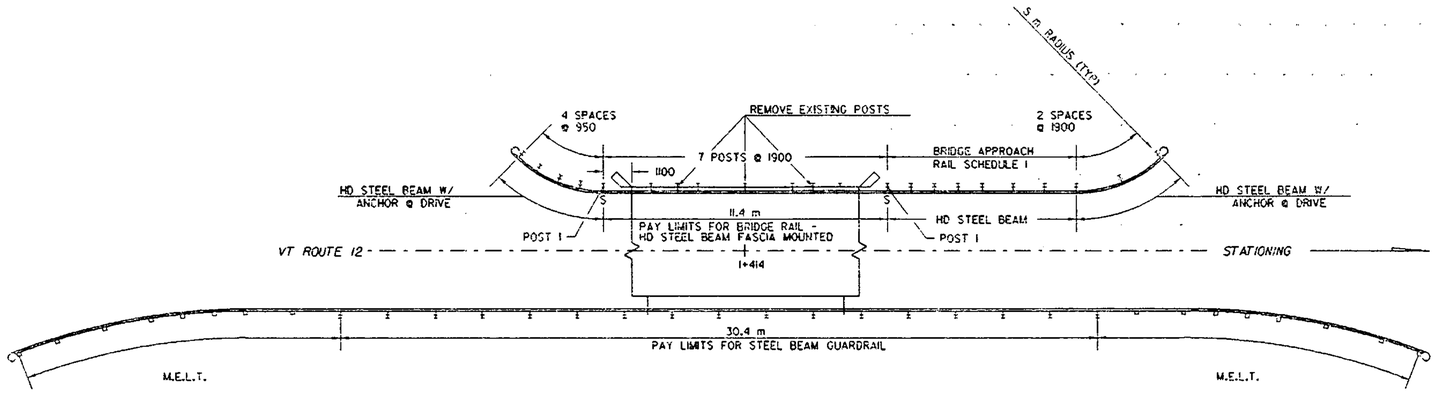
DATUM
VERTICAL
HORIZONTAL

**BRIDGE DETAIL SHEET #1**

| | |
|---|---|
| PROJECT: RANDOLPH-BRAINTREE | PROJECT NO.: STP 9602(10)S |
| DESIGN FILE NAME: /pave/95c018/pc018.dgn | |
| IPARM FILE NAME: pc018drl.i | PLOT DATE: 8/96 |
| SURVEYED BY: CLD | SURVEY DATE: 11/95 |
| SQUAD LEADER: JAW | DRAWN BY: SJS |
| | SHEET: 12 OF 14 |

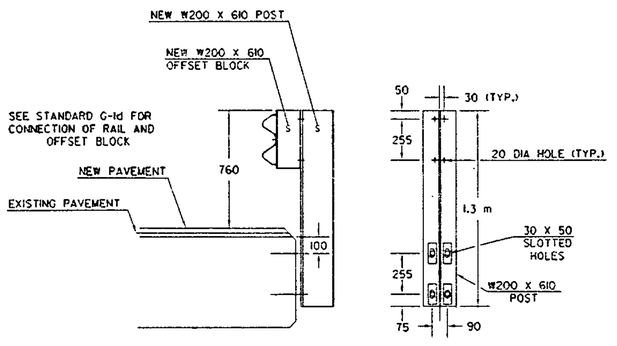
: Sheet Number: 12

Metric



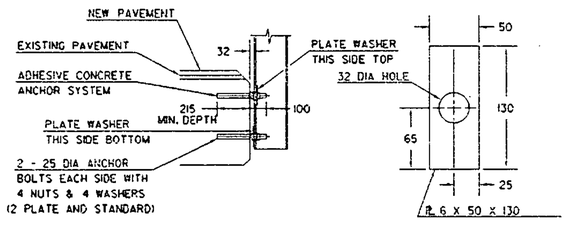

# BRIDGE #47 @ STA 1+414

SCALE 1:100




**FASCIA MOUNTED STEEL POST DETAIL**

N.T.S.




**ANCHORAGE DETAIL**

N.T.S.

**PLATE WASHER DETAIL**

N.T.S.

## NOTES

1. ANCHOR BOLTS SHALL BE ASTM A307, 25 mm DIAMETER BY 355 mm IN LENGTH WITH A MINIMUM THREAD LENGTH OF 100 mm.
2. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM 153 (AASHTO M 232) AND SHALL CONFORM TO VT SPECIFICATION 714 UNLESS OTHERWISE NOTED.
3. INSTALLATION OF NEW ANCHOR BOLTS AND POSTS SHALL BE SUBSIDIARY TO THE BRIDGE RAIL ITEM.
4. POSTS, BRACKETS AND PLATE WASHERS SHALL BE ASTM A36 STEEL.
5. A MINIMUM PULOUT STRENGTH OF 13 600 kg SHALL BE ATTAINED ON ALL NEW BOLTS THAT ARE GROUTED IN PLACE. A SAMPLE GROUTED BOLT WILL BE TESTED BEFORE MATERIALS ARE APPROVED FOR USE, AND THEN RANDOM BOLTS WILL BE FIELD TESTED BY THE STATE OF VERMONT TO ENSURE THIS STRENGTH IS BEING ATTAINED. 48-HOURS ADVANCE NOTICE IS REQUIRED TO ALERT THE VAOT AS TO WHEN THE CONTRACTOR WILL BE READY FOR THIS TESTING.
6. THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT ALL LANES SHALL BE OPENED TO TRAFFIC DURING NON-WORKING HOURS. THEREFORE, NO GAPS BETWEEN EXISTING RAILING AND NEW RAILING WILL BE PERMITTED. DETAILS FOR TEMPORARY RAIL, IF REQUIRED TO BRIDGE THESE GAPS, SHALL BE SUBMITTED FOR APPROVAL. THE CONTRACTOR WILL BE ALLOWED TO WORK ON THE RAIL ON ONLY ONE SIDE OF THE BRIDGE AT A TIME. TWO WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES. ANY TEMPORARY RAIL REQUIRED SHALL BE PAID SUBSIDIARY TO ITEM 621.21 - "HEAVY DUTY STEEL BEAM GUARDRAIL."
7. THESE CONTRACT DOCUMENTS HAVE BEEN PREPARED BASED ON LIMITED FIELD INVESTIGATION AND RECORD DRAWINGS AVAILABLE AT THE TIME. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS TO THE CONSTRUCTION DETAILS AND WORK QUANTITIES. THE CONTRACTOR SHALL PERFORM THE WORK IN ACCORDANCE WITH FIELD CONDITIONS. ALL DIMENSIONS AND JOINT LOCATIONS SHALL BE FIELD CHECKED BY THE CONTRACTOR PRIOR TO SUBMISSION OF FABRICATION DRAWINGS FOR APPROVAL.

*NOTE : ALL DIMENSIONS IN MILLIMETERS EXCEPT AS INDICATED.*

DATUM
VERTICAL
HORIZONTAL

**BRIDGE DETAIL SHEET #2**

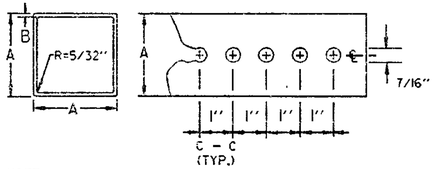
| | |
|---|---|
| PROJECT : RANDOLPH-BRAINTREE | PROJECT NO. : STP 9602(I)S |
| DESIGN FILE NAME: /pave/95c018/pc018.dgn | |
| FARM FILE NAME: pc018dt2.1 | PLOT DATE: 8/96 |
| SURVEYED BY: CLD | SURVEY DATE: 11/95 |
| SQUAD LEADER: JAH | DRAWN BY: SJS |
| | SHEET: 13 OF 14 |

: Sheet Number: 13

## GUARDRAIL DEFLECTION CHART
(PER AASHTO - ROADSIDE DESIGN GUIDE - 1988)

| TYPE | | GR POST SPACING | DEFLECTION |
|---|---|---|---|
| THREE CABLE | W/STEEL POSTS | 16' - 0" | 12' |
| | W/WOODEN POSTS | 12' - 6" | 12' |
| W-BEAM | W/WEAK POST | 12' - 6" | 7' |
| | W/STRONG POST | 6' - 3" | 3' |
| BOX BEAM | | 6' - 0" | 5' |
| THRIE BEAM | W/WEAK POST | 12' - 6" | 4' |
| | W/STRONG POST | 6' - 3" | 2' |
| LONG-SPAN NESTED W-BEAM GUARDRAIL W/STEEL POSTS | | 12' - 6"<br>18' - 9" | 3.1'<br>3.2' |

THIS CHART LISTS THE THEORETICAL DEFLECTION DISTANCE UPON IMPACT OF VARIOUS GUARDRAIL WITH DIFFERENT TYPES AND SPACING OF POSTS.




NOTE :

THE POSTS SHALL BE CAREFULLY FORMED OF STEEL WITH A MINIMUM YIELD OF 55,000 PSI, INTO A SIZE AND SHAPE WITH CORNERS INDUCTION WELDED IN SUCH A MANNER THAT NEITHER FLASH NOR WELD SHALL INTERFERE WITH THE TELESCOPING PROPERTIES, NOR DAMAGE THE GALVANIZING.

- THE WALL THICKNESS TOLERANCES SHALL BE +.005 AND -.010 FOR THE 12 GAUGE.

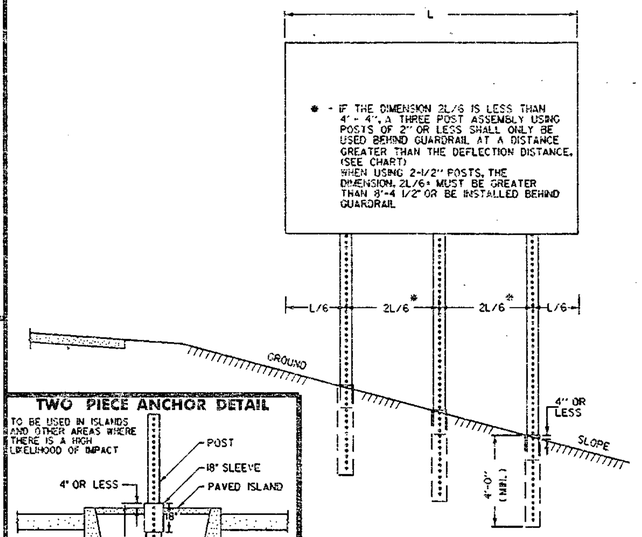
### DIMENSION DETAILS AND POST SELECTION CHART

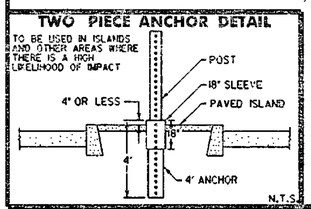
| POST SELECTION CHART | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SIGN AREA ( FT² ) X H ( FT ) ≤ SV ( SELECTION VALUE ) | | | | | | | | |
| POST SIZE | DIMENSIONS | | | SECTION MODULUS IN³ | ONE POST Sv | TWO POST Sv | THREE POST Sv | NUMBER PERMITTED IN 8' PATH |
| LBS/FT. | A | *B | GAUGE | | | | | |
| 2.30 | 1-3/4" | .105 | 12 | 0.265 | 73 | 146 | 219 | TWO |
| 2.65 | 2" | .105 | 12 | 0.372 | 102 | 204 | 306 | TWO |
| 3.35 | 2-1/2" | .105 | 12 | 0.642 | 177 | 354 | 531 | ONE |

DESIGN CRITERIA:

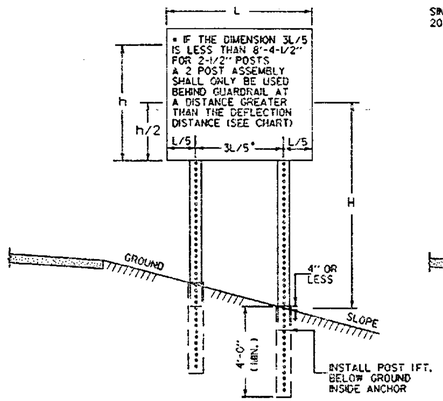
WIND SPEED = 60 MPH (10 -YEAR MEAN RECURRENCE INTERVAL)
WIND PRESSURE = 14 PSF
STEEL MINIMUM YIELD = 55,000 PSI
ALLOWABLE STRESS = (1.4) 0.60 FY

DATUM
VERTICAL N/A
HORIZONTAL N/A




### MULTI-POST INSTALLATIONS



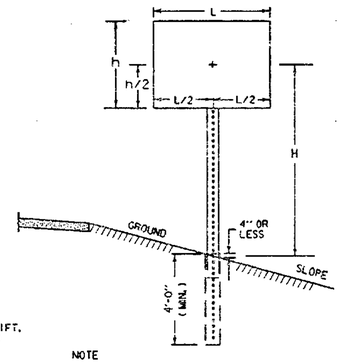

### POST SPACING DETAILS

### 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 RESIDENT ENGINEER. BACKFILL SHALL BE COMPACTED AS DIRECTED BY THE RESIDENT ENGINEER.

SIGN CLEARANCES - HORIZONTAL AND VERTICAL SIGN CLEARANCES SHALL BE SHOWN ON THE PLANS OR THE APPROPRIATE STD. SHEETS.

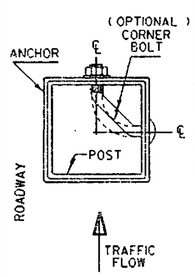
SINGLE POST INSTALLATIONS SHALL BE LIMITED TO A SIGN AREA OF 20 SQ. FT. OR LESS

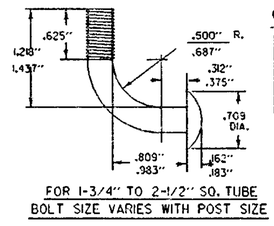



NOTE

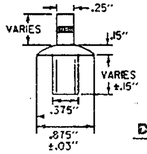
WHEN USING SQUARE STEEL POSTS ON STEEP SLOPES (10N 2 OR STEEPER) ADD ONE FOOT EMBEDMENT FOR GREATER STABILITY.

### TOP VIEW OF ANCHOR, POST AND BOLT




FOR 1-3/4" TO 2-1/2" SQ. TUBE
BOLT SIZE VARIES WITH POST SIZE

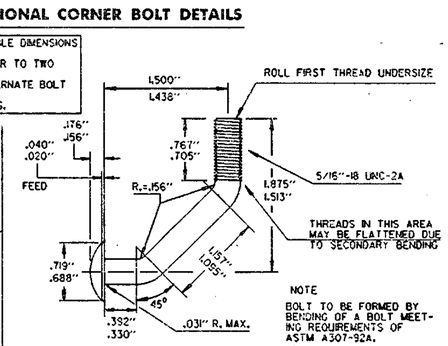



THIS DRIVE RIVET MAY BE SUBSTITUTED FOR EITHER OF THE CORNER BOLTS SHOWN ABOVE OR TO THE RIGHT.

DRIVE RIVET

### OPTIONAL CORNER BOLT DETAILS

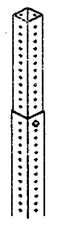
DOUBLE DIMENSIONS REFER TO TWO ALTERNATE BOLT SIZES.




NOTE
BOLT TO BE FORMED BY BENDING OF A BOLT MEETING REQUIREMENTS OF ASTM A307-92A.

- DIMENSIONS VARY AS NEEDED FOR POST SIZE USED

### CONNECTION DETAIL



POST IS TO BE INSERTED INTO ANCHOR ONE FOOT BELOW GROUND LEVEL. ANCHOR IS TO BE 4'-0" MINIMUM LENGTH WITH NO MORE THAN 4" ABOVE GROUND. ANCHOR IS ONE SIZE (1/4") GREATER THAN THE POST AND ALL ANCHORS ARE TO BE 12 GAGE EXCEPT ANCHORS FOR 2-1/2" POSTS ARE TO BE 7 GAGE. CONNECTION IS TO BE MADE USING THE BOLT PROVIDED WITH THE SIGN SYSTEM (SEE DETAILS LEFT). AT THE TOP HOLE IN THE ANCHOR (APPROXIMATELY 3-1/2" ABOVE GROUND), THREE INCH ANCHORS WHICH DO NOT HAVE HOLES ON 1" CENTERS WILL REQUIRE DRILLING OF 7/16" HOLES FOR CONNECTIONS.

(SEE DETAIL LEFT FOR BOLT PLACEMENT)

# COMPOSITE SQUARE STEEL SIGN POST DETAIL SHEET

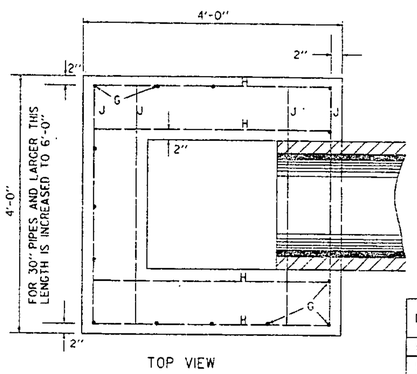
SURVEYED BY N/A DATE N/A
DRAWN BY PAVE DATE 6/96
SQUAD LEADER N/A
DESIGN FILE NO. /pave/95c018/pc018.dgn
PARM FILE pc018st.i DATE PLOTTED 1-OCT-1996
PROJ. NAME RANDOLPH-BRAINTREE
PROJ. NO. STP 9602(1)
SHEET 14 OF 14 SHEETS

: Sheet Number: 14

## REINFORCED CONCRETE DROP INLET WITH GRATE ( BOTTOM SECTION )

SEE SHEETS D-9,D-10,D-11, AND D-16 FOR TOP SECTION

MINIMUM DEPTH FOR
15" 3'-6"
18" 3'-6"
24" 4'-0"



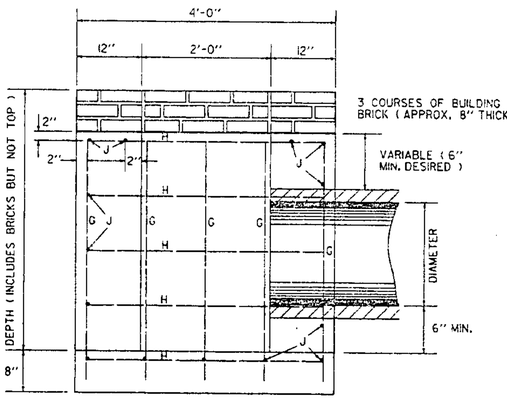

TOP VIEW

| STEEL SCHEDULE FOR DROP INLET ( BOTTOM SECTION ONLY ) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH | 12" TO 24" DIAMETER 4' x 4' D.I. | | | | | | 30" DIAMETER 4' x 6' D.I. | | | | | |
| | NO. J | LENGTH | NO. H | LENGTH | NO. G | LENGTH | NO. J | LENGTH | NO. H | LENGTH | NO. G | LENGTH |
| 3'-0" | 12 | 3'-8" | 13 | 3'-8" | 15 | 2'-8" | | | | | | |
| 3'-6" | 12 | 3'-8" | 13 | 3'-8" | 15 | 3'-2" | | | | | | |
| 4'-0" | 14 | 3'-8" | 15 | 3'-8" | 15 | 3'-8" | | | | | | |
| 4'-6" | 14 | 3'-8" | 15 | 3'-8" | 15 | 4'-2" | | | | | | |
| 5'-0" | 16 | 3'-8" | 17 | 3'-8" | 15 | 4'-8" | | | | | | |
| 5'-6" | 16 | 3'-8" | 17 | 3'-8" | 15 | 5'-2" | | | | | | |
| 6'-0" | 16 | 3'-8" | 19 | 3'-8" | 15 | 5'-8" | | | | | | |
| | | | | | | | 12 | 5'-8" | 17 | 3'-8" | 17 | 4'-2" |
| | | | | | | | 14 | 5'-8" | 19 | 3'-8" | 17 | 4'-8" |
| | | | | | | | 14 | 5'-8" | 19 | 3'-8" | 17 | 5'-2" |
| | | | | | | | 16 | 5'-8" | 21 | 3'-8" | 17 | 5'-8" |

| DEPTH | 36" DIAMETER 4' x 6' D.I. | | | | | |
|---|---|---|---|---|---|---|
| | NO. J | LENGTH | NO. H | LENGTH | NO. G | LENGTH |
| 5'-0" | 14 | 5'-8" | 19 | 3'-8" | 17 | 4'-8" |
| 5'-6" | 14 | 5'-8" | 19 | 3'-8" | 17 | 5'-2" |
| 6'-0" | 16 | 5'-8" | 21 | 3'-8" | 17 | 5'-8" |

BRICKS ARE INCLUDED IN CONCRETE QUANTITIES IN CHART

| CONCRETE AND STEEL QUANTITIES FOR DROP INLETS ( BOTTOM SECTION ONLY ) | | | | | | |
|---|---|---|---|---|---|---|
| DEPTH | 12"-24" DIA. | | 30" DIA. | | 36" DIA. | |
| | CONC BY C.Y. | STEEL | CONC BY C.Y. | STEEL | CONC BY C.Y. | STEEL |
| 3'-0" | 1.73 | 138 | | | | |
| 3'-6" | 1.95 | 145 | | | | |
| 4'-0" | 2.17 | 168 | | | | |
| 4'-6" | 2.40 | 176 | 3.08 | 210 | | |
| 5'-0" | 2.62 | 199 | 3.37 | 238 | 3.29 | 238 |
| 5'-6" | 2.84 | 207 | 3.67 | 247 | 3.59 | 247 |
| 6'-0" | 3.06 | 230 | 3.97 | 276 | 3.89 | 276 |




SIDE VIEW

TO FIND VOLUME OF CONCRETE FOR THE ENTIRE STRUCTURE, ADD THE VOLUME FOR THE TOP USED, TO THE VOLUME IN THIS TABLE. FOR VOLUME IN TOP, SEE SHEETS D-9, D-10.

ALL REINFORCING STEEL TO BE NO. 5 Ø DEFORMED BARS, EVENLY SPACED, WITH A MAXIMUM SPACING OF 12" CENTER TO CENTER.

DROP INLET TO BE CONSTRUCTED IN ACCORDANCE WITH STRUCTURAL CONCRETE, SECTION 501.

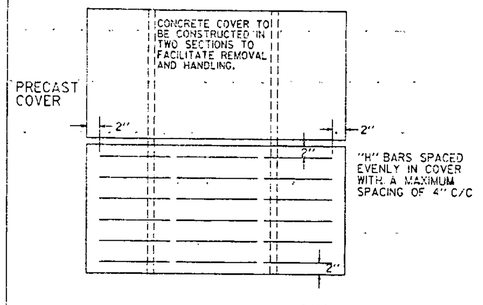
FURNISHING AND LAYING OF BRICKS FOR ADJUSTING ELEVATION OF GRATE, SHALL BE INCLUDED IN UNIT BID PRICE FOR CONCRETE, CLASS B, PAY ITEM 501.25, AND THEIR VOLUME TO BE INCLUDED IN THE FINAL QUANTITIES.

MORTAR, TYPE II, TO BE USED FOR JOINT FILLER AND LAYING OF BRICK.

FOR PIPES OF 30" OR MORE IN DIAMETER, ALLOWANCE SHALL BE MADE FOR THE OPENING IN COMPUTING CONCRETE VOLUMES. THIS DEDUCTION WILL BE BASED ON THE RATED DIAMETER OF THE PIPE USED, WITH THE SAME DEDUCTION FOR CONCRETE AND METAL PIPE.

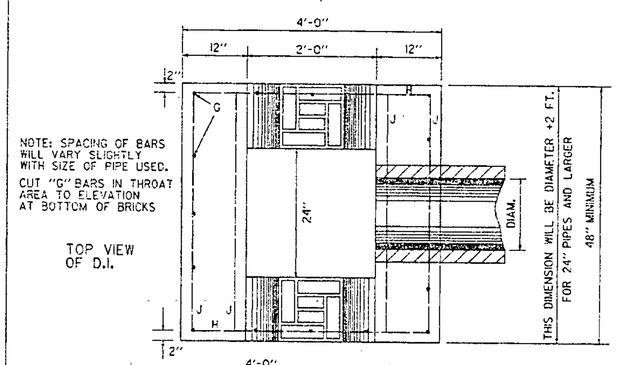
## REINFORCED CONCRETE DROP INLET WITH PRECAST COVER

DROP INLET AND COVER TO BE CONSTRUCTED IN ACCORDANCE WITH STRUCTURAL CONCRETE, SECTION 501




| STEEL SCHEDULE FOR DROP INLETS WITH PRECAST COVERS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH | 12" TO 24" DIAMETER | | | | 30" DIAMETER | | | | | | | |
| | G | LENGTH | H-J | LENGTH | G | LENGTH | J | LENGTH | H | LENGTH | | |
| 2'-0" | 15 | 2'-4" | 31 | 3'-8" | | | | | | | | |
| 2'-6" | 15 | 2'-10" | 33 | 3'-8" | | | | | | | | |
| 3'-0" | 15 | 3'-4" | 36 | 3'-8" | | | | | | | | |
| 3'-6" | 15 | 3'-10" | 36 | 3'-8" | 16 | 3'-10" | 12 | 4'-2" | 23 | 3'-8" | | |
| 4'-0" | 15 | 4'-4" | 39 | 3'-8" | 16 | 4'-4" | 14 | 4'-2" | 23 | 3'-8" | | |
| 4'-5" | 15 | 4'-10" | 39 | 3'-8" | 16 | 4'-10" | 14 | 4'-2" | 25 | 3'-8" | | |
| 5'-0" | 15 | 5'-4" | 42 | 3'-8" | 16 | 5'-4" | 16 | 4'-2" | 25 | 3'-8" | | |
| 5'-6" | 15 | 5'-10" | 42 | 3'-8" | 16 | 5'-10" | 16 | 4'-2" | 27 | 3'-8" | | |
| 6'-0" | 15 | 6'-4" | 45 | 3'-8" | 16 | 6'-4" | 18 | 4'-2" | 27 | 3'-8" | | |

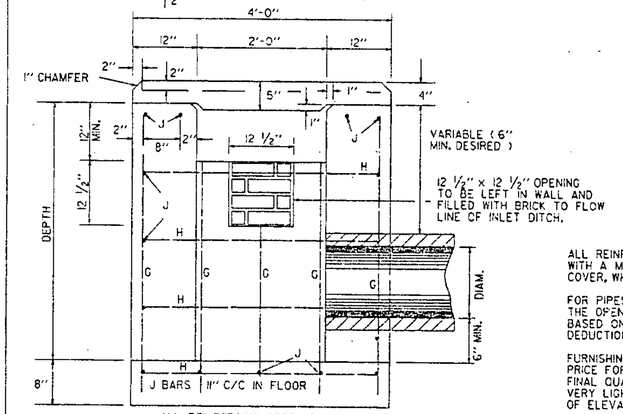
| DEPTH | 36" DIAMETER | | | | | |
|---|---|---|---|---|---|---|
| | G | LENGTH | J | LENGTH | H | LENGTH |
| 4'-0" | 16 | 4'-4" | 14 | 4'-8" | 28 | 3'-8" |
| 4'-6" | 16 | 4'-10" | 14 | 4'-8" | 28 | 3'-8" |
| 5'-0" | 16 | 5'-4" | 16 | 4'-8" | 30 | 3'-8" |
| 5'-6" | 16 | 5'-10" | 16 | 4'-8" | 30 | 3'-8" |
| 6'-0" | 16 | 6'-4" | 18 | 4'-8" | 32 | 3'-8" |




NOTE: SPACING OF BARS WILL VARY SLIGHTLY WITH SIZE OF PIPE USED.

