

TRANSMITTAL LETTER

PUBLICATION:

Publication 111

DATE:

6/17/2013

SUBJECT:

Publication 111 Traffic Control - Pavement Markings and Signing Standards TC-8600 and
TC-8700 Series

INFORMATION AND SPECIAL INSTRUCTIONS:

The attached Standard Drawings shall be used by Department personnel and consultants whenever applicable for the design, details and installation of traffic control Signs and Pavement Markings. The previous edition of Publication 111M, issued May 2007, and any changes thereto shall be replaced by this edition.

The attached pages contain a summary of the major changes that have been incorporated into this edition.

CANCEL AND DESTROY THE FOLLOWING:

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APPROVED FOR ISSUANCE BY:



Charles C. Goodhart, Director
Bureau of Maintenance and Operations

PennDOT Publication 111 Revision Log

No.	Sheet #	Sheet Name	CHANGE
General Change			Removed all reference to metric units
8700C			
	1 of 18	Spacing Charts Direct Applied Letters & Numerals / General Information	Revised notes
1	18 of 18	Spacing Charts Direct Applied / Arrows	Revised Notes
8701A			
2	1 of 13	Interchange Advance Signing General Notes	Changed sheet number (previously Sheet 1 of 7)
3	2 of 13	Advance Signing Diamond Interchange (One Exit)	Changed sheet number (previously Sheet 2 of 7)
4	3 of 13	Signing One-Lane Crossroad Approach	Changed title, sheet number, revised signing options (previously Sheet 3 of 7)
5	4 of 13	Signing Diamond Interchange Multi-Lane Crossroad Approach	New Sheet
6	5 of 13	Signing One-Lane Crossroad Approach With Nearby Intersecting Road	New Sheet
7	6 of 13	Advance Signing Cloverleaf Interchange	Changed sheet number (previously Sheet 4 of 7)
8	7 of 13	Signing Cloverleaf Interchange Multi-Lane Crossroad Approach	Changed Title, sheet number, revised signing options (previously Sheet 5 of 7)
9	8 of 13	Signing Partial Cloverleaf Interchange Multi-Lane Crossroad Approach	New Sheet
10	9 of 13	Signing Diagrammatic & Lane Drop	Revised signing layout, notes added (previously Sheet 6 of 7)
11	10 of 13	Typical Signing Closely Spaced Interchanges	Changed sheet number (previously Sheet 7 of 7)
12	11 of 13	Signing Jughandles	New Sheet
13	12 of 13	Signing Traditional Jughandles	New Sheet
14	13 of 13	Signing Intermediate & Minor Interchange Multi-Lane Exits With An Option Lane	New Sheet
8701D			
15	1 of 13	Sign Details Freeway, Expressway and Conventional Roads Guide Signs / Advance Guide Signs	Added 10.6/8 and 8/6 Destination sizing to all signs, revised notes, changed title and sheet number (previously Sheet 1 of 9)
16	2 of 13	Sign Details Freeway, Expressway and Conventional Roads Guide Signs / Overhead Lane Assignment Signs	Added 10.6/8 and 8/6 Destination sizing to all signs, revised sign layouts, revised notes, changed title and sheet number (previously Sheet 2 of 9)
17	3 of 13	Sign Details Freeway, Expressway and Conventional Roads Guide Signs / Exit Direction Signs	Added 10.6/8 and 8/6 Destination sizing to all signs, revised notes, changed title and sheet number (previously Sheet 3 of 9)
18	4 of 13	Sign Details Freeway, Expressway and Conventional Roads Guide Signs / Exit Direction Signs With Advisory Speed Panel	New Sheet
19	5 of 13	Sign Details Freeway and Expressway Guide Signs / Diagrammatic Signs	Revised sign layout, revised notes and changed sheet number (previously Sheet 4 of 9)
20	6 of 13	Sign Details Freeway and Expressway Guide Signs / Overhead Arrow-per-Lane Signs	New Sheet
22	7 of 13	Sign Details Freeway and Expressway Guide Signs / Exit Only & Next Exit Panels	Added Next Exit Panel, revised notes, moved Exit Signs to sheet 8 of 13, change title and sheet number (previously Sheet 5 of 9)
21	8 of 13	Sign Details Freeway and Expressway Guide Signs / Gore Signs & Exit Panels	New Sheet
23	9 of 13	Sign Details Freeway and Expressway Guide Signs / Supplemental Guide Signs & Miscellaneous Interchange Signs	Added Left Panel to "Community Interchanges Identification Sign", revised notes, changed sheet number (previously Sheet 6 of 9)
24	10 of 13	Sign Details Freeway and Expressway Guide Signs / General Motorist Service Signs	Changed sheet number (previously Sheet 7 of 9)

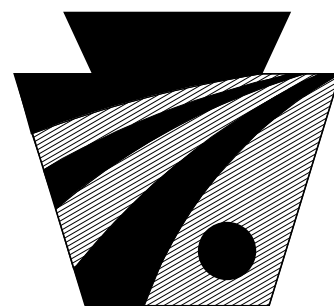
PennDOT Publication 111 Revision Log

No.	Sheet #	Sheet Name	CHANGE
25	11 of 13	Sign Details Freeway and Expressway Guide Signs / Ramp destination and Boundary Signs	Changed sheet number (previously Sheet 8 of 9)
26	12 of 13	Sign Details Exit Destination Roundabout Guide Signs	New Sheet
27	13 of 13	Sign Details Freeway and Expressway Guide Sign / Cardinals and Shield	Added 24" and 30" to route number shields, added 24" to Penna. Turnpike Shield, added size 10/8 and 8/6 sizes to "Cardinal Details", changed sheet number (previously Sheet 9 of 9)
8702A			
28	2 of 8	Post Mounted Signs, Type A / Post Selection Table	Revised notes
8702B			
29	1 of 9	Post Mounted Signs, Type B / Steel Square Post Erection Details	Revised Table for Dimension of Corner Bolts
30	3 of 9	Post Mounted Signs, Type B / Steel Square Post Erection Details	Revised Table for Dimension of Corner Bolts
31	9 of 9	Post Mounted Signs, Type B / Sign Location/Installation Details	Revised notes
8702C			
32	1 of 2	Post Mounted Signs, Type C / Erection Details	Revised notes
8702D			
33	1 of 2	Post Mounted Signs, Type D / Erection Details	Replaced Adhesive Anchor Detail with Mechanical Anchor Detail
8702E			
34	5 of 5	Post Mounted Signs , Type E / Wood Posts - Direct Burial Erection Details Temporary Use Only	Revised notes

No.	Sheet #	Sheet Name	CHANGE
General Change			Removed all references to metric units
8600			
1	1 of 13	Pavement Markings - Expressway / Freeway	Added or 6' to Dotted Extension Line
2	1 of 13	Pavement Markings - Expressway / Freeway	Added 4" Min / 6" TYP. To Broken Lane Line and Broken Lane Line with Black Shadow Lines
3	1 of 13	Pavement Markings - Expressway / Freeway	Removed Gore Markings Symbol
4	3 of 13	Pavement Markings - Conventional	Added or 6' to Dotted Extension Line
5	3 of 13	Pavement Markings - Conventional	Stopped edge line from going through crosswalk on the Plan
6	3 of 13	Pavement Markings - Conventional	Added when additional lanes are added to what is otherwise a and all multi-lane highways to note 1
7	4 of 13	Pavement Markings - Conventional	Added ≤ 35 MPH to Transverse Median Marking, Chevron Gore Marking and One-way Barrier Gore Marking
8	5 of 13	Pavement Markings - Crosswalks	Added Details are for Crosswalk Pavement Markings Only above Detail A, B & C
9	5 of 13	Pavement Markings - Crosswalks	Removed Plan - Typical Crosswalk
10	5 of 13	Pavement Markings - Crosswalks	Changed sign nomenclature from W11-2 with or without W16-2 (__ FT.) or W16-9P (AHEAD) to W11-2 with W16-103P (__ FT. AHEAD) or W16-9P (AHEAD) in the Plan - Crosswalk with Advance Warning Pavement Markings
11	5 of 13	Pavement Markings - Crosswalks	Changed (OPTIONAL) R5-1L to R1-5L
12	5 of 13	Pavement Markings - Crosswalks	Removed the edge line from going through the crosswalk on the Plan
13	6 of 13	Pavement Markings - Crosswalks	Changed 24" Max. to 60" Max. on Type B & C Crosswalk spacing
14	6 of 13	Pavement Markings - Crosswalks	Added Tan to Approved Non-reflective Colors.
15	6 of 13	Pavement Markings - Crosswalks	Spelled Decorative correctly in Plan - Crosswalk with Decorative Pattern
16	6 of 13	Pavement Markings - Crosswalks	Changed number 6 to number 4 under the notes and on the Plan - Crosswalk with Decorative Pattern
17	6 of 13	Pavement Markings - Crosswalks	Changed Material width on Type C from 60" Max. to 24" Max.
18	6 of 13	Pavement Markings - Crosswalks	Changed Spacing on Type C from 24" Max. to 60" Max.
19	7 of 13	Pavement Markings - Railroad Crossing	Stopped Edge Lines from going through the tracks and kept them back 4' from edge of the tracks.
20	7 of 13	Pavement Markings - Railroad Crossing	Changed note 1 from controlled intersections to grade crossings.
21	8 of 13	Pavement Markings - Legends and Symbols	Changed title from Conventional, Speed Humps, Yield and Bicycle to Legends and Symbols
22	8 of 13	Pavement Markings - Legends and Symbols	Added Ped Symbol and Shared Lane Marking Symbol
23	9 of 13	Pavement Markings - Legends and Symbols	Added See page 3 of 11, note 14 for spacing between words above LEGENDS comment.
24	10 of 13	Pavement Markings - Legends and Symbols	Added (OPTIONAL) to Lane Reduction Transition Arrow
25	10 of 13	Pavement Markings - Legends and Symbols	Changed Quantity for Pavement Marking Removal from e.g., 20²FT to 20 FT²
26	11 of 13	Pavement Markings - Legends and Symbols	Added sheet 11 - Slow Curve Arrows
27	12 of 13	Pavement Markings - Legends and Symbols	Added sheet 12 - Roundabout Arrows
28	13 of 13	Pavement Markings - Legends and Symbols Standard Alphabet & Numerals	Changed from sheet 11 to sheet 13
29	13 of 13	Pavement Markings - Legends and Symbols Standard Alphabet & Numerals	Removed () from title around Standard Alphabet & Numerals
8602			
30	1 of 4	Snowplowable Raised Pavement Markers	Turned Two-way Marker with Yellow/Red Reflector 45° Left for the Exit Gore Area
31	1 of 4	Snowplowable Raised Pavement Markers	Turned Two-way Marker with White/Red Reflector 45° Left for the Exit Gore Area
32	1 of 4	Snowplowable Raised Pavement Markers	Changed bottom two arrows to go to the left on Multi-lane Split
33	1 of 4	Snowplowable Raised Pavement Markers	Changed Symbol to match the Two-way Marker with Yellow/Blank Reflector on the Multi-Lane Split, 60' Physical Gore Area

34	1 of 4	Snowplowable Raised Pavement Markers	Changed Variable at 20' Distance on Multi-Lane Split
8604			
35	2 of 4	Delineation - Guide Rail and Barrier Details	Changed note 7 to say Use any Bulletin 15 approved sheeting.
36	2 of 4	Delineation - Guide Rail and Barrier Details	Added See Note 7 to Terminal Section Detail and Type WZ Top-Mount Barrier Delineator
37	3 of 4	Delineation - Location Details Interchange Areas	Changed D10-4 to D10 Series on the Median Crossover
38	3 of 4	Delineation - Location Details Interchange Areas	Changed R5-3-6 to R5-101 on the Median Crossover
39	3 of 4	Delineation - Location Details Interchange Areas	Changed w16-1 to OM1-3 under Legend
40	4 of 4	Delineation and Markers - Location/Placement Notes	Changed W16 to OM under Location: E.
41	4 of 4	Delineation and Markers - Location/Placement Notes	Changed W16-1 to OM1-3 under Types of Delineator: D.

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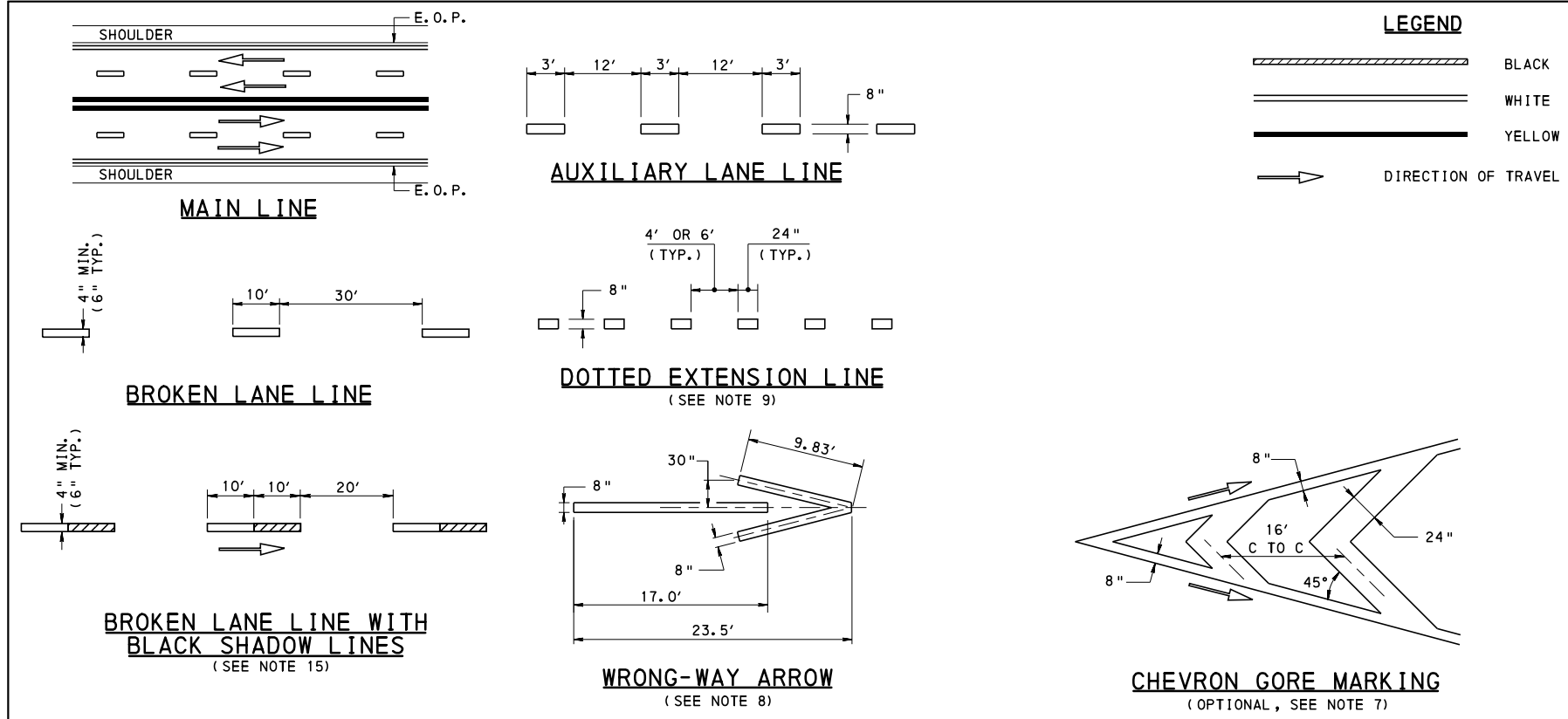
PUBLICATION 111

BUREAU OF MAINTENANCE AND OPERATIONS

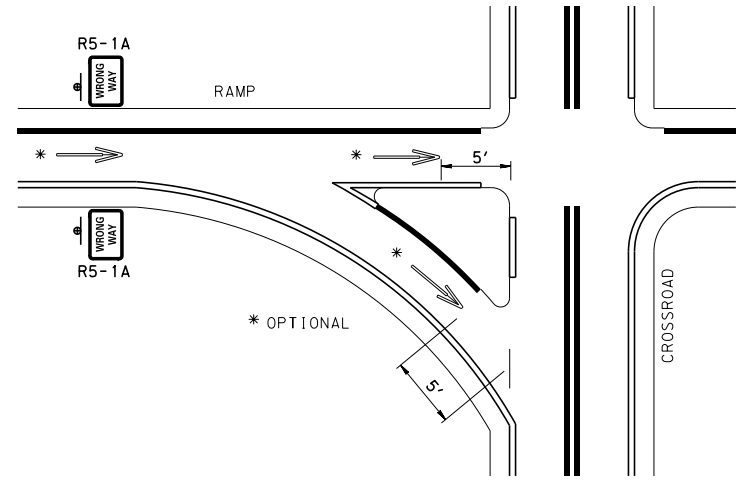
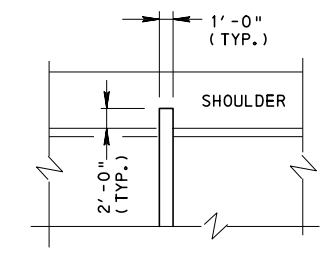
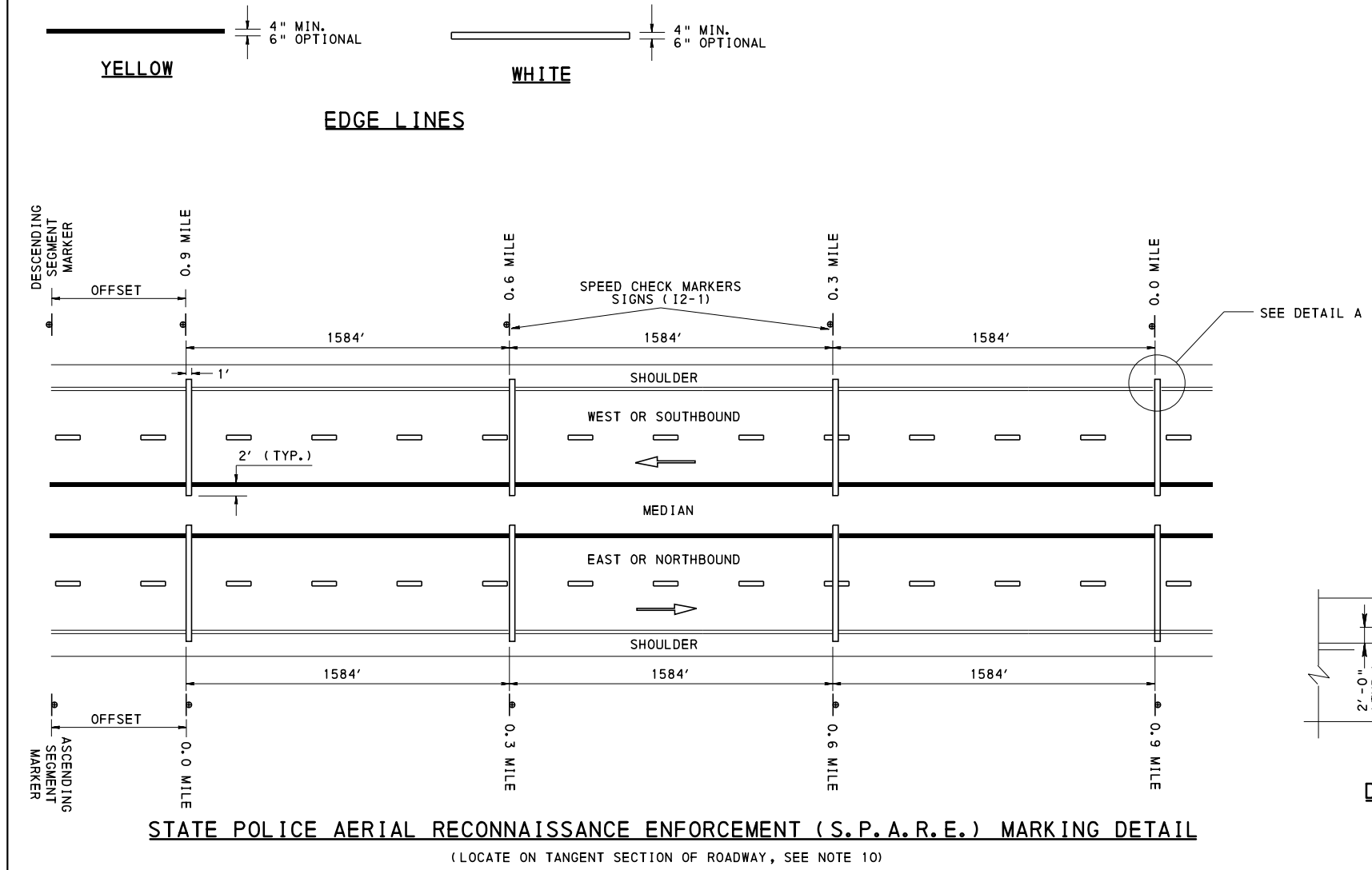
JUNE 2013

INDEX OF TRAFFIC CONTROL – PAVEMENT MARKINGS AND SIGNING STANDARDS

<u>STANDARD DRAWING NO.</u>	<u>DATE</u>	<u>DESCRIPTION</u>
TC-8600 (13 SHEETS)	JUN. 13, 2013	PAVEMENT MARKINGS (EXPRESSWAY / FREEWAY, CONVENTIONAL, LEGENDS & SYMBOLS)
TC-8602 (4 SHEETS)	JUN. 13, 2013	SNOWPLOWABLE RAISED PAVEMENT MARKERS
TC-8604 (4 SHEETS)	JUN. 13, 2013	DELINEATION
TC-8700C (12 SHEETS)	JUN. 13, 2013	SPACING CHARTS / DIRECT APPLIED LETTERS, NUMERALS & ARROWS
TC-8701A (13 SHEETS)	JUN. 13, 2013	ADVANCE SIGNING FOR INTERCHANGES
TC-8701D (13 SHEETS)	JUN. 13, 2013	SIGN DETAILS / FREEWAY & EXPRESSWAY GUIDE SIGNS
TC-8701E (2 SHEETS)	JUN. 13, 2013	EXTRUDED ALUMINUM CHANNEL SIGNS
TC-8701P (1 SHEET)	JUN. 13, 2013	FREEWAY & EXPRESSWAY ADVANCE SIGNING FOR PARKING AREAS
TC-8701R (1 SHEET)	JUN. 13, 2013	FREEWAY & EXPRESSWAY ADVANCE SIGNING FOR REST AREAS
TC-8701S (4 SHEETS)	JUN. 13, 2013	FLAT SHEET ALUMINUM SIGNS WITH EXTRUDED ALUMINUM STIFFENERS
TC-8701W (1 SHEET)	JUN. 13, 2013	FREEWAY & EXPRESSWAY ADVANCE SIGNING FOR WELCOME CENTERS
TC-8702A (8 SHEETS)	JUN. 13, 2013	POST-MOUNTED SIGNS, TYPE A
TC-8702B (9 SHEETS)	JUN. 13, 2013	POST-MOUNTED SIGNS, TYPE B
TC-8702C (2 SHEETS)	JUN. 13, 2013	POST-MOUNTED SIGNS, TYPE C
TC-8702D (2 SHEETS)	JUN. 13, 2013	POST-MOUNTED SIGNS, TYPE D
TC-8702E (5 SHEETS)	JUN. 13, 2013	POST-MOUNTED SIGNS, TYPE E
TC-8710 (1 SHEET)	JUN. 13, 2013	DISTANCE MARKERS
TC-8715 (4 SHEETS)	JUN. 13, 2013	SIGN LIGHTING
TC-8716 (1 SHEET)	JUN. 13, 2013	TYPE III BARRICADE
TC-8717 (1 SHEET)	JUN. 13, 2013	TEMPORARY PORTABLE SIGN POST, "H" BASE AND "X" BASE



- NOTES:**
1. MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH PENNSYLVANIA DEPARTMENT OF TRANSPORTATION'S PUBLICATION 408, UNLESS NOTED OTHERWISE.
 2. REFLECTORIZE ALL NON-BLACK PAVEMENT MARKINGS.
 3. EDGE LINES SHOULD BE 4" MINIMUM WIDE SOLID LINE OF THE COLOR INDICATED AND PLACED 4" INSIDE THE EDGE OF THE PAVEMENT SHOULDER.
 4. ON EXPRESSWAYS/FREEWAYS MAKE BROKEN LANE LINES 6" WIDE AND LOCATE 4" TO THE RIGHT OF THE PAVEMENT JOINT OR SEAM.
 5. APPLY ALL PAINTED CENTER LINES, LANE LINES AND LEGENDS AT 15 MILS MINIMUM WET THICKNESS.
 6. APPLY PAINTED EDGE LINES AT 12 MILS MINIMUM WET THICKNESS.
 7. USE CROSSHATCHING AT EXIT GORE AREAS WHEN VISIBILITY OR SIGHT DISTANCE OF THE GORE IS RESTRICTED.
 8. PLACE OPTIONAL WRONG-WAY ARROWS IN CENTER OF EACH LANE OF AN EXIT RAMP, 5' FROM STOP BAR OR PAVEMENT EDGE AND ACROSS FROM WRONG-WAY SIGNS.
 9. DOTTED EXTENSION LINES ON EXPRESSWAY/FREEWAYS SHALL BE USED TO EXTEND RAMP, LANE DROP, MAIN LINE, AND INTERSECTION EDGE LINES IN ORDER TO PROVIDE GUIDANCE.
 10. TYPICAL S.P.A.R.E. ZONE LENGTH IS 0.9 MILES, MINIMUM IS 0.6 MILES.
 11. FOR ADDITIONAL DETAILS REFER TO MARKINGS, CHAPTER 3, MUTCD.
 12. FOR CONVENTIONAL HIGHWAY PAVEMENT MARKINGS, SEE SHEETS 3 AND 4.
 13. FOR LEGENDS & SYMBOLS PAVEMENT MARKINGS, SEE SHEETS 6, 7 AND 8.
 14. FOR LOCATION AND INSTALLATION OF SNOWPLOWABLE RAISED PAVEMENT MARKERS, SEE TC-8602.
 15. BLACK SHADOW LINES REQUIRED FOR CONCRETE ROADWAY SURFACES WITH EPOXY MARKINGS ONLY.

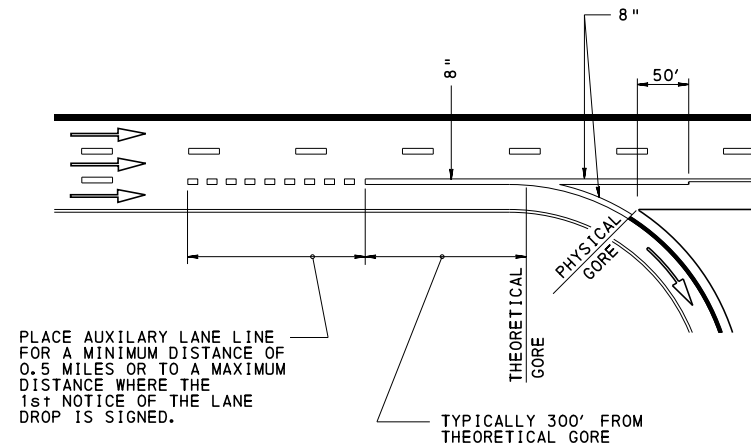


COMMONWEALTH OF PENNSYLVANIA
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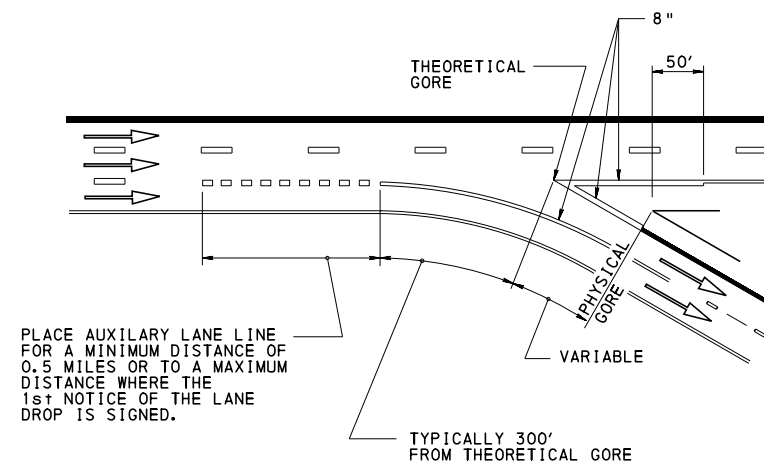
PAVEMENT MARKINGS

EXPRESSWAY / FREEWAY

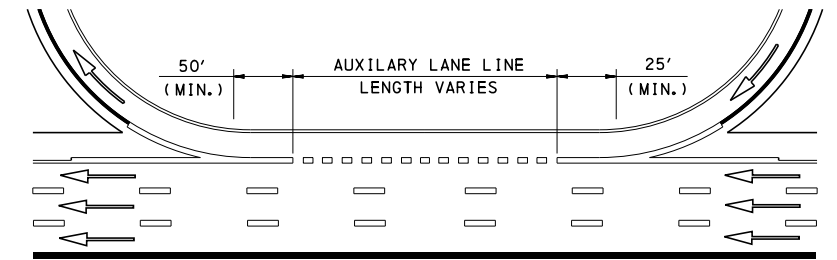
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 1 OF 13 TC-8600
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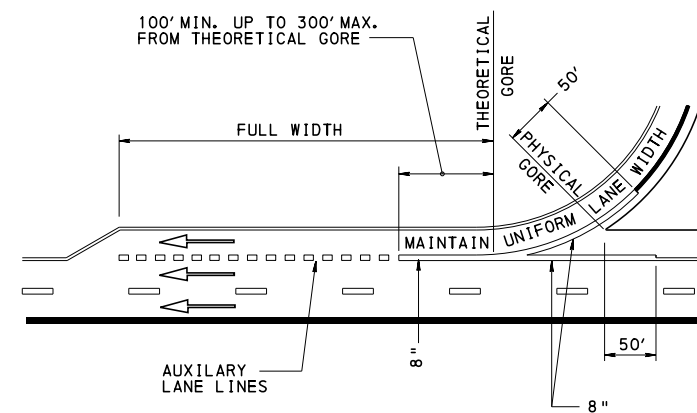
EXIT ONLY LANE DROP



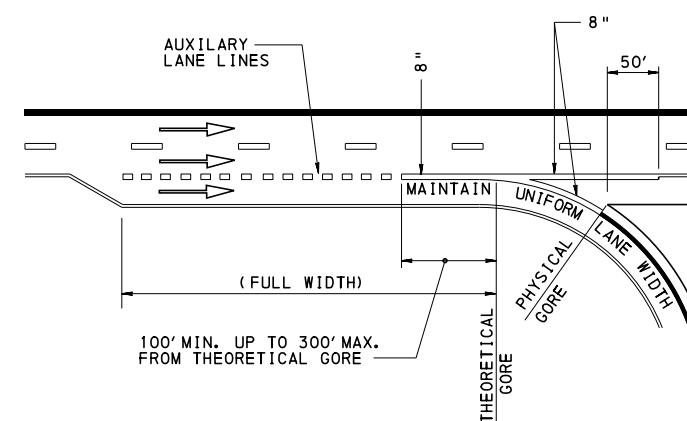
MULTIPLE EXIT LANES



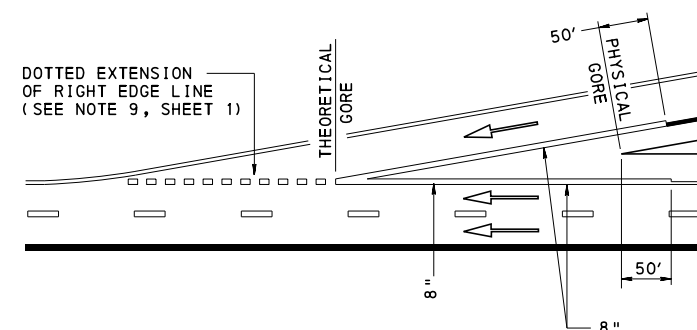
CLOVERLEAF INTERCHANGE



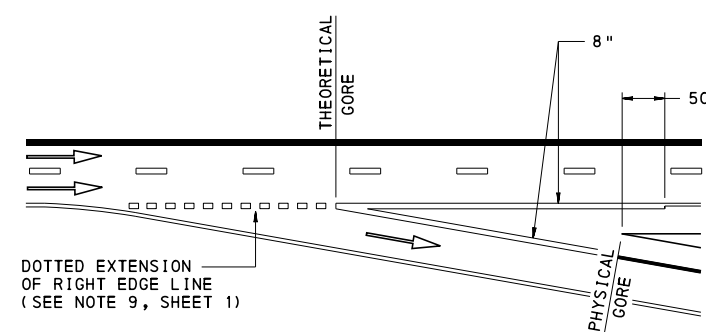
PARALLEL LANE



PARALLEL LANE



**TAPERED LANE
ACCELERATION LANE**



**TAPERED LANE
DECELERATION LANE**

LEGEND

- WHITE
- YELLOW
- DIRECTION OF TRAVEL

NOTES:

LANE, EDGE AND CENTER LINES

1. MAKE ALL LANE LINES, EITHER SOLID OR BROKEN WHITE, 4" MINIMUM WIDE WHEN ADDITIONAL LANES ARE ADDED TO WHAT IS OTHERWISE A TWO-LANE, TWO-WAY HIGHWAY AND 6" WIDE ON ALL MULTI-LANE HIGHWAYS.
2. LANE LINES ON AN APPROACH TO A SIGNALIZED INTERSECTION SHALL BE SOLID WHITE FOR A DISTANCE OF 150' MEASURED FROM THE STOP BAR.
3. LANE LINES THAT DELINEATE THE EDGE OF A TURNING LANE ARE TO BE SOLID WHITE LINES WITH A LENGTH EQUAL 2X/3, BUT NOT LESS THAN 1/3 THE LENGTH OF THE TURN LANE, MEASURED FROM THE STOP BAR.
4. MAKE EDGE LINES SOLID WHITE LINES 4" WIDE, EXCEPT USE SOLID YELLOW LINES WHEN ADJACENT TO A MEDIAN WHICH SEPARATES OPPOSING DIRECTIONS OF VEHICULAR TRAFFIC FLOW.
5. ON TWO-LANE, TWO-WAY HIGHWAYS, THE CENTER LINES ARE YELLOW, 4" WIDE EITHER SOLID, BROKEN OR A COMBINATION THEREOF. A SOLID BARRIER LINE SHALL PRECEDE ALL CONTROLLED INTERSECTIONS BY THE MINIMUM DISTANCE NOTED IN TABLE A.
6. ON FOUR (4) OR MORE LANE UNDIVIDED HIGHWAYS, FOR CENTER LINES USE THE TWO-WAY BARRIER LINES.
7. "CENTER LANE LEFT TURN ONLY" MARKINGS ARE TWO (2) SETS OF ONE-WAY BARRIER LINES WITH BROKEN YELLOW LINES INSIDE OF THE SOLID YELLOW LINES.
8. EXTEND THE LANE LINES, EDGE LINES AND/OR CENTER LINES A DISTANCE OF 150' FROM THE STOP BAR ON MINOR APPROACHES, WHERE CONDITIONS PERMIT.

STOP LINE

9. STOP LINES ARE SOLID WHITE LINES THAT COMPLETELY TRAVERSE EACH TRAFFIC LANE. AT AN INTERSECTION WITH A STOP SIGN, THE STOP LINE SHOULD BE PLACED AT A LOCATION NO LESS THAN 4', OR MORE THAN 30' FROM THE NEAREST EDGE OF THE INTERSECTING ROADWAY TO ENSURE MAXIMUM SIGHT DISTANCE TO THE CROSSING ROUTE. WHEN USED ON MULTI-LANE APPROACH TO A SIGNALIZED INTERSECTION, THE STOP LINE MAY BE STAGGERED TO ASSIST TURNING VEHICLES AND TO IMPROVE SIGHT DISTANCE FOR MOTORIST DESIRING TO MAKE A TURN ON RED.
10. LOCATE STOP LINES AT A MINIMUM OF 4' IN ADVANCE OF AND PARALLEL TO THE CROSSWALK LINES UNLESS OTHERWISE NOTED.

YIELD LINE FOR DETAILS SEE SHEET 5.

11. YIELD LINES ARE TO CONSIST OF A ROW OF SOLID WHITE ISOSCELES TRIANGLES POINTING TOWARD APPROACHING VEHICLES EXTENDING ACROSS APPROACH LANES TO INDICATE THE POINT AT WHICH THE YIELD IS INTENDED OR REQUIRED TO BE MADE.

MEDIAN MARKINGS

12. TRANSVERSE MEDIAN MARKINGS ARE 24" WIDE YELLOW LINES SPACED AS INDICATED ON SHEET 4, WITHIN TWO (2) SETS OF TWO-WAY BARRIER LINES. USE TRANSVERSE LINES ONLY WHEN REQUIRED TO PROVIDE EMPHASIS IF THE SIGHT DISTANCE OR VISIBILITY IS RESTRICTED.

GORE MARKINGS

13. EDGE LINES ARE 4" SOLID WHITE LINES. USE TRANSVERSE OR DIAGONAL LINES ONLY WHEN REQUIRED TO PROVIDE ADDITIONAL EMPHASIS IF THE SIGHT DISTANCE OR VISIBILITY OF GORE IS RESTRICTED.

PAVEMENT LEGENDS

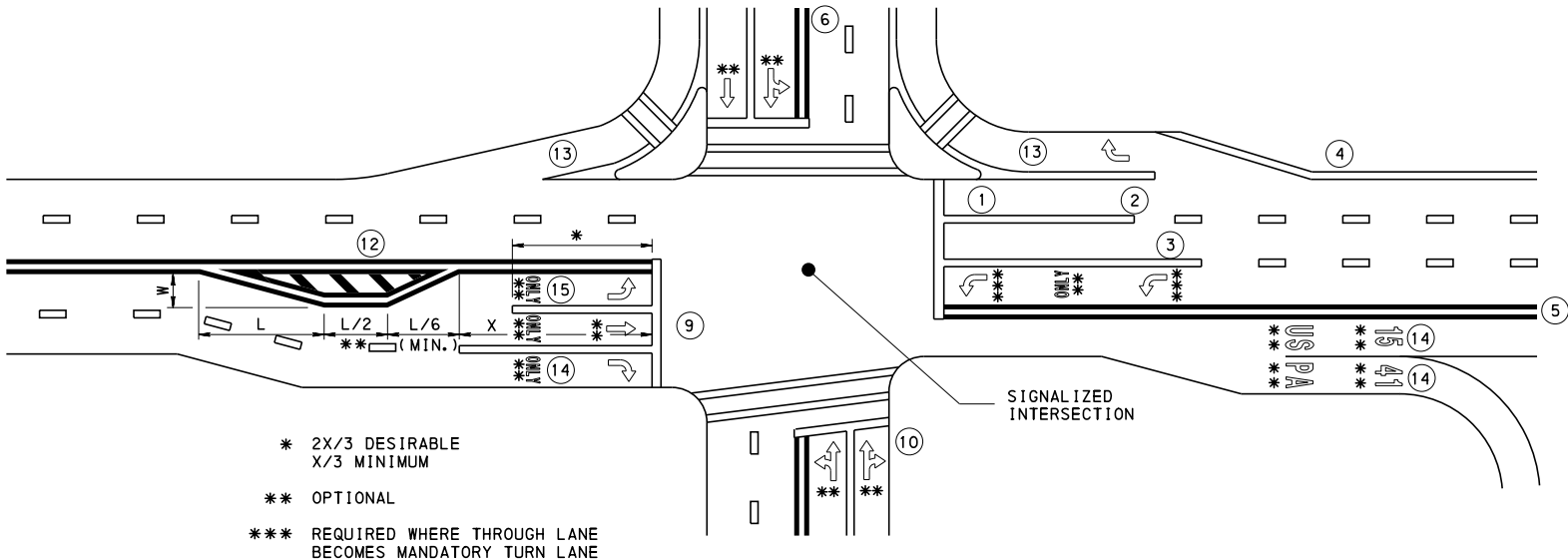
14. WORD AND SYMBOL MARKINGS SHOULD NOT EXCEED THREE LINES OF INFORMATION. IF A PAVEMENT MARKING WORD MESSAGE CONSISTS OF MORE THAN ONE LINE OF INFORMATION, IT SHOULD READ IN THE DIRECTION OF TRAVEL. THE FIRST WORD OF THE MESSAGE SHOULD BE NEAREST TO THE ROAD USER. THE LONGITUDINAL SPACE BETWEEN WORD OR SYMBOL MESSAGE MARKINGS, INCLUDING ARROW MARKINGS, SHOULD BE AT LEAST FOUR TIMES THE HEIGHT OF THE CHARACTERS FOR LOW-SPEED ROADS, BUT NOT MORE THAN TEN TIMES THE HEIGHT OF THE CHARACTERS UNDER ANY CONDITIONS. ON ALL APPROACHES, CENTER THE LEGENDS WITHIN THE LANE.
15. ALIGN THE LEGENDS TRANSVERSELY ACROSS EACH PAVEMENT. THE MINIMUM DISTANCE BETWEEN THE ARROW SYMBOL AND STOP BAR IS 20'.

DOTTED EXTENSION LINES

16. DOTTED EXTENSION LINES MAY BE USED TO DELINEATE TRAVEL PATHS FOR TURNING TRAFFIC MOVEMENTS AT OFFSET, SKEWED OR COMPLEX INTERSECTIONS AND FOR MULTIPLE TURN LANES.

LANE REDUCTION ARROW (LRA)

17. FOR DETAILS SEE SHEET 10.



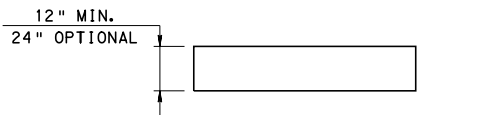
PLAN

OFFSET TABLE

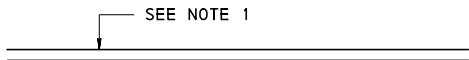
$L = \frac{WS^2}{60}$	FOR CONVENTIONAL ROADWAYS WHERE THE 85 TH PERCENTILE SPEED IS 40 MPH OR LESS
$L = WS$	FOR CONVENTIONAL ROADWAYS WHERE THE 85 TH PERCENTILE SPEED IS 45 MPH OR GREATER AND FOR ALL FREEWAYS AND EXPRESSWAYS
WHERE:	S = 85 TH PERCENTILE SPEED (MPH) W = OFFSET
X = 25' PER 30 TURNING V.P.H. THE MINIMUM IS 75'	

SPEED LIMIT OR 85 TH PERCENTILE SPEED (MPH)	DISTANCE (FT)
35 OR LESS	300
40	350
45	400
50	450
55	500

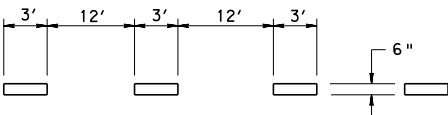
TABLE A
(SEE NOTE 5)



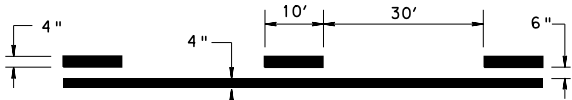
STOP LINE



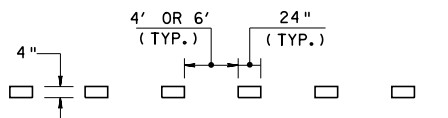
SOLID LANE LINE



AUXILIARY LANE LINE



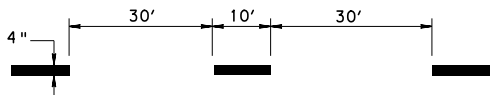
ONE-WAY BARRIER LINES
(SEE NOTE 5)



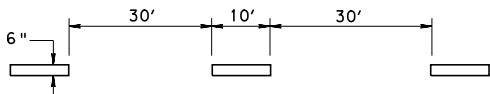
DOTTED EXTENSION LINE



TWO-WAY BARRIER LINES
(SEE NOTE 5)



YELLOW



WHITE

BROKEN LANE LINE

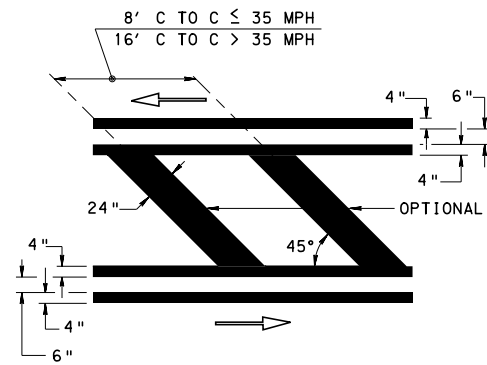
LEGEND

- WHITE
- YELLOW
- DIRECTION OF TRAVEL
- NOTE REFERENCE NUMBER

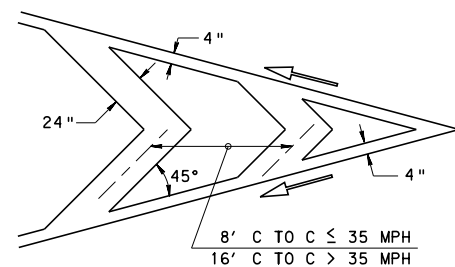
COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

PAVEMENT MARKINGS

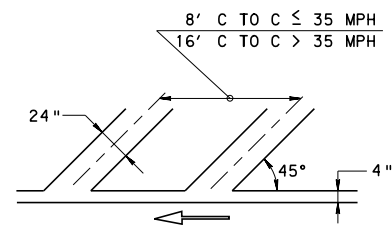
CONVENTIONAL



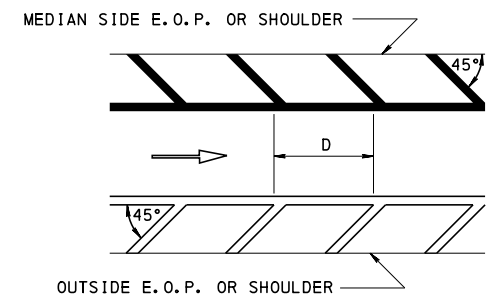
TRANSVERSE MEDIAN MARKING



CHEVRON GORE MARKING
(OPTIONAL)

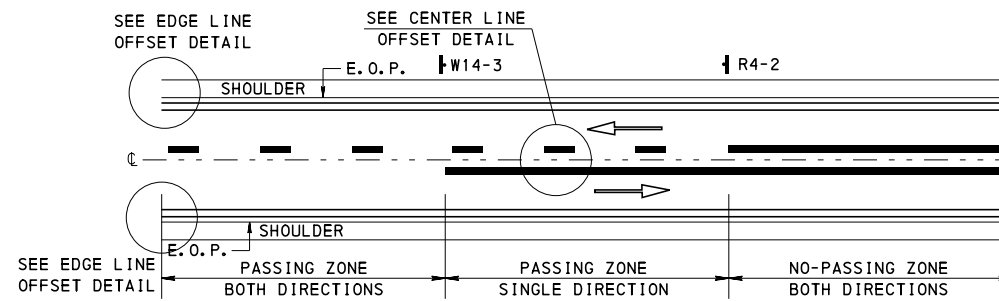


ONE-WAY BARRIER GORE MARKING
(OPTIONAL)

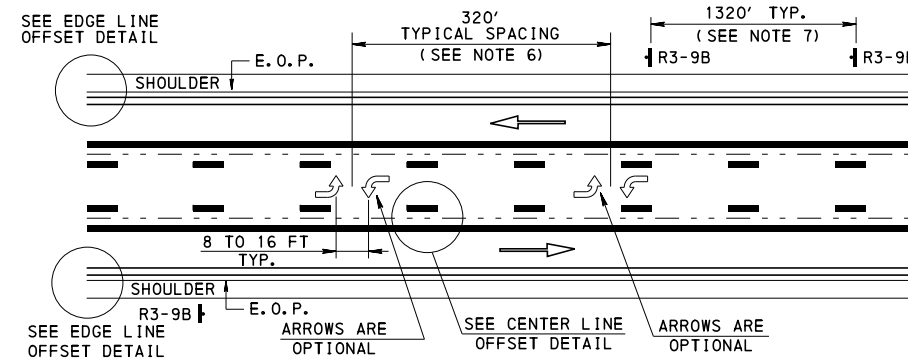


D = SPACING OF DIAGONAL LINES (TYPICALLY EQUAL IN FEET TO THE POSTED SPEED LIMIT). INCREASE SPACING OF DIAGONALS TO 200' OR MORE ON INTERSTATE ROADWAYS.

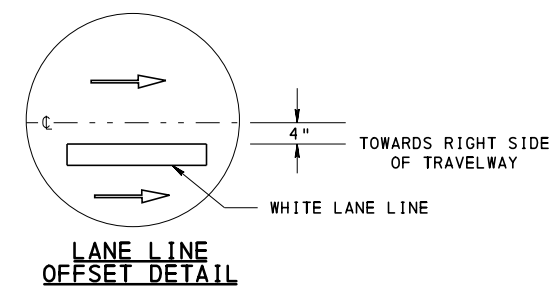
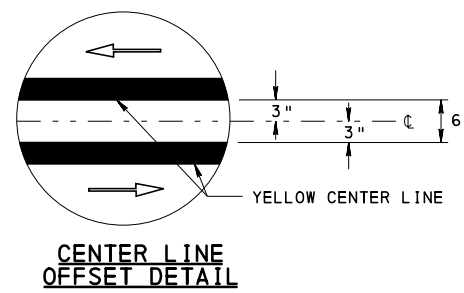
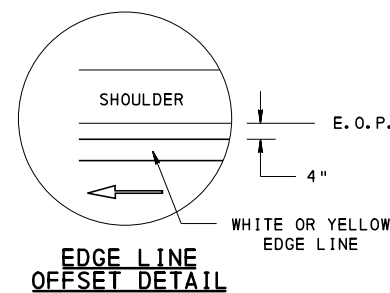
EDGE OF PAVEMENT OR SHOULDER ISLAND



TWO-LANE, TWO-WAY UNDIVIDED ROADWAY



TWO-LANE, TWO-WAY UNDIVIDED ROADWAY WITH TWO-WAY LEFT TURN LANE



LEGEND

- WHITE
- YELLOW
- DIRECTION OF TRAVEL

NOTES:

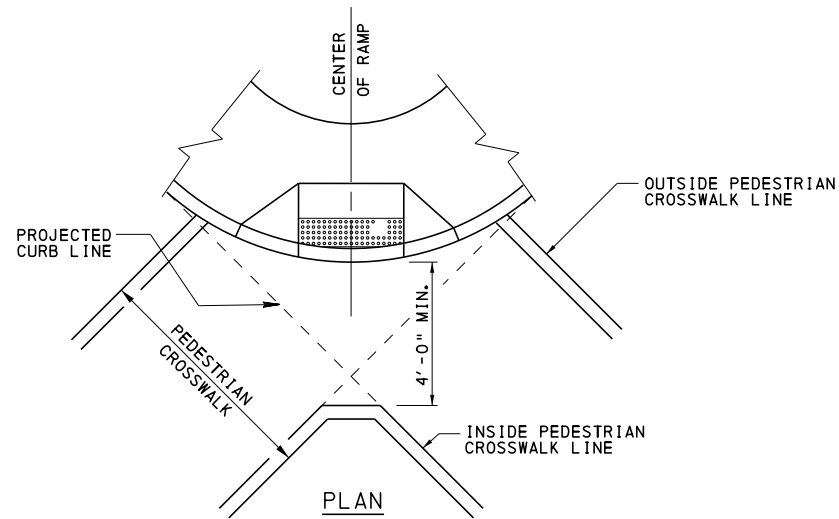
- OFFSET PAVEMENT MARKING LINES 4" FROM LONGITUDINAL PAVEMENT CONSTRUCTION JOINTS, AS DETERMINED BY THE ENGINEER OR AS INDICATED BELOW:
 - YELLOW SKIP LINES ON TWO-LANE, TWO-WAY ROADWAYS (WHERE PASSING IS ALLOWED IN BOTH DIRECTIONS) CAN BE OFFSET 3" FROM THE CENTER LINE TO ALLOW FOR FUTURE REPAINTING OF THE LINES WITH COMPATIBLE DEPARTMENT EQUIPMENT.
 - OFFSET DOUBLE YELLOW CENTER LINES 3" ON EACH SIDE OF THE CENTER LINE TO ALLOW FOR PLACEMENT OF PAVEMENT MARKERS (PRESENT OR FUTURE PLACEMENT).
- PASSING - NO PASSING ZONES WILL BE DETERMINED BY THE ENGINEER.
- EDGE LINES ARE NOT REQUIRED ALONG CURB AND GUTTER LOCATIONS.
- DO NOT CONTINUE EDGE LINES THRU INTERSECTIONS, AND DO NOT BREAK EDGE LINES AT DRIVEWAYS.
- PLACE EDGE LINES AT RAISED ISLAND LOCATIONS, OUTLINING THE SHAPE OF THE RAISED ISLAND.
- 320' TYPICAL SPACING BETWEEN SETS OF ARROW SYMBOLS CAN BE INCREASED OR DECREASED AS DETERMINED BY THE ENGINEER.
- 1320' TYPICAL DISTANCE BETWEEN CENTER LANE - LEFT TURN ONLY SIGNS (R3-9B) CAN BE INCREASED OR DECREASED AS DETERMINED BY THE ENGINEER.

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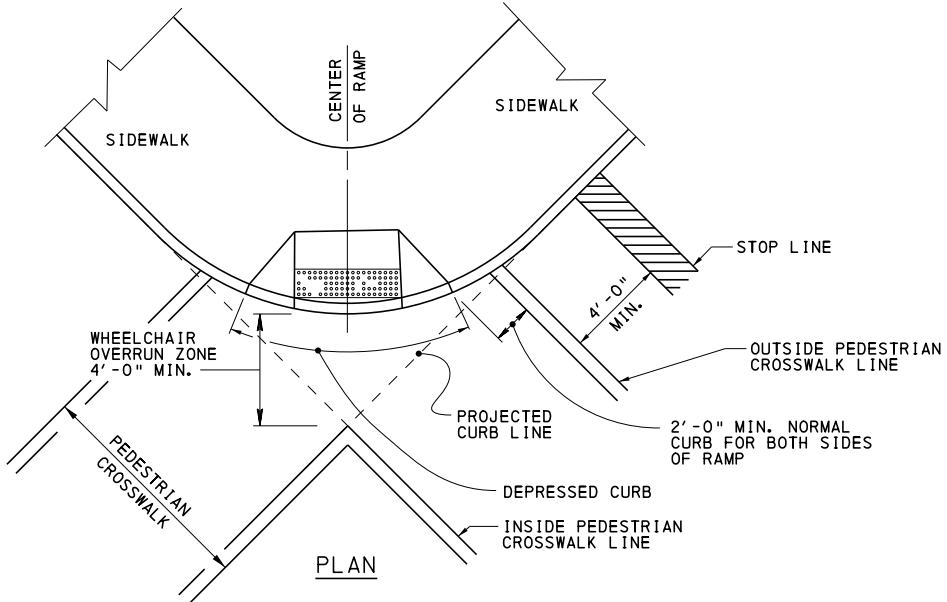
PAVEMENT MARKINGS

CONVENTIONAL

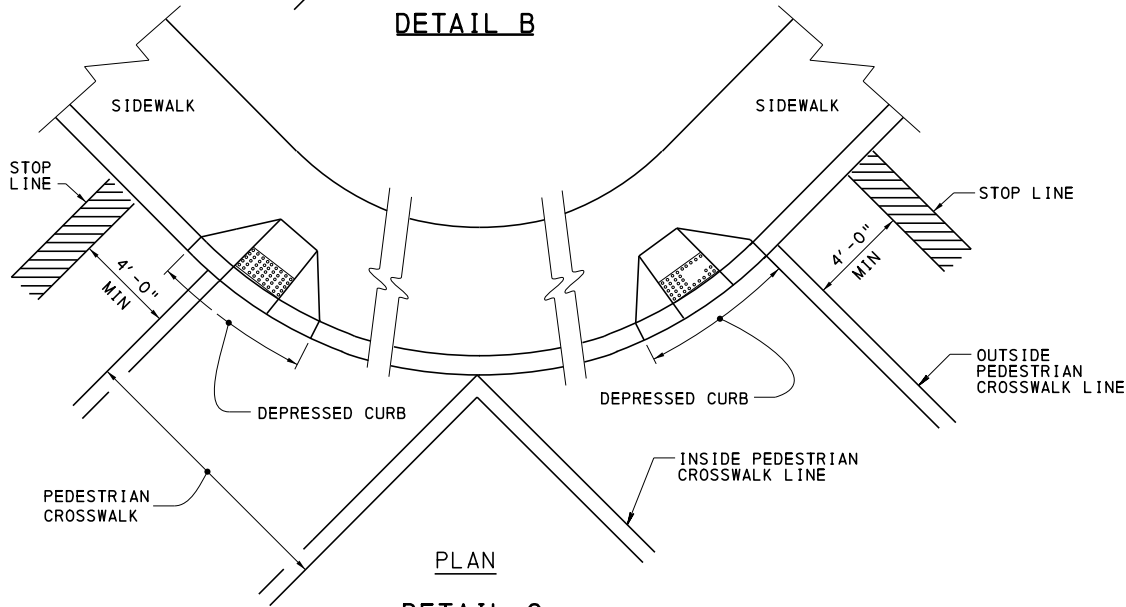
DETAILS ARE FOR CROSSWALK PAVEMENT MARKINGS ONLY



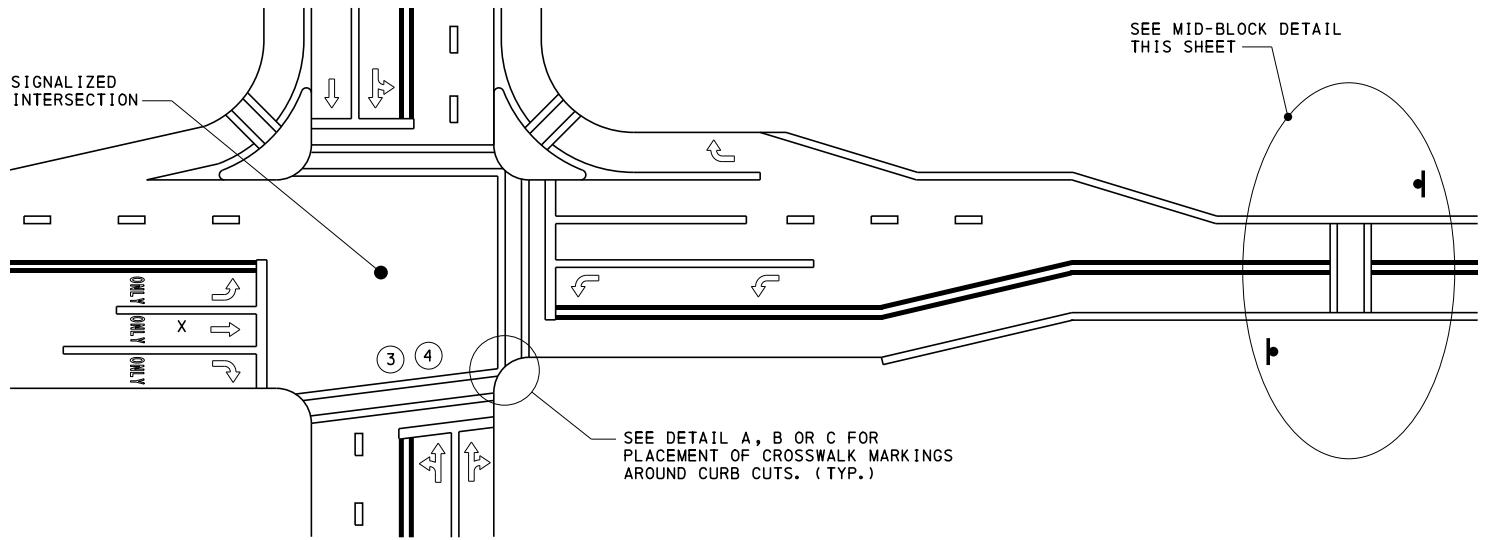
PLAN
DETAIL A



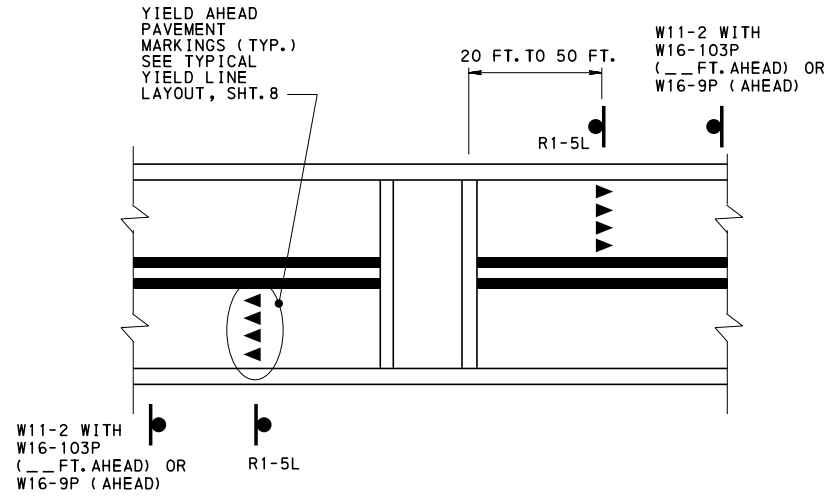
PLAN
DETAIL B



PLAN
DETAIL C



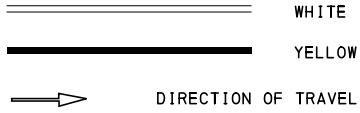
PLAN



PLAN - CROSSWALK WITH ADVANCE WARNING
PAVEMENT MARKINGS

MID-BLOCK CROSSWALK DETAIL
REFER TO PUBLICATION 46 CHAPTER 11.9
AND MUTCD PART 3B.17 FOR MORE DETAILS.

LEGEND



NOTES:

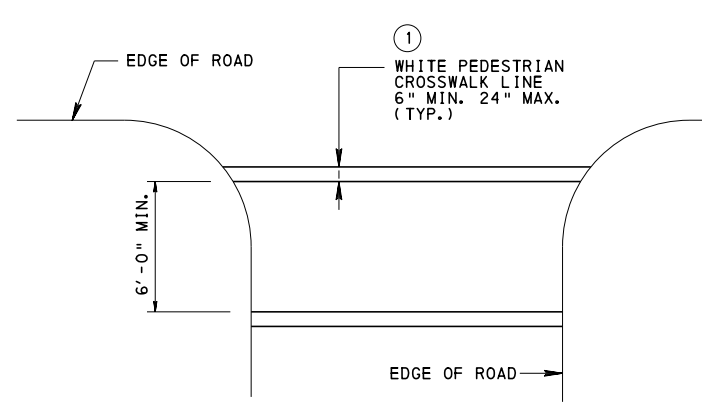
1. THE MINIMUM WIDTH OF CROSSWALKS SHALL BE 6' AND MAKE THE CROSSWALK LINES SOLID WHITE NOT LESS THAN 6" WIDE, THE LINES FORMING A CROSSWALK SHALL BE PARALLEL TO EACH OTHER AND EXTEND ACROSS THE ROADWAY FROM FACE OF CURB TO FACE OF CURB OR EDGE OF SHOULDER AS APPLICABLE.
2. FOR STANDARD CROSSWALK MARKINGS AND APPROVED DECORATIVE CROSSWALK PATTERN CONFIGURATION AND COLORS SEE SHEET 6.

COMMONWEALTH OF PENNSYLVANIA
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BUREAU OF MAINTENANCE AND OPERATIONS

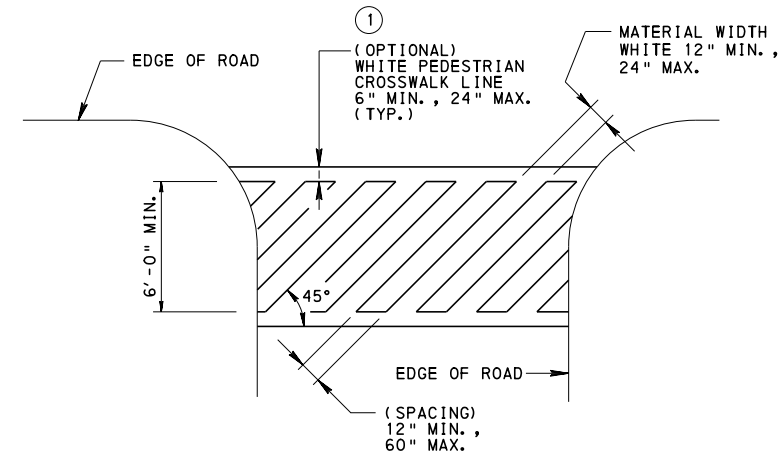
PAVEMENT MARKINGS

CROSSWALKS

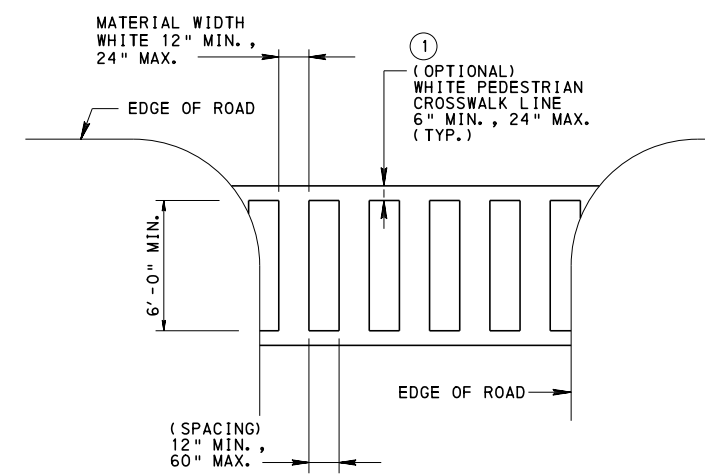
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 5 OF 13 TC-8600
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TYPE A - PARALLEL



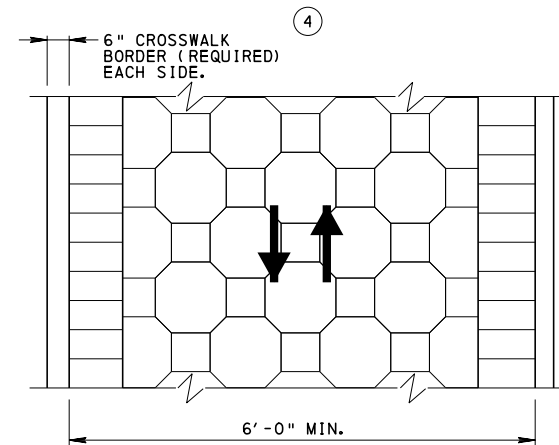
TYPE B - DIAGONAL



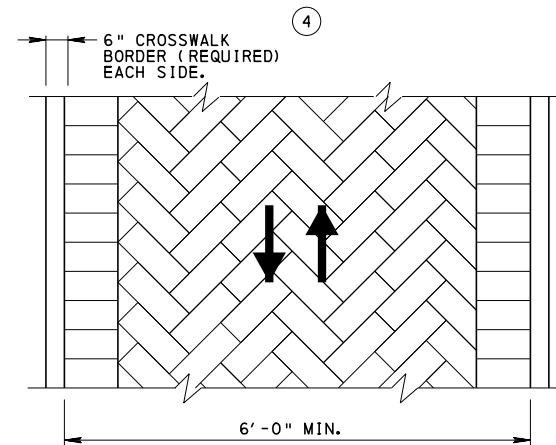
TYPE C - PERPENDICULAR

STANDARD CROSSWALK MARKINGS

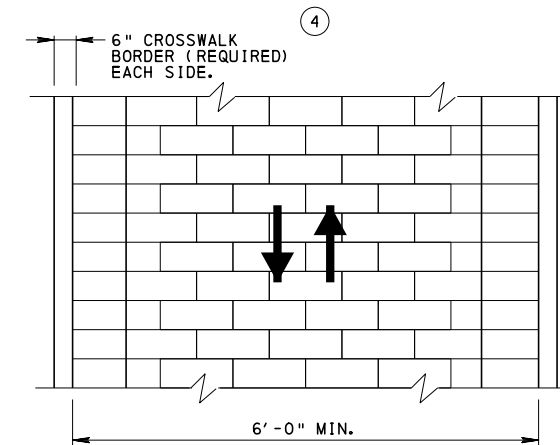
DECORATIVE CROSSWALK



TYPE D - COURTYARD



TYPE E - HERRINGBONE



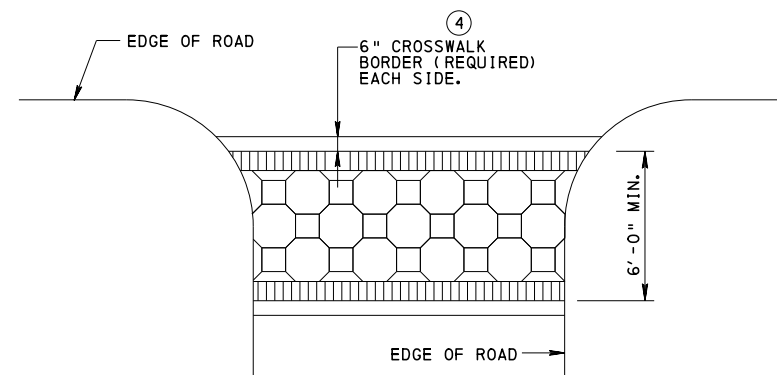
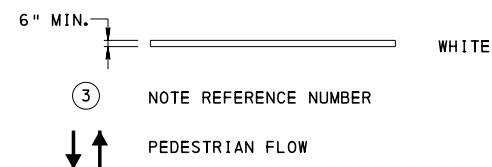
TYPE F - OFFSET BRICK

APPROVED NON-REFLECTIVE COLORS: WHITE, BLACK, BROWN, SILVER-GRAY, TAN AND MAROON

NOTES:

1. MAKE THE CROSSWALK LINES SOLID WHITE, NOT LESS THAN 6" WIDE.
2. EXTEND THE CROSSWALK ACROSS THE ROADWAY FROM FACE OF CURB TO FACE OF CURB OR EDGE OF SHOULDER AS APPLICABLE.
3. THE MINIMUM WIDTH OF CROSSWALKS SHALL BE 6'.
4. A WHITE BORDER, 6" WIDE, IS REQUIRED ALONG EACH SIDE OF THE DECORATIVE CROSSWALK, THE BORDERS ARE TO BE PARALLEL USING A PENNDOT APPROVED PAVEMENT MARKING MATERIAL AND EXTENDS FROM FACE OF CURB TO FACE OF CURB OR SHOULDER.

LEGEND



PLAN - CROSSWALK WITH DECORATIVE PATTERN

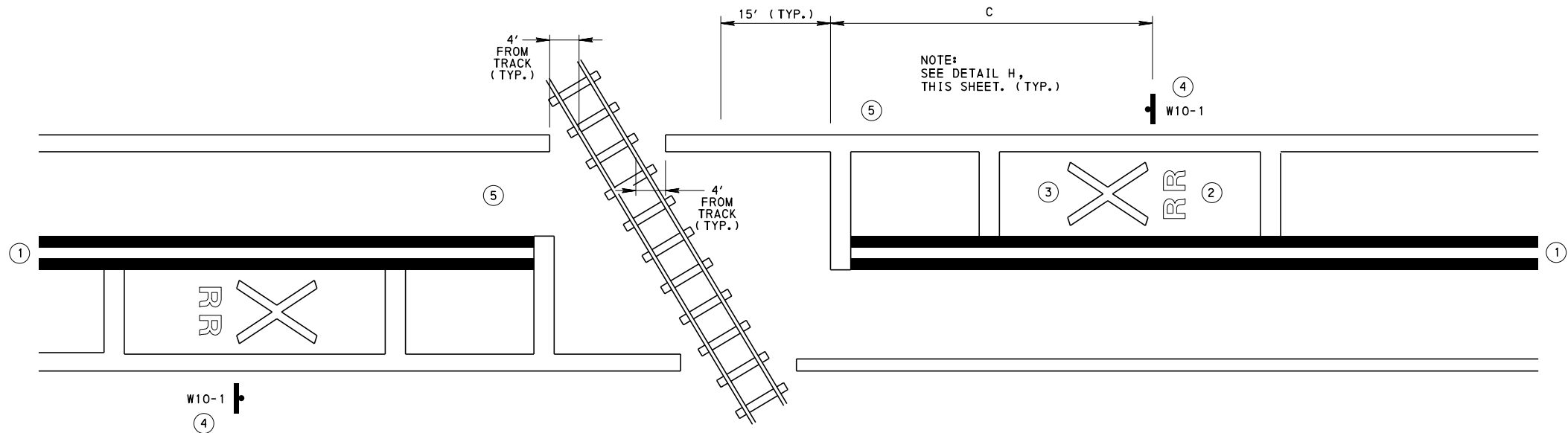
SEE DECORATIVE CROSSWALK PATTERNS.
(DECORATIVE CROSSWALK PATTERN MUST BE
CONTAINED WITHIN THE 6" WHITE PEDESTRIAN
CROSSWALK BORDERS FORMING THE CROSSWALK)

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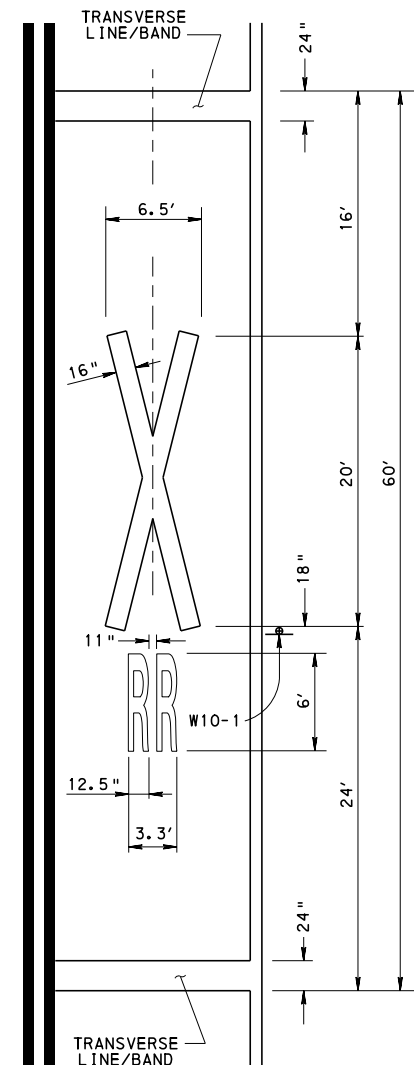
PAVEMENT MARKINGS

CROSSWALKS

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RAILROAD CROSSING MARKING
(SEE MUTCD FIG. 8B-6 AND 8B-7 FOR MORE DETAILS)



DETAIL H

LEGEND

6" MIN. WHITE
YELLOW

③ NOTE REFERENCE NUMBER

SPEED LIMIT OR 85 TH PERCENTILE SPEED (MPH)	DISTANCE (FT)
35 OR LESS	300
40	350
45	400
50	450
55	500

TABLE A
SEE NOTE 1

POSTED OR 85 TH PERCENTILE SPEED (MPH)	C (FT)
20	100
25	100
30	100
35	150
40	225
45	300
50	375
55	450
60	550
65	650

LOCATION OF RAILROAD CROSSING SIGN
SEE NOTE 4

NOTES

- ON TWO-LANE, TWO-WAY HIGHWAYS, THE CENTER LINES ARE YELLOW, 4" WIDE EITHER SOLID, BROKEN OR A COMBINATION THEREOF. A SOLID BARRIER LINE SHALL PRECEDE ALL GRADE CROSSINGS BY THE MINIMUM DISTANCE NOTED IN TABLE A.
- CENTER THE RAILROAD SYMBOLS WITHIN EACH LANE ON ALL PAVED APPROACHES TO HIGHWAY-RAIL GRADE CROSSINGS. IN THOSE SITUATIONS WHERE THERE IS INADEQUATE SPACE FOR THE PAVEMENT MARKINGS OR WHERE THE INSTALLATION WOULD CREATE OPERATIONAL PROBLEMS WITH TURNING LANES OR OTHER SPECIAL CONDITIONS, PAVEMENT MARKINGS ARE NOT REQUIRED PROVIDING AN ENGINEERING STUDY INDICATES THAT OTHER TRAFFIC CONTROL DEVICES PROVIDE SUITABLE WARNING AND CONTROL.
- ON MULTI-LANE ROADS EXTEND THE TRANSVERSE LINES ACROSS ALL TRAFFIC LANES ON EACH APPROACH AND USE INDIVIDUAL SYMBOLS IN EACH APPROACH LANE.
- LOCATE A PORTION OF RAILROAD PAVEMENT MARKING SYMBOL DIRECTLY OPPOSITE THE ADVANCE WARNING SIGN W10-1. USE DIMENSION "C" FOR PLACEMENT OF ADVANCE WARNING SIGN W10-1.
- LOCATE STOP LINES 8' FROM THE GATE (IF PRESENT), BUT NO CLOSER THAN 15' FROM THE NEAREST RAIL.

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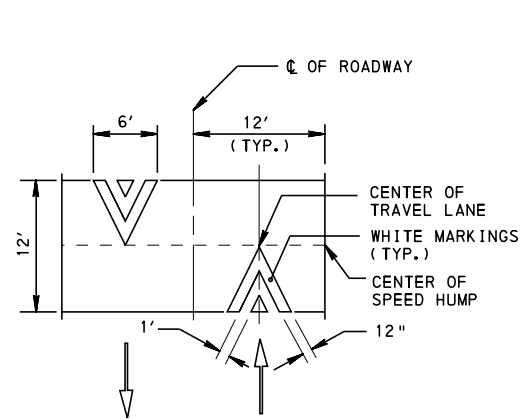
PAVEMENT MARKINGS

RAILROAD CROSSING

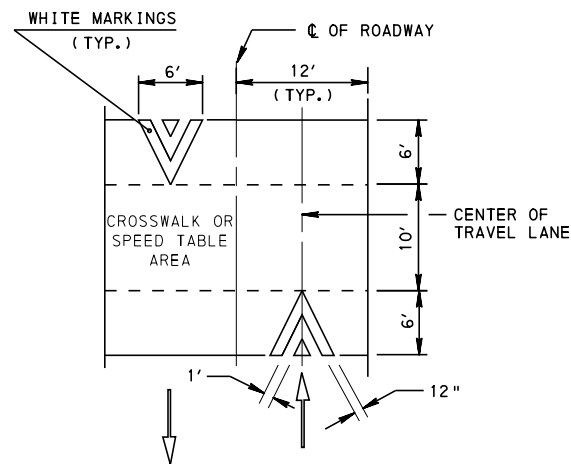
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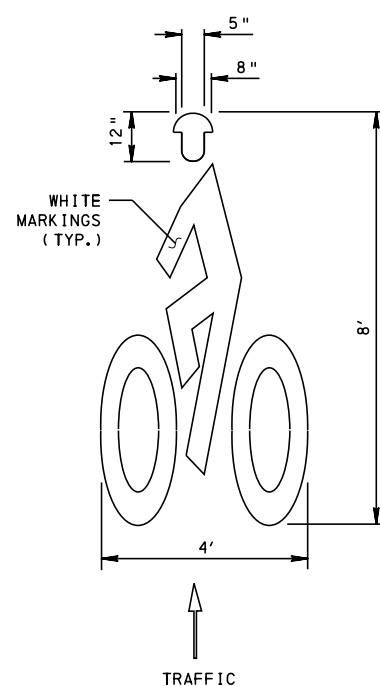
SHT. 7 OF 13
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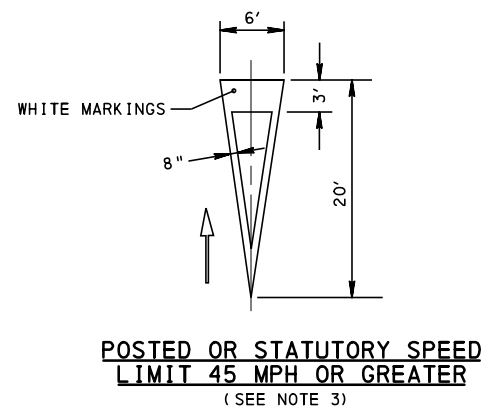
**TYPICAL PAVEMENT MARKINGS
FOR SPEED HUMPS**



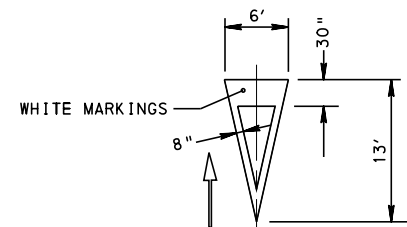
**TYPICAL PAVEMENT MARKINGS
FOR SPEED TABLES OR SPEED HUMPS
WITH CROSSWALKS**



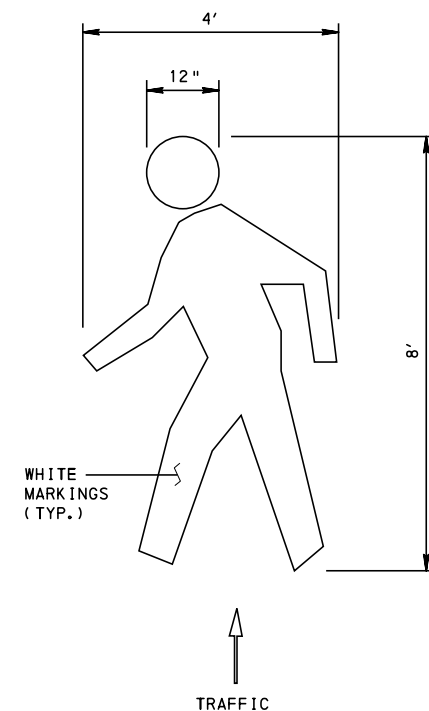
BICYCLE WITH RIDER SYMBOL
(SEE NOTE 2 & 4)



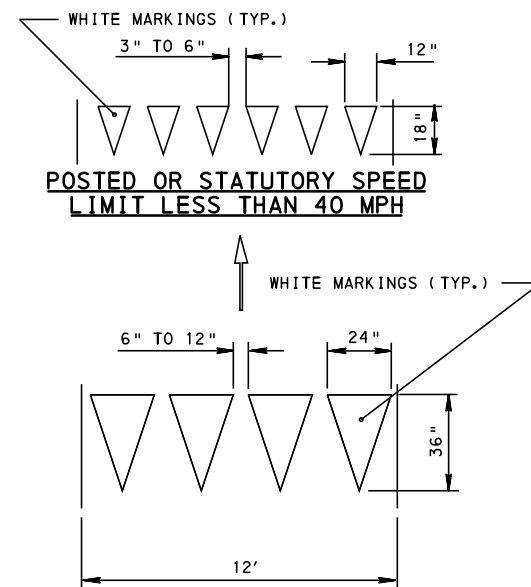
**POSTED OR STATUTORY SPEED
LIMIT 45 MPH OR GREATER**
(SEE NOTE 3)



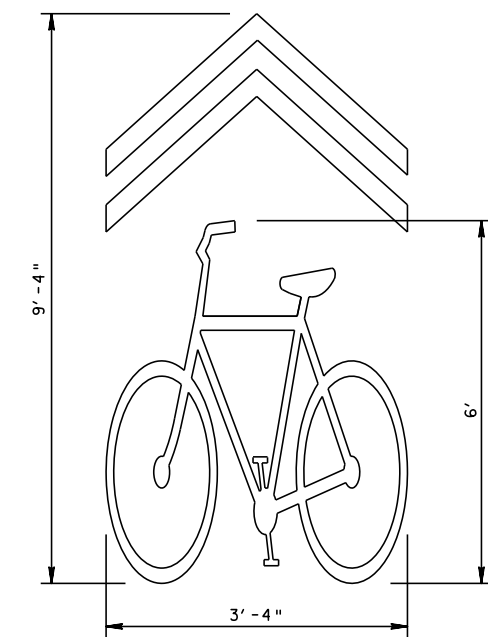
**POSTED OR STATUTORY SPEED
LIMIT LESS THAN 45 MPH**
(SEE NOTE 3)



PED SYMBOL
(SEE NOTE 2)



TYPICAL YIELD LINE LAYOUT
(OPTIONAL)

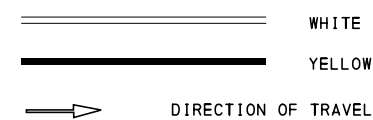


SHARED LANE MARKING
(SEE NOTE 4)

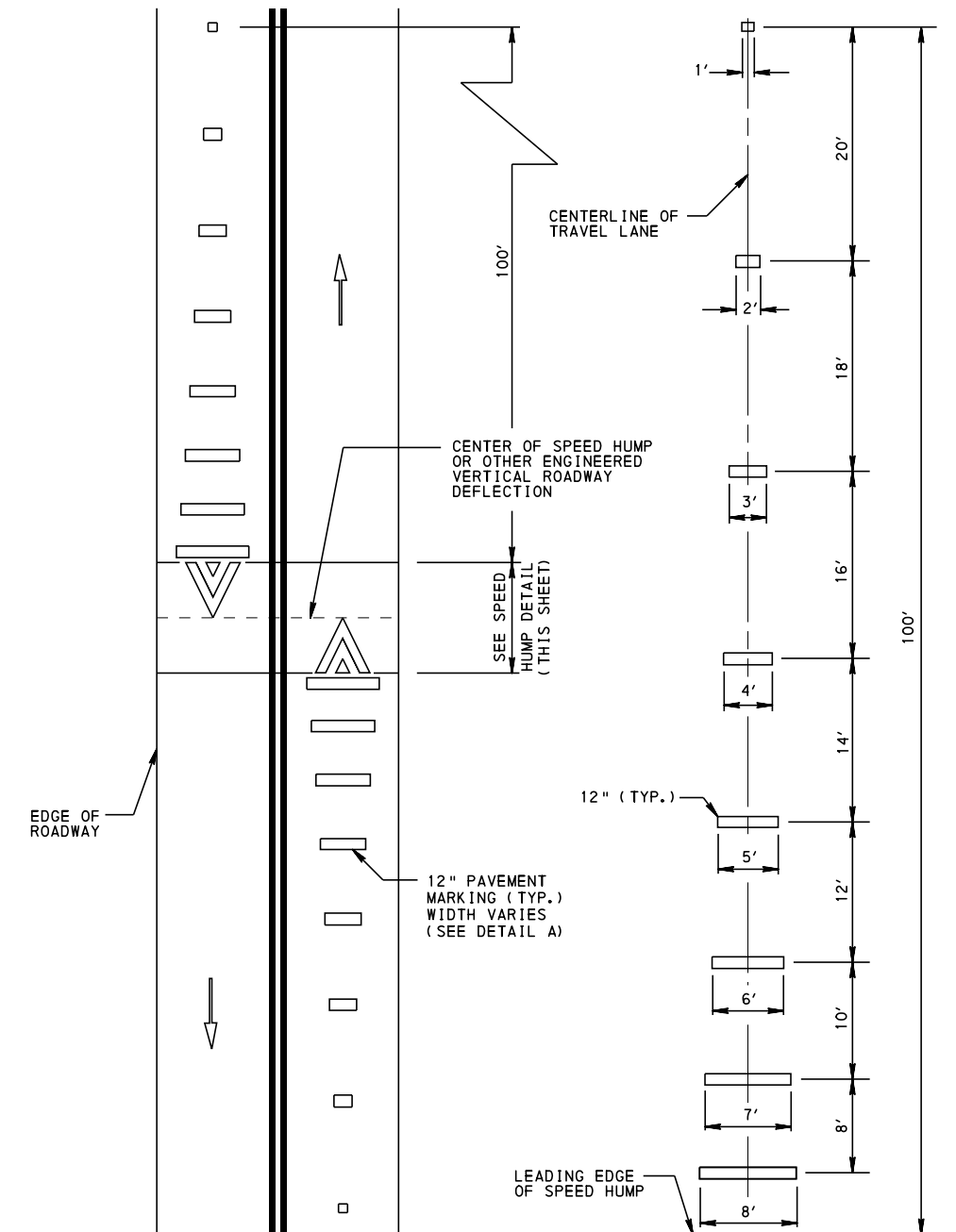
NOTES:

1. YIELD LINES MAY BE USED TO INDICATE THE POINT BEHIND WHICH VEHICLES ARE REQUIRED TO YIELD IN COMPLIANCE WITH A YIELD SIGN.
2. YIELD LINES, PED SYMBOL AND BICYCLE RIDER SYMBOL MAY BE SMALLER THAN SUGGESTED WHEN INSTALLED ON MUCH NARROWER, SLOW-SPEED FACILITIES SUCH AS SHARED-USE PATHS.
3. USE MUTCD CHAPTER 2C, TABLE 2C-4, CONDITION "B" FOR ADVANCE PLACEMENT DISTANCE OF YIELD AHEAD TRIANGLE SYMBOL.
4. USE MUTCD CHAPTER 9C.

LEGEND

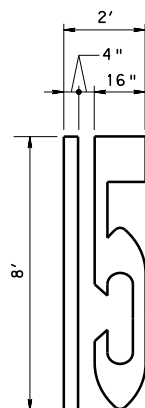
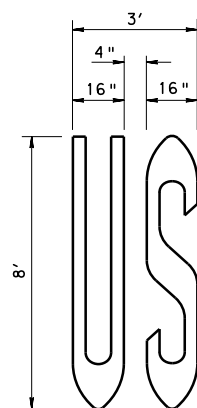
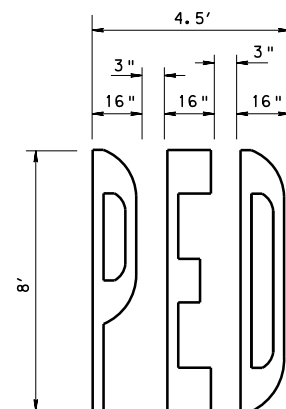
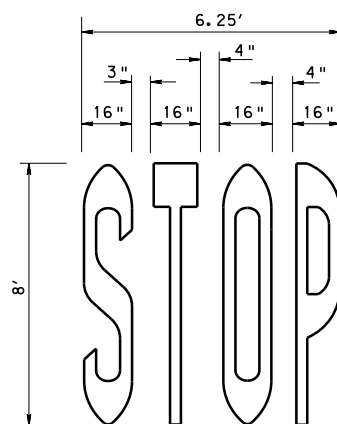
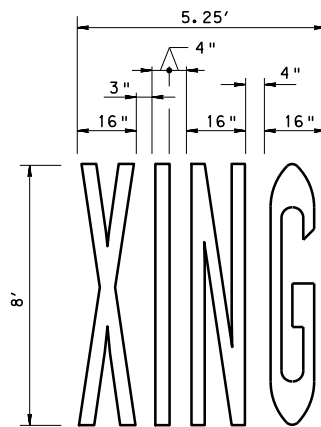
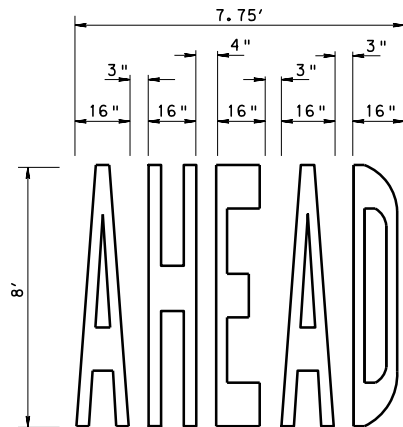
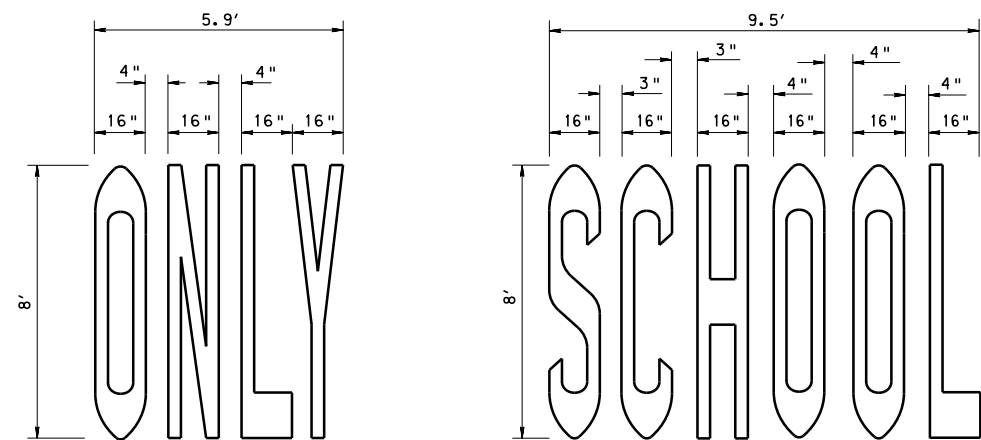


WHITE
YELLOW
DIRECTION OF TRAVEL



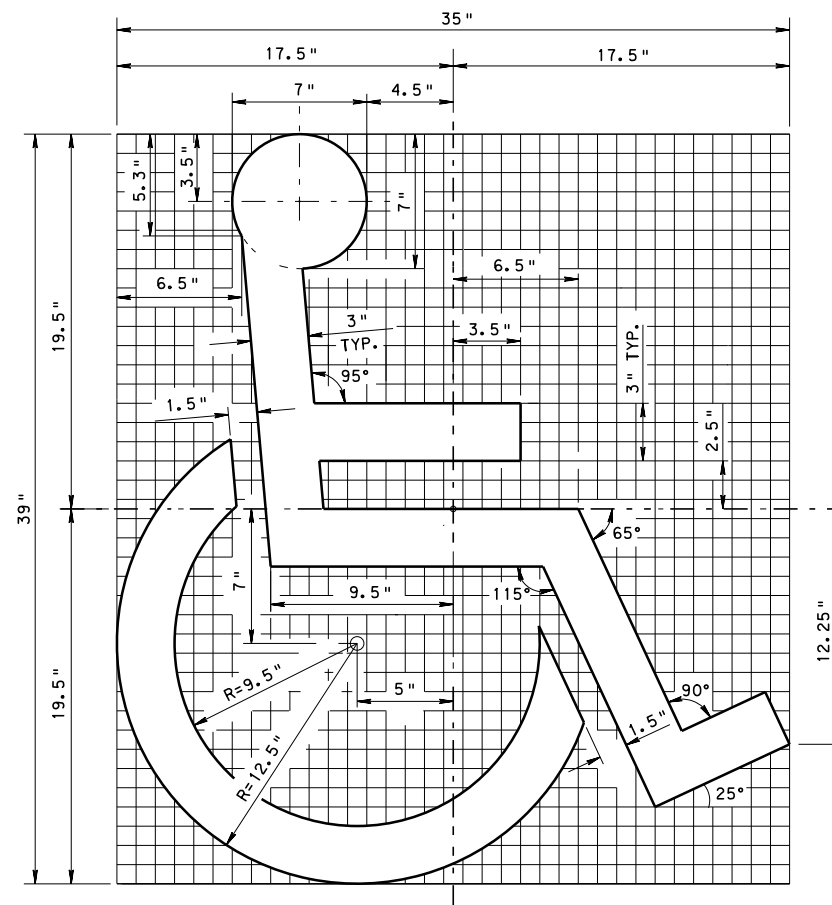
DETAIL A

**TYPICAL ADVANCE WARNING MARKING FOR SPEED HUMPS OR
OTHER ENGINEERED VERTICAL ROADWAY DEFLECTIONS**



SEE FHWA'S STANDARD ALPHABETS FOR HIGHWAY SIGNS
AND PAVEMENT MARKINGS FOR OTHER DETAILS.
SEE PAGE 3, NOTE 14 FOR SPACING BETWEEN WORDS.

LEGENDS

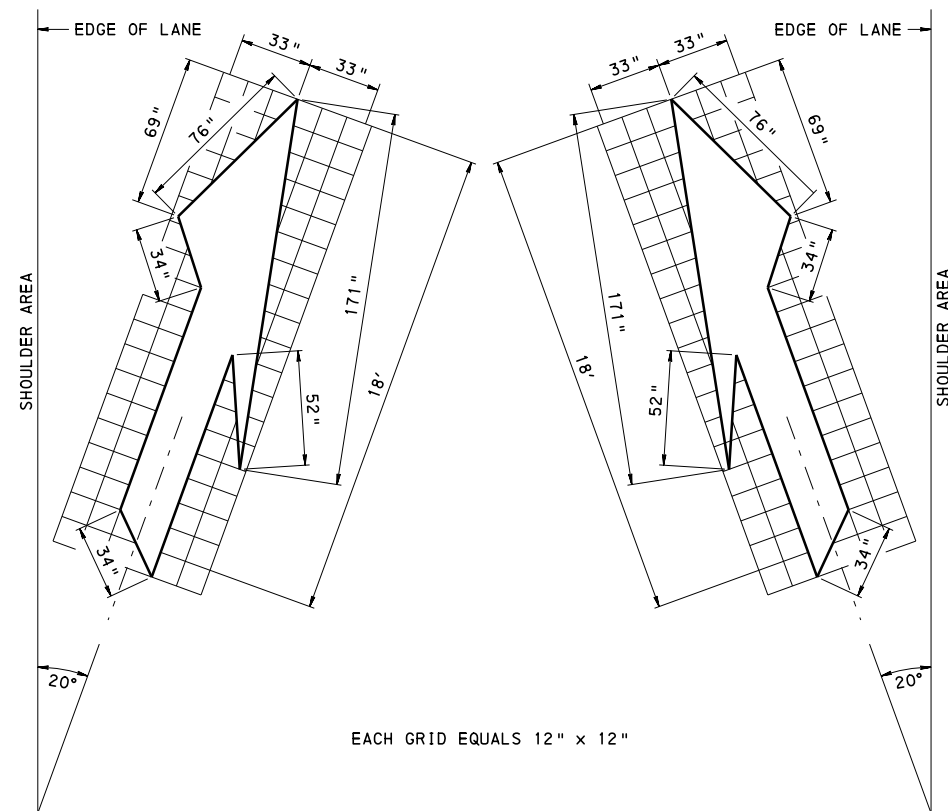


HANDICAPPED MARKING
(EACH GRID EQUALS 1" x 1")

NOTE:

- HANDICAPPED SYMBOL SHALL BE WHITE. IT MAY BE INSTALLED ALONE OR WITH A BLUE BACKGROUND WHICH EXTENDS A MINIMUM OF 3" BEYOND THE SYMBOL. IF MATERIAL THICKNESS OF SYMBOL IS GREATER THAN 20 MILS THE BLUE BACKGROUND MUST BE USED. ANY REDUCTION IN DIMENSIONS MUST BE APPROVED BY THE DEPARTMENT.

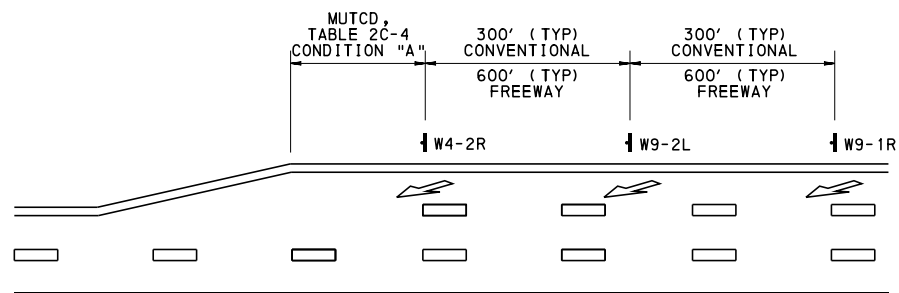
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PAVEMENT MARKINGS		
LEGENDS AND SYMBOLS		
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LEFT LANE
(MERGE RIGHT)

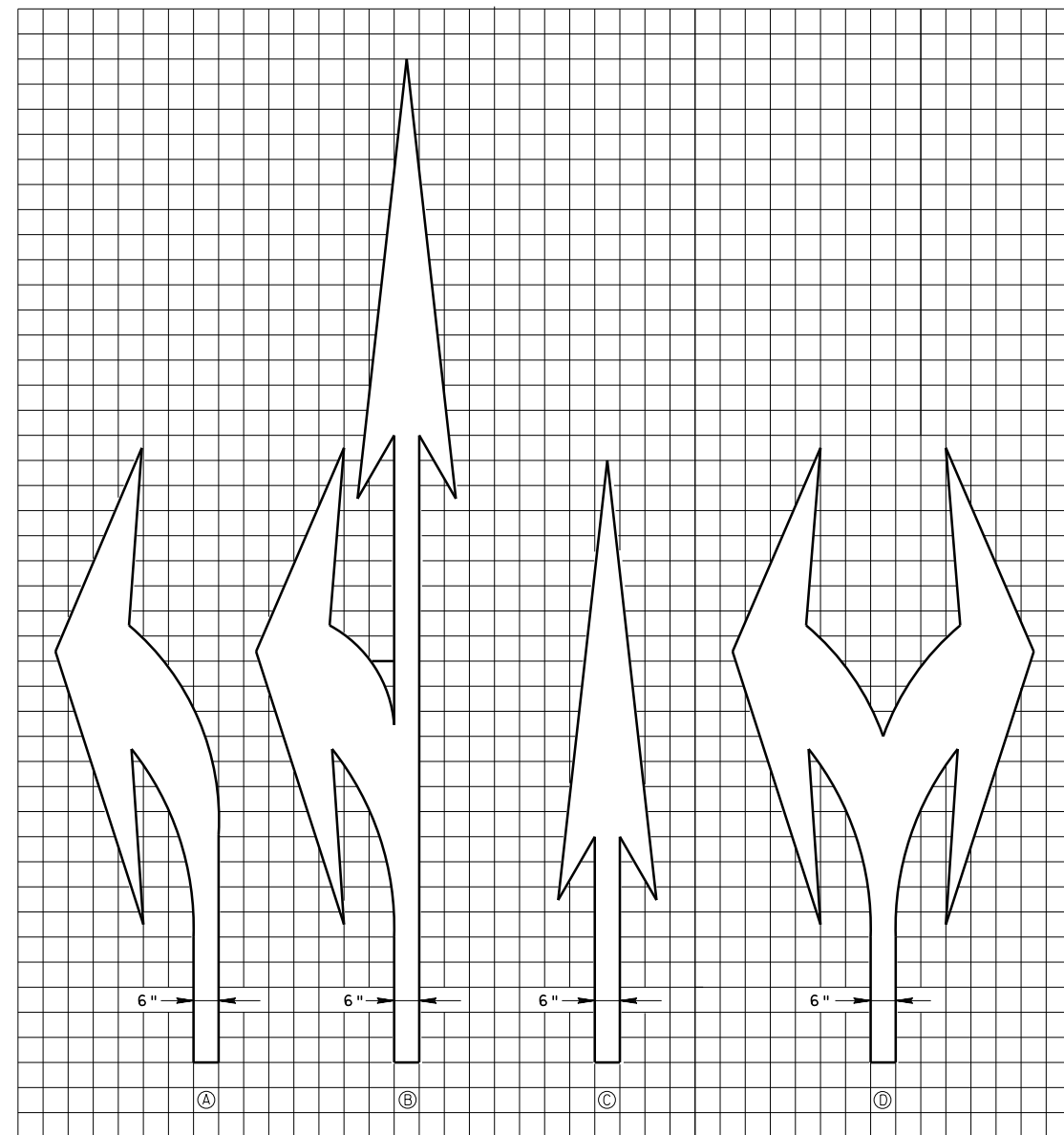
RIGHT LANE
(MERGE LEFT)

LANE REDUCTION TRANSITION ARROW
(OPTIONAL)



1. LOCATE LANE REDUCTION ARROW IN CENTER OF LANE.
 2. PLACE LANE REDUCTION ARROWS IN GROUPS OF THREE WHEN CONDITIONS PERMIT.
 3. FOLLOW MUTCD - TABLE 2C-4 (CONDITION A) FOR PLACEMENT OF FIRST LANE REDUCTION ARROW IN ADVANCE OF TAPER.
- INTERSTATE - EXPRESSWAY/FREEWAY
4. PLACE ADDITIONAL LANE REDUCTION ARROWS AT 600' INTERVALS.
- CONVENTIONAL ROADWAYS
5. PLACE ADDITIONAL LANE REDUCTION ARROWS AT 300' INTERVALS.

LANE REDUCTION ARROW PLACEMENT



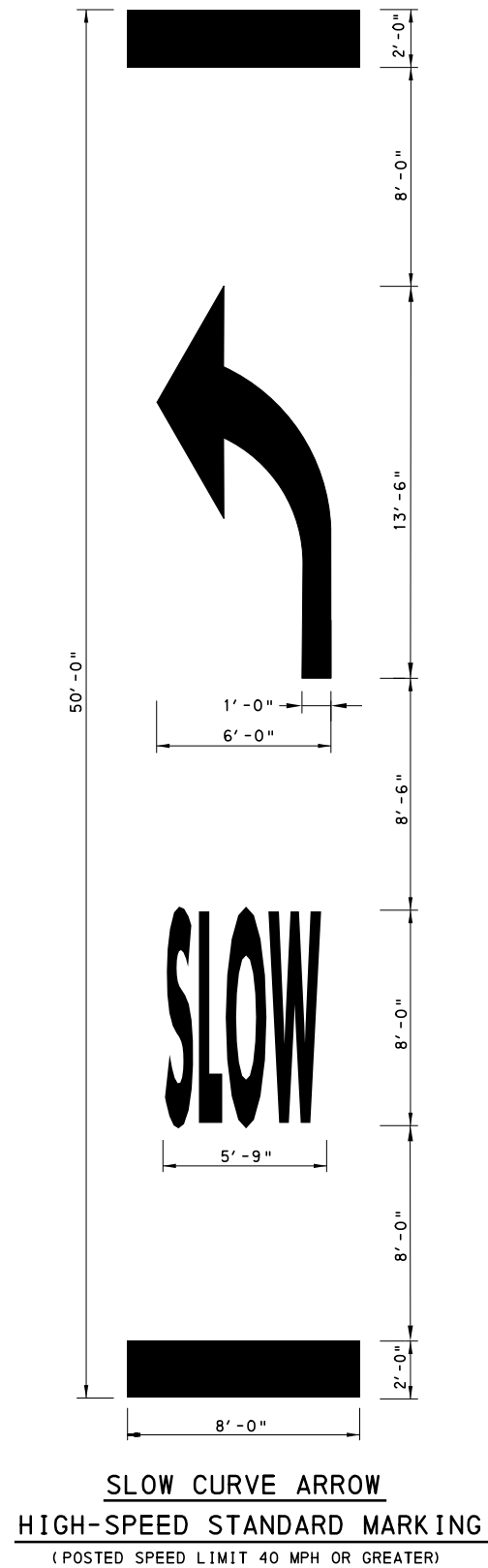
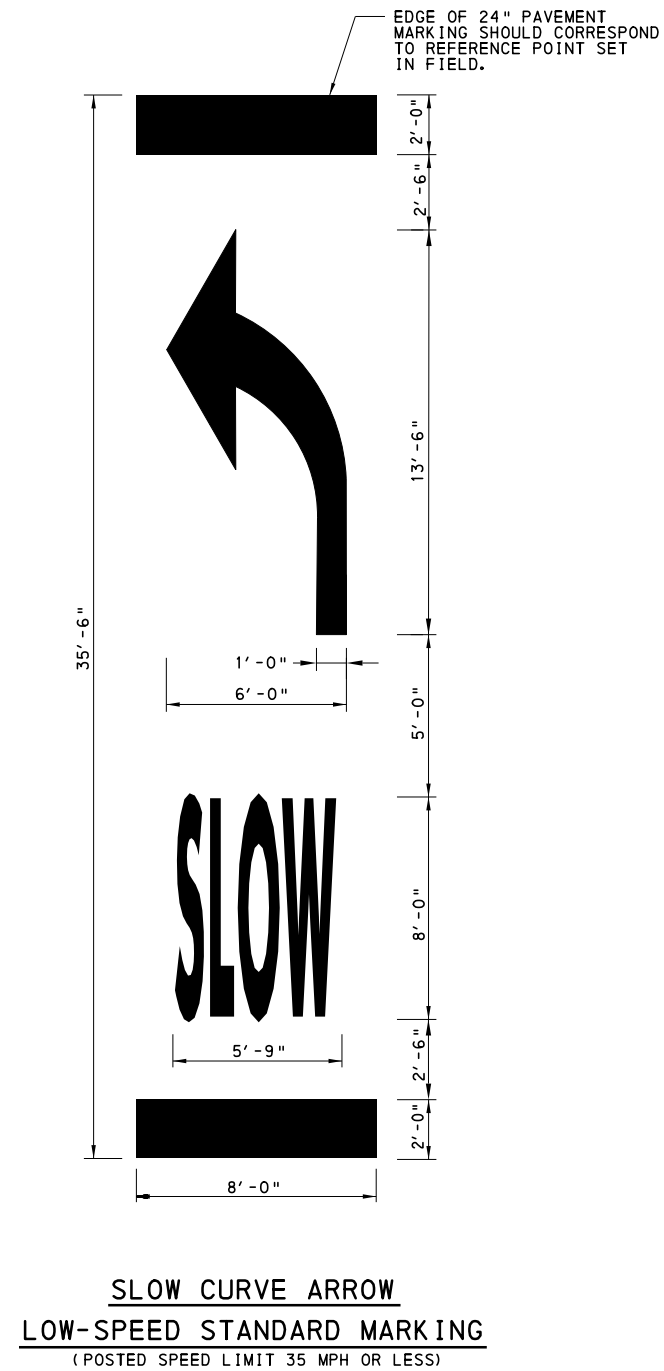
ARROW	QUANTITY FOR PAVEMENT MARKING REMOVAL
A	20 FT ²
B	32 FT ²
C	13 FT ²
D	32 FT ²

MARKING ARROWS

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BUREAU OF MAINTENANCE AND OPERATIONS

PAVEMENT MARKINGS

LEGENDS AND SYMBOLS

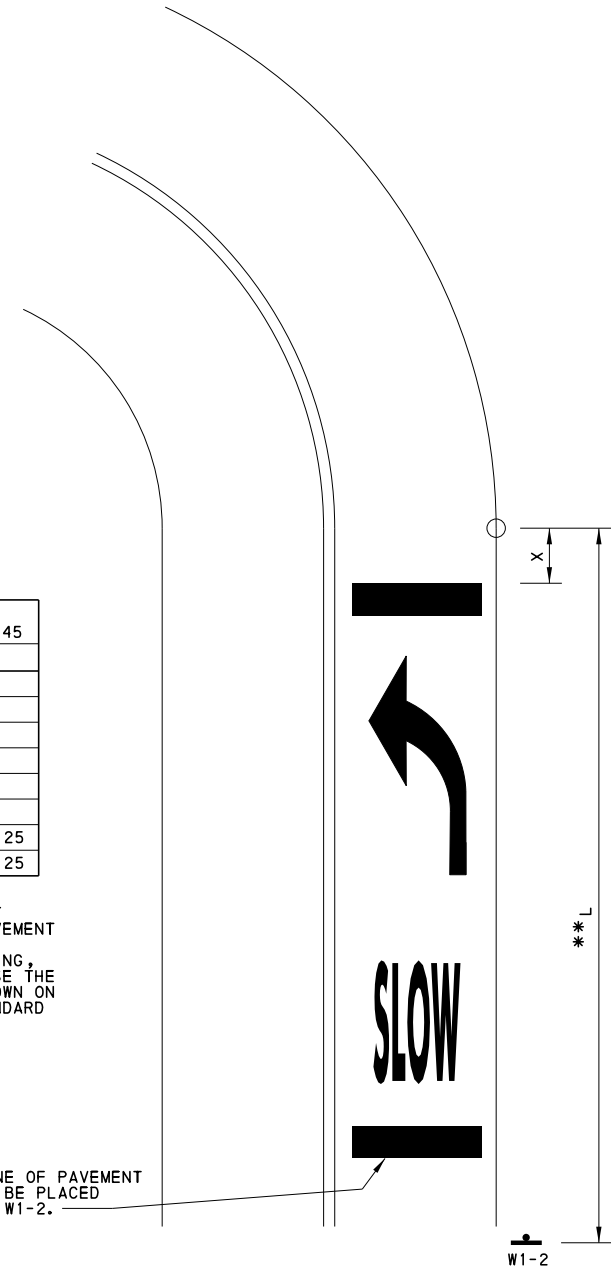


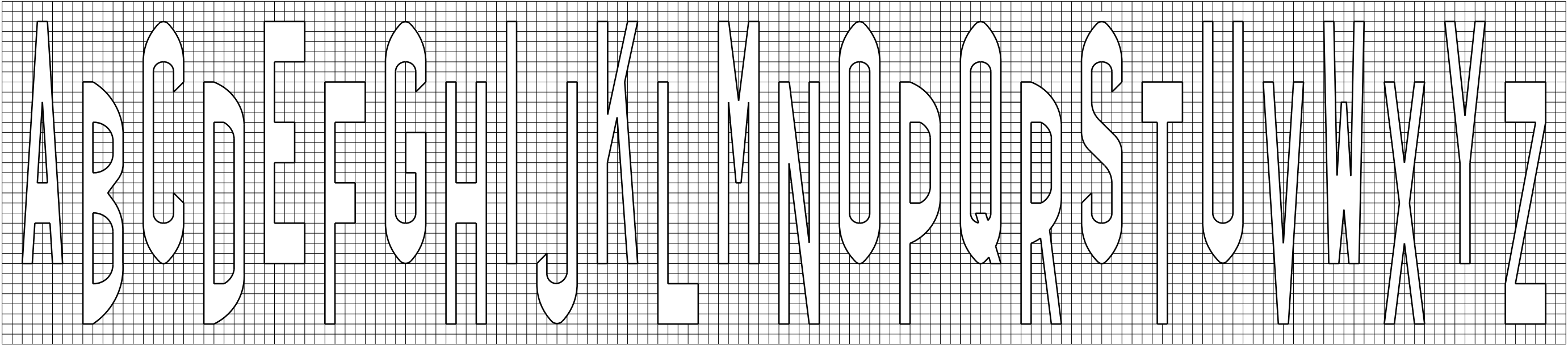
POSTED SPEED	WARNING SPEED							
	10	15	20	25	30	35	40	45
20*	45	35						
25*	45	40	35					
30*	50	40	40	35				
35*	50	45	45	40	35			
40	25	25	25	25	25	25		
45	40	40	25	25	25	25	25	
50	75	75	65	50	40	25	25	25
55	115	115	90	90	75	50	40	25

*NOTE: ON ROADWAYS WITH A POSTED SPEED LIMIT OF 35 MPH OR LESS, USE THE 35'-6" PAVEMENT MARKING LEGEND AS SHOWN ON THE SLOW CURVE ARROW, LOW SPEED STANDARD MARKING, THIS SHEET. ON ALL OTHER ROADWAYS, USE THE 50'-0" PAVEMENT MARKING LEGEND AS SHOWN ON THE SLOW CURVE ARROW, HIGH-SPEED STANDARD MARKING, THIS SHEET.

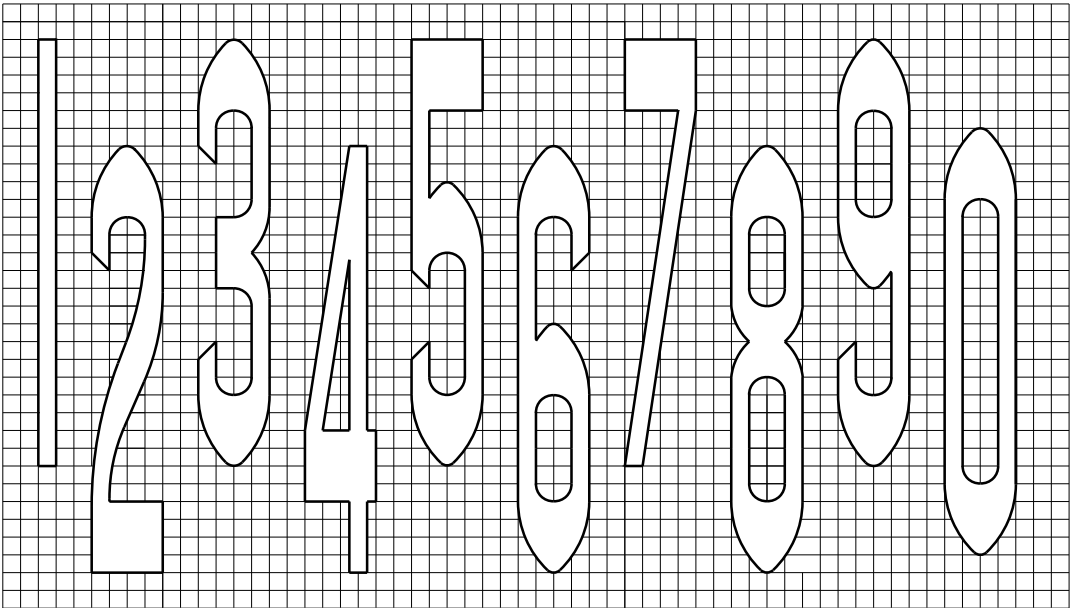
FRONT EDGE OF LINE OF PAVEMENT LEGEND SHALL NOT BE PLACED UPSTREAM OF SIGN W1-2.

TYPICAL LAYOUT AND PLACEMENT OF SUPPLEMENTAL CURVE PAVEMENT MARKING





STANDARD ALPHABET



STANDARD NUMERALS

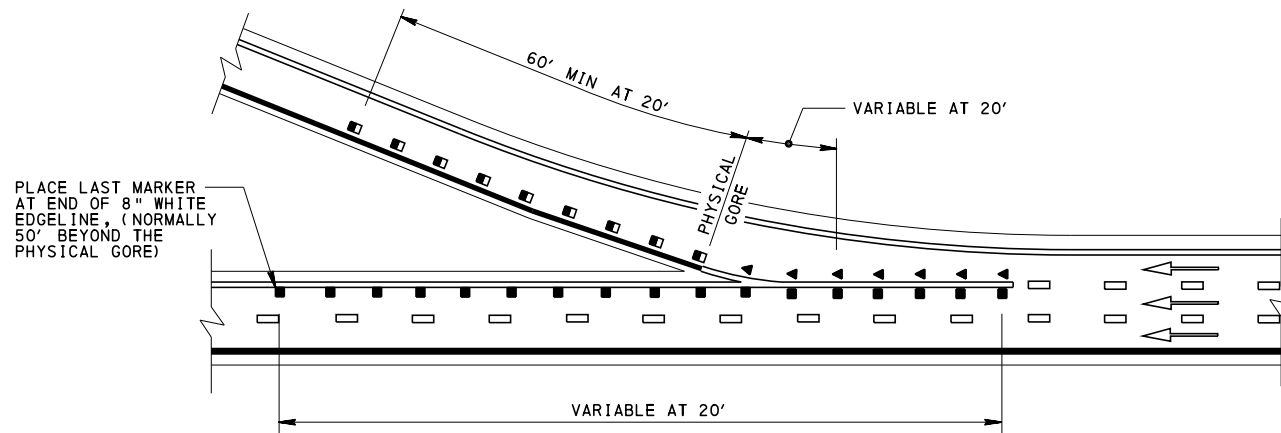
- NOTES:**
- 1. STANDARD CHARACTERS ARE 24 GRID UNITS HIGH AND 4 UNITS WIDE (EXCEPT LETTER "I" AND THE NUMBER "1" WHICH ARE 1 UNIT WIDE).
 - 2. VERTICAL STROKES ARE 1 UNIT WIDE, HORIZONTAL STROKES ARE 4 UNITS HIGH.
 - 3. SPACE 1 UNIT (MIN.) BETWEEN CHARACTERS OR AS OTHERWISE SHOWN (OPTICAL SPACING MAY BE USED).
 - 4. STANDARD CHARACTER HEIGHTS ARE 8', EXCEPT FOR THE 6' RAILROAD "R" SYMBOL.
 - 5. FOR 8' HIGH CHARACTERS, THE WIDTH IS 16" (USE 4" FOR EACH GRID SQUARE).
 - 6. FOR 10' HIGH CHARACTERS, THE WIDTH IS 20" (USE 5" FOR EACH GRID SQUARE).
 - 7. FOR 6' HIGH CHARACTERS, THE WIDTH IS 12" (USE 3" FOR EACH GRID SQUARE).

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

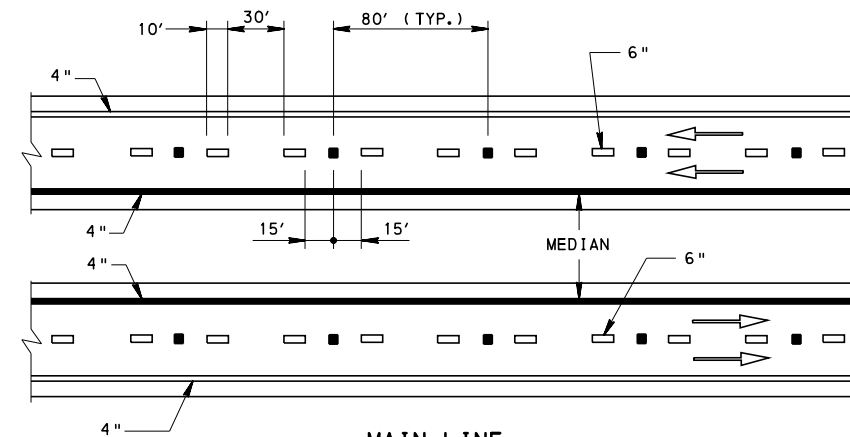
PAVEMENT MARKINGS

LEGEND AND SYMBOLS
STANDARD ALPHABET & NUMERALS

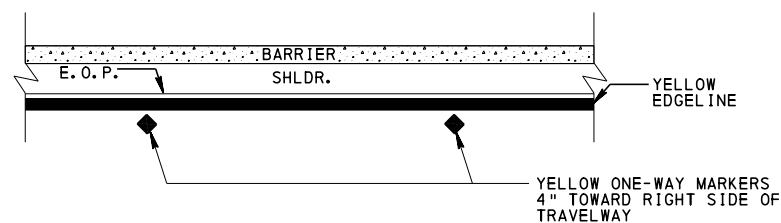
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 13 OF 13 TC-8600
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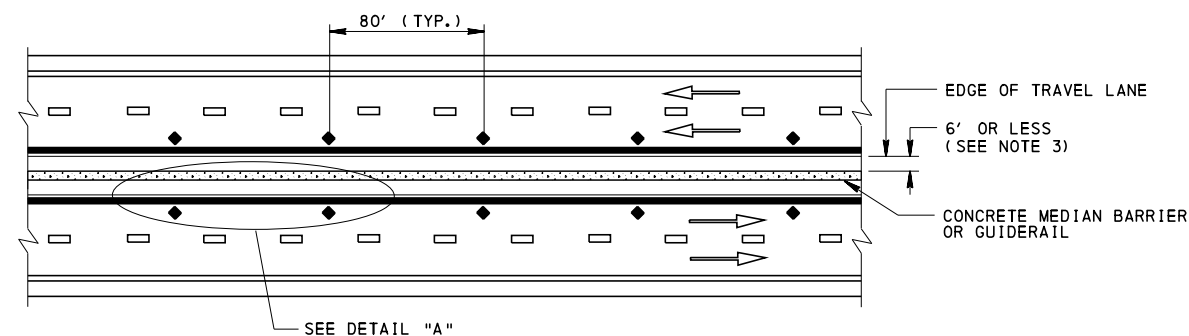
EXIT GORE AREA



MAIN LINE



DETAIL "A"



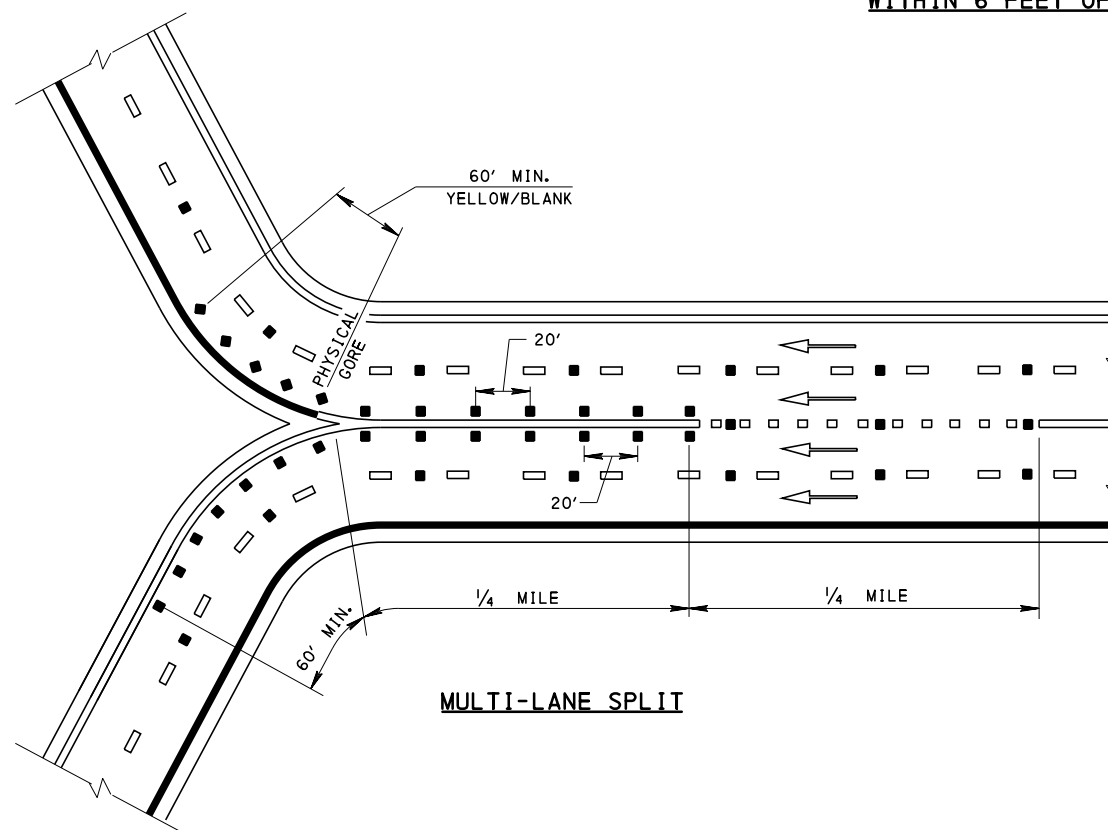
**CONCRETE MEDIAN BARRIER OR GUIDERAIL
WITHIN 6 FEET OF TRAVEL LANE**

LEGEND

- TWO-WAY MARKER WITH WHITE/BLANK REFLECTOR
- ◆ TWO-WAY MARKER WITH YELLOW/BLANK REFLECTOR
- ▲ TWO-WAY MARKER WITH WHITE/RED REFLECTOR
- TWO-WAY MARKER WITH YELLOW/RED REFLECTOR
- WHITE
- YELLOW
- BROKEN WHITE
- ➔ DIRECTION OF TRAVEL

NOTES:

1. MATERIAL AND WORKMANSHIP IN ACCORDANCE WITH PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PUBLICATION 408, OR AS INDICATED OR DIRECTED.
2. PLACE MARKERS ALONG A LANE LINE (BROKEN LINE) MIDWAY BETWEEN THE PAINTED PORTIONS.
3. PLACE MARKERS ALONG AN EDGE OR CHANNELIZING LINE WITH NEAR EDGE OF MARKER CASTING 4" FROM NEAR EDGE OF PAINTED LINE, WHEN CONCRETE MEDIAN BARRIER OR GUIDERAIL IS WITHIN 6' OF TRAVEL LANE.
4. INSTALL MARKERS 4" MIN. FROM ANY PAVEMENT SEAM, JOINT OR EDGE.
5. SEE SHEET 4 FOR MARKER DETAILS.
6. FOR MARKER SPACING ON CURVES SEE SHEET 3.



MULTI-LANE SPLIT

INSTALLATION PATTERNS - FREEWAYS & EXPRESSWAYS

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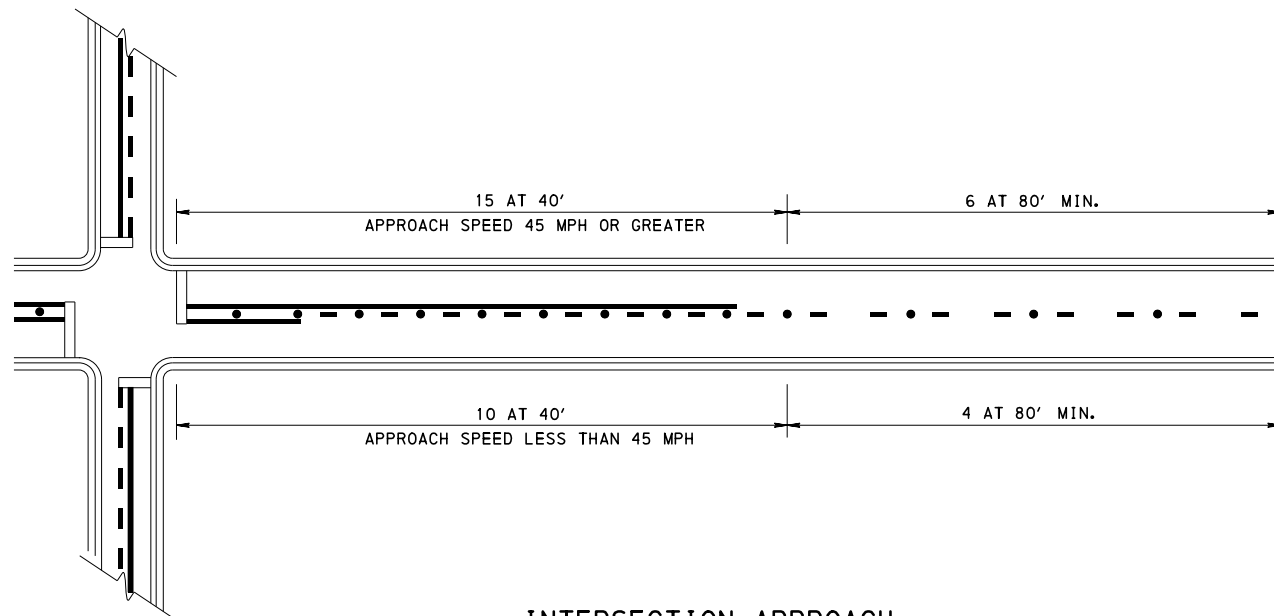
SNOWPLOWABLE RAISED
PAVEMENT MARKERS

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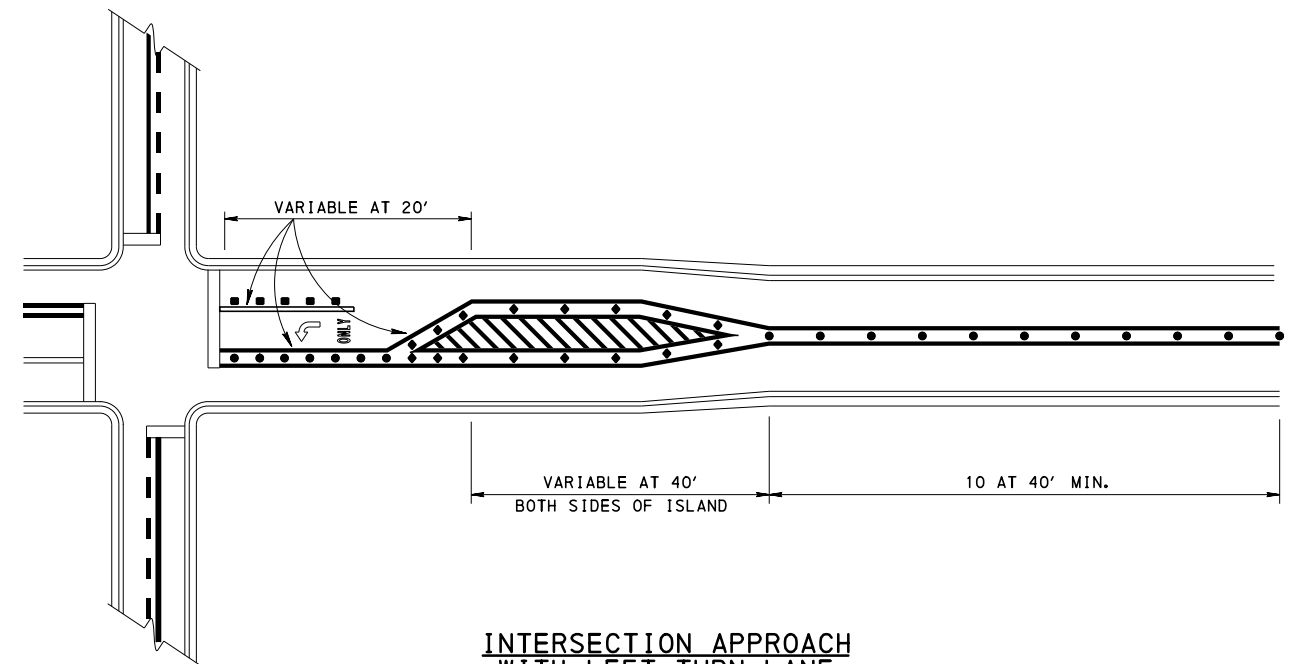
RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

SHT. 1 OF 4

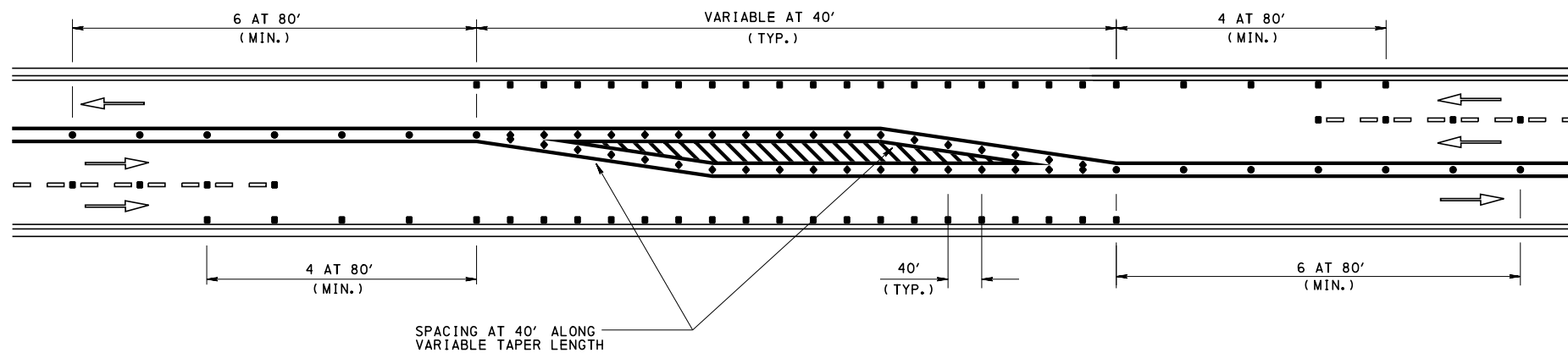
TC-8602



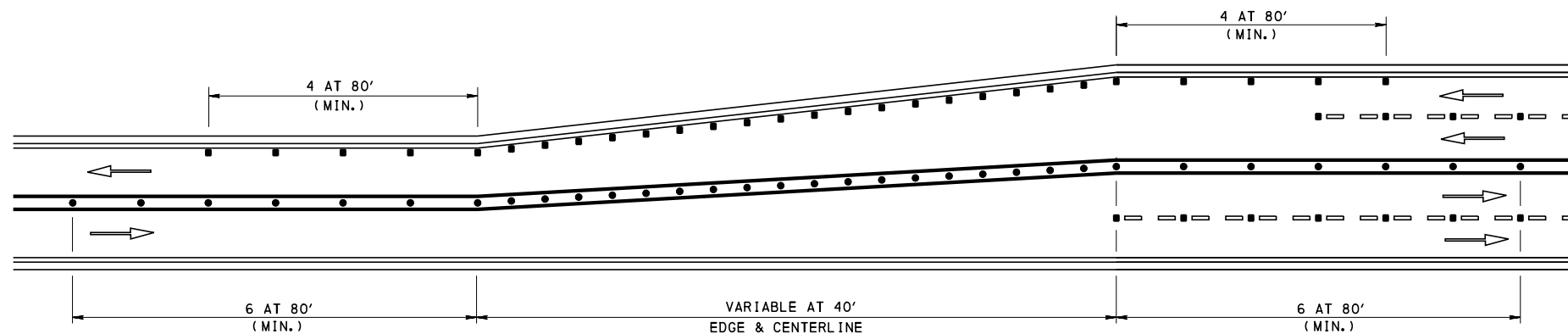
INTERSECTION APPROACH



INTERSECTION APPROACH
WITH LEFT-TURN LANE



TWO LANES TO ONE LANE



FOUR LANES TO TWO LANES

TRANSITION

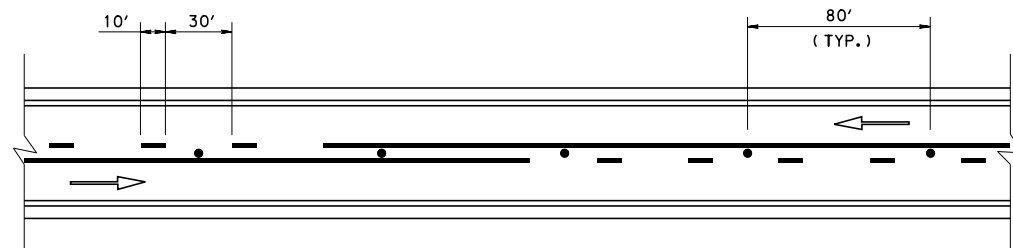
LEGEND

- TWO-WAY MARKER WITH WHITE/BLANK REFLECTOR
- ◆ TWO-WAY MARKER WITH YELLOW/BLANK REFLECTOR
- TWO-WAY MARKER WITH YELLOW/YELLOW REFLECTOR
- ===== WHITE
- ===== YELLOW
- - - - - BROKEN WHITE
- - - - - BROKEN YELLOW
- ➡ DIRECTION OF TRAVEL

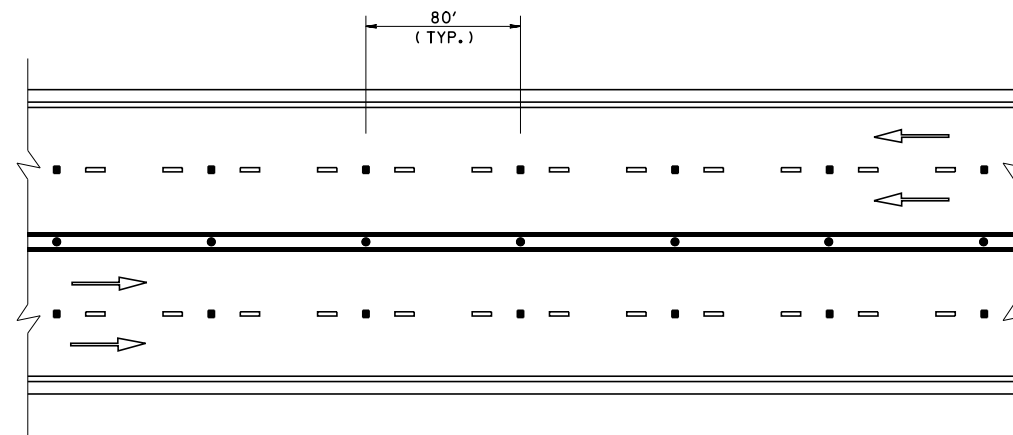
NOTES:

1. SEE SHEET 3 FOR ADDITIONAL NOTES.
2. FOR MARKER SPACING ON CURVES SEE SHEET 3.

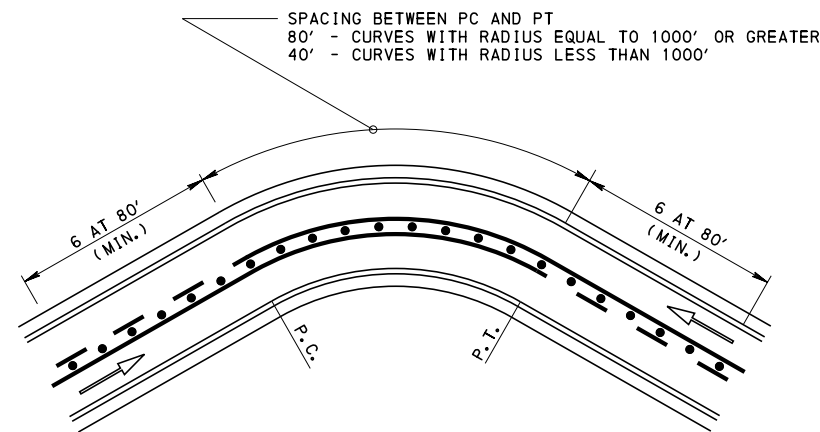
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SNOWPLOWABLE RAISED PAVEMENT MARKERS		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 2 OF 4 TC-8602



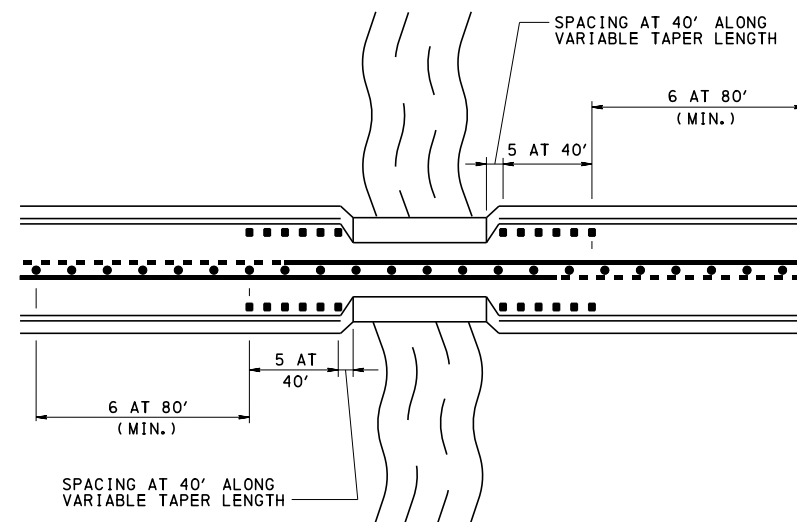
TWO-LANE ROADWAY



UNDIVIDED FOUR LANES



CURVES

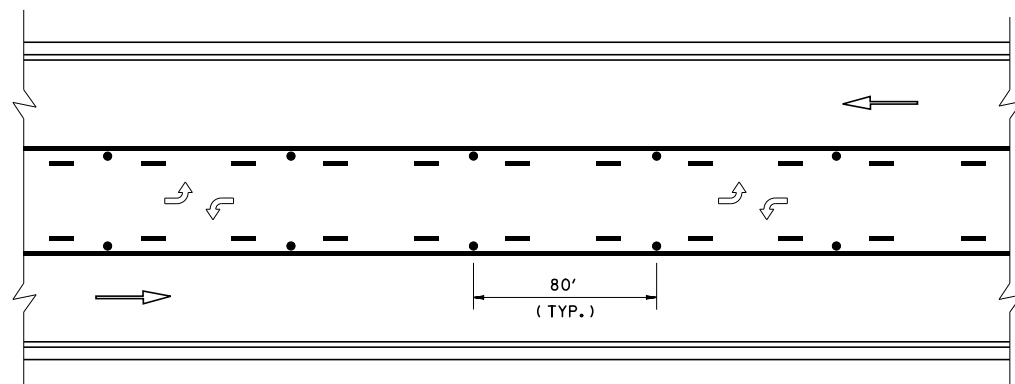


NARROW BRIDGE

ACROSS STRUCTURE USE BARRIER-MOUNT DELINEATORS

NOTES:

1. MARKERS INSTALLED AT THE DOUBLE YELLOW CENTER LINE SHALL BE PLACED BETWEEN THE TWO PAINTED LINES. MARKERS SHALL NOT BE PLACED WITHIN THE LIMITS OF THE PAINTED LINES EXCEPT WHERE LINES DEVIATE VISIBLY FROM THEIR CORRECT ALIGNMENT, AND THEN ONLY WITH THE APPROVAL OF THE ENGINEER.
2. PLACE MARKERS INSTALLED ALONG A LANE LINE (BROKEN LINE) MIDWAY BETWEEN THE PAINTED PORTION.
3. PLACE MARKERS ALONG AN EDGE OR CHANNELIZING LINE WITH THE NEAR EDGE OF THE MARKER CASTING 1" MAXIMUM FROM THE NEAR EDGE OF THE PAINTED LINE.
4. SPACE MARKERS INSTALLED AT THE CENTERLINE AT 80' UNLESS OTHERWISE SHOWN ON THE DRAWINGS. AT LOCATIONS IDENTIFIED AS FOG AREAS OR AREAS WITH A HIGH INCIDENCE OF HEAD-ON OR SIDESWIPE CRASHES, SPACE THE CENTERLINE MARKERS AT 40'.