CUT "G" BARS IN THROAT AREA TO ELEVATION AT BOTTOM OF BRICKS

TOP VIEW OF D.I.




ALL REINFORCING STEEL TO HAVE 2" MIN. COVER EXCEPT IN COVER

SIDE VIEW OF D.I.

| CONCRETE AND STEEL QUANTITIES FOR DROP INLETS OF VARIOUS DEPTHS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| DROP INLETS WITH PRECAST COVERS | | | | | | | | |
| DEPTH | 12" 15" 18" | | 24" | | 30" | | 36" | |
| | CONC BY C.Y. | STEEL LBS | CONC BY C.Y. | STEEL LBS. | CONC BY C.Y. | STEEL LBS | CONC BY C.Y. | STEEL LBS. |
| 2'-0" | 1.4 | 155 | | | | | | |
| 2'-6" | 1.6 | 171 | 1.6 | 171 | | | | |
| 3'-0" | 1.8 | 190 | 1.8 | 190 | | | | |
| 3'-6" | 2.0 | 198 | 2.0 | 198 | 2.1 | 204 | | |
| 4'-0" | 2.3 | 217 | 2.3 | 217 | 2.3 | 221 | 2.5 | 248 |
| 4'-6" | 2.5 | 225 | 2.5 | 225 | 2.6 | 237 | 2.7 | 256 |
| 5'-0" | 2.7 | 244 | 2.7 | 244 | 2.8 | 254 | 3.0 | 282 |
| 5'-6" | 2.9 | 252 | 2.9 | 252 | 3.0 | 270 | 3.2 | 290 |
| 6'-0" | 3.2 | 271 | 3.2 | 271 | 3.3 | 287 | 3.5 | 316 |

ALL REINFORCING BARS SHALL BE NO.5 Ø DEFORMED BARS, EVENLY SPACED, WITH A MAXIMUM SPACING OF 12" CENTER TO CENTER, EXCEPT IN THE COVER, WHERE THE MAXIMUM SPACING IS 4" CENTER TO CENTER.

FOR PIPES OF 30" OR MORE IN DIAMETER, ALLOWANCE SHALL BE MADE FOR THE OPENING IN COMPUTING CONCRETE VOLUMES. THIS DEDUCTION WILL BE BASED ON THE RATED DIAMETER OF THE PIPE USED, WITH THE SAME DEDUCTION FOR CONCRETE AND METAL PIPE.

FURNISHING AND LAYING OF BRICKS, SHALL BE INCLUDED IN THE UNIT BID PRICE FOR CONCRETE, CLASS B, AND THEIR VOLUME TO BE INCLUDED IN THE FINAL QUANTITIES. ONLY SUFFICIENT MORTAR TO BE USED TO PROVIDE A VERY LIGHT BOND TO ALLOW WITH EASE, FUTURE REMOVAL, FOR CORRECTION OF ELEVATION OF FLOW LINE.

MORTAR, TYPE II, TO BE USED FOR JOINT FILLER AND LAYING OF BRICK.

REVISIONS AND CORRECTIONS

DEC. 6, 1971 - ORIGINAL APPROVAL

JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED

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

Gordon S. MacAllen P.E.
DIRECTOR OF ENGINEERING

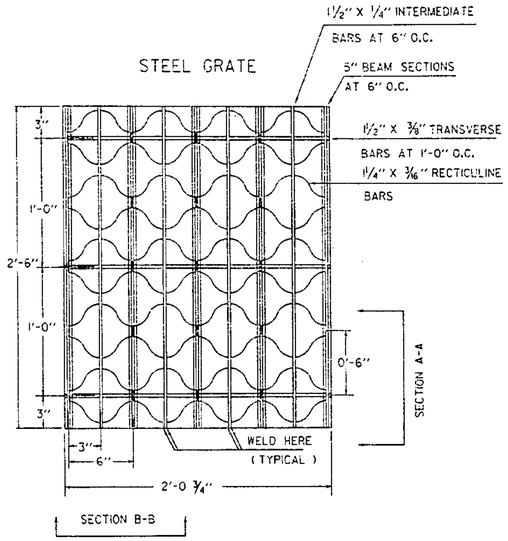
Robert M. Murphy PE
DESIGN ENGINEER

# REINFORCED CONCRETE DROP INLET WITH PRECAST COVER
# REINFORCED CONCRETE DROP INLET WITH GRATE ( BOTTOM SECTION )
## ( SEE SHEETS D-9, D-10, AND D11 FOR TOP SECTION )

VERMONT AGENCY OF TRANSPORTATION

# STANDARD D-8

## STEEL GRATE

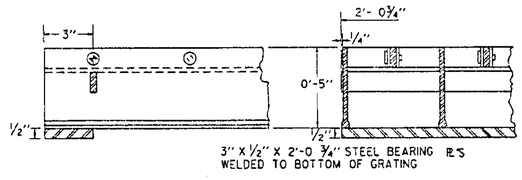



PLAN

GRATE SIZE SINGLE 24 ¾" X 30"
DOUBLE 24 ¾" X 54"

WEIGHT 95 LBS OR MORE
GRATES SHALL BE CAPABLE OF SUPPORTING H-20 (32,000 LB. AXLE LOAD) INCLUDING 30% IMPACT.

| UNIT STRESSES (LBS PER SQ. IN.) | | 16,000 | 20,000 |
|---|---|---|---|
| MAIN BAR PARALLEL TO TRAFFIC | H-20 | 49" | 53" |
| MAIN BAR PERPENDICULAR TO TRAFFIC | H-20 | 39" | 42" |

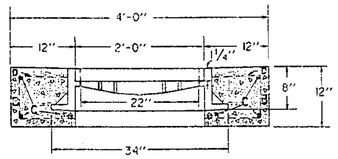



SECTION A-A SECTION B-B

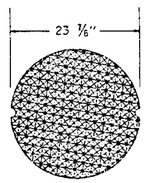
## CAST IRON COVER WITH FRAME

| BAR | NO. | LENGTH | |
|---|---|---|---|
| B | 4 | | 8" 3'-8" 8" |
| C | 6 | 3'-8" | STRAIGHT |
| D | 4 | 3'-8" | STRAIGHT |

ALL REINFORCING STEEL TO BE No. 5 DEFORMED BARS



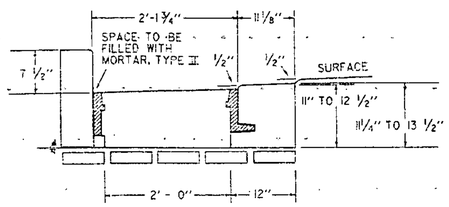

ELEVATION




GENERAL NOTES:
WEIGHT OF FRAME AND COVER = 425 LBS.

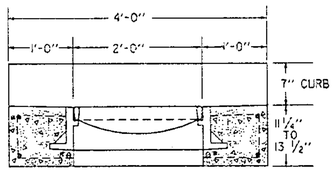
PLAN

## CAST IRON GRATE WITH FRAME




ELEVATION OF REINFORCED CONCRETE DROP INLET WITH VERTICAL GRANITE CURB AND 3 FLANGE CAST IRON FRAME FOR CAST IRON GRATE

SEE STANDARD D-9 FOR CONCRETE VOLUME, REINFORCING STEEL SCHEDULE, AND CURB JOINT DETAIL.

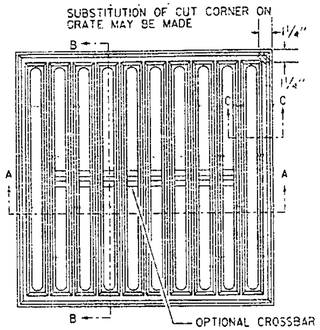



ELEVATION

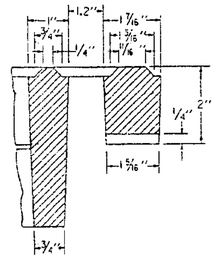
WEIGHT OF 3 FLANGED FRAME AND GRATE

| | |
|---|---|
| GRATE | 220 LBS |
| FRAME | 260 LBS |
| TOTAL | 480 LBS |

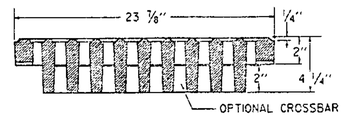
## CAST IRON GRATE, TYPE A



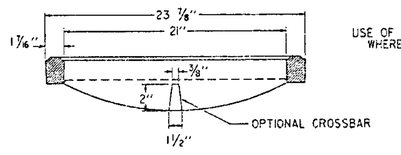

PLAN




SECTION C-C

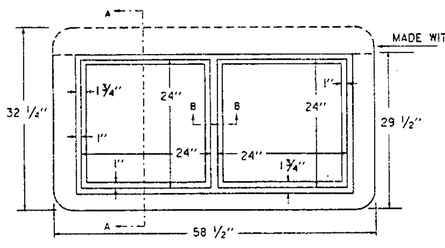



SECTION A-A

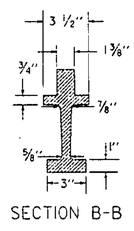



SECTION B-B

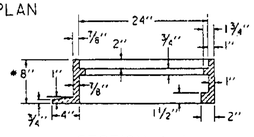
USE OF THE TYPE A GRATE IS PROHIBITED WHERE BICYCLE TRAFFIC IS EXPECTED




PLAN

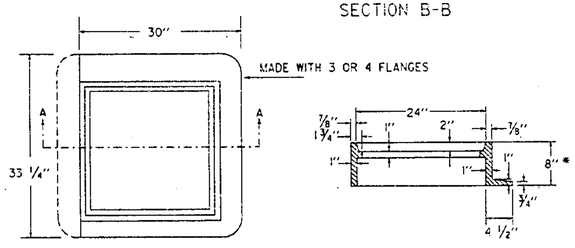



SECTION B-B




SECTION A-A

RECTANGULAR CAST IRON FRAME FOR TWO 24" SQUARE CAST IRON GRATES




PLAN SECTION A-A

SQUARE CAST IRON FRAME FOR CAST IRON GRATE TYPE A

* NOTE: FRAME DEPTH TO BE "6" WHEN USED IN CONJUNCTION WITH DROP INLET DETAILED ON STANDARD D-6.

THIS FRAME TO BE PLACED IN DROP INLET TOP BEFORE CONCRETE IS POURED.

4 FLANGES UNLESS OTHERWISE INDICATED. FRAMES TO BE FURNISHED WITH 3 FLANGES WHEN USED IN CONJUNCTION WITH CURB OR AS DIRECTED BY THE ENGINEER.

REVISIONS AND CORRECTIONS

- DEC. 6, 1971 - ORIGINAL APPROVAL
- APR. 25, 1972 - CAST IRON COVER CHANGED FROM SQUARE TO CIRCULAR
- SEPT. 4, 1980 - OPTIONAL CROSSBAR ADDED TO A GRATE; NOTE ADDED TO A GRATE FRAME DETAIL
- AUG. 25, 1981 - NOTE ADDED RESTRICTING USE OF TYPE A GRATE
- JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED

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

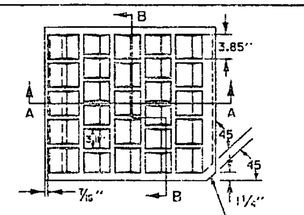
Gordon R. MacArthur, P.E.
DIRECTOR OF ENGINEERING

Robert M. Murphy, P.E.
DESIGN ENGINEER

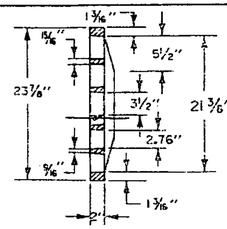
# STEEL GRATE
# CAST IRON GRATE TYPE A
# CAST IRON COVER

VERMONT AGENCY OF TRANSPORTATION

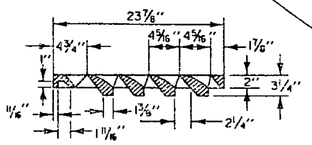
STANDARD
D-11




NOTE: FLOW




SECTION B-B



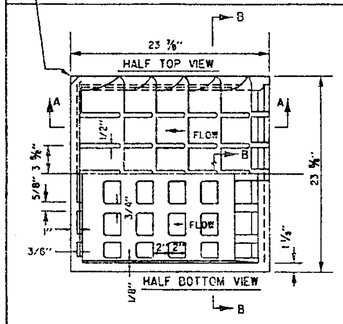

SECTION A-A

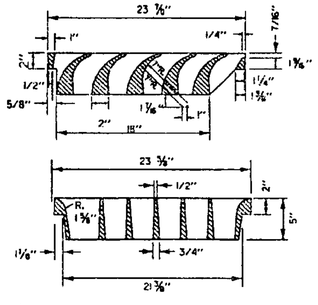
NOTE: THIS CORNER LEFT OFF FOR "RIGHT" GRATE DIAGONALLY OPPOSITE CORNER FOR "LEFT" GRATE TO FIT IN KEYED FRAMES.

THIS CORNER LEFT OFF FOR "RIGHT" GRATE, DIAG. OPPOSITE CORNER FOR "LEFT" GRATE, TO FIT IN KEYED FRAMES.

TYPE "E" GRATE
(NOT TO SCALE)

NOTE: ALTERNATE TYPE E GRATE BELOW



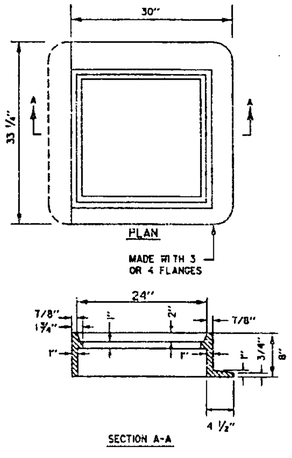

SECTION B-B

CAST IRON GRATE
TYPE E

NOTE: THIS FRAME TO BE PLACED IN DROP INLET TOP BEFORE CONCRETE IS POURED.

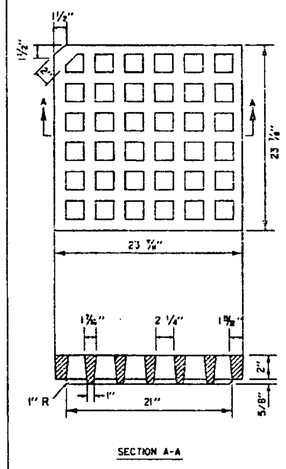
4 FLANGES UNLESS OTHERWISE INDICATED.

FRAMES TO BE FURNISHED WITH 3 FLANGES WHEN USED IN CONJUNCTION WITH CURB OR AS DIRECTED BY THE ENGINEER.



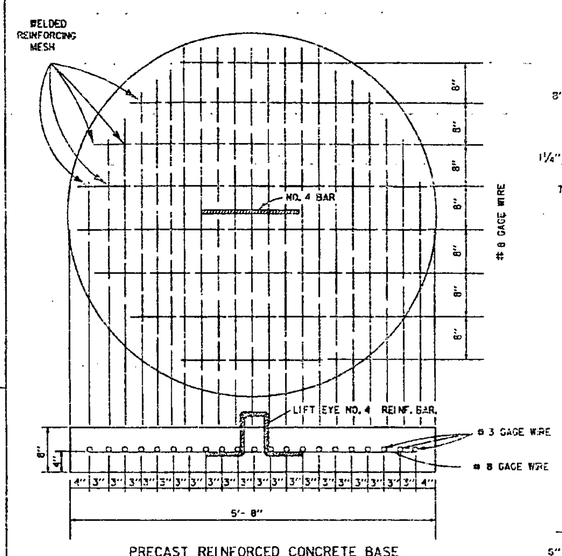

SECTION A-A

FRAME
FOR
TYPE D OR TYPE E
GRATE

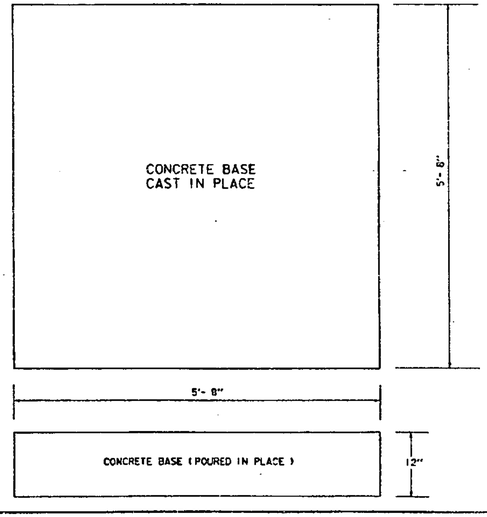


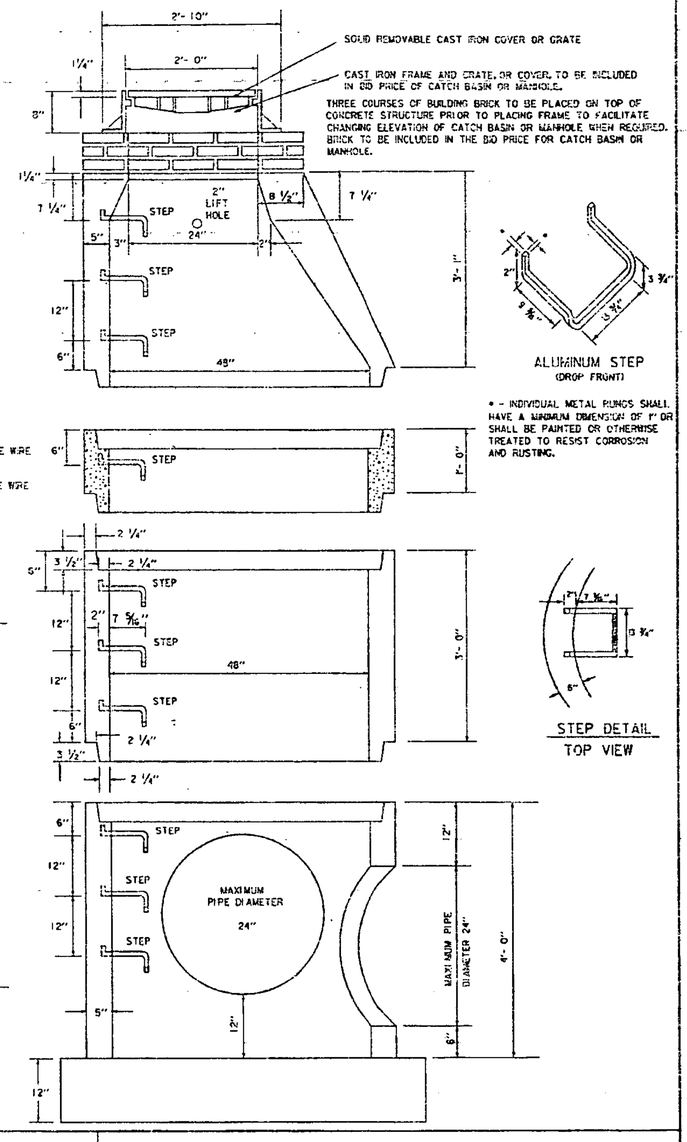

SECTION A-A

CAST IRON GRATE
TYPE D




PRECAST REINFORCED CONCRETE BASE




SOLID REMOVABLE CAST IRON COVER OR GRATE

CAST IRON FRAME AND GRATE, OR COVER, TO BE INCLUDED IN BID PRICE OF CATCH BASIN OR MANHOLE.

THREE COURSES OF BUILDING BRICK TO BE PLACED ON TOP OF CONCRETE STRUCTURE PRIOR TO PLACING FRAME TO FACILITATE CHANGING ELEVATION OF CATCH BASIN OR MANHOLE WHEN REQUIRED. BRICK TO BE INCLUDED IN THE BID PRICE FOR CATCH BASIN OR MANHOLE.




ALUMINUM STEP
(DROP FRONT)

* - INDIVIDUAL METAL RUNGS SHALL HAVE A MINIMUM DIMENSION OF 1" OR SHALL BE PAINTED OR OTHERWISE TREATED TO RESIST CORROSION AND RUSTING.




STEP DETAIL
TOP VIEW

REVISIONS AND CORRECTIONS

DEC. 6, 1971 - ORIGINAL APPROVAL
OCT. 22, 1976 - CAST IRON GRATE WITH FRAME, TYPE E ADDED
OCT. 6, 1978 - TYPE D GRATE ADDED
OCT. 30, 1985 - IMPERFECT TRENCH DETAILS DELETED
FEB. 17, 1993 - SECOND CAST IRON GRATE TYPE E ADDED.
MAR. 23, 1994 - ADDED NOTE FOR STEP DETAILS
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED

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

DIRECTOR OF ENGINEERING

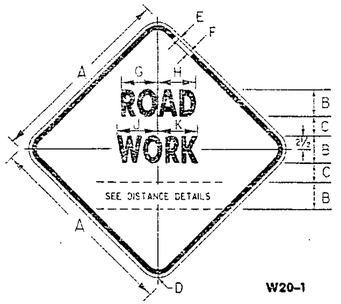
DESIGN ENGINEER

**PRECAST REINFORCED CONCRETE CATCH BASIN W/ CAST IRON GRATE**
**PRECAST REINFORCED CONCRETE MANHOLE W/ CAST IRON COVER**

**CAST IRON GRATE WITH FRAME, TYPE D**
**CAST IRON GRATE WITH FRAME, TYPE E**

VERMONT AGENCY OF TRANSPORTATION

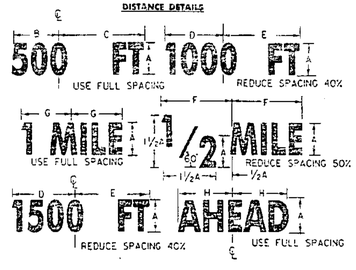
# STANDARD D-15

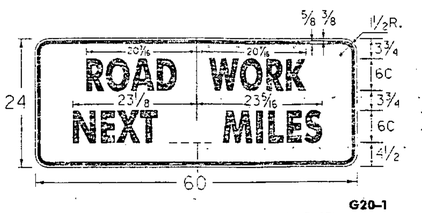



W20-1

| | DIMENSIONS (INCHES) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K |
| STD. | 48 | 7C | 4¾ | 3" R. | ¾ | 1¼ | 5½ | 9⅛ | 10½ | 10⅜ |
| URBAN | 36 | 5C | 3⅝ | 2¼R. | ⅝ | ⅞ | 6⅞ | 7⅛ | 7½ | 7⅜ |

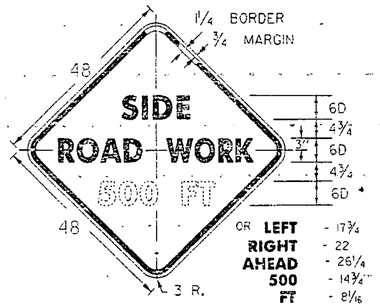
**DISTANCE DETAILS**



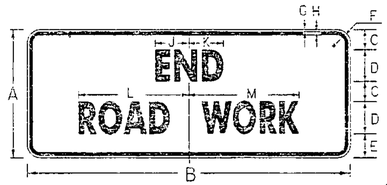

G20-1

THIS SIGN TO BE USED WHEN PROJECT LENGTH EXCEEDS 2 MILES OR AS REQUESTED BY THE RESIDENT ENGINEER. SHOW MILEAGE TO NEAREST ¼ MILE USING FRACTIONS. NOT DECIMALS. HAND LETTERING OF MILEAGE WILL NOT BE ALLOWED. (ALL DIMENSIONS SHOWN IN INCHES)



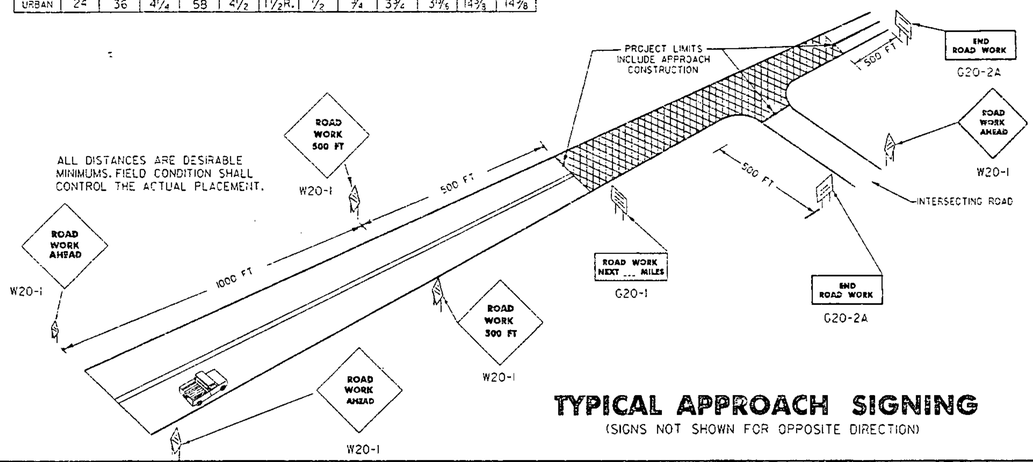

W20-1 * REDUCE SPACING 50%

| | DIMENSIONS (INCHES) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H |
| 5D | 10¾ | 10¾ | 11⅝ | 11¼ | 11¼ | 11¼ | 9½ | 10⅞ |
| 6C | 10⅜ | 10½ | 11¼ | 12 | 12½ | 9⅛ | 10½ | |
| 7C | 12 | 12⅜ | 13¼ | 14 | 14¾ | 10⅜ | 12¼ | |
| 8D | 16¼ | 17¼ | 17 | 18 | 18 | 14⅜ | 17⅜ | |




G20-2A

| | DIMENSIONS (INCHES) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M |
| STD. | 24 | 60 | 3½ | 6C | 4½ | 1½R. | ⅜ | ⅝ | 6¼ | 6⅜ | 20⅞ | 20⅛ |
| URBAN | 24 | 36 | 4¼ | 5B | 4½ | 1½R. | ½ | ¾ | 3½ | 3⅛ | 14⅔ | 14⅞ |




## TYPICAL APPROACH SIGNING

(SIGNS NOT SHOWN FOR OPPOSITE DIRECTION)

**(ALL DIMENSIONS SHOWN IN INCHES UNLESS OTHERWISE NOTED)**

## NOTES

THE 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**

THE 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 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 | 1/2, 5/8, OR 3/4 INCHES |
| GALVANIZED SHEET STEEL | 12 GAGE |

**RETLECTORIZATION**

ALL REFLECTORIZED MATERIAL SHALL CONSIST OF TYPE IIB OR TYPE III 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 7 FEET ABOVE THE EDGE OF PAVEMENT, AND THE NEAREST EDGE OF A SIGN SHALL BE AT LEAST 6 FEET OUTSIDE THE SHOULDER POINT, 4 FEET OUTSIDE GUARD RAIL, OR 2 FEET OUTSIDE 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.

## NOTES CONT.

**GENERAL**

THE COST OF FURNISHING, INSTALLING, 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.

## 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. THESE POSTS SHALL HAVE A UNIFORM CROSS-SECTION AND SHALL BE MADE FROM GRADE 2, AIR-DRIED SOUTHERN YELLOW PINE OR ANOTHER EQUIVELANT SOFTWOOD. AN ACCEPTABLE EQUIVELANT SOFTWOOD SHALL HAVE AN EXTREME FIBER IN BENDING "Fb" DESIGN VALUE NOT TO EXCEED 1400 psi AND HORIZONTAL SHEAR "Fv" DESIGN VALUE NOT TO EXCEED 90 psi SPECIFICATION "DESIGN VALUES FOR WOOD CONSTRUCTION" AND RELATED SUPPLEMENT, DATED 1986.

AS ESTABLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION IN THEIR NATIONAL DESIGN THE FOLLOWING ARE CONSIDERED TO BE ACCEPTABLE WOODEN POSTS:

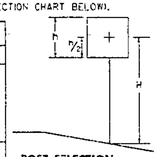
1. 4" X 4" (ACTUAL DIMENSIONS ARE 3.5" X 3.5")
   A) ACCEPTABLE FOR SINGLE OR DUAL POSTS INSTALLATION WITH NO MODIFICATIONS.
   B) ACCEPTABLE FOR THREE POSTS (OR MORE) INSTALLATION ONLY WHEN THERE ARE NO MORE THAN TWO POSTS IN A 7 FOOT PATH.
2. 4" X 6" (ACTUAL DIMENSIONS ARE 3.5" X 5.5")
   A) ACCEPTABLE FOR SINGLE POST INSTALLATIONS ONLY WHEN MODIFIED BY DRILLING TWO 1 1/2" DIAMETER HOLES, ONE AT 4" AND THE OTHER AT 18" ABOVE THE GROUND LINE AND PERPINDICULAR TO THE ROADWAY CENTERLINE.
   B) ACCEPTABLE FOR MULTIPLE POSTS (TWO OR MORE) INSTALLATIONS ONLY WHEN MODIFIED AS ABOVE AND THE MINIMUM SPACING BETWEEN POSTS IS 7 FEET.
3. 6" X 6" (ACTUAL DIMENSIONS ARE 5.5" X 5.5")
   A) ACCEPTABLE FOR SINGLE POST INSTALLATIONS ONLY WHEN MODIFIED BY DRILLING TWO 2" DIAMETER HOLES, ONE AT 4" AND THE OTHER AT 18" ABOVE THE GROUND LINE AND PERPINDICULAR TO ROADWAY CENTERLINE.
   B) ACCEPTABLE FOR MULTIPLE POST INSTALLATIONS ONLY WHEN MODIFIED AS ABOVE AND THE MINIMUM SPACING BETWEEN POSTS IS 7 FEET.
4. 6" X 8" (ACTUAL DIMENSIONS ARE 5.5" X 7.5")
   A) ACCEPTABLE FOR SINGLE POST INSTALLATIONS ONLY WHEN MODIFIED BY DRILLING TWO 3" DIAMETER HOLES, ONE AT 4" AND THE OTHER AT 18" ABOVE THE GROUND LINE AND PERPINDICULAR TO THE ROADWAY CENTERLINE.
   B) ACCEPTABLE FOR MULTIPLE POST INSTALLATIONS ONLY WHEN MODIFIED AS ABOVE AND THE MINIMUM SPACING BETWEEN POSTS IS 7 FEET.

**ADDITIONAL DESIGN CRITERIA:**

THE LONGER DIMENSION OF THE POST(S), SUCH AS THE 6" DIMENSION OF THE 4" X 6" POST, SHALL BE PLACED PARALLEL TO THE ROADWAY CENTERLINE.
ALL WOODEN POSTS SHALL HAVE AN EMBEDMENT DEPTH OF 4 FEET.
NO CROSS-BRACING OR BACK-BRACING TO KEEP THE POSTS PLUMB WILL BE ALLOWED.
CONCRETE FOUNDATIONS COLLARS OR SOIL BEARING PLATES ARE NOT PERMITTED.
CONSTRUCTIONS SIGNS SHALL BE PLACED ON TWO OR MORE POSTS WHEN ANY OF THE FOLLOWING CONDITIONS GOVERN:

A) THE SIGN WIDTH (HORIZONTAL DIMENSIONS FOR DIAMOND SHAPED SIGNS) EXCEEDS 3 1/2 FEET.
B) THE EXPOSED SIGN AREA OF ANY SINGLE SIGN OR ASSEMBLY EXCEEDS 12 ½ SQ. FEET.
C) THE Sv OF A SINGLE POST IS EXCEEDED. (SEE THE POST SELECTION CHART BELOW).

| WOOD POST SELECTION CHART | | |
|---|---|---|
| SIGN AREA (FT²) X HEIGHT (FT) < Sv (SELECTION VALUE) | | |
| POST SIZE | Sv | DESIGN CRITERIA: |
| 4" X 4" | 64 | WIND SPEED = 60 MPH (10-YEAR |
| 4" X 6" | 147 | MEAN OCCURENCE INTERVAL) |
| 6" X 6" | 216 | WIND PRESSURE = 15 psf |
| 6" X 8" | 389 | ALLOWABLE BENDING STRESS |




POST SELECTION CHART DETAIL

**OTHER STDS. REQUIRED:**

REVISIONS AND CORRECTIONS

MAY 26, 1989 - DATE OF ORIGINAL ISSUE

OCT 21, 1992 - REVISED WOOD POST REQUIREMENTS, ADDED SIGN DETAILS, & REVISED TITLE BLOCK

AUG 08, 1995 - MINOR NOTE REVISIONS

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

APPROVED

Gordon A. McArthur
DIRECTOR OF ENGINEERING

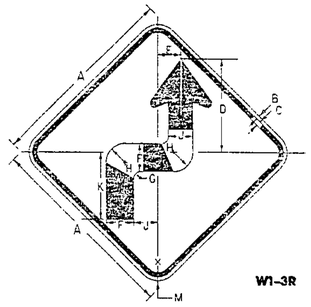
David A. Ross
TRAFFIC AND SAFETY ENGINEER

# CONSTRUCTION APPROACH SIGNS

/traf/std/stdel00c.dgn : stdel00.i

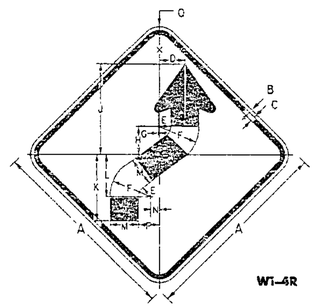
VERMONT AGENCY OF TRANSPORTATION

# STANDARD E-100



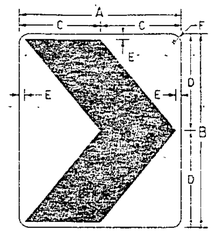
W1-3R

| SIGN | DIMENSIONS (INCHES) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M |
| STD. & MIN. | 36 | 5/8 | 7/8 | 17 7/16 | 4 7/32 | 5 1/4 | 1 1/4 | 3 5/8 | 4 1/2 | 12 25/32 | 1 7/32 | 2 1/4 |
| SPECIAL | 48 | 3/4 | 1 1/4 | 23 3/4 | 5 5/8 | 7 | 1 5/8 | 4 7/8 | 6 | 16 5/8 | 2 3/8 | 3 |



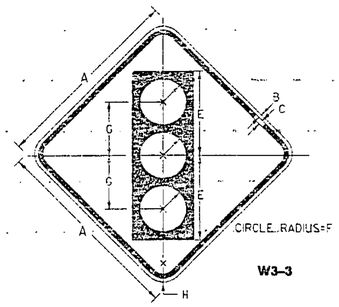
W1-4R

| SIGN | DIMENSIONS (INCHES) | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N | P | O |
| STD. & MIN. | 36 | 5/8 | 7/8 | 4 29/32 | 2 1/4 | 7 1/2 | 5/32 | 5 1/4 | 16 7/8 | 12 3/8 | 7 7/8 | 5 1/4 | 1 11/16 | 3 15/16 | 2 1/4 |
| SPECIAL | 48 | 3/4 | 1 1/4 | 6 5/16 | 3 | 10 | 7/16 | 7 | 22 1/2 | 16 1/2 | 10 1/2 | 7 | 2 1/4 | 5 1/4 | 3 |



W1-8

| SIGN | DIMENSIONS (INCHES) | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | F |
| STD. | 18 | 24 | 9 | 12 | 3/4 | 1 1/2 |
| SPECIAL | 24 | 30 | 12 | 15 | 1/8 | 1 1/2 |
| EXPWY. | 30 | 36 | 15 | 18 | 1 | 1 7/8 |
| FRWY. | 36 | 48 | 18 | 24 | 1 7/8 | 2 1/4 |

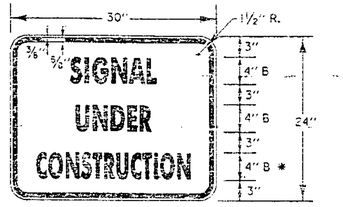


W3-3

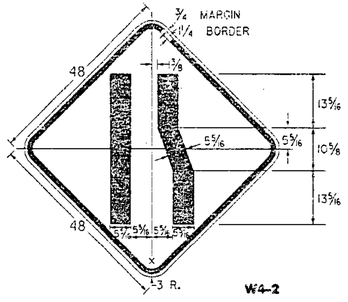
| SIGN | DIMENSIONS (INCHES) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H |
| STD. & MIN. | 36 | 5/8 | 7/8 | 5 3/4 | 16 3/4 | 4 1/4 | 10 | 2 1/4 |
| SPECIAL | 48 | 3/4 | 1 1/4 | 7 1/2 | 20 | 5 | 12 1/2 | 3 |

**COLORS**

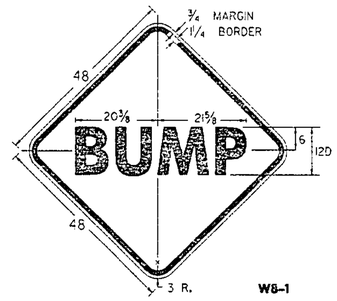
SYMBOL & LEGEND - BLACK (NON-REFL)
BACKGROUND - ORANGE (REFL)
TOP CIRCLE RED (REFL)
MIDDLE CIRCLE YELLOW (REFL)
BOTTOM CIRCLE GREEN (REFL)



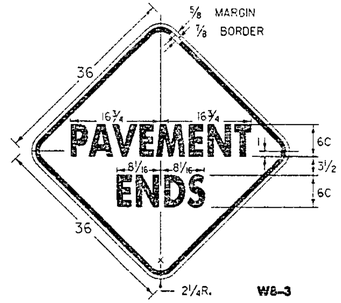

* REDUCE SPACING 50%



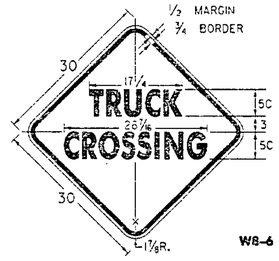
W4-2



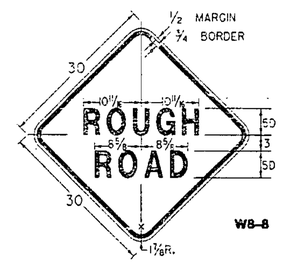

W8-1



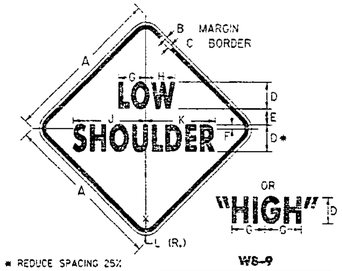

W8-3




W8-6



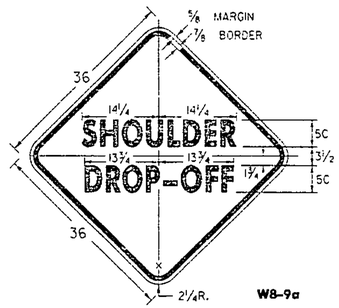

W8-8



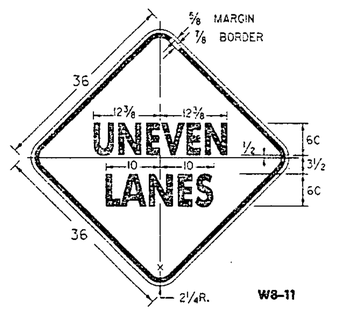

W8-9

* REDUCE SPACING 25%

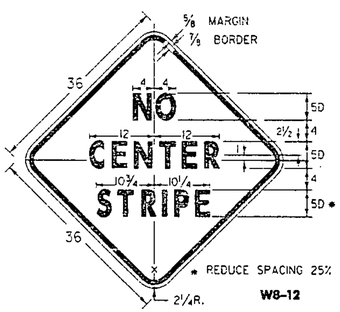
| SIGN | DIMENSIONS (INCHES) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | |
| STD. | 30 | 1/2 | 3/4 | 5C | 3 | 3/4 | 5 5/16 | 5 5/16 | 13 5/16 | 13 5/16 | 1 7/8 | |
| FWY. | 48 | 3/4 | 1 1/4 | 8C | 5 | 1 1/4 | 8 1/4 | 9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




W8-9a

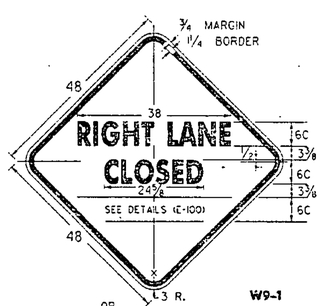



W8-11




* REDUCE SPACING 25%

W8-12




W9-1

**(ALL DIMENSIONS SHOWN 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 TYPE IIB OR TYPE III 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.

**OTHER STDS. REQUIRED:** E-100

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
OCT. 21, 1992 - ADDED ADDITIONAL SIGN DIMENSIONS, REVISED CHEVRON BACKROUND TO ORANGE, & REVISED TITLE BLOCK
AUG. 08, 1995 - ADDED AND DELETED VARIOUS SIGN DETAILS

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

APPROVED

DIRECTOR OF ENGINEERING

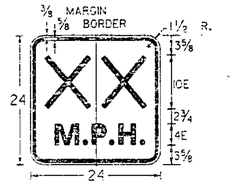
TRAFFIC AND SAFETY ENGINEER

# CONSTRUCTION SIGN DETAILS

/trof/std/stce101.dgn : std101.i

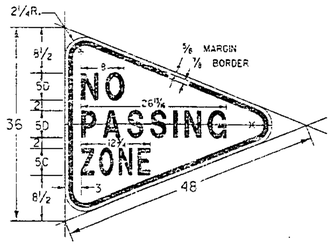
VERMONT AGENCY OF TRANSPORTATION

STANDARD
E-101

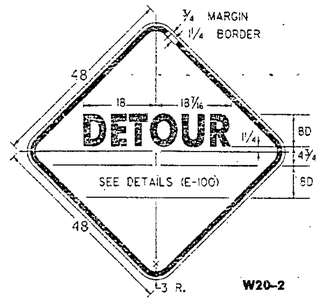



'XX' DENOTES ADVISORY SPEED AS SHOWN ON THE PLANS

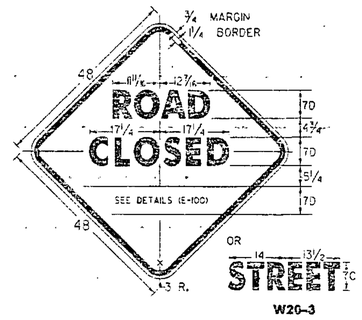
W13-1



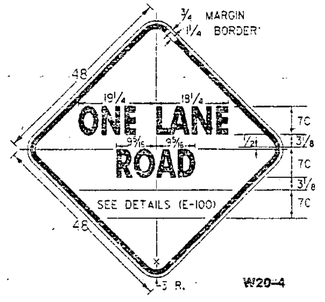

W14-3



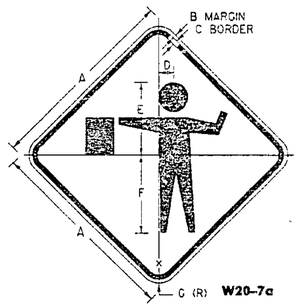

W20-2



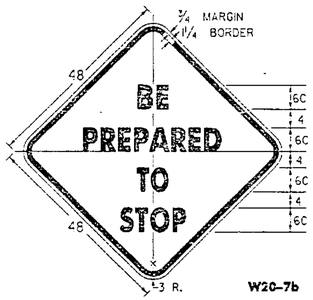

W20-3



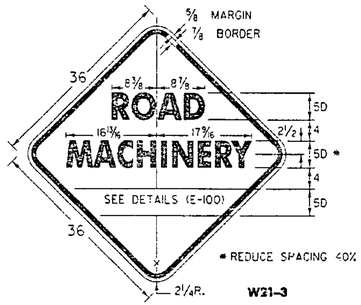

W20-4




W20-7a

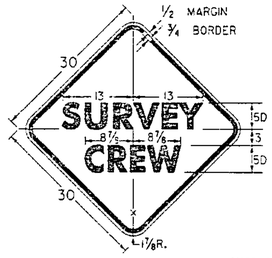



W20-7b




* REDUCE SPACING 40%

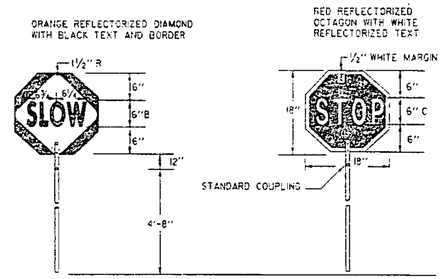
W21-3




W21-6

ORANGE REFLECTORIZED DIAMOND WITH BLACK TEXT AND BORDER

RED REFLECTORIZED OCTAGON WITH WHITE REFLECTORIZED TEXT



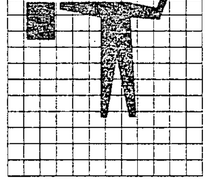

## SIGN DETAIL



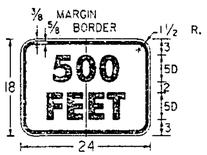

## STAFF DETAIL

MATERIALS
THE SIGN MATERIALS SHALL BE 0.063" ALUMINUM WITH COLORS AS INDICATED ON DETAILS.
THE STAFF SHALL BE 3/4" TO 1 1/4" DIAMETER RIGID ALUMINUM CONDUIT/TUBING WITH A WALL THICKNESS OF 0.125", OR 1" TO 1 1/2" DIAMETER RIGID PVC CONDUIT/TUBING WITH 0.125" WALL THICKNESS

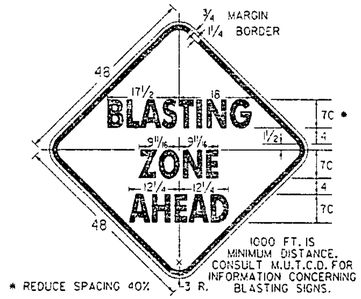
MOUNTING
THE STAFF SHALL BE MOUNTED WITH EITHER TWO 1/4" DIAMETER ALUMINUM BOLTS OR TWO 1/4" DIAMETER ALUMINUM RIVETS.



## SIGN PADDLE FOR FLAGPERSON



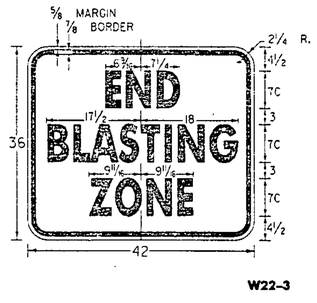

| SIGN | DIMENSIONS(INCHES) | | | | | | |
|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G |
| STD. | 36 | 5/8 | 7/8 | 2 3/4 | 13 1/2 | 14 5/8 | 2 1/4 |
| FWY. | 48 | 3/4 | 1 1/4 | 3 3/4 | 18 | 19 1/2 | 3 |



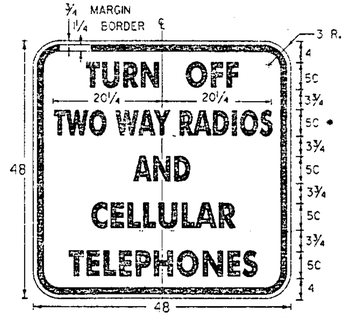

* REDUCE SPACING 40%

1000 FT. IS MINIMUM DISTANCE. CONSULT M.U.T.C.D. FOR INFORMATION CONCERNING BLASTING SIGNS.

W22-1




W22-3




* REDUCE SPACING 50%

VW22-1

## 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 SHALL BE ON A REFLECTORIZED ORANGE BACKGROUND OF TYPE IIB OR TYPE III REFLECTIVE SHEETING, UNLESS OTHERWISE NOTED. THE EXCEPTION IS THE PADDLE SIGN.

SIGN DETAILS INDICATE THE APPROPRIATE COLOR.

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.

**(ALL DIMENSIONS SHOWN IN INCHES)**

**OTHER STDS. REQUIRED:** E-100

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
JAN. 23, 1989 - DELETE MOTORCYCLE SYMBOL SIGN AND SPEED SIGN. ADDED TWO SIGNS
OCT. 21, 1992 - ADDED A SIGN. REVISED A SIGN DIMENSION & TYPE ERROR & REVISED TITLE BLOCK
AUG. 08, 1995 - ADDED FLAGGER GRID

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

APPROVED

Gordon A. MacArthur
DIRECTOR OF ENGINEERING

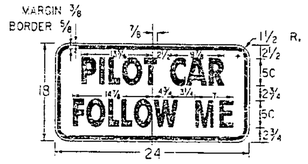
David A. Ross
TRAFFIC AND SAFETY ENGINEER

# CONSTRUCTION SIGN DETAILS

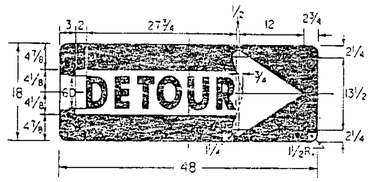
/traf/std/stdel02.dgn : stdel02.i

VERMONT AGENCY OF TRANSPORTATION

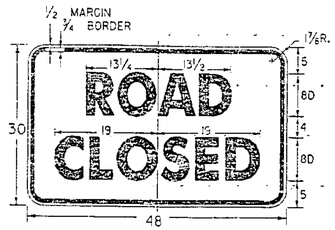
STANDARD
E-102




G20-4

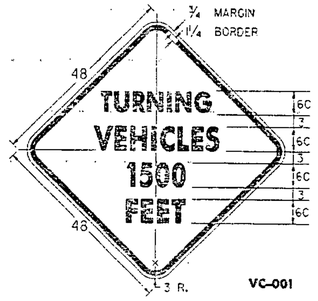



M4-10(R)

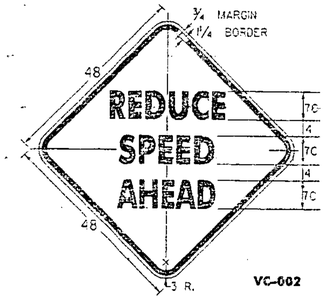



R11-2

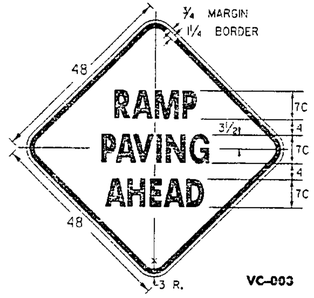
COLORS:
BLACK TEXT AND BORDER
WHITE REFLECTORIZED BACKGROUND



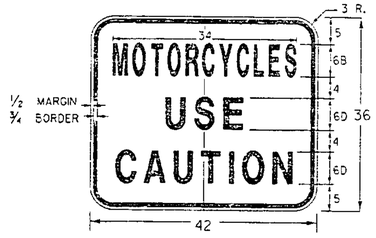

VC-001



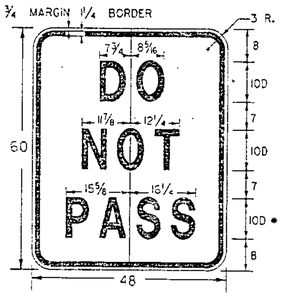

VC-002




VC-003

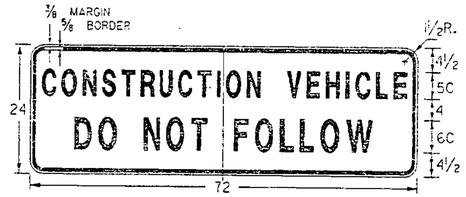



VC-004



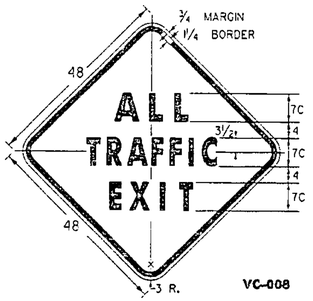

VC-005

* REDUCE SPACING BY 40%

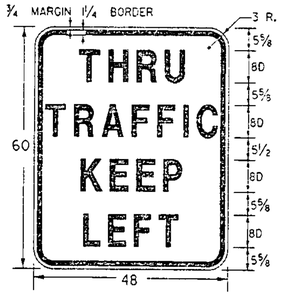



VC-007

IT IS SUGGESTED THAT THIS SIGN BE DESIGNED TO FOLD, (DOWN OR ACROSS), OR BE COVERED, OR BE REMOVED WHEN NOT IN USE. THE SIGN SHOULD ALSO BE MOUNTED AS TO NOT INTERFERE WITH THE VISIBILITY OF DIRECTIONAL OR TAIL LIGHTS AS REQUIRED BY LAW.