CENTER LANE LEFT-TURN ONLY

LEGEND

- TWO-WAY MARKER WITH WHITE/BLANK REFLECTOR
- TWO-WAY MARKER WITH YELLOW/YELLOW REFLECTOR
- WHITE
- YELLOW
- - BROKEN WHITE
- - BROKEN YELLOW
- ➡ DIRECTION OF TRAVEL

COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF MAINTENANCE AND OPERATIONS

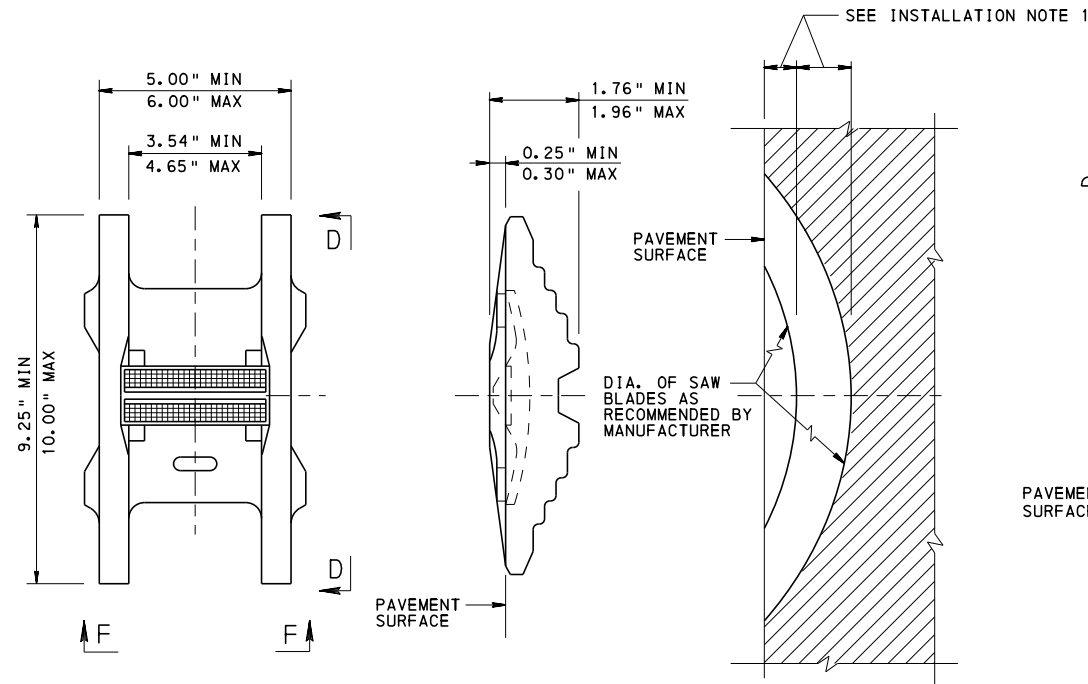
SNOWPLOWABLE RAISED
 PAVEMENT MARKERS

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PLAN VIEW
TWO-WAY

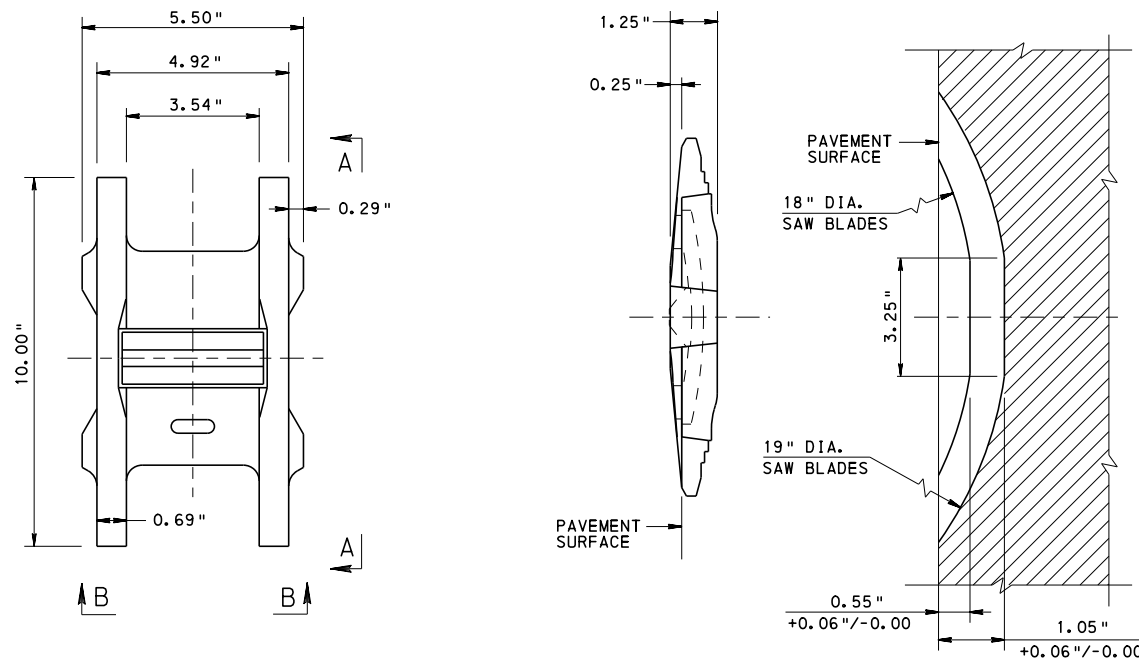
SECTION D-D

SECTION F-F

RAISED PAVEMENT MARKERS

INSTALLATION NOTES:

1. SAW CUT TO DIMENSIONS RECOMMENDED BY MANUFACTURER.
2. INSPECT SAW CUT FOR PROPER FIT OF THE MARKER.
 - PROVIDE APPROXIMATELY 0.125" CLEARANCE (SIDE-TO-SIDE MOVEMENT) FOR THE CASTING WHEN INSERTED INTO THE CUT.
 - INSTALL MARKER WITH ALL LEVELING LUGS IN CONTACT WITH THE PAVEMENT.
 - INSURE THE LEADING EDGES OF THE CASTING LIE BELOW THE PAVEMENT SURFACE.
3. SAW CUT AREAS TO BE DRY AND FREE OF MATERIAL THAT ADVERSELY AFFECTS THE ADHESIVE BOND.
4. INSTALL THE MARKERS WITH TWO-COMPONENT EPOXY ADHESIVE THAT MEETS AASHTO STANDARD SPECIFICATION M237 AND CLASSIFIED AS TYPE IV, BY FIRST FILLING THE SAW CUT TO WITHIN APPROXIMATELY 0.375" OF PAVEMENT SURFACE AND THEN PLACING THE MARKER BY HAND INTO THE EPOXY FILLED SAW CUT. AFTER PLACEMENT OF MARKER, MAKE THE EPOXY FLUSH OR SLIGHTLY BELOW PAVEMENT SURFACE. NO EPOXY SHOULD OBSCURE OR BLOCK THE LENS.



PLAN VIEW

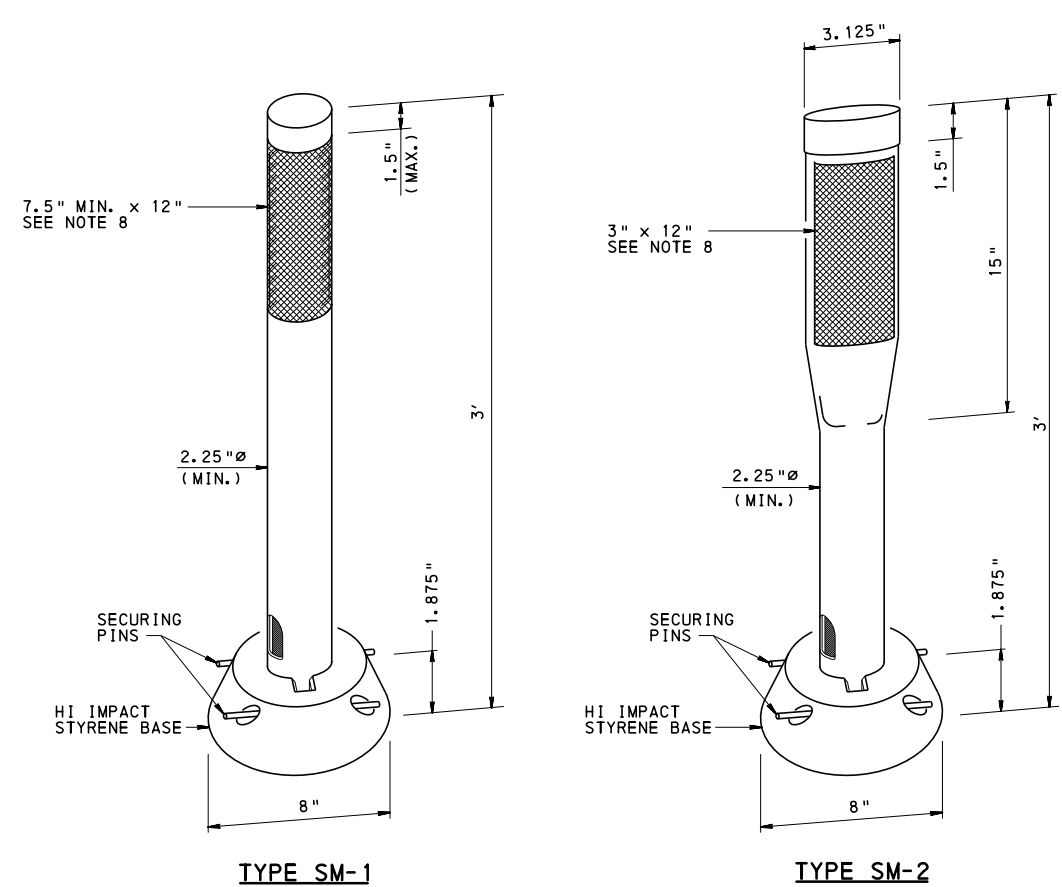
SECTION A-A

SECTION B-B

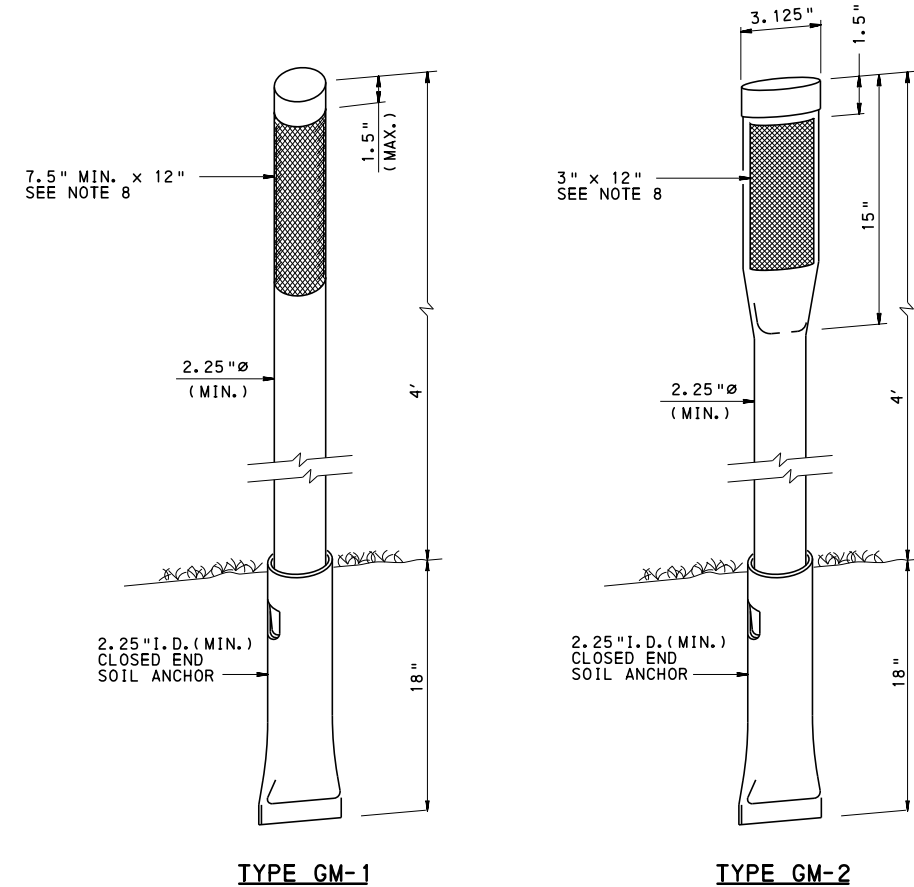
BRIDGE DECK MARKER

COMMONWEALTH OF PENNSYLVANIA
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SNOWPLOWABLE RAISED PAVEMENT MARKERS

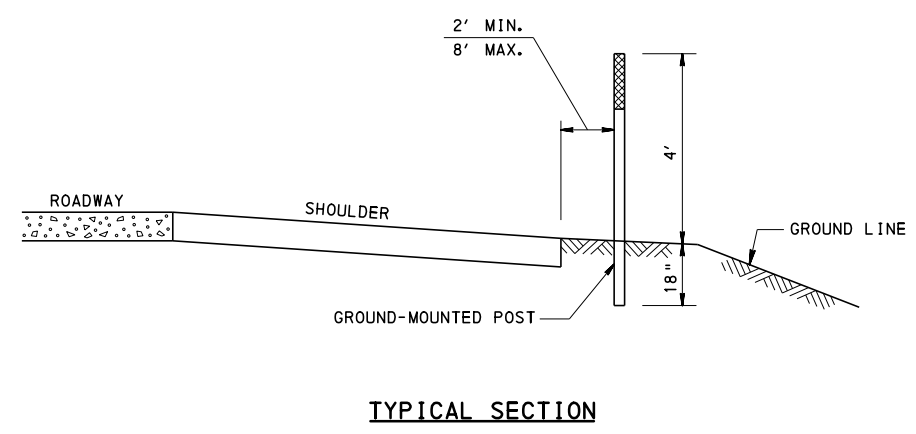
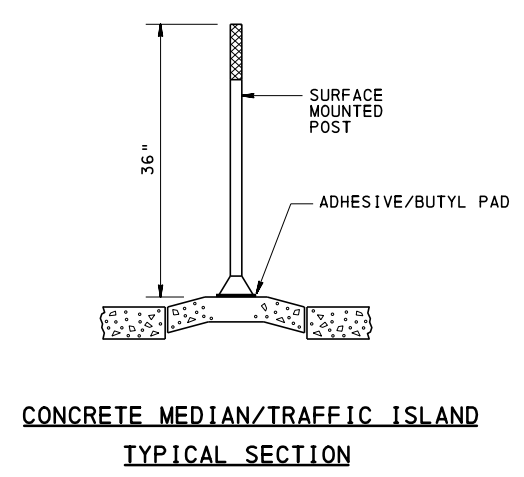


SURFACE-MOUNTED POSTS



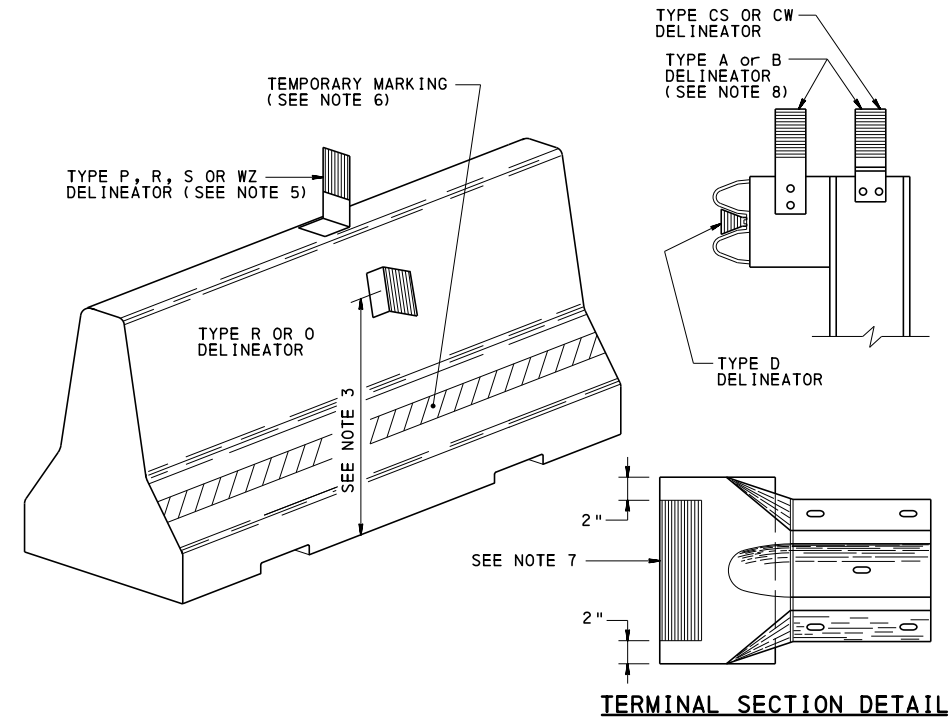
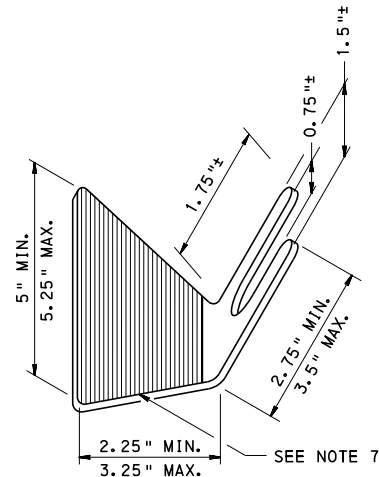
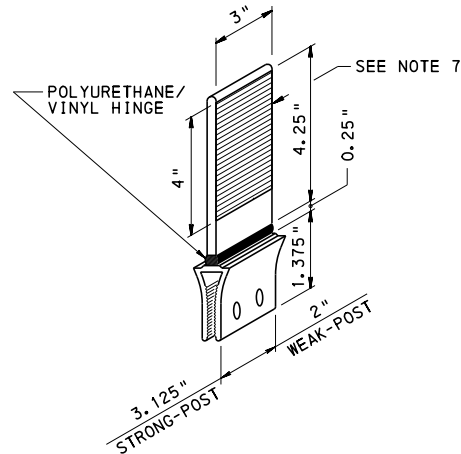
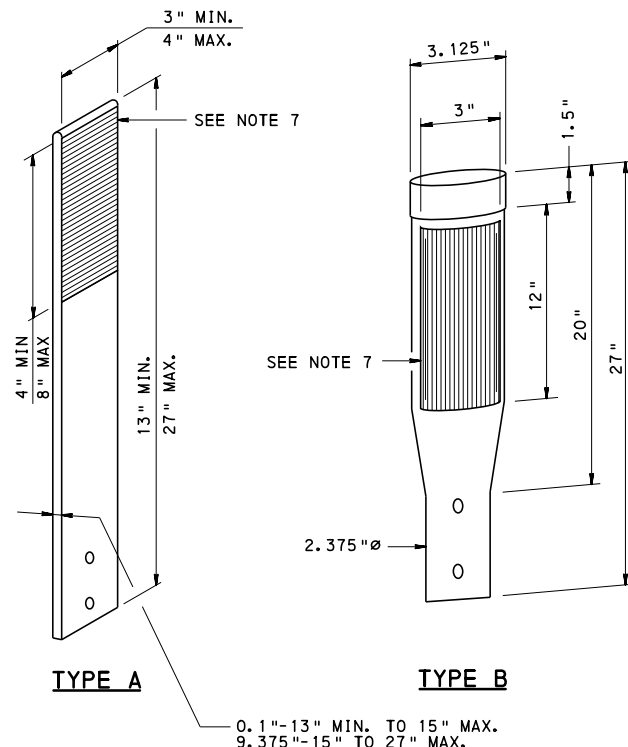
GROUND-MOUNTED POSTS

- NOTES:**
1. USE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH PUBLICATION 408.
 2. GALVANIZE METAL SOIL ANCHOR AFTER FABRICATION, IN ACCORDANCE WITH ASTM A 123.
 3. FOR GUIDE RAIL AND BARRIER DELINEATORS, SEE SHEET 2.
 4. FOR INTERCHANGE AREAS LOCATION DETAILS, SEE SHEET 3.
 5. FOR LOCATION/PLACEMENT NOTES, SEE SHEET 4.
 6. FOR DELINEATOR SPACING ON CURVES, SEE SHEET 3.
 7. USE TYPE SM-1 AND GM-1 POSTS IN AREAS WHERE TRAFFIC MOVEMENTS NEED MULTI-DIRECTION DELINEATION, SUCH AS ISLANDS, RADII AT INTERSECTIONS AND THE ENDS OF MEDIANS.
 8. USE ANY BULLETIN 15 APPROVED SHEETING.



PLACEMENT

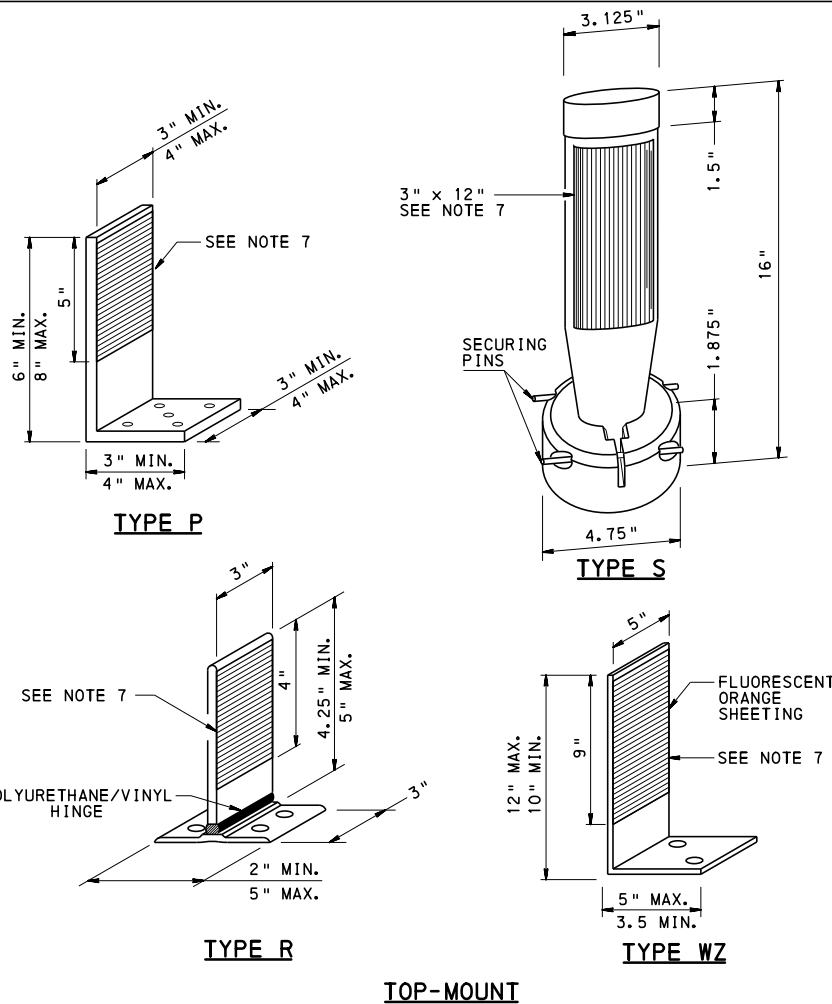
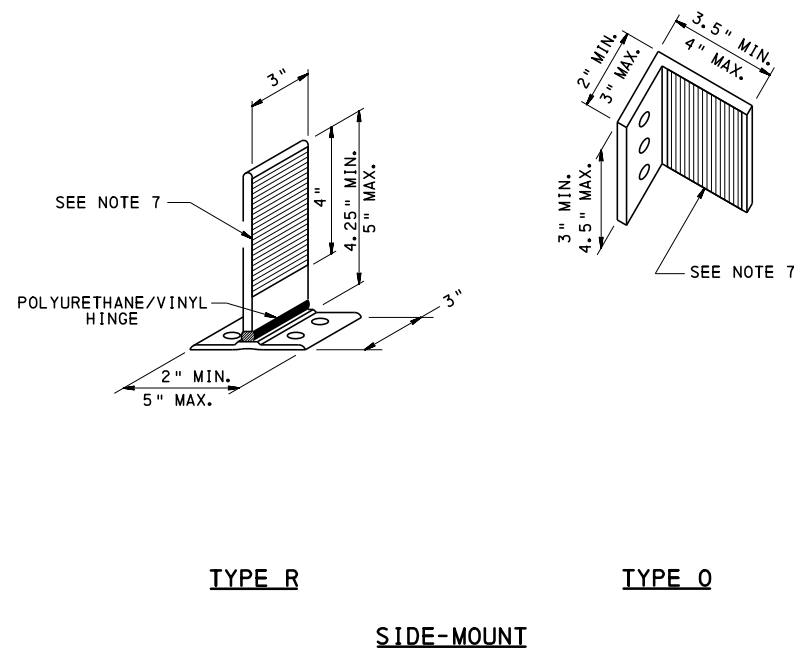
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
DELINEATION		
FLEXIBLE POSTS DETAILS		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 1 OF 4 TC-8604



GUIDE-RAIL DELINEATORS

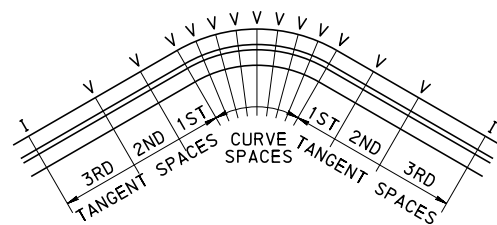
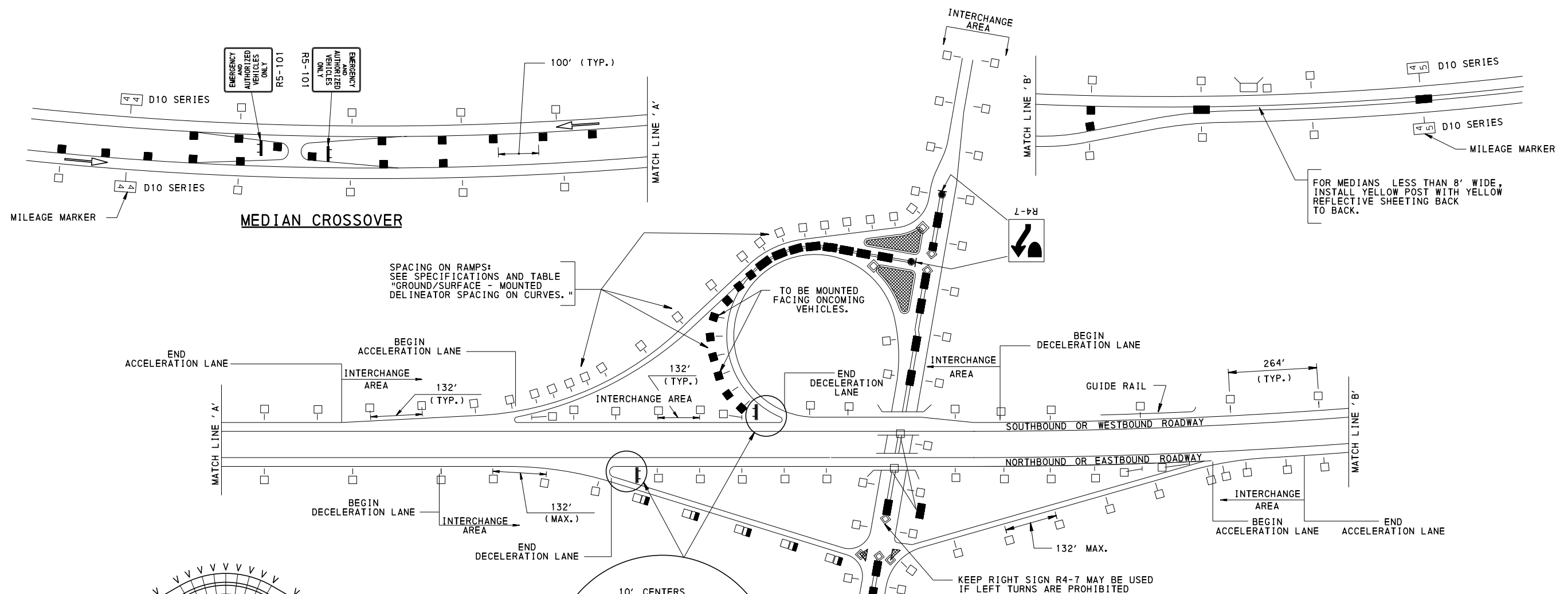
DELINEATOR PLACEMENT

1. SEE PUB. 72M, RC-52M & RC-53M FOR GUIDE RAIL DETAILS.
2. SEE PUB. 72M, RC-57M FOR CONCRETE MEDIAN BARRIER DETAILS.



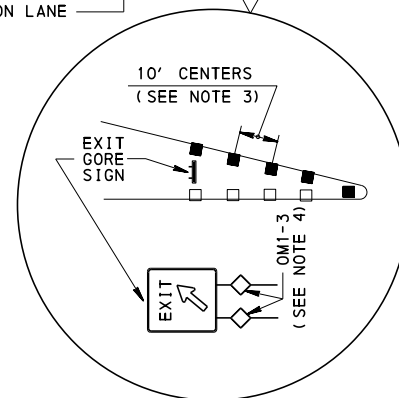
NOTES:

1. USE MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH PUBLICATION 408.
2. INSTALL DELINEATORS ON GUIDE RAIL AT 37.5' SPACING ON HORIZONTAL CURVES WITH A RADIUS LESS THAN OR EQUAL TO 1000' AND AT 75' SPACING ON HORIZONTAL CURVES WITH A RADIUS GREATER THAN 1000' AND TANGENTS. INSTALL 1 FT² MINIMUM OF TYPE III YELLOW REFLECTIVE SHEETING ON TERMINAL SECTION END TREATMENTS.
3. SIDE-MOUNTED DELINEATORS TYPE "R" OR TYPE "O" SHALL BE LOCATED 26" FROM THE PAVEMENT TO THE CENTER OF THE DELINEATOR. AN ADDITIONAL SIDE-MOUNTED DELINEATOR MAY BE LOCATED ON THE LOWER SLOPE OF THE BARRIER WHEN JUSTIFIED BY ENGINEERING JUDGEMENT.
4. MOUNT DELINEATORS ON THE TOP AND/OR SIDE OF BARRIERS OR BRIDGE PARAPETS AS SPECIFIED AT A MAXIMUM LONGITUDINAL SPACING OF 80' FOR TANGENT SECTIONS AND 40' FOR CURVE SECTIONS WITH A RADIUS LESS THAN 1,000'.
5. IN WORK ZONES, INSTALL TYPE WZ DELINEATORS ON THE TOP OF ALL TEMPORARY BARRIERS THAT ARE ADJACENT TO TRAVEL LANES AT MAXIMUM 40' SPACING. USE ORANGE SHEETING. USE SHEETING ON BOTH SIDES OF DELINEATOR WHEN USED BETWEEN TRAFFIC TRAVELING IN OPPOSITE DIRECTIONS. TYPE WZ DELINEATORS MAY BE MADE OF ANY LIGHTWEIGHT MATERIALS THAT MAINTAIN A VERTICAL ORIENTATION (±10 DEGREES) AND DO NOT NEED TO BE OF AN APPROVED TYPE LISTED IN BULLETIN 15.
6. IN AN EFFORT TO MINIMIZE ERADICATION IN WORK ZONES, CONTINUOUS WHITE OR YELLOW 6" WIDE PAVEMENT MARKINGS MAY BE INSTALLED AS SHOWN ON TEMPORARY BARRIER INSTEAD OF BEING PLACED ON THE ROAD SURFACE. THE LINE MAY BE ANY APPROVED PAINT OR PAVEMENT MARKING TAPE THAT SATISFIES THE MINIMUM RETROREFLECTIVITY REQUIREMENTS.
7. USE ANY BULLETIN 15 APPROVED SHEETING.
8. AS PER MANUFACTURER'S RECOMMENDATION.



RADIUS ON CURVE		SPACING ON CURVE	SPACING IN ADVANCE OF AND BEYOND CURVES		
MAX. FEET	MIN. FEET		FIRST SPACE	SECOND SPACE	THIRD SPACE
7000 to 5501	220				
5500 to 4001	200				
4000 to 2901	180		264	264	264
2900 to 2451	160				
2450 to 2001	140				
2000 to 1551	120				
1550 to 1151	100		200		
1150 to 751	80		160		
750 to 351	60		120	180	240
350 to 151	40		80	120	180
150 to 100	20		40	80	160

**GROUND/SURFACE-MOUNTED
DELINEATOR SPACING ON CURVES**



LEGEND

- WHITE POST AND SHEETING
- YELLOW POST AND SHEETING
- RED POST AND SHEETING
- YELLOW POST WITH YELLOW SHEETING BACK TO BACK
- WHITE POST AND SHEETING FACING TRAFFIC WITH RED SHEETING FACING WRONG-WAY MOVEMENT
- DELINEATORS LOCATED AS DIRECTED BY THE ENGINEER
- ◇ OM1-3 OR YELLOW FLEXIBLE DELINEATOR POST (FOR NARROW MEDIANS)
- ➔ DIRECTION OF TRAVEL

NOTES:

1. INSTALL GROUND/SURFACE-MOUNTED DELINEATORS IN ADVANCE OF POINT WHERE TANGENT MEETS SPIRAL OR POINT OF CURVATURE AND BEYOND POINT WHERE SPIRAL MEETS TANGENT OR POINT OF TANGENCY. SPACE SHOWN IN TABLE, BEGINNING AT MID-POINT OF CURVE.
2. INSTALL GUIDE RAIL AND BARRIER MOUNT DELINEATORS AS INDICATED ON SHEET 2.
3. IN GORE AREAS, MAKE THE COLOR OF THE DELINEATORS THE SAME, AS THE ADJACENT EDGE LINE AND RAISED PAVEMENT MARKERS.
4. INSTALL ONLY ONE OM1-3 SIGN ON EACH POST OF GORE EXIT SIGN.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

DELINEATION

**LOCATION DETAILS
INTERCHANGE AREAS**

1. LOCATION:

- A. LIGHTED THROUGH ROADWAYS - DO NOT PLACE DELINEATORS ON THE THROUGH ROADWAY BETWEEN INTERCHANGES WHERE FIXED SOURCE LIGHTING IS INSTALLED UNLESS OTHERWISE SPECIFIED.
- B. UNLIGHTED THROUGH ROADWAYS - ON ROADWAYS WITHOUT FIXED SOURCE LIGHTING, CONTINUOUSLY PLACE DELINEATORS ALONG THE RIGHT SIDE OF THE THROUGH ROADWAYS. PLACE DELINEATORS ON THE LEFT SIDE OF THROUGH ROADWAYS AT THE FOLLOWING LOCATIONS:
- I. WHERE GUIDE RAIL OR CONCRETE BARRIER IS LOCATED ON THE LEFT WITHIN 6' OF THE EDGE OF SHOULDER.
 - II. ALONG RIGHT-HAND HORIZONTAL CURVES WITH A RADIUS OF 2000' OR LESS.
 - III. ALONG COMBINATIONS OF OVER-VERTICALS AND RIGHT-HAND HORIZONTAL CURVES WITH A RADIUS LESS THAN 2900'.
 - IV. ON THE APPROACH AND THROUGHOUT LEFT LANE DROPS OR PAVEMENT WIDTH TRANSITIONS.
 - V. WITHIN THE LIMITS OF MEDIAN CROSSEOVERS (AS SHOWN ON SHEET 3).
 - VI. WITHIN THE LIMITS OF VARIABLE MEDIAN WIDTHS (AS SHOWN ON SHEET 3).
 - VII. ALONG PAVED MEDIANS WITH CURBING.
- C. INTERCHANGE AREAS - PLACE DELINEATORS ALONG THE RIGHT SIDE IN ALL INTERCHANGE AREAS AND ALONG THE LEFT SIDE WITHIN THE LIMITS OF ALL LEFT-HAND RAMPS. PLACE DELINEATORS ALONG ACCELERATION, DECELERATION AND SPEED CHANGE LANES; ALONG THE RIGHT SIDE OF THE THROUGH ROADWAY AND ALONG THE OUTSIDE OR BOTH SIDES AS SPECIFIED ON ALL RAMPS.
- D. BRIDGE PARAPETS - PLACE DELINEATORS ON PARAPETS OF ALL BRIDGES WHERE RPMs ARE USED ON APPROACH ROADWAY.
- E. SPECIAL PURPOSE DELINEATION - PLACE OBJECT AND CLEARANCE MARKER GROUP (OM SERIES) ALONG THE THROUGH ROADWAY AND WITHIN THE INTERCHANGE AREA AS SPECIFIED IN ADDITION TO THE ABOVE SPECIFIED DELINEATORS.
- F. MAINTENANCE MARKERS - PLACE ONE RED FLEXIBLE DELINEATOR POST ADJACENT TO NEAR EDGE OF MAINTENANCE APPURTENANCE (END PIPE, END WALL, INLET, ETC...). MATCH REFLECTIVE SHEETING COLOR WITH THE NEAREST PAVEMENT MARKING EDGE LINE COLOR.

2. LONGITUDINAL SPACING:

- A. RIGHT SIDE OF THROUGH ROADWAYS - INSTALL DELINEATORS AT 264' EXCEPT IN INTERCHANGE AREAS WITH RIGHT-HAND RAMPS, ACCELERATION OR DECELERATION LANES AND ALONG HORIZONTAL CURVES.
- B. LEFT SIDE OF THROUGH ROADWAYS - WHEN REQUIRED, INSTALL DELINEATORS AT 264' EXCEPT IN INTERCHANGE AREAS WITH LEFT-HAND RAMPS, ACCELERATION OR DECELERATION LANES, ON MEDIAN BARRIERS AND ALONG HORIZONTAL CURVES.
- C. INTERCHANGE AREAS - SPACE DELINEATORS IN INTERCHANGE AREA AT 132'.
- D. HORIZONTAL CURVES - SPACE DELINEATORS AS INDICATED IN THE TABLE "GROUND/SURFACE-MOUNTED DELINEATOR SPACING ON CURVES," SEE SHEET 3.
- E. EXIT GORES, CHANNELIZING ISLANDS AND RAMP TERMINALS - THE DESIGN VARIES SUFFICIENTLY AT THESE LOCATIONS MAKING TYPICAL SPACING UNAVAILABLE FOR EVERY SITUATION. DETERMINE DELINEATOR SPACING AND APPLICATION ON SITE AND AS DIRECTED BY THE ENGINEER. HOWEVER, USE A MINIMUM SPACING OF 20' EXCEPT AS INDICATED.
- F. SPECIAL PURPOSE DELINEATION - PLACE SPECIAL PURPOSE DELINEATION (W16 SERIES) ALONG THE ROADWAY WITHOUT REGARD TO LONGITUDINAL SPACING. SPACE DELINEATION ON MEDIAN BARRIERS IN ACCORDANCE WITH NOTE 4 ON SHEET 2.
- G. MEDIAN CROSSEOVERS - PLACE DELINEATORS AT 100' SPACING AS INDICATED ON SHEET 3 WITH A MINIMUM OF FIVE DELINEATORS ON THE APPROACH TO THE CROSSOVER AND THREE DELINEATORS BEYOND THE CROSSOVER.
- H. MAINTENANCE MARKERS - PLACE MAINTENANCE MARKERS ALONG THE ROADWAY WITHOUT REGARD TO LONGITUDINAL SPACING.

3. VERTICAL PLACEMENT:

INSTALL DELINEATORS THAT THE TOPS ARE APPROXIMATELY 4' ABOVE THE GROUND. INSTALL ON CONCRETE BARRIERS OR GUIDE RAIL AS INDICATED ON SHEET 2.

4. LATERAL PLACEMENT:

- A. NO GUIDE RAIL - INSTALL DELINEATORS 2' TO 8' BEHIND THE OUTER EDGE OF THE SHOULDER, OR AS DIRECTED.
- B. GUIDE RAIL - INSTALL DELINEATORS IN THE WEB OF GUIDE RAIL OR ON GUIDE RAIL POSTS AS INDICATED ON SHEET 2, IF THE GUIDE RAIL IS LESS THAN 8' FROM THE OUTER EDGE OF SHOULDER. DO NOT USE GROUND-MOUNTED DELINEATORS IN AREAS WITH GUIDE RAIL. IF THE GUIDE RAIL IS MORE THAN 8' FROM THE OUTER EDGE OF THE SHOULDER, INSTALL DELINEATORS AS SPECIFIED IN NOTE 4.A.
- C. CURB IN PLACE - INSTALL DELINEATORS IMMEDIATELY BEHIND CURB PROVIDED PLACEMENT WILL NOT EXCEED 8' BEHIND THE EDGE OF SHOULDER. IF THE CURB IS MORE THAN 8' FROM THE EDGE OF SHOULDER, INSTALL DELINEATORS AS SPECIFIED IN NOTE 4.A.
- D. OBSTRUCTION MARKERS - INSTALL OBSTRUCTION MARKER DELINEATORS ADJACENT TO NEAR EDGE OF THE OBSTRUCTION.
- E. MAINTENANCE MARKERS - INSTALL MARKERS ADJACENT TO NEAR EDGE OF THE APPURTENANCE (END PIPE, END WALL, INLET, ETC...).

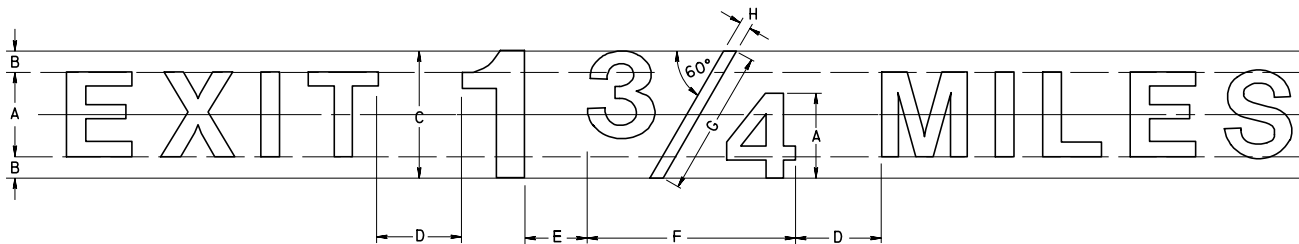
5. TYPES OF DELINEATOR:

- A. WHITE DELINEATORS - PLACE ON RIGHT SIDE OF THROUGH ROADWAYS, ALONG RIGHT-HAND ACCELERATION, DECELERATION AND SPEED-CHANGE LANES, RAMPS AND ON CHANNELIZING OR DIVISIONAL ISLANDS WHERE TRAFFIC IN THE SAME DIRECTION MAY PROCEED ON BOTH SIDES OF THE ISLAND.
- B. YELLOW DELINEATORS - PLACE ON LEFT SIDE OF THROUGH ROADWAYS, RAMPS AND ON CHANNELIZING OR DIVISIONAL ISLANDS WHERE TRAFFIC IN THE SAME DIRECTION TRAVELS TO THE RIGHT OF THE ISLAND AND ALONG LEFT-HAND ACCELERATION, DECELERATION AND SPEED CHANGE LANES AND ON FAR SIDE OF MEDIAN CROSSEOVERS. ALSO AT EDGE OF OBSTRUCTIONS ADJACENT TO THE ROADWAY AND AT POINT WHERE GUIDE RAIL BECOMES TANGENT TO THE ROADWAY.
- C. RED DELINEATORS - PLACE ON RIGHT, LEFT, OR BOTH SIDES OF ROADWAYS OR RAMPS TO INDICATE WRONG-WAY MOVEMENT. ALSO PLACE ON BOTH SIDES OF RUN-AWAY TRUCK ESCAPE RAMPS.
- D. SPECIAL PURPOSE DELINEATOR (OM1-3) MARKERS - PLACE MARKERS AT LOCATIONS SHOWN ON SHEET 3.
- E. MAINTENANCE MARKERS - PLACE RED POST WITH WHITE REFLECTIVE SHEETING ON RIGHT SIDE OF THROUGH HIGHWAY. PLACE RED POST WITH YELLOW REFLECTIVE SHEETING ON LEFT SIDE OF THROUGH HIGHWAY.

NOTES:

1. MAINTENANCE MARKERS ARE RED FLEXIBLE DELINEATOR POSTS INSTALLED TO CALL OUT THE LOCATION OF END PIPES, END WALLS, INLETS, ETC... FOR MAINTENANCE PURPOSES ONLY. ANY MAINTENANCE APPURTENANCE WITHIN OR ADJACENT TO THE ROADWAY THAT IS DEEMED A HAZARD SHOULD BE REMOVED, MODIFIED OR DELINEATED AS SUCH.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
DEL INEATION AND MARKERS		
LOCATION / PLACEMENT NOTES		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 4 OF 4 TC-8604



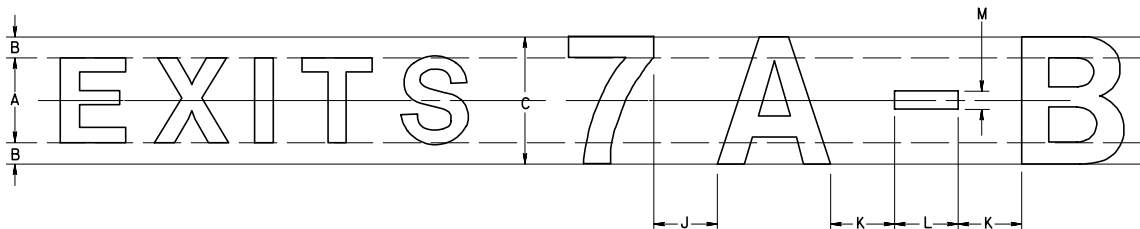
NOTES:

1. DIAGONAL OF FRACTION TO BE CENTERED OPTICALLY.
2. FOR DIMENSION F, WHEN THE NUMERATOR OF A FRACTION IS 1 (ONE), USE $2.2 \times A$. FOR ALL OTHER NUMERATORS, USE $2.5 \times A$.
3. THE SOLIDUS (SLANTED LINE OR FORWARD SLASH) IS INTENDED TO BE USED FOR FRACTIONS ONLY.

SIZE OF THE FRACTION RECTANGLE IS DETERMINED AS FOLLOWS:

DIMENSION	TITLE	RATIO TO HEIGHT OF UPPER CASE
A	LETTER HEIGHT	$1.0 \times \text{UPPER CASE}$
B	SPACE TO TOP OR BOTTOM OF RECTANGLE	$0.25 \times A$
C	HEIGHT OF RECTANGLE	$1.5 \times A$
D	SPACE TO NEXT CHARACTER	$1.5 \times A$
E	SPACE FROM WHOLE NUMBER TO A FRACTION OR DECIMAL POINT	$0.75 \times A$
F	WIDTH OF RECTANGLE	SEE NOTE 2
G	LENGTH OF DIAGONAL	$1.7 \times A$
H	THICKNESS OF DIAGONAL	LETTER STROKE WIDTH

SIZE AND SPACING OF FRACTIONS
(EXCEPT SEE SHEET 9 OF 12 OF TC-8701D FOR FRACTIONS ON LINES WITH UPPER/LOWER CASE LEGEND)



NOTE:

THE DASH IS TO BE CENTERED OPTICALLY.

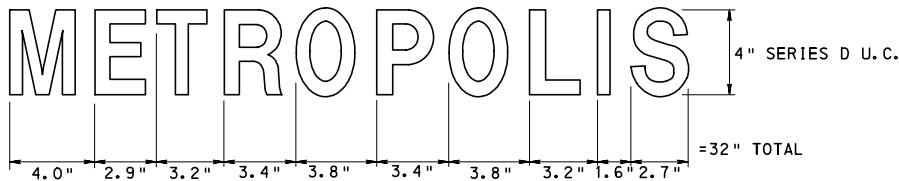
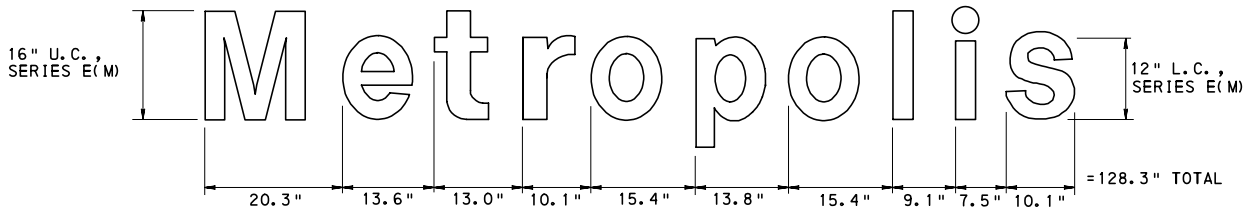
SIZE AND SPACING OF DASHES ARE DETERMINED AS FOLLOWS:

DIMENSION	TITLE	RATIO TO HEIGHT OF UPPER CASE
A	LETTER HEIGHT	$1.0 \times \text{UPPER CASE}$
B	SPACE TO TOP OR BOTTOM OF RECTANGLE	$0.25 \times A$
C	HEIGHT OF RECTANGLE	$1.5 \times A$
J	SPACE FROM NUMBER TO A CHARACTER	$0.75 \times A$
K	SPACE FROM DASH TO A CHARACTER	$0.75 \times A$
L	LENGTH OF DASH	$0.75 \times A$
M	THICKNESS OF DASH	STROKE WIDTH

SIZE AND SPACING OF DASHES

HOW TO USE THE SPACING CHARTS ON THE FOLLOWING SHEETS:

- a. SELECT THE PROPER CHART FROM SHEETS 2 THROUGH 17. (FOR LETTER AND NUMERAL SIZES WHERE A SPACING CHART HAS NOT BEEN PROVIDED, USE ONE OR MORE OF THE EXISTING CHARTS TO DETERMINE PROPER SPACING. FOR EXAMPLE, FOR 15" SERIES E NUMERALS, USE 1.5 TIMES THE VALUES SHOWN FOR 10" SERIES E NUMERALS.)
- b. IN THE LEFT-HAND VERTICAL COLUMN, LOCATE THE FIRST LETTER OF THE WORD BEING SPACED.
- c. LOCATE THE NEXT LETTER OF THE WORD BEING SPACED IN THE TOP HORIZONTAL COLUMN.
- d. THE FIGURE AT THE INTERSECTION OF THE TWO COLUMNS IS THE TOTAL WIDTH IN INCHES OF THE FIRST LETTER PLUS THE SPACE TO THE LEFT EDGE OF THE NEXT LETTER.
- e. TO COMPUTE THE LENGTH OF A WORD, ADD THE FIGURES OBTAINED BY REPEATING STEPS a, b, c AND d FOR EACH SUCCESSIVE LETTER PLUS THE LETTER WIDTH ONLY OF THE LAST LETTER. SEE EXAMPLES. (THE LETTER WIDTHS ARE GIVEN IN THE EXTREME LEFT-HAND COLUMN OF EACH CHART.)
- f. THE MINIMUM SPACING BETWEEN WORDS IN THE SAME LINE SHOULD BE THE HEIGHT OF THE UPPER CASE LETTER USED IN THAT LINE.



EXAMPLES

NOTES:

1. SEE TC-8701D FOR SIGN LAYOUT DETAILS FOR FREEWAY AND EXPRESSWAY SIGNS.
2. TO DETERMINE THE PROPER SIZE, SERIES AND TYPE OF LEGEND TO BE USED, SEE THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) AND TC-8701D.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SPACING CHARTS DIRECT APPLIED LETTERS & NUMERALS		
GENERAL INFORMATION		
RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 1 OF 12 TC-8700C

20" UPPER CASE to 15" lower case																											
15 20		15" UPPER CASE										20" UPPER CASE															
		a	c	d	e	g	o	q	i	b	h	k	l	m	n	p	r	u	f	j	s	t	v	w	x	y	z
18.8	A	23.2		23.6		24.0			24.4				22.8	20.0	22.8	22.4	22.0	22.2	21.8	22.0							
15.2	B	20.8		21.2		21.6			22.0				20.4	17.6	20.4	20.0	19.6	19.8	19.4	19.6	20.6						
16.4	C	21.2		21.6		22.0			22.4				20.8	18.0	20.8	20.4	20.0	20.2	19.8	20.0	21.0						
16.2	D	22.0		22.4		22.8			23.2				21.6	18.8	21.6	21.2	20.8	21.0	20.6	20.8	21.8						
12.8	E	18.2		18.6		19.0			19.4				17.8	15.0	17.8	17.4	17.0	17.2	16.8	17.0	18.0						
12.2	F	17.4		17.8		18.2			18.6				17.0	14.2	17.0	16.6	16.2	16.4	16.0	16.2	17.2						
17.4	G	23.2		23.6		24.0			24.4				22.8	20.0	22.8	22.4	22.0	22.2	21.8	22.0	23.0						
15.4	H	22.0		22.4		22.8			23.2				21.6	18.8	21.6	21.2	20.8	21.0	20.6	20.8	21.8						
4.0	I	10.6		11.0		11.4			11.8				10.2	7.4	10.2	9.8	9.4	9.6	9.2	9.4	10.4						
11.2	J	17.8		18.2		18.6			19.0				17.4	14.6	17.4	17.0	16.6	16.8	16.4	16.6	17.6						
15.6	K	20.0		20.4		20.8			21.2				19.6	16.8	19.6	19.2	18.8	19.0	18.6	18.8	19.8						
11.8	L	16.8		17.2		17.6			18.0				16.4	13.6	16.4	16.0	15.6	15.8	15.4	15.6	16.6						
18.4	M	25.0		25.4		25.8			26.2				24.6	21.8	24.6	24.2	23.8	24.0	23.6	23.8	24.8						
16.6	N	23.2		23.6		24.0			24.4				22.8	20.0	22.8	22.4	22.0	22.2	21.8	22.0	23.0						
18.6	O	24.4		24.8		25.2			25.6				24.0	21.2	24.0	23.6	23.2	23.4	23.0	23.2	24.2						
14.6	P	19.6		20.0		20.4			20.8				19.2	16.4	19.2	18.8	18.4	18.6	18.2	18.4	19.4						
18.6	Q	24.4		24.8		25.2			25.6				24.0	21.2	24.0	23.6	23.2	23.4	23.0	23.2	24.2						
15.0	R	20.6		21.0		21.4			21.8				20.2	17.4	20.2	19.8	19.4	19.6	19.2	19.4	20.4						
14.4	S	19.6		20.0		20.4			20.8				19.2	16.4	19.2	18.8	18.4	18.6	18.2	18.4	19.4						
14.4	T	19.0		19.4		19.8			20.2				18.6	15.8	18.6	18.2	17.8	18.0	17.6	17.8	18.8						
15.6	U	22.2		22.6		23.0			23.4				21.8	19.0	21.8	21.4	21.0	21.2	20.8	21.0	22.0						
17.0	V	21.4		21.8		22.2			22.6				21.0	18.2	21.0	20.6	20.2	20.4	20.0	20.2	21.2						
26.6	W	31.2		31.6		32.0			32.4				30.8	28.0	30.8	30.4	30.0	30.2	29.8	30.0	31.0						
17.2	X	21.4		21.8		22.2			22.6				21.0	18.2	21.0	20.6	20.2	20.4	20.0	20.2	21.2						
17.6	Y	21.6		22.0		22.4			22.8				21.2	18.4	21.2	20.8	20.4	20.6	20.2	20.4	21.4						
14.4	Z	19.6		20.0		20.4			20.8				19.2	16.4	19.2	18.8	18.4	18.6	18.2	18.4	19.4						

16" UPPER CASE to 12" lower case																											
12 16																											
	a	c	d	e	g	o	q	i	b	h	k	l	m	n	p	r	u	f	j	s	t	v	w	x	y	z	
15.0	A	18.6		18.9		19.2			19.5				18.2	16.0	18.2	17.9	17.6	17.8	17.4	17.6	18.4						
12.2	B	16.6		17.0		17.3			17.6				16.3	14.1	16.3	16.0	15.7	15.8	15.5	15.7	16.5						
13.1	C	17.0		17.3		17.6			17.9				16.6	14.4	16.6	16.3	16.0	16.2	15.8	16.0	16.8						
13.0	D	17.6		17.9		18.2			18.6				17.3	15.0	17.3	17.0	16.6	16.8	16.5	16.6	17.4						
10.2	E	14.6		14.9		15.2			15.5				14.2	12.0	14.2	13.9	13.6	13.8	13.4	13.6	14.4						
9.8	F	13.9		14.2		14.6			14.9				13.6	11.4	13.6	13.3	13.0	13.1	12.8	13.0	13.8						
13.9	G	18.6		18.9		19.2			19.5				18.2	16.0	18.2	17.9	17.6	17.8	17.4	17.6	18.4						
12.3	H	17.6		17.9		18.2			18.6				17.3	15.0	17.3	17.0	16.6	16.8	16.5	16.6	17.4						
3.2	I	8.5		8.8		9.1			9.4				8.2	5.9	8.2	7.8	7.5	7.7	7.4	7.5	8.3						
9.0	J	14.2		14.6		14.9			15.2				13.9	11.7	13.9	13.6	13.3	13.4	13.1	13.3	14.1						
12.5	K	16.0		16.3		16.6			17.0				15.7	13.4	15.7	15.4	15.0	15.2	14.9	15.0	15.8						
9.4	L	13.4		13.8		14.1			14.4				13.1	10.9	13.1	12.8	12.5	12.6	12.3	12.5	13.3						
14.7	M	20.0		20.3		20.6			21.0				19.7	17.4	19.7	19.4	19.0	19.2	18.9	19.0	19.8						
13.3	N	18.6		18.9		19.2			19.5				18.2	16.0	18.2	17.9	17.6	17.8	17.4	17.6	18.4						
14.9	O	19.5		19.8		20.2			20.5				19.2	17.0	19.2	18.9	18.6	18.7	18.4	18.6	19.4						
11.7	P	15.7		16.0		16.3			16.6				15.4	13.1	15.4	15.0	14.7	14.9	14.6	14.7	15.5						
14.9	Q	19.5		19.8		20.2			20.5				19.2	17.0	19.2	18.9	18.6	18.7	18.4	18.6	19.4						
12.0	R	16.5		16.8		17.1			17.4				16.2	13.9	16.2	15.8	15.5	15.7	15.4	15.5	16.3						
11.5	S	15.7		16.0		16.3			16.6				15.4	13.1	15.4	15.0	14.7	14.9	14.6	14.7	15.5						
11.5	T	15.2		15.5		15.8			16.2				14.9	12.6	14.9	14.6	14.2	14.4	14.1	14.2	15.0						
12.5	U	17.8		18.1		18.4			18.7				17.4	15.2	17.4	17.1	16.8	17.0	16.6	16.8	17.6						
13.6	V	17.1		17.4		17.8			18.1				16.8	14.6	16.8	16.5	16.2	16.3	16.0	16.2	17.0						
21.3	W	25.0		25.3		25.6			25.9				24.6	22.4	24.6	24.3	24.0	24.2	23.8	24.0	24.8						
13.8	X	17.1		17.4		17.8			18.1				16.8	14.6	16.8	16.5	16.2	16.3	16.0	16.2	17.0						
14.1	Y	17.3		17.6		17.9			18.2				17.0	14.7	17.0	16.6	16.3	16.5	16.2	16.3	17.1						
11.5	Z	15.7		16.0		16.3			16.6				15.4	13.1	15.4	15.0	14.7	14.9	14.6	14.7	15.5						

13.3" UPPER CASE to 10" lower case																											
10 13.3																											
	a	c	d	e	g	o	q	i	b	h	k	l	m	n	p	r	u	f	j	s	t	v	w	x	y	z	
12.5	A	15.4		15.7		16.0								16.2				15.2	13.3	15.2	14.9	14.6	14.8	14.5	14.6	15.3	
10.1	B	13.8		14.1		14.4								14.6				13.6	11.7	13.6	13.3	13.0	13.2	12.9	13.0	13.7	
10.9	C	14.1		14.4		14.6								14.9				13.8	12.0	13.8	13.6	13.3	13.4	13.2	13.3	14.0	
10.8	D	14.6		14.9		15.2								15.4				14.4	12.5	14.4	14.1	13.8	14.0	13.7	13.8	14.5	
8.5	E	12.1		12.4		12.6								12.9				11.8	10.0	11.8	11.6	11.3	11.4	11.2	11.3	12.0	
8.1	F	11.6		11.8		12.1								12.4				11.3	9.4	11.3	11.0	10.8	10.9	10.6	10.8	11.4	
11.6	G	15.4		15.7		16.0								16.2				15.2	13.3	15.2	14.9	14.6	14.8	14.5	14.6	15.3	
10.2	H	14.6		14.9		15.2								15.4				14.4	12.5	14.4	14.1	13.8	14.0	13.7	13.8	14.5	
2.7	I	7.0		7.3		7.6								7.8				6.8	4.9	6.8	6.5	6.3	6.4	6.1	6.3	6.9	
7.4	J	11.8		12.1		12.4								12.6				11.6	9.7	11.6	11.3	11.0	11.2	10.9	11.0	11.7	
10.4	K	13.3		13.6		13.8								14.1				13.0	11.2	13.0	12.8	12.5	12.6	12.4	12.5	13.2	
7.8	L	11.2		11.4		11.7								12.0				10.9	9.0	10.9	10.6	10.4	10.5	10.2	10.4	11.0	
12.2	M	16.6		16.9		17.2								17.4				16.4	14.5	16.4	16.1	15.8	16.0	15.7	15.8	16.5	
11.0	N	15.4		15.7		16.0								16.2				15.2	13.3	15.2	14.9	14.6	14.8	14.5	14.6	15.3	
12.4	O	16.2		16.5		16.8								17.0				16.0	14.1	16.0	15.7	15.4	15.6	15.3	15.4	16.1	
9.7	P	13.0		13.3		13.6								13.8				12.8	10.9	12.8	12.5	12.2	12.4	12.1	12.2	12.9	
12.4	Q	16.2		16.5		16.8								17.0				16.0	14.1	16.0	15.7	15.4	15.6	15.3	15.4	16.1	
10.0	R	13.7		14.0		14.2								14.5				13.4	11.6	13.4	13.2	12.9	13.0	12.8	12.9	13.6	
9.6	S	13.0		13.3		13.6								13.8				12.8	10.9	12.8	12.5	12.2	12.4	12.1	12.2	12.9	
9.6	T	12.6		12.9		13.2								13.4				12.4	10.5	12.4	12.1	11.8	12.0	11.7	11.8	12.5	
10.4	U	14.8		15.0		15.3								15.6				14.5	12.6	14.5	14.2	14.0	14.1	13.8	14.0	14.6	
11.3	V	14.2		14.5		14.8								15.0				14.0	12.1	14.0	13.7	13.4	13.6	13.3	13.4	14.1	
17.7	W	20.7		21.0		21.3								21.5				20.5	18.6	20.5	20.2	20.0	20.1	19.8	20.0	20.6	
11.4	X	14.2		14.5		14.8								15.0				14.0	12.1	14.0	13.7	13.4	13.6	13.3	13.4	14.1	
11.7	Y	14.4		14.6		14.9								15.2				14.1	12.2	14.1	13.8	13.6	13.7	13.4	13.6	14.2	
9.6	Z	13.0		13.3		13.6								13.8				12.8	10.9	12.8	12.5	12.2	12.4	12.1	12.2	12.9	

15" lower case to 15" lower case																									
15	14.8	13.6					14.6	4.6	14.4					13.6	9.6	8.8	12.8	9.8	15.2	23.2	15.4	15.6	12.2		
		14.8	14.6	15.4	16.0	14.4			13.6	14.2	14.8	13.8	9.2											13.6	
		a	c	e	g	i			k	m	o	q	u											w	y
14.8	a	20.0	20.4	20.4	20.4	20.8			21.2	19.6	16.8	19.6	19.2	18.8	19.0	18.6	18.8	19.8							
14.4	b	20.0	20.4	20.4	20.4	20.8			21.2	19.6	16.8	19.6	19.2	18.8	19.0	18.6	18.8	19.8							
13.6	c	18.2	18.6	18.6	19.0	19.4			19.4	17.8	15.0	17.8	17.4	17.0	17.2	16.8	17.0	18.0							
14.6	d	21.0	21.4	21.4	21.8	22.2			22.2	20.6	17.8	20.6	20.2	19.8	20.0	19.6	19.8	20.8							
14.8	e	20.4	20.8	20.8	21.2	21.6			21.6	20.0	17.2	20.0	19.6	19.2	19.4	19.0	19.2	20.2							
9.6	f	14.2	14.6	14.6	15.0	15.4			15.4	13.8	11.0	13.8	13.4	13.0	13.2	12.8	13.0	14.0							
14.6	g	21.0	21.4	21.4	21.8	22.2			22.2	20.6	17.8	20.6	20.2	19.8	20.0	19.6	19.8	20.8							
13.8	h	20.2	20.6	20.6	21.0	21.4			21.4	19.8	17.0	19.8	19.4	19.0	19.2	18.8	19.0	20.0							
4.6	i	10.6	11.0	11.0	11.4	11.8			11.8	10.2	7.4	10.2	9.8	9.4	9.6	9.2	9.4	10.4							
8.8	j	14.8	15.2	15.2	15.6	16.0			16.0	14.4	11.6	14.4	14.0	13.6	13.8	13.4	13.6	14.6							
14.2	k	18.2	18.6	18.6	19.0	19.4			19.4	17.8	15.0	17.8	17.4	17.0	17.2	16.8	17.0	18.0							
6.4	l	11.2	11.6	11.6	12.0	12.4			12.4	10.8	8.0	10.8	10.4	10.0	10.2	9.8	10.0	11.0							
22.6	m	29.0	29.4	29.4	29.8	30.2			30.2	28.6	25.8	28.6	28.2	27.8	28.0	27.6	27.8	28.8							
13.8	n	20.2	20.6	20.6	21.0	21.4			21.4	19.8	17.0	19.8	19.4	19.0	19.2	18.8	19.0	20.0							
15.4	o	21.0	21.4	21.4	21.8	22.2			22.2	20.6	17.8	20.6	20.2	19.8	20.0	19.6	19.8	20.8							
14.6	p	20.2	20.6	20.6	21.0	21.4			21.4	19.8	17.0	19.8	19.4	19.0	19.2	18.8	19.0	20.0							
16.0	q	21.0	21.4	21.4	21.8	22.2			22.2	20.6	17.8	20.6	20.2	19.8	20.0	19.6	19.8	20.8							
9.2	r	13.8	14.2	14.2	14.6	15.0			15.0	13.4	10.6	13.4	13.0	12.6	12.8	12.4	12.6	13.6							
12.8	s	18.0	18.4	18.4	18.8	19.2			19.2	17.6	14.8	17.6	17.2	16.8	17.0	16.6	16.8	17.8							
9.8	t	14.6	15.0	15.0	15.4	15.8			15.8	14.2	11.4	14.2	13.8	13.4	13.6	13.2	13.4	14.4							
13.6	u	20.0	20.4	20.4	20.8	21.2			21.2	19.6	16.8	19.6	19.2	18.8	19.0	18.6	18.8	19.8							
15.2	v	19.2	19.6	19.6	20.0	20.4			20.4	18.8	16.0	18.8	18.4	18.0	18.2	17.8	18.0	19.0							
23.2	w	27.4	27.8	27.8	28.2	28.6			28.6	27.0	24.2	27.0	26.6	26.2	26.4	26.0	26.2	27.2							
15.4	x	19.2	19.6	19.6	20.0	20.4			20.4	18.8	16.0	18.8	18.4	18.0	18.2	17.8	18.0	19.0							
15.6	y	19.6	20.0	20.0	20.4	20.8			20.8	19.2	16.4	19.2	18.8	18.4	18.6	18.2	18.4	19.4							
12.2	z	17.2	17.6	17.6	18.0	18.4			18.4	16.8	14.0	16.8	16.4	16.0	16.2	15.8	16.0	17.0							

12" lower case to 12" lower case																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
12	11.8		10.9		11.8		11.7		12.3		12.8		11.7		3.7		11.5		11.0		5.1		18.1		11.0		11.7		7.4		10.9		7.7		7.0		10.2		7.8		12.2		18.6		12.3		12.5		9.8																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	a	c	e	g	o	q	d	i	b	h	k	m	p	r	u	f	j	s	t	v	w	x	y	z																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
11.8	a	16.0	16.3	16.3	16.3	16.6	17.0	15.7	13.4	15.7	15.4	15.0	15.2	14.9	15.0	15.8	16.6	16.3	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16

10" lower case to 10" lower case																																																																								
10	9.8						9.7						3.1						6.4						5.9						8.5						6.5						10.1						15.4						10.2						10.4						8.1					
	a		c		e		g		o		q		d		i		b		h		k		m		p		r		u		f		j		s		t		v		w		x		y		z																									
	a	c	e	g	o	q	d	i	b	h	k	m	p	r	u	f	j	s	t	v	w	x	y	z																																																
9.8	a	13.3	13.6	13.6	13.8	13.8	13.8	14.1	14.1	14.1	14.1	14.1	14.1	14.1	13.0	11.2	13.0	12.8	12.5	12.6	12.4	12.5	13.2																																																	
9.6	b	13.3	13.6	13.6	13.8	13.8	13.8	14.1	14.1	14.1	14.1	14.1	14.1	14.1	13.0	11.2	13.0	12.8	12.5	12.6	12.4	12.5	13.2																																																	
9.0	c	12.1	12.4	12.4	12.4	12.6	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	11.8	10.0	11.8	11.6	11.3	11.4	11.2	11.3	12.0																																																	
9.7	d	14.0	14.2	14.2	14.5	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	13.7	11.8	13.7	13.4	13.2	13.3	13.0	13.2	13.8																																																	
9.8	e	13.6	13.8	13.8	14.1	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	13.3	11.4	13.3	13.0	12.8	12.9	12.6	12.8	13.4																																																	
6.4	f	9.4	9.7	9.7	10.0	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	10.2	9.2	7.3	9.2	8.9	8.6	8.8	8.5	8.6	9.3																																																	
9.7	g	14.0	14.2	14.2	14.5	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	13.7	11.8	13.7	13.4	13.2	13.3	13.0	13.2	13.8																																																	
9.2	h	13.4	13.7	13.7	14.0	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	13.2	11.3	13.2	12.9	12.6	12.8	12.5	12.6	13.3																																																	
3.1	i	7.0	7.3	7.3	7.6	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	7.8	6.8	4.9	6.8	6.5	6.3	6.4	6.1	6.3	6.9																																																	
5.9	j	9.8	10.1	10.1	10.4	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	10.6	9.6	7.7	9.6	9.3	9.0	9.2	8.9	9.0	9.7																																																	
9.4	k	12.1	12.4	12.4	12.6	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	12.9	11.8	10.0	11.8	11.6	11.3	11.4	11.2	11.3	12.0																																																	
4.3	l	7.4	7.7	7.7	8.0	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	7.2	5.3	7.2	6.9	6.7	6.8	6.5	6.7	7.3																																																	
15.0	m	19.3	19.6	19.6	19.8	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	19.0	17.2	19.0	18.8	18.5	18.6	18.4	18.5	19.2																																																	
9.2	n	13.4	13.7	13.7	14.0	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	13.2	11.3	13.2	12.9	12.6	12.8	12.5	12.6	13.3																																																	
10.2	o	14.0	14.2	14.2	14.5	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	13.7	11.8	13.7	13.4	13.2	13.3	13.0	13.2	13.8																																																	
9.7	p	13.4	13.7	13.7	14.0	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	13.2	11.3	13.2	12.9	12.6	12.8	12.5	12.6	13.3																																																	
10.6	q	14.0	14.2	14.2	14.5	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	14.8	13.7	11.8	13.7	13.4	13.2	13.3	13.0	13.2	13.8																																																	
6.1	r	9.2	9.4	9.4	9.7	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	8.9	7.0	8.9	8.6	8.4	8.5	8.2	8.4	9.0																																																	
8.5	s	12.0	12.2	12.2	12.5	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	12.8	11.7	9.8	11.7	11.4	11.2	11.3	11.0	11.2	11.8																																																	
6.5	t	9.7	10.0	10.0	10.2	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	9.4	7.6	9.4	9.2	8.9	9.0	8.8	8.9	9.6																																																	
9.0	u	13.3	13.6	13.6	13.8	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	14.1	13.0	11.2	13.0	12.8	12.5	12.6	12.4	12.5	13.2																																																	
10.1	v	12.8	13.0	13.0	13.3	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	12.5	10.6	12.5	12.2	12.0	12.1	11.8	12.0	12.6																																																	
15.4	w	18.2	18.5	18.5	18.8	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	18.0	16.1	18.0	17.7	17.4	17.6	17.3	17.4	18.1																																																	
10.2	x	12.8	13.0	13.0	13.3	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	13.6	12.5	10.6	12.5	12.2	12.0	12.1	11.8	12.0	12.6																																																	
10.4	y	13.0	13.3	13.3	13.6	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	13.8	12.8	10.9	12.8	12.5	12.2	12.4	12.1	12.2	12.9																																																	
8.1	z	11.4	11.7	11.7	12.0	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	11.2	9.3	11.2	10.9	10.6	10.8	10.5	10.6	11.1																																																	

15 20			20" UPPER CASE to 15" lower case																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
			14.8				13.6				12.8				12.2				9.6				8.8				8.0				7.2				6.4				5.6				4.8				4.0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			
			a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
18.8	A	22.0		22.4		22.8		23.2		23.6		24.0		24.4		24.8		25.2		25.6		26.0		26.4		26.8		27.2		27.6		28.0		28.4		28.8		29.2		29.6		30.0		30.4		30.8		31.2		31.6		32.0		32.4		32.8		33.2		33.6		34.0		34.4		34.8		35.2		35.6		36.0		36.4		36.8		37.2		37.6		38.0		38.4		38.8		39.2		39.6		40.0		40.4		40.8		41.2		41.6		42.0		42.4		42.8		43.2		43.6		44.0		44.4		44.8		45.2		45.6		46.0		46.4		46.8		47.2		47.6		48.0		48.4		48.8		49.2		49.6		50.0		50.4		50.8		51.2		51.6		52.0		52.4		52.8		53.2		53.6		54.0		54.4		54.8		55.2		55.6		56.0		56.4		56.8		57.2		57.6		58.0		58.4		58.8		59.2		59.6		60.0		60.4		60.8		61.2		61.6		62.0		62.4		62.8		63.2		63.6		64.0		64.4		64.8		65.2		65.6		66.0		66.4		66.8		67.2		67.6		68.0		68.4		68.8		69.2		69.6		70.0		70.4		70.8		71.2		71.6		72.0		72.4		72.8		73.2		73.6		74.0		74.4		74.8		75.2		75.6		76.0		76.4		76.8		77.2		77.6		78.0		78.4		78.8		79.2		79.6		80.0		80.4		80.8		81.2		81.6		82.0		82.4		82.8		83.2		83.6		84.0		84.4		84.8		85.2		85.6		86.0		86.4		86.8		87.2		87.6		88.0		88.4		88.8		89.2		89.6		90.0		90.4		90.8		91.2		91.6		92.0		92.4		92.8		93.2		93.6		94.0		94.4		94.8		95.2		95.6		96.0		96.4		96.8		97.2		97.6		98.0		98.4		98.8		99.2		99.6		100.0		100.4		100.8		101.2		101.6		102.0		102.4		102.8		103.2		103.6		104.0		104.4		104.8		105.2		105.6		106.0		106.4		106.8		107.2		107.6		108.0		108.4		108.8		109.2		109.6		110.0		110.4		110.8		111.2		111.6		112.0		112.4		112.8		113.2		113.6		114.0		114.4		114.8		115.2		115.6		116.0		116.4		116.8		117.2		117.6		118.0		118.4		118.8		119.2		119.6		120.0		120.4		120.8		121.2		121.6		122.0		122.4		122.8		123.2		123.6		124.0		124.4		124.8		125.2		125.6		126.0		126.4		126.8		127.2		127.6		128.0		128.4		128.8		129.2		129.6		130.0		130.4		130.8		131.2		131.6		132.0		132.4		132.8		133.2		133.6		134.0		134.4		134.8		135.2		135.6		136.0		136.4		136.8		137.2		137.6		138.0		138.4		138.8		139.2		139.6		140.0		140.4		140.8		141.2		141.6		142.0		142.4		142.8		143.2		143.6		144.0		144.4		144.8		145.2		145.6		146.0		146.4		146.8		147.2		147.6		148.0		148.4		148.8		149.2		149.6		150.0		150.4		150.8		151.2		151.6		152.0		152.4		152.8		153.2		153.6		154.0		154.4		154.8		155.2		155.6		156.0		156.4		156.8		157.2		157.6		158.0		158.4		158.8		159.2		159.6		160.0		160.4		160.8		161.2		161.6		162.0		162.4		162.8		163.2		163.6		164.0		164.4		164.8		165.2		165.6		166.0		166.4		166.8		167.2		167.6		168.0		168.4		168.8		169.2		169.6		170.0		170.4		170.8		171.2		171.6		172.0		172.4		172.8		173.2		173.6		174.0		174.4		174.8		175.2		175.6		176.0		176.4		176.8		177.2		177.6		178.0		178.4		178.8		179.2		179.6		180.0		180.4		180.8		181.2		181.6		182.0		182.4		182.8		183.2		183.6		184.0		184.4		184.8		185.2		185.6		186.0		186.4		186.8		187.2		187.6		188.0		188.4		188.8		189.2		189.6		190.0		190.4		190.8		191.2		191.6		192.0		192.4		192.8		193.2		193.6		194.0		194.4		194.8		195.2		195.6		196.0		196.4		196.8		197.2		197.6		198.0		198.4		198.8		199.2		199.6		200.0		200.4		200.8		201.2		201.6		202.0		202.4		202.8		203.2		203.6		204.0		204.4		204.8		205.2		205.6		206.0		206.4		206.8		207.2		207.6		208.0		208.4		208.8		209.2		209.6		210.0		210.4		210.8		211.2		211.6		212.0		212.4		212.8		213.2		213.6		214.0		214.4		214.8		215.2		215.6		216.0		216.4		216.8		217.2		217.6		218.0		218.4		218.8		219.2		219.6		220.0		220.4		220.8		221.2		221.6		222.0		222.4		222.8		223.2		223.6		224.0		224.4		224.8		225.2		225.6		226.0		226.4		226.8		227.2		227.6		228.0		228.4		228.8		229.2		229.6		230.0		230.4		230.8		231.2		231.6		232.0		232.4		232.8		233.2		233.6		234.0		234.4		234.8		235.2		235.6		236.0		236.4		236.8		237.2		237.6		238.0		238.4		238.8		239.2		239.6		240.0		240.4		240.8		241.2		241.6		242.0		242.4		242.8		243.2		243.6		244.0		244.4		244.8		245.2		245.6		246.0		246.4		246.8		247.2		247.6		248.0		248.4		248.8		249.2		249.6		250.0		250.4		250.8		251.2		251.6		252.0		252.4		252.8		253.2		253.6		254.0		254.4		254.8		255.2		255.6		256.0		256.4		256.8		257.2		257.6		258.0		258.4		258.8		259.2		259.6		260.0		260.4		260.8		261.2		261.6		262.0		262.4		262.8		263.2		263.6		264.0		264.4		264.8		265.2		265.6		266.0		266.4		266.8		267.2		267.6		268.0		268.4		268.8		269.2		269.6		270.0		270.4		270.8		271.2		271.6		272.0		272.4		272.8		273.2		273.6		274.0		274.4		274.8		275.2		275.6		276.0		276.4		276.8		277.2		277.6		278.0		278.4		278.8		279.2		279.6		280.0		280.4		280.8		281.2		281.6		282.0		282.4		282.8		283.2		283.6		284.0		284.4		284.8		285.2		285.6		286.0		286.4		286.8		287.2		287.6		288.0		288.4		288.8		289.2		289.6		290.0		290.4		290.8		291.2		291.6		292.0		292.4		292.8		293.2		293.6		294.0		294.4		294.8		295.2		295.6		296.0		296.4		296.8		297.2		297.6		298.0		298.4		298.8		299.2		299.6		300.0		300.4		300.8		301.2		301.6		302.0		302.4		302.8		303.2		303.6		304.0		304.4		304.8		305.2		305.6		306.0		306.4		306.8		307.2		307.6		308.0		308.4		308.8		309.2		309.6		310.0		310.4		310.8		311.2		311.6		312.0		312.4		312.8		313.2		313.6		314.0		314.4		314.8		315.2		315.6		316.0		316.4		316.8		317.2		317.6		318.0		318.4		318.8		319.2		319.6		320.0		320.4		320.8		321.2		321.6		322.0		322.4		322.8		323.2		323.6		324.0		324.4		324.8		325.2		325.6		326.0		326.4		326.8		327.2		327.6		328.0		328.4		328.8		329.2		329.6		330.0		330.4		330.8		331.2		331.6		332.0		332.4		332.8		333.2		333.6		334.0		334.4		334.8		335.2		335.6		336.0		336.4		336.8		337.2		337.6		338.0		338.4		338.8		339.2		339.6		340.0		340.4		340.8		341.2		341.6		342.0		342.4		342.8		343.2		343.6		344.0		344.4		344.8		345.2		345.6		346.0		346.4		346.8		347.2		347.6		348.0		348.4		348.8		349.2		349.6		350.0		350.4		350.8		351.2		351.6		352.0		352.4		352.8		353.2		353.6		354.0		354.4		354.8		355.2		355.6		356.0		356.4		356.8		357.2		357.6		358.0		358.4		358.8		359.2		359.6		360.0		360.4		360.8		361.2		361.6		362.0		362.4		362.8		363.2		363.6		364.0		364.4		364.8		365.2		365.6		366.0		366.4		366.8		367.2		367.6

12 16		16" UPPER CASE to 12" lower case																							
		11.8	10.9	11.7	11.7	12.8	3.7	11.5	11.0	11.4	5.1	11.0	11.7	12.4	7.7	7.0	10.2	7.8	12.2	18.6	12.3	12.5	9.8		
		a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x
15.0	A	17.6	17.9	17.9	18.2	18.2	18.6	18.6	17.3	15.0	17.1	17.0	16.6	16.8	16.5	16.6	17.4	15.5	15.0	16.8	16.5	16.6	17.4		
12.2	B	15.7	16.0	16.3	16.3	16.6	16.6	15.4	13.1	15.2	15.0	14.7	14.9	14.6	14.7	15.5	15.0	16.8	16.5	16.6	17.4				
13.1	C	16.0	16.3	16.6	16.6	17.0	17.0	15.7	13.4	15.5	15.4	15.0	15.2	14.9	15.0	15.8	15.8	15.0	16.8	16.5	16.6	17.4			
13.0	D	16.6	17.0	17.3	17.6	17.6	17.6	16.3	14.1	16.2	16.0	15.7	15.8	15.5	15.7	16.5	16.5	15.0	16.8	16.5	16.6	17.4			
10.2	E	13.6	13.9	14.2	14.6	14.6	14.6	13.3	11.0	13.1	13.0	12.6	12.8	12.5	12.6	13.4	13.4	12.0	16.8	16.5	16.6	17.4			
9.8	F	13.0	13.3	13.6	13.9	13.9	13.9	12.6	10.4	12.5	12.3	12.0	12.2	11.8	12.0	12.8	12.8	11.0	16.8	16.5	16.6	17.4			
13.9	G	17.6	17.9	18.2	18.6	18.6	18.6	17.3	15.0	17.1	17.0	16.6	16.8	16.5	16.6	17.4	17.4	15.0	16.8	16.5	16.6	17.4			
12.3	H	17.1	17.4	17.8	18.1	18.1	18.1	16.8	14.6	16.6	16.5	16.2	16.3	16.0	16.2	17.0	17.0	14.0	16.8	16.5	16.6	17.4			
3.2	I	7.5	7.8	8.2	8.5	8.5	8.5	7.2	5.0	7.0	6.9	6.6	6.7	6.4	6.6	7.4	7.4	4.0	16.8	16.5	16.6	17.4			
9.0	J	13.3	13.6	13.9	14.2	14.2	14.2	13.0	10.7	12.8	12.6	12.3	12.5	12.2	12.3	13.1	13.1	9.0	16.8	16.5	16.6	17.4			
12.5	K	15.0	15.4	15.7	16.0	16.0	16.0	14.7	12.5	14.6	14.4	14.1	14.2	13.9	14.1	14.9	14.9	11.0	16.8	16.5	16.6	17.4			
9.4	L	12.5	12.8	13.1	13.4	13.4	13.4	12.2	9.9	12.0	11.8	11.5	11.7	11.4	11.5	12.3	12.3	8.0	16.8	16.5	16.6	17.4			
14.7	M	19.0	19.4	19.7	20.0	20.0	20.0	18.7	16.5	18.6	18.4	18.1	18.2	17.9	18.1	18.9	18.9	13.0	16.8	16.5	16.6	17.4			
13.3	N	17.6	17.9	18.2	18.6	18.6	18.6	17.3	15.0	17.1	17.0	16.6	16.8	16.5	16.6	17.4	17.4	11.0	16.8	16.5	16.6	17.4			
14.9	O	18.6	18.9	19.2	19.5	19.5	19.5	18.2	16.0	18.1	17.9	17.6	17.8	17.4	17.6	18.4	18.4	12.0	16.8	16.5	16.6	17.4			
11.7	P	14.7	15.0	15.4	15.7	15.7	15.7	14.4	12.2	14.2	14.1	13.8	13.9	13.6	13.8	14.6	14.6	9.0	16.8	16.5	16.6	17.4			
14.9	Q	18.6	18.9	19.2	19.5	19.5	19.5	18.2	16.0	18.1	17.9	17.6	17.8	17.4	17.6	18.4	18.4	12.0	16.8	16.5	16.6	17.4			
12.0	R	15.5	15.8	16.2	16.5	16.5	16.5	15.2	13.0	15.0	14.9	14.6	14.7	14.4	14.6	15.4	15.4	10.0	16.8	16.5	16.6	17.4			
11.5	S	14.7	15.0	15.4	15.7	15.7	15.7	14.4	12.2	14.2	14.1	13.8	13.9	13.6	13.8	14.6	14.6	9.0	16.8	16.5	16.6	17.4			
11.5	T	14.2	14.6	14.9	15.2	15.2	15.2	13.9	11.7	13.8	13.6	13.3	13.4	13.1	13.3	14.1	14.1	8.0	16.8	16.5	16.6	17.4			
12.5	U	16.8	17.1	17.4	17.8	17.8	17.8	16.5	14.2	16.3	16.2	15.8	16.0	15.7	15.8	16.6	16.6	11.0	16.8	16.5	16.6	17.4			
13.6	V	16.2	16.5	16.8	17.1	17.1	17.1	15.8	13.6	15.7	15.5	15.2	15.4	15.0	15.2	16.0	16.0	10.0	16.8	16.5	16.6	17.4			
21.3	X	24.0	24.3	24.6	25.0	25.0	25.0	23.7	21.4	23.5	23.4	23.0	23.2	22.9	23.0	23.8	23.8	17.0	16.8	16.5	16.6	17.4			
13.8	W	16.2	16.5	16.8	17.1	17.1	17.1	15.8	13.6	15.7	15.5	15.2	15.4	15.0	15.2	16.0	16.0	10.0	16.8	16.5	16.6	17.4			
14.1	Y	16.3	16.6	17.0	17.3	17.3	17.3	16.0	13.8	15.8	15.7	15.4	15.5	15.2	15.4	16.2	16.2	11.0	16.8	16.5	16.6	17.4			
11.5	Z	14.7	15.0	15.4	15.7	15.7	15.7	14.4	12.2	14.2	14.1	13.8	13.9	13.6	13.8	14.6	14.6	9.0	16.8	16.5	16.6	17.4			

10 13.3		13.3" UPPER CASE to 10" lower case																			
		9.8					9.0					8.5					8.1				
		a	c	d	e	q	f	h	k	l	m	n	p	r	u	v	w	x	y	z	
12.5	A	14.6			14.9	15.2					14.4	12.5	14.2	14.1	13.8	14.0	13.7	13.8	14.5		
10.1	B	13.0		13.3		13.6				13.8	12.8	10.9	12.6	12.5	12.2	12.4	12.1	12.2	12.9		
10.9	C	13.3		13.6		13.8				14.1	13.0	11.2	12.9	12.8	12.5	12.6	12.4	12.5	13.2		
10.8	D	13.8		14.1		14.4				14.6	13.6	11.7	13.4	13.3	13.0	13.2	12.9	13.0	13.7		
8.5	E	11.3		11.6		11.8				12.1	11.0	9.2	10.9	10.8	10.5	10.6	10.4	10.5	11.2		
8.1	F	10.8		11.0		11.3				11.6	10.5	8.6	10.4	10.2	10.0	10.1	9.8	10.0	10.6		
11.6	G	14.6		14.9		15.2				15.4	14.4	12.5	14.2	14.1	13.8	14.0	13.7	13.8	14.5		
10.2	H	14.2		14.5		14.8				15.0	14.0	12.1	13.8	13.7	13.4	13.6	13.3	13.4	14.1		
2.7	I	6.3		6.5		6.8				7.0	6.0	4.1	5.9	5.7	5.5	5.6	5.3	5.5	6.1		
7.4	J	11.0		11.3		11.6				11.8	10.8	8.9	10.6	10.5	10.2	10.4	10.1	10.2	10.9		
10.4	K	12.5		12.8		13.0				13.3	12.2	10.4	12.1	12.0	11.7	11.8	11.6	11.7	12.4		
7.8	L	10.4		10.6		10.9				11.2	10.1	8.2	10.0	9.8	9.6	9.7	9.4	9.6	10.2		
12.2	M	15.8		16.1		16.4				16.6	15.6	13.7	15.4	15.3	15.0	15.2	14.9	15.0	15.7		
11.0	N	14.6		14.9		15.2				15.4	14.4	12.5	14.2	14.1	13.8	14.0	13.7	13.8	14.5		
12.4	O	15.4		15.7		16.0				16.2	15.2	13.3	15.0	14.9	14.6	14.8	14.5	14.6	15.3		
9.7	P	12.2		12.5		12.8				13.0	12.0	10.1	11.8	11.7	11.4	11.6	11.3	11.4	12.1		
12.4	Q	15.4		15.7		16.0				16.2	15.2	13.3	15.0	14.9	14.6	14.8	14.5	14.6	15.3		
10.0	R	12.9		13.2		13.4				13.7	12.6	10.8	12.5	12.4	12.1	12.2	12.0	12.1	12.8		
9.6	S	12.2		12.5		12.8				13.0	12.0	10.1	11.8	11.7	11.4	11.6	11.3	11.4	12.1		
9.6	T	11.8		12.1		12.4				12.6	11.6	9.7	11.4	11.3	11.0	11.2	10.9	11.0	11.7		
10.4	U	14.0		14.2		14.5				14.8	13.7	11.8	13.6	13.4	13.2	13.3	13.0	13.2	13.8		
11.3	V	13.4		13.7		14.0				14.2	13.2	11.3	13.0	12.9	12.6	12.8	12.5	12.6	13.3		
17.7	W	20.0		20.2		20.5				20.7	19.7	17.8	19.6	19.4	19.2	19.3	19.0	19.2	19.8		
11.4	X	13.4		13.7		14.0				14.2	13.2	11.3	13.0	12.9	12.6	12.8	12.5	12.6	13.3		
11.7	Y	13.6		13.8		14.1				14.4	13.3	11.4	13.2	13.0	12.8	12.9	12.6	12.8	13.4		
9.6	Z	12.2		12.5		12.8				13.0	12.0	10.1	11.8	11.7	11.4	11.6	11.3	11.4	12.1		

8 10.6		10.6" UPPER CASE to 8" lower case																								
		7.8	7.2	7.7	7.8	7.7	8.2	8.5	2.4	7.6	7.3	7.5	12.0	7.3	7.7	4.9	7.2	5.1	4.7	6.8	5.2	8.1	12.3	8.2	8.3	6.5
		a	d	e	e	o	o	q	i	v	z	k	l	o	p	u	u	r	j	s	t	v	w	x	y	z
10.0	A	11.7		11.9		11.9		12.1				12.3					11.4	10.0	11.3	11.2	11.0	11.1	10.9	11.0	11.6	
8.1	B	10.4		10.6		10.6		10.8				11.0					10.2	8.7	10.1	10.0	9.8	9.9	9.6	9.8	10.3	
8.7	C	10.6		10.8		11.0		11.2				11.2					10.4	8.9	10.3	10.2	10.0	10.1	9.9	10.0	10.5	
8.6	D	11.0		11.2		11.4		11.7				11.7					10.8	9.3	10.7	10.6	10.4	10.5	10.3	10.4	10.9	
6.8	E	9.0		9.2		9.4		9.6				9.6					8.8	7.3	8.7	8.6	8.4	8.5	8.3	8.4	8.9	
6.5	F	8.6		8.8		9.0		9.2				9.2					8.4	6.9	8.3	8.2	8.0	8.1	7.8	8.0	8.5	
9.2	G	11.7		11.9		12.1		12.3				12.3					11.4	10.0	11.3	11.2	11.0	11.1	10.9	11.0	11.6	
8.2	H	11.3		11.6		11.8		12.0				12.0					11.1	9.6	11.0	10.9	10.7	10.8	10.6	10.7	11.2	
2.1	I	5.0		5.2		5.4		5.6				5.6					4.8	3.3	4.7	4.6	4.3	4.5	4.2	4.3	4.9	
5.9	J	8.8		9.0		9.2		9.4				9.4					8.6	7.1	8.5	8.4	8.2	8.3	8.1	8.2	8.7	
8.3	K	10.0		10.2		10.4		10.6				10.6					9.8	8.3	9.6	9.5	9.3	9.4	9.2	9.3	9.9	
6.3	L	8.3		8.5		8.7		8.9				8.9					8.1	6.6	8.0	7.8	7.6	7.7	7.5	7.6	8.2	
9.8	M	12.6		12.8		13.0		13.3				13.3					12.4	10.9	12.3	12.2	12.0	12.1	11.9	12.0	12.5	
8.8	N	11.7		11.9		12.1		12.3				12.3					11.4	10.0	11.3	11.2	11.0	11.1	10.9	11.0	11.6	
9.9	O	12.3		12.5		12.7		12.9				12.9					12.1	10.6	12.0	11.9	11.7	11.8	11.6	11.7	12.2	
7.7	P	9.8		10.0		10.2		10.4				10.4					9.5	8.1	9.4	9.3	9.1	9.2	9.0	9.1	9.6	
9.9	Q	12.3		12.5		12.7		12.9				12.9					12.1	10.6	12.0	11.9	11.7	11.8	11.6	11.7	12.2	
8.0	R	10.3		10.5		10.7		10.9				10.9					10.1	8.6	10.0	9.9	9.6	9.8	9.5	9.6	10.2	
7.6	S	9.8		10.0		10.2		10.4				10.4					9.5	8.1	9.4	9.3	9.1	9.2	9.0	9.1	9.6	
7.6	T	9.4		9.6		9.9		10.1				10.1					9.2	7.7	9.1	9.0	8.8	8.9	8.7	8.8	9.3	
8.3	U	11.1		11.3		11.6		11.8				11.8					10.9	9.4	10.8	10.7	10.5	10.6	10.4	10.5	11.0	
9.0	V	10.7		10.9		11.1		11.3				11.3					10.5	9.0	10.4	10.3	10.1	10.2	10.0	10.1	10.6	
14.1	W	15.9		16.1		16.3		16.5				16.5					15.7	14.2	15.6	15.5	15.3	15.4	15.2	15.3	15.8	
9.1	X	10.7		10.9		11.1		11.3				11.3					10.5	9.0	10.4	10.3	10.1	10.2	10.0	10.1	10.6	
9.3	Y	10.8		11.0		11.2		11.4				11.4					10.6	9.1	10.5	10.4	10.2	10.3	10.1	10.2	10.7	
7.6	Z	9.8		10.0		10.2		10.4				10.4					9.5	8.1	9.4	9.3	9.1	9.2	9.0	9.1	9.6	

8 " UPPER CASE to 6" lower case																											
6 8		5.9	5.4	5.8	5.9	5.8	6.2	6.4	1.8	5.8	5.5	5.7	2.6	9.0	5.5	3.7	3.4	3.8	3.5	5.1	3.9	6.1	9.3	6.2	6.2	4.9	
		a	d	e	g	o	q	i	r	s	t	v	w	x	y	z											
7.5	A	8.8						9.0	9.1									8.6	7.5	8.6	8.5	8.3	8.4		8.3	8.7	
6.1	B	7.8						8.2					8.3					7.7	6.6	7.6	7.5	7.4	7.4	7.3	7.4	7.8	
6.6	C	8.0						8.2	8.3				8.5					7.8	6.7	7.8	7.7	7.5	7.6	7.4	7.5	7.9	
6.5	D	8.3						8.6					8.8					8.2	6.0	8.1	8.0	7.8	7.9	7.8	7.8	8.2	
5.1	E	6.8						7.1					7.3					6.6	5.5	6.6	6.5	6.3	6.4	6.2	6.3	6.7	
4.9	F	6.5						6.6	6.8				7.0					6.3	5.2	6.2	6.2	6.0	6.1	5.9	6.0	6.4	
7.0	G	8.8						9.1					9.3					8.6	7.5	8.6	8.5	8.3	8.4	8.2	8.3	8.7	
6.2	H	8.6						8.7	8.9				9.0					8.4	7.3	8.3	8.2	8.1	8.2	8.0	8.1	8.5	
1.6	I	3.8						3.9	4.1				4.2					3.6	2.5	3.5	3.4	3.3	3.4	3.2	3.3	3.7	
4.5	J	6.6						6.8	7.0				7.1					6.5	5.4	6.4	6.3	6.2	6.2	6.1	6.2	6.6	
6.2	K	7.5						7.7	7.8				8.0					7.4	6.2	7.3	7.2	7.0	7.1	7.0	7.0	7.4	
4.7	L	6.2						6.4	6.6				6.7					6.1	5.0	6.0	5.9	5.8	5.8	5.7	5.8	6.2	
7.4	M	9.5						9.7	9.8				10.0					9.4	8.2	9.3	9.2	9.0	9.1	9.0	9.0	9.4	
6.6	N	8.8						9.0	9.1				9.3					8.6	7.5	8.6	8.5	8.3	8.4	8.2	8.3	8.7	
7.4	O	9.3						9.4	9.6				9.8					9.1	8.0	9.0	9.0	8.8	8.9	8.7	8.8	9.2	
5.8	P	7.4						7.5	7.7				7.8					7.2	6.1	7.1	7.0	6.9	7.0	6.8	6.9	7.3	
7.4	Q	9.3						9.4	9.6				9.8					9.1	8.0	9.0	9.0	8.8	8.9	8.7	8.8	9.2	
6.0	R	7.8						7.9	8.1				8.2					7.6	6.5	7.5	7.4	7.3	7.4	7.2	7.3	7.7	
5.8	S	7.4						7.5	7.7				7.8					7.2	6.1	7.1	7.0	6.9	7.0	6.8	6.9	7.3	
5.8	T	7.1						7.3	7.4				7.6					7.0	5.8	6.9	6.8	6.6	6.7	6.6	6.6	7.0	
6.2	U	8.4						8.6	8.7				8.9					8.2	7.1	8.2	8.1	7.9	8.0	7.8	7.9	8.3	
6.8	V	8.1						8.2	8.4				8.6					7.9	6.8	7.8	7.8	7.6	7.7	7.5	7.6	8.0	
10.6	W	12.0						12.2	12.3				12.5					11.8	10.7	11.8	11.7	11.5	11.6	11.4	11.5	11.9	
6.9	X	8.1						8.2	8.4				8.6					7.9	6.8	7.8	7.8	7.6	7.7	7.5	7.6	8.0	
7.0	Y	8.2						8.3	8.5				8.6					8.0	6.9	7.9	7.8	7.7	7.8	7.6	7.7	8.1	
5.8	Z	7.4						7.5	7.7				7.8					7.2	6.1	7.1	7.0	6.9	7.0	6.8	6.9	7.3	

NOTE:

ALL DIMENSIONS ARE IN INCHES.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SPACING CHARTS DIRECT APPLIED LETTERS & NUMERALS		
UPPER CASE & LOWER CASE CLEARVIEW HIGHWAY 5WR		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thunne</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SH. 4 OF 12 TC-8700C

15" lower case to 15" lower case																									
15																									
	a	c	e	g	i	k	m	o	q	s	u	w	y	z											
14.8	a	18.8	19.2	19.2	19.6					20.0					18.4	15.6	18.2	18.0	17.6	17.8	17.4	17.6	18.6		
14.4	b	18.8	19.2	19.2	19.6					20.0					18.4	15.6	18.2	18.0	17.6	17.8	17.4	17.6	18.6		
13.6	c	17.0	17.4	17.4	17.8					18.2					16.6	13.8	16.4	16.2	15.8	16.0	15.6	15.8	16.8		
14.6	d	19.8	20.2	20.2	20.6					21.0					19.4	16.6	19.2	19.0	18.6	18.8	18.4	18.6	19.6		
14.8	e	19.2	19.6	19.6	20.0					20.4					18.8	16.0	18.6	18.4	18.0	18.2	17.8	18.0	19.0		
9.6	f	13.0	13.4	13.4	13.8					14.2					12.6	9.8	12.4	12.2	11.8	12.0	11.6	11.8	12.8		
14.6	g	19.8	20.2	20.2	20.6					21.0					19.4	16.6	19.2	19.0	18.6	18.8	18.4	18.6	19.6		
13.8	h	19.0	19.4	19.4	19.8					20.2					18.6	15.8	18.4	18.2	17.8	18.0	17.6	17.8	18.8		
4.6	i	9.4	9.8	9.8	10.2					10.6					9.0	6.2	8.8	8.6	8.2	8.4	8.0	8.2	9.2		
8.8	j	13.6	14.0	14.0	14.4					14.8					13.2	10.4	13.0	12.8	12.4	12.6	12.2	12.4	13.4		
14.2	k	17.0	17.4	17.4	17.8					18.2					16.6	13.8	16.4	16.2	15.8	16.0	15.6	15.8	16.8		
6.4	l	10.0	10.4	10.4	10.8					11.2					9.6	6.8	9.4	9.2	8.8	9.0	8.6	8.8	9.8		
22.6	m	27.8	28.2	28.2	28.6					29.0					27.4	24.6	27.2	27.0	26.6	26.8	26.4	26.6	27.6		
13.8	n	19.0	19.4	19.4	19.8					20.2					18.6	15.8	18.4	18.2	17.8	18.0	17.6	17.8	18.8		
15.4	o	19.8	20.2	20.2	20.6					21.0					19.4	16.6	19.2	19.0	18.6	18.8	18.4	18.6	19.6		
14.6	p	19.0	19.4	19.4	19.8					20.2					18.6	15.8	18.4	18.2	17.8	18.0	17.6	17.8	18.8		
16.0	q	19.8	20.2	20.2	20.6					21.0					19.4	16.6	19.2	19.0	18.6	18.8	18.4	18.6	19.6		
9.2	r	12.6	13.0	13.0	13.4					13.8					12.2	9.4	12.0	11.8	11.4	11.6	11.2	11.4	12.4		
12.8	s	16.8	17.2	17.2	17.6					18.0					16.4	13.6	16.2	16.0	15.6	15.8	15.4	15.6	16.6		
9.8	t	13.6	14.0	14.0	14.4					14.8					13.2	10.4	13.0	12.8	12.4	12.6	12.2	12.4	13.4		
13.6	u	18.8	19.2	19.2	19.6					20.0					18.4	15.6	18.2	18.0	17.6	17.8	17.4	17.6	18.6		
15.2	v	18.0	18.4	18.4	18.8					19.2					17.6	14.8	17.4	17.2	16.8	17.0	16.6	16.8	17.8		
23.2	w	26.2	26.6	26.6	27.0					27.4					25.8	23.0	25.6	25.4	25.0	24.8	24.4	24.6	25.6		
15.4	x	18.0	18.4	18.4	18.8					19.2					17.6	14.8	17.4	17.2	16.8	17.0	16.6	16.8	17.8		
15.6	y	18.4	18.8	18.8	19.2					19.6					18.0	15.2	17.8	17.6	17.2	17.4	17.0	17.2	18.2		
12.2	z	16.0	16.4	16.4	16.8					17.2					15.6	12.8	15.4	15.2	14.8	15.0	14.6	14.8	15.8		

12" lower case to 12" lower case																									
12																									
	a	c	e	g	i	k	m	o	q	s	u	w	y	z											
11.8	a	15.0	15.4	15.4	15.8					16.0					14.7	12.5	14.6	14.4	14.1	14.2	13.9	14.1	14.9		
11.5	b	15.0	15.4	15.4	15.8					16.0					14.7	12.5	14.6	14.4	14.1	14.2	13.9	14.1	14.9		
10.9	c	13.6	13.9	13.9	14.2					14.6					13.3	11.0	13.1	13.0	12.6	12.8	12.5	12.6	13.4		
11.7	d	15.8	16.2	16.2	16.5					16.8					15.5	13.3	15.4	15.2	14.9	15.0	14.7	14.9	15.7		
11.8	e	15.4	15.7	15.7	16.0					16.3					15.0	12.8	14.9	14.7	14.4	14.6	14.2	14.4	15.2		
7.7	f	10.4	10.7	10.7	11.0					11.4					10.1	7.8	9.9	9.8	9.4	9.6	9.3	9.4	10.2		
11.7	g	15.8	16.2	16.2	16.5					16.8					15.5	13.3	15.4	15.2	14.9	15.0	14.7	14.9	15.7		
11.0	h	15.2	15.5	15.5	15.8					16.2					14.9	12.6	14.7	14.6	14.2	14.4	14.1	14.2	15.0		
3.7	i	7.5	7.8	7.8	8.2					8.5					7.2	5.0	7.0	6.9	6.6	6.7	6.4	6.6	7.4		
7.0	j	10.9	11.2	11.2	11.5					11.8					10.6	8.3	10.4	10.2	9.9	10.1	9.8	9.9	10.7		
11.4	k	13.6	13.9	13.9	14.2					14.6					13.3	11.0	13.1	13.0	12.6	12.8	12.5	12.6	13.4		
5.1	l	8.0	8.3	8.3	8.6					9.0					7.7	5.4	7.5	7.4	7.0	7.2	6.9	7.0	7.8		
18.1	m	22.2	22.6	22.6	22.9					23.2					21.9	19.7	21.8	21.6	21.3	21.4	21.1	21.3	22.1		
11.0	n	15.2	15.5	15.5	15.8					16.2					14.9	12.6	14.7	14.6	14.2	14.4	14.1	14.2	15.0		
12.3	o	15.8	16.2	16.2	16.5					16.8					15.5	13.3	15.4	15.2	14.9	15.0	14.7	14.9	15.7		
11.7	p	15.2	15.5	15.5	15.8					16.2					14.9	12.6	14.7	14.6	14.2	14.4	14.1	14.2	15.0		
12.8	q	15.8	16.2	16.2	16.5					16.8					15.5	13.3	15.4	15.2	14.9	15.0	14.7	14.9	15.7		
7.4	r	10.1	10.4	10.4	10.7					11.0					9.8	7.5	9.6	9.4	9.1	9.3	9.0	9.1	9.9		
10.2	s	13.4	13.8	13.8	14.1					14.4					13.1	10.9	13.0	12.8	12.5	12.6	12.3	12.5	13.3		
7.8	t	10.9	11.2	11.2	11.5					11.8					10.6	8.3	10.4	10.2	9.9	10.1	9.8	9.9	10.7		
10.9	u	15.0	15.4	15.4	15.7					16.0					14.7	12.5	14.6	14.4	14.1	14.2	13.9	14.1	14.9		
12.2	v	14.4	14.7	14.7	15.0					15.4					14.1	11.8	13.9	13.8	13.4	13.6	13.3	13.4	14.2		
18.6	w	21.0	21.3	21.3	21.6					21.9					20.6	18.4	20.5	20.3	20.0	20.2	19.8	20.0	20.8		
12.3	x	14.4	14.7	14.7	15.0					15.4					14.1	11.8	13.9	13.8	13.4	13.6	13.3	13.4	14.2		
12.5	y	14.7	15.0	15.0	15.4					15.7					14.4	12.2	14.2	14.1	13.8	13.9	13.6	13.8	14.6		
9.8	z	12.8	13.1	13.1	13.4					13.8					12.5	10.2	12.3	12.2	11.8	12.0	11.7	11.8	12.6		

10		10" lower case to 10" lower case																																																																																																																																																																																																																																																																																																																																																																																																																													
		9.8		9.0		9.8		10.2		10.6		9.7		3.1		9.6		9.2		4.3		15.0		9.7		9.0		6.4		5.9		8.5		6.5		10.1		15.4		10.2		10.4		8.1																																																																																																																																																																																																																																																																																																																																																																																			
		a		c		e		g		i		k		m		o		q		s		u		w		y		z		a		c		e		g		i		k		m		o		q		s		u		w		y		z																																																																																																																																																																																																																																																																																																																																																																							
		a		c		e		g		i		k		m		o		q		s		u		w		y		z		a		c		e		g		i		k		m		o		q		s		u		w		y		z																																																																																																																																																																																																																																																																																																																																																																							
9.8	a	12.5	12.8	12.8	13.0	13.3	12.2	10.4	12.1	12.0	11.7	11.8	11.6	11.7	12.4	9.6	b	12.5	12.8	12.8	13.0	13.3	12.2	10.4	12.1	12.0	11.7	11.8	11.6	11.7	12.4	9.0	c	11.3	11.6	11.6	11.8	12.1	11.0	9.2	10.9	10.8	10.5	10.6	10.4	10.5	11.2	9.7	d	13.2	13.4	13.4	13.7	14.0	12.9	11.0	12.8	12.6	12.4	12.5	12.2	12.4	13.0	9.8	e	12.8	13.0	13.0	13.3	13.6	12.5	10.6	12.4	12.2	12.0	12.1	11.8	12.0	12.6	6.4	f	8.6	8.9	8.9	9.2	9.4	8.4	6.5	8.2	8.1	7.8	8.0	7.7	7.8	8.5	9.7	g	13.2	13.4	13.4	13.7	14.0	12.9	11.0	12.8	12.6	12.4	12.5	12.2	12.4	13.0	9.2	h	12.6	12.9	12.9	13.2	13.4	12.4	10.5	12.2	12.1	11.8	12.0	11.7	11.8	12.5	3.1	i	6.3	6.5	6.5	6.8	7.0	6.0	4.1	5.9	5.7	5.5	5.6	5.3	5.5	6.1	5.9	j	9.0	9.3	9.3	9.6	9.8	8.8	6.9	8.6	8.5	8.2	8.4	8.1	8.2	8.9	9.4	k	11.3	11.6	11.6	11.8	12.1	11.0	9.2	10.9	10.8	10.5	10.6	10.4	10.5	11.2	4.3	l	6.7	6.9	6.9	7.2	7.4	6.4	4.5	6.3	6.1	5.9	6.0	5.7	5.9	6.5	15.0	m	18.5	18.8	18.8	19.0	19.3	18.2	16.4	18.1	18.0	17.7	17.8	17.6	17.7	18.4	9.2	n	12.6	12.9	12.9	13.2	13.4	12.4	10.5	12.2	12.1	11.8	12.0	11.7	11.8	12.5	10.2	o	13.2	13.4	13.4	13.7	14.0	12.9	11.0	12.8	12.6	12.4	12.5	12.2	12.4	13.0	9.7	p	12.6	12.9	12.9	13.2	13.4	12.4	10.5	12.2	12.1	11.8	12.0	11.7	11.8	12.5	10.6	q	13.2	13.4	13.4	13.7	14.0	12.9	11.0	12.8	12.6	12.4	12.5	12.2	12.4	13.0	6.1	r	8.4	8.6	8.6	8.9	9.2	8.1	6.3	8.0	7.8	7.6	7.7	7.4	7.6	8.2	8.5	s	11.2	11.4	11.4	11.7	12.0	10.9	9.0	10.8	10.6	10.4	10.5	10.2	10.4	11.0	6.5	t	9.0	9.3	9.3	9.6	9.8	8.8	6.9	8.6	8.5	8.2	8.4	8.1	8.2	8.9	9.0	u	12.5	12.8	12.8	13.0	13.3	12.2	10.4	12.1	12.0	11.7	11.8	11.6	11.7	12.4	10.1	v	12.0	12.2	12.2	12.5	12.8	11.7	9.8	11.6	11.4	11.2	11.3	11.0	11.2	11.8	15.4	w	17.4	17.7	17.7	18.0	18.2	17.2	15.3	17.0	16.9	16.6	16.8	16.5	16.6	17.3	10.2	x	12.0	12.2	12.2	12.5	12.8	11.7	9.8	11.6	11.4	11.2	11.3	11.0	11.2	11.8	10.4	y	12.2	12.5	12.5	12.8	13.0	12.0	10.1	11.8	11.7	11.4	11.6	11.3	11.4	12.1	8.1	z	10.6	10.9	10.9	11.2	11.4	10.4	8.5	10.2	10.1	9.8	10.0	9.7	9.8	10.0

24" UPPER CASE to 18" lower case																																					
24	18	15.2		15.3		15.8		15.3		4.5		4.5		25.4		15.3		11.7		9.8		23.7		8.4		15.2		12.0		17.9		19.4		18.6		15.8	
		q	a	d	e	g	o	q	b	h	i	k	l	m	n	p	r	f	w	j	s	t	v	y	x			z									
24.0	A		29.6												30.4			29.3	27.5	28.5	27.8	28.5	29.8														
19.1	B		25.8								27.7				27.1			25.4	23.6	25.2	24.3	24.3	25.9														
19.1	C		25.4								26.9				26.8			24.8	23.2		24.7	25.1	25.6														
19.1	D		25.2								27.1				27.1			25.1	22.9		24.7	25.1	25.4														
17.7	E		24.1								25.6				23.5			23.5	21.8		23.3	23.7	24.2														
17.6	F		20.6								23.6				21.3			21.3	20.6		20.9	21.1	22.1														
19.2	G		25.6								27.1				25.0			25.0	23.3		24.8	25.2	25.7														
19.2	H		27.5								29.0				27.1			27.1	25.6		26.8	27.2	27.6														
4.8	I		13.1								14.6				12.7			12.7	11.2		12.4	12.8	13.2														
18.2	J		26.2								26.8				25.8			25.8	24.3		25.3	25.7	26.4														
19.7	K		24.5								26.8				24.2			24.2	22.4		23.9	24.3	24.9														
17.7	L		22.6								24.8				22.2			22.2	20.5		22.0	22.3	23.0														
22.2	M		30.5								32.0				30.1			30.1	28.6		29.8	30.2	30.6														
19.2	N		27.5								29.0				27.1			27.1	25.6		26.8	27.2	27.6														
20.0	O		26.1								28.0				26.0			26.0	23.8		25.6	26.0	26.3														
19.2	P		25.0								26.0				24.6			24.6	22.2		24.1	24.5	24.8														
20.0	Q		26.1								28.0				26.0			26.0	23.8		25.6	26.0	26.3														
19.2	R		25.3								27.2				25.2			25.2	23.1		24.8	25.2	25.6														
19.2	S		24.8								26.8				24.5			24.5	23.0		24.2	24.6	25.0														
17.7	T		22.2								24.8				21.8			21.8	21.1		22.2	22.6	23.0														
19.2	U		27.2								27.8				26.8			26.8	25.3		26.3	26.7	27.5														
21.9	V		26.0								28.7				26.4			26.4	25.4		26.9	27.3	27.7														
25.4	W		31.0								31.7				30.6			30.6	28.9		29.9	31.1	29.9	31.1													
20.7	X		26.3								27.1				26.0			26.0	24.2		25.2	24.5	25.2	26.5													
24.0	Y		27.0								30.0				27.8			27.8	26.6		26.9	27.4	28.9														
19.2	Z		26.7								28.2				26.5			26.5	24.5		26.3	26.7	27.1														

20" UPPER CASE to 15" lower case																																			
20	15	12.6		12.8		13.1		12.8		3.8		3.8		21.1		12.8		9.8		8.1		7.0		12.6		10.0		14.9		16.1		15.5		13.1	
		a	c	d	e	g	o	q	b	h	i	k	l	m	n	p	r	f	w	j	s	t	v	y	x	z									
20.0	A			24.8										25.3				24.4	23.0	23.8	23.1		23.8	24.9											
15.9	B			21.5										23.0				21.1	19.6	21.0	20.3		20.3	21.6											
15.9	C			21.1										22.4				20.8	19.4		20.6		20.9	21.4											
15.9	D			21.0										22.6				20.9	19.1		20.6		20.9	21.1											
14.8	E			20.0										21.3				19.6	18.3		19.5		19.8	20.3											
14.6	F			17.1										19.6				17.8	17.1		17.4		17.6	18.4											
16.0	G			21.3										22.5				20.9	19.5		20.8		21.0	21.5											
16.0	H			22.9										24.1				22.5	21.3		22.4		22.8	23.0											
4.0	I			10.9										12.1				10.5	9.3		10.4		10.8	11.0											
15.1	J			21.9										22.3				21.5	20.3		21.1		21.4	22.0											
16.4	K			20.4										22.4				20.1	18.8		20.0		20.3	20.8											
14.8	L			18.8										20.8				18.5	17.1		18.4		18.6	19.1											
18.5	M			25.4										26.6				25.0	23.8		24.9		25.3	25.5											
16.0	N			22.9										24.1				22.5	21.3		22.4		22.8	23.0											
16.6	O			21.8										23.4				21.6	19.9		21.4		21.6	21.9											
16.0	P			20.9										21.6				20.5	18.5		20.0		20.4	20.8											
16.6	Q			21.8										23.4				21.6	19.9		21.4		21.6	21.9											
16.0	R			21.1										22.8				21.0	19.3		20.8		21.0	21.3											
16.0	S			20.8										22.4				20.4	19.1		20.3		20.5	20.9											
14.8	T			18.5										20.8				18.3	17.5		18.5		18.8	19.1											
16.0	U			22.8										23.1				22.4	21.1		22.0		22.3	22.9											
18.3	V			21.8										23.9				22.0	21.3		22.5		22.8	23.1											
21.1	W			25.9										26.4				25.5	24.1		24.9	24.3	24.9	26.0											
17.3	X			22.0										22.5				21.6	20.3		21.0	20.4	21.0	22.1											
20.0	Y			22.5										25.0				23.1	22.3		22.4		22.8	24.0											
16.0	Z			22.3										23.5				22.1	20.4		22.0		22.3	22.5											

16" UPPER CASE to 12" lower case																									
16	12																								
		10.1	10.3	10.5	10.3	3.0	3.0	16.9	10.3	7.8	6.5	15.8	5.6	10.1	8.0	11.9	12.9	12.4	10.5						
		a	d	e	g	o	q	b	h	i	k	l	m	n	p	r	f	w	j	s	t	v	y	x	z
16.0	A				19.8						20.3						19.5	18.4	19.0	18.5	19.0	19.9			
12.8	B				17.3						18.5						17.0	15.8	16.9	16.3	16.3	17.4			
12.8	C				17.0						18.0						16.6	15.5	16.5	16.5	16.8	17.1			
12.8	D				16.9						18.1						16.8	15.4	16.5	16.5	16.8	17.0			
11.9	E				16.1						17.1						15.8	14.6	15.6	15.6	15.9	16.3			
11.8	F				13.8						15.8						14.3	13.8	14.0	14.1	14.1	14.8			
12.8	G				17.0						18.0						16.6	15.5	16.5	16.5	16.8	17.1			
12.8	H				18.3						19.3						18.0	17.0	17.9	18.1	18.1	18.4			
3.3	I				8.8						9.8						8.5	7.5	8.4	8.6	8.6	8.9			
12.1	J				17.5						17.9						17.3	16.3	16.9	17.1	17.1	17.6			
13.0	K				16.3						17.8						16.0	14.9	15.9	16.1	16.1	16.5			
11.9	L				15.1						16.6						14.9	13.8	14.8	15.0	15.0	15.4			
14.8	M				20.3						21.3						20.0	19.0	19.9	20.1	20.1	20.4			
12.8	N				18.3						19.3						18.0	17.0	17.9	18.1	18.1	18.4			
13.4	O				17.5						18.8						17.4	16.0	17.1	17.4	17.4	17.6			
12.8	P				16.6						17.3						16.4	14.8	16.0	16.3	16.3	16.5			
13.4	Q				17.5						18.8						17.4	16.0	17.1	17.4	17.4	17.6			
12.8	R				16.9						18.1						16.8	15.4	16.5	16.5	16.8	17.0			
12.8	S				16.5						17.9						16.3	15.3	16.1	16.4	16.4	16.6			
11.9	T				14.9						16.6						14.6	14.1	14.9	15.1	15.1	15.4			
12.8	U				18.1						18.5						17.9	16.9	17.5	17.8	17.8	18.3			
14.6	V				17.4						19.1						17.6	17.0	18.0	18.3	18.3	18.5			
16.9	W				20.6						21.1						20.4	19.3	19.9	19.4	19.9	20.8			
13.9	X				17.6						18.1						17.4	16.3	16.9	16.4	16.9	17.8			
16.0	Y				18.0						20.0						18.5	17.8	17.9	18.3	18.3	19.3			
12.8	Z				17.8						18.8						17.6	16.3	17.5	17.8	17.8	18.0			

[illegible]

8 10.6		10.6" UPPER CASE to 8" lower case																													
		6.8				7.0	6.8	2.0 6.8		11.3		6.8	5.3 6.8		4.4	10.6	3.8	6.8	5.0	8.4	8.6	8.3	7.0								
		q	c	d	e	g	q	b	h	i	k	l	m	n	p	r	s	t	u	v	y	x	z								
10.8	A				13.2									13.6			13.1	12.3	12.8	12.5	12.8	13.3									
8.5	B				11.5									12.3			11.3	10.5	11.3	10.8	10.8	11.6									
8.5	C				11.3									12.0			11.1	10.4		11.0		11.2	11.4								
8.5	D				11.3									12.1			11.2	10.3		11.0		11.2	11.3								
7.9	E				10.7									11.4			10.4	9.7		10.4	10.6	10.8									
7.9	F				9.2									10.6			9.6	9.2		9.4		9.5	9.9								
8.5	G				11.3									12.0			11.1	10.4		11.0		11.2	11.4								
8.6	H				12.3									13.0			12.1	11.5		12.1	12.2	12.4									
2.3	I				5.9									6.6			5.8	5.1		5.7		5.8	6.0								
8.1	J				11.7									12.0			11.6	10.9		11.3		11.5	11.8								
8.8	K				10.9									11.9			10.8	10.0		10.7		10.8	11.1								
7.9	L				10.0									11.1			9.9	9.1		9.8		10.0	10.2								
10.0	M				13.7									14.3			13.5	12.8		13.4		13.6	13.7								
8.5	N				12.2									12.8			12.0	11.3		11.9		12.1	12.2								
8.9	O				11.6									12.5			11.6	10.7		11.4		11.6	11.7								
8.5	P				11.1									11.5			10.9	9.8		10.7		10.8	11.0								
8.9	Q				11.6									12.5			11.6	10.7		11.4		11.6	11.7								
8.5	R				11.3									12.1			11.2	10.3		11.0		11.2	11.3								
8.5	S				11.0									11.9			10.8	10.2		10.7		10.9	11.1								
7.9	T				9.9									11.1			9.7	9.4		9.9		10.0	10.2								
8.5	U				12.1									12.3			11.9	11.3		11.7		11.9	12.2								
9.8	V				11.6									12.7			11.8	11.3		12.0		12.2	12.3								
11.3	W				13.7									14.1			13.6	12.8		13.3	13.0	13.3	13.8								
9.3	X				11.7									12.1			11.6	10.8		11.3	11.0	11.3	11.8								
10.8	Y				12.1									13.4			12.4	11.9		12.0		12.3	12.9								
8.5	Z				11.9									12.5			11.8	10.8		11.7		11.9	12.0								

6 8		8 " UPPER CASE to 6 " lower case																																	
		5.1				5.3		5.1		1.5		1.5		8.4		5.1		3.3		7.9		2.8		5.1		4.0		6.0		6.5		6.1		5.3	
		d	c	d	e	g	h	i	k	l	m	n	p	r	t	u	v	w	x	y	z	s	t	u	v	w	x	y	z	a	b	c	d		
		g	h	i	k	l	m	n	p	r	t	u	v	w	x	y	z	a	b	c	d	e	f	g	h	i	k	l	m	n	p	r	t	u	
8.0	A			9.9						10.1							9.8	9.2			9.5	9.3			9.5	9.9									
6.4	B			8.6						9.3							8.5	7.9	8.4	8.1					8.1	8.7									
6.4	C			8.5						9.0							8.3	7.8			8.3				8.4	8.6									
6.4	D			8.4						9.1							8.4	7.7			8.3				8.4	8.5									
5.9	E			8.0						8.5							7.8	7.3			7.8				7.9	8.1									
5.9	F			6.9						7.9							7.1	6.9			7.0				7.1	7.4									
6.4	G			8.5						9.0							8.3	7.8			8.3				8.4	8.6									
6.4	H			9.1						9.6							9.0	8.5			8.9				9.1	9.2									
1.6	I			4.4						4.9							4.2	3.7			4.2				4.3	4.4									
6.0	J			8.7						8.9							8.6	8.1			8.4				8.5	8.8									
6.5	K			8.1						8.9							8.0	7.4			7.9				8.1	8.3									
5.9	L			7.5						8.3							7.4	6.8			7.3				7.4	7.6									
7.4	M			10.1						10.6							10.0	9.5			9.9				10.1	10.2									
6.4	N			9.1						9.6							9.0	8.5			8.9				9.1	9.2									
6.6	O			8.7						9.3							8.6	7.9			8.5				8.6	8.8									
6.4	P			8.3						8.6							8.2	7.4			8.0				8.1	8.3									
6.6	Q			8.7						9.3							8.6	7.9			8.5				8.6	8.8									
6.4	R			8.4						9.1							8.4	7.7			8.3				8.4	8.5									
6.4	S			8.3						8.9							8.1	7.6			8.1				8.2	8.3									
5.9	T			7.4						8.3							7.3	7.0			7.4				7.5	7.6									
6.4	U			9.1						9.3							8.9	8.4			8.8				8.9	9.1									
7.3	V			8.6						9.5							8.8	8.4			8.9				9.1	9.2									
8.4	W			10.3						10.5							10.1	9.6	9.9	9.6				9.9	10.3										
6.9	X			8.8						9.0							8.6	8.1	8.4	8.1				8.4	8.8										
8.0	Y			9.0						10.0							9.3	8.9			8.9				9.1	9.6									
6.4	Z			8.9						9.4							8.8	8.1			8.8				8.9	9.0									

[illegible]

8 " lower case to 8 " lower case																						
8	6.8				7.0	6.8		2.0	6.8	11.3	6.8	5.3	6.8	4.4	10.6	3.8	6.8	5.4	8.0	8.6	8.3	7.0
	q	c	e	g	o	q	h	k	z	n	p	r	u	f	w	j	s	t	v	y	x	z
6.8	a			10.0						10.8				9.9	9.1		9.7		9.9		9.9	10.1
6.8	b			9.1						10.0				8.9	8.2		8.8		9.0		9.0	9.2
6.8	c			9.2						10.1				9.1	8.3		9.0		9.2		9.3	
6.8	d			10.0						10.8				9.9	9.1		9.7		9.9		10.1	
6.8	e			9.2						10.1				9.1	8.3		9.0		9.2		9.3	
4.4	f			6.7						7.7				6.5	5.8		6.5		6.6		6.8	
6.8	g			10.0						10.8				9.9	9.1		9.7		9.9		10.1	
6.8	h			10.0						10.8				9.9	9.1		9.7		9.9		10.1	
2.0	i			5.3						6.1				5.1	4.3		5.0		5.2		5.4	
3.8	j			7.0						7.8				6.9	6.1		6.7		6.9		7.1	
6.8	k			9.1						10.0				8.9	8.2		8.8		9.0		9.2	
2.0	l			5.3						6.1				5.1	4.3		5.0		5.2		5.4	
11.3	m			14.5						15.3				14.4	13.6		14.2		14.4		14.6	
6.8	n			10.0						10.8				9.9	9.1		9.7		9.9		10.1	
7.0	o			9.3						10.3				9.2	8.4		9.1		9.2		9.4	
6.8	p			9.1						10.0				8.9	8.2		8.8		9.0		9.2	
6.8	q			10.0						10.8				9.9	9.1		9.7		9.9		10.1	
5.3	r			6.8						7.7				6.8	5.9		6.6		6.8		6.9	
6.8	s			9.1						10.0				8.9	8.2		8.8		9.0		9.2	
5.4	t			7.8						8.7				7.6	6.9		7.5		7.7		7.9	
6.8	u			10.0						10.8				9.9	9.1		9.7		9.9		10.1	
8.0	v			10.1						11.0				9.9	9.1		9.9		10.0		10.2	
10.6	w			12.8						13.6				12.6	11.9		12.6		12.7		12.9	
8.3	x			10.5						11.4				10.3	9.6		10.3		10.4		10.6	
8.6	y			10.7						11.6				10.6	9.8		10.5		10.6		10.8	
7.0	z									10.4				9.2	8.5		9.2		9.3		9.5	