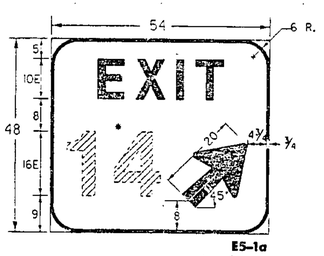



VC-008




VR-118

COLORS: BLACK BORDER & TEXT
WHITE (REFL.) BACKGROUND




E5-1a

* EXIT NUMBER AS PER PLANS
OPTICALLY SPACED

COLORS:
BACKGROUND - GREEN (REFL.)
BORDER, ARROW AND LEGEND - WHITE (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 SHALL BE ON A REFLECTORIZED ORANGE BACKGROUND OF TYPE IIB OR TYPE III REFLECTIVE SHEETING, UNLESS OTHERWISE NOTED.

SIGN DETAILS INDICATE THE APPROPRIATE COLOR.

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.

**(ALL DIMENSIONS SHOWN IN INCHES)**

**OTHER STDS. REQUIRED:** E-100

REVISIONS AND CORRECTIONS

AUG 08, 1995 - DATE OF ORIGINAL ISSUE

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

APPROVED

Gordon D. MacAskill
DIRECTOR OF ENGINEERING

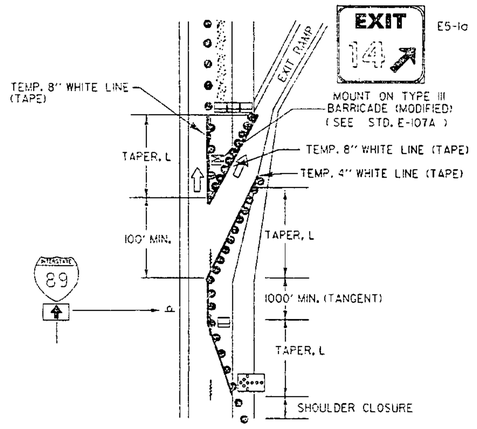
David A. Rorr
TRAFFIC AND SAFETY ENGINEER

# CONSTRUCTION SIGN DETAILS

/traf/std/stce102.cgn : stde102A.i

VERMONT AGENCY OF TRANSPORTATION

STANDARD
E-102A




NOT TO SCALE

**MAINLINE LANE CLOSURE AT AN EXIT RAMP**

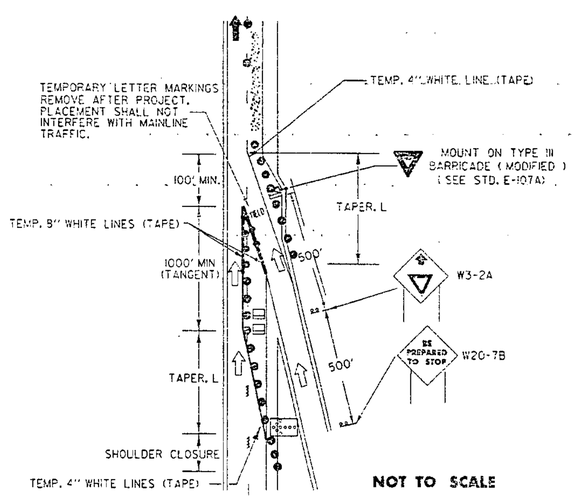
THIS DETAIL SHALL BE USED WHEN THE WORK ZONE BEGINS AT THE CORE OR THE MAINLINE LANE CLOSURE DRUM PLACEMENT INTERFERES WITH THE EXIT RAMP.

**NOTES:**

1) ALL SIGNS SHALL BE MOUNTED ON FIXED POSTS (YIELDING TYPE) UNLESS OTHERWISE NOTED.
2) CHANNELIZING DEVICES SHALL BE PLACED AS FOLLOWS:
   TAPERS - DEVICES SHALL BE SPACED A MAXIMUM OF "S" (THE SPEED LIMIT IN FEET) APART.
   TANGENT - DEVICES SHALL BE SPACED 2 X "S" (THE SPEED LIMIT IN FEET) APART.
3) ALL DISTANCES ARE DESIRABLE MINIMUMS FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
4) TAPER RATES ARE BASED ON THE POSTED MAINLINE AND EXIT SPEEDS.
5) TEMPORARY PAVEMENT MARKINGS ARE REQUIRED WHEN THE LAYOUT IS TO BE IN EFFECT FOR THREE DAYS OR MORE.
6) LANE CLOSURES AND TAPER LENGTHS, L, AS DETAILED ON STANDARD E-103.
7) EXIT SIGN SHALL BE MOUNTED A MINIMUM OF 3' ABOVE THE GROUND AND HIGH ENOUGH TO BE SEEN ABOVE CHANNELIZING DEVICES.

**LEGEND**

- REFL. 28" CONES
- REFL. PLASTIC DRUMS
- PAVEMENT MARKING REMOVAL
- INDICATES TRAFFIC FLOW
- WORK AREA
- FLASHING ARROW PANEL
- TYPE III BARRICADES
- TYPE III BARRICADES (MOD.)

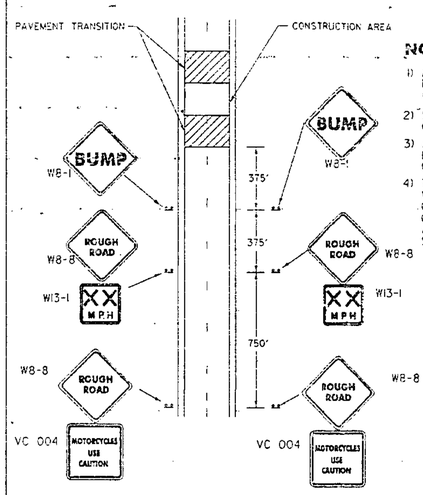



NOT TO SCALE

**MAINLINE LANE CLOSURE AT AN ENTRANCE RAMP**

THIS DETAIL SHALL BE USED WHEN THE WORK ZONE BEGINS AT AT THE END OF THE ACCELERATION LANE OR THE MAINLINE LANE CLOSURE DRUM PLACEMENT INTERFERES WITH THE ON-RAMP TRAFFIC.

IF THE LENGTH OF THE ACCELERATION LANE IS NOT ADEQUATE, THE YIELD SIGN SHALL BE REPLACED WITH A STOP SIGN. IF A STOP SIGN IS USED, IT SHOULD BE ACCOMPANIED BY A STOP BAR.

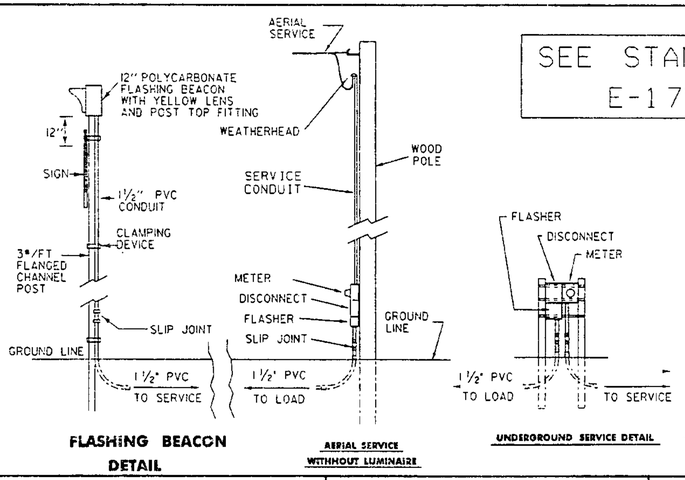



**NOTES:**

1) ADVISORY SPEED AS DETERMINED BY THE RESIDENT ENGINEER ( 40 M.P.H. MINIMUM RECOMMENDED )
2) SIGNS MOUNTED ON FIXED POSTS, ( YIELDING TYPE )
3) ALL DISTANCES ARE DESIRABLE MINIMUMS. FIELD CONDITION SHALL CONTROL THE ACTUAL PLACEMENT.
4) THE BUMP SIGN MAY BE ELIMINATED WHEN THERE IS NO BUMP. WHEN THE CONTRACTOR IS WORKING IN THE CONSTRUCTION AREA THE APPROPRIATE ADVANCED WARNING SIGN PACKAGE SHALL BE USED. SEE STD.E-103.

NOT TO SCALE

**ADVANCED WARNING SIGN PACKAGE FOR COLD PLANED ( SCARIFIED ) SURFACES.**

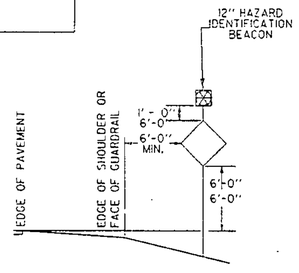



**FLASHING BEACON DETAIL**

**AERIAL SERVICE WITHOUT LUMINAIRE**

**UNDERGROUND SERVICE DETAIL**

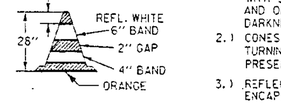
SEE STANDARD E-175




**SIGN PLACEMENT DETAIL**

**NOTES:**

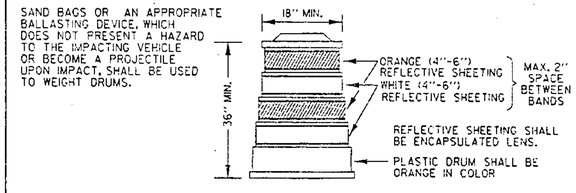
1.) AT THE CONTRACTOR'S OPTION:
   A. THE POWER SUPPLY MAY BE AERIAL OR UNDERGROUND (SEE DETAIL).
   B. POWER FOR A FLASHING BEACON MAY BE COMBINED WITH POWER FOR A TRAFFIC SIGNAL OR THEY MAY HAVE SEPARATE POWER SOURCES.
   C. THE FLASHER MAY BE INSTALLED ON A STANCHION NEAR THE SIGN, ON A UTILITY POLE (WITH UTILITY COMPANY APPROVAL) OR AT THE SAME LOCATION AS A TRAFFIC SIGNAL CONTROLLER.
2.) THE FLASHER UNIT SHALL BE ONE CIRCUIT AND INCLUDE A RADIO INTERFERENCE FILTER.
3.) BATTERY OPERATED FLASHERS WILL NOT BE ALLOWED.
4.) BOTTOM OF THE BEACON SHALL BE A MIN. OF 8'-0" AND A MAX. OF 12'-0" ABOVE THE EDGE OF THE PAVEMENT.
5.) FOR URBAN AREA PLACEMENT SEE STD. E-121.




**NOTES:**

1.) 28" CONES SHALL BE USED ON ROADWAYS WITH SPEED LIMITS OF 35 MPH OR MORE AND ON ALL ROADWAYS DURING HOURS OF DARKNESS.
2.) CONES MAY BE WEIGHTED TO PREVENT OVER-TURNING. HOWEVER THE WEIGHTS SHALL NOT PRESENT A HAZARD IF THE CONE IS STRUCK.
3.) REFLECTIVE SHEETING SHALL BE ENCAPSULATED LENS.

**28" REFLECTORIZED CONE**




**REFLECTORIZED PLASTIC DRUM**

**OTHER STDS. REQUIRED:** E-101, E-102, E-102A, E-103, E-107A, E-136, E-150, E-175

REVISIONS AND CORRECTIONS

APR 12, 1988 - DATE OF ORIGINAL ISSUE
JAN 23, 1989 - REVISED EXIT SIGN - CLARIFIED EXIT TAPER
SEPT 20, 1993 - REVISED RAMP CLOSURES, FLASHING BEACON DETAILS AND MOVED TYPE III BARRICADE (MOD) TO STDE-107A
AUG 08, 1995 - REVISED BEACON SIZE

APPROVED

Gordon D. MacArthur
DIRECTOR OF ENGINEERING

David A. Ross
TRAFFIC AND SAFETY ENGINEER

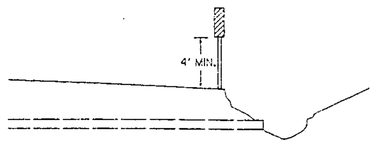
APPROVED FOR THIS PROJECT AND/OR DESIGN IMPLEMENTATION. FHWA FINAL APPROVAL PENDING.

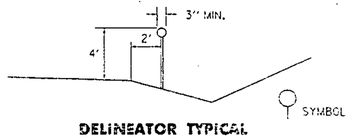
# TRAFFIC CONTROL MISCELLANEOUS DETAILS

/trcf/std/stde106.dgn : stde106.i

VERMONT AGENCY OF TRANSPORTATION

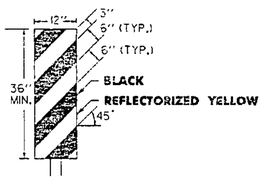
STANDARD E-106



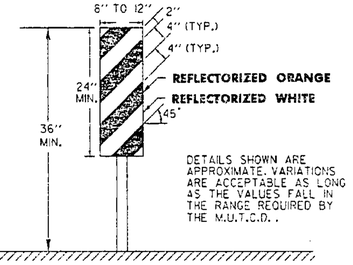

**DELINEATOR TYPICAL**

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 MARKERS ARE USED TO MARK OBSTRUCTIONS WITHIN OR ADJACENT TO THE ROADWAY. 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, AND 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 BLACK AND REFLECTORIZED YELLOW STRIPES. (SLOPING DOWNWARD IN THE DIRECTION TRAFFIC IS TO PASS).

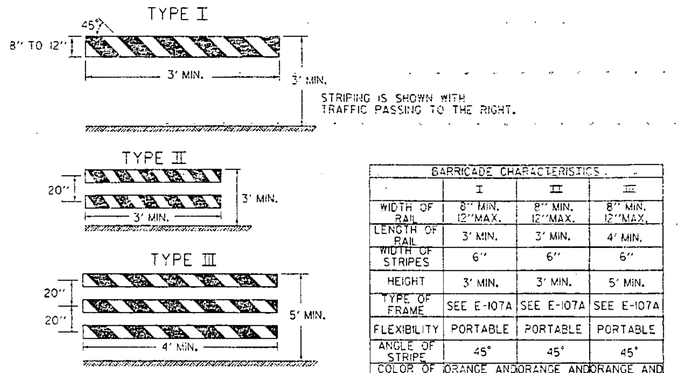



DETAILS SHOWN ARE APPROXIMATE. VARIATIONS ARE ACCEPTABLE AS LONG AS THE VALUES FALL IN THE RANGE REQUIRED BY THE M.U.T.C.D..

**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, CHANNELIZING OR BARRICADING WHERE SPACE IS AT A MINIMUM.

## DELINEATOR, VERTICAL PANEL AND OBJECT MARKER DETAILS FOR CONSTRUCTION AREAS WHERE TRAFFIC IS MAINTAINED




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. 12" MAX. | 8" MIN. 12" MAX. | 8" MIN. 12" MAX. |
| LENGTH OF RAIL | 3' MIN. | 3' MIN. | 4' MIN. |
| WIDTH OF STRIPES | 6" | 6" | 6" |
| HEIGHT | 3' MIN. | 3' MIN. | 5' MIN. |
| TYPE OF FRAME | SEE E-107A | SEE E-107A | SEE E-107A |
| FLEXIBILITY | PORTABLE | PORTABLE | PORTABLE |
| ANGLE OF STRIPE | 45° | 45° | 45° |
| COLOR OF STRIPES | ORANGE AND WHITE | ORANGE AND WHITE | ORANGE AND WHITE |

**BARRICADE CHARACTERISTICS**

| DETOUR DESIGN SPEED | MINIMUM RADIUS (FT.)[a] SUPERELEVATION (FT./FT.) | | | | |
|---|---|---|---|---|---|
| (M.P.H.) | 0.00[b] | 0.02 | 0.04 | 0.06 | 0.08 |
| 20 | 160 | 140 | 130 | 120 | 110 |
| 25 | 245 | 220 | 200 | 185 | 170 |
| 30 | 375 | 335 | 305 | 275 | 255 |
| 35 | 510 | 455 | 410 | 375 | 340 |
| 40 | 715 | 630 | 575 | 510 | 470 |
| 50 | 1190 | 1045 | 955 | 850 | 765 |

a. PER AASHTO REQUIREMENTS
b. 0.00 SUPERELEVATION SHOULD BE AVOIDED IF POSSIBLE

## BARRICADES

**APPLICATION NOTES**

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

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

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

**MATERIALS**

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

1. WOODEN BARRICADES (TYPE 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 M.P.H. ARE EXPECTED UNLESS INSTALLED FOR PEDESTRIAN CONTROL BEHIND APPROVED POSITIVE BARRIERS.
   B) MAY BE USED WHERE OPERATING SPEEDS OF 20 M.P.H. OR LESS ARE EXPECTED.
2. TYPE III WOODEN BARRICADES SHALL NOT BE USED.

**COLORS**

THE BARRICADE PANELS SHOWN ON THIS SHEET SHALL HAVE AN 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 REFLECTIVE SHEETING ON BARRICADE PANELS SHALL BE TYPE □□.

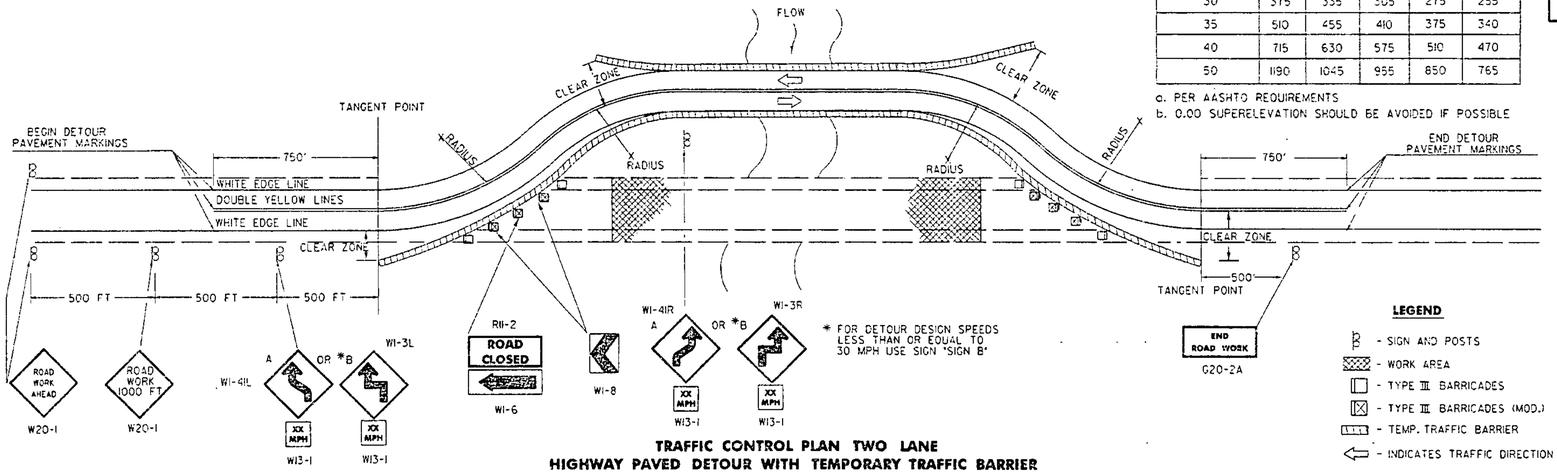
**LOCATION**

THE BARRICADES SHOWN ON THIS SHEET WILL BE LOCATED BY THE RESIDENT 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 RESIDENT ENGINEER. THEY SHALL BE COMPLETELY VISIBLE TO THE APPROACHING TRAFFIC AT ALL TIMES. DAMAGED, DEFACED, OR DIRTY BARRICADES SHALL BE REPAIRED, CLEANED, OR REPLACED AS ORDERED BY THE RESIDENT 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 REQUIREMENTS FOR THE DETOUR SIGN LAYOUT REQUIREMENTS.




* FOR DETOUR DESIGN SPEEDS LESS THAN OR EQUAL TO 30 MPH USE SIGN "SIGN B"

**LEGEND**

- SIGN AND POSTS
- WORK AREA
- TYPE III BARRICADES
- TYPE III BARRICADES (MOD.)
- TEMP. TRAFFIC BARRIER
- INDICATES TRAFFIC DIRECTION

**TRAFFIC CONTROL PLAN TWO LANE HIGHWAY PAVED DETOUR WITH TEMPORARY TRAFFIC BARRIER**

## DETOUR NOTES

1.) SIGNS AND DELINEATION SHOWN FOR ONE DIRECTION OF TRAFFIC ONLY.

2.) THE 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 RESIDENT ENGINEER.

4.) UNPAVED DETOURS REQUIRE PAVEMENT MARKINGS FOR TRANSITIONS FROM EXISTING PAVEMENT.

5.) THE NUMBER OF CHANNELIZING DEVICES, BARRICADES AND OTHER TRAFFIC CONTROL DEVICES SHOWN ON THIS SHEET ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED SHALL BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR CURVE, ETC.).

6.) AASHTO CLEAR ZONE REQUIREMENTS SHOULD BE MET. IF NOT THEN AN APPROVED ENERGY ABSORPTION ATTENUATOR SUITABLE FOR THE TEMPORARY TRAFFIC BARRIER USED AND FOR THE DESIGN SPEED SHALL BE INSTALLED PER THE CURRENT AASHTO ROADSIDE DESIGN GUIDE.

7.) THE DETOUR DESIGN SPEED SHOULD BE NO LESS THAN 10 M.P.H. BELOW THE POSTED SPEED LIMIT, UNLESS PHYSICAL RESTRICTIONS PREVENT THIS.

8.) SEE STANDARD SHEETS E-100, E-101 AND E-102 FOR SIGN DETAIL AND MATERIAL REQUIREMENTS.

9.) IF THE USE OF TEMPORARY TRAFFIC BARRIER IS NOT REQUIRED, THEN REFLECTORIZED PLASTIC DRUMS SHALL BE USED.

**OTHER STDS. REQUIRED:** E-100, E-101, E-102, E-102a, E-107a

REVISIONS AND CORRECTIONS

SEPT. 10, 1987 - DATE OF ORIGINAL ISSUE
APRIL 29, 1988 - FHWA REVIEW COMMENTS
SEPT. 20, 1993 - NEW RADIUS CHART, BARRICADE ALIGNMENT AND USE OF TEMPORARY TRAFFIC BARRIER
AUG. 08, 1995 - REVISED SIGNING PER MUTCD

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

APPROVED

Gordon S. MacAuthur
DIRECTOR OF ENGINEERING

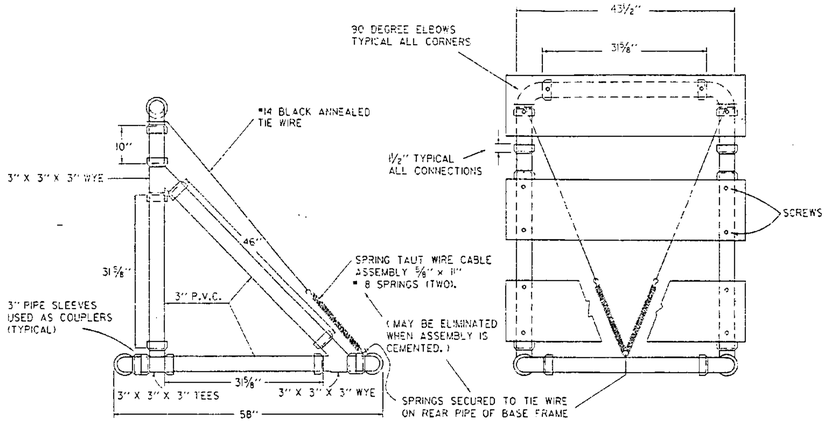
David A. Ross
TRAFFIC AND SAFETY ENGINEER

# DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS

/trcf/std/std107.dgn : std107.i

VERMONT AGENCY OF TRANSPORTATION

# STANDARD E-107




**SIDE VIEW**
**TYPE III BARRICADE**

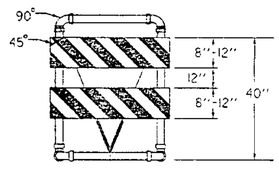
**FRONT VIEW**
**TYPE III BARRICADE**

MATERIALS FOR TYPE I AND II BARRICADES

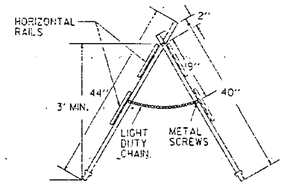
20' - 1" PVC
4 - 1" PVC 90° ELBOWS
30" -½" ID THINWALL PVC CONDUIT
36" -¼" STEEL ROD
4 - 1" WASHERS
24" - LIGHT DUTY CHAIN
½" - #12 PAN HEAD METAL SCREWS (AS REQUIRED)
2 -¾" COTTER PINS
2 OR 4 - 8" OR 12" X 36" X 0.025 " BARRICADE RAILS (AS REQUIRED)

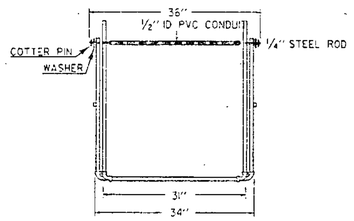
MATERIALS FOR TYPE III BARRICADES

30 LF - 3" I.D. PVC PIPE
6 - 3" 90° ELBOWS
2 - 3" TEES
4 - 3" WYES
3 - 8" OR 12" X 48" X 0.025" BARRICADE RAILS
2 - 5/8" X 11" #8 SPRING ( IF ASSEMBLY IS NOT CEMENTED)
12 - 1" #14 PAN HEAD METAL SCREWS
15 LF - #14 BALCK ANNEALED TIE WIRE ( IF ASSEMBLY IS NOT CEMENTED)




**TYPE III ( MODIFIED ) BARRICADE**
**( STRIPING IS SHOWN WITH TRAFFIC PASSING TO THE RIGHT ).**




**TYPE I AND TYPE II BARRICADE**

## MATERIALS

THE PIPE, WYES, TEES AND ELBOWS USED TO CONSTRUCT BARRICADES SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D 2241 FOR P.V.C. 1120 OR 1220 SDR-21, PRESSURE RATING 200 PSI. THE WYES, TEES AND ELBOWS SHALL CONFORM TO THE REQUIREMENTS OF ASTM DESIGNATION D 2466, TYPE II, GRADE 1. 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 STRIPES ( SLOPING DOWNWARD AT AN

## MAINTENANCE

BARRICADES SHALL BE MAINTAINED IN CLEAN AND LEGIBLE CONDITIONS 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 (⅜" DIAM.) IN EACH SECTION OF PIPE AND FITTINGS IF THE ASSEMBLY IS NOT CEMENTED.