[illegible]

13.3" DIGIT to 13.3" DIGIT												
13.3	11.1	10.6							4.4	10.6	12.4	10.6
	0	2	3	6	8	9	1	5	4	7		
11.1	0	13.9					14.5		13.9			
4.4	1	7.8					7.8		7.1			
10.6	2	13.4					14.0		13.4			
10.6	3	13.4					14.0		13.4			
12.4	4	15.1					15.1		13.3			
10.6	5	13.4					14.0		13.4			
10.6	6	13.4					14.0		13.4			
10.6	7	13.4					13.4		11.5			
10.6	8	13.4					14.0		13.4			
10.6	9	13.4					14.0		13.4			

10.6" DIGIT to 10.6" DIGIT										
10.6	8.9	8.5				7.5	8.5	9.5	8.5	
	0	2	3	6	8	9	1	5	4	7
8.9	0			11.1			11.6		11.1	
3.5	1			6.2			6.2		5.7	
8.5	2			10.7			11.2		10.7	
8.5	3			10.7			11.2		10.7	
9.9	4			12.1			12.1		10.6	
8.5	5			10.7			11.2		10.7	
8.5	6			10.7			11.2		10.7	
8.5	7			10.7			10.7		9.2	
8.5	8			10.7			11.2		10.7	
8.5	9			10.7			11.2		10.7	

8" DIGIT to 8" DIGIT											
8	6.6	6.4						2.6	6.4	7.4	6.4
		0	2	3	6	8	9	1	5	4	7
6.6	0	8.3						8.7	8.3		
2.6	1	4.7						4.7	4.3		
6.4	2	8.0						8.4	8.0		
6.4	3	8.0						8.4	8.0		
7.4	4	9.0						9.0	7.9		
6.4	5	8.0						8.4	8.0		
6.4	6	8.0						8.4	8.0		
6.4	7	8.0						8.0	6.9		
6.4	8	8.0						8.4	8.0		
6.4	9	8.0						8.4	8.0		

NOTE:

ALL DIMENSIONS ARE IN INCHES.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SPACING CHARTS DIRECT APPLIED LETTERS & NUMERALS		
UPPER CASE & LOWER CASE SERIES E MODIFIED		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thunne</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 7 OF 12 TC-8700C

18" UPPER CASE to 18" UPPER CASE																										
18		18.0	13.5	13.2	16.3	18.6	18.0	14.3	13.2	14.3	3.1	13.6	16.6		14.3							14.9	14.3	15.5	14.3	
	A	J	T	V	W	Y	B	D	E	F	H	I	K	L	M	N	P	R	U	C	G	O	Q	S	X	Z
18.0	A						19.2																			21.7
14.3	B						18.1																			18.1
14.3	C						16.8																			18.1
14.3	D						18.1																			18.1
13.2	E						15.7																			16.9
13.2	F						15.7																			16.9
14.3	G						18.1																			18.1
14.3	H						18.1																			19.0
3.1	I						6.8																			7.7
13.5	J						17.2																			18.1
14.6	K						17.1																			18.3
13.2	L						14.5																			16.9
16.6	M						20.3																			21.2
14.3	N						18.1																			19.0
14.9	O						18.6																			18.6
14.3	P						18.1																			18.1
14.9	Q						18.6																			18.6
14.3	R						18.1																			18.1
14.3	S						18.1																			18.1
13.2	T						14.5																			16.9
14.3	U						18.1																			19.0
16.3	V						17.6																			20.0
18.8	W						20.1																			22.6
15.5	X						17.9																			19.2
18.0	Y						19.2																			21.7
14.3	Z						16.8																			18.1

18" DIGIT to 18" DIGIT												
18	14.9						14.3					
	0	2	3	6	8	9	5.3	1	5	4	16.6	14.3
14.9	0											
5.3	1											
14.3	2											
14.3	3											
16.6	4											
14.3	5											
14.3	6											
14.3	7											
14.3	8											
14.3	9											

6" UPPER CASE to 6" UPPER CASE																														
6	6.0						4.8						4.8						5.0						4.8		5.2		4.8	
	A	J	T	V	W	Y	B	D	E	F	H	I	K	L	M	N	P	R	U	C	G	O	Q	S	X	Z				
6.0	A																													
4.8	B																													
4.8	C																													
4.8	D																													
4.4	E																													
4.4	F																													
4.8	G																													
4.8	H																													
1.0	I																													
4.5	J																													
4.9	K																													
4.4	L																													
5.5	M																													
4.8	N																													
5.0	O																													
4.8	P																													
5.0	Q																													
4.8	R																													
4.8	S																													
4.4	T																													
4.8	U																													
5.4	V																													
6.3	W																													
5.2	X																													
6.0	Y																													
4.8	Z																													

12" UPPER CASE to 12" UPPER CASE																										
12	12.0						9.6						8.8						7.6							
	A	J	T	V	W	Y	B	D	E	F	H	I	K	L	M	N	P	R	U	C	G	O	Q	S	X	Z
12.0	A																									
9.6	B																									
9.6	C																									
9.6	D																									
8.8	E																									
8.8	F																									
9.6	G																									
9.6	H																									
2.1	I																									
9.0	J																									
9.8	K																									
8.8	L																									
11.1	M																									
9.6	N																									
9.9	O																									
9.6	P																									
9.9	Q																									
9.6	R																									
9.6	S																									
8.8	T																									
9.6	U																									
10.9	V																									
12.6	W																									
10.3	X																									
12.0	Y																									
9.6	Z																									

12" DIGIT to 12" DIGIT												
12	9.9	9.6						3.6	9.6	11.1	9.6	
		0	2	3	6	8	9					1
9.9	0	12.4						13.0		12.4		
3.6	1	6.7						6.7		6.0		
9.6	2	12.0						12.7		12.0		
9.6	3	12.0						12.7		12.0		
11.1	4	13.5						13.5		11.9		
9.6	5	12.0						12.7		12.0		
9.6	6	12.0						12.7		12.0		
9.6	7	12.0						12.0		10.4		
9.6	8	12.0						12.7		12.0		
9.6	9	12.0						12.7		12.0		

18 " UPPER CASE to 18 " UPPER CASE																											
18		15.1					12.1	11.0					12.1	12.1					12.7	12.1							
		A	J	T	V	W		B	D	E	F	H		I	K	L	M	N			P	R	U	C	G	O	Q
15.1	A													18.4												18.4	
12.1	B													16.3												15.5	
12.1	C													15.5												15.5	
12.1	D													16.3												15.5	
11.0	E													14.4												14.4	
11.0	F													14.4												14.4	
12.1	G													16.3												15.5	
12.1	H													16.3												16.3	
2.8	I													7.0												7.0	
11.3	J													15.5												15.5	
12.4	K													15.8												15.8	
11.0	L													14.4												14.4	
13.9	M													18.2												18.2	
12.1	N													16.3												16.3	
12.7	O													16.9												16.0	
12.1	P													16.3												15.5	
12.7	Q													16.9												16.0	
12.1	R													16.3												15.5	
12.1	S													16.3												15.5	
11.0	T													14.4												14.4	
12.1	U													16.3												16.3	
13.5	V													16.9												16.9	
15.8	W													19.1												19.1	
12.1	X													15.5												15.5	
15.2	Y													18.6												18.6	
12.1	Z													15.5												15.5	

18" DIGIT to 18" DIGIT												
18	12.7						12.1					
	0	2	3	6	8	9	4	4	1	5	4	7
12.7	0						16.0				16.9	16.0
4.4	1						8.6				8.6	7.8
12.1	2						15.5				16.3	15.5
12.1	3						15.5				16.3	15.5
13.2	4						16.6				16.6	14.3
12.1	5						15.5				16.3	15.5
12.1	6						15.5				16.3	15.5
12.1	7						15.5				15.5	13.2
12.1	8						15.5				16.3	15.5
12.1	9						15.5				16.3	15.5

6" UPPER CASE to 6" UPPER CASE																										
6	5.0						4.0						3.7						4.0							
	A	J	T	V	W	Y	B	D	E	F	H	I	K	L	M	N	P	R	U	C	G	O	Q	S	X	Z
5.0	A													6.1												6.1
4.0	B													5.4												5.2
4.0	C													5.2												5.2
4.0	D													5.4												5.2
3.7	E													4.8												4.8
3.7	F													4.8												4.8
4.0	G													5.4												5.2
4.0	H													5.4												5.4
0.9	I													2.4												2.4
3.8	J													5.2												5.2
4.1	K													5.2												5.2
3.7	L													4.8												4.8
4.6	M													6.1												6.1
4.0	N													5.4												5.4
4.2	O													5.6												5.3
4.0	P													5.4												5.2
4.2	Q													5.6												5.3
4.0	R													5.4												5.2
4.0	S													5.4												5.2
3.7	T													4.8												4.8
4.0	U													5.4												5.4
4.5	V													5.6												5.6
5.3	W													6.4												6.4
4.0	X													5.2												5.2
5.1	Y													6.2												6.2
4.0	Z													5.2												5.2

12" UPPER CASE to 12" UPPER CASE																													
12	10.0					8.1					7.3					1.9					8.1					8.4		8.1	
	A	J	T	V	W	Y	B	D	E	F	H	I	K	L	M	N	P	R	U	C	G	O	Q	S	X	Z			
10.0	A													12.3												12.3			
8.1	B													10.9												10.3			
8.1	C													10.3												10.3			
8.1	D													10.9												10.3			
7.3	E													9.6												9.6			
7.3	F													9.6												9.6			
8.1	G													10.9												10.3			
8.1	H													10.9												10.9			
1.9	I													4.7												4.7			
7.5	J													10.3												10.3			
8.3	K													10.5												10.5			
7.3	L													9.6												9.6			
9.3	M													12.1												12.1			
8.1	N													10.9												10.9			
8.4	O													11.3												10.7			
8.1	P													10.9												10.3			
8.4	Q													11.3												10.7			
8.1	R													10.9												10.3			
8.1	S													10.9												10.3			
7.3	T													9.6												9.6			
8.1	U													10.9												10.9			
9.0	V													11.3												11.3			
10.5	W													12.8												12.8			
8.1	X													10.3												10.3			
10.1	Y													12.4												12.4			
8.1	Z													10.3												10.3			

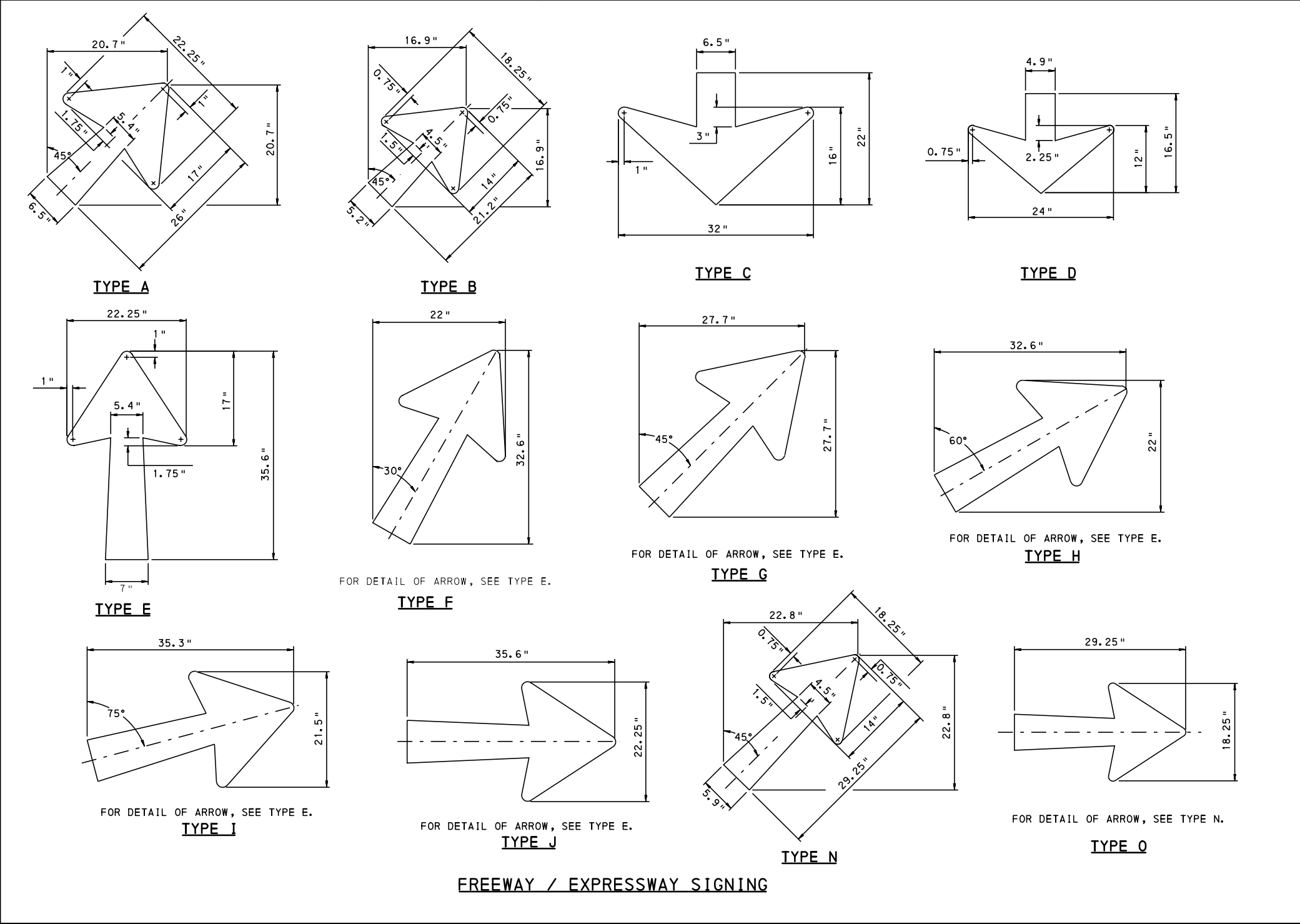
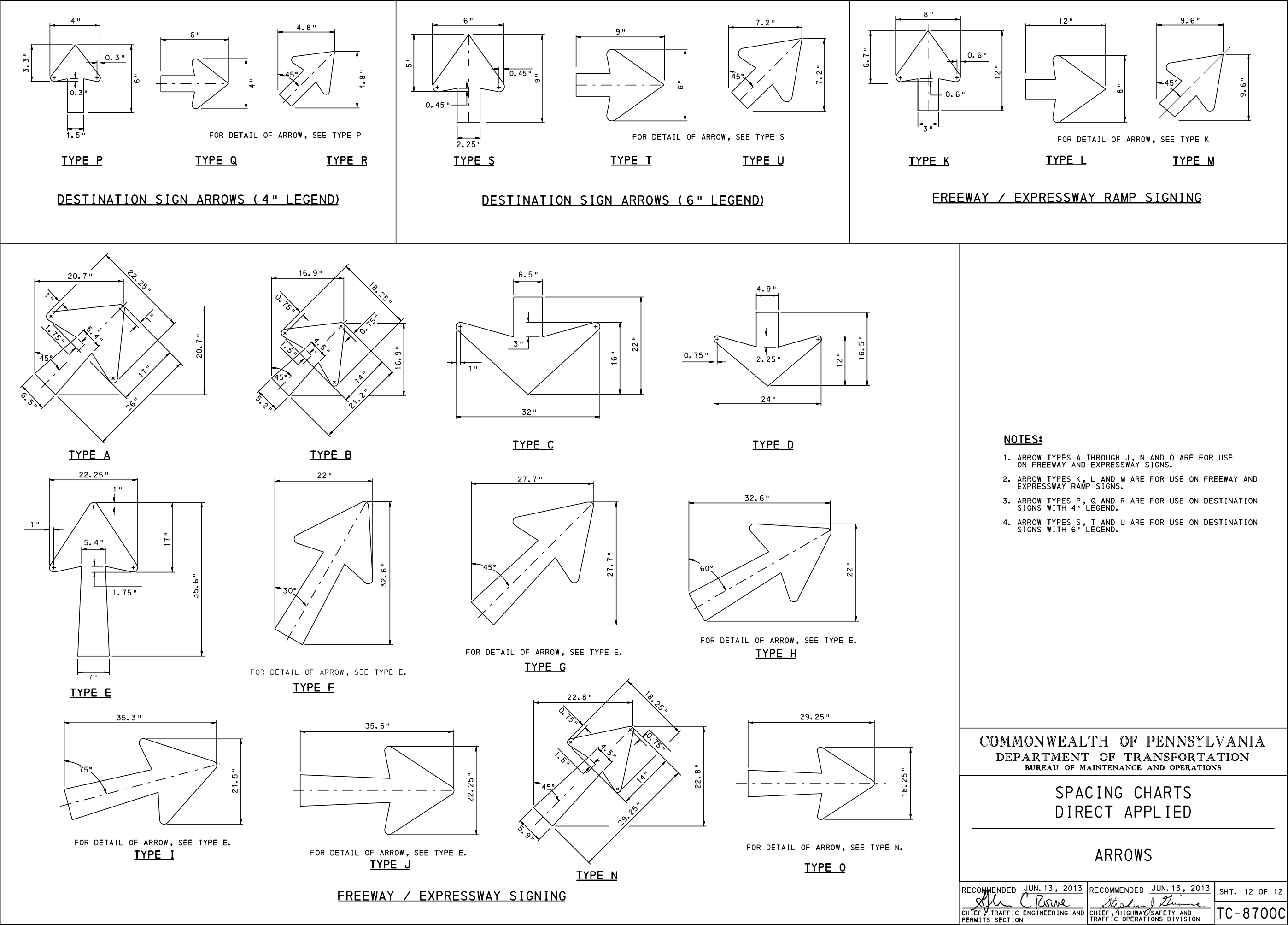
10" UPPER CASE to 10" UPPER CASE																										
10		5.3	4.4	3.8	4.6	5.3	4.2		3.8	4.2	1.3	4.4	3.8	4.6	4.2		4.5	4.2	4.6							
		A	J	T	V	W	Y	B	D	E	F	H	I	K	L	M	N	P	R	U	C	G	O	Q	S	X
5.3	A		5.8									6.8												6.8		
4.2	B		5.7									6.1												5.7		
4.2	C		5.2									5.7												5.7		
4.2	D		5.7									6.1												5.7		
3.8	E		4.8									5.3												5.3		
3.8	F		4.8									5.3												5.3		
4.2	G		5.7									6.1												5.7		
4.2	H		5.7									6.1												6.1		
1.3	I		2.8									3.1												3.1		
4.4	J		5.9									6.3												6.3		
4.4	K		5.4									5.9												5.9		
3.8	L		4.3									5.3												5.3		
4.8	M		6.3									6.7												6.7		
4.2	N		5.7									6.1												6.1		
4.5	O		6.0									6.4												6.0		
4.2	P		5.7									6.1												5.7		
4.5	Q		6.0									6.4												6.0		
4.2	R		5.7									6.1												5.7		
4.2	S		5.7									6.1												5.7		
3.8	T		4.3									5.3												5.3		
4.2	U		5.7									6.1												6.1		
4.6	V		5.1									6.1												6.1		
6.3	W		6.8									7.8												7.8		
4.6	X		5.6									6.1												6.1		
5.3	Y		5.8									6.8												6.8		
4.2	Z		5.2									5.7												5.7		

10" DIGIT to 10" DIGIT												
10		4.5	4.2					2.0	4.2	4.8	4.2	
		0	2	3	6	8	9	1	5	4	7	
4.5	0		6.0					6.4		6.0		
2.0	1		3.9					3.9		3.5		
4.2	2		5.7					6.1		5.7		
4.2	3		5.7					6.1		5.7		
4.8	4		6.3					6.3		5.3		
4.2	5		5.7					6.1		5.7		
4.2	6		5.7					6.1		5.7		
4.2	7		5.7					5.7		4.7		
4.2	8		5.7					6.1		5.7		
4.2	9		5.7					6.1		5.7		

4 " UPPER CASE to 4 " UPPER CASE																										
4		2.1	1.8	1.5	1.8	2.5	2.1	1.7	1.5	1.7	0.5	1.8	1.5	1.9	1.7			1.8	1.7	1.8	1.7					
	A	J	T	V	W	Y	B	D	E	F	H	I	K	L	M	N	P	R	U	C	G	O	Q	S	X	Z
2.1	A		2.3								2.7															2.7
1.7	B		2.3								2.4															2.3
1.7	C		2.1								2.3															2.3
1.7	D		2.3								2.4															2.3
1.5	E		1.9								2.1															2.1
1.5	F		1.9								2.1															2.1
1.7	G		2.3								2.4															2.3
1.7	H		2.3								2.4															2.4
0.5	I		1.1								1.3															1.3
1.8	J		2.4								2.5															2.5
1.8	K		2.2								2.4															2.4
1.5	L		1.7								2.1															2.1
1.9	M		2.5								2.7															2.7
1.7	N		2.3								2.4															2.4
1.8	O		2.4								2.6															2.4
1.7	P		2.3								2.4															2.3
1.8	Q		2.4								2.6															2.4
1.7	R		2.3								2.4															2.3
1.7	S		2.3								2.4															2.3
1.5	T		1.7								2.1															2.1
1.7	U		2.3								2.4															2.4
1.8	V		2.0								2.4															2.4
2.5	W		2.7								3.1															3.1
1.8	X		2.2								2.4															2.4
2.1	Y		2.3								2.7															2.7
1.7	Z		2.1								2.3															2.3

4" DIGIT to 4" DIGIT												
4		1.8	1.7					0.8	1.7	1.9	1.7	
		0	2	3	6	8	9	1	5	4	7	
1.8	0		2.4					2.6		2.4		
0.8	1		1.6					1.6		1.4		
1.7	2		2.3					2.4		2.3		
1.7	3		2.3					2.4		2.3		
1.9	4		2.5					2.5		2.1		
1.7	5		2.3					2.4		2.3		
1.7	6		2.3					2.4		2.3		
1.7	7		2.3					2.3		1.9		
1.7	8		2.3					2.4		2.3		
1.7	9		2.3					2.4		2.3		

8" UPPER CASE to 8" UPPER CASE																										
8		4.3	3.5	3.0	3.7	3.0	4.3	3.4	3.0	3.4	1.0	3.0	3.0	3.9	3.4		3.6	3.4	3.4							
		A	J	T	V	W	Y	B	D	E	F	H	I	K	L	M	N	P	R	U	C	G	O	Q	S	X
4.3	A		4.7										5.5													5.5
3.4	B		4.6										4.9													4.6
3.4	C		4.2										4.6													4.6
3.4	D		4.6										4.9													4.6
3.0	E		3.8										4.2													4.2
3.0	F		3.8										4.2													4.2
3.4	G		4.6										4.9													4.6
3.4	H		4.6										4.9													4.9
1.0	I		2.2										2.5													2.5
3.5	J		4.7										5.0													5.0
3.5	K		4.3										4.7													4.7
3.0	L		3.4										4.2													4.2
3.9	M		5.1										5.4													5.4
3.4	N		4.6										4.9													4.9
3.6	O		4.8										5.1													4.8
3.4	P		4.6										4.9													4.6
3.6	Q		4.8										5.1													4.8
3.4	R		4.6										4.9													4.6
3.4	S		4.6										4.9													4.6
3.0	T		3.4										4.2													4.2
3.4	U		4.6										4.9													4.9
3.7	V		4.1										4.9													4.9
5.0	W		5.4										6.2													6.2
3.7	X		4.5										4.9													4.9
4.3	Y		4.7										5.5													5.5
3.4	Z		4.2										4.6													4.6



NOTES:

- ARROW TYPES A THROUGH J, N AND O ARE FOR USE ON FREEWAY AND EXPRESSWAY SIGNS.
- ARROW TYPES K, L AND M ARE FOR USE ON FREEWAY AND EXPRESSWAY RAMP SIGNS.
- ARROW TYPES P, Q AND R ARE FOR USE ON DESTINATION SIGNS WITH 4" LEGEND.
- ARROW TYPES S, T AND U ARE FOR USE ON DESTINATION SIGNS WITH 6" LEGEND.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

SPACING CHARTS
DIRECT APPLIED

ARROWS

RECOMMENDED JUN. 13, 2013 <i>Stephen C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 12 OF 12 TC-8700C
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SIGNING PLANS

1. THE SIGNING PLANS SHOULD BE DRAWN TO A SCALE OF 1 : 1000 (1" = 100'). A PLAN VIEW OF THE SIGNS AND SIGN SUPPORTS SHOULD BE DEPICTED AT THE APPROXIMATE LOCATIONS AND SMALL PICTORIAL DRAWINGS OF THE SIGN FACES SHOULD BE INCLUDED NEAR THE PLAN VIEW, ALONG WITH THE TYPE OF POST AND/OR SUPPORT. A NUMBER SHALL BE ASSIGNED TO EACH SIGN NOT INCLUDED IN THE DEPARTMENT'S PUBLICATION 236 AND CROSS-REFERENCED TO THE SIGN FABRICATION DETAILS.
2. ALL SIGNS SHALL BE DESIGNED IN ACCORDANCE TO THE LAYOUT DETAILS INCLUDED IN TRAFFIC STANDARD TC-8701D.
3. SIGN LIGHTING SHOULD BE INCLUDED FOR ALL OVERHEAD GUIDE SIGNS EXCEPT SIGNS ON TANGENT ROADWAYS WHERE MOTORISTS HAVE A CLEARVIEW OF THE SIGN FOR A MINIMUM OF 240 m (800') AND WHERE THE VERTICAL ALIGNMENT IS SUCH THAT LOW BEAM HEADLIGHTS WILL ILLUMINATE THE SIGNS.

DESCRIPTION OF SIGNS

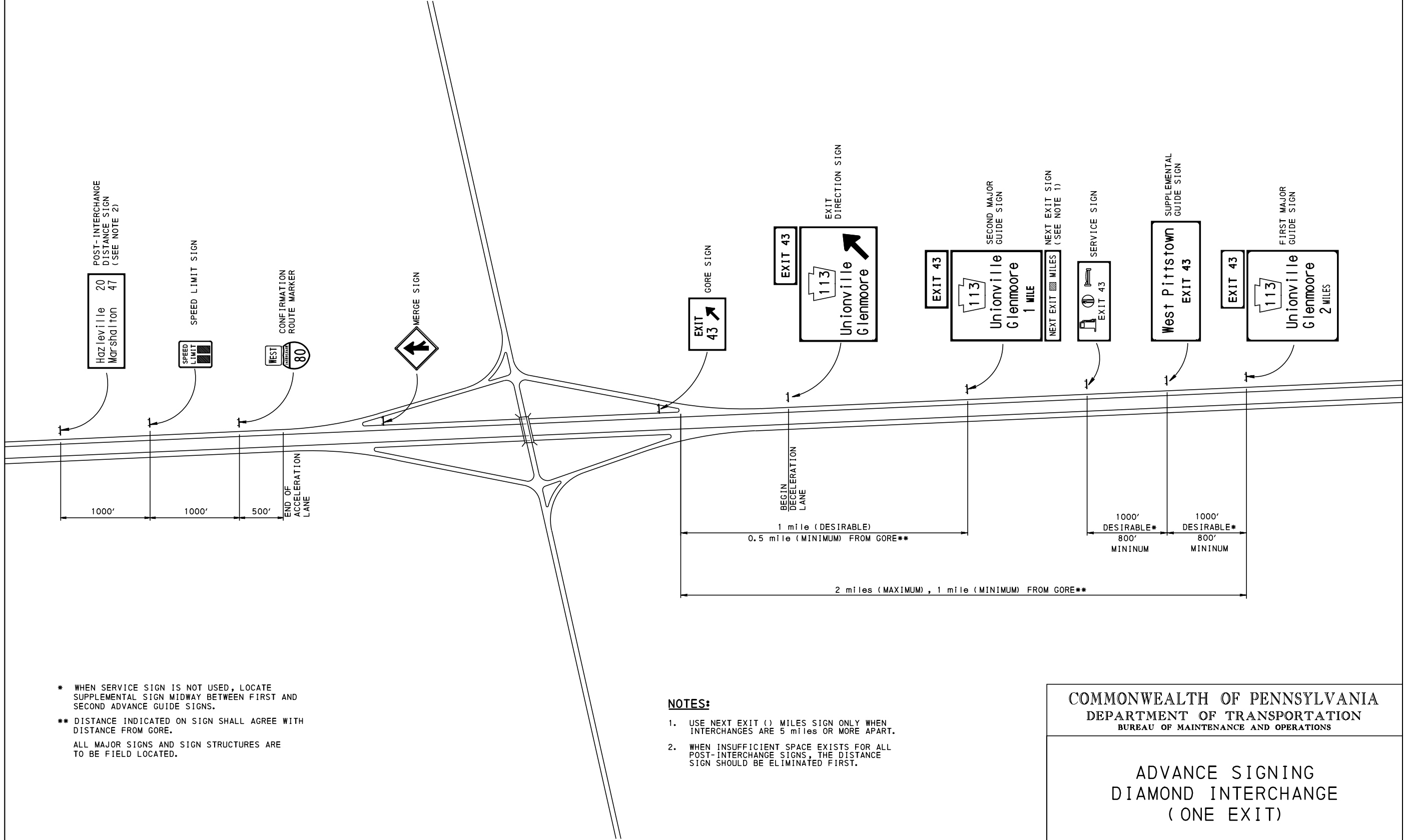
1. MAJOR GUIDE SIGNS PROVIDE MOTORISTS ADVANCE INFORMATION ON THE PRINCIPAL DESTINATIONS SERVED BY THE INTERCHANGE. TWO OR THREE MAJOR GUIDE SIGNS SHOULD BE USED, WITH TYPICAL PLACEMENT BEING 3.2 km (2 miles), 1.6 km (1 mile) AND 0.8 km (0.5 mile) IN ADVANCE OF THE EXIT. THE FOLLOWING INFORMATION SHOULD BE DISPLAYED ON MAJOR GUIDE SIGNS, BEGINNING FROM THE TOP OF THE SIGN.
 - A. AN EXIT PANEL WHEN THE EXIT IS NUMBERED. THE PANEL SHOULD BE ON THE RIGHT SIDE FOR RIGHT-HAND EXITS, AND ON THE LEFT SIDE FOR LEFT-HAND EXITS.
 - B. A SHIELD FOR EACH NUMBERED TRAFFIC ROUTE ASSIGNED TO THE CROSSING ROUTE OR WHICH IS VERY CLOSE TO THE INTERCHANGE. A CARDINAL DIRECTION SHOULD BE ASSOCIATED WITH EACH ROUTE WHERE TRAFFIC CAN ONLY GO IN ONE DIRECTION, AND THE WORD "TO" SHOULD BE USED ABOVE THE SHIELD OF ROUTES WHICH ARE CLOSE TO THE INTERCHANGE.
 - C. THE NAME OF THE TWO NEAREST COMMUNITIES AS IDENTIFIED ON THE OFFICIAL TRANSPORTATION MAP, ONE TO THE LEFT AND ONE TO THE RIGHT, UNLESS ALTERNATE DESTINATIONS ARE APPROVED IN ACCORDANCE WITH DEPARTMENT POLICY. AT SINGLE EXIT INTERCHANGES, THE COMMUNITY NAME TO THE LEFT SHOULD BE ABOVE THE COMMUNITY NAME TO THE RIGHT; AT DOUBLE EXIT INTERCHANGES, THE TOP NAME SHOULD BE THE COMMUNITY SERVED BY THE FIRST EXIT. IN URBAN AREAS, THE STREET NAME SHOULD BE USED IN LIEU OF COMMUNITY NAMES.
 - D. THE DISTANCE TO THE EXIT IN MILES AND/OR FRACTIONS OF MILES SHOULD BE SHOWN BELOW THE COMMUNITY NAMES OR THE STREET NAME. FRACTIONS SHOULD TYPICALLY BE SHOWN TO THE NEAREST 1/4 MILE, ALTHOUGH THE FRACTIONS "1/8" AND "3/8" ARE ACCEPTABLE. THE WORD "EXIT" OR "EXITS" SHOULD PRECEDE THE DISTANCE IF THE EXIT IS NOT NUMBERED.
2. A SUPPLEMENTAL GUIDE SIGN MAY INCLUDE ONE OR TWO DESTINATIONS, WHICH MAY BE A LARGE COMMUNITY NOT IDENTIFIED ON THE MAJOR GUIDE SIGNS OR ANY OTHER LARGE TRAFFIC GENERATOR IN ACCORDANCE WITH DEPARTMENT POLICY.
3. SERVICE SIGNS ARE USED TO IDENTIFY GAS, FOOD, LODGING, CAMPING, VISITOR INFORMATION, HOSPITAL, DIESEL, AND STATE POLICE. WITH THE EXCEPTION OF STATE POLICE, GENERAL MOTORIST SERVICE SIGNS INSTALLED ON NEW PANELS SHALL BE THE SYMBOL TYPE AS ILLUSTRATED IN TRAFFIC STANDARD TC-8701D.

AS AN ALTERNATE TO GENERAL MOTORISTS SERVICE SIGNS, LOGO SIGNS MAY BE INSTALLED ON SELECTED INTERSTATE HIGHWAYS AND OTHER FREEWAYS IN ACCORDANCE WITH DEPARTMENT POLICY. WHEN LOGO SIGNS ARE INSTALLED, ALL GENERAL MOTORIST SERVICE SIGNS WILL BE REMOVED, UNLESS A SPECIFIC SERVICE IS NOT REPRESENTED BY A LOGO SIGN.
4. EXIT DIRECTION SIGNS SHOULD INCLUDE THE SAME TRAFFIC ROUTES AND DESTINATIONS AS INCLUDED ON THE MAJOR GUIDE SIGNS, AS APPROPRIATE, PLUS AN UPWARD-POINTING OR SLANTING ARROW. THE ALIGNMENT OF THE ARROW SHOULD APPROXIMATE THE ANGLE RELATED TO THE SHARPNESS OF THE TURN.
5. GORE SIGNS SHALL BE LOCATED IN THE AREA BETWEEN THE MAIN ROADWAY AND THE RAMP AT ALL EXITS. THE SIGNS SHALL HAVE THE WORD "EXIT" AND AN ARROW; IF THE EXIT IS NUMBERED, THE NUMBER OR NUMBER AND LETTER SHOULD ALSO BE INCLUDED.
6. CONFIRMATION ROUTE MARKERS SHOULD NOT BE USED BETWEEN CLOSELY SPACED INTERCHANGES OR WHEN A "PULL-THRU SIGN" FOLLOWS THE INTERCHANGE.

7. OFF-RAMP DIRECTIONAL SIGNS ARE USED ON ALL DIAMOND INTERCHANGE OFF-RAMPS, AND SHOULD INCLUDE ALL DESTINATIONS INCLUDED ON THE MAJOR AND SUPPLEMENTAL GUIDE SIGNS. THE DISTANCE IN THE NEAREST NUMBER OF WHOLE MILES TO THE DESTINATION SHOULD BE INCLUDED IF THE DESTINATION IS OVER 3.2 km (2 miles) AWAY, WHERE THE DISTANCE IS THE DISTANCE TO THE CENTER OF THE COMMUNITY OR ENTRANCE TO THE TRAFFIC GENERATOR.
8. POST-INTERCHANGE DISTANCE SIGNS SHOULD BE USED IN RURAL AREAS AND WHERE UNDUE REPETITION OF MESSAGES WILL NOT OCCUR. WHEN USED, IT SHOULD INCLUDE TWO OR THREE DESTINATION POINTS AND THE DISTANCES IN THE NEAREST NUMBER OF WHOLE MILES TO THOSE POINTS. THE FIRST DESTINATION SHOULD BE THE CLOSEST MEANINGFUL COMMUNITY WHICH IS NEAR AN INTERCHANGE; THE LAST DESTINATION IS THE NEAREST NATIONAL CONTROL CITY; AND AN INTERMEDIATE DESTINATION MAY BE INCLUDED BETWEEN THE TWO OTHER DESTINATIONS. CONSIDERATION MAY ALSO BE GIVEN TO INCLUDING MAJOR INTERSECTING HIGHWAY ROUTES AS DESTINATIONS USING THE ROUTE NUMBER (I.e., PA 30, US 30, etc.) EXCEPT PA TURNPIKE MAY BE USED. SHIELDS ARE NOT REQUIRED.
9. NEXT () EXITS AREA SIGNS MAY BE USED IN ADVANCE OF MORE THAN THREE INTERCHANGES SERVING AN URBAN AREA OR HISTORICAL OR RECREATIONAL REGION. INTERCHANGE SEQUENCE SERIES SIGNS MAY BE USED PRIOR TO ALL BUT THE LAST INTERCHANGE.
10. INTERCHANGE SEQUENCE SIGNS ARE USED IN LARGE URBAN AREAS WHEN THE INTERCHANGES ARE CLOSELY SPACED IN ORDER TO IDENTIFY THE NEXT TWO OR THREE INTERCHANGES. WHEN USED, THE INTERCHANGE SEQUENCE SIGNS SHOULD NORMALLY BE INSTALLED IN THE MEDIAN OR ON AN OVERHEAD STRUCTURE. THEY FREQUENTLY CAN BE INSTALLED BACK-TO-BACK, ONE IN EACH DIRECTION.
11. COMMUNITY INTERCHANGES IDENTIFICATION SIGNS MAY BE USED FOR SUBURBAN OR RURAL COMMUNITIES SERVED BY TWO OR THREE INTERCHANGES. THE SIGN IS IDENTICAL TO THE INTERCHANGE SEQUENCE SIGN EXCEPT THE NAME OF THE COMMUNITY AND THE WORD "EXITS" IS SHOWN ON THE TOP OF THE SIGN. THE SIGN SHOULD BE LOCATED IN ADVANCE OF THE FIRST INTERCHANGE FOR THE COMMUNITY.
12. LANE ASSIGNMENT SIGNS MAY BE USED TO ASSIGN A PARTICULAR LANE FOR A GIVEN DESTINATION. A DOWN ARROW IS NORMALLY USED, BUT ALTERNATE MESSAGES SUCH AS "LEFT LANE", "RIGHT LANES", ETC. MAY BE USED.
13. PULL-THRU SIGNS MAY BE USED WHEN THE GEOMETRICS OF THE INTERCHANGE ARE COMPLEX, SUCH AS AT THE JUNCTION OF FREEWAYS AND WHEN IT IS NOT CLEAR TO THE DRIVER WHICH ROADWAY IS THE THROUGH ROADWAY. A NATIONAL OR REGIONAL CONTROL CITY SHOULD BE USED AS THE DESTINATION. DOWN ARROWS MAY BE USED WHEN THE ALIGNMENT AND NUMBER OF THROUGH LANES IS NOT READILY EVIDENT. (PULL-THRU SIGNS ARE SIMILAR TO LANE ASSIGNMENT SIGNS BUT NEVER HAVE DISTANCES OR EXIT PANELS.)
14. EXIT ONLY PANELS SHOULD BE USED FOR ALL INTERCHANGE LANE DROPS AT WHICH THE THROUGH ROUTE IS CARRIED ON THE MAINLINE. EXIT ONLY PANELS SHOULD ALWAYS BE INSTALLED OVERHEAD, IN CONJUNCTION WITH LANE ASSIGNMENT SIGNS, EXIT DIRECTION SIGNS AND DIAGRAMMATIC SIGNS.
15. DIAGRAMMATIC SIGNS PROVIDE A GRAPHIC VIEW OF THE EXIT IN RELATIONSHIP TO THE MAIN HIGHWAY. THEY SHOULD BE USED FOR SPLITS HAVING OFF-RAMP MOVEMENTS TO THE LEFT, OPTIONAL LANE SPLITS, EXITS WITH ROUTE DISCONTINUITY, AND LEFT EXIT LANE DROPS; AND THEY ALSO MAY BE USED AT TWO-LANE EXITS WITH AN OPTIONAL LANE.
16. EXIT PANELS SHALL BE USED ON ALL MAJOR GUIDE, EXIT DIRECTION, LANE ASSIGNMENT, AND DIAGRAMMATIC SIGNS WHEN EXIT NUMBERS HAVE BEEN ASSIGNED. THE PLURAL "EXITS" SHOULD BE USED IN ADVANCE OF INTERCHANGES WITH MORE THAN ONE EXIT, ALONG WITH THE RAMP DESIGNATIONS "A-B" OR "B-A", DEPENDING UPON WHICH RAMP DESIGNATION IS SERVED FIRST. (WHEN THERE ARE TWO EXITS, THE FIRST ONE IN THE DIRECTION OF INCREASING DISTANCE MARKERS IS DESIGNATED AS "A", THE SECOND ONE AS "B".)
17. ADVISORY EXIT SPEED SIGNS (W13-2) AS DETAILED IN THE DEPARTMENT'S PUBLICATION 236M SHALL BE INSTALLED ALONGSIDE THE DECELERATION LANE, POSITIONED APPROXIMATELY AT THE MID-POINT.
18. NEXT EXIT () MILES SIGN SHOULD BE USED BELOW THE ADVANCE GUIDE SIGN NEAREST THE INTERCHANGE (NORMALLY THE 1 MILE ADVANCE GUIDE SIGN) WHEN THE DISTANCE BETWEEN SUCCESSIVE RURAL INTERCHANGES IS MORE THAN 8 km (5 miles). THIS SIGN MAY BE FABRICATED AS AN INTEGRAL PART OF THE ADVANCE GUIDE SIGN OR MAY BE A SEPARATE SUPPLEMENTARY PANEL, WHEN A SEPARATE PANEL IS USED, ENSURE THAT IT IS INSTALLED ON THE POST ABOVE THE HINGE PLATE.

19. OVERHEAD ARROW-PER-LANE GUIDE SIGNS ARE USED WHERE AN OPTION LANE IS PRESENT AT FREEWAY AND EXPRESSWAY MULTI-LANE EXIT INTERCHANGES AND SPLITS. THEY DISPLAY AN UPWARD-POINTING ARROW ABOVE EACH LANE THAT CONVEYS THE DIRECTION(S) OF TRAVEL THAT THE LANE SERVES AT THE POINT OF DEPARTURE. THEY HAVE BEEN SHOWN TO BE SUPERIOR TO EITHER CONVENTIONAL GUIDE SIGNS OR DIAGRAMMATIC GUIDE SIGNS.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
INTERCHANGE ADVANCE SIGNING GENERAL NOTES		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 1 OF 13 TC-8701A



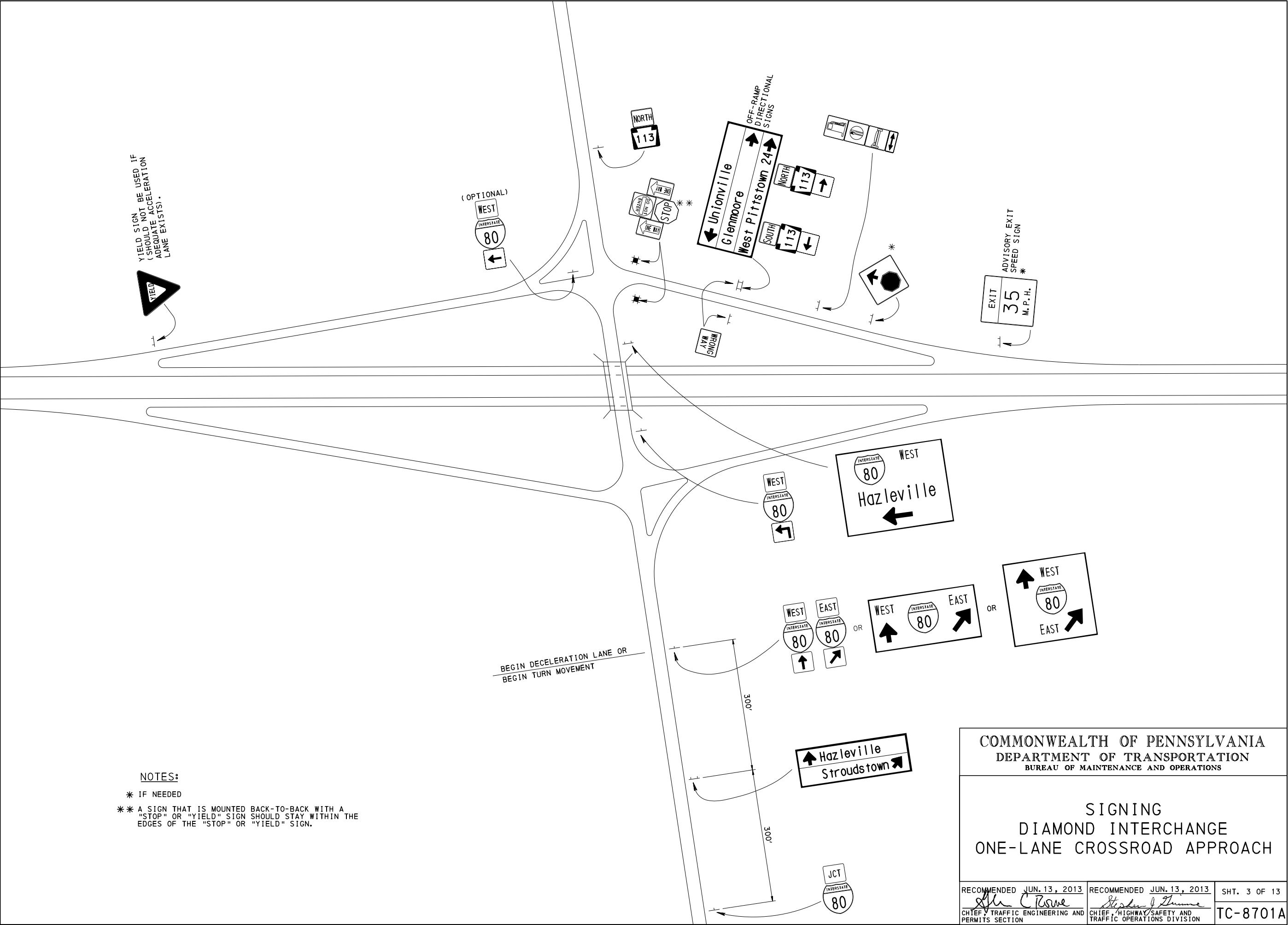
* WHEN SERVICE SIGN IS NOT USED, LOCATE SUPPLEMENTAL SIGN MIDWAY BETWEEN FIRST AND SECOND ADVANCE GUIDE SIGNS.

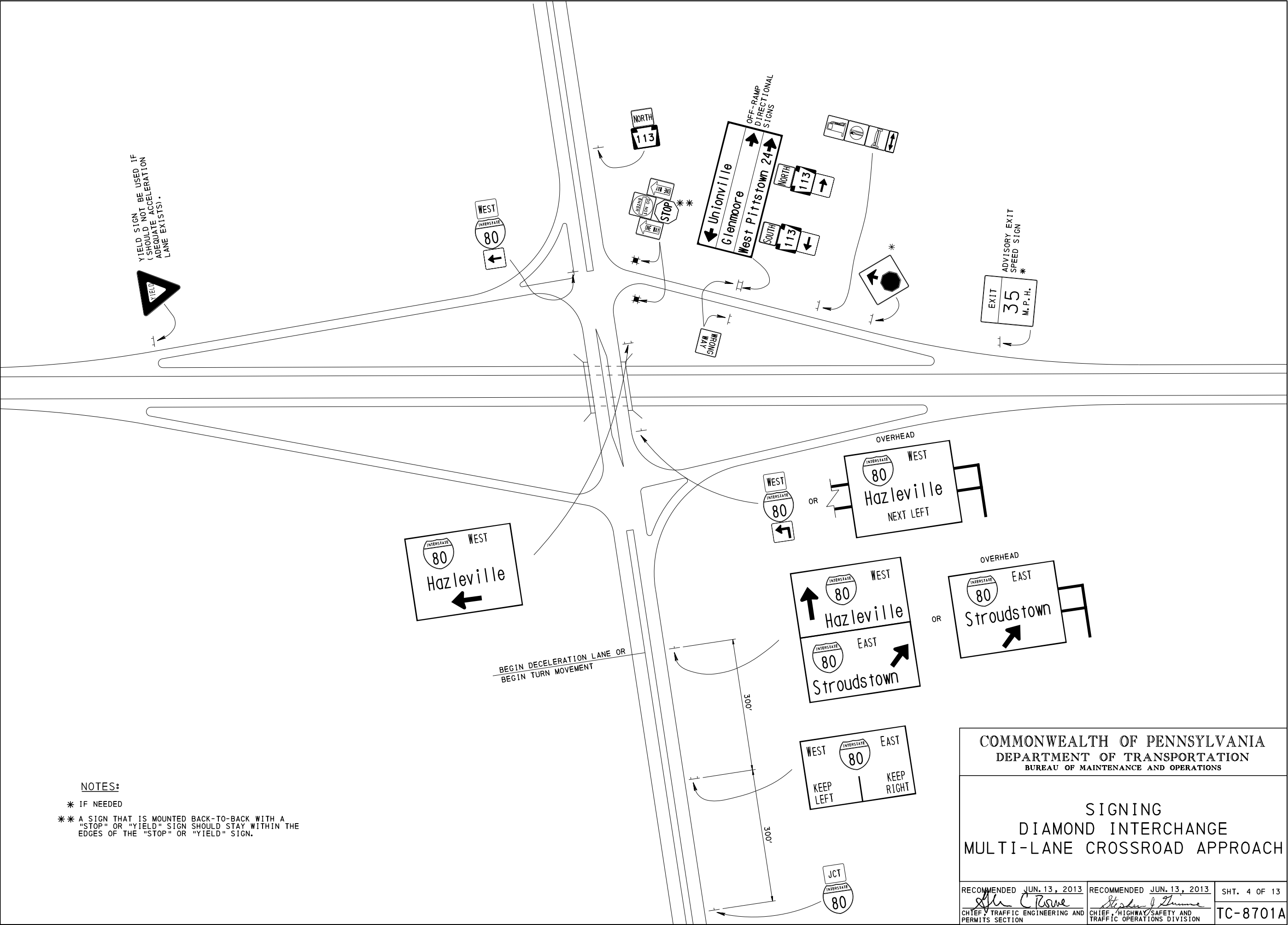
** DISTANCE INDICATED ON SIGN SHALL AGREE WITH DISTANCE FROM GORE.

ALL MAJOR SIGNS AND SIGN STRUCTURES ARE TO BE FIELD LOCATED.

- NOTES:**
1. USE NEXT EXIT () MILES SIGN ONLY WHEN INTERCHANGES ARE 5 miles OR MORE APART.
 2. WHEN INSUFFICIENT SPACE EXISTS FOR ALL POST-INTERCHANGE SIGNS, THE DISTANCE SIGN SHOULD BE ELIMINATED FIRST.

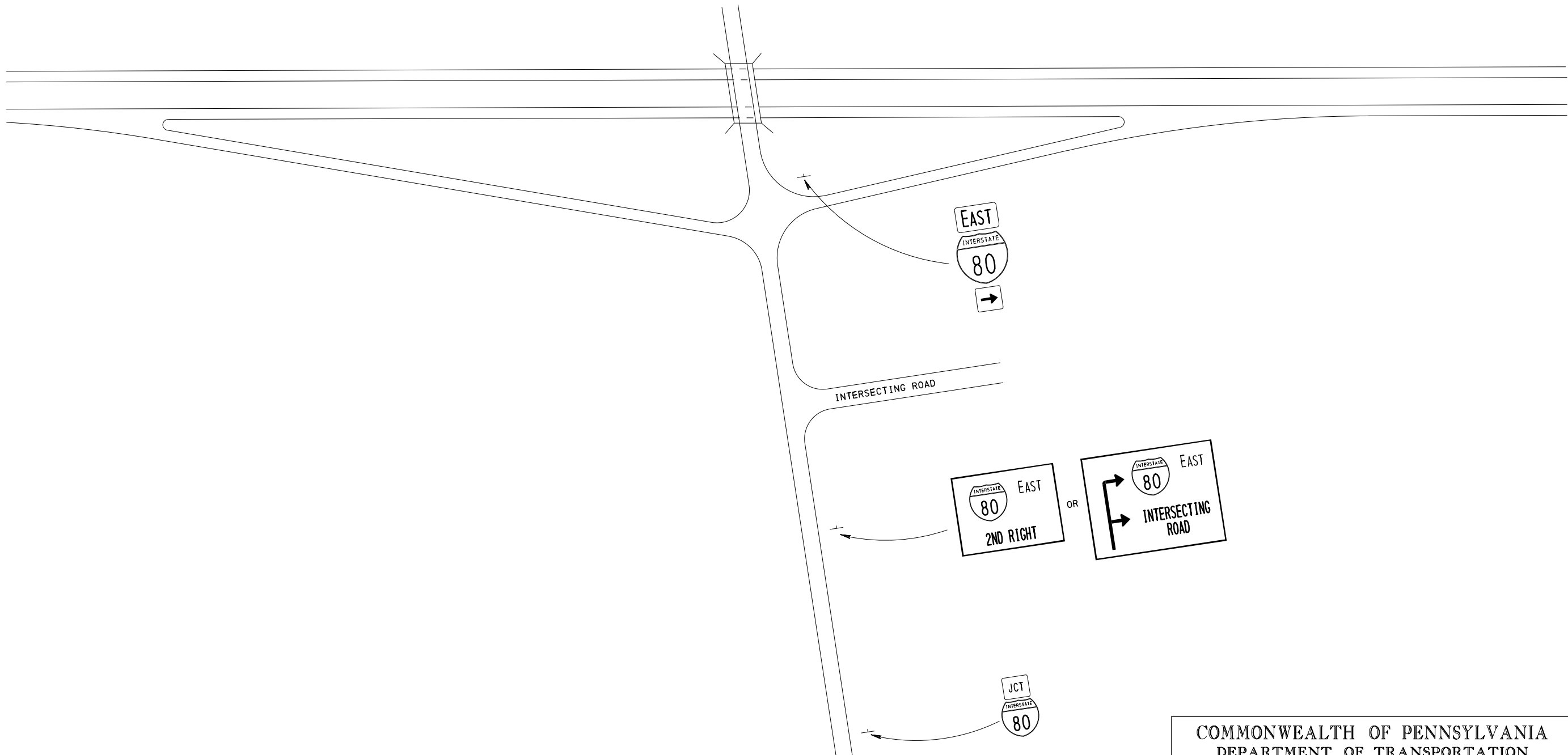
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
ADVANCE SIGNING DIAMOND INTERCHANGE (ONE EXIT)		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 2 OF 13 TC-8701A



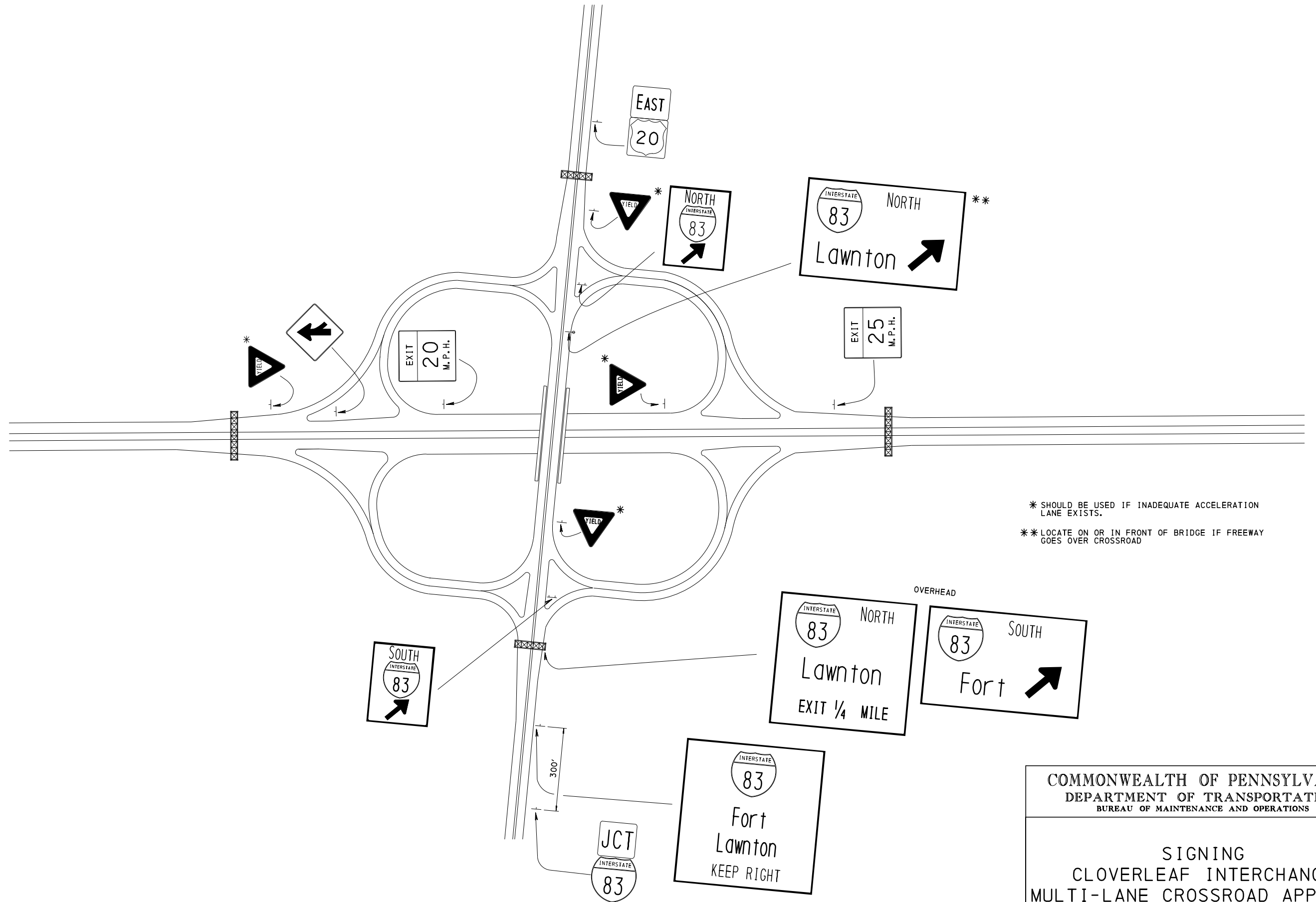


NOTES:

- * IF NEEDED
- ** A SIGN THAT IS MOUNTED BACK-TO-BACK WITH A "STOP" OR "YIELD" SIGN SHOULD STAY WITHIN THE EDGES OF THE "STOP" OR "YIELD" SIGN.



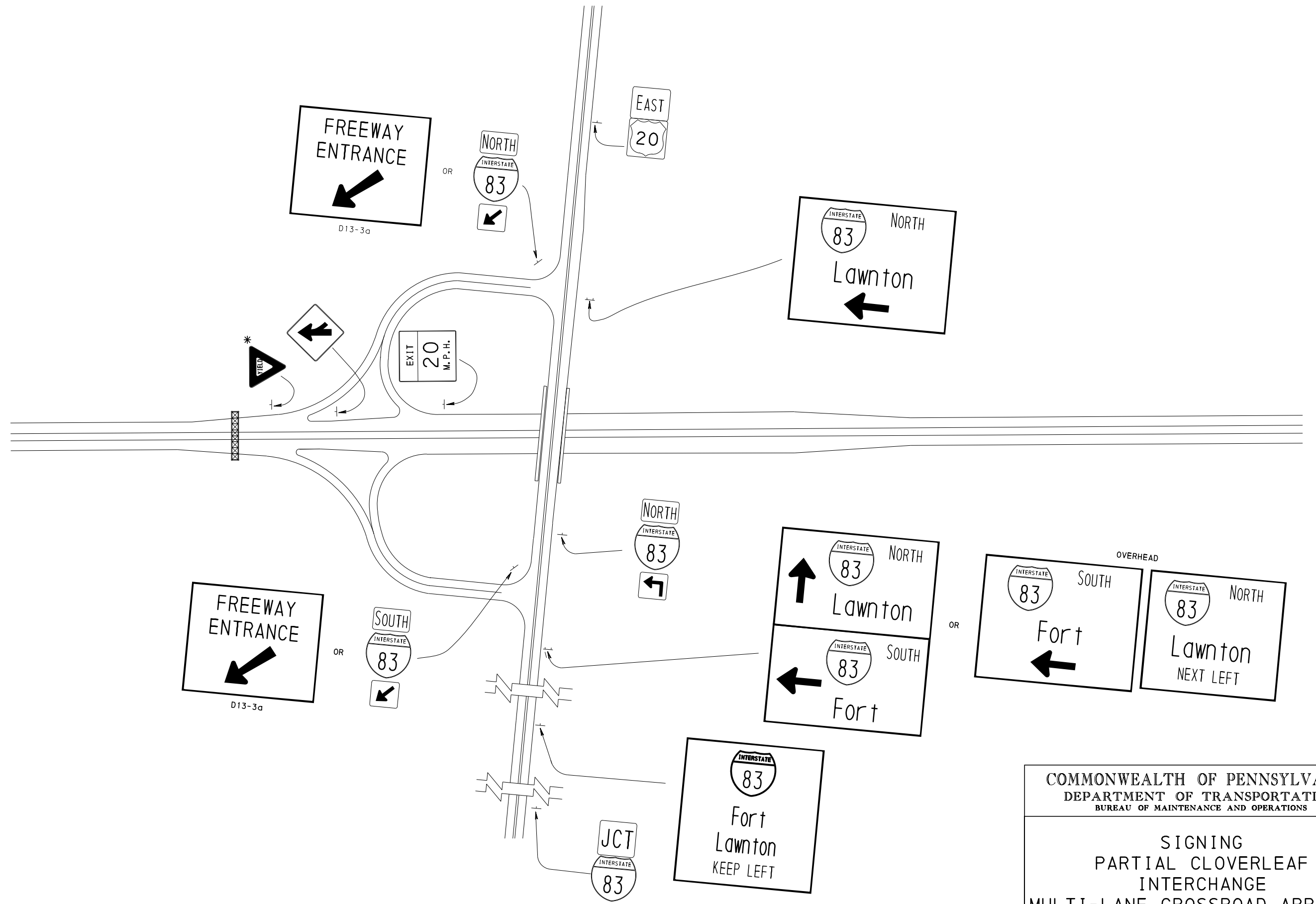
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SIGNING ONE-LANE CROSSROAD APPROACH WITH NEARBY INTERSECTING ROAD		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 5 OF 13 TC-8701A



* SHOULD BE USED IF INADEQUATE ACCELERATION LANE EXISTS.

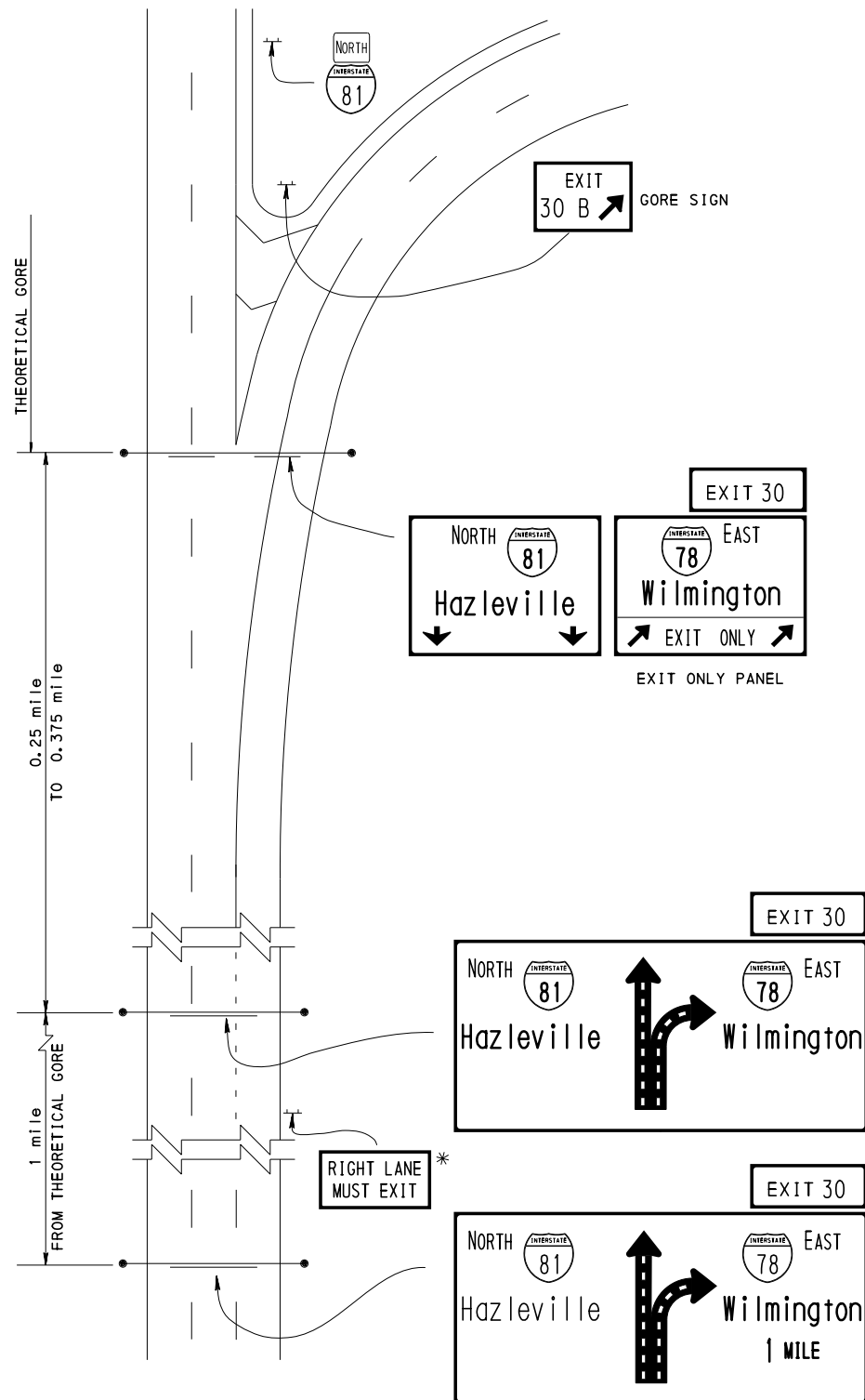
** LOCATE ON OR IN FRONT OF BRIDGE IF FREEWAY GOES OVER CROSSROAD

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SIGNING CLOVERLEAF INTERCHANGE MULTI-LANE CROSSROAD APPROACH		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 7 OF 13 TC-8701A

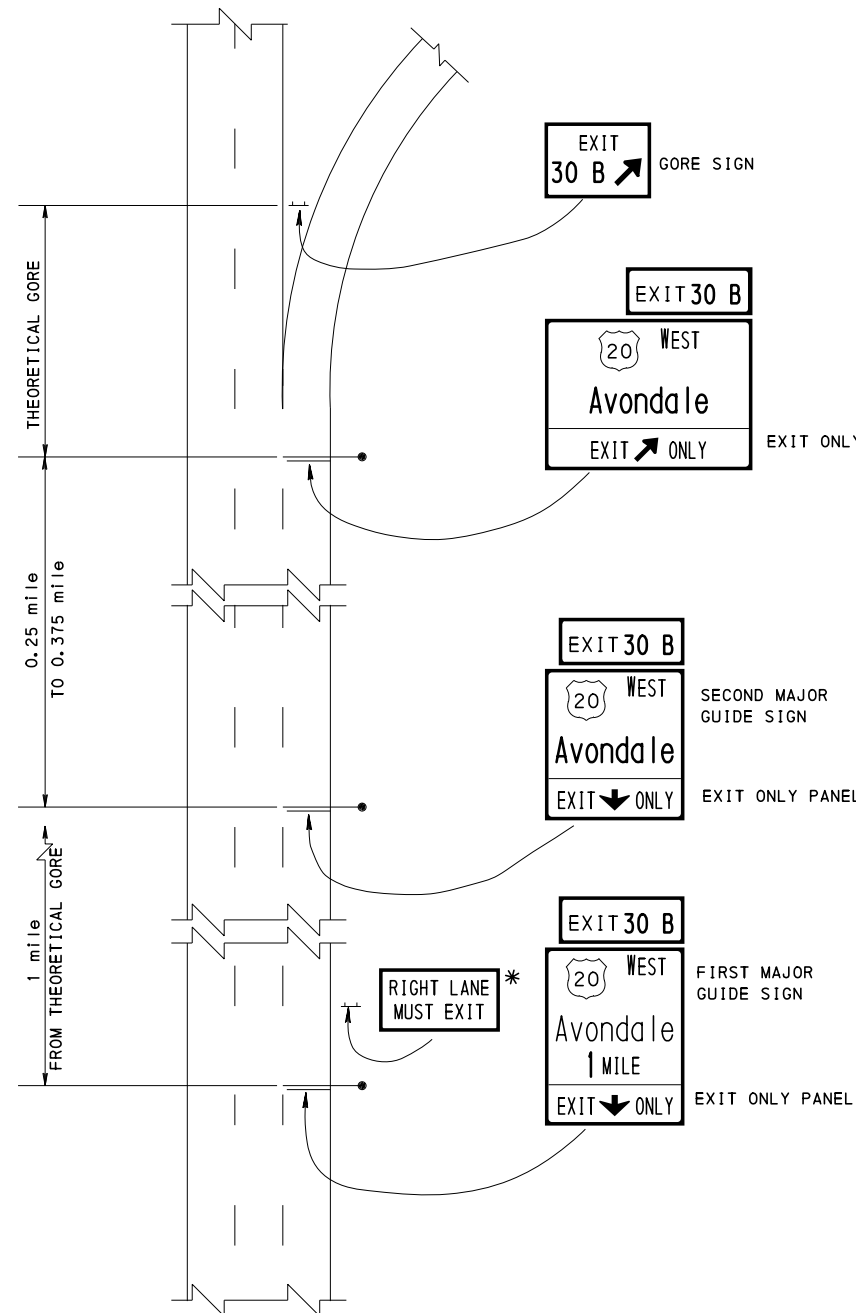


* SHOULD BE USED IF INADEQUATE ACCELERATION LANE EXISTS.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SIGNING PARTIAL CLOVERLEAF INTERCHANGE MULTI-LANE CROSSROAD APPROACH		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 8 OF 13 TC-8701A



DIAGRAMMATIC SIGNING



LANE DROP SIGNING

NOTE:

1. DIAGRAMMATIC GUIDE SIGNS USED WHERE AN OPTION LANE IS PRESENT AT A FREEWAY OR EXPRESSWAY SPLIT OR MULTI-LANE EXIT.
2. DIAGRAMMATIC GUIDE SIGNS SHALL NOT BE USED AT CLOVERLEAF INTERCHANGES FOR THE PURPOSE OF DEPICTING SUCCESSIVE DEPARTURES FROM THE MAINLINE OR SEPARATE DOWNSTREAM DEPARTURES FROM A COLLECTOR-DISTRIBUTOR ROADWAY.