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

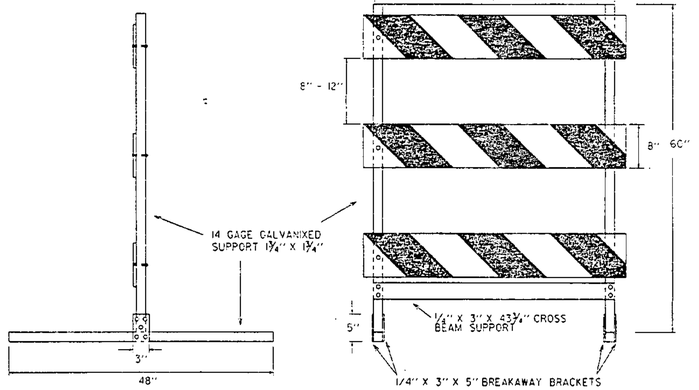
BE A HAZARD TO VEHICLES PASSING ON EITHER SIDE. GLUED JOINTS MAY PROVIDE ADDITIONAL STABILITY TO THE INSTALLATION.

TYPE I BARRICADES SHALL UTILIZE ONE HORIZONTAL RAIL IN EACH DIRECTION.

TYPE II BARRICADES SHALL BE A TYPE I BARRICADE WITH AN ADDITIONAL HORIZONTAL RAIL MOUNTED BELOW THE OTHER IN EACH DIRECTION.

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

SEE STD E-107 FOR ADDITIONAL INFORMATION.



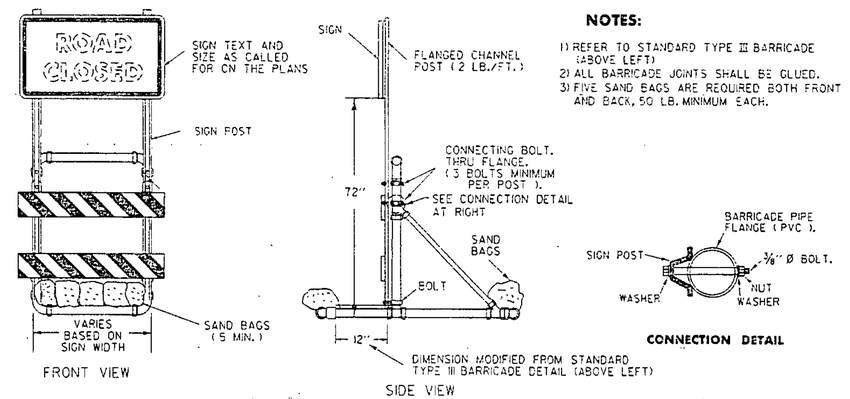

**SIDE AND FRONT VIEW OF TYPE III METAL BARRICADE**

MATERIALS FOR METAL TYPE III BARRICADES

PANELS (3):
6' X 48' GALVANIZED STEEL...COVERED 1 OR 2 SIDES WITH WHITE/ORANGE, DIAGONALLY STRIPED REFLECTIVE SHEETING

VERTICAL SUPPORTS (2): 14 GAGE GALVANIZED TUBING 1 3/4" X 1 3/4" X 60"
HORIZONTAL SUPPORTS (2): 14 GAGE GALVANIZED TUBING 1 3/4" X 1 3/4" X 48"
CROSS BEAM SUPPORT (1): COLD GALVANIZED STEEL 1/4" X 3" X 43 3/4"
BREAKAWAY BRACKETS (4): COLD GALVANIZED STEEL 1/4" X 3" X 5"

FASTENERS:
6 - SHEAR BOLTS WITH LOCK NUTS 1/4"D X 2 3/4"
4 - FULCRUM BOLTS WITH LOCK NUTS 3/8"D X 2 3/4"
4 - FASTENER BOLTS WITH LOCK NUTS 3/8"D X 2 3/4"
6 - PANEL BOLTS WITH LOCK NUTS AND WASHERS 1/4"D X 2"
ALL FASTENERS GALVANIZED STEEL.
ALL BOLTS HEX HEAD.




**NOTES:**

1) REFER TO STANDARD TYPE III BARRICADE (ABOVE LEFT)
2) ALL BARRICADE JOINTS SHALL BE GLUED.
3) FIVE SAND BAGS ARE REQUIRED BOTH FRONT AND BACK, 50 LB. MINIMUM EACH.

**SIGN MOUNTING ON TYPE III BARRICADE ( MODIFIED )**

**OTHER STDS. REQUIRED:** E-107

REVISIONS AND CORRECTIONS

SEPT. 10, 1987 - ADDED METAL TYPE III BARRICADE
SEPT. 20, 1993 - REVISED NOTES AND TYPE III (MOD.) BARRICADE DETAIL
AUG. 08, 1995 - ADDED METAL TYPE III BARRICADE

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

APPROVED

Gordon D. MacArthur
DIRECTOR OF ENGINEERING

David Q. Ross
TRAFFIC AND SAFETY ENGINEER

# BREAKAWAY BARRICADE DETAILS

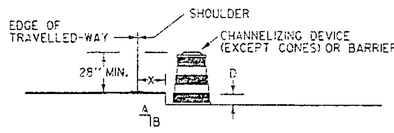
/traf/std/stcel07a.dgn : stcel07a.i

VERMONT AGENCY OF TRANSPORTATION

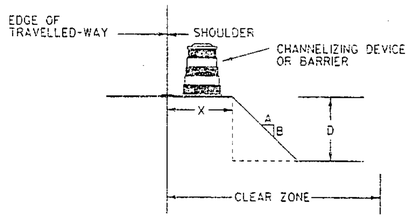
# STANDARD E-107 A

## CONDITION 1
## DROP-OFF ADJACENT TO TRAVELLED-WAY

**TYPE A**



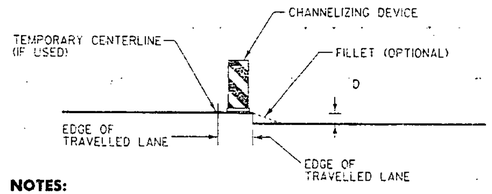

**TYPE B**




**NOTES:**

1. CHANNELIZING DEVICES OR BARRIER SHOULD BE PLACED TO MAXIMIZE THE WIDTH OF THE TRAVELED-WAY.
2. FOR SPECIFIC REQUIREMENTS USE CHART ''A''.
3. IF THE DROP-OFF REQUIRES CHANNELIZING DEVICES TO REMAIN INPLACE OVERNIGHT THEN ''LOW SHOULDER'' OR 'SHOULDER DROP OFF' SIGNS SHOULD BE INSTALLED.

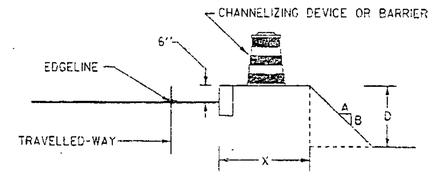
## CONDITION 2
## DROP-OFF BETWEEN ADJACENT TRAVELLED LANES




**NOTES:**

1. WHENEVER A LONGITUDINAL DROP-OFF BETWEEN ADJACENT TRAVELLED-LANES IS TO BE LEFT OVERNIGHT THEN ''UNEVEN LANES'' SIGNS AND CHANNELIZING DEVICES SHOULD BE INSTALLED.
2. IF REQUIRED, THE CHANNELIZING DEVICES USED SHOULD BE THOSE WHICH MAXIMIZE THE TRAVELLED LANE ( IE. CONES, VERTICAL PANELS OR TUBULAR MARKERS).
3. A BITUMINOUS CONCRETE FILLET WITH A 3:1 SLOPE MAY BE USED IN LIEU OF CHANNELIZING DEVICES. HOWEVER THE ''UNEVEN LANES'' SIGNS SHOULD BE INSTALLED REGARDLESS.

## CONDITION 3
## DROP-OFF BEYOND SHOULDER OR CURB




**NOTES:**

1. CHANNELIZING DEVICES OR BARRIER SHOULD BE PLACED TO MAXIMIZE THE WIDTH OF THE TRAVELLED WAY.
2. FOR SPECIFIC REQUIREMENTS USE CHART "A" OR "B" AS APPLICABLE.

## CHART A
### ALL SPEEDS
### NO CURB

| X (FEET) | DROP (D) (INCHES) | A/B SLOPE | DEVICE REQUIRED |
|---|---|---|---|
| 0 TO 4' | LESS THAN 2" | ANY | NONE |
| | 2" TO 5" | 3:1 OR FLATTER | NONE |
| | | STEEPER THAN 3:1 | CHANNELIZING DEVICE |
| | GREATER THAN 5" | 3:1 OR FLATTER | NONE |
| | | STEEPER THAN 3:1 | BARRIER |
| 4' TO 10' | LESS THAN 5" | ANY | NONE |
| | 5" TO 12" | 3:1 OR FLATTER | NONE |
| | | STEEPER THAN 3:1 | BARRIER |
| | GREATER THAN 12" | 3:1 OR FLATTER | NONE |
| | | STEEPER THAN 3:1 | BARRIER |
| 10' TO CZ | LESS THAN OR EQUAL TO 12" | ANY | NONE |
| | GREATER THAN 12" | 3:1 OR FLATTER | NONE |
| | | STEEPER THAN 3:1 | BARRIER |

1. CLEAR ZONE (CZ) IS TO BE DETERMINED PER THE CURRENT AASHTO ROADSIDE DESIGN GUIDE.
2. CHANNELIZING DEVICES MAY BE USED INSTEAD OF BARRIER FOR SHORT TERM (ONE-DAY) OPERATIONS.
3. ON BORDERLINE CONDITIONS THE ENGINEER SHALL DETERMINE WHICH TREATMENT IS ADEQUATE FOR THE EXISTING CONDITIONS.

## GENERAL NOTES

1. THESE CONDITIONS AND TREATMENTS ARE ONLY PART OF THE TRAFFIC CONTROL SYSTEM AND SHALL BE USED IN ADDITION TO THE PROPER WORK ZONE SIGNING.
2. THE FOLLOWING ARE ACCEPTABLE CHANNELIZING DEVICES: SEE STANDARD SHEETS E-106, E-107 AND E-107A FOR FURTHER DETAILS
   A. VERTICAL PANEL
   B. TYPE I OR TYPE II BARRICADE
   C. PLASTIC DRUM
   *D. CONE - WHERE APPLICABLE

   *CONES SHALL NOT BE USED WHEN THE CHANNELIZING DEVICE IS REQUIRED TO BE PLACED BELOW THE GRADE OF THE TRAVELLED-WAY. (SEE CONDITION 1, TYPE A)
3. WHERE BARRIER IS CALLED FOR, EITHER CONRETE BARRIER (JERSEY SHAPE). STEEL BEAM GUARDRAIL OR OTHER FHWA APPROVED BARRIER MAY BE USED.

   -BARRIER ENDS FACING ONCOMING TRAFFIC SHALL BE TAPERED BEYOND THE CLEAR ZONE OR PROTECTED WITH AN APPROVED END TREATMENT DESIGNED FOR THE 85TH PERCENTILE SPEED OR THE POSTED SPEED LIMIT OF THE ROADWAY.
4. CHANNELIZING DEVICE SPACING SHALL BE AS FOLLOWS:

   TAPERS - CHANNELIZING DEVICES SHALL BE SPACED A MAXIMUM OF 'S' (THE SPEED LIMIT IN FEET, 65 MPH = 65 FT) CENTER TO CENTER.

   TANGENT - CHANNELIZING DEVICES SHALL BE SPACED 'S' (THE SPEED LIMIT IN FEET, 65 MPH = 65 FT) TO A MAXIMUM OF '2S' CENTER TO CENTER.
5. ''LOW SHOULDER'' OR ''UNEVEN LANES'' SIGNS, WHEN USED, SHALL BEGIN PRIOR TO THE DROP-OFF CONDITION AND SHOULD BE REPEATED EVERY 1500 FEET.

## CHART B
### 40 MPH OR LESS
### WITH CURB

| X (FEET) | DROP (D) (INCHES) | DEVICE REQUIRED |
|---|---|---|
| 0-10' | LESS THAN OR EQUAL TO 12" | NONE |
| 0-10' | GREATER THAN 12" | CHANNELIZING DEVICE |
| GREATER THAN 10 | ANY | NONE |

**NOTES:**

1. USE THIS CHART ONLY FOR CONDITION 3.
2. USE THIS CHART FOR VERTICAL CURBS OF 6" OR GREATER FOR LOWER CURBS OR MOUNTABLE USE CHART A.
3. FOR CURBED SECTIONS WITH POSTED SPEEDS ABOVE 40 MPH USE CHART A.

**OTHER STDS. REQUIRED:** E-101, E-106, E-107, E-107A

REVISIONS AND CORRECTIONS

SEPT. 20, 1993 - DATE OF ORIGINAL ISSUE
AUG. 18, 1995 - ADDED SHOULDER WARNING NOTE

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

APPROVED

DIRECTOR OF ENGINEERING

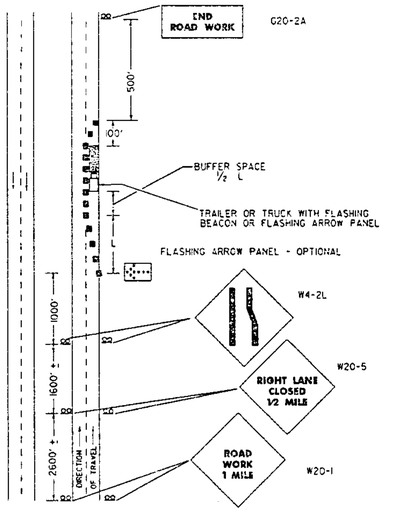
TRAFFIC AND SAFETY ENGINEER

# CONSTRUCTION ZONE LONGITUDINAL DROP OFFS

/traf/std/std108.dgn : std108.i

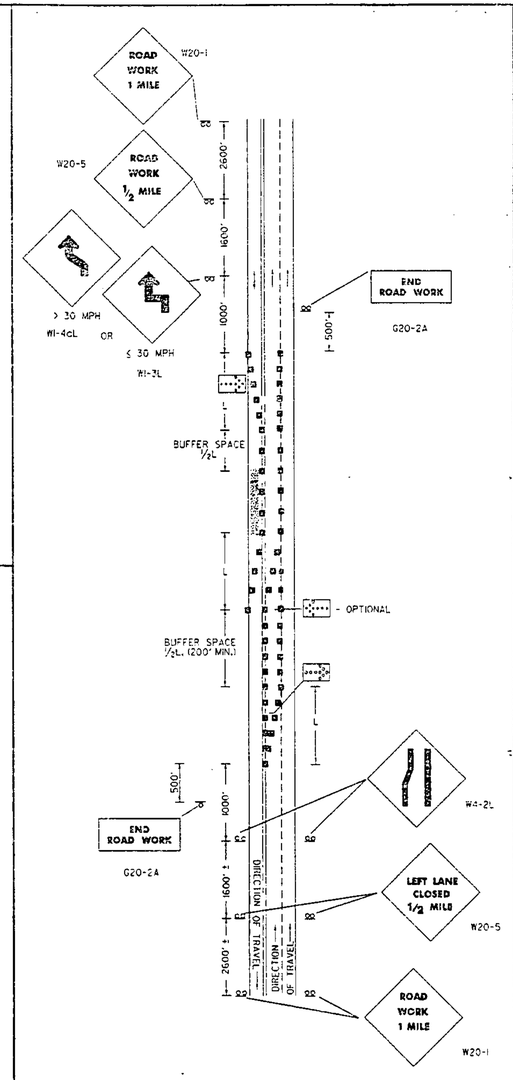
VERMONT AGENCY OF TRANSPORTATION

# STANDARD E-108



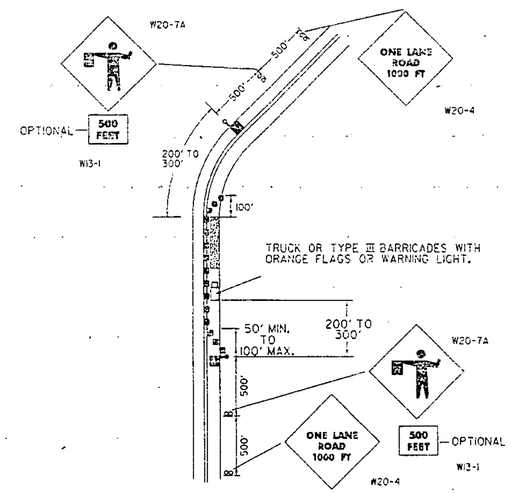

TYPICAL APPLICATION - DAYTIME MAINTENANCE OPERATIONS OF SHORT DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF ROADWAY IS CLOSED.

NTS



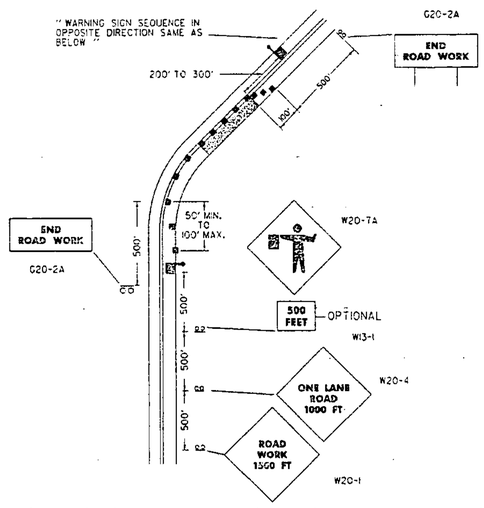

TYPICAL APPLICATION - DAYTIME MAINTENANCE OPERATION OF SHORT DURATION ON A 3 LANE ROADWAY WHERE CENTER LANE IS USED FOR OPPPOSING TRAFFIC

NTS




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

NTS




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

NTS

## NOTES

**REFLECTORIZATION**

ALL SIGNS USED DURING THE HOURS OF DARKNESS SHALL BE REFLECTORIZED (TYPE I OR III). CONES USED FOR TRAFFIC CONTROL AT NIGHT SHALL COMPLY WITH STANDARD E-106.

**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 STEEL OR ALUMINUM | 0.125 INCHES |
| HIGH DENSITY OVERLAYED PLYWOOD | 1/2, 5/8, OR 3/4 INCHES |
| GALVANIZED SHEET STEEL | 12 GAGE |

1. SIGNS WITH "ROAD WORK 1500 FT. AND "END ROAD WORK" TEXT SHALL BE USED WHEN THE WORK IS NOT COMPLETE AND A HAZARD REMAINS OVERNIGHT.
2. THE FLAGPERSON SHALL USE THE SIGN PADDLE DETAILED ON STANDARD SHEET E-102.
3. 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.
4. 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 YIELDING WOOD OR METAL POSTS SET SECURELY IN THE GROUND (IN ACCORDANCE WITH STD. E-121), OR ON PORTABLE SUPPORTS WHEN APPROPRIATE. THE INSTALLATION OF SIGNS AND BARRICADES SHALL BE SUBJECT TO THE APPROVAL OF THE ENGINEER.
5. 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.
6. ALL DISTANCES ARE DESIRABLE SPECIFICATIONS. FIELD CONDITIONS SHALL CONTROL THE ACTUAL PLACEMENT.
7. SIGN DETAILS NOT SHOWN ON THIS SHEET CAN BE FOUND ON STANDARD SHEETS E-100, E-101, AND E-102.
8. TAPER FORMULA
   - L = SXW 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.
9. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT IN M.P.H.. ON TANGENT SECTIONS THE MAXIMUM SPACING SHOULD BE APPROXIMATELY EQUAL TO TWICE THE POSTED SPEED LIMIT.
10. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK THE FLAGPERSON STATIONS AT NIGHT AS NEEDED.
11. AT SHORT WORK ZONES WHERE ADEQUATE SIGHT DISTANCE IS AVAILABLE FOR THE SAFE HANDLING OF TRAFFIC ONE FLAGGER MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
12. CHANNELIZING DEVICES SHALL BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
13. THE NUMBER OF CHANNELIZING AND OTHER TRAFFIC CONTROL DEVICES SHOWN ON THIS SHEET ARE FOR ILLUSTRATIVE PURPOSES ONLY. THE ACTUAL NUMBER REQUIRED SHALL BE DETERMINED BASED ON INDIVIDUAL DETOUR CONDITIONS (TAPERS, SPEED LIMITS, LENGTH OF DETOUR CURVE, ETC.).

**LEGEND:**

| | |
|---|---|
| FLAGPERSON | WORK AREA |
| CHANNELIZING DEVICES (CONES OR DRUMS) | SIGN & POSTS |
| FLASHING ARROW PANEL | TYPE III BARRICADES |

**OTHER STDS. REQUIRED:** E-100, E-101, E-102, E-106

REVISIONS AND CORRECTIONS

SEPT 10, 1987 - DATE OF ORIGINAL ISSUE
MAR 01, 1988 - FHWA REVIEW COMMENTS
SEP 20, 1993 - REVISED NOTES & MISC. DETAILS
AUG 06, 1995 - DELETED SIGN DETAILS

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

APPROVED

Gordon D. MacArthur
DIRECTOR OF ENGINEERING

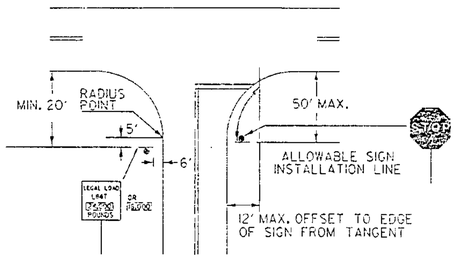
David A. Ross
TRAFFIC AND SAFETY ENGINEER

# MAJOR MAINTENANCE OPERATION LANE CLOSURE

/traf/std/stde110.dgn : stde110.1

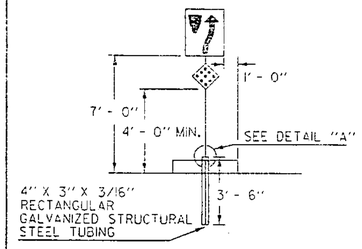
VERMONT AGENCY OF TRANSPORTATION

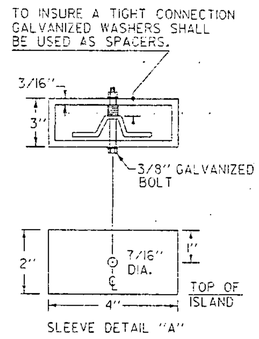
# STANDARD E-110




STOP SIGN SHALL BE PLACED ON DRIVERS RIGHT, MAINTAINING MAXIMUM VISIBLITY. CLEARANCE SHALL BE A MINIMUM OF 6' AND A MAXIMUM OF 50' FROM EDGE LINE OF INTERSECTING ROADWAY AND DOES NOT HAVE TO BE ADJACENT TO THE STOP BAR.

**LEGAL LOAD LIMIT AND STOP SIGNS AT INTERSECTIONS WITH TOWN HIGHWAYS**

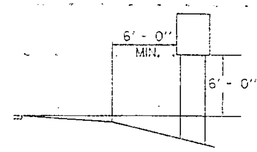


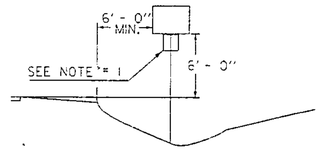



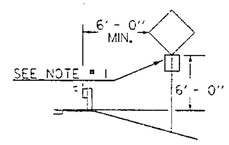

SLEEVE DETAIL "A"

**SIGNS ON MEDIAN ISLANDS IN THE LINE OF TRAFFIC**

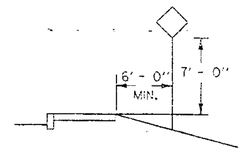
INCREASE VERTICAL CLEARANCE TO 7' IN AREAS OF FREQUENT ROADSIDE PARKING OR PEDESTRIAN ACTIVITY

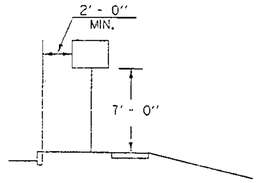


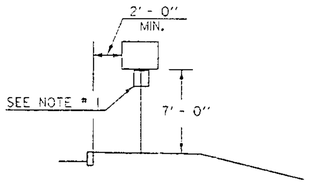




**RURAL**




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**

**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.

POST REFERENCE:

REFER TO THE DETAILS ON THE APPROPRIATE STANDARD DRAWING FOR INFORMATION CONCERNING THE PROPER MOUNTING OF SIGNS ON APPROPRIATE POSTS.

**OTHER STDS. REQUIRED:** E-160 E-161 E-162 E-163 E-164

REVISIONS AND CORRECTIONS

JAN. 23, 1995 - DATE OF ORIGINAL ISSUE

AUG. 08, 1995 - VARIOUS MINOR NOTE REVISIONS

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

APPROVED

DIRECTOR OF ENGINEERING

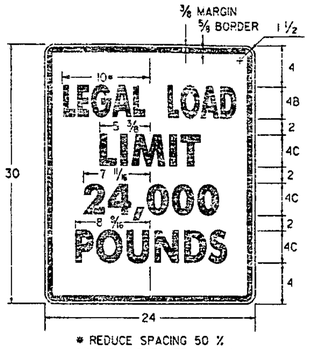
TRAFFIC AND SAFETY ENGINEER

# STANDARD SIGN PLACEMENT CONVENTIONAL ROAD

/traf/std/stce121.dgn : stdel21.i

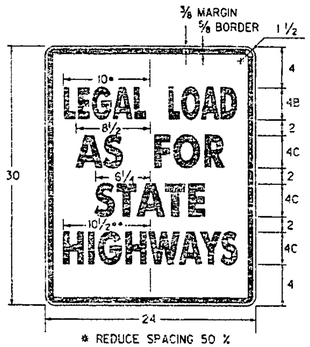
VERMONT AGENCY OF TRANSPORTATION

STANDARD E-121



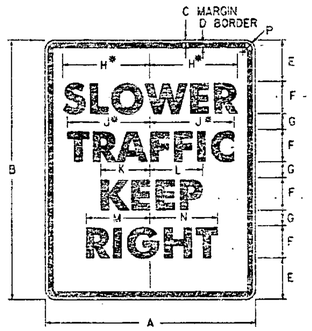

* REDUCE SPACING 50 %
LINE 3 ALTERNATE - 16,000

VR-017




* REDUCE SPACING 50 %
** REDUCE SPACING 38 %

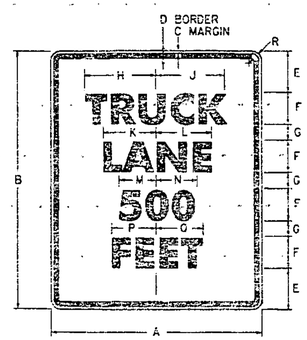
VR-079




* REDUCE SPACING 25 %

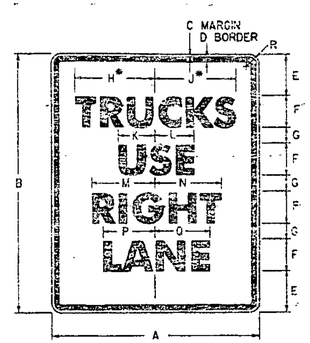
R6-3

| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N | P |
| STD. | 24 | 30 | 3/8 | 5/8 | 3 5/8 | 4D | 2 1/4 | 9 3/4 | 10 | 6 | 6 5/16 | 7 1/8 | 7 5/8 | 11/2 |
| EXPWY. | 36 | 48 | 5/8 | 7/8 | 6 | 6D | 4 | 14 5/8 | 15 | 9 | 9 15/16 | 10 11/16 | 11 3/8 | 2 1/4 |
| FWY. | 48 | 60 | 3/4 | 1 1/4 | 7 1/4 | 8D | 4 1/2 | 19 1/2 | 20 | 12 | 13 1/8 | 14 1/4 | 15 1/4 | 3 |




R4-6

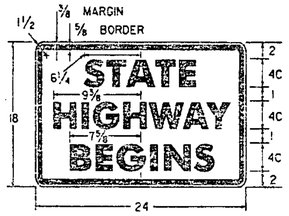
| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R |
| STD. | 24 | 30 | 3/8 | 5/8 | 3 5/8 | 4E | 2 1/4 | 9 3/16 | 9 11/16 | 7 9/16 | 7 11/16 | 5 11/16 | 5 11/16 | 6 7/8 | 7 1/16 | 11/2 |
| EXPWY. | 36 | 48 | 5/8 | 7/8 | 6 | 6E | 4 | 14 3/4 | 14 1/2 | 11 5/16 | 11 1/2 | 8 1/2 | 8 3/4 | 10 5/16 | 10 5/8 | 2 1/4 |
| FWY. | 48 | 60 | 3/4 | 1 1/4 | 7 1/4 | 8E | 4 1/2 | 19 5/8 | 19 3/8 | 15 1/8 | 15 3/16 | 11 3/8 | 11 3/8 | 13 3/4 | 14 1/8 | 3 |




* REDUCE SPACING 32 %

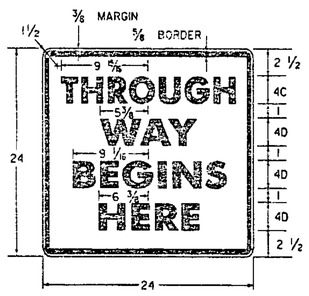
R4-5

| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R |
| STD. | 24 | 30 | 3/8 | 5/8 | 3 5/8 | 4D | 2 1/4 | 9 3/16 | 9 3/16 | 4 3/4 | 5 | 7 1/8 | 7 5/8 | 6 1/4 | 6 5/8 | 11/2 |
| EXPWY. | 36 | 48 | 5/8 | 7/8 | 6 | 6D | 4 | 14 5/16 | 13 13/16 | 7 1/8 | 7 1/2 | 10 11/16 | 11 3/8 | 9 3/16 | 9 15/16 | 2 1/4 |
| FWY. | 48 | 60 | 3/4 | 1 1/4 | 7 1/4 | 8D | 4 1/2 | 19 1/8 | 18 3/8 | 9 1/2 | 10 | 14 1/4 | 15 1/4 | 12 1/2 | 13 1/4 | 3 |



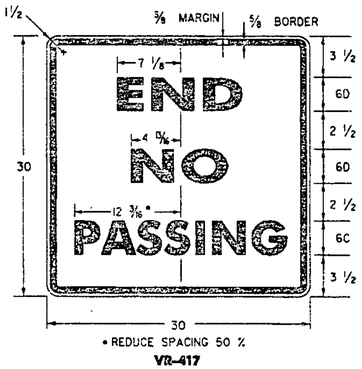

VR-039


VR-038



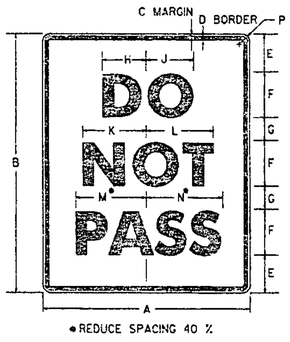

VR-041


VR-040




* REDUCE SPACING 50 %

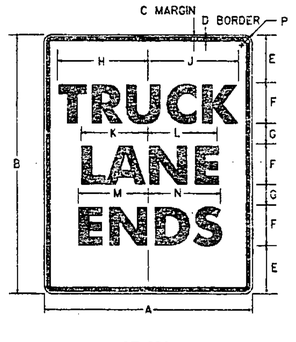
VR-417




* REDUCE SPACING 40 %

R4-1

| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N | P |
| STD. | 24 | 30 | 3/8 | 5/8 | 3 1/2 | 6D | 2 1/2 | 4 11/16 | 5 | 7 1/8 | 7 3/8 | 9 3/8 | 9 3/4 | 11/2 |
| EXPWY. | 36 | 48 | 5/8 | 7/8 | 7 | 8D | 5 | 6 1/4 | 6 5/8 | 9 1/2 | 9 3/4 | 12 1/2 | 13 | 2 1/4 |
| FWY. | 48 | 60 | 3/4 | 1 1/4 | 8 | 10D | 7 | 7 3/4 | 8 5/16 | 11 7/8 | 12 1/4 | 15 5/8 | 16 1/4 | 3 |




VR-186

| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M | N | P |
| STD. | 24 | 30 | 3/8 | 3/8 | 3 1/2 | 6C | 2 1/2 | 10 1/4 | 10 3/16 | 7 3/4 | 7 3/4 | 7 15/16 | 8 | 11/2 |
| EXPWY. | 36 | 48 | 5/8 | 7/8 | 7 | 6C | 5 | 13 5/16 | 13 5/16 | 10 3/16 | 10 5/16 | 10 11/16 | 10 11/16 | 2 1/4 |
| FWY. | 48 | 60 | 3/4 | 1 1/4 | 8 | 10D | 7 | 20 5/8 | 20 5/16 | 15 3/16 | 15 5/16 | 16 1/16 | 16 1/16 | 3 |

GENERAL:

1. ALL DIMENSIONS IN INCHES.

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 REGULATORY SIGNS SHOWN ON THIS SHEET MAY BE ANY OF THE FOLLOWING OF THE MINIMUM THICKNESS NOTED.

| | 24'' X 18''<br>24'' X 24''<br>24'' X 30''<br>30'' X 30'' | 36'' X 48''<br>48'' X 60'' |
|---|---|---|
| FLAT SHEET ALUMINUM | 0.080'' | 0.100'' |
| HIGH DENSITY OVERLAID PLYWOOD | 1/2'' | 5/8'' |
| GALVANIZED FLAT SHEET STEEL | 16 GAGE | 14 GAGE |

THE REFLECTIVE MATERIAL FOR GROUND MOUNTED SIGNS SHALL BE AASHTO TYPE II OR III WHITE REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND OF THE SIGN. THE THE TEXT OF THE SIGNS MAY BE LETTERING FILM, SILK SCREENED OR HAND PAINTED. HAND PAINTING MUST BE COMPARABLE IN QUALITY TO THE RESULTS OBTAINED BY SILK SCREENING.

SPECIFICATIONS:

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

TEXT DESIGN:

LETTERS, DIGITS, ARROWS, SPACING AND TEXT DIMENSIONS SHALL CONFORM WITH THE ''STANDARD ALPHABET FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS'' AND DESIGNS PRESCRIBED IN THE STANDARD HIGHWAY SIGNS AS SPECIFIED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

**OTHER STDS.: NONE REQUIRED**

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
SEPT. 20, 1995 - ADDED AND DELETED SIGN DETAIL, ADDED SIGN ID NUMBERS, MINOR NOTE REVISIONS.

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

APPROVED

DIRECTOR OF ENGINEERING

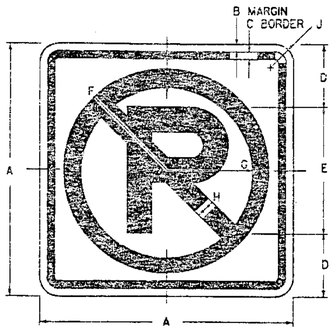
TRAFFIC AND SAFETY ENGINEER

# REGULATORY SIGN DETAILS

/traf/std/stde141.dgn : stde141.t

VERMONT AGENCY OF TRANSPORTATION

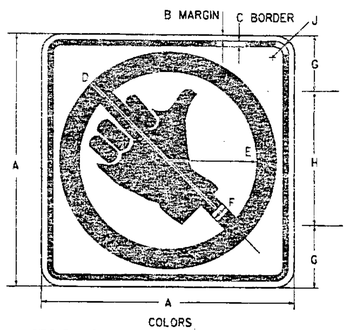
STANDARD
E-141




COLORS
CIRCLE AND DIAGONAL - RED ( REFL - RURAL )
SYMBOL AND BORDER - BLACK ( NON - REFL )
BACKGROUND - WHITE ( REFL - RURAL )

**R8-3A**

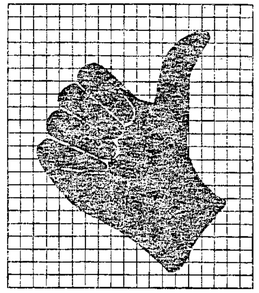
| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J |
| URBAN MIN. AND STD. | 12 | 3/8 | 3/8 | 3 | 6E(M) | 4 7/8 | 3 3/8 | 1 | 1 1/2 |
| RURAL MIN. AND STD. | 24 | 3/8 | 5/8 | 6 | 12E(M) | 10 1/2 | 8 1/2 | 2 | 1 1/2 |
| EXPWY. | 36 | 5/8 | 7/8 | 9 | 18E(M) | 15 3/4 | 12 3/4 | 3 | 2 1/4 |
| FWY. | 48 | 3/4 | 1 1/4 | 12 | 24E(M) | 21 | 17 | 4 | 3 |

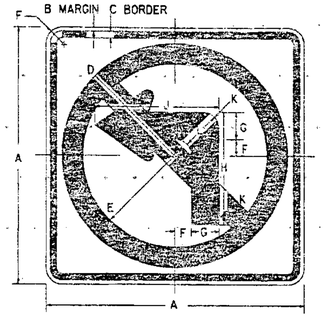



COLORS
CIRCLE AND DIAGONAL - RED ( REFL )
SYMBOL AND BORDER - BLACK ( NON - REFL )
BACKGROUND - WHITE ( REFL )

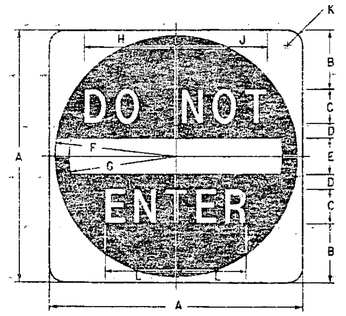
**R9-4A**

| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J |
| MIN. | 18 | 3/8 | 5/8 | 7 1/8 | 6 3/8 | 1 1/2 | 3 3/4 | 10 1/2 | 1 1/2 |
| STD. | 24 | 5/8 | 5/8 | 10 1/2 | 8 1/2 | 2 | 5 | 14 | 1 1/2 |





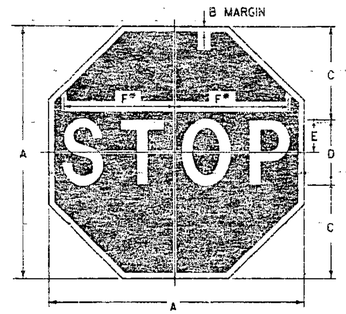

**R3-2**




COLORS
SYMBOL - RED ( REFL )
LEGEND AND BACKGROUND - WHITE ( REFL )
ENCAPSULATED LENS

**R5-1**

| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L |
| MIN. AND STD. | 30 | 6 1/2 | 4D | 2 | 5 | 14 1/2 | 12 1/2 | 9 3/4 | 10 | 1 7/8 | 7 7/8 |
| EXPWY. | 36 | 7 1/2 | 5D | 2 1/2 | 6 | 17 1/2 | 15 | 12 | 12 3/8 | 2 1/4 | 8 15/16 |
| SPECIAL | 48 | 11 | 6D | 3 | 8 | 23 1/2 | 20 | 14 1/2 | 15 | 3 | 11 3/4 |

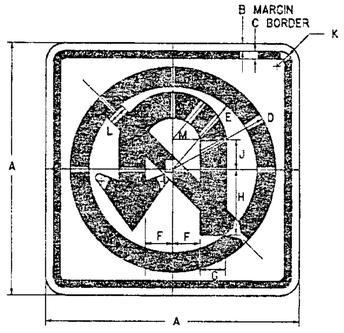



• REDUCE SPACING 40 %

COLORS
LEGEND - WHITE ( REFL )
BACKGROUND - RED ( REFL )
ENCAPSULATED LENS

**R1-1**

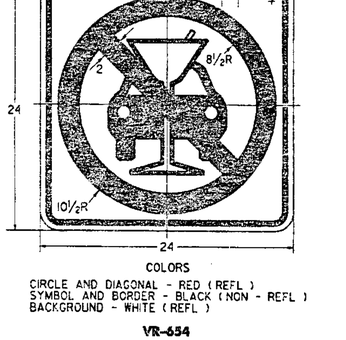
| SIGN | DIMENSIONS ( INCHES ) | | | | | |
|---|---|---|---|---|---|---|
| | A | B | C | D | E | F |
| BIKE | 18 | 3/8 | 6 | 6C | 3 | 7 3/4 |
| MIN. | 24 | 5/8 | 8 | 8C | 4 | 10 |
| STD. | 30 | 3/4 | 10 | 10C | 5 | 12 1/2 |
| EXPWY. | 36 | 7/8 | 12 | 12C | 6 | 15 |
| SPECIAL | 48 | 1 1/4 | 16 | 16C | 8 | 20 |




COLORS
CIRCLE AND DIAGONAL - RED ( REFL )
ARROW AND BORDER - BLACK ( NON - REFL )
BACKGROUND - WHITE ( REFL )

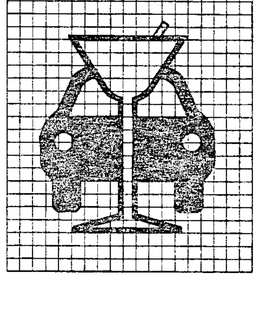
**R3-4**

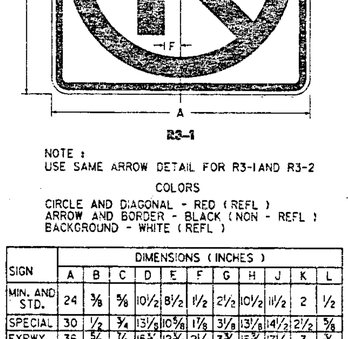
| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L | M |
| MIN. AND STD. | 24 | 3/8 | 5/8 | 10 1/2 | 8 1/2 | 2 1/2 | 2 1/2 | 6 | 2 1/4 | 1 1/2 | 2 | 5 |
| SPECIAL | 30 | 1/2 | 3/4 | 13 1/8 | 10 5/8 | 3/8 | 3 1/8 | 7 1/2 | 2 13/16 | 1 7/8 | 2 1/2 | 6 1/4 |
| EXPWY. | 36 | 5/8 | 7/8 | 15 3/4 | 12 3/4 | 3 3/4 | 3 3/4 | 9 | 3 3/8 | 2 1/4 | 3 | 7 1/2 |
| SPECIAL | 48 | 3/4 | 1 1/4 | 21 | 17 | 5 | 5 | 12 | 4 1/2 | 3 | 4 | 10 |




COLORS
CIRCLE AND DIAGONAL - RED ( REFL )
SYMBOL AND BORDER - BLACK ( NON - REFL )
BACKGROUND - WHITE ( REFL )

**VR-654**



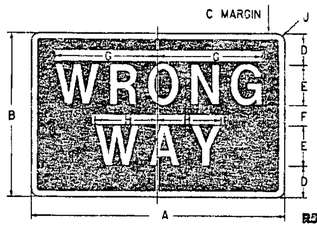



**R3-1**

NOTE :
USE SAME ARROW DETAIL FOR R3-1 AND R3-2

COLORS
CIRCLE AND DIAGONAL - RED ( REFL )
ARROW AND BORDER - BLACK ( NON - REFL )
BACKGROUND - WHITE ( REFL )

| SIGN | DIMENSIONS ( INCHES ) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J | K | L |
| MIN. AND STD. | 24 | 3/8 | 5/8 | 10 1/2 | 8 1/2 | 1/2 | 2 1/2 | 10 1/2 | 11 1/2 | 2 | 1/2 |
| SPECIAL | 30 | 1/2 | 3/4 | 13 1/8 | 10 5/8 | 1 1/8 | 3 1/8 | 13 1/8 | 14 1/2 | 2 1/2 | 5/8 |
| EXPWY. | 36 | 5/8 | 7/8 | 15 3/4 | 12 3/4 | 2 1/4 | 3 3/4 | 15 3/4 | 17 1/4 | 3 | 3/4 |
| SPECIAL | 48 | 3/4 | 1 1/4 | 21 | 17 | 3 | 5 | 21 | 23 | 4 | 1 |




**R5-1A**

"WRONG WAY"
COLORS
LEGEND - WHITE ( REFL )
BACKGROUND - RED ( REFL )
ENCAPSULATED LENS

| SIGN | DIMENSIONS ( INCHES ) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | E | F | G | H | J |
| MIN. | 30 | 18 | 5/8 | 3 | 5D | 2 | 11 1/16 | 6 11/16 | 1 1/2 |
| STD. | 36 | 24 | 3/4 | 4 1/2 | 6D | 3 | 13 5/16 | 8 1/16 | 1 1/2 |
| SPECIAL | 42 | 30 | 7/8 | 5 | 8D | 4 | 17 3/4 | 10 3/4 | 1 7/8 |

## GENERAL:

1. ALL DIMENSIONS IN INCHES.
2. SEE STANDARD E-144 FOR ARROWHEAD DETAILS.

## COLORS:

THE REGULATORY SIGNS SHOWN ON THIS SHEET SHALL HAVE BLACK TEXT ON REFLECTORIZED 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 REGULATORY SIGNS SHOWN ON THIS SHEET MAY BE ANY OF THE FOLLOWING OF THE MINIMUM THICKNESS NOTED.

| | 12'' X 12'' 18'' X 18'' | 24'' X 24'' 30'' X 18'' 30'' X 30'' | 36'' X 24'' 36'' X 36'' 42'' X 30'' 48'' X 48'' |
|---|---|---|---|
| FLAT SHEET ALUMINUM | 0.060'' | 0.080'' | 0.100'' |
| HIGH DENSITY OVERLAID PLYWOOD | 1/2'' | 1/2'' | 5/8'' |
| GALVANIZED FLAT SHEET STEEL | 18 GAGE | 16 GAGE | 14 GAGE |

THE REFLECTIVE MATERIAL SHALL BE AASHTO TYPE II OR III WHITE REFLECTIVE SHEETING APPLIED TO THE ENTIRE BACKGROUND OF THE SIGN. THE BLACK PORTIONS OF THE SIGNS MAY BE LETTERING FILM, SILK SCREENED OR HAND PAINTED. HAND PAINTING MUST BE COMPARABLE IN QUALITY TO THE RESULTS OBTAINED BY SILK SCREENING. ENCAPSULATED LENS REFLECTIVE SHEETING SHALL BE USED FOR THE SIGN BACKGROUND WHERE NOTED.

## SPECIFICATIONS:

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

## TEXT DESIGN:

LETTERS, DIGITS, ARROWS, SPACING AND TEXT DIMENSIONS SHALL CONFORM WITH THE ''STANDARD ALPHABET FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS'' AND DESIGNS PRESCRIBED IN THE STANDARD HIGHWAY SIGNS AS SPECIFIED IN THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

**OTHER STDS. : E-144**
**REQUIRED**

REVISIONS AND CORRECTIONS

OCT. 30, 1987 - DATE OF ORIGINAL ISSUE
SEPT. 20, 1995 - ADDED AND DELETED SIGN DETAILS, ADDED SIGN ID NUMBERS, MINOR NOTE REVISIONS.

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

APPROVED

Gordon B. McArthur
DIRECTOR OF ENGINEERING

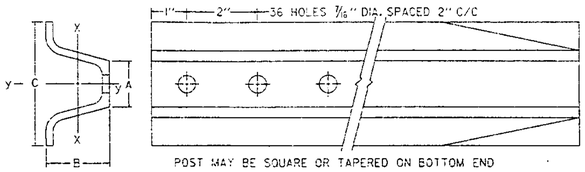
David O. Burr
TRAFFIC AND SAFETY ENGINEER

# REGULATORY SIGN DETAILS

VERMONT AGENCY OF TRANSPORTATION

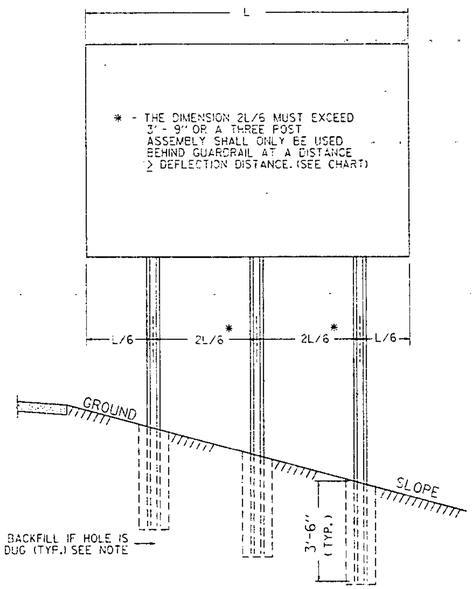
STANDARD
E-143

/traf/std/stde143.dgn : stde143.1



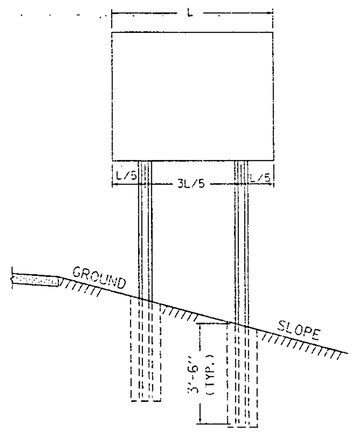

| POST SIZE (LB/FT.) | DIMENSIONS | | | SECTION MODULUS, X-X |
|---|---|---|---|---|
| | A | B | C | |
| 2 | 1 3/32" | 1 3/4" | 3 1/16" | 0.225 IN.$^3$ |
| 3 | 1 5/16" | 1 7/8" | 3 1/2" | 0.403 IN.$^3$ |

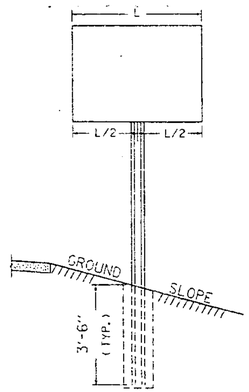
SIMILAR DIMENSIONS ARE ACCEPTABLE, HOWEVER SECTION MODULUS VALUES SHALL NOT BE EXCEEDED.




## 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 TOGHETHER THE POSTS DO NOT CREATE A HAZARD, REFER TO V.A.O.T. SIGN POST DESIGN GUIDELINE FOR ADDITIONAL DETAILS.




## POST SPACING DETAILS

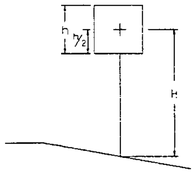
## GENERAL NOTES

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 INSTALLTION SHALL BE USED IN AREAS OF POOR SOIL CONDITIONS OR AS DIRECTED BY THE RESIDENT ENGINEER. BACKFILL SHALL BE COMPACTED AS DIRECTED BY THE RESIDENT ENGINEER.