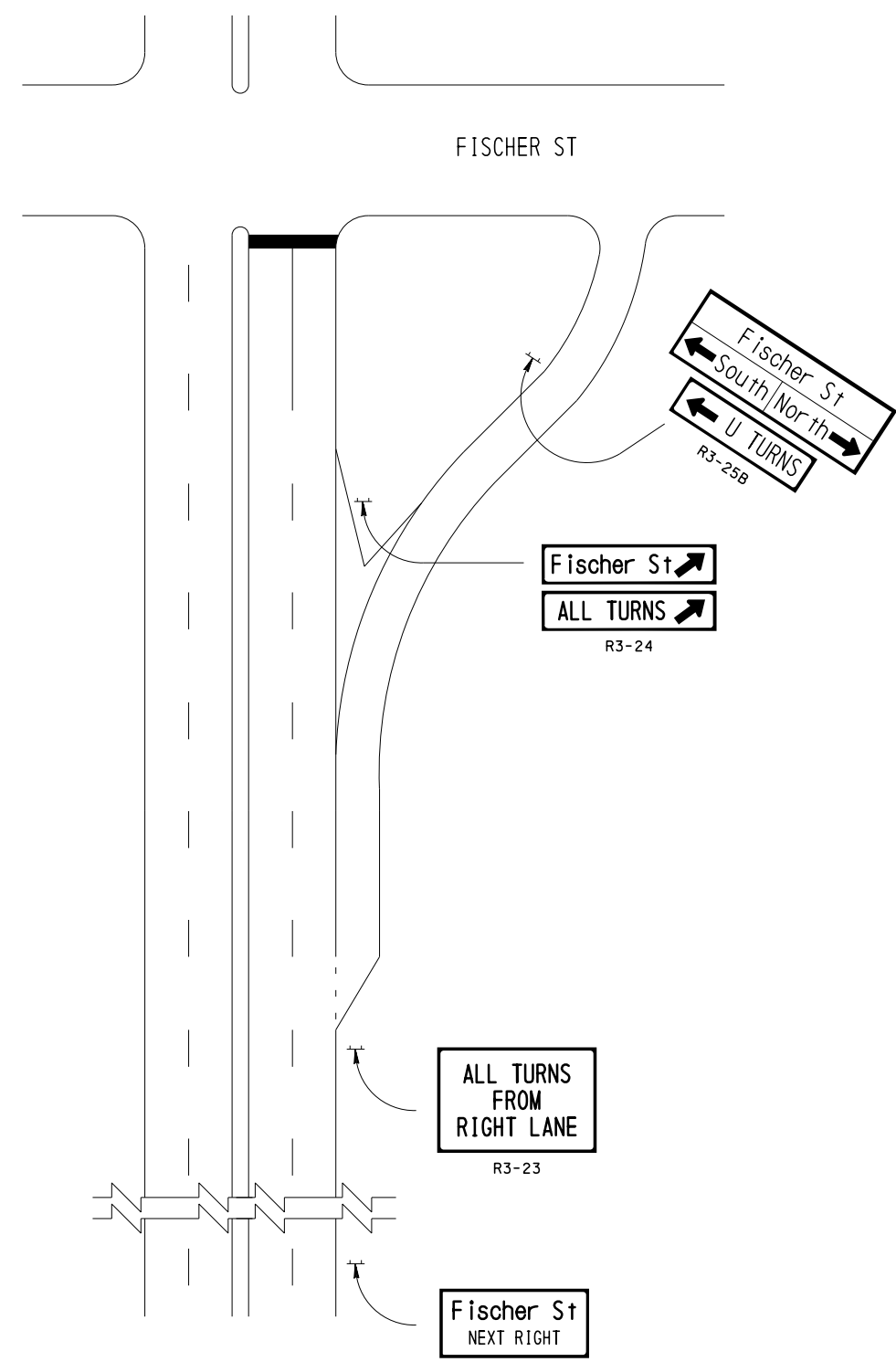
THE DIAGRAMMATIC GUIDE SIGNS AT COVERLEAF INTERCHANGES SHALL BE LIMITED TO THE FOLLOWING CASES:

- WHERE THE OUTER (NON-LOOP) EXIT RAMP OF THE CLOVERLEAF IS A MULTI-LANE EXIT HAVING AN OPTIONAL EXIT LANE THAT ALSO CARRIES THE THROUGH ROUTE.
- AT CLOVERLEAF INTERCHANGES THAT INCLUDE COLLECTOR-DISTRIBUTOR ROADWAYS THAT ARE ACCESSED FROM THE MAINLINE BY A MULTI-LANE EXIT HAVING AN OPTIONAL EXIT LANE THAT ALSO CARRIES THE THROUGH ROUTE. THE DIAGRAMMATIC GUIDE SIGN SHALL ONLY SHOW THE CONFIGURATION OF THE LANES AT THE EXIT POINT TO THE COLLECTOR-DISTRIBUTOR ROADWAY AND NOT THE ENTIRE INTERCHANGE CONFIGURATION.

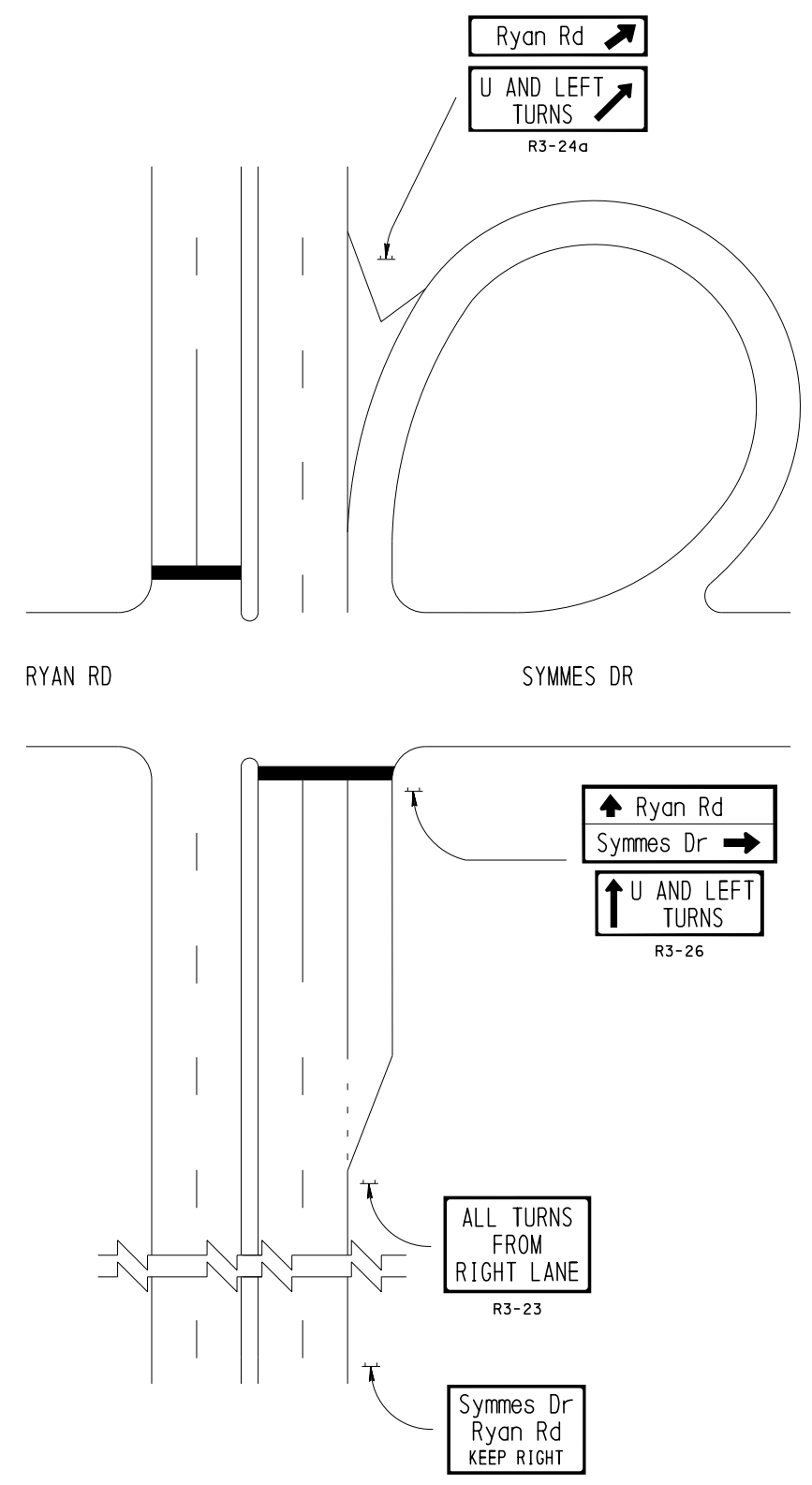
* OPTIONAL

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BUREAU OF MAINTENANCE AND OPERATIONS

SIGNING
DIAGRAMMATIC & LANE DROP

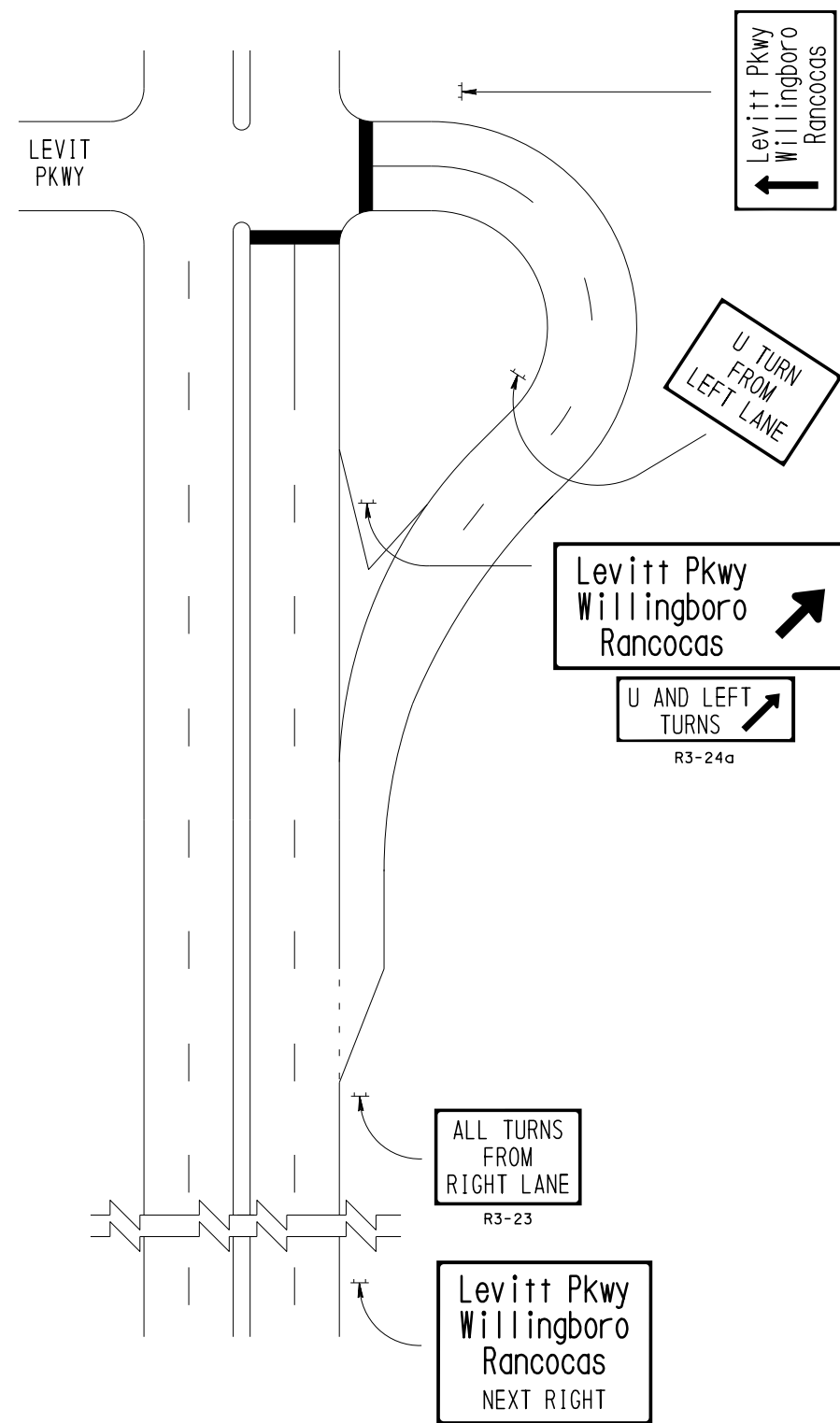


URNS MADE PRIOR TO THE INTERSECTION

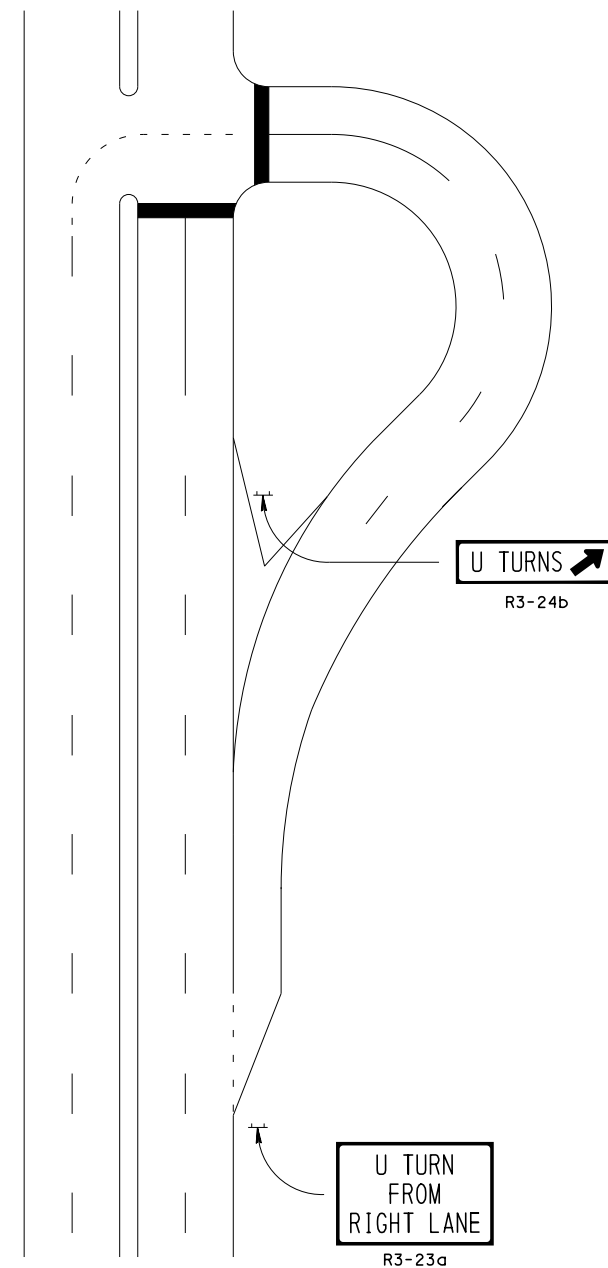


URNS MADE BEYOND THE INTERSECTION

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SIGNING JUGHANDLES		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 11 OF 13 TC-8701A



TRADITIONAL T-INTERSECTION
JUGHANDLE



TRADITIONAL U TURN
JUGHANDLE

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

SIGNING
TRADITIONAL JUGHANDLES

1. SIGN DIMENSIONS: WIDTHS AND HEIGHTS OF SIGNS SHALL BE IN MULTIPLES OF 6". THE SIGN HEIGHTS OF EXTRUDED ALUMINUM PANEL SIGNS ARE ACCEPTABLE IN MULTIPLES OF 6". THE INCREASED HEIGHTS OF SIGNS SHALL BE DISTRIBUTED EQUALLY BETWEEN THE LEGEND CLEARANCE DIMENSIONS AT THE TOP AND BOTTOM OF THE SIGN, WHEN THE USE OF EXTRUDED ALUMINUM PANELS RESULTS IN A VERTICAL SIGN DIMENSION GREATER THAN REQUIRED.
2. SINGLE SHIELD: WHEN MOUNTED ALONE, SHIELD SHALL BE CENTERED WITHIN THE WIDTH DIMENSION.
3. MULTIPLE SHIELDS: WHEN MULTIPLE SHIELDS ARE USED, THEY SHALL BE EVENLY SPACED WITHIN THE WIDTH DIMENSION AND SHALL BE ON THE SAME VERTICAL ALIGNMENT.
4. SINGLE SHIELD WITH CARDINAL DIRECTION: THE CARDINAL DIRECTION SHALL BE MOUNTED ON THE SAME SIDE OF THE SHIELD AS THE EXIT, WITH THE TOP LINE OF THE SHIELD AND THE CARDINAL AT THE SAME ELEVATION. CARDINALS MAY BE CENTERED OVER THE SHIELD WHEN THE SHIELD/CARDINAL BECOMES THE CONTROLLING LINE FOR THE WIDTH DIMENSION.
5. MULTIPLE SHIELDS AND CARDINALS: WHEN MULTIPLE SHIELDS ARE USED WITH CARDINALS, THE CARDINALS SHALL BE CENTERED OVER THE APPROPRIATE SHIELDS. A CARDINAL MAY BE CENTERED OVER TWO SHIELDS WHEN APPLICABLE.
6. DESTINATION: THE DESTINATION MESSAGE SHOULD ORDINARILY CONSIST OF NOT MORE THAN TWO DESTINATIONS. A DESTINATION MAY BE A CITY, TOWN OR VILLAGE NAME; A STREET NAME; OR THE NAME OF A LARGE TRAFFIC GENERATOR. FOR SUPPLEMENTAL GUIDE SIGNS, THE DESTINATION MAY BE ANY APPROVED SUPPLEMENTAL DESTINATION.
7. ACTION MESSAGE: THE ACTION MESSAGE SHALL CONSIST OF EITHER A DISTANCE INDICATION, A DIRECTION INDICATION, OR A LANE ASSIGNMENT ARROW.
8. EXIT PANELS: EXIT PANELS SHALL BE USED ON MAJOR GUIDE SIGNS WHENEVER EXIT NUMBERS HAVE BEEN ASSIGNED. WHEN USED, THEY SHALL BE INSTALLED ON THE SAME SIDE OF THE SIGN AS THE EXIT. WHEN EXIT PANELS ARE USED, THE WORD "EXIT" SHALL NOT BE USED IN THE MAIN SIGN. ACTION MESSAGE FOR NUMBERED EXITS TO THE LEFT, A LEFT EXIT NUMBER (E1-5DP) PLAQUE SHALL BE ADDED TO THE TOP LEFT-HAND EDGE OF THE SIGN. FOR NON-NUMBERED EXITS TO THE LEFT, A LEFT (E1-5AP) PLAQUE SHALL BE ADDED TO THE TOP LEFT-HAND EDGE OF THE SIGN.
9. EXIT ONLY PANELS: EXIT ONLY PANELS SHALL BE USED ONLY FOR A LANE DROP. THE PANELS SHALL BE YELLOW REFLECTORIZED BACKGROUND WITH BLACK LEGEND, AND SHALL BE DESIGNED TO FIT WITHIN THE WHITE BORDER OF THE COMPLETE SIGN PANEL. THE TOP OF THE EXIT ONLY PANEL SHOULD BE A MINIMUM OF 10.5" BELOW THE BOTTOM OF THE LOWEST DESTINATION. SEE SHEET 5 OF THIS STANDARD FOR DETAILS OF EXIT PANELS.
10. INTERCHANGE CLASSIFICATION: FOR FREEWAY AND EXPRESSWAY SIGNING PURPOSES, INTERCHANGES ARE CLASSIFIED AS MAJOR OR INTERMEDIATE AS DEFINED BELOW:
 - A. MAJOR/CATEGORY A -- INTERCHANGES WITH OTHER FREEWAYS OR EXPRESSWAYS.
 - B. MAJOR/CATEGORY B -- INTERCHANGES WITH HIGH-VOLUME MULTILANE HIGHWAYS, PRINCIPAL URBAN ARTERIALS AND MAJOR RURAL ROUTES WHERE THE INTERCHANGING TRAFFIC IS HEAVY OR INCLUDES MANY DRIVERS UNFAMILIAR WITH THE AREA.
 - C. INTERMEDIATE -- MOST INTERCHANGES WITH URBAN OR RURAL ROUTES.
11. LEGEND SIZES: WITH RESPECT TO NOTE 10, LETTER AND NUMERAL SIZES FOR ADVANCE GUIDE, EXIT DIRECTION, AND OVERHEAD SIGNS ARE:

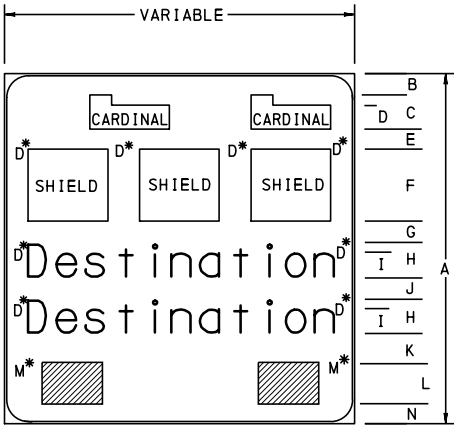
44 MAY ONLY BE USED ON CONVENTIONAL ROADS WITH A SPEED LIMIT LESS THAN OR EQUAL TO
45 40 MPH. IF A LOT OF BUSINESS SIGNS COMPETE FOR DRIVERS' ATTENTION, LARGER LEGEND
46 AND ROUTE MARKER SHIELDS SHOULD BE CONSIDERED.

-
- Diagram illustrating the layout and dimensions of a variable message sign (VMS) for a highway interchange. The sign is rectangular with a black border. The layout includes:
- Top Section:** Two rectangular boxes labeled "CARDINAL" with a small "D*" label to their right.
 - Middle Section:** Three rectangular boxes labeled "SHIELD" with a small "D*" label to their left.
 - Bottom Section:** Two large rectangular boxes labeled "Destination" with a small "D*" label to their left and right. Below these are two smaller rectangular boxes labeled "EXIT" and "MILES" with a small "L*" label to their left and right.
- Dimensions are indicated by letters A through N, representing various heights and widths of the sign components and the overall sign structure.

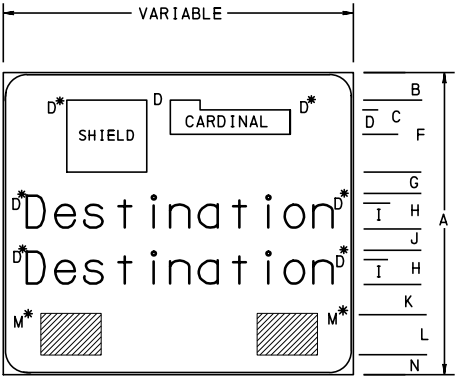
[illegible]

Figure 1: Example of a variable data field. The diagram illustrates a rectangular sign with a rounded top. The sign contains the text "SHIELD" and "CARDINAL" in two boxes at the top, followed by "Destination" repeated twice, and "EXIT" followed by a bracketed "L" and "MILES" at the bottom. Dimensions are indicated: "VARIABLE" for the width, "A" for the height, and "B" for the top section height. Various points are labeled with "D*" and "L*". To the right, a vertical dimension line "A" is shown with horizontal segments labeled B, C, D, E, F, G, H, I, J, K, L, M, and N.

* INDICATES MINIMUM SPACING.



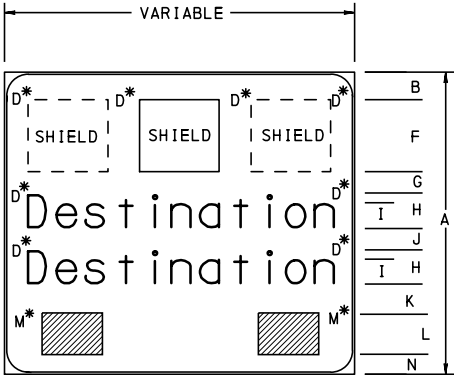
DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)													
		A	B	C	D	E	F	G	H	I	J	K	L	M	N
20/15	1	168	18	18	15	12	36	14	20	15		12	22	18	16
20/15	2	198	16	18	15	12	36	14	20	15	15	12	22	18	13
16/12	1	144	13.4	15	12	10	36	12	16	12		9.6	22	15	10
16/12	2	168	12.4	15	12	10	36	11	16	12	12	8.6	22	15	9
13.3/10	1	126	11.6	12	10	8	36	10	13.3	10		8.6	16.5	15	10
13.3/10	2	150	11.9	12	10	8	36	10	13.3	10	10	9	16.5	15	10
10.6/8	1	102	9.4	10	8	6	24	8	10.6	8		8	16.5	12	9.5
10.6/8	2	120	9.1	10	8	6	24	8	10.6	8	8	8	16.5	12	9.2
8/6	1	90	8.2	8	6	5	24	6	8	6		6	16.5	10	8.3
8/6	2	102	7.2	8	6	5	24	6	8	6	6	6	16.5	10	7.3



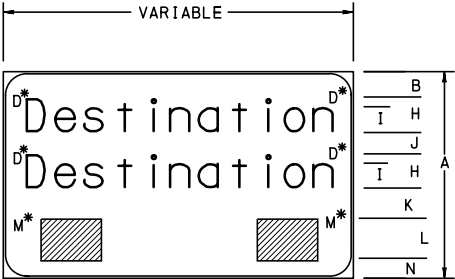
DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)													
		A	B	C	D	F	G	H	I	J	K	L	M	N	
20/15	1	132	15	18	15	36	14	20	15		12	22	18	13	
20/15	2	168	15.4	18	15	36	14	20	15	15	12	22	18	13.6	
16/12	1	120	13.4	15	12	36	13	16	12		9.6	22	15	10	
16/12	2	144	12	15	12	36	12	16	12	12	8.6	22	15	9.4	
13.3/10	1	108	12	12	10	36	10	13.3	10		9.4	16.5	15	10.8	
13.3/10	2	132	12.4	12	10	36	10	13.3	10	10	9.4	16.5	15	11.1	
10.6/8	1	84	8.4	10	8	24	8	10.6	8		8	16.5	12	8.5	
10.6/8	2	102	8.1	10	8	24	8	10.6	8	8	8	16.5	12	8.2	
8/6	1	78	7.7	8	6	24	7	8	6		7	16.5	10	7.8	
8/6	2	90	7.7	8	6	24	6	8	6	6	6	16.5	10	7.8	

NOTES:

- SIGNS ON THIS SHEET ARE TO BE USED OVERHEAD FOR LANE ASSIGNMENTS.
- REFER TO TC-8700C FOR ARROW DETAILS. TYPE C ARROW DIMENSIONS ARE SHOWN FOR ILLUSTRATIVE PURPOSES, BUT TYPE A THROUGH TYPE D ARROWS MAY ALSO BE USED FOR THE SIGNS SHOWN ON THIS SHEET. THE TYPE A OR C ARROWS SHALL BE USED FOR THE 20"/15" AND 16"/12" LEGEND SIZES, AND THE TYPE B OR D ARROWS SHALL BE USED FOR THE 13.3"/10" LEGEND SIZE.
- ON OVERHEAD SIGNS WHERE DOWN ARROWS ARE USED TO INDICATE A LANE TO BE FOLLOWED, A DOWN ARROW SHALL BE POSITIONED APPROXIMATELY OVER THE CENTER OF EACH LANE AND SHALL POINT VERTICALLY DOWNWARD TOWARD THE APPROXIMATE CENTER OF THAT LANE. DOWN ARROWS SHALL BE USED ONLY ON OVERHEAD GUIDE SIGNS THAT RESTRICT THE USE OF SPECIFIC LANES TO TRAFFIC BOUND FOR THE DESTINATION(S) AND/OR ROUTE(S) INDICATED BY THESE ARROWS. DOWN ARROWS SHALL NOT BE USED UNLESS AN ARROW CAN BE LOCATED OVER AND POINTED TO THE APPROXIMATE CENTER OF EACH LANE THAT CAN BE USED TO REACH THE DESTINATION DISPLAYED ON THE SIGN.
- IF DOWN ARROWS ARE USED, HAVING MORE THAN ONE DOWN ARROW POINTING TO THE SAME LANE ON A SINGLE OVERHEAD SIGN (OR ON MULTIPLE SIGNS ON THE SAME OVERHEAD STRUCTURE) SHALL NOT BE PERMITTED.



DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)													
		A	B	D	F	G	H	I	J	K	L	M	N		
20/15	1	132	15	15	36	14	20	15		12	22	18	13		
20/15	2	168	15.4	15	36	14	20	15	15	12	22	18	13.6		
16/12	1	120	13.4	12	36	13	16	12		9.6	22	15	10		
16/12	2	144	12	12	36	12	16	12	12	8.6	22	15	9.4		
13.3/10	1	108	12	10	36	10	13.3	10		9.4	16.5	15	10.8		
13.3/10	2	132	12.4	10	36	10	13.3	10	10	9.4	16.5	15	11.1		
10.6/8	1	84	8.4	8	24	8	10.6	8		8	16.5	12	8.5		
10.6/8	2	102	8.1	8	24	8	10.6	8	8	8	16.5	12	8.2		
8/6	1	78	7.7	6	24	7	8	6		7	16.5	10	7.8		
8/6	2	90	7.7	6	24	6	8	6	6	6	16.5	10	7.8		



DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)													
		A	B	D	H	I	J	K	L	M	N				
20/15	1	84	16	15	20	15		12	22	18	14				
20/15	2	120	16.4	15	20	15	15	12	22	18	14.6				
16/12	1	72	14	12	16	12		9.6	22	15	10.4				
16/12	2	96	12.4	12	16	12	12	8.6	22	15	9				
13.3/10	1	60	11	10	13.3	10		9.4	16.5	15	9.8				
13.3/10	2	84	11.2	10	13.3	10	10	9.4	16.5	15	10.3				
10.6/8	1	54	9.4	8	10.6	8		8	16.5	12	9.5				
10.6/8	2	72	8.1	8	10.6	8	9	9	16.5	12	8.2				
8/6	1	48	8	6	8	6		7.5	16.5	10	8				
8/6	2	60	6.7	6	8	6	7	7	16.5	10	6.8				

* INDICATES MINIMUM SPACING.

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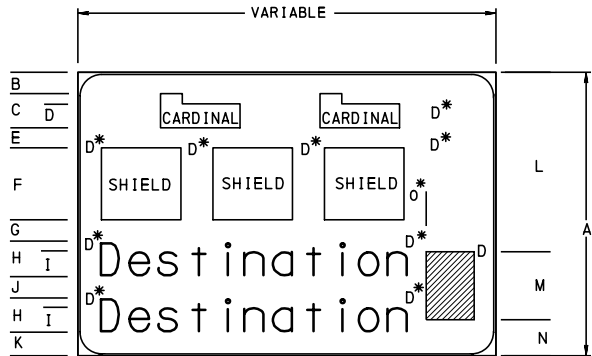
SIGN DETAILS - FREEWAY,
EXPRESSWAY AND CONVENTIONAL
ROAD GUIDE SIGNS

OVERHEAD LANE
ASSIGNMENT SIGNS

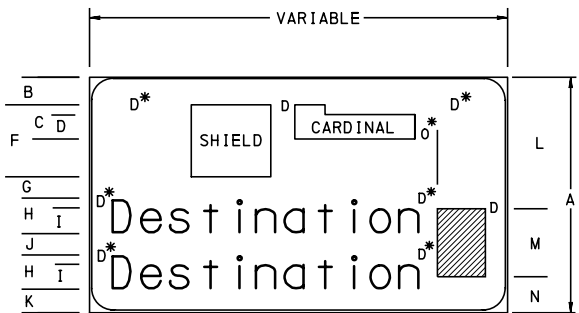
RECOMMENDED JUN. 13, 2013
CHIEF, TRAFFIC ENGINEERING AND
PERMITS SECTION

RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

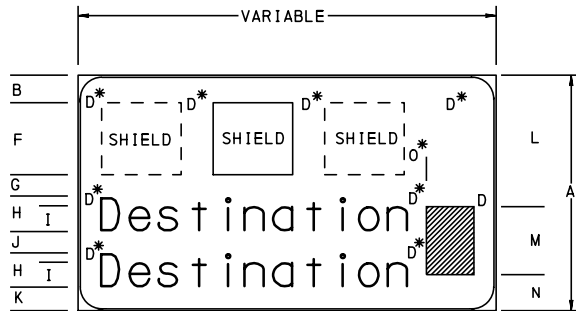
SHT. 2 OF 13
TC-8701D



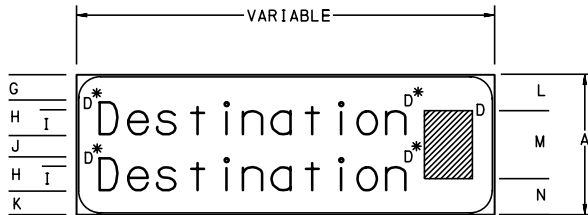
DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)														
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
20/15	1	132	16	18	15	12	36	14	20	15	15	16.4	83.4	32.6	16	
20/15	2	168	16.6	18	15	12	36	14	20	15	15	16.4	110.4	32.6	25	
16/12	1	114	13	15	12	10	36	11	16	12		13	68.4	32.6	13	8
16/12	2	144	13	15	12	10	36	12	16	12	12	14	92.4	32.6	19	
13.3/10	1	102	11.3	12	10	8	36	10	13.3	10		11.4	58	32.6	11.4	8
13.3/10	2	126	11.7	12	10	8	36	10	13.3	10	10	11.7	77.4	32.6	16	
10.6/8	1	78	9.7	10	8	6	24	8	10.6	8		9.7	41.5	26.8	9.7	8
10.6/8	2	96	9.4	10	8	6	24	8	10.6	8	8	9.4	58.6	26.8	10.6	
8/6	1	66	7.5	8	6	5	24	6	8	6		7.5	31.7	26.8	7.5	8
8/6	2	84	7.3	8	6	5	24	7	8	6	7	9.7	49.9	26.8	7.3	



DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)													
		A	B	C	D	F	G	H	I	J	K	L	M	N	O
20/15	1	102	16	18	15	36	14	20	15		16	53.4	32.6	16	
20/15	2	138	16.6	18	15	36	14	20	15	15	16.4	80.4	32.6	25	
16/12	1	90	13	15	12	36	12	16	12		13	44.4	32.6	13	8
16/12	2	120	14	15	12	36	12	16	12	12	14	68.4	32.6	19	
13.3/10	1	84	12	12	10	36	11	13.3	10		11.7	39.6	32.6	11.8	8
13.3/10	2	108	12.4	12	10	36	11	13.3	10	10	12	59.4	32.6	16	
10.6/8	1	60	8.7	10	8	24	8	10.6	8		8.7	24.5	26.8	8.7	8
10.6/8	2	78	8.4	10	8	24	8	10.6	8	8	8.4	41.6	26.8	9.6	
8/6	1	54	8	8	6	24	6	8	6		8	19.2	26.8	8	6
8/6	2	72	8.8	8	6	24	7	8	6	7	9.2	37.4	26.8	7.8	6



DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)												
		A	B	D	F	G	H	I	J	K	L	M	N	O
20/15	1	102	16	15	36	14	20	15		16	53.4	32.6	16	
20/15	2	138	16.6	15	36	14	20	15	15	16.4	80.4	32.6	25	
16/12	1	90	13	12	36	12	16	12		13	44.4	32.6	13	8
16/12	2	120	14	12	36	12	16	12	12	14	68.4	32.6	19	
13.3/10	1	84	12	10	36	11	13.3	10		11.7	39.6	32.6	11.8	8
13.3/10	2	108	12.4	10	36	11	13.3	10	10	12	59.4	32.6	16	
10.6/8	1	60	8.7	8	24	8	10.6	8		8.7	24.5	26.8	8.7	8
10.6/8	2	78	8.4	8	24	8	10.6	8	8	8.4	41.6	26.8	9.6	
8/6	1	54	8	6	24	6	8	6		8	19.2	26.8	8	8
8/6	2	72	8.8	6	24	7	8	6	7	9.2	37.4	26.8	7.8	



DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)									
		A	D	G	H	I	J	K	L	M	N
20/15	1	54	15	17	20	15		17	10.8	32.6	10.6
20/15	2	90	15	17.6	20	15	15	17.4	28.8	32.6	28.6
16/12	1	54	12	19	16	12		19	10.8	32.6	10.6
16/12	2	72	12	14	16	12	12	14	19.8	32.6	19.6
13.3/10	1	54	10	20.4	13.3	10		20.3	10.8	32.6	10.6
13.3/10	2	60	10	11.7	13.3	10	10	11.7	13.8	32.6	13.6
10.6/8	1	48	8	18.7	10.6	8		18.7	10.6	26.8	10.6
10.6/8	2	48	8	9.4	10.6	8	8	9.4	10.6	26.8	10.6
8/6	1	42	6	17	8	6		17	7.6	26.8	7.6
8/6	2	42	6	10	8	6	6	10	7.6	26.8	7.6

* INDICATES MINIMUM SPACING.

NOTES:

1. MAJOR GUIDE SIGNS FOR ALL LANE DROPS AT INTERSECTION SHALL BE MOUNTED OVERHEAD. AN EXIT ONLY SIGN PANEL SHALL BE USED FOR ALL INTERCHANGES LANE DROPS AT WHICH THE THROUGH ROUTE IS CARRIED ON THE MAINLINE.
2. REFER TO TC-8700C FOR ARROW DETAILS. TYPE F AND TYPE (x) ARROW DIMENSIONS ARE SHOWN FOR ILLUSTRATIVE PURPOSES, BUT TYPE E THROUGH TYPE J ARROWS MAY ALSO BE USED FOR THE SIGNS SHOWN ON THIS SHEET.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

SIGN DETAILS
FREEWAY, EXPRESSWAY AND
CONVENTIONAL ROADS
GUIDE SIGNS

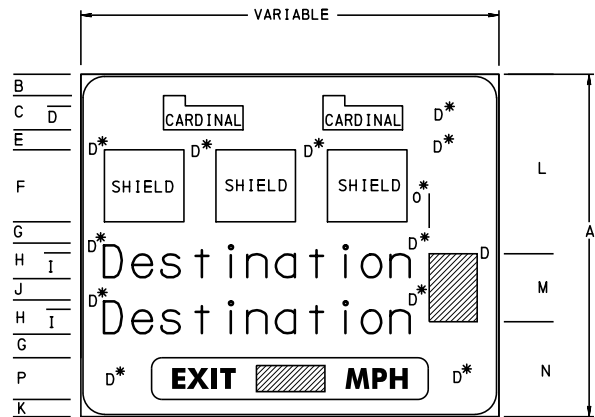
EXIT DIRECTION SIGNS

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PERMITS SECTION

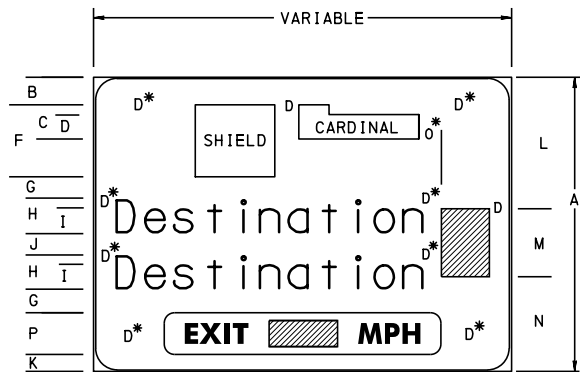
RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

SHT. 3 OF 13

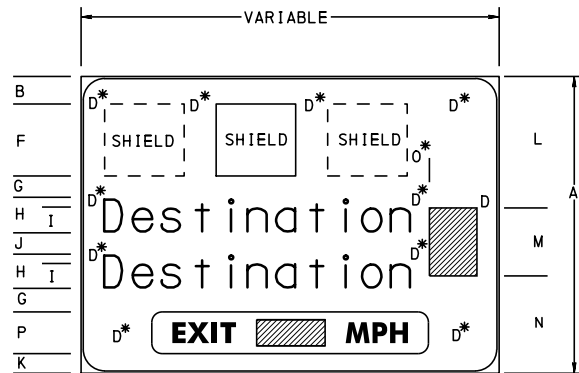
TC-8701D



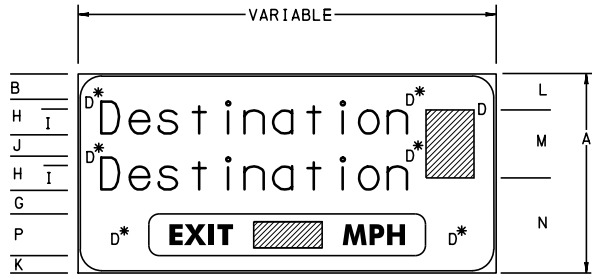
DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)															
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
20/15	1	174	18	18	15	12	36	14	20	15		18	83.4	32.6	58		24
20/15	2	210	18.5	18	15	12	36	14	20	15	15	18.5	110.4	32.6	67		24
16/12	1	150	13.5	15	12	10	36	11	16	12		13.5	68.9	32.6	48.5	8	24
16/12	2	180	13	15	12	10	36	12	16	12	12	14	92.4	32.6	55		24
13.3/10	1	138	12.3	12	10	8	36	10	13.3	10		12.4	58	32.6	47.4	8	24
13.3/10	2	162	12.7	12	10	8	36	10	13.3	10	10	12.7	77.4	32.6	52		24
10.6/8	1	102	9.7	10	8	6	24	8	10.6	8		9.7	41.5	26.8	33.7	8	16
10.6/8	2	120	9.4	10	8	6	24	8	10.6	8	8	9.4	58.6	26.8	34.6		16
8/6	1	84	7	8	6	5	24	6	8	6		7	31.2	26.8	26	6	13
8/6	2	96	6	8	6	5	24	6	8	6	6	6	44.2	26.8	25	6	13



DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)															
		A	B	C	D	F	G	H	I	J	K	L	M	N	O	P	
20/15	1	144	18	18	15	36	14	20	15		18	53.4	32.6	58		24	
20/15	2	180	18.5	18	15	36	14	20	15	15	18.5	80.4	32.6	67		24	
16/12	1	126	13	15	12	36	12	16	12		13	44.4	32.6	49	8	24	
16/12	2	156	14	15	12	36	12	16	12	12	14	68.4	32.6	55		24	
13.3/10	1	120	13	12	10	36	11	13.3	10		12.7	39.6	32.6	47.8	8	24	
13.3/10	2	144	13.2	12	10	36	11	13.3	10	10	13.2	59.4	32.6	52		24	
10.6/8	1	84	8.7	10	8	24	8	10.6	8		8.7	24.5	26.8	32.7	8	16	
10.6/8	2	102	8.4	10	8	24	8	10.6	8	8	8.4	41.6	26.8	33.6		16	
8/6	1	72	7.5	8	6	24	6	8	6		7.5	18.7	26.8	26.5	6	13	
8/6	2	84	6.5	8	6	24	6	8	6	6	6.5	31.7	26.8	25.5	6	13	

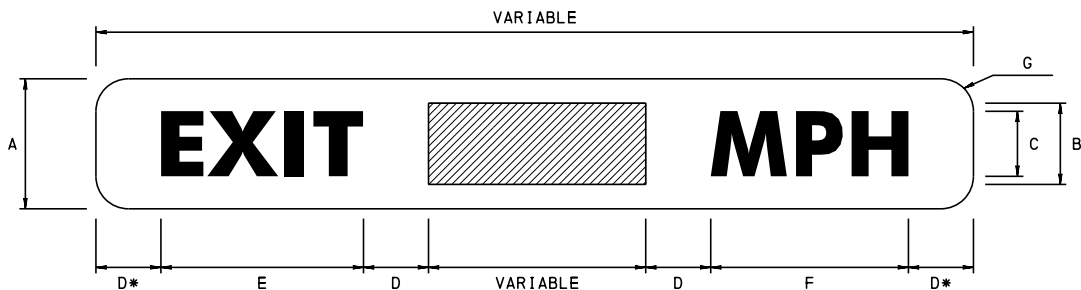


DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)													
		A	B	D	F	G	H	I	J	K	L	M	N	O	P
20/15	1	144	18	15	36	14	20	15		18	53.4	32.6	58		24
20/15	2	180	18.5	15	36	14	20	15	15	18.5	80.4	32.6	67		24
16/12	1	126	13	12	36	12	16	12		13	44.4	32.6	49	8	24
16/12	2	156	14	12	36	12	16	12	12	14	68.4	32.6	55		24
13.3/10	1	120	13	10	36	11	13.3	10		13	39.6	32.6	47.8	8	24
13.3/10	2	144	13.2	10	36	11	13.3	10	10	13.2	59.4	32.6	52		24
10.6/8	1	84	8.7	8	24	8	10.6	8		8.7	24.5	26.8	32.7	8	16
10.6/8	2	102	8.4	8	24	8	10.6	8	8	8.4	41.6	26.8	33.6		16
8/6	1	72	7.5	6	24	6	8	6		7.5	18.7	26.8	26.5	6	13
8/6	2	84	6.5	6	24	6	8	6	6	6.5	31.7	26.8	25.5	6	13



DEST. SIZE	DEST. LINES	DIMENSIONS (INCHES)											
		A	B	D	G	H	I	J	K	L	M	N	P
20/15	1	96	19	15	14	20	15		19	10.8	32.6	52.6	24
20/15	2	132	19.5	15	14	20	15	15	19.5	28.8	32.6	70.6	24
16/12	1	90	19	12	12	16	12		19	10.8	32.6	46.6	24
16/12	2	108	14	12	12	16	12	12	14	19.8	32.6	55.6	24
13.3/10	1	90	21.4	10	10	13.3	10		21.3	10.8	32.6	46.6	24
13.3/10	2	96	12.7	10	10	13.3	10	10	12.7	13.8	32.6	49.6	24
10.6/8	1	72	17.7	8	17.6	10.6	8		10.1	10.1	26.8	35.1	16
10.6/8	2	72	9.4	8	8	10.6	8	8	9.4	10.6	26.8	34.6	16
8/6	1	60	16	6	15.9	8	6		7.1	7.1	26.8	26.1	13
8/6	2	60	9.0	6	8.9	8	6	6	7.1	7.1	26.8	26.1	13

* INDICATES MINIMUM SPACING.



DEST. SIZE	DIMENSIONS (INCHES)						
	A	B	C	D	E	F	G
20/15	24	15 E	12 E	12	37.4	36.5	6
16/12	24	15 E	12 E	12	37.4	36.5	6
13.3/10	24	15 E	12 E	12	37.4	36.5	6
10.6/8	16	10 E	8 E	8	24.9	24.2	4
8/6	13	8 E	6 E	6	18.8	18.2	3.3

EXIT ADVISORY SPEED PANEL

- NOTES:
1. MAJOR GUIDE SIGNS FOR ALL LANE DROPS AT INTERSECTION SHALL BE MOUNTED OVERHEAD. AN EXIT ONLY SIGN PANEL SHALL BE USED FOR ALL INTERCHANGES LANE DROPS AT WHICH THE THROUGH ROUTE IS CARRIED ON THE MAINLINE.
 2. WHERE EXTRA EMPHASIS OF AN ESPECIALLY LOW ADVISORY RAMP SPEED IS NEEDED, AN EXIT XX MPH SIGN PANEL MAY BE PLACED AT THE BOTTOM OF THE EXIT DIRECTION SIGN TO SUPPLEMENT, BUT NOT REPLACE, THE EXIT OR RAMP ADVISORY SPEED WARNING SIGNS. THE SIGN PANEL SHALL HAVE A YELLOW REFLECTORIZED BACKGROUND WITH BLACK NON-REFLECTORIZED LENGEND.
 3. REFER TO TC-8700C FOR ARROW DETAILS. TYPE F ARROW DIMENSIONS ARE SHOWN FOR ILLUSTRATIVE PURPOSES, BUT TYPE E THROUGH TYPE J ARROWS MAY ALSO BE USED FOR THE SIGNS SHOWN ON THIS SHEET.

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SIGN DETAILS - FREEWAY,
EXPRESSWAY AND CONVENTIONAL
ROAD GUIDE SIGNS

EXIT DIRECTION SIGNS WITH
ADVISORY SPEED PANEL

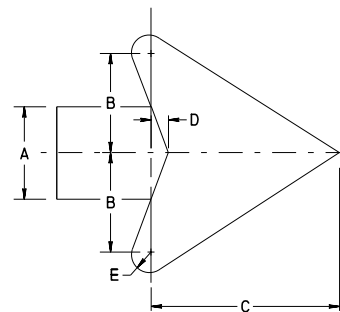
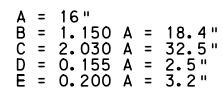
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CHIEF, TRAFFIC ENGINEERING AND
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1. THE GRAPHIC LEGEND SHALL BE OF A PLAN VIEW SHOWING A SIMPLIFIED OFF-RAMP ARRANGEMENT.
2. NO OTHER SYMBOLS OR ROUTE SHIELDS SHALL BE USED AS A SUBSTITUTE FOR ARROWHEADS.
3. ONLY ONE DESTINATION MAY BE SHOWN FOR EACH ARROWHEAD, WITH A MAXIMUM OF TWO DESTINATIONS PER SIGN.
4. THE GRAPHIC SHOULD NOT DEPICT DECELERATION LANES. THE "EXIT ONLY" SIGN PANEL SHALL NOT BE USED ON A DIAGRAMMATIC GUIDE SIGNS IN ADVANCE OF THE INTERCHANGE.
5. THE ARROWHEAD FOR THE DIVERGING MOVEMENT SHOULD BE POSITIONED LOWER ON THE SIGN THAN THE ARROWHEAD FOR THE MOVEMENT THAT CONTINUES STRAIGHT AHEAD, INDEPENDENT OF WHICH MOVEMENT CARRIES THE THROUGH ROUTE. WHERE THE MOVEMENTS ARE FREEWAY OR EXPRESSWAY SPLITS RATHER THAN EXITS, THE ARROWHEADS SHOULD BE POSITIONED AT APPROXIMATELY THE SAME HEIGHT ON THE SIGN.
6. ARROW SHAFTS SHOULD CONTAIN LANE LINES WHERE APPROPRIATE AND ROUTE SHIELDS SHALL NOT BE USED AS A SUBSTITUTE FOR ARROWHEADS.
7. ROUTE SHIELDS, CARDINAL DIRECTIONS, AND DESTINATIONS SHOULD BE CLEARLY RELATED TO THE ARROWHEAD, AND THE ARROWHEAD SHOULD POINT TOWARD THE ROUTE SHIELD FOR THE OFF MOVEMENT.
8. THE CARDINAL DIRECTION SHOULD GENERALLY BE PLACED ADJACENT TO THE ROUTE SHIELD AND THE DESTINATION SHOULD BE PLACED BELOW AND JUSTIFIED WITH THE ROUTE SHIELD.

9. EXIT NUMBER PANELS SHOULD BE LOCATED TOWARD THE TOP LEFT EDGE OF THE SIGN FOR A LEFT EXIT AND TOWARD THE TOP RIGHT EDGE FOR RIGHT EXITS.
10. FOR NUMBERED EXITS, THE EXIT PANEL OR LEFT EXIT PANEL SHALL BE USED AT THE TOP OF THE SIGN. FOR UNNUMBERED LEFT EXITS, THE LEFT PLAQUE SHALL BE USED AT THE TOP LEFT EDGE OF THE SIGN.
11. FOR EXITS OR SPLITS LEADING IN A SINGLE DIRECTION, THE CARDINAL DIRECTION SIGN BE PLACED ADJACENT TO THE ROUTE SHIELD, AND THE DESTINATION SHOULD BE PLACED BELOW THE ROUTE SHIELD AND CARDINAL DIRECTION.
12. THE EXIT ONLY SIGN PANELS SHALL BE USED ON THE EXIT DIRECTION SIGN AT THE THEORETICAL GORE, EXCEPT AT SPLITS OF TWO OVERLAPPING ROUTES WHERE NEITHER OF THE ROUTES IS DESIGNATED AS AN EXIT.
13. SPECIFIC DESIGN STANDARDS FOR GRAPHIC COMPONENTS AND OTHER RECOMMENDED FEATURES ARE SHOWN IN THIS STANDARD.
14. SEE SHEET 12 OF THIS STANDARD FOR SHIELD AND CARDINAL DETAILS.
15. SEE TC-8701A SHEET 6 FOR ADVANCE PLACEMENT OF SIGN.



ARROWHEAD DETAIL

SIGN DETAILS FREEWAY AND EXPRESSWAY GUIDE SIGNS

DIAGRAMMATIC SIGNS

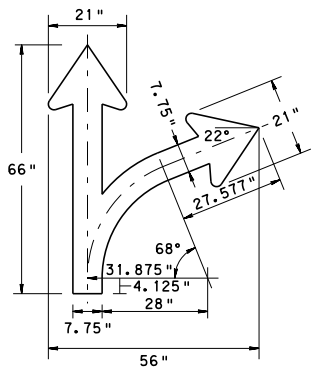
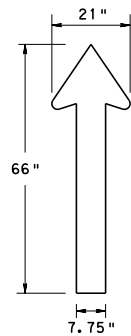
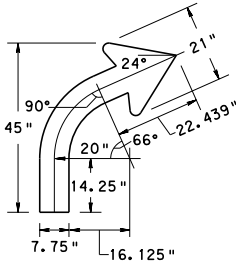
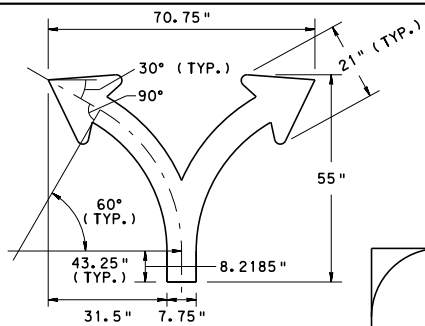
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RECOMMENDED JUN. 13, 2013
Stephen J. Trinne
 CHIEF, HIGHWAY SAFETY AND
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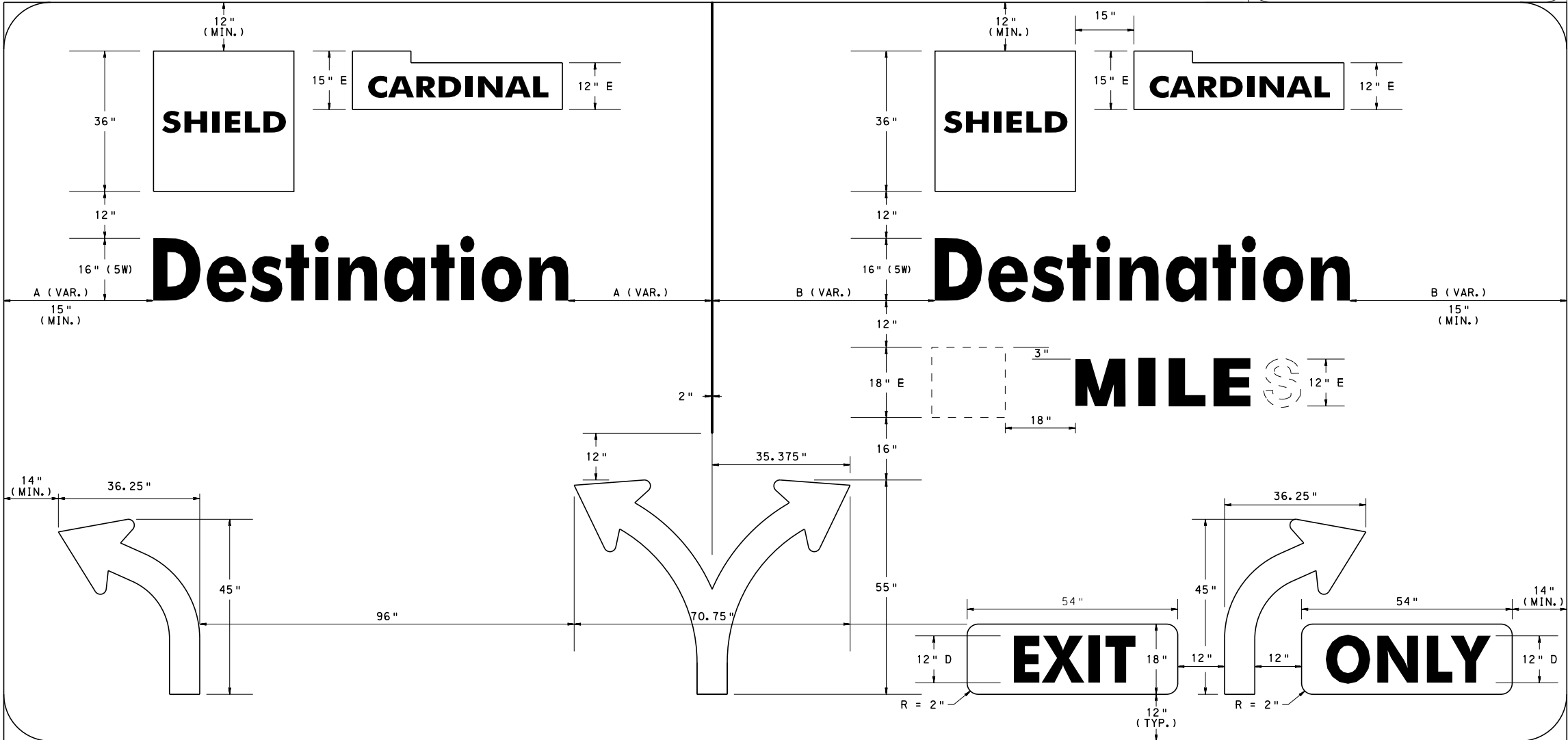
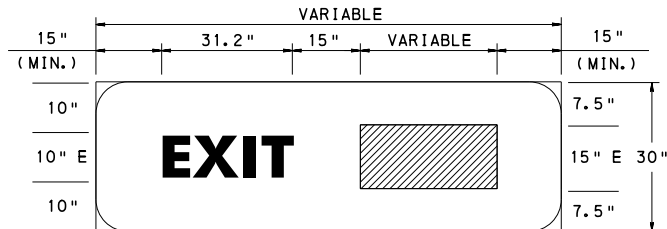
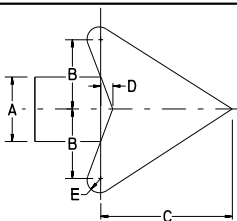
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C-8701D



A = 7.75"
B = 1.150 A = 8.9"
C = 2.030 A = 15.7"
D = 0.155 A = 1.2"
E = 0.200 A = 1.55"

ARROWHEAD DETAIL



NOTES:

- OVERHEAD ARROW-PER-LANE GUIDES SIGNS USED ON FREEWAYS AND EXPRESSWAYS SHALL INCLUDE ONE ARROW ABOVE EACH LANE AND SHALL BE DESIGNED IN ACCORDANCE WITH THE FOLLOWING CRITERIA.
- THE SIGN SHALL INCLUDE AN UPWARD-POINTING ARROW FOR EACH LANE OF THE APPROACH TO THE SPLIT OR EXIT, AND THE SHAFT OF EACH ARROW SHALL BE LOCATED APPROXIMATELY OVER THE CENTER OF THE LANE WHICH IT APPLIES.
- ARROWS FOR CONTINUING THROUGH LANES SHALL BE VERTICALLY UPWARD POINTING UNLESS THOSE LANES ARE ON A SIGNIFICANTLY CURVED ALIGNMENT BEYOND THE THEORETICAL GORE, IN WHICH CASE THE ARROWS FOR THE CONTINUING THROUGH LANES SHALL INDICATE THE APPROXIMATE DEGREE OF CURVATURE.
- THE ARROW FOR A LANE THAT MUST EXIT SHALL BE CURVED IN THE DIRECTION OF THE EXIT AND SHALL BE BLACK-ON-YELLOW EXIT AND ONLY SIGN PANELS ADJACENT TO THE LOWER END OF THE ARROW SHAFT. THE BLACK-ON-YELLOW EXIT AND ONLY SIGN PANELS SHALL NOT BE USED FOR A SPLIT OF TWO OVERLAPPING ROUTES WHERE NEITHER OF THE DIVERGING ROUTES IS DESIGNED AS AN EXIT. WHERE THE THROUGH LANES CURVE AND THE EXIT CONTINUES ON A STRAIGHT ALIGNMENT, UPWARD-POINTING VERTICAL ARROWS SHALL BE USED FOR THE EXITING MOVEMENT AND CURVED ARROWS FOR THE THROUGH MOVEMENT.
- THE ARROW FOR AN OPTIONAL EXIT LANE THAT ALSO CARRIES THE THROUGH ROUTE SHALL HAVE A SINGLE SHAFT THAT BIFURCATES INTO A VERTICALLY UPWARD-POINTING ARROW AND A CURVING ARROW CORRESPONDING TO THE CONFIGURATION OF THE THROUGH AND EXIT LANES.
- FOR SPLITS WITH AN OPTION LANE, THE ARROW FOR THE LANE FROM WHICH EITHER DIRECTION OF THE SPLIT CAN BE ACCESSED SHALL HAVE A SINGLE SHAFT THAT BIFURCATES INTO TWO UPWARD-POINTING CURVING ARROWS SHOWING THE APPROXIMATE DEGREES OF CURVATURE OF THE TWO ROADWAYS BEYOND THE THEORETICAL GORE.
- A VERTICAL WHITE LINE SHALL BE USED TO SEPARATE THE ROUTE SHIELDS AND DESTINATIONS FOR THE TWO DIVERGING MOVEMENTS FROM EACH OTHER.
- THE DISTANCE TO THE EXIT OR SPLIT SHALL BE DISPLAYED BELOW THE OFF-MOVEMENT DESTINATION ON THE ADVANCE SIGNS AT THE 1-MILE AND 2-MILE LOCATIONS.
- THE NUMBER OF LANES DISPLAYED ON A SIGN SHALL CORRESPOND TO THE NUMBER OF LANES AT THE LOCATION OF THAT SIGN. AN ADVANCE SIGN SHALL NOT DEPICT LANES THAT ARE ADDED DOWNSTREAM OF THE SIGN LOCATION.
- FOR NUMBERED EXITS, THE EXIT PANEL OR LEFT EXIT PANEL SHALL BE USED AT THE TOP OF THE SIGN IN ACCORDANCE WITH MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. FOR UNNUMBERED LEFT EXITS, THE LEFT PLAQUE SHALL BE USED AT THE TOP LEFT EDGE OF THE SIGN.
- NO MORE THAN ONE DESTINATION SHOULD BE DISPLAYED FOR EACH MOVEMENT, AND NO MORE THAN TWO DESTINATIONS SHOULD BE DISPLAYED PER SIGN.
- THE ARROWHEAD(S) FOR THE DIVERGING MOVEMENT SHOULD BE POSITIONED LOWER ON THE SIGN THAN THE ARROWHEAD(S) FOR MOVEMENT THAT CONTINUES STRAIGHT AHEAD, INDEPENDENT OF WHICH MOVEMENT CARRIES THE THROUGH ROUTE. WHERE THE MOVEMENTS ARE FREEWAY OR EXPRESSWAY SPLITS RATHER THAN EXITS, THE ARROWHEADS SHOULD BE POSITIONED AT APPROXIMATELY THE SAME HEIGHT ON THE SIGN.
- ROUTE SHIELDS, CARDINAL DIRECTIONS, AND DESTINATIONS SHOULD BE POSITIONED ON THE SIGN SUCH THAT THEY ARE CLEARLY RELATED TO THE ARROWHEAD(S) FOR THE MOVEMENT TO WHICH THEY APPLY.
- THE CARDINAL DIRECTION SHOULD BE PLACED ADJACENT TO THE ROUTE SHIELD FOR EXITS OR SPLITS LEADING IN A SINGLE CARDINAL DIRECTION.
- THE VERTICAL WHITE LINE THAT IS USED TO SEPARATE THE ROUTE SHIELDS AND DESTINATIONS FOR THE TWO DIVERGING MOVEMENTS FROM EACH OTHER SHOULD NOT DESCEND BELOW THE TOP OF THE ARROWHEADS FOR THE THROUGH LANES, AND SHOULD BE POSITIONED APPROXIMATELY HALFWAY BETWEEN THE DIVERGING ARROWHEADS FOR THE OPTIONAL MOVEMENT LANE.
- WHERE EXTRA EMPHASIS OF AN ESPECIALLY LOW ADVISORY RAMP SPEED IS NEEDED, AN EXIT ADVISORY SPEED SIGN PANEL MAY BE PLACED BELOW THE APPLICABLE DESTINATION LEGEND TO SUPPLEMENT, BUT NOT TO REPLACE, THE EXIT OR RAMP ADVISORY SPEED WARNING SIGNS.
- SPECIFIC DESIGN STANDARDS FOR GRAPHIC COMPONENTS AND OTHER RECOMMENDED FEATURES ARE SHOWN IN THIS STANDARD.
- SEE SHEET 12 OF THIS STANDARD FOR SHIELD AND CARDINAL DETAILS.
- THE "EXIT" AND "ONLY" PANELS SHALL HAVE A YELLOW REFLECTORIZED BACKGROUND WITH BLACK NONREFLECTORIZED LEGEND.