IN AREAS WHERE LEDGE ROCK IS ENCOUNTERED, POSTS WILL BE SET IN A HOLE WITH 2" CLEARANCE AND GROUTED WITH TYPE 4 MORTAR 24" BELOW THE SURFACE OF THE SOLID ROCK, UNLESS THE POSTS PENETRATE THE GROUND A MINIMUM OF 3'-6". THE PORTION OF THE POST IN CONTACT WITH THE MORTAR SHALL BE COATED WITH AN APPROVED COATING.

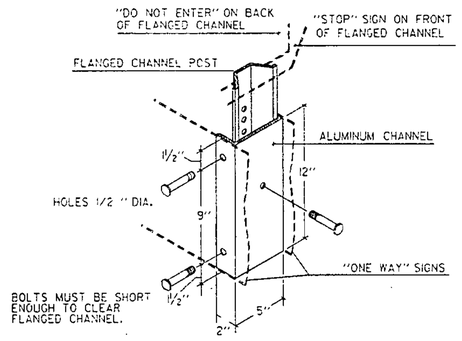
SIGN CLEARANCES - HORIZONTAL AND VERTICAL SIGN CLEARANCES SHALL BE SHOWN ON THE PLANS OR THE APPROPRIATE STD. SHEETS.

SINGLE POST INSTALLATIONS SHALL BE LIMITED TO A SIGN AREA OF 12-1/2 SQ.FT. OR LESS.




| 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 = 13 PSF STEEL MIN YIELD Fy = 50,000 PSI ALLOWABLE STRESS = (1.4) 0.60 Fy |
| 2 LB/FT. (TWO POST INSTALLATION) | 62 | |
| 3 LB/FT. | 107 | |

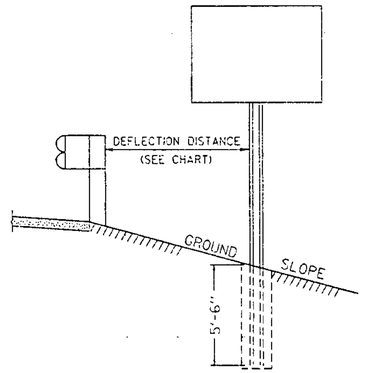
SINGULAR 2 LB./FT. POSTS SHALL ONLY TO BE USED IN URBAN AREAS.




DETAIL OF TYPE "A" OR "B" MOUNTING BRACKET. SEE STANDARD E-120 FOR CLEARANCES.

| GUARDRAIL DEFLECTION CHART (PER AASHTO - ROADSIDE DESIGN GUIDE - 1988) | | | |
|---|---|---|---|
| TYPE | | GR POST SPACING | DEFLECTION |
| THREE CABLE | W/STEEL POSTS | 16'-0" | 12' |
| | W/WOODEN POSTS | 12'-6" | 12' |
| W-BEAM | W/WEAK POST | 12'-6" | 7' |
| | W/STRONG POST | 6'-3" | 3' |
| BOX BEAM | | 6'-0" | 5' |
| THRIE BEAM | W/WEAK POST | 12'-6" | 4' |
| | W/STRONG POST | 6'-3" | 2' |

THIS CHART LISTS THE THEORETICAL DEFLECTION DISTANCE UPON IMPACT OF VARIOUS GUARDRAIL WITH DIFFERENT TYPES AND SPACING OF POSTS.




WHEN USING FLANGED CHANNEL POSTS ON STEEP SLOPES (1 ON 2 OR STEEPER FILL SLOPES BEHIND GUARDRAIL), ADD 2' EMBEDMENT TO THE POST LENGTH TO GIVE THE ASSEMBLY MORE STABILITY. HOWEVER IF SIGN POST IS LOCATED INSIDE THE DEFLECTION DISTANCE, THE SIGN POST SHALL BE SET AT A DEPTH OF 3'-6".

**OTHER STDS. REQUIRED:**

REVISIONS AND CORRECTIONS

SEP. 10, 1987 - DATE OF ORIGINAL ISSUE
MAR. 01, 1988 - FHWA REVIEW COMMENTS
OCT. 21, 1992 - ADDED DETAILS, REVISED NOTES & REVISED TITLE BLOCK
AUG. 18, 1995 - DELETION OF 2.5 #/FT. POST AND TWO-RAIL ALUMINUM. ADDED ADDITIONAL NOTE.

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

APPROVED

Gordon R. MacArthur
DIRECTOR OF ENGINEERING

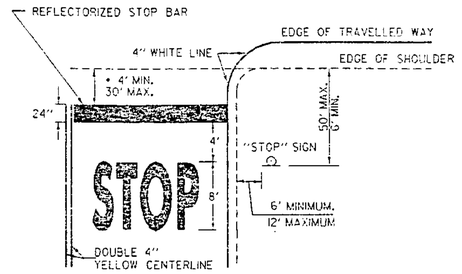
Daniel C. Davis
TRAFFIC AND SAFETY ENGINEER

# FLANGED CHANNEL STEEL SIGN POST

/traf/std/stdel60.dgn : stdel60.i

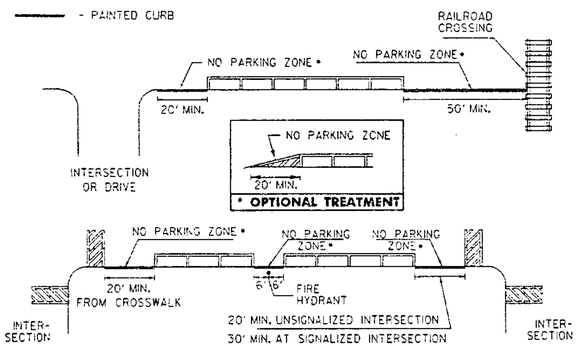
VERMONT AGENCY OF TRANSPORTATION

STANDARD E-160

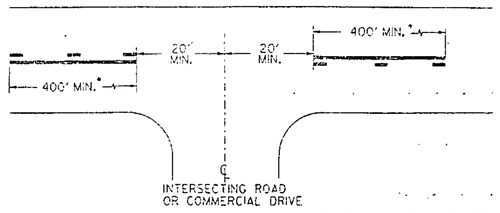



• THE "DESIRED STOPPING POINT" IS THE LOCATION BASED ON SITE CONDITIONS THAT BEST ALLOWS THE STOPPED VEHICLE TO VIEW THE APPROACHING TRAFFIC.

**STOP BAR LAYOUT**




**NO PARKING LAYOUT DETAILS**



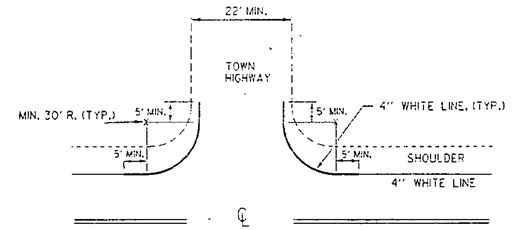

• THE SOLID LINE SHALL BE PAIRED WITH EITHER A SOLID OR DASHED LINE DEPENDING ON SIGHT DISTANCE AVAILABILITY IN THE OPPOSING DIRECTION. ADJUSTMENTS TO THE 40 FOOT CENTERLINE OPENING MAY BE MADE TO ACCOMMODATE SKEWED INTERSECTIONS.

CENTERLINE BREAKES:

A. AT ALL STATE HIGHWAYS AND TOWN HIGHWAYS, INCLUDING CLASS 4 TH'S. THAT HAVE STOP AND LEGAL LOAD LIMIT SIGNS INSTALLED

B. COMMERCIAL DRIVES:
1. WHERE A SEPERATE TURN LANE EXISTS ON THE MAIN LINE (LT. OR RT.)
2. SIGNIFICANT TRAFFIC VOLUMES EXISTS.
3. IF MOTORISTS NEED ASSISTANCE TO DEFINE ENTRANCE POINTS.

**CENTERLINE LAYOUT**

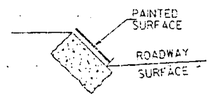



EDGELINES SHALL BE APPLIED TO ALL STATE HIGHWAYS AND SHOULD BE MAINTAINED AT A CONSTANT DISTANCE FROM THE CENTERLINE UNLESS PAVEMENT WIDTH INCREASES TO ALLOW WIDER LANES.

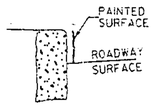
APPLY EDGELINE AS DETAILED ON ALL PAVED CLASS 1 & CLASS 2 TOWN HIGHWAYS AND ANY CLASS 3 TOWN HIGHWAY 22 FEET OR MORE IN WIDTH.

IF MIN. 30 FOOT RADIUS CANNOT BE OBTAINED, OR THE TOWN HIGHWAY IS NOT PAVED, BREAK THE EDGELINE USING AN 80 FOOT GAP AT INTERSECTION.

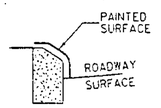
**EDGELINE LAYOUTS**



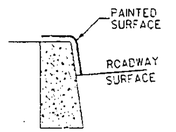

**GRANITE SLOPE EDGING**




**VERTICAL GRANITE CURB**

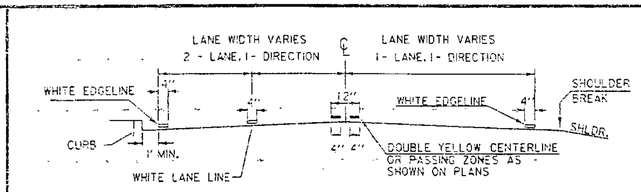



TYPE A (CONCRETE)

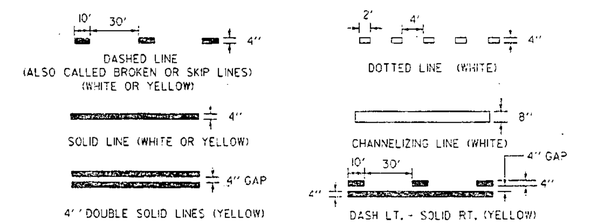



TYPE B (CONCRETE)

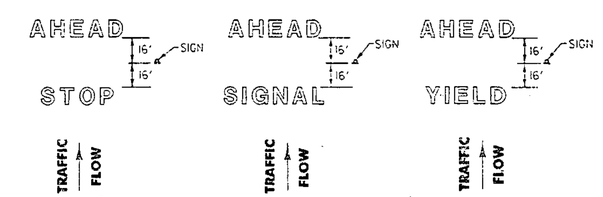
**PAINTED CURB**




**PAVEMENT MARKING PLACEMENT DETAIL**

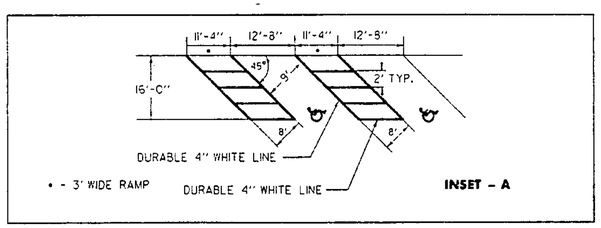



**PAVEMENT MARKING LINE DETAILS**



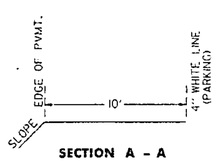

**LETTER IN WORD MARKING SPACING DETAIL**

**NOTE: SINGLE WORDS CENTERED ON SIGN ie: SCHOOL OR YIELD**



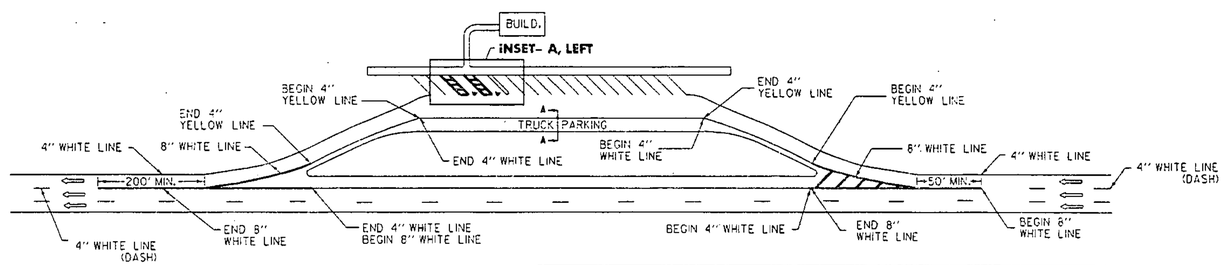

**INSET - A**

**NOTE:**
SEE STANDARD SHEET E-191 FOR HANDICAP SYMBOL POSITIONING AND DETAIL.




**SECTION A - A**

**TRUCK PARKING DETAIL**




**REST AREA PARKING DETAILS**

**THIS SHEET IS NOT TO SCALE**

**OTHER STDS. E - 191, E - 192 REQUIRED**

REVISIONS AND CORRECTIONS

AUG. 18, 1995 - DATE OF ORIGINAL ISSUE

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

APPROVED

DIRECTOR OF ENGINEERING

TRAFFIC AND SAFETY ENGINEER

# PAVEMENT MARKING DETAILS

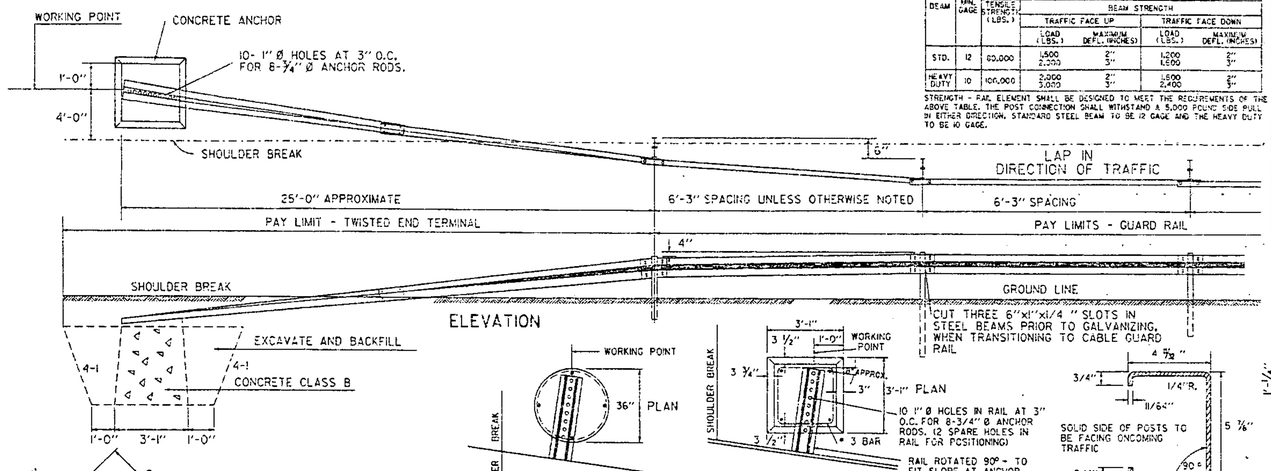
/trof/std/stdel93.dgn/stdel93.i

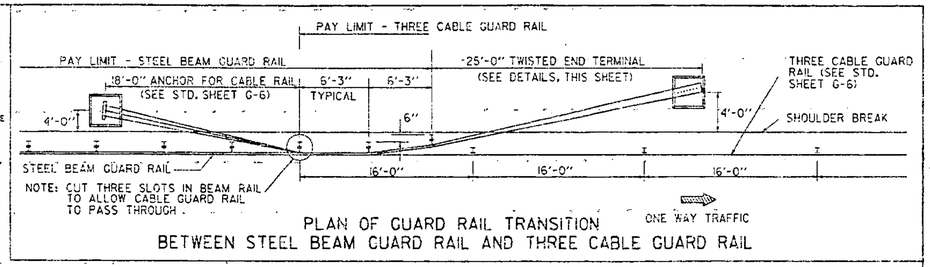
VERMONT AGENCY OF TRANSPORTATION

STANDARD E-193

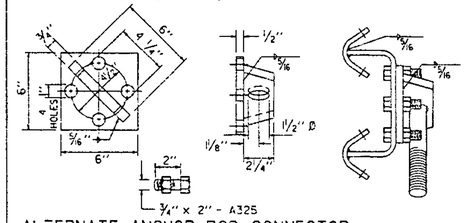
| BEAM | MIN. GAGE | TENSILE STRENGTH (LBS.) | RAIL OR JOINT BEAM STRENGTH | | | |
|---|---|---|---|---|---|---|
| | | | TRAFFIC FACE UP | | TRAFFIC FACE DOWN | |
| | | | LOAD (LBS.) | MAXIMUM DEFL. (INCHES) | LOAD (LBS.) | MAXIMUM DEFL. (INCHES) |
| STD. | 12 | 80,000 | 1,500<br>2,000 | 2"<br>3" | 1,200<br>1,600 | 2"<br>3" |
| HEAVY DUTY | 10 | 100,000 | 2,000<br>3,000 | 2"<br>3" | 1,500<br>2,400 | 2"<br>3" |

STRENGTH - RAIL ELEMENT SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF THE ABOVE TABLE. THE POST CONNECTION SHALL WITHSTAND A 5,000 POUND SIDE PULL IN EITHER DIRECTION. STANDARD STEEL BEAM TO BE 12 GAGE AND THE HEAVY DUTY TO BE 10 GAGE.

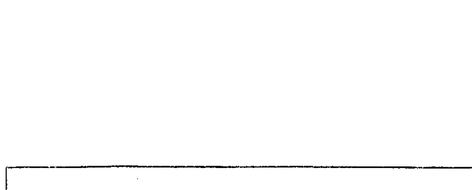



PLAN OF GUARD RAIL TRANSITION
BETWEEN STEEL BEAM GUARD RAIL AND THREE CABLE GUARD RAIL



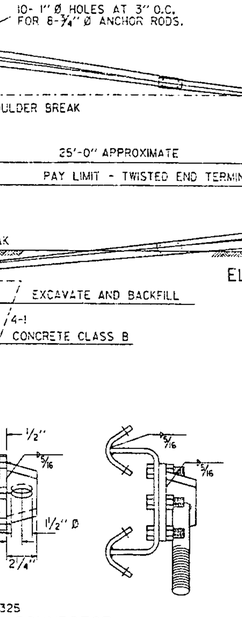

ALTERNATE ANCHOR ROD CONNECTOR

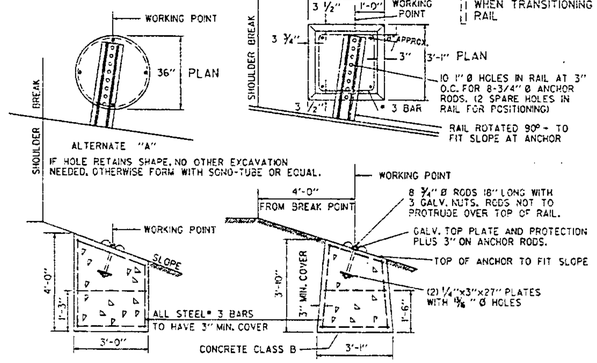



ANCHOR ROD CONNECTOR
(MALLEABLE IRON CASTING OR EQUAL)

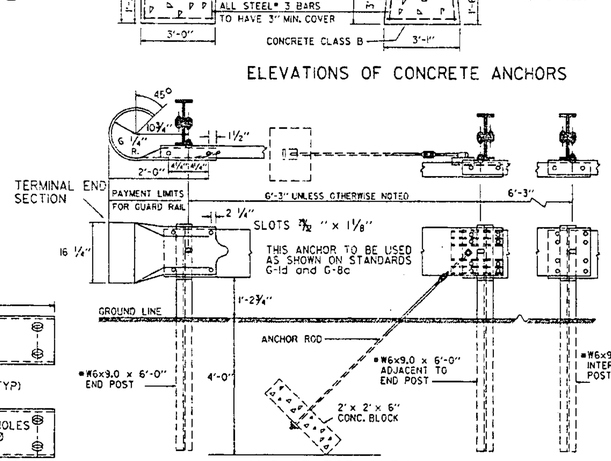



ANCHOR SPIDER
( WELDMENT )



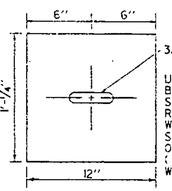

ELEVATIONS OF CONCRETE ANCHORS



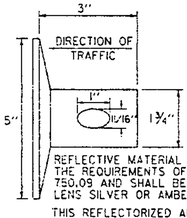

ANCHOR FOR STEEL BEAM RAIL
*W6x8.5 IS AN ACCEPTABLE ALTERNATE



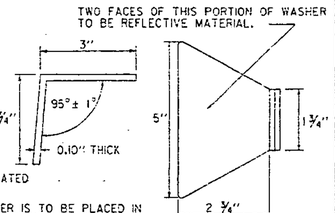

ALL POSTS IN A GIVEN RUN OF BARRIER TO BE UNIFORM
ALTERNATE POST



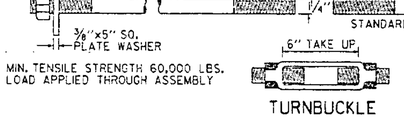

USE A 12" LONG FORMED BACK-UP PLATE OF STEEL BEAM GUARD RAIL AT EACH POST WHERE THERE IS A SINGLE THICKNESS OF BEAM RAIL. ( NOT REQUIRED WITH WOOD POST SYSTEM ).




REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.09 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER.



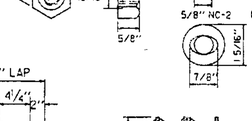

THIS REFLECTORIZED ALUMINUM WASHER IS TO BE PLACED IN VALLEY OF BEAM WHEN MOUNTING BEAM ONTO EACH FIFTH POST. WASHER SHALL MEET SPECIFICATION REQUIREMENTS FOR A.S.T.M. B-209 ALLOY 5052-H32

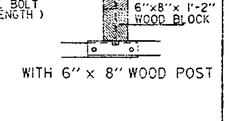



ANCHOR ROD

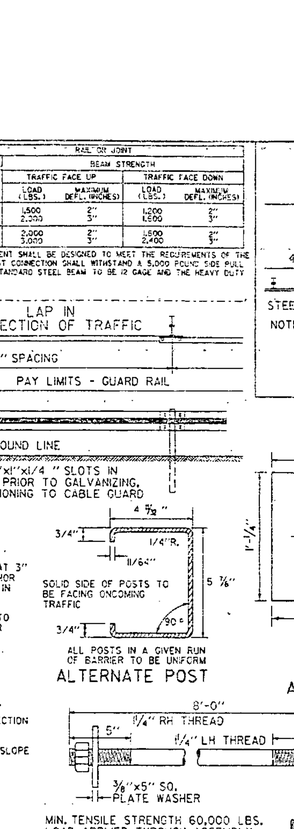
MIN. TENSILE STRENGTH 60,000 LBS. LOAD APPLIED THROUGH ASSEMBLY

TURNBUCKLE

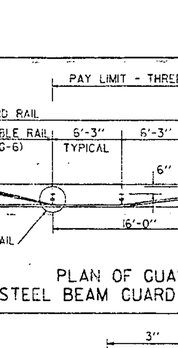



WITH 6" x 8" WOOD POST




OFFSET BLOCK




ELEVATION OF GUARD RAIL SPLICE AT POST




CROSS SECTION THROUGH GUARD RAIL SPLICE




CHANNEL ANCHOR (10" (x 1-3" MIN., 15.3 LBS. PER FT.) TO BE INSTALLED ON END POST AND ON 3 ADJACENT TO END POSTS WHERE NO OTHER ANCHOR IS USED.




SIDE ELEVATIONS OF POSTS FOR SHOULDER INSTALLATION

REVISIONS AND CORRECTIONS

DEC. 8, 1971 - ORIGINAL APPROVAL DATE
APR. 10, 1972 - POST HEIGHT INCREASED
JAN. 17, 1978 - REVISED ANCHOR DETAIL
JUNE 1, 1978 - CHANNEL ANCHOR DETAILS CHANGED
MAY 28, 1979 - NOTE ON REFLECTIVE MATERIAL CHANGED
DEC. 18, 1980 - INCREASED SHOULDER WIDENING FOR GUARD RAIL
MAR. 12, 1984 - REVISED ANCHOR SPIDER DETAILS
JUNE 5, 1984 - POST SIZE AND BACK UP PLATE NOTE CHANGED
DEC. 21, 1984 - REMOVED POST WASHER
OCT. 31, 1985 - REVISED TO CONFORM TO 1985 SPECIFICATIONS
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED

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

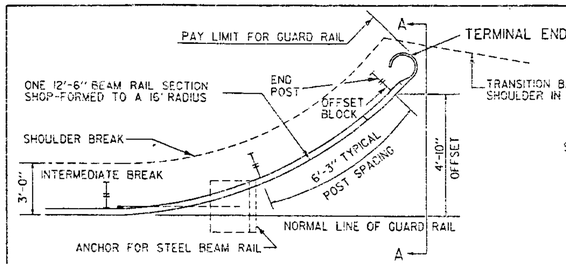
Gordon D. MacMillan, P.E.
DIRECTOR OF ENGINEERING

John M. Murphy, PE
DESIGN ENGINEER

# STEEL BEAM GUARD RAIL
# HEAVY DUTY STEEL BEAM GUARD RAIL
# TWISTED END TERMINAL
# ANCHOR FOR STEEL BEAM RAIL

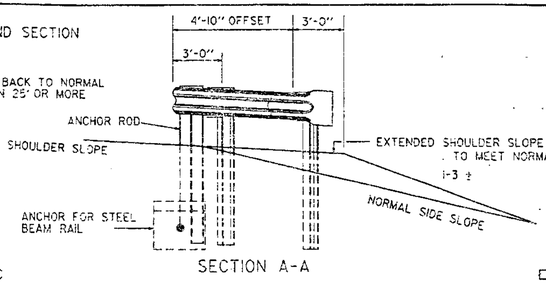
VERMONT AGENCY OF TRANSPORTATION

STANDARD
G-1

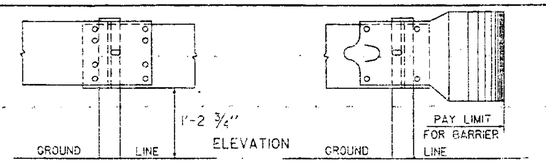


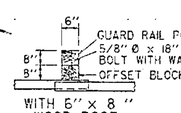

APPROACH END DETAIL
(NOT APPROVED FOR USE WHERE V > 40 MPH)

DIRECTION OF TRAFFIC

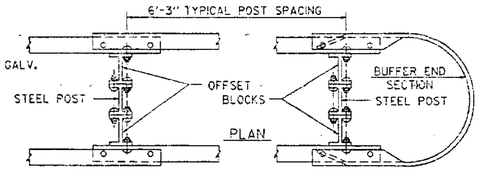



SECTION A-A



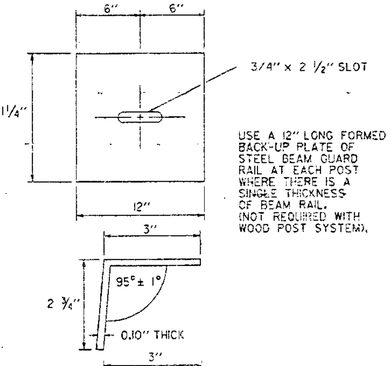




WITH 6" x 8 " WOOD POST




STEEL BEAM MEDIAN BARRIER

BARRIER END

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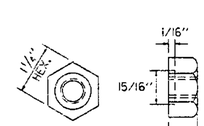
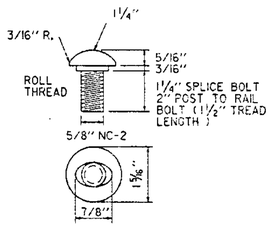
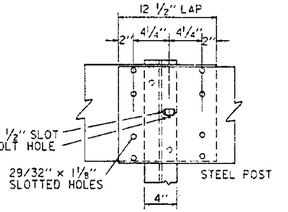
REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.09 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER.

THIS REFLECTORIZED ALUMINUM WASHER IS TO BE PLACED IN VALLEY OF BEAM WHEN MOUNTING BEAM ONTO EACH FIFTH POST. WASHER SHALL MEET SPECIFICATION REQUIREMENTS FOR A.S.T.M. B-209 ALLOY 5052-H-32.

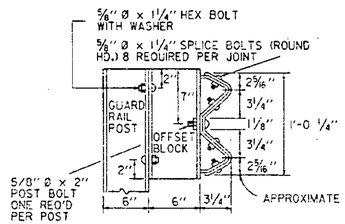



THE NUT MUST BE FREE RUNNING FIT ON THE BOLT AFTER GALVANIZATION.

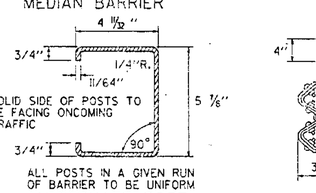



ELEVATION OF GUARD RAIL SPLICE AT POST

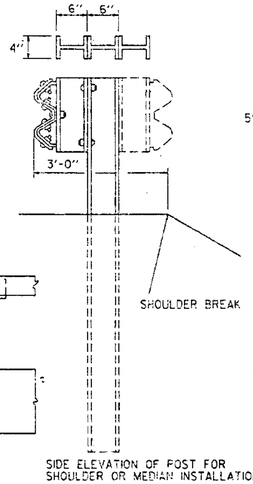



CROSS SECTION THROUGH GUARD RAIL SPLICE

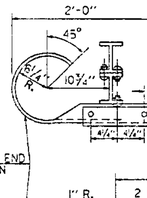


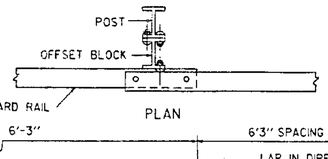

ALL POSTS IN A GIVEN RUN OF BARRIER TO BE UNIFORM

ALTERNATE POST

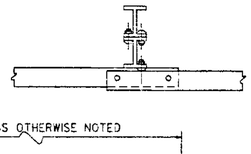


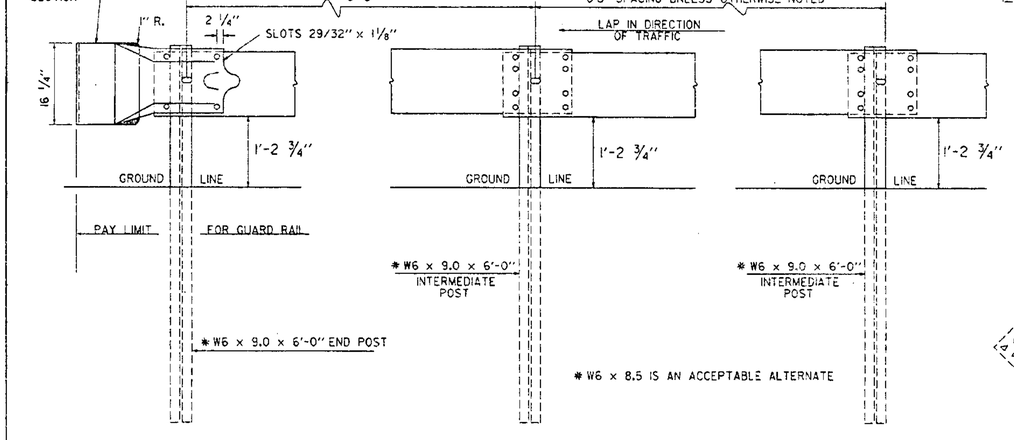

SIDE ELEVATION OF POST FOR SHOULDER OR MEDIAN INSTALLATION



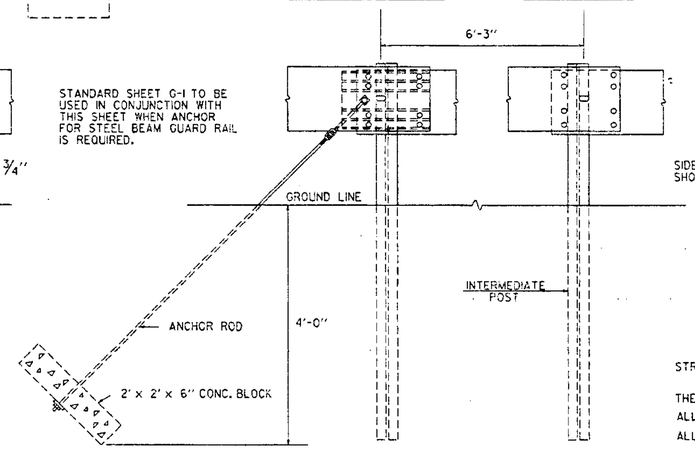

PLAN






ASSEMBLY ELEVATION

STANDARD SHEET G-1 TO BE USED IN CONJUNCTION WITH THIS SHEET WHEN ANCHOR FOR STEEL BEAM GUARD RAIL IS REQUIRED.




ANCHOR FOR STEEL BEAM RAIL

| BEAM | MIN. GAGE | TENSILE STRENGTH (LBS.) | RAIL OR JOINT BEAM STRENGTH | | | |
|---|---|---|---|---|---|---|
| | | | TRAFFIC FACE UP | | TRAFFIC FACE DOWN | |
| | | | LOAD (LBS.) | MAXIMUM DEF. (INCHES) | LOAD (LBS.) | MAXIMUM DEF. (INCHES) |
| STANDARD | 12 | 80,000 | 1,500<br>2,000 | 2"<br>3" | 1,200<br>1,600 | 2"<br>3" |
| HEAVY DUTY | 10 | 100,000 | 2,000<br>3,000 | 2"<br>3" | 1,600<br>2,400 | 2"<br>3" |

STRENGTH - RAIL ELEMENT SHALL BE DESIGNED TO MEET THE REQUIREMENTS OF THE ABOVE TABLE.

THE POST CONNECTION SHALL WITHSTAND A 5,000 POUND SIDE PULL IN EITHER DIRECTION.

ALL METAL PARTS SHALL BE GALVANIZED.

ALL WOOD POSTS SHALL BE GIVEN A PRESERVATIVE TREATMENT.

STANDARD STEEL BEAM TO BE 12 GAGE AND THE HEAVY DUTY TO BE 10 GAGE.

REVISIONS AND CORRECTIONS
MAY 6, 1976 - ORIGINAL APPROVAL DATE
SEP. 10, 1976 - MINIMUM LENGTH & ADVANCE OF NEED NOTES REMOVED
MAR. 2, 1977 - ROUND WOOD POSTS REMOVED
SEPT. 12, 1977 - REFERENCE TO ROUND WOOD POSTS REMOVED
MAY 29, 1979 - NOTE ON REFLECTIVE MATERIAL CHANGED
APRIL 28, 1980 - APPROACH END DETAILS REDRAWN
DEC. 16, 1980 - INCREASED SHOULDER WIDENING FOR GUARD RAIL
JUNE 5, 1984 - POST SIZE AND BACK UP PLATE NOTE CHANGED
DEC. 21, 1984 - REMOVED POST WASHER
OCT. 31, 1985 - REVISED TO CONFORM TO 1986 SPECIFICATIONS
JUNE 1, 1994 - REISSUED, WITHOUT CHANGE, UNDER NEW SIGNATURES.

APPROVED

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

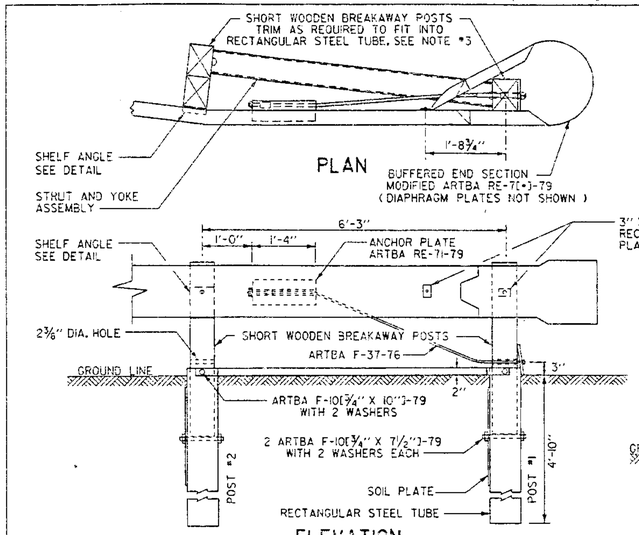
Gracia D. MacArthur PE
DIRECTOR OF ENGINEERING

Robert M. Murphy PE
DESIGN ENGINEER

# STEEL BEAM GUARD RAIL
# HEAVY DUTY STEEL BEAM GUARD RAIL
# STEEL BEAM MEDIAN BARRIER
# ANCHOR FOR STEEL BEAM RAIL

VERMONT AGENCY OF TRANSPORTATION

STANDARD
G-1d

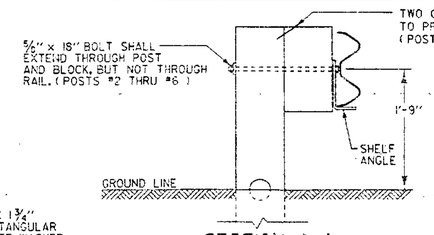



PLAN



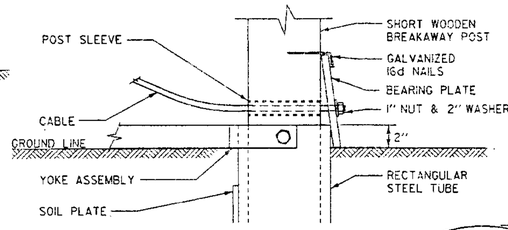

ELEVATION

BUFFERED END & ANCHORAGE ASSEMBLY

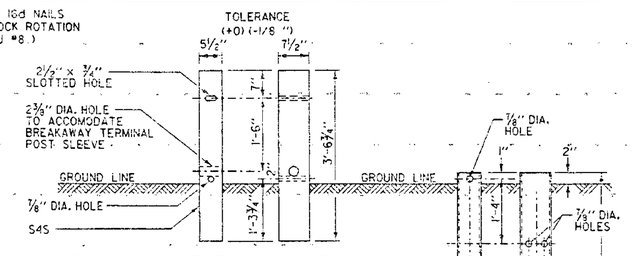



SECTION A-A

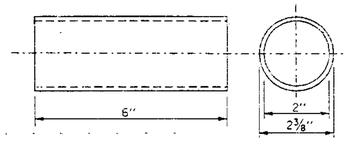
BREAKAWAY LINE POST AND BLOCK (MODIFIED ARTBA P-11-79)




POST ONE DETAILS




SHORT WOODEN BREAKAWAY POST




BREAKAWAY TERMINAL POST SLEEVE

ARTBA F-34-76 (POST #1 ONLY)

RECTANGULAR STEEL TUBE

TS 8" x 6" x 0.1875"

GENERAL NOTES:

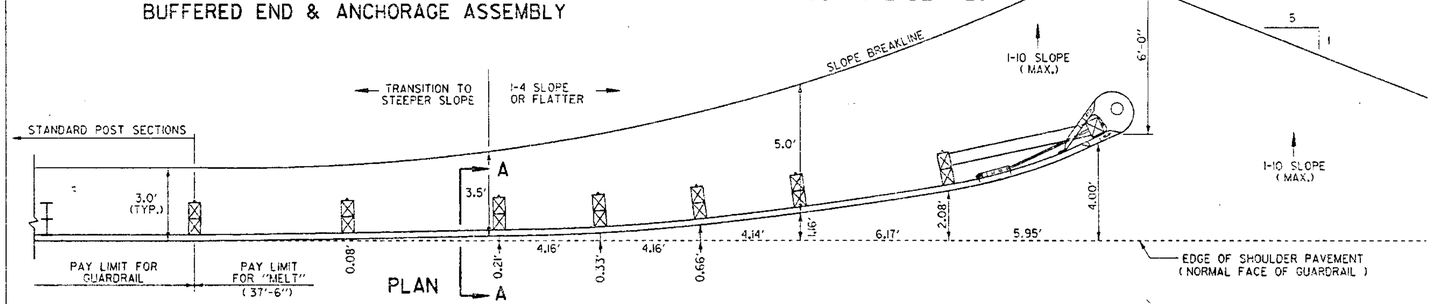
1. FOR DESCRIPTION AND SPECIFICATION OF PART IDENTIFIED "ARTBA ....." SEE LATEST REPORT PREPARED AND APPROVED BY THE AASHTO-AGC-ARTBA JOINT COOPERATIVE COMMITTEE. "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE".

2. ALL ANGLES, CHANNELS, PLATES, DIAPHRAGM PLATES AND RECTANGULAR STRUCTURAL TUBING SHALL CONFORM TO THE REQUIREMENTS OF THE VAOT STANDARD SPECIFICATIONS, SUBSECTION 714.11. WELDING SHALL MEET THE CURRENT REQUIREMENTS OF THE VAOT STANDARD SPECIFICATIONS, SUBSECTION 506.10. ALL STRUCTURAL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH VAOT STANDARD SPECIFICATIONS, SECTION 714 - STRUCTURAL STEEL.

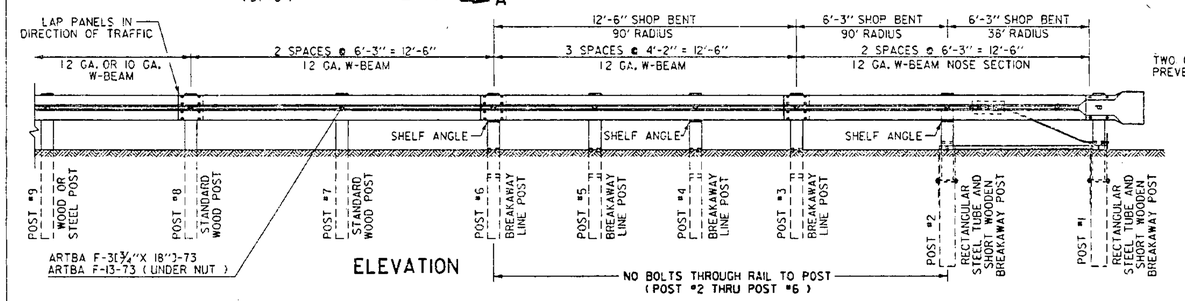
3. SHORT WOODEN BREAKAWAY POSTS SHALL BE MADE OF S4S TIMBER WITH A BENDING STRESS GRADE OF 1200 PSI MINIMUM AND SHALL BE GRADE MARKED OR CERTIFIED BY A RECOGNIZED ASSOCIATION OR AGENCY WHICH IS CERTIFIED BY THE BOARD OF REVIEW, AMERICAN LUMBER STANDARDS COMMITTEE, TO GRADE THE SPECIES. THE POSTS SHALL RECEIVE A PRESERVATIVE TREATMENT. AFTER ANY TRIMMING OR DRILLING, IN ACCORDANCE WITH VAOT STANDARD SPECIFICATIONS, SUBSECTION 728.01.

4. THE POST OFFSET DIMENSIONS ARE GIVEN TO THE FACE OF GUARDRAIL. THE POSTS ARE TO BE SET RADIAL TO THE RAILING AT EACH POST LOCATION.

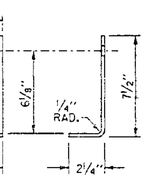
5. NOTE : THE AREA OUTSIDE AND DOWNSTREAM OF THE FIRST 12½' (BREAKAWAY NOSE SECTION ) OF THE MELT SHOULD BE FREE OF OBSTACLES AND GRADED IN SUCH A WAY AS TO ALLOW A VEHICLE TO BREAK THROUGH THE BREAKAWAY NOSE SECTION AND COME TO A SAFE STOP.




PLAN

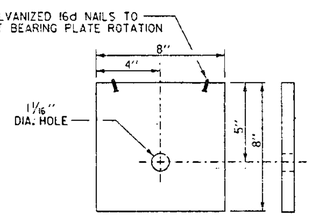



ELEVATION



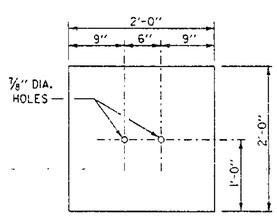

SHELF ANGLE DETAIL

(POSTS #2, #4 & #6)



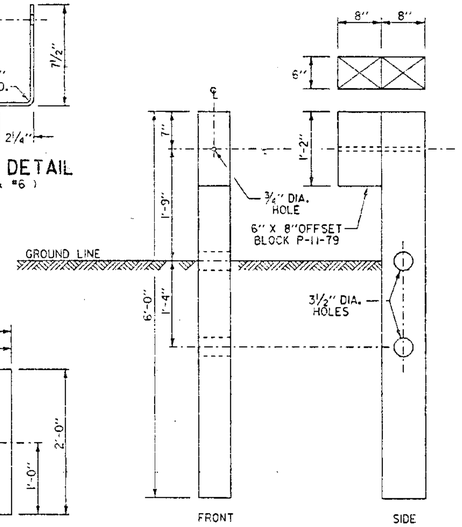

BEARING PLATE

⅝" THICK PLATE




SOIL PLATE

¼" THICK PLATE




BREAKAWAY LINE POST

POSTS #3, #4, #5 AND #6.

REVISIONS AND CORRECTIONS

JUNE 30, 1995 ORIGINAL APPROVAL
JANUARY 18,1996 CHANGED DIAMETER AND LENGTH OF BOLT (SECTION A-A)

APPROVED

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

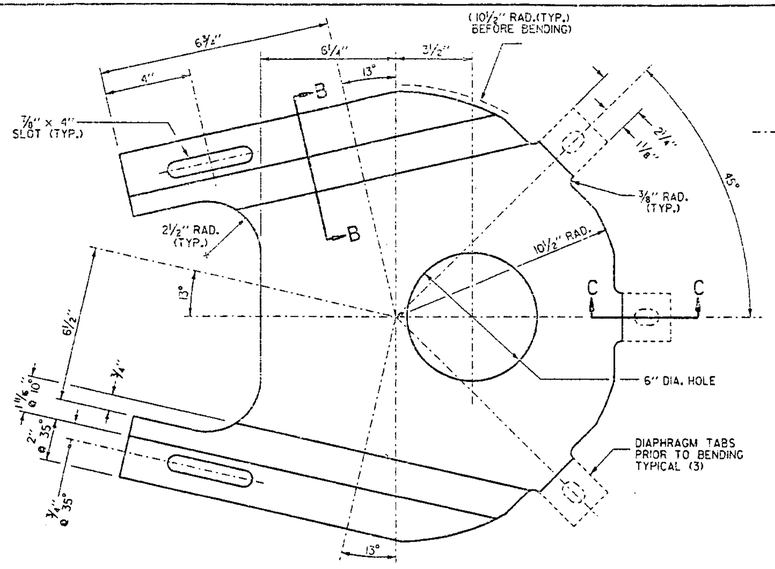
DIRECTOR OF ENGINEERING

DESIGN ENGINEER

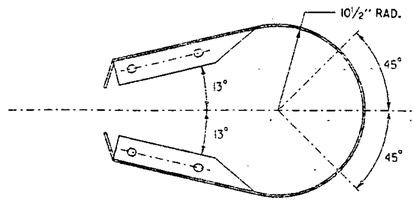
# MODIFIED ECCENTRIC LOADER TERMINAL WITH WOOD POSTS (MELT)

VERMONT AGENCY OF TRANSPORTATION

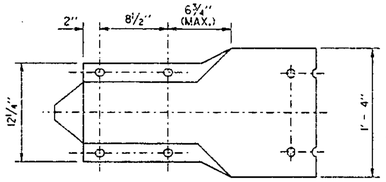
STANDARD G-17 a



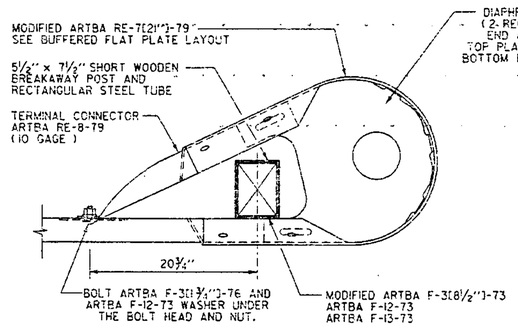

DIAPHRAGM PLATE DETAIL
12 GAGE - ( 2 REQUIRED EACH TERMINAL )



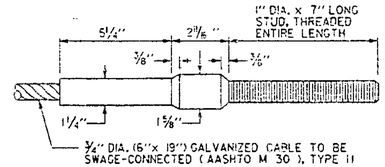

BUFFERED END SECTION
PLAN



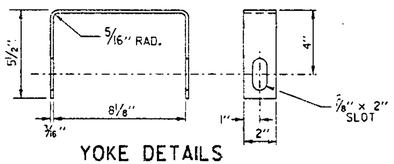

BUFFERED END SECTION
ELEVATION



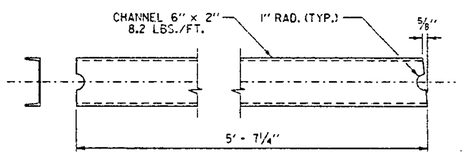

BUFFERED END ASSEMBLY



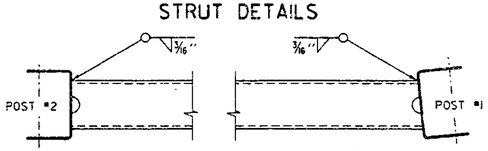

STANDARD SWAGED FITTING AND STUD
CABLE ASSEMBLY ARTBA F-37-76



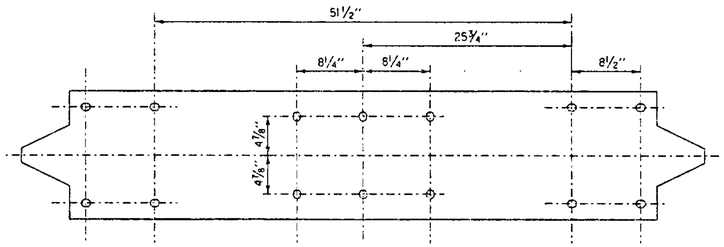

YOKE DETAILS




STRUT DETAILS

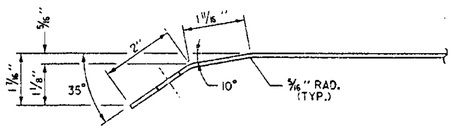



STRUT AND YOKE ASSEMBLY
SHOWN LEGS DOWN. FOR OPPOSITE HAND, INSTALL LEGS UP

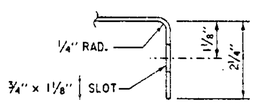



BUFFERED END SECTION
FLAT PLATE LAYOUT
(MODIFIED ARTBA RE-7(21")-79)

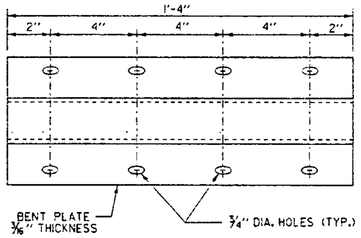
ALL SLOTS 29/32" x 1⅛"
ALL BOLTS ARTBA F-3(1¼")-76



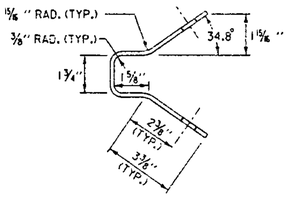

DIAPHRAGM PLATE DETAIL
SECTION B-B

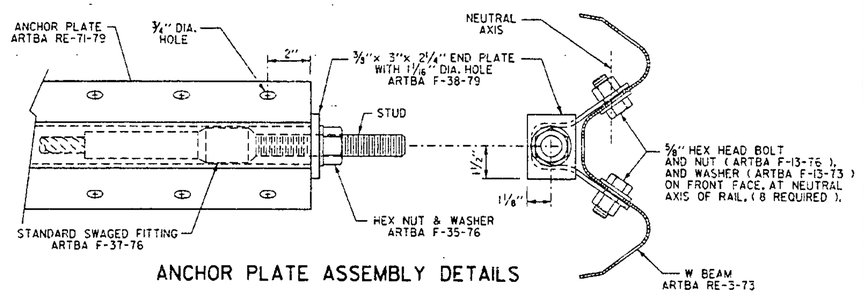



DIAPHRAGM PLATE DETAIL
SECTION C-C




ANCHOR PLATE
ARTBA RE-71-79




ANCHOR PLATE ASSEMBLY DETAILS

REVISIONS AND CORRECTIONS
JUNE 30, 1995 ORIGINAL APPROVAL

APPROVED

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

DIRECTOR OF ENGINEERING

DESIGN ENGINEER

# MODIFIED ECCENTRIC LOADER TERMINAL WITH WOOD POSTS (MELT)

VERMONT AGENCY OF TRANSPORTATION

STANDARD
G-17b