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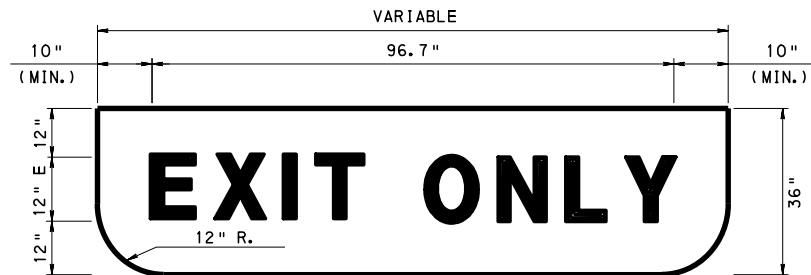
SIGN DETAILS
FREEWAY AND EXPRESSWAY
GUIDE SIGNS

OVERHEAD ARROW-PER-LANE
SIGNS

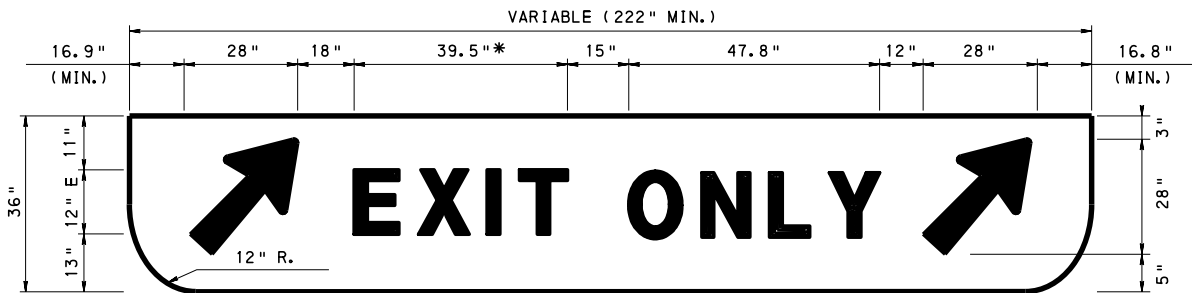
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CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

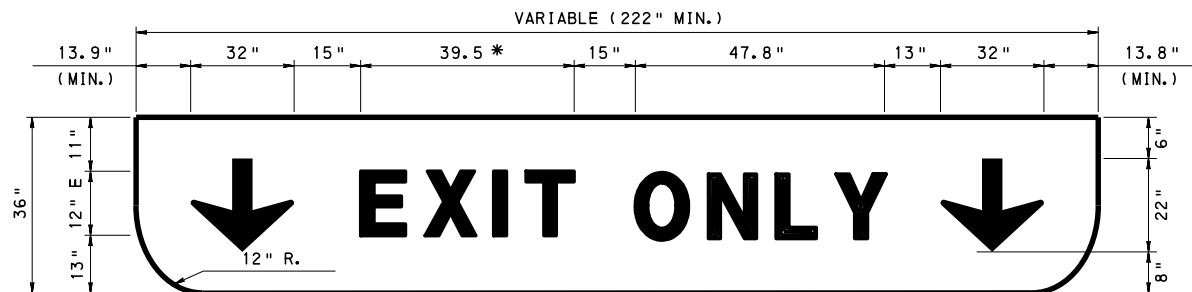
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TC-8701D



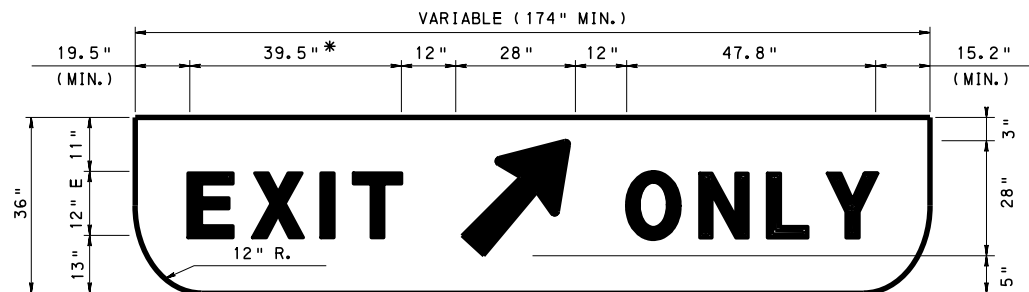
EXIT ONLY PANEL



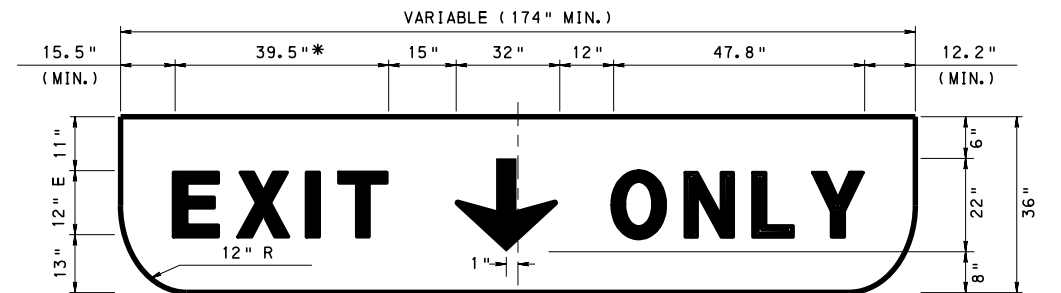
EXIT ONLY PANEL



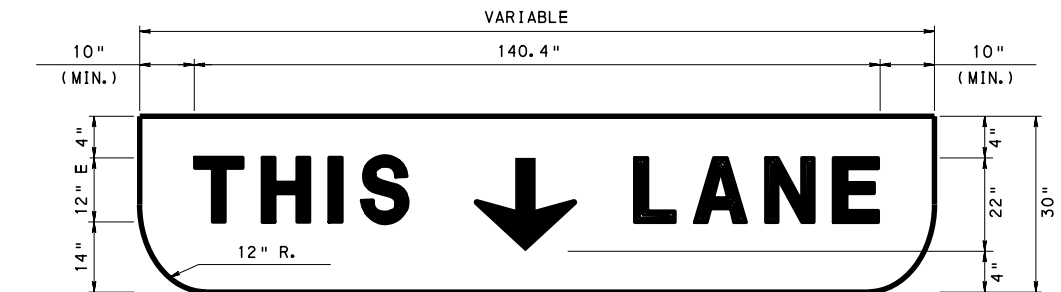
EXIT ONLY PANEL



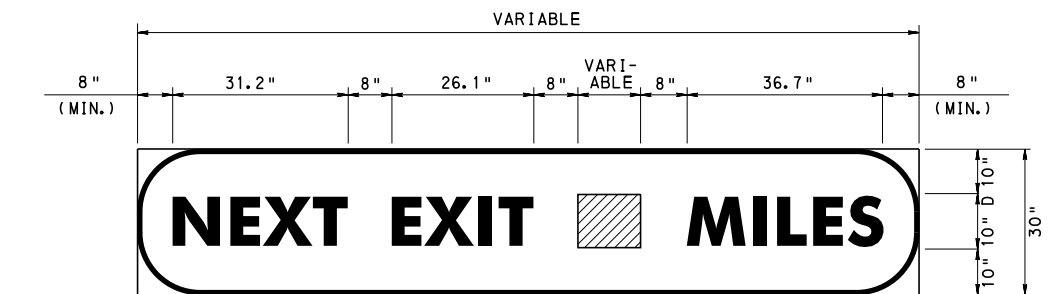
EXIT ONLY PANEL



EXIT ONLY PANEL



THIS LANE PANEL



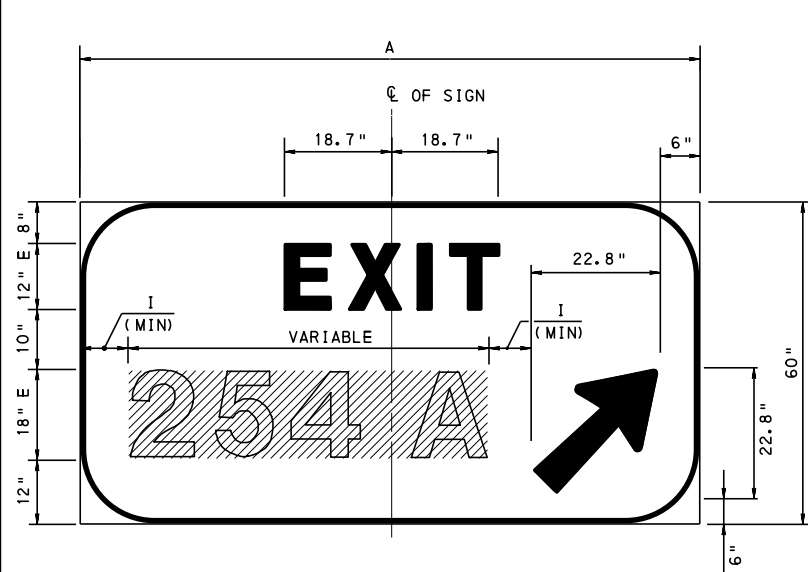
NEXT EXIT PANEL

NOTES:

- EXIT ONLY AND THIS LANE PANELS SHALL HAVE A YELLOW REFLECTORIZED BACKGROUND AND BLACK NONREFLECTORIZED LEGEND WITH A 0.5" MARGIN AND 1.5" BLACK BORDER.
- REFER TO TC-8700C FOR ARROW DETAILS. TYPE N ARROW SHALL BE USED ON THE GORE SIGNS, AND TYPE C ARROW SHALL BE USED ON THE EXIT ONLY AND THIS LANE PANELS.

*INCREASE SPACING BETWEEN LETTERS BY 40%

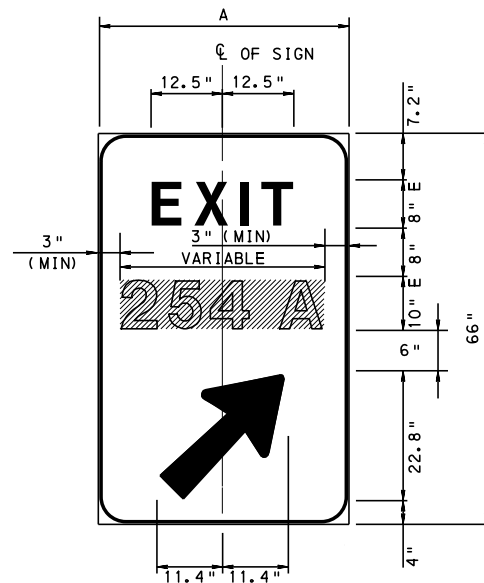
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SIGN DETAILS FREEWAY AND EXPRESSWAY GUIDE SIGNS		
EXIT ONLY & NEXT EXIT PANELS		
RECOMMENDED JUN. 13, 2013 CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 7 OF 13 TC-8701D



NUMBER OF		DIMENSIONS (INCHES)	
DIGITS	LETTERS	A	I (MIN)
1	0	72	13.3
2	0	84	10
1	1*	96	11.8
3	0	96	6.7
2	1*	108	8.5
3	1*	120	5.2

* 9" FOR DIGIT TO LETTER SPACING

TYPE I
(STANDARD)



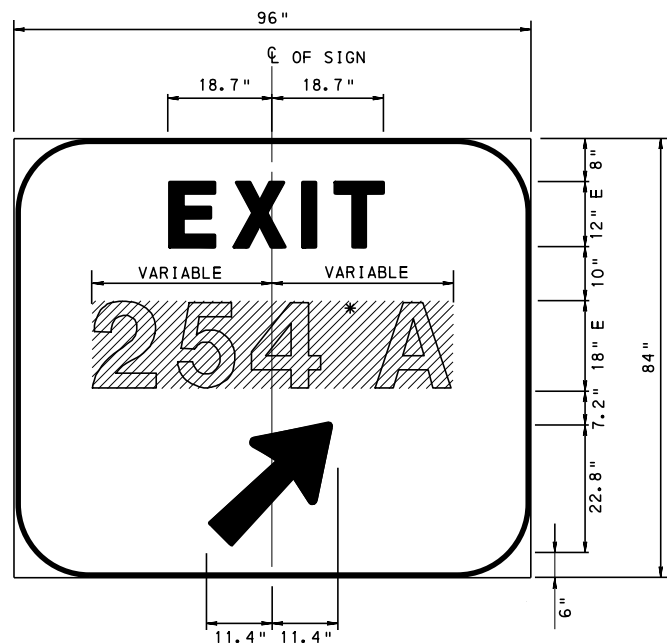
BORDER: 1.4"
CORNER RADIUS: 4"

NUMBER OF		DIMENSIONS (mm (INCHES))	
DIGITS	LETTERS	A	I (MIN)
1	0	36	13.3
2	0	36	10
1	1**	36	11.8
3	0	36	6.7
2	1**	48	8.5
3	1**	54	5.2

**USE 15" FOR
DIGIT TO LETTER SPACING

TYPE III

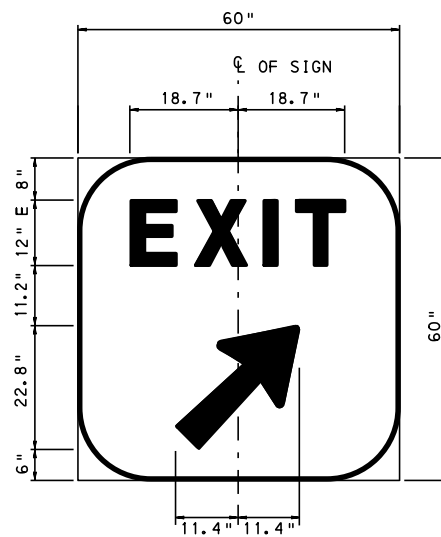
(SPECIAL CASE - USE ONLY WHEN LATERAL
SPACING PROHIBITS THE USE OF TYPE II)



* USE 9" FOR DIGIT TO LETTER SPACING

TYPE II

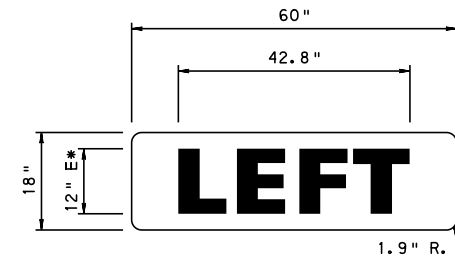
(SPECIAL CASE - USE ONLY WHEN LATERAL
SPACING PROHIBITS THE USE OF TYPE I)



TYPE IV

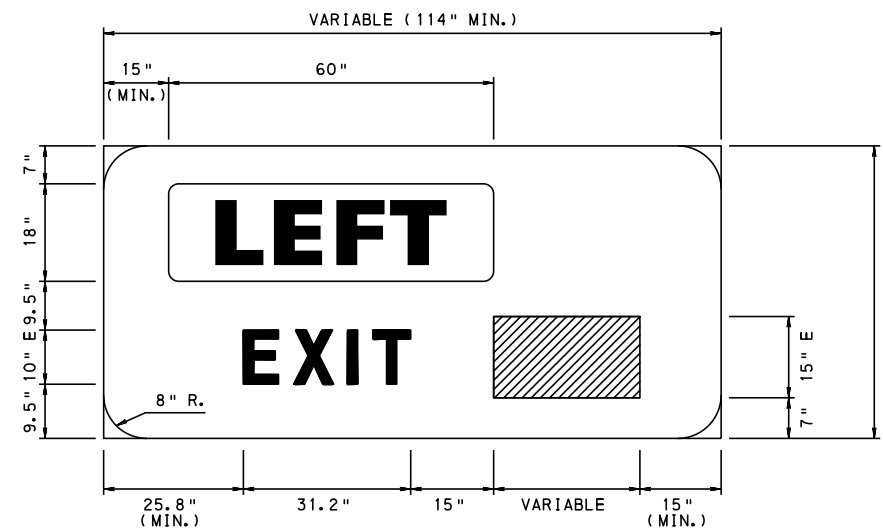
(USE FOR UNNUMBERED EXITS ONLY)

GORE SIGNS

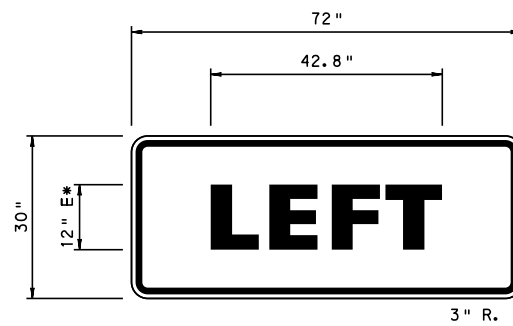


* INCREASE SPACING BY 25%

LEFT PANEL



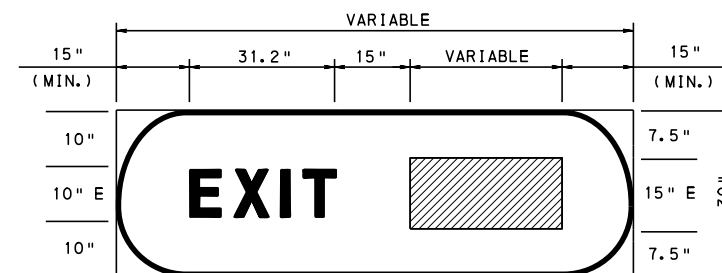
LEFT EXIT PANEL



* INCREASE SPACING BY 25%

MARGIN: 0.8"
BORDER: 1.3"

LEFT PLAQUE



EXIT PANEL

NOTES:

- THE LEFT PLAQUE AND LEFT PANEL SHALL HAVE A YELLOW REFLECTORIZED BACKGROUND AND BLACK NONREFLECTORIZED LEGEND.
- REFER TO TC-8700C FOR ARROW DETAILS. TYPE N ARROW SHALL BE USED ON THE GORE SIGNS, AND TYPE C ARROW SHALL BE USED ON THE EXIT ONLY AND THIS LANE PANELS.
- LEFT PLAQUES SHALL BE USED ABOVE THE TOP LEFT EDGE OF NON-NUMBERED ADVANCE GUIDE SIGNS AND EXIT DIRECTION SIGNS. THE LEFT PANEL SHALL BE ADDED TO EXIT PANELS.

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SIGN DETAILS FREEWAY AND EXPRESSWAY GUIDE SIGNS

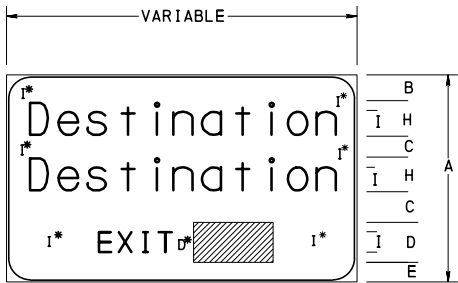
GORE SIGNS & EXIT PANELS

RECOMMENDED JUN. 13, 2013
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RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND
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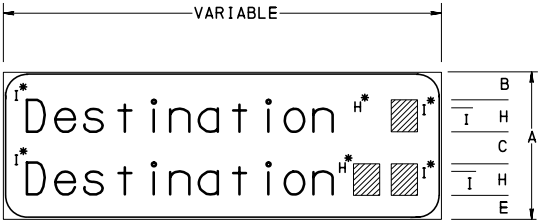
SHT. 8 OF 13

TC-8701D



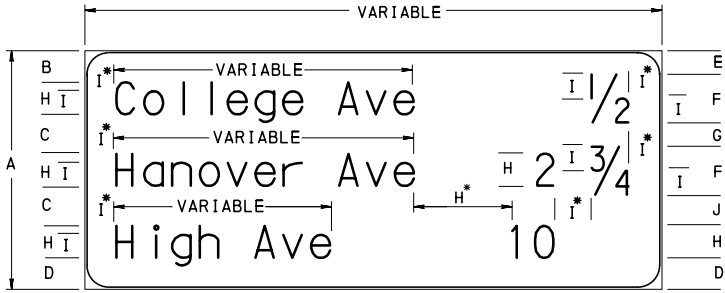
TYPE FACILITY	DESTINATION LINES	DIMENSIONS (INCHES)						
		A	B	C	D	E	H	I
EXPRESSWAY	1	48	8.2	9	12	8.2	10.6	8
	2	72	9.4	10	12	9.4	10.6	8
FREEWAY	1	60	10.4	11	15	10.3	13.3	10
	2	84	10.2	11	15	10.2	13.3	10

SINGLE EXIT SUPPLEMENTAL GUIDE SIGN



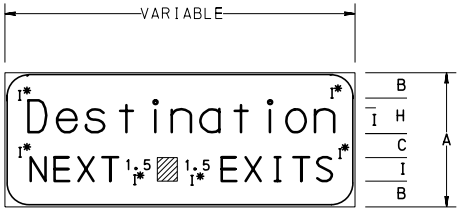
TYPE FACILITY	DESTINATION LINES	DIMENSIONS (INCHES)						
		A	B	C	E	H	I	
EXPRESSWAY	2	48	11	10	11	8	6	
	3	60	10	8	10	8	6	
FREEWAY	2	54	11	10.8	11	10.6	8	
	3	72	10.1	10	10.1	10.6	8	

POST INTERCHANGE DISTANCE SIGN



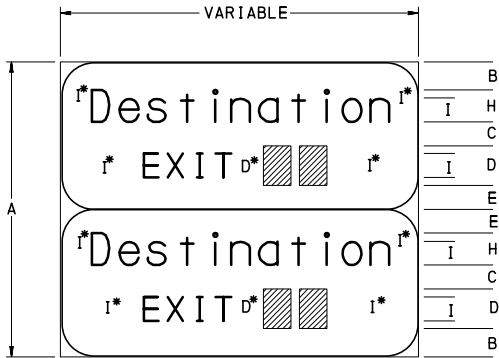
TYPE FACILITY	DESTINATION LINES	DIMENSIONS (INCHES)										
		A	B	C	D	E	F	G	H	I	J	
EXPRESSWAY	2	54	11.4	10	11.4	10.7	12	8.6	10.6	8	9.3	
	3	72	10.1	10	10.1	9.4	12	8.6	10.6	8	9.3	
FREEWAY	2	60	11.2	11	11.2	10.4	15	9.2	13.3	10	10.1	
	3	84	11	11	11.1	10.2	15	9.2	13.3	10	10.2	

INTERCHANGE SEQUENCE SIGN



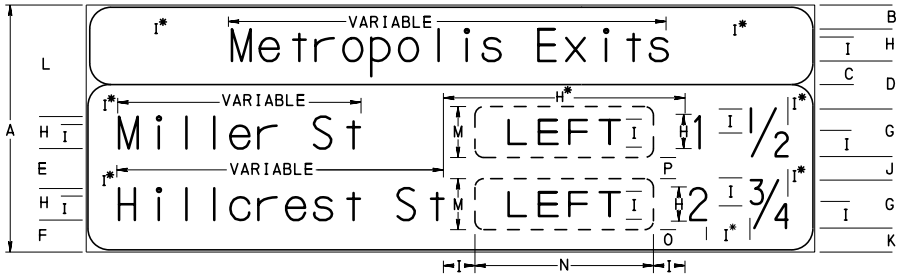
TYPE FACILITY	DIMENSIONS (INCHES)				
	A	B	C	H	I
EXPRESSWAY	48	9.8	9.8	10.6	8
FREEWAY	54	10.3	10.1	13.3	10

NEXT (NUMBER) EXITS AREA SIGN



TYPE FACILITY	DIMENSIONS (INCHES)						
	A	B	C	D	E	H	I
EXPRESSWAY	96	8.8	8	12	8.6	10.6	8
FREEWAY	120	10.9	10	15	10.8	13.3	10

DOUBLE EXIT SUPPLEMENTAL GUIDE SIGN



TYPE FACILITY	DESTINATION LINES	DIMENSIONS (INCHES)															
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
EXPRESSWAY	2	78	10.2	8.2	16	9.4	10	12	10.6	8	8	9.2	37.4	12	36	9.3	8
	3	96	10.2	8.2	16	8.4	10	12	10.6	8	7	9.2	37.4	12	36	9.3	7
FREEWAY	2	96	12.3	10.4	20	11.7	11.3	15	13.3	10	10	10.4	46.4	12	42	12	10.4
	3	120	11.3	10.4	20	11.7	11.3	15	13.3	10	10	10.4	45.4	12	42	12	10.4

COMMUNITY INTERCHANGES IDENTIFICATION SIGN

* INDICATES MINIMUM SPACING.

- NOTES:
- WHERE THE EXIT DIRECTION IS TO THE LEFT, A LEFT SIGN PANEL SHALL BE DISPLAYED IN THE SAME LINE IMMEDIATELY TO THE RIGHT OF THE INTERCHANGE NAME OR ROUTE NUMBER.
 - SEE TC-8700C, SHEET 1 FOR LAYOUT OF FRACTIONS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

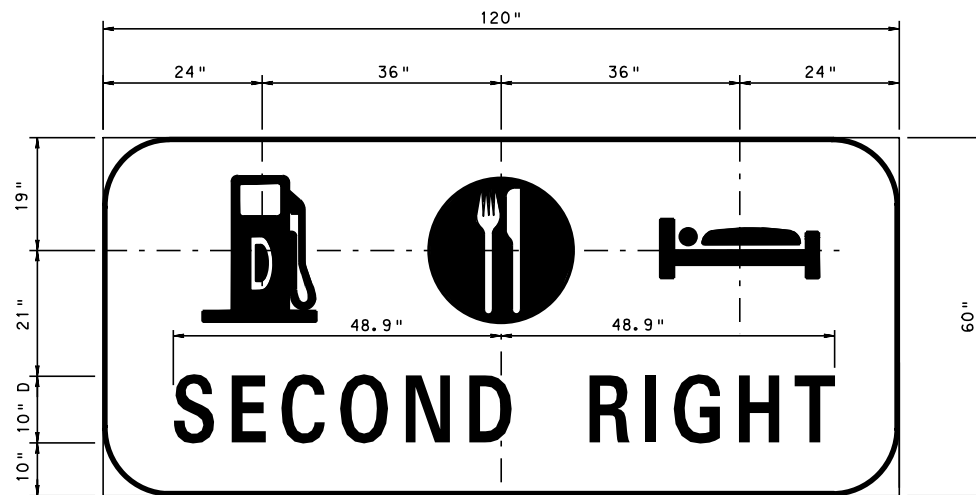
SIGN DETAILS
FREEWAY AND EXPRESSWAY
GUIDE SIGNS

SUPPLEMENTAL GUIDE SIGNS
& MISCELLANEOUS
INTERCHANGE SIGNS

RECOMMENDED JUN. 13, 2013
CHIEF TRAFFIC ENGINEERING AND PERMITS SECTION

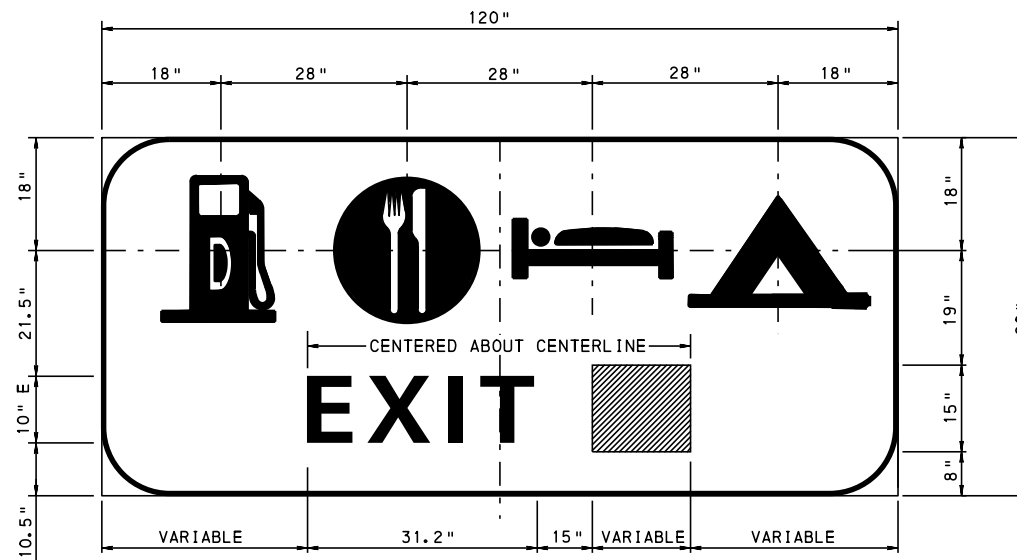
RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SHT. 9 OF 13
TC-8701D



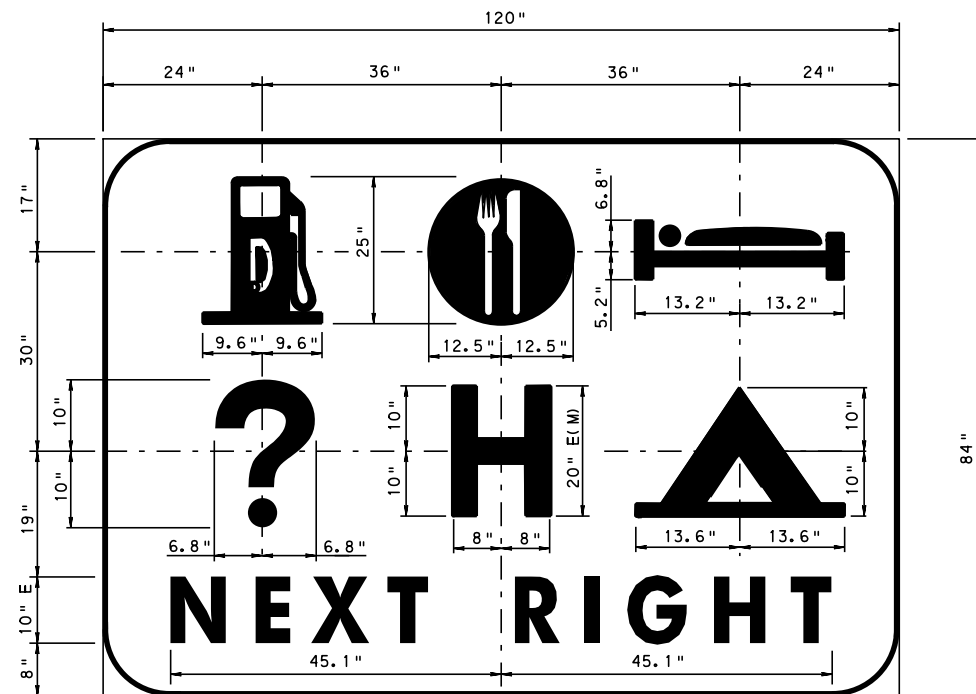
SEE 6-SERVICE SIGN FOR SERVICE SYMBOL DIMENSIONS

3-SERVICE SIGN

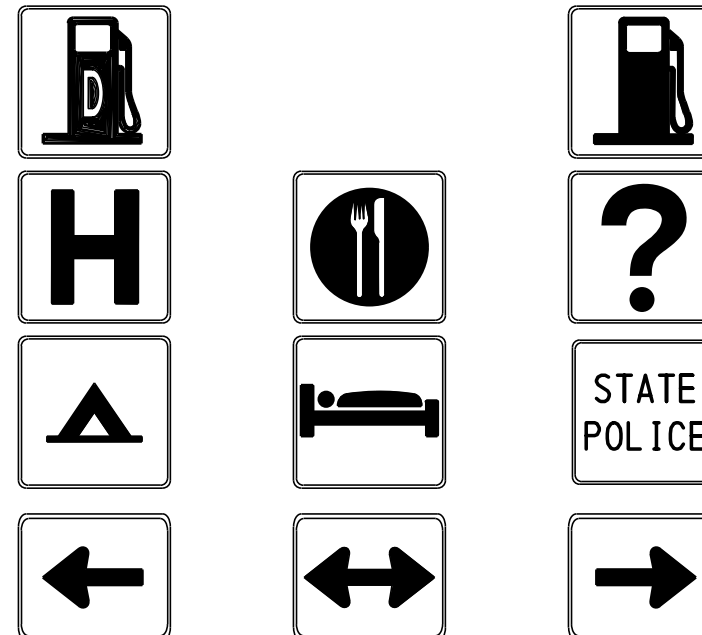


SEE 6-SERVICE SIGN FOR SERVICE SYMBOL DIMENSIONS

4-SERVICE SIGN



6-SERVICE SIGN



RAMP SIGNING

NOTES:

1. ALL SERVICE SIGNS SHALL HAVE A BLUE REFLECTORIZED BACKGROUND AND WHITE REFLECTORIZED SYMBOLS, LEGENDS, AND BORDERS. UNLESS NOTED OTHERWISE, THE TYPE OF REFLECTIVE SHEETING SHALL COMPLY WITH DEPARTMENT PUBLICATION 408.
2. ALL MAINLINE SERVICE SIGNS SHALL HAVE A 2" BORDER WITH 9" CORNER RADIi.
3. THE STANDARD MAINLINE SERVICE SIGN SHALL USE A 120" x 60" PANEL AND SHALL USE THE THREE-SYMBOL LAYOUT. IF FOUR SYMBOLS ARE REQUIRED, THE SYMBOLS SHALL BE AS INDICATED. IF MORE THAN FOUR SYMBOLS ARE REQUIRED, A 120" x 84" PANEL SHALL BE USED.
4. WHEN THE EXIT IS NUMBERED, THE EXIT NUMBER SHOULD BE USED INSTEAD OF "NEXT RIGHT" OR "SECOND RIGHT".
5. FOR THE LAYOUT OF RAMP SIGNING [24" x 24"], SEE D9 SERIES IN DEPARTMENT PUBLICATION 236. USE 24" x 12" SERVICES ARROW (D9-2-2) WITH RAMP SIGNING.
6. NORMAL SEQUENCE SHOULD BE GAS (DIESEL), FOOD, LODGING, AND THEN OTHERS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

SIGN DETAILS
FREEWAY AND EXPRESSWAY
GUIDE SIGNS

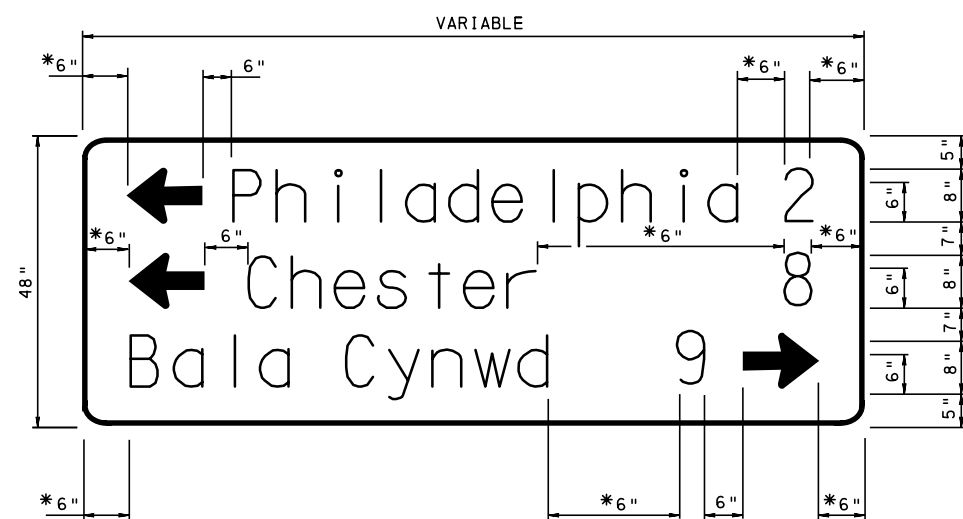
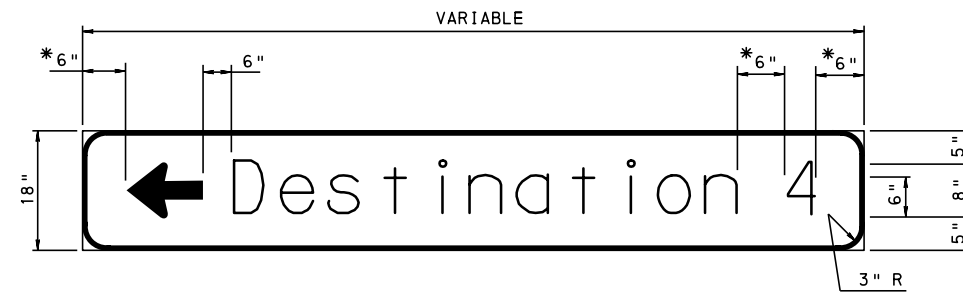
GENERAL MOTORIST
SERVICE SIGNS

RECOMMENDED JUN. 13, 2013
John C. Rowe
CHIEF, TRAFFIC ENGINEERING AND
PERMITS SECTION

RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

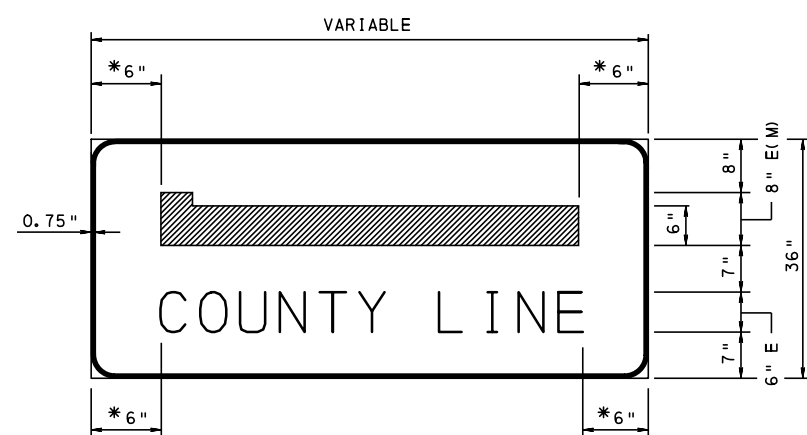
SHT. 10 OF 13

TC-8701D

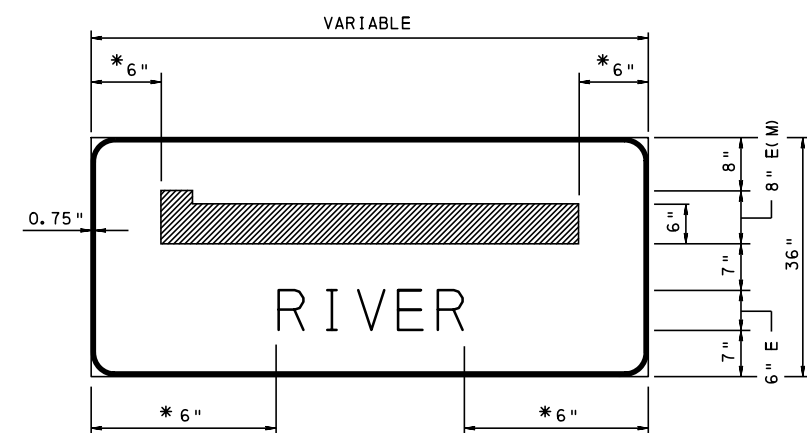


RAMP DESTINATION SIGNS

* INDICATES MINIMUM SPACING



COUNTY BOUNDARY SIGNS

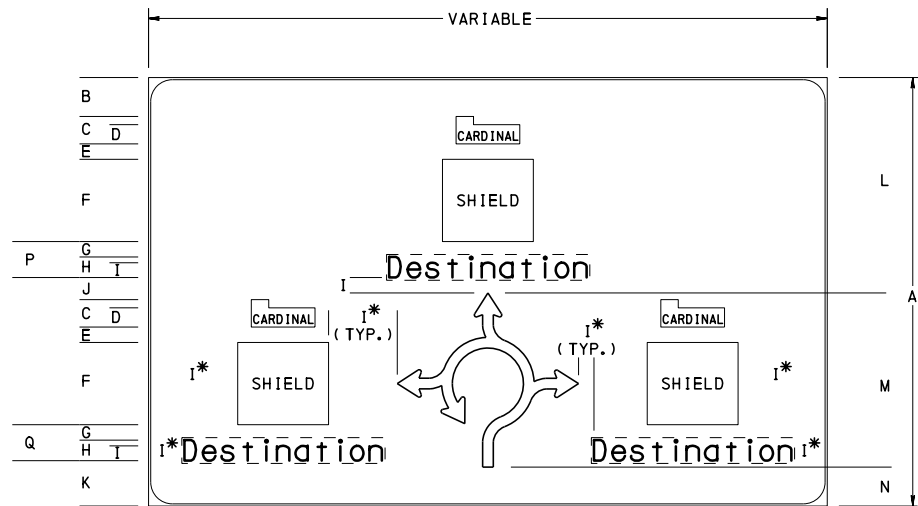


WATERWAY SIGNS

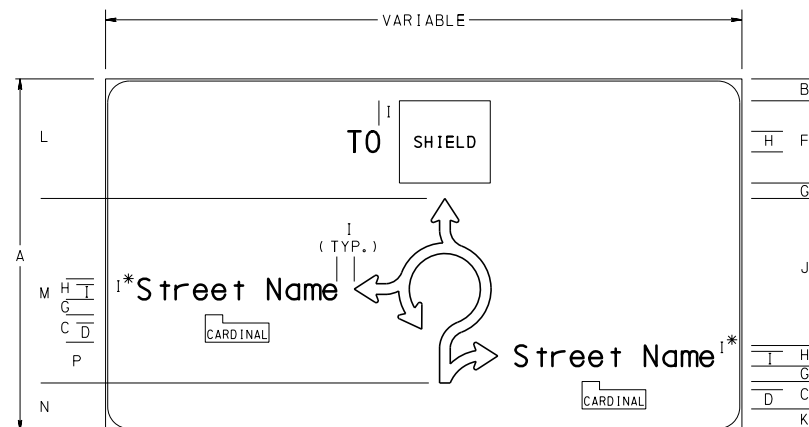
NOTES:

1. ALL SIGNS ON THIS SHEET SHALL HAVE A 1.25" BORDER WITH 6" CORNER RADII, UNLESS OTHERWISE NOTED.
2. REFER TO TC-8700C FOR ARROW DETAILS. TYPE K, TYPE L OR TYPE M ARROWS SHALL BE USED FOR THE RAMP DESTINATION SIGNS.
3. BOUNDARY AND WATERWAY SIGNS SHALL HAVE WHITE REFLECTORIZED BACKGROUND AND BLUE REFLECTORIZED LEGEND AND BORDER. UNLESS NOTED OTHERWISE, THE TYPE OF REFLECTIVE SHEETING SHALL COMPLY WITH DEPARTMENT PUBLICATION 408.

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
SIGN DETAILS FREEWAY AND EXPRESSWAY GUIDE SIGNS		
RAMP DESTINATION AND BOUNDARY SIGNS		
RECOMMENDED JUN. 13, 2013 CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 11 OF 13 TC-8701D

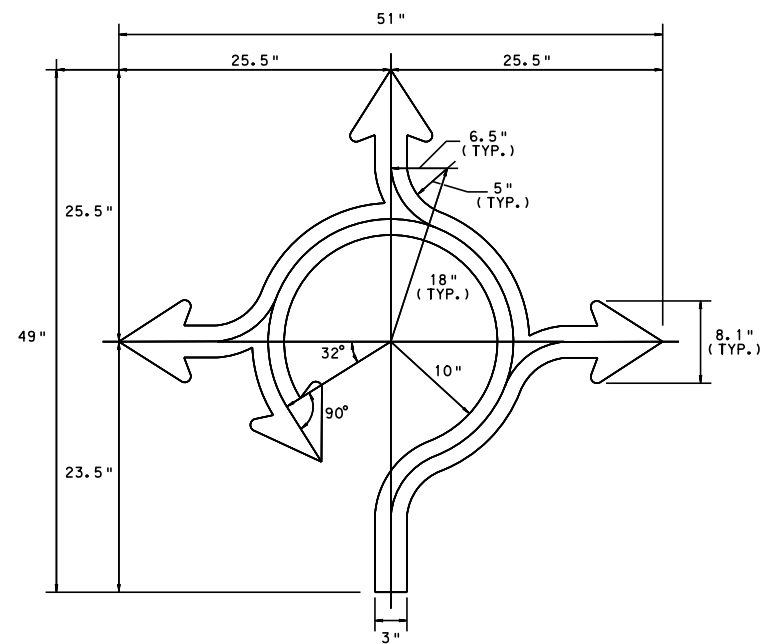


DESTINATIONS	DIMENSIONS (INCHES)														
DESTINATIONS	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P
DESTINATIONS	114	7	8	6	4	24	4.5	6	4.5	5.8	8.2	58	49	7	
NO DESTINATIONS	102	5.9	8	6	4	24			4.5		7.8	47.2	49	5.8	4.5

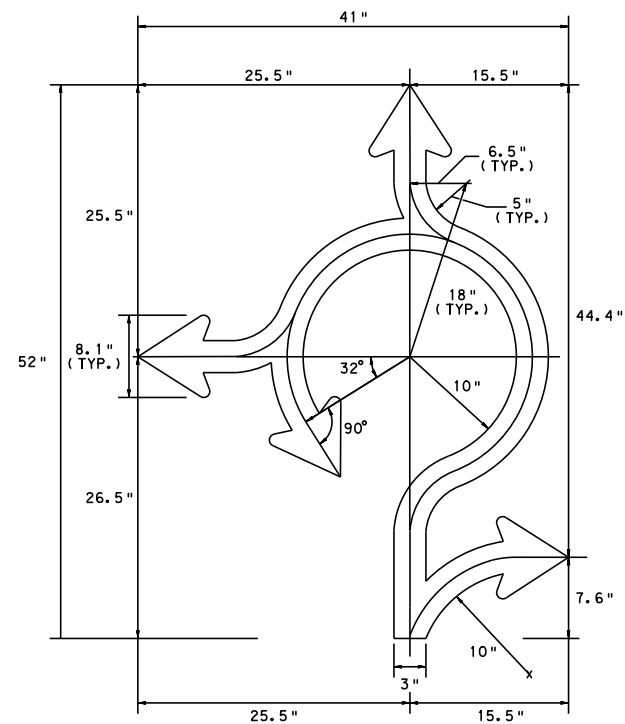


DIMENSIONS (INCHES)												
A	B	C	D	F	G	H	I	J	K	L	M	P
102	6.8	8	6	24	4.5	6	4.5	41.4	6.8	35.3	52	11

* INDICATES MINIMUM SPACING.



ROUNDAABOUT TYPE A

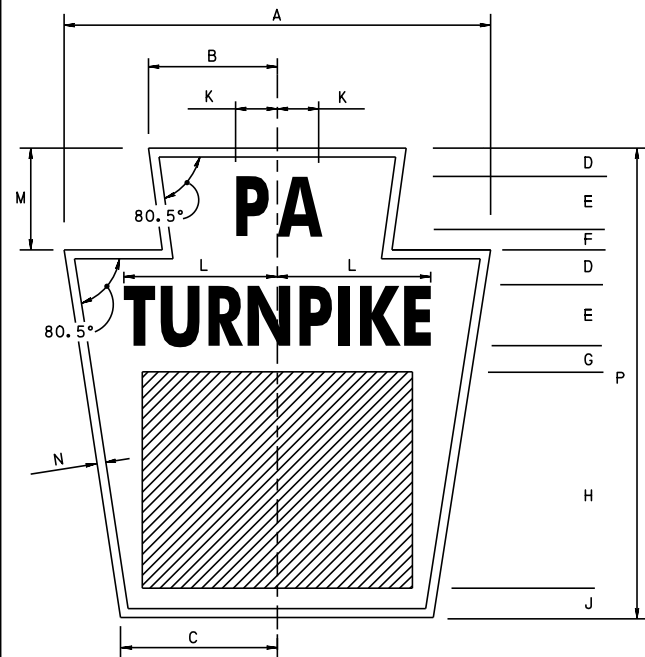


ROUNDAABOUT TYPE B

NOTES:
1. VARIATIONS OF THESE DETAILS MAY BE USED TO DEPICT ACTUAL FIELD CONDITIONS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

SIGN DETAILS
EXIT DESTINATION
ROUNDAABOUT GUIDE SIGNS

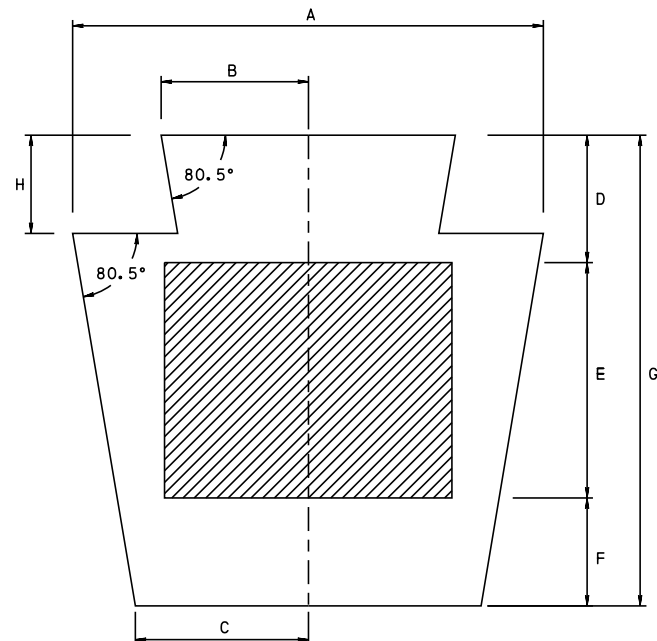


COLOR: GREEN REFLECTORIZED BACKGROUND
WHITE REFLECTORIZED LEGEND AND BORDER

NUMBER OF DIGITS	DIMENSIONS (")						
	A	B	C	D	E	F	G
1 or 2	24	7	8.9	1.5	2.7D	0.8	1.2
	36	10.5	13.3	2.4	4D	1.2	1.8
3	30	10	11.9	1.5	2.7D	0.8	1.2
	45	15	17.8	2.4	4D	1.2	1.8

NUMBER OF DIGITS	DIMENSIONS (")						
	H	J	K	L	M	N	P
1 or 2	12D	1.5	2.3	8.4	5	1	24
	18D	2.2	3.4	12.6	7.6	1.5	36
3	12D	1.5	2.3	8.4	5	1	24
	18D	2.2	3.4	12.6	7.6	1.5	36

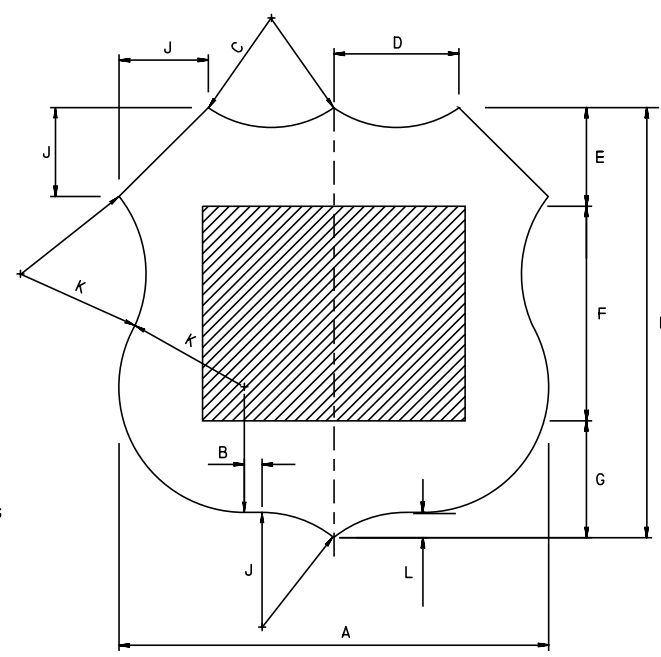
PA. TURNPIKE ROUTE SHIELD



COLOR: WHITE REFLECTORIZED BACKGROUND
BLACK NONREFLECTORIZED LEGEND

NUMBER OF DIGITS	DIMENSIONS (")							
	A	B	C	D	E	F	G	H
1 or 2	24	7	8.9	6.5	12D	5.5	24	5.1
	36	10.5	13.3	9.8	18D	8.2	24	7.6
3	30	10	11.9	6.5	2.7D	5.5	24	5.1
	45	15	17.8	9.8	12D	8.2	24	7.6

PA. SHIELD

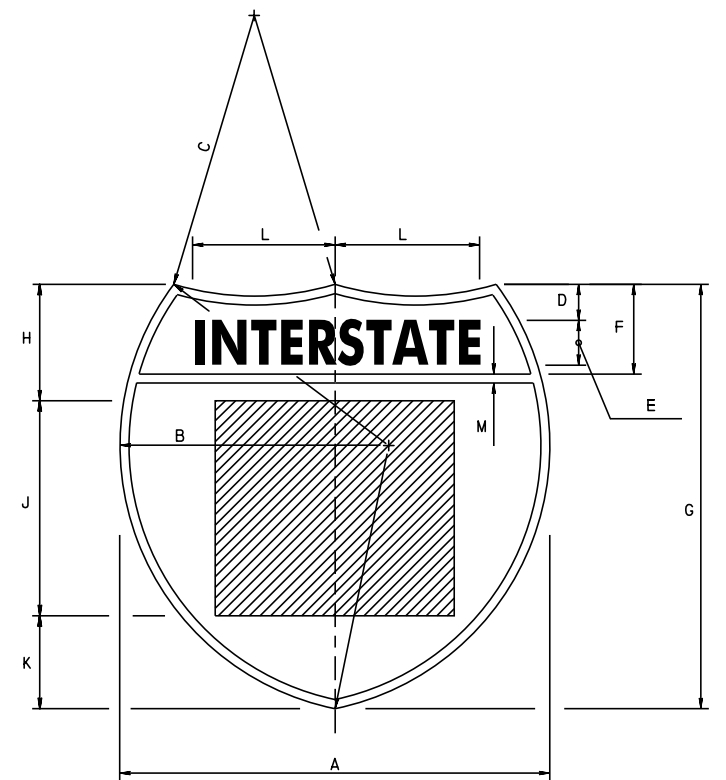


COLOR: WHITE REFLECTORIZED BACKGROUND
BLACK NONREFLECTORIZED LEGEND

NUMBER OF DIGITS	DIMENSIONS (")					
	A	B	C	D	E	F
1 or 2	24	1	5	7	5.5	12D
	36	1.5	7.5	10.5	8.2	18D
3	30	3.7	9	10	5.5	12D
	45	5.5	13.5	15	8.2	18D

NUMBER OF DIGITS	DIMENSIONS (")				
	G	H	J	K	L
1 or 2	6.5	24	5	7	2
	9.8	36	7.5	10.5	3
3	6.5	24	5	7	2
	9.8	36	7.5	10.5	3

U.S. SHIELD

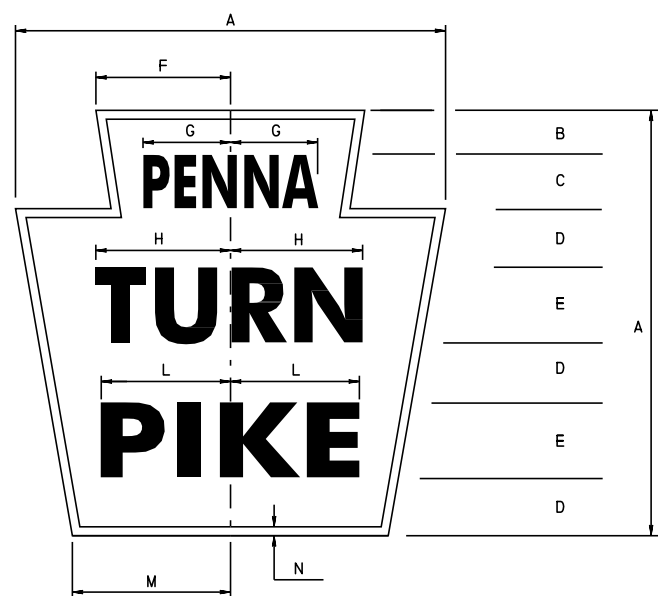


COLOR: WHITE REFLECTORIZED LEGEND AND BORDER
RED REFLECTORIZED TOP BACKGROUND
BLUE REFLECTORIZED BOTTOM BACKGROUND

NUMBER OF DIGITS	DIMENSIONS (")					
	A	B	C	D	E	F
1 or 2	24	15	15	2	2.5	4.9
	36	22.5	22.5	3	3.75	7.4
3	30	17	24	2	2.5	4.9
	45	25.5	36	3	3.75	7.4

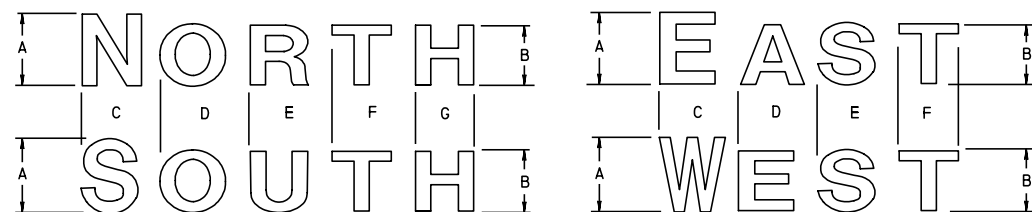
NUMBER OF DIGITS	DIMENSIONS (")					
	G	H	J	K	L	M
1 or 2	24	6.5	12D	5.5	7.8	0.5
	36	9.8	18D	8.2	11.8	0.8
3	24	6.5	12D	5.5	7.8	0.5
	36	9.8	18D	8.2	11.8	0.8

INTERSTATE SHIELD



COLOR: GREEN REFLECTORIZED BACKGROUND
WHITE REFLECTORIZED LEGEND AND BORDER

PENNA. TURNPIKE SHIELD



SERIES E CAPITAL

DIMENSIONS (")						
A	B	C	D	E	F	G
24	1.8	2.7D	2.9	5.4D	7.5	5.3
36	2.8	4D	4.4	8D	11.25	7.9

DIMENSIONS (")			
H	L	M	N
8.9	7.5	8.9	1
13.1	11.2	13.3	1.5

PENNA. TURNPIKE SHIELD

		DIMENSIONS (")						
		A	B	C	D	E	F	G
NORTH	18	15	18.6	16.3	15.0	14.1	12.0	76.0
	15	12	15.4	13.0	12.0	11.3	9.6	61.3
	12	10	12.4	10.9	10.0	9.4	8.0	50.7
	10	8	10.1	8.7	8.0	7.5	6.4	40.7
SOUTH	8	6	8.0	6.5	6.0	5.7	4.8	31.0
	18	15	17.7	16.3	15.0	14.1	12.0	75.1
	15	12	14.7	13.0	12.0	11.3	9.6	60.6
	12	10	11.8	10.9	10.0	9.4	8.0	50.1
EAST	10	8	10.1	8.7	8.0	7.5	6.4	40.7
	8	6	8.0	6.5	6.0	5.7	4.8	31.0
	18	15	15.5	18.1	15.0	11.0		59.6
	15	12	12.9	14.5	12.0	8.8		48.2
WEST	12	10	10.3	12.1	10.0	7.3		39.7
	10	8	8.5	9.7	8.0	5.9		32.1
	8	6	6.7	7.2	6.0	4.4		24.3
	18	15	22.2	14.1	15.0	11.0		62.3
	15	12	18.5	11.3	12.0	8.8		50.6
	12	10	14.8	9.4	10.0	7.3		41.5
	10	8	11.9	7.5	8.0	5.9		33.3
	8	6	9.4	5.7	6.0	4.4		25.5

CARDINAL DETAILS

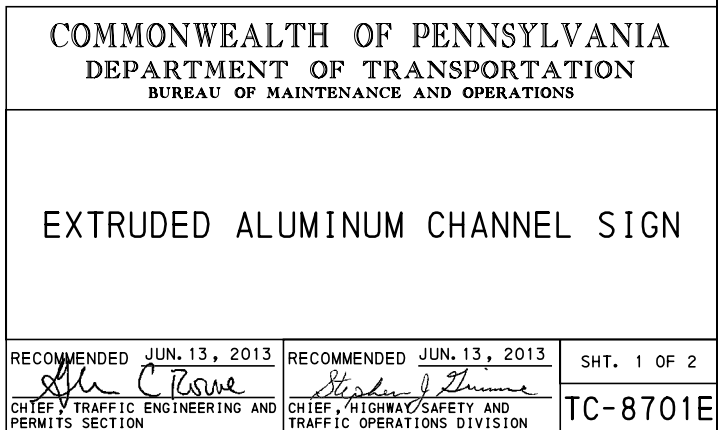
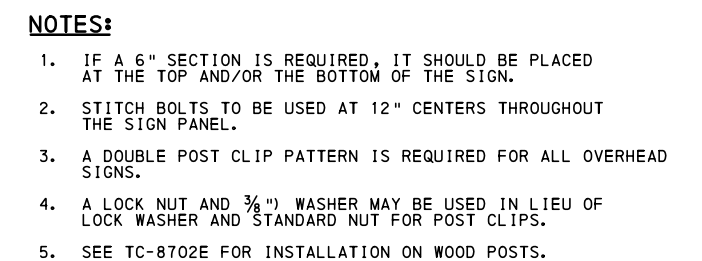
NOTES:

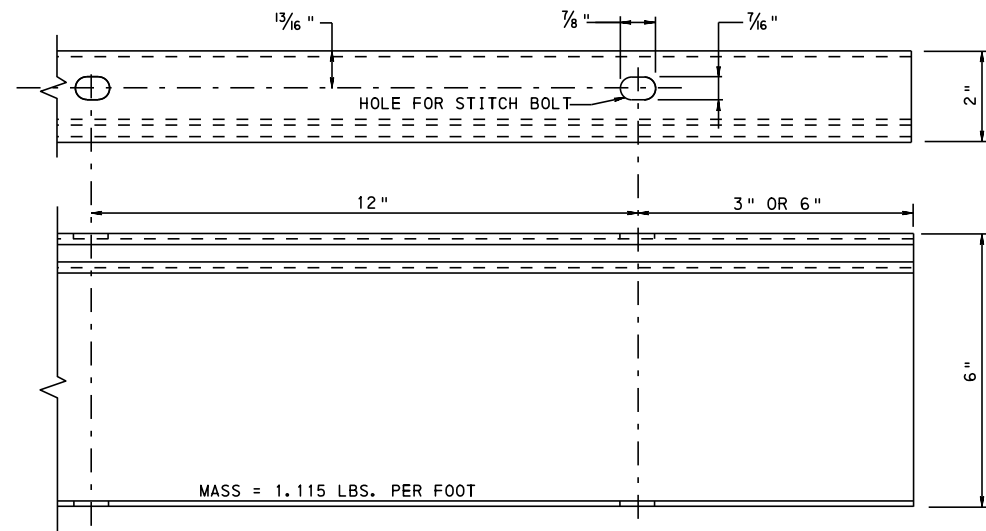
- THESE IRREGULAR-SHAPED SHIELDS SHALL BE FABRICATED FROM TYPE III OR IV REFLECTIVE SHEETING AND SHALL BE USED ON ALL GUIDE SIGNS IN LIEU OF THOSE SHIELDS DEPICTED IN PUBLICATION 236.
- THE PA TURNPIKE ROUTE SHIELD SHALL ONLY BE USED WITH PA NUMBERED TRAFFIC ROUTES, I.E., NOT WITH INTERSTATE ROUTES SUCH AS I-76, I-276, I-476, ETC.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

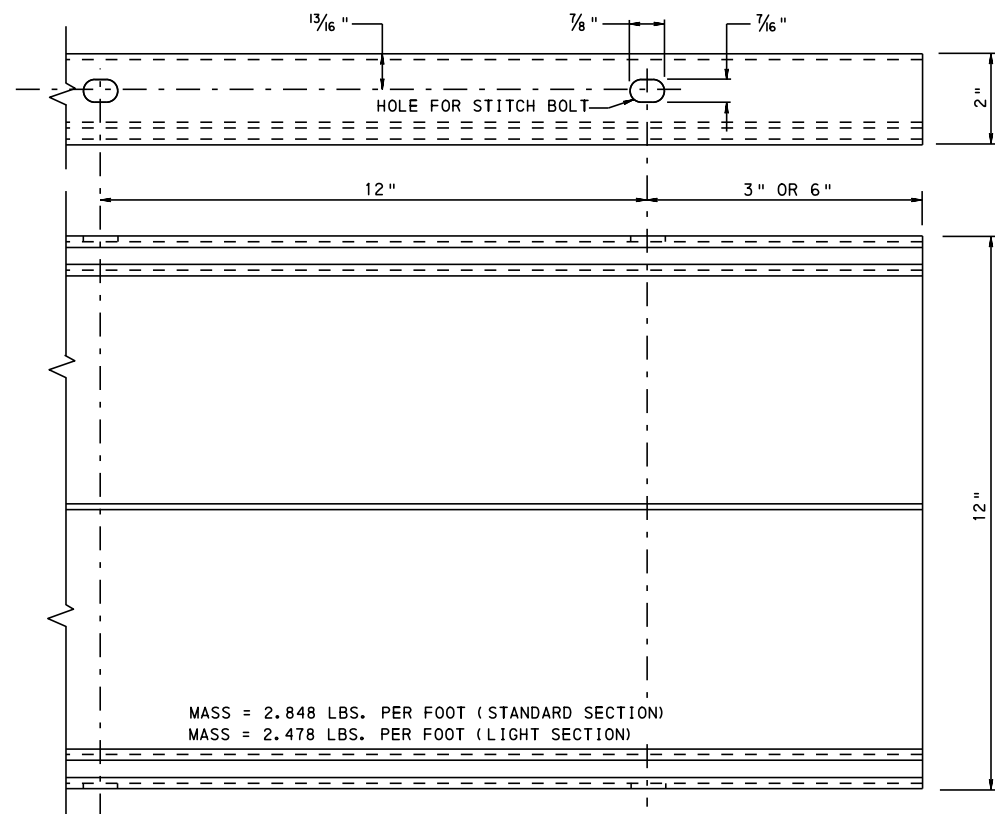
SIGN DETAILS
FREEWAY AND EXPRESSWAY
GUIDE SIGNS

CARDINALS AND SHIELDS

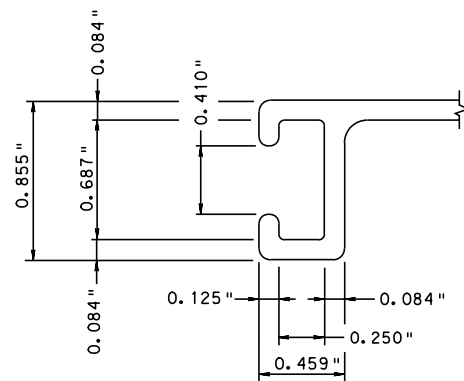




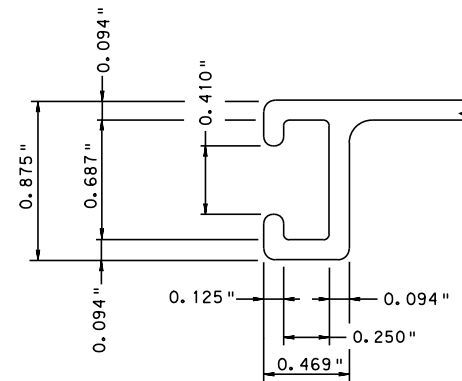
6" EXTRUDED ALUMINUM CHANNEL
REAR VIEW



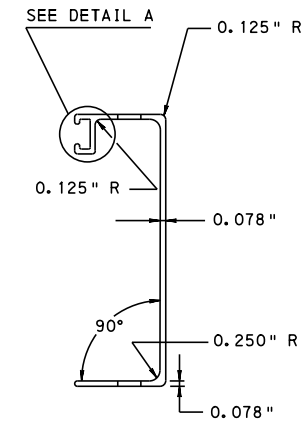
12" EXTRUDED ALUMINUM CHANNEL
REAR VIEW



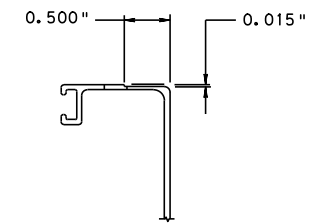
DETAIL A



DETAIL B

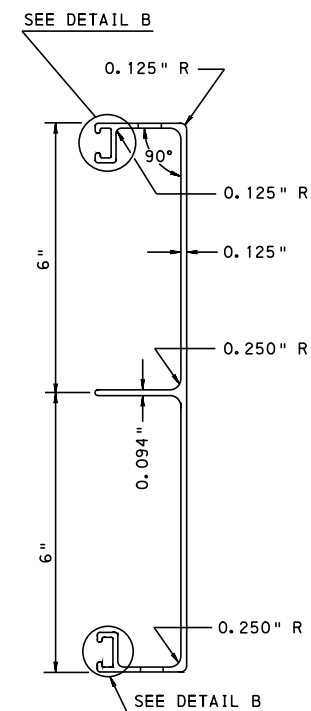


END VIEW

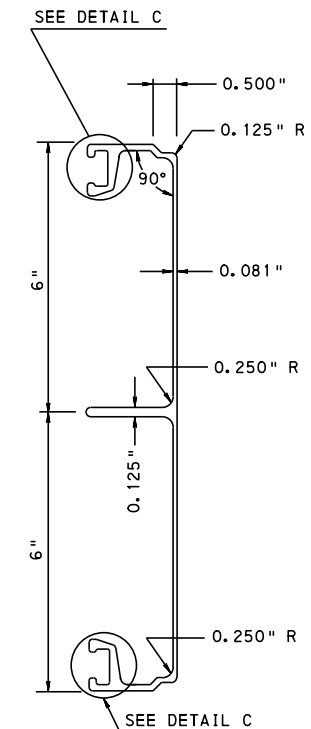


**APPROVED ALTERNATE
CORNER DETAIL**

DIMENSIONS NOT SHOWN ARE
SAME AS END VIEW



END VIEW



**END VIEW
LIGHT SECTION**

NOTES:

1. USE EITHER THE STANDARD SECTION (28008) OR THE LIGHT SECTION (401771).
2. FOR DETAILS A, B, AND C USE 0.062" R ON ALL OUTSIDE CORNERS AND 0.031" R ON ALL INSIDE CORNERS UNLESS OTHERWISE SPECIFIED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

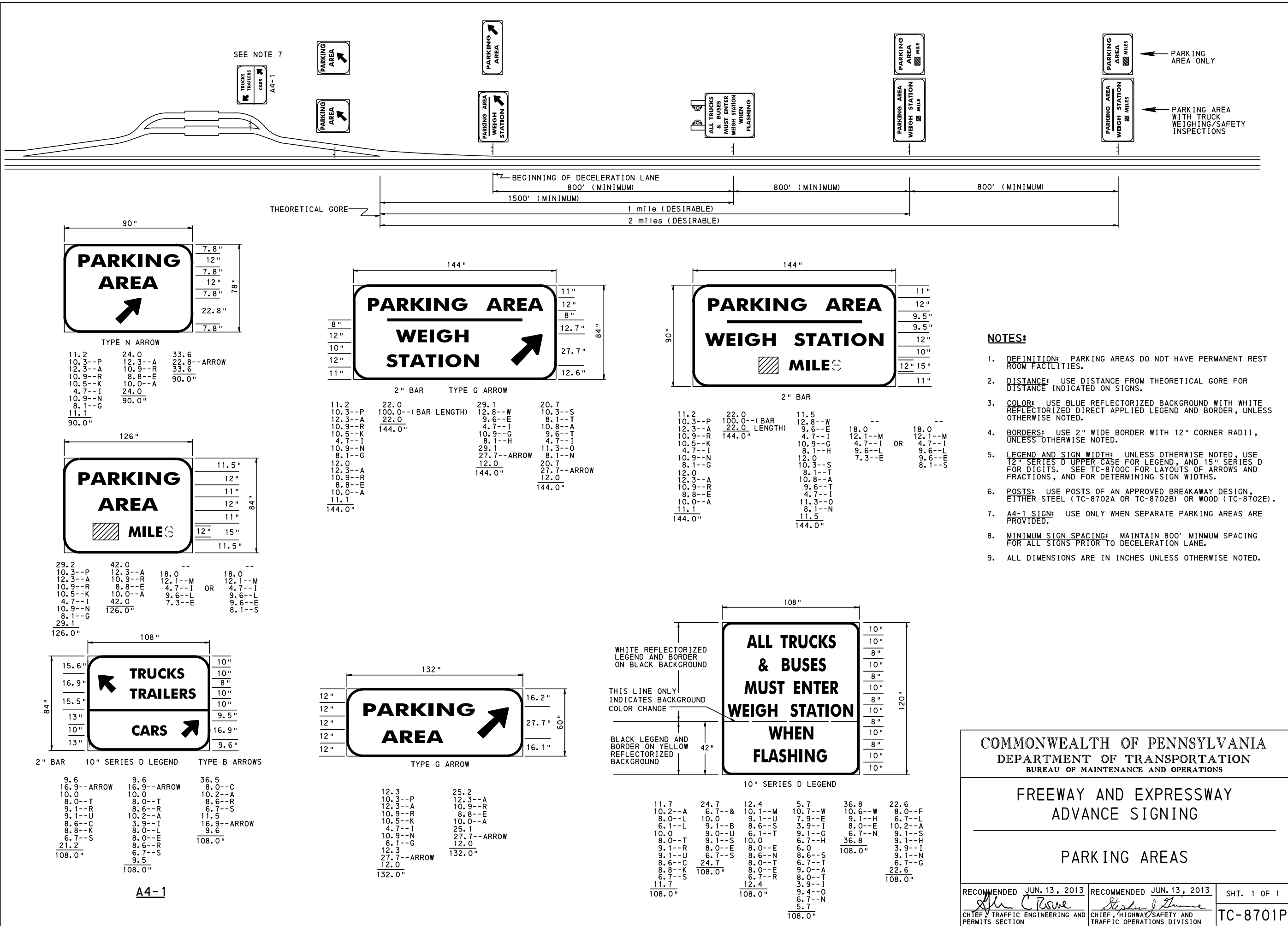
EXTRUDED ALUMINUM CHANNEL SIGN

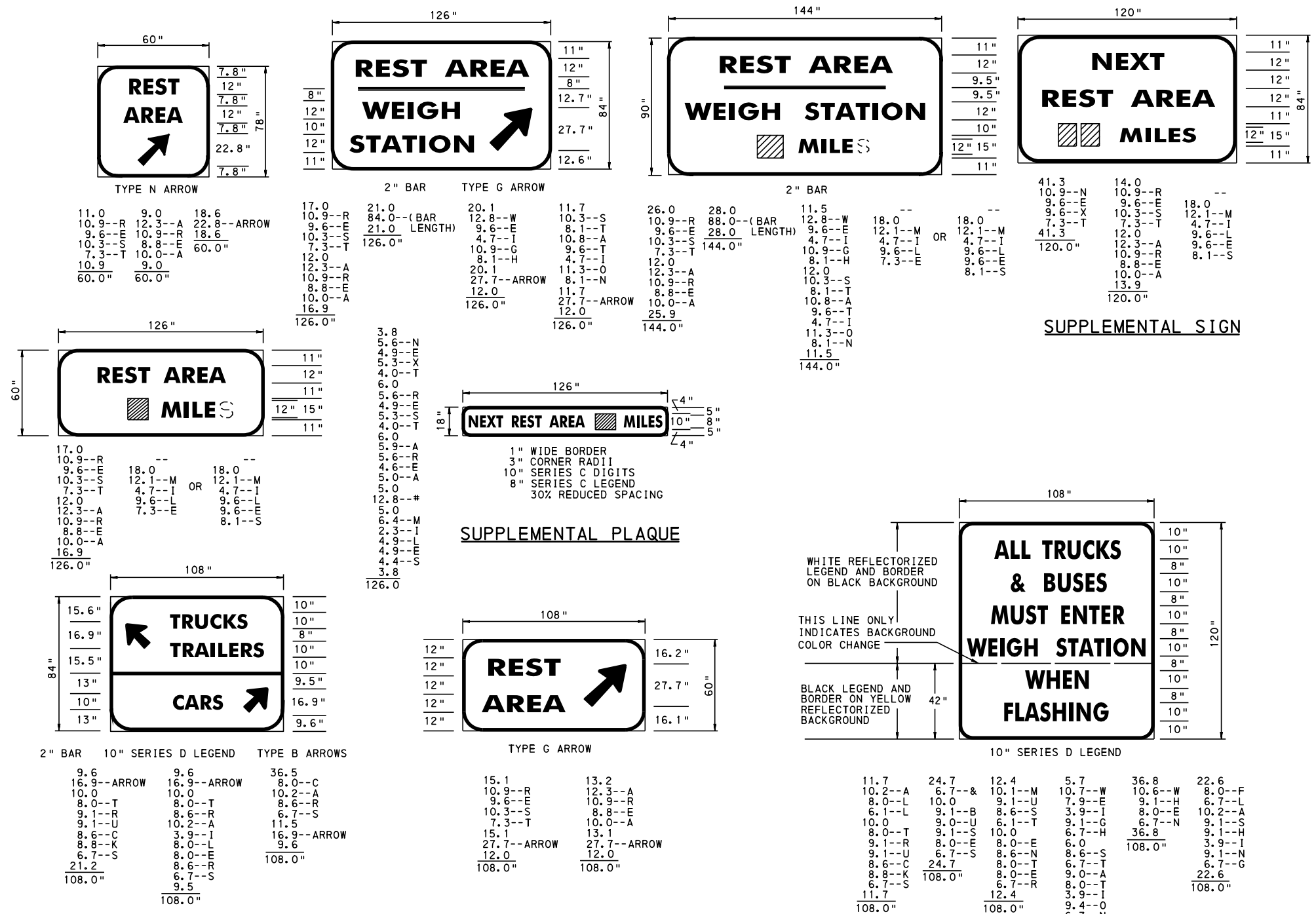
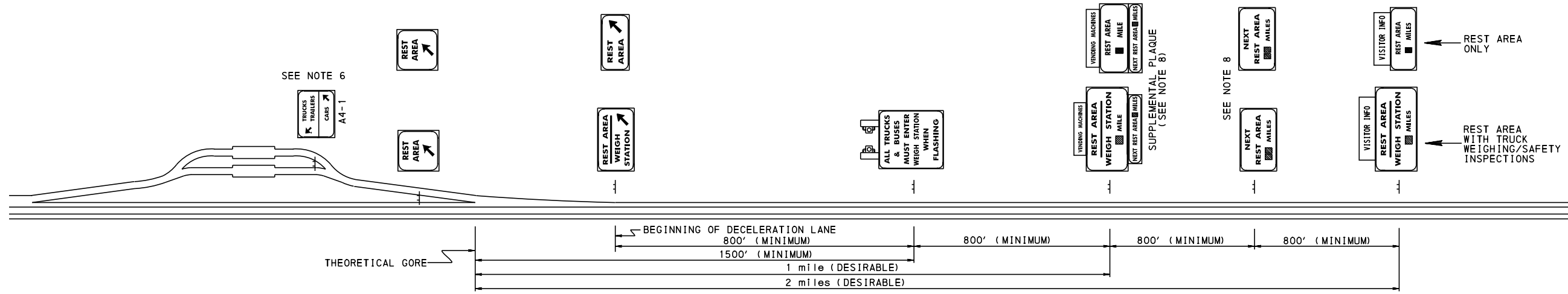
RECOMMENDED JUN. 13, 2013
John C. Rowe
CHIEF, TRAFFIC ENGINEERING AND
PERMITS SECTION

RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

SHT. 2 OF 2

TC-8701E





- NOTES:**
- DISTANCE:** USE DISTANCE FROM THEORETICAL GORE FOR DISTANCE INDICATED ON SIGNS.
 - COLOR:** USE BLUE REFLECTORIZED BACKGROUND WITH WHITE REFLECTORIZED DIRECT APPLIED LEGEND AND BORDER, UNLESS OTHERWISE NOTED.
 - BORDERS:** USE 2" WIDE BORDER WITH 12" CORNER RADII, UNLESS OTHERWISE NOTED.
 - LEGEND AND SIGN WIDTH:** UNLESS OTHERWISE NOTED, USE 12" SERIES D UPPER CASE FOR LEGEND, AND 15" SERIES D FOR DIGITS. SEE TC-8700C FOR LAYOUTS OF ARROWS AND FRACTIONS, AND FOR DETERMINING SIGN WIDTHS.
 - POSTS:** USE POSTS OF AN APPROVED BREAKAWAY DESIGN, EITHER STEEL (TC-8702A OR TC-8702B) OR WOOD (TC-8702E).
 - A4-1 SIGN:** USE ONLY WHEN SEPARATE PARKING AREAS ARE PROVIDED.
 - MINIMUM SIGN SPACING:** MAINTAIN 800' MINIMUM SPACING FOR ALL SIGNS PRIOR TO DECELERATION LANE.
 - NEXT REST AREA SUPPLEMENTAL SIGN:** THIS SIGN MAY BE ELIMINATED IF SUFFICIENT SIGN SPACING DOES NOT EXIST. WHEN THIS SIGN IS ELIMINATED, ONLY THEN INSTALL "NEXT REST AREA -- MILES" SUPPLEMENTAL PLAQUE UNDER SECOND ADVANCE SIGN.
 - VISITOR INFO SIGN (D5-6-1):** USE AS SHOWN IF THE REST AREA IS STAFFED TO PROVIDE VISITOR (TOURIST) INFORMATION IN ACCORDANCE WITH DEPARTMENT POLICY. SEE PUBLICATION 236M FOR LAYOUT. IF THE SIGN NEEDS TO BE COVERED PERIODICALLY OR IF A FOLDING SIGN IS USED, IT MAY BE MOUNTED BELOW THE MAIN SIGN, PROVIDED PROPER SIGN HEIGHT IS MAINTAINED AND THE BREAKAWAY FEATURE OF THE POSTS IS UNAFFECTED.
 - VENDING MACHINES SIGN (D5-6-2):** USE IF VENDING MACHINES ARE AVAILABLE. SEE PUBLICATION 236M FOR LAYOUT. SEE NOTE 9 CONCERNING ALTERNATE LOCATION FOR FOLDING SIGNS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

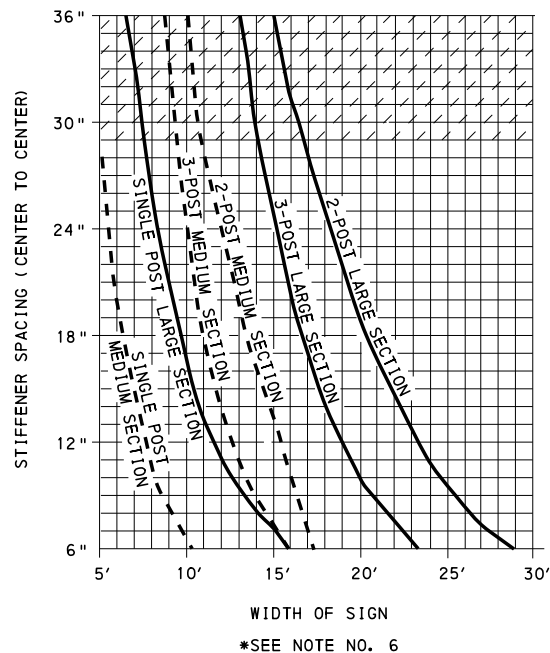
FREEWAY AND EXPRESSWAY
ADVANCE SIGNING

REST AREAS

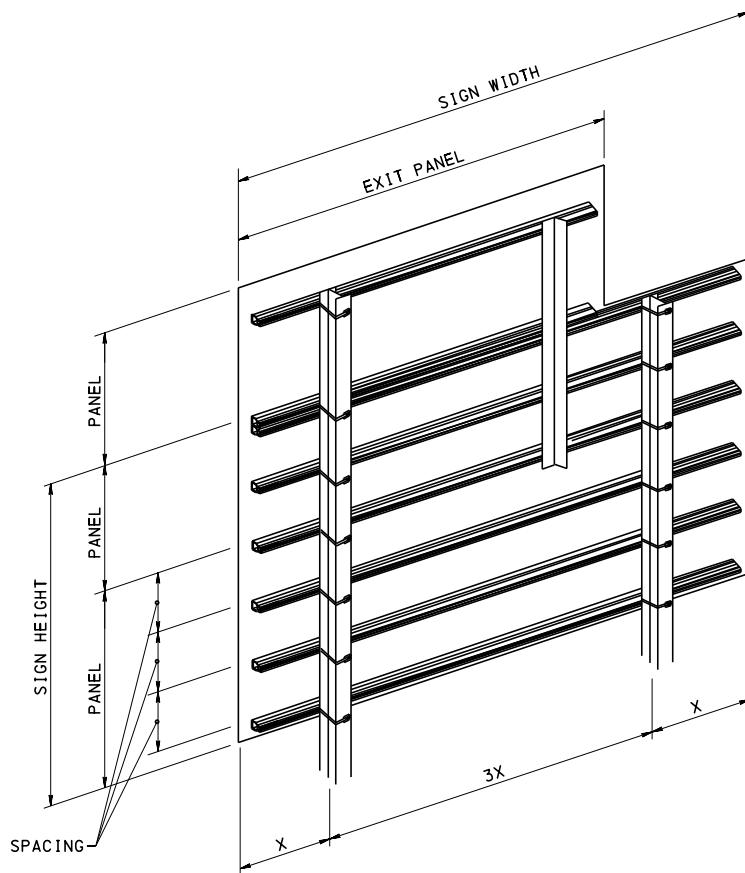
RECOMMENDED JUN. 13, 2013
CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

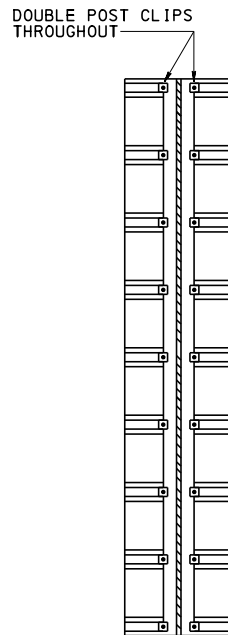
SHT. 1 OF 1
TC-8701R



STIFFENER SPACING CHARTS

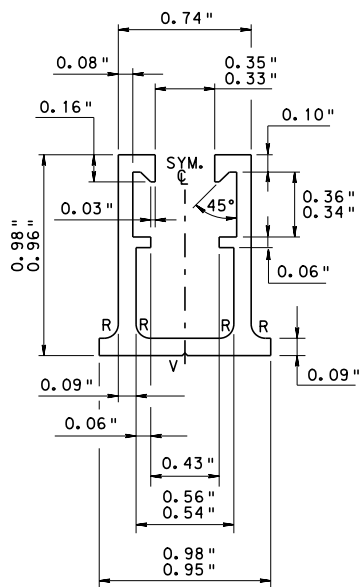


STIFFENER LOCATION



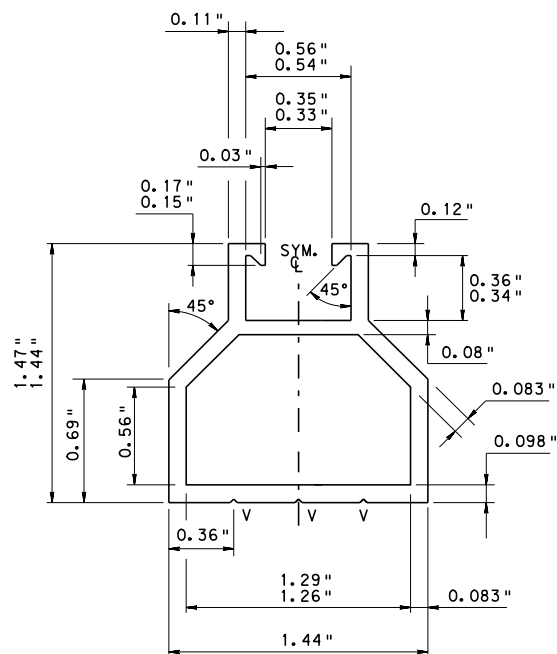
REAR VIEW
(POST & OVERHEAD MOUNTED)

- NOTES:**
- THIS STANDARD SHALL APPLY TO LARGE REFLECTORIZED SIGNS MANUFACTURED FROM FLAT SHEET ALUMINUM, BRACED WITH EXTRUDED ALUMINUM STIFFENERS, AND CONNECTED TO A SPECIFIED TYPE OF POST (OR VERTICAL SUPPORT OF A STRUCTURE) BY USE OF TWIST-IN TOGGLE AND BUCKLE STRAPS, OR STAINLESS STEEL POST CLIPS. WHEN POST CLIPS ARE USED, A DOUBLE POST CLIP PATTERN IS REQUIRED FOR BOTH POST MOUNTED AND OVERHEAD SIGN INSTALLATIONS.
 - ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THIS STANDARD AND PUB. 408.
 - THE STIFFENER SPACING CHART ON THIS SHEET IS DESIGNED TO ACCOMMODATE "SINGLE-POST" INSTALLATIONS AND "MULTIPLE-POST" INSTALLATIONS WHERE THE SPACING BETWEEN THE POSTS (OR VERTICAL SUPPORTS) IS THREE TIMES THE SIGN OVERHANG BEYOND THE END POSTS. (THE SPACING BETWEEN THE POSTS ON A "TWO-POST" INSTALLATION IS THREE-FIFTHS OF THE SIGN WIDTH, AND SPACING BETWEEN THE POSTS ON A "THREE-POST" INSTALLATION IS ONE-THIRD OF THE SIGN WIDTH.)
 - WHEN SIGNS ARE TO BE INSTALLED AND THE SPACING OF THE POSTS IS OTHER THAN THOSE INDICATED IN NOTE NO. 3, THE FABRICATOR SHOULD CONSULT THE DISTRICT TRAFFIC ENGINEER FOR THE PROPER SPACING OF THE STIFFENERS. HOWEVER, THE SPACING BETWEEN THE STIFFENERS SHALL NOT BE GREATER THAN THE SPACING INDICATED IN THE CHART FOR THE SAME WIDTH OF SIGN.
 - TO USE THE STIFFENER SPACING CHART, START WITH THE SIGN WIDTH AND GO VERTICALLY UPWARD UNTIL INTERSECTING THE CURVED LINE INDICATING THE PROPER NUMBER OF POSTS (OR VERTICAL SUPPORTS) AND THE TYPE OF STIFFENER SECTION TO BE USED. THE MAXIMUM STIFFENER SPACING IS INDICATED HORIZONTALLY TO THE LEFT.
 - THE MAXIMUM STIFFENER SPACING IS NORMALLY 29", HOWEVER, FOR SIGNS MADE OF A CONTINUOUS SHEET OF ALUMINUM THROUGHOUT THE HEIGHT OF THE SIGN AND ON WHICH THE FLAT SHEET ALUMINUM OVERHANGS BOTH THE TOP AND BOTTOM STIFFENERS BY A DISTANCE EQUAL TO ONE-THIRD OF THE SPACING BETWEEN STIFFENERS, STIFFENER SPACINGS INDICATED IN THE SHADED PORTION OF THE CHART MAY BE USED. (EXAMPLE: A 144" x 60" SIGN COULD BE INSTALLED ON TWO POSTS USING ONLY TWO LARGE SECTION STIFFENERS SPACED AT THE ULTIMATE 36" SPACING, WITH 12" OF THE SIGN ABOVE THE TOP STIFFENER AND 12" OF THE SIGN BELOW THE BOTTOM STIFFENER.)
 - PANELS MAY BE SPLICED USING ANY OF THREE ARRANGEMENTS SHOWN ON SHEET 2 OF THIS STANDARD.
 - SEE TC-8702E FOR INSTALLATION ON WOOD POSTS.



V = VEE GROOVE 0.01" DEEP x 90°
R = 0.10" RADIUS

MEDIUM SECTION



V = VEE GROOVE 0.015" DEEP x 90°

LARGE SECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

FLAT SHEET ALUMINUM SIGNS
WITH EXTRUDED ALUMINUM STIFFENERS

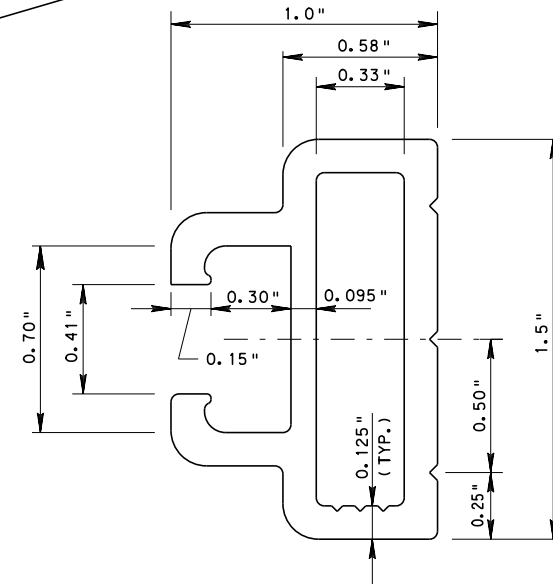
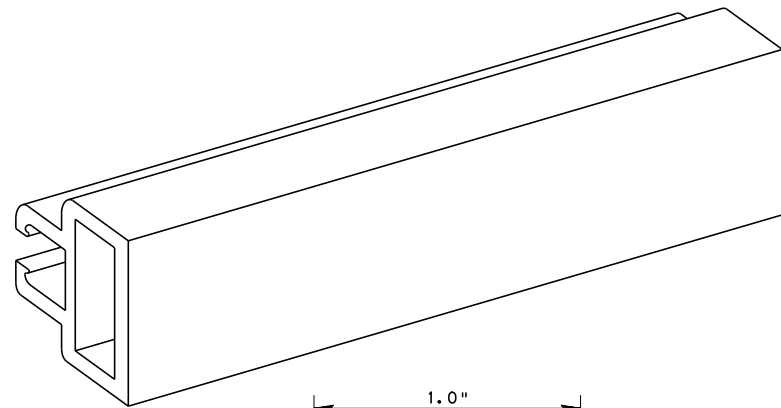
GENERAL INFORMATION

RECOMMENDED JUN. 13, 2013
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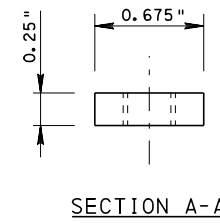
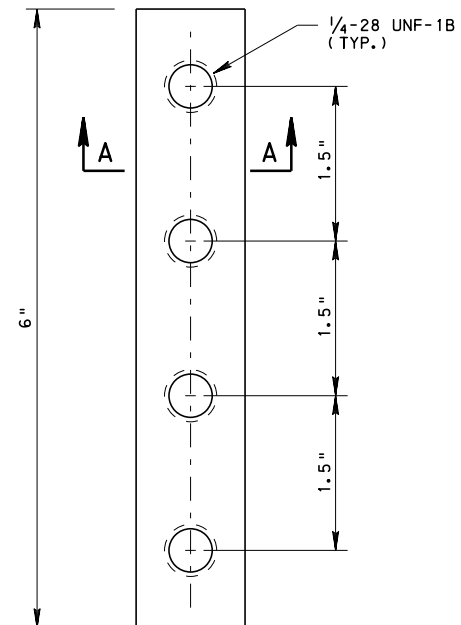
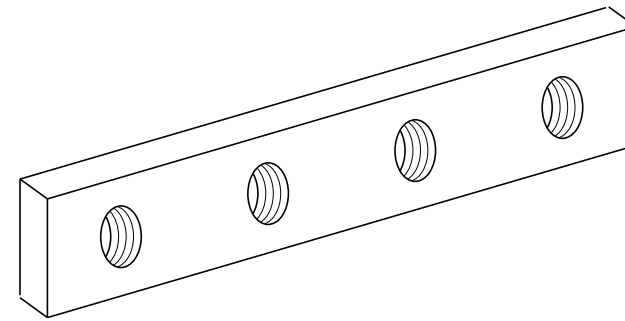
RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SHT. 1 OF 4

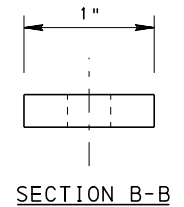
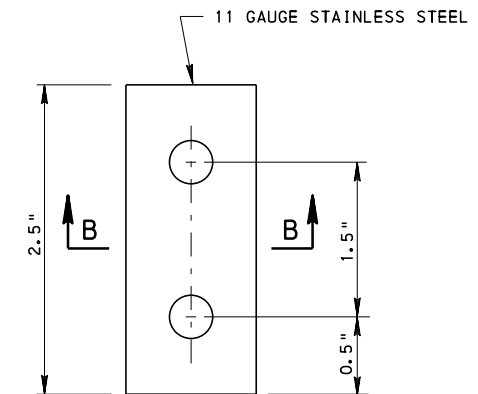
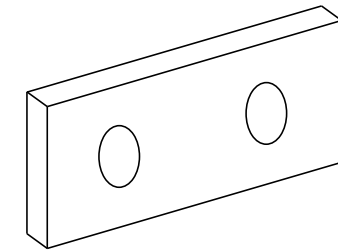
TC-8701S



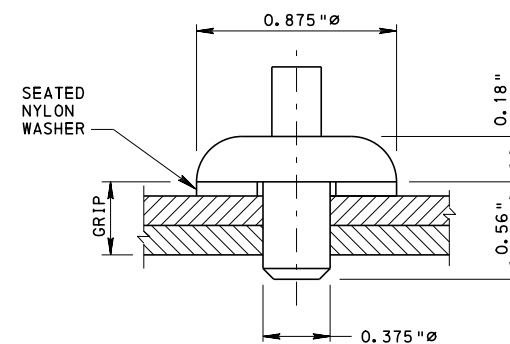
ALUMINUM EXTRUSION SIGN BRACE



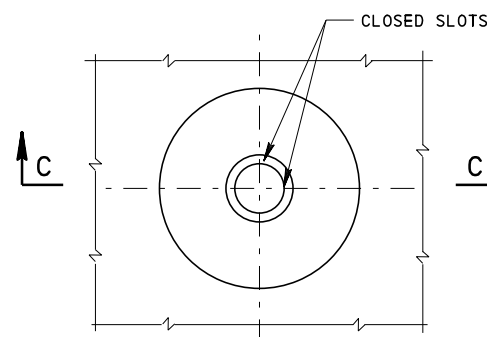
SPLICE PLATE



BUTTING PLATE

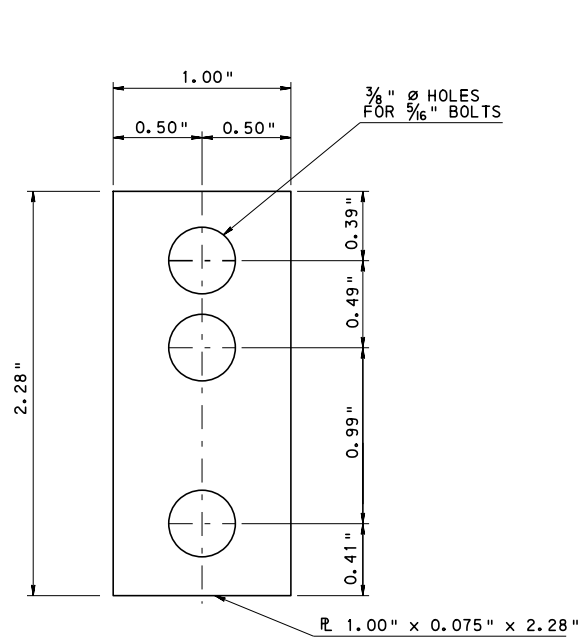


SECTION C-C

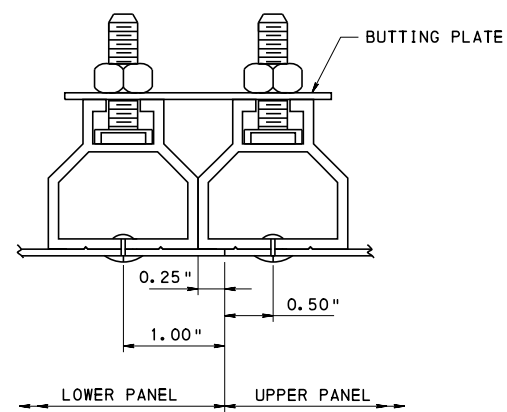


RIVET

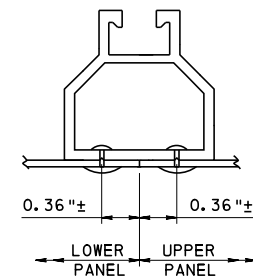
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
FLAT SHEET ALUMINUM SIGNS WITH EXTRUDED ALUMINUM STIFFENERS		
GENERAL INFORMATION		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 2 OF 4 TC-8701S



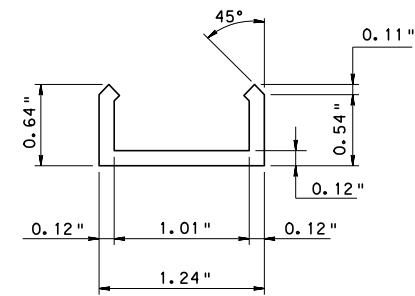
BUTTING PLATE



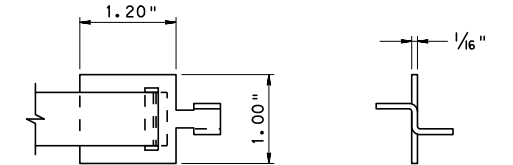
**DOUBLE LARGE SECTION
PANEL SPLICE**



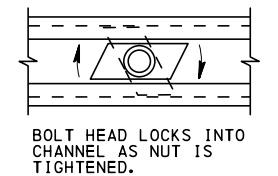
**SINGLE LARGE SECTION
PANEL SPLICE**



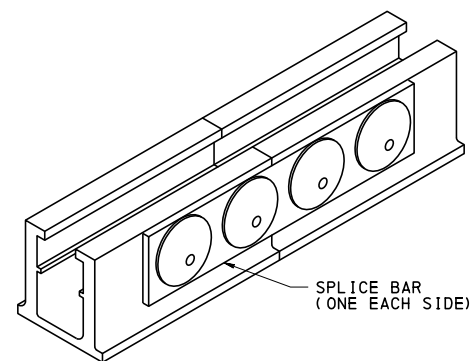
**LARGE SECTION
SPLICE BAR**



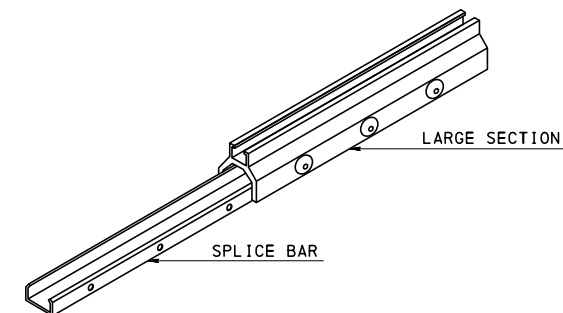
TWIST-IN TOGGLE



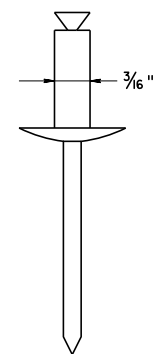
TWIST-IN BOLT



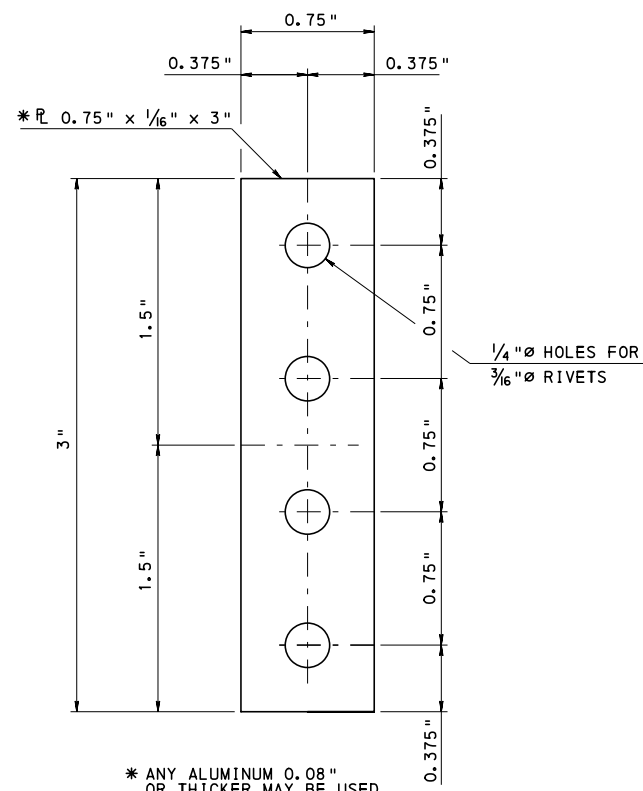
**MEDIUM SECTION
SPLICE**



**LARGE SECTION
SPLICE**

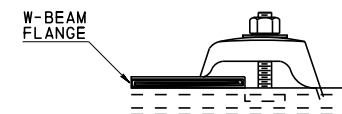


POP RIVET

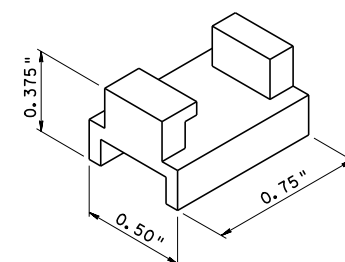


* ANY ALUMINUM 0.08" OR THICKER MAY BE USED

**MEDIUM SECTION
SPLICE BAR**

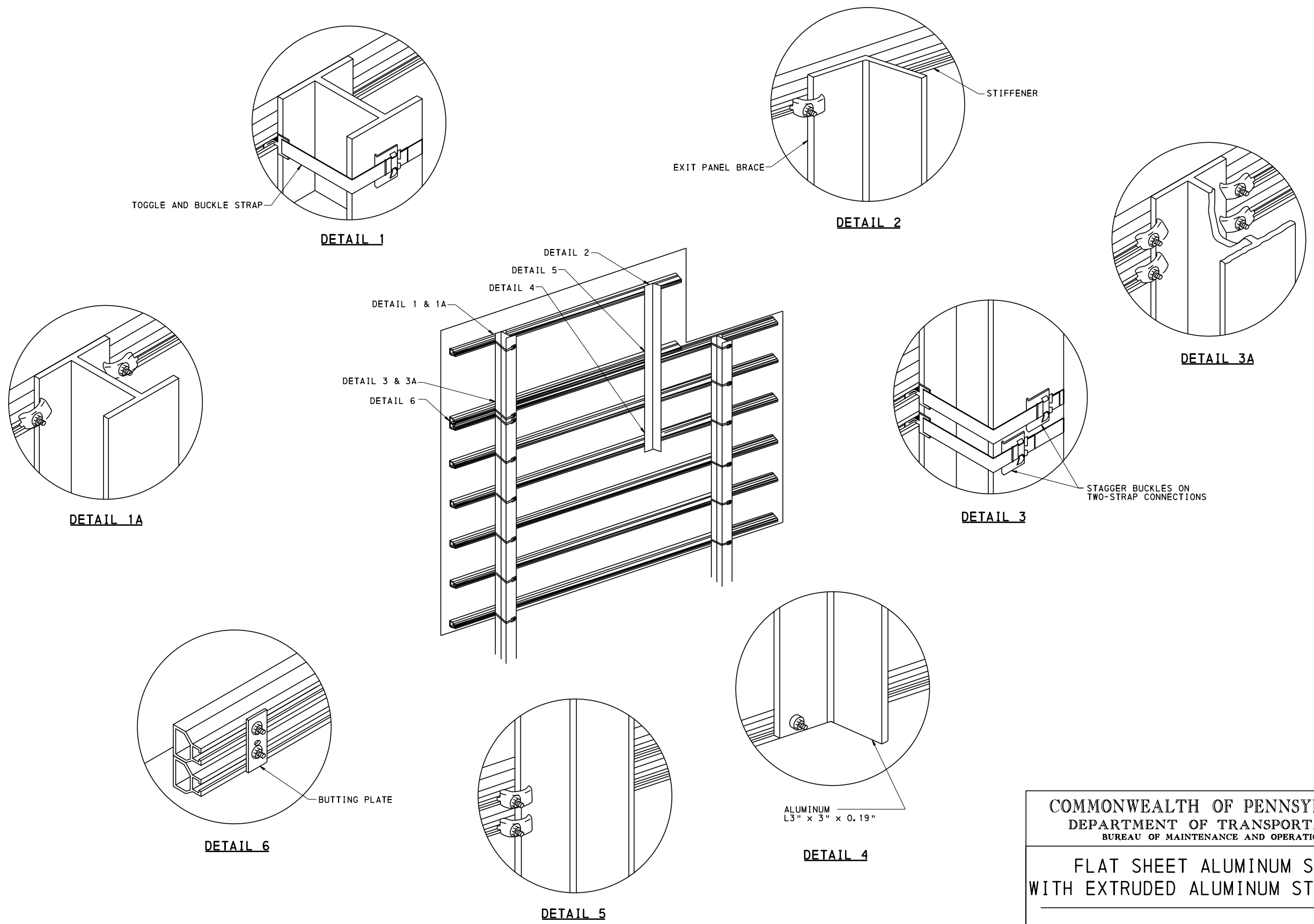


**POST CLIP
SF-VHB**

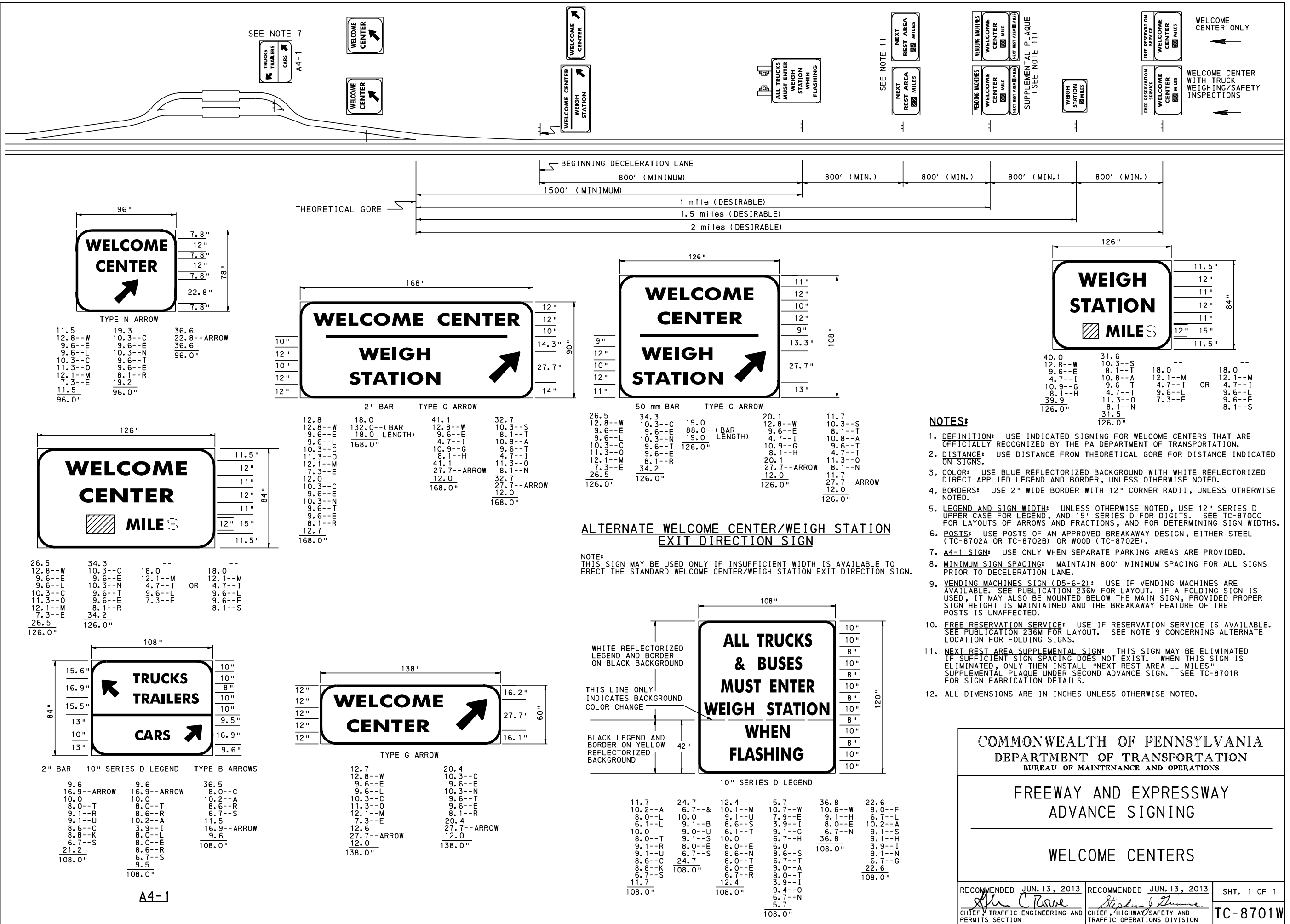


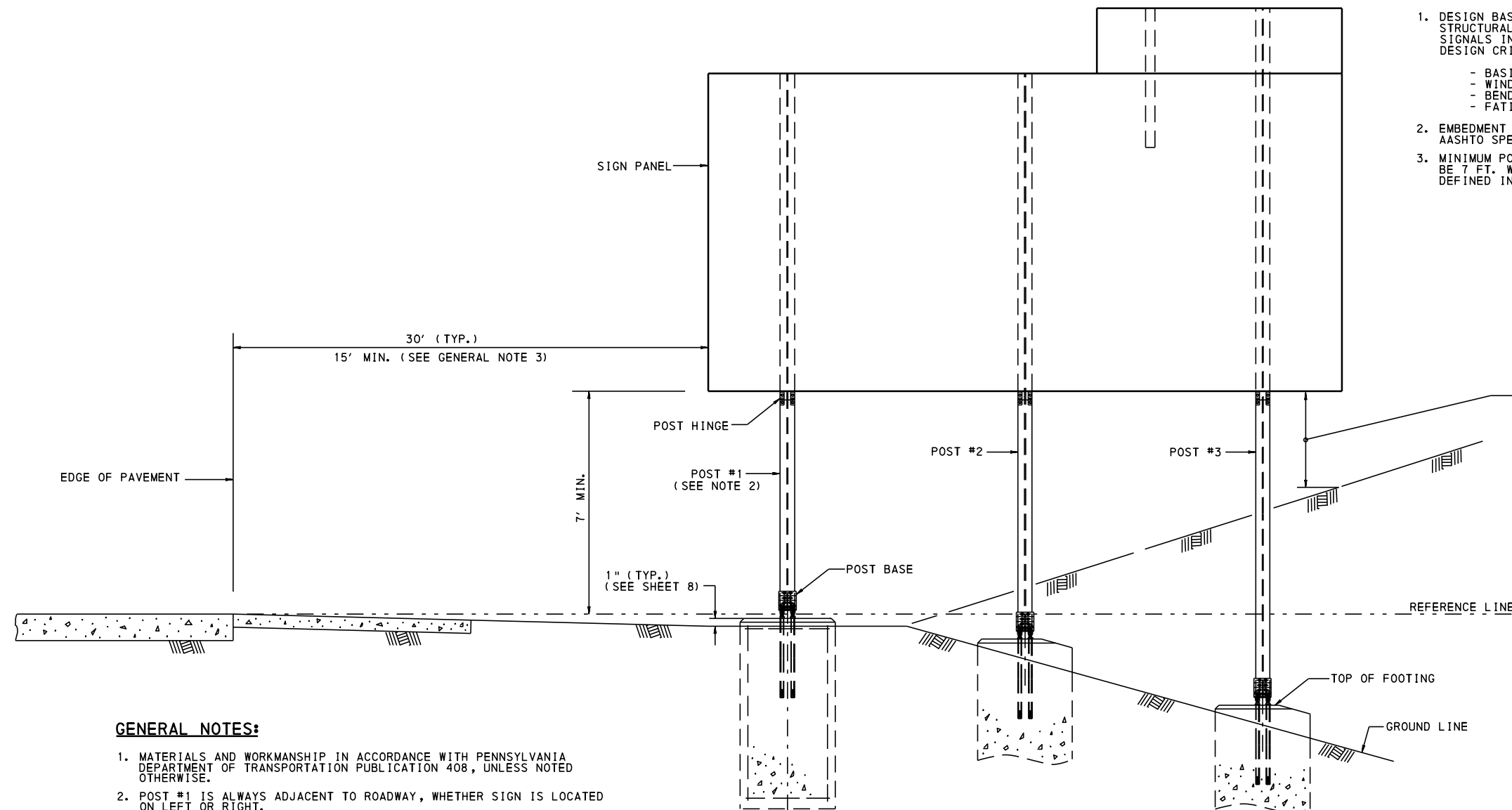
PLASTIC INSERT

COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
FLAT SHEET ALUMINUM SIGNS WITH EXTRUDED ALUMINUM STIFFENERS		
SPLICE AND CONNECTION DETAILS		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 3 OF 4 TC-8701S



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
FLAT SHEET ALUMINUM SIGNS WITH EXTRUDED ALUMINUM STIFFENERS		
POST & STIFFENER CONNECTIONS		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 4 OF 4 TC-8701S





DESIGN CRITERIA:

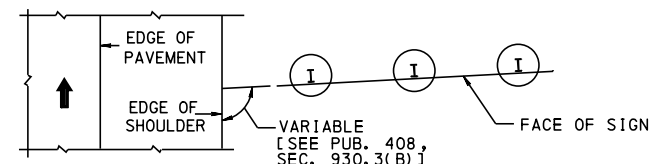
- DESIGN BASED ON 2001 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS INCLUDING 2002 INTERIM SPECIFICATIONS WITH THE FOLLOWING DESIGN CRITERIA:
 - BASIC WIND SPEED (V) = 90 MPH (3-SECOND GUST)
 - WIND IMPORTANCE FACTOR (I_r) = 0.71 (10 YEAR DESIGN LIFE)
 - BENDING COEFFICIENT (C_b) = 1.30
 - FATIGUE IS NOT CONSIDERED FOR ROADSIDE SIGNS.
- EMBEDMENT OF FOOTINGS IS BASED ON BROMS' METHOD OUTLINED IN THE AASHTO SPECIFICATIONS. SEE SHEET 8 FOR SOIL PROPERTIES.
- MINIMUM POST HEIGHT BETWEEN GROUND LEVEL AND BOTTOM OF SIGN WILL BE 7 FT. WHENEVER THE POST IS LOCATED IN THE CLEAR ZONE AS DEFINED IN PUBLICATION 13M.

5' MIN.
(EXCEPT 1' MIN. AT LOCATIONS WHERE NO PART OF THE SIGN FACE WILL BE OBSCURED BY VEGETATION AND WHERE THE SIGN IS PROTECTED BY GUIDERAIL OR LOCATED WHERE IT IS VERY UNLIKELY TO BE HIT BY AN ERRANT VEHICLE, e.g., ON A VERY STEEP BANK.)

GENERAL NOTES:

- MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PUBLICATION 408, UNLESS NOTED OTHERWISE.
- POST #1 IS ALWAYS ADJACENT TO ROADWAY, WHETHER SIGN IS LOCATED ON LEFT OR RIGHT.
- AT LOCATIONS WITH UNMOUNTABLE CURB, GUIDE RAIL OR BARRIER, PLACE THE NEAR EDGE OF THE SIGN AT LEAST 2 FT. BEHIND THE CURB FACE, GUIDE RAIL OR BARRIER. AT LOCATIONS WITH GUIDE RAIL OR BARRIER, IT IS DESIRABLE TO PLACE POST #1 BEYOND THE DEFLECTION DISTANCE OF THE GUIDE RAIL OR BARRIER. PRIOR TO FABRICATION, DETERMINE ACTUAL LATERAL PLACEMENT IN THE FIELD WITH THE APPROVAL OF THE ENGINEER.
- LOCATE SIGNS TO AVOID PLACING SUPPORTS IN DRAINAGE DITCHES.
- MOUNT ALL SIGN PANELS ABOVE POST HINGES.
- FOR SELECTION OF POSTS, REFER TO POST SELECTION TABLES ON SHEETS 2 THROUGH 4.
- FOR POST BASE AND HINGE DETAILS, REFER TO SHEET 5.
- FOR SELECTION OF FOOTING SIZE AND REINFORCEMENT, REFER TO FOOTING SELECTION TABLE ON SHEET 8.
- FOR DETAIL OF SIGN PANELS AND ATTACHMENT HARDWARE, SEE TRAFFIC STANDARD TC-8701E OR TC-8701S.

SIGN ELEVATION



PLAN VIEW

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE A

ERECTION DETAILS

RECOMMENDED JUN. 13, 2013

CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013

CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SHT. 1 OF 8

TC-8702A

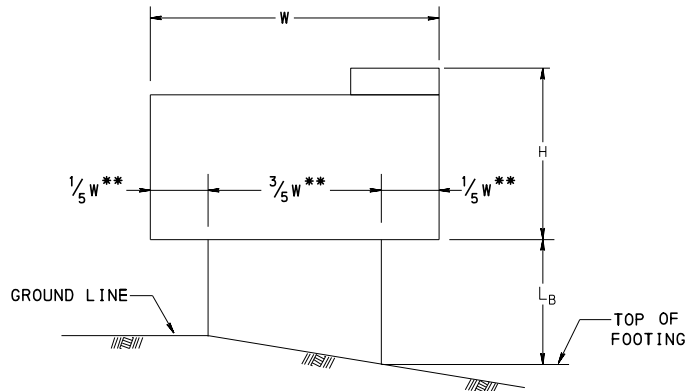
POST SELECTION TABLE - TWO POSTS																			
W FT	L _B FT	HEIGHT "H" IN FT																	
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'		
6'	7'	P1	P1	P1	P1	P1	P1	P1	P2	P2	P3	P3	P3	P3	P3	-	-	-	
	8'	P1	P1	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	-	-	-		
	9'	P1	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	-	-	-	-		
	10'	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	-	-	-	-	-		
	11'	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-		
	12'	P1	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-		
	13'	P1	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-		
	14'	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-	-		
	15'	P1	P2	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-	-		
7'	16'	P1	P2	P2	P3	P3	P3	P3	-	-	-	-	-	-	-	-	-		
	17'	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-	-	-	-		
	7'	P1	P1	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	-	-	-		
	8'	P1	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	-	-	-	-		
	9'	P1	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	-	-	-	-		
	10'	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-		
	11'	P1	P1	P1	P1	P2	P2	P2	P3	P3	-	-	-	-	-	-	-		
	12'	P1	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-		
	13'	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-	-		
8'	14'	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-	-	-		
	15'	P2	P2	P3	P3	P3	P3	P3	-	-	-	-	-	-	-	-	-		
	16'	P2	P2	P3	P3	P3	P3	-	-	-	-	-	-	-	-	-	-		
	17'	P2	P2	P3	P3	P3	-	-	-	-	-	-	-	-	-	-	-		
	7'	P1	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	-	-	-	-		
	8'	P1	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	-	-	-	-		
	9'	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-		
	10'	P1	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-		
	11'	P1	P1	P1	P2	P2	P2	P3	P3	-	-	-	-	-	-	-	-		
9'	12'	P1	P1	P2	P2	P2	P3	P3	P3	-	-	-	-	-	-	-	-		
	13'	P1	P2	P2	P2	P3	P3	P3	P4 *	P4 *	P5 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *		
	14'	P1	P2	P3	P3	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P10 *		
	15'	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P10 *	P10 *		
	16'	P2	P3	P3	P3	P3	P4 *	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	-	-	-		
	17'	P2	P3	P3	P3	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P8 *	-	-	-	-		
	7'	P1	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P4 *	P4 *	P5 *	P5 *	P7 *		
	8'	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *		
	9'	P1	P1	P1	P2	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *	P8 *		
10'	10'	P1	P1	P2	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *		
	11'	P1	P1	P2	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *		
	12'	P1	P2	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	P10 *		
	13'	P1	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P8 *	P10 *		
	14'	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P7 *	P8 *	P8 *	P10 *	P10 *		
	15'	P2	P2	P3	P3	P4 *	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P8 *	P10 *	P10 *	P10 *		
	16'	P2	P3	P3	P3	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P9 *	-	-	-	-		
	17'	P2	P3	P3	P4 *	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	-	-	-	-	-		
	11'	7'	P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P4 *	P4 *	P5 *	P5 *	P6 *	P7 *	
8'		P1	P1	P1	P1	P2	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *		
9'		P1	P1	P1	P2	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *		
10'		P1	P1	P2	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	P10 *		
11'		P1	P2	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	P10 *		
12'		P1	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P9 *	P10 *		
13'		P1	P2	P2	P3	P3	P4 *	P5 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P8 *	P10 *	P10 *		
14'		P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P7 *	P8 *	P10 *	P10 *	P10 *		
15'		P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P9 *	P10 *	P10 *	-		
12'	16'	P2	P3	P3	P4 *	P5 *	P5 *	P5 *	P6 *	P7 *	P7 *	P7 *	P8 *	-	-	-	-		
	17'	P3	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *	-	-	-	-	-	-		
	7'	P1	P1	P1	P1	P2	P2	P3	P3	P3	P4 *	P5 *	P6 *	P7 *	P7 *	P7 *	P8 *		
	8'	P1	P1	P1	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *		
	9'	P1	P1	P2	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	P10 *		
	10'	P1	P1	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *	P10 *		
	11'	P2	P2	P2	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *	P10 *	P10 *	P10 *		
	12'	P1	P2	P2	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *	P10 *	P10 *	P10 *		
	13'	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	P10 *	P10 *	P10 *	-		
13'	14'	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	P9 *	P10 *	P10 *	-	-		
	15'	P2	P3	P3	P3	P4 *	P5 *	P5 *	P6 *	P7 *	P7 *	P8 *	P10 *	P10 *	P10 *	-	-		
	16'	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	-	-	-	-	-	-		
	17'	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *	-	-	-	-	-	-	-		
	7'	P1	P1	P1	P2	P2	P3	P3	P3	P4 *	P5 *	P6 *	P7 *	P7 *	P7 *	P7 *	P8 *		
	8'	P1	P1	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *	P10 *		
	9'	P1	P1	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	P10 *	P10 *		
	10'	P1	P2	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	P10 *	P10 *		
	11'	P2	P2	P2	P3	P3	P3	P3	P4 *	P5 *	P5 *	P5 *	P7 *	P7 *	P8 *	P9 *	P10 *		
14'	12'	P2	P2	P3	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *	P10 *	P10 *	P10 *	-		
	13'	P2	P2	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *	P10 *	P10 *	P10 *	-	-		
	14'	P2	P3	P3	P4 *	P4 *	P5 *	P5 *	P7 *	P7 *	P8 *	P10 *	P10 *	P10 *	-	-	-		
	15'	P3	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *	P7 *	P8 *	P10 *	P10 *	P10 *	-	-	-		
	16'	P3	P3	P4 *	P4 *	P5 *	P6 *	P7 *	P7 *	P8 *	-	-	-	-	-	-	-		
	17'	P3	P3	P4 *	P5 *	P5 *	P7 *	P7 *	P8 *	P9 *	-	-	-	-	-	-	-		

* SEE NOTE 6

(TABLE CONTINUED ON SHEET 3)

LEGEND:

P1 = W6 x 9
P2 = W6 x 12
P3 = W6 x 15
P4 = W8 x 18
P5 = W8 x 21
P6 = W10 x 22
P7 = W10 x 26
P8 = W14 x 30
P9 = W18 x 35
P10 = W18 x 40



**** SEE NOTE 6**

SIGN ON TWO POSTS

SKETCH A

POST SELECTION EXAMPLE

FOR A SIGN WHERE

W = 6'
H = 4'
L_B = (17')

TWO P2 = W6 x 12 STEEL POSTS ARE REQUIRED.

SIGN POST SELECTION NOTES:

1. DETERMINE VALUES OF "W", "H", AND "L_B" AS INDICATED IN SKETCH "A".
W = MAXIMUM WIDTH OF SIGN.
H = MAXIMUM HEIGHT OF SIGN.
L_B = MAXIMUM DISTANCE BETWEEN TOP OF A FOOTING AND BOTTOM OF SIGN.
2. FOR SELECTION OF POSTS, ENTER TABLES WITH VALUES OF "W", "H" AND "L_B".
3. FOR A SIGN SIZE BETWEEN THOSE VALUES OF "W", "H" AND "L_B" IN THE TABLE, USE NEXT HIGHEST FT VALUE.
4. ALL POSTS ARE ASTM A 572/A 572M, GRADE 50 STEEL.
5. USE THE LONGEST POST TO SELECT ALL POST SIZES.
6. POSTS IN THE SELECTION TABLE WITH AN "*" MUST HAVE A MINIMUM CLEAR SPACING OF 7' BETWEEN POSTS BY INCREASING THE 3/5 W SPACING. THE REMAINING SIGN WIDTH "W" SHOULD BE EQUALLY DISTRIBUTED TO THE OVERHANGS.
7. THERE IS NO NEED TO CHECK THE BELOW WEIGHT CRITERIA FOR POSTS DETERMINED USING THIS POST SELECTION TABLE. NO MORE THAN TWO POSTS MAY BE ERRECTED WITHIN A 7' PATH. A SINGLE POST SPACED WITH A CLEAR DISTANCE OF 7' OR MORE FROM ANOTHER POST, SHALL HAVE A MASS NO GREATER THAN 44 LB/FT. THE TOTAL MASS BELOW THE HINGE PLATE, BUT ABOVE THE SHEAR PLATE OF THE BREAKAWAY BASE, SHALL NOT EXCEED 600 LB. FOR TWO POSTS SPACED WITH LESS THAN 7' CLEARANCE, EACH POST SHALL HAVE A MASS LESS THAN 17 LB/FT.
8. SEE SHEET 4 FOR THREE-POST INSTALLATION.

NOTES:

1. THE MOUNTING HEIGHT MAY BE ADJUSTED WHEN SUPPORTS ARE LOCATED NEAR THE EDGE OF THE RIGHT-OF-WAY ON A STEEP BACKSLOPE IN ORDER TO AVOID THE SOMETIMES LESS DESIRABLE ALTERNATIVE OF PLACING THE SIGN CLOSER TO THE ROADWAY.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS, TYPE A

POST SELECTION TABLE

RECOMMENDED JUN. 13, 2013

John C. Rowe
CHIEF, TRAFFIC ENGINEERING AND
PERMITS SECTION

RECOMMENDED JUN. 13, 2013

Stephen J. Thumme
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

SHT. 2 OF 8

TC-8702A

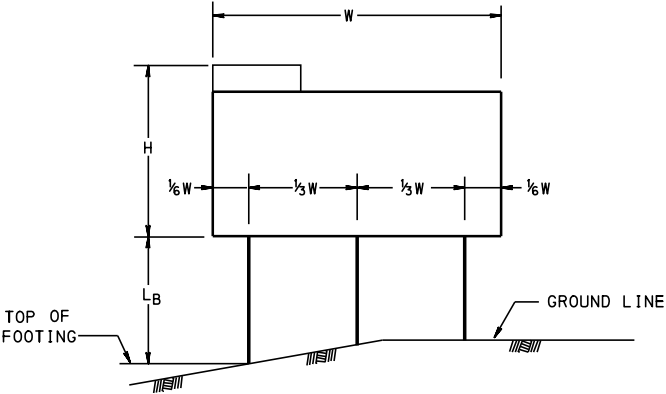
(TABLE CONTINUED FROM SHEET 2)

POST SELECTION TABLE - TWO POSTS																			
W (FEET)	L _B (FEET)	HEIGHT "H" (FEET)																	
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'	17'	18'	19'		
15'	7'	P1	P1	P1	P2	P2	P3	P3	P3	P4	P4	P5	P6	P7	P7	P8	P10	P10	
	8'	P1	P1	P2	P2	P3	P3	P3	P4	P4	P5	P6	P7	P7	P8	P9	P10	P10	
	9'	P1	P1	P2	P2	P3	P3	P3	P4	P4	P5	P7	P7	P8	P9	P10	P10	P10	
	10'	P1	P2	P2	P3	P3	P3	P4	P4	P5	P5	P7	P7	P8	P10	P10	P10	P10	
	11'	P1	P2	P3	P3	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10	P10	-	
	12'	P2	P2	P3	P3	P3	P3	P5	P5	P6	P7	P7	P8	P9	P10	P10	-	-	
	13'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7	P8	P9	P10	P10	-	-	-	
	14'	P2	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10	P10	-	-	-	-	
	15'	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	
16'	16'	P3	P3	P4	P5	P5	P7	P7	P8	P9	-	-	-	-	-	-	-	-	
	17'	P3	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-	-	-	-	
	7'	P1	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7	P8	P10	P10	
	8'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P5	P6	P7	P7	P8	P10	P10	P10	
	9'	P1	P2	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	P10	
	10'	P1	P2	P2	P3	P3	P3	P4	P4	P5	P5	P7	P7	P8	P9	P10	P10	-	
	11'	P2	P2	P3	P3	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10	P10	-	
	12'	P2	P2	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10	P10	-	-	-	
	13'	P2	P3	P3	P4	P4	P5	P6	P7	P7	P8	P10	P10	P10	-	-	-	-	
17'	14'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10	P10	-	-	-	-	
	15'	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	-	
	16'	P3	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-	-	-	-	
	17'	P3	P4	P5	P5	P7	P7	P8	P9	-	-	-	-	-	-	-	-	-	
	7'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7	P8	P10	P10	P10	
	8'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10	P10	
	9'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	P10	-	
	10'	P1	P2	P3	P3	P3	P4	P5	P5	P5	P7	P7	P8	P10	P10	P10	-	-	
	11'	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P8	P10	P10	P10	-	-	-	
18'	12'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	P10	-	-	-	
	13'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	
	14'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	
	15'	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	-	
	16'	P3	P3	P4	P5	P7	P7	P8	-	-	-	-	-	-	-	-	-	-	
	17'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-	-	-	-	-	
	7'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7	P8	P10	P10	P10	
	8'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P8	P10	P10	P10	-	
	9'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	
19'	10'	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	
	11'	P2	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	
	12'	P2	P3	P3	P4	P4	P5	P7	P7	P8	P9	P10	P10	-	-	-	-	-	
	13'	P2	P3	P3	P4	P5	P6	P7	P7	P8	P10	P10	P10	-	-	-	-	-	
	14'	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	-	
	15'	P3	P3	P4	P5	P7	P7	P9	P10	P10	-	-	-	-	-	-	-	-	
	16'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-	-	-	-	-	
	17'	P3	P4	P5	P7	P7	P8	P9	-	-	-	-	-	-	-	-	-	-	
	7'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7	P8	P10	P10	P10	
20'	8'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10	-	-	
	9'	P1	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7	P10	P10	P10	-	-	-	
	10'	P2	P2	P3	P3	P4	P4	P5	P5	P7	P7	P9	P10	P10	P10	-	-	-	
	11'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	
	12'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	
	13'	P3	P3	P3	P5	P5	P7	P7	P9	P10	P10	-	-	-	-	-	-	-	
	14'	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	-	
	15'	P3	P4	P5	P5	P7	P7	P8	P10	P10	-	-	-	-	-	-	-	-	
	16'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-	-	-	-	-	
21'	17'	P3	P4	P5	P7	P7	P8	-	-	-	-	-	-	-	-	-	-	-	
	7'	P1	P1	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7	P8	P10	P10	P10	P10	
	8'	P1	P2	P2	P3	P3	P4	P4	P5	P6	P7	P7	P8	P10	P10	P10	-	-	
	9'	P1	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	
	10'	P2	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	
	11'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P9	P10	P10	-	-	-	-	-	
	12'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	
	13'	P3	P3	P3	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	-	
	14'	P3	P3	P4	P5	P6	P7	P7	P9	P10	P10	-	-	-	-	-	-	-	
22'	15'	P3	P4	P5	P5	P7	P7	P8	P10	P10	-	-	-	-	-	-	-	-	
	16'	P3	P4	P5	P7	P7	P8	-	-	-	-	-	-	-	-	-	-	-	
	17'	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-	-	-	-	-	-	
	7'	P1	P1	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7	P8	P10	P10	P10	-	
	8'	P1	P2	P2	P3	P3	P4	P5	P5	P6	P7	P7	P8	P10	P10	P10	-	-	
	9'	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	
	10'	P2	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	
	11'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-	-	-	-	
	12'	P2	P3	P3	P4	P5	P7	P7	P7	P9	P10	P10	-	-	-	-	-	-	

POST SELECTION TABLE - THREE POSTS																
W (FEET)	L _B (FEET)	HEIGHT "H" (FEET)														
		4'	5'	6'	7'	8'	9'	10'	11'	12'	13'	14'	15'	16'		
22'	7'	P1	P1	P1	P2	P2	P3	P3	P3	P4	P5	P5	P6	P7		
	8'	P1	P1	P2	P2	P3	P3	P3	P4	P4	P5	P5	P7	P7		
	9'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8		
	10'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7	P8		
	11'	P1	P2	P3	P3	P3	P4	P4	P5	P7	P7	P7	P8	P10		
	12'	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10		
	13'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10		
	14'	P2	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10	P10		
	15'	P3	P3	P3	P4	P5	P5	P7	P7	P8	-	-	-	-		
	16'	P3	P3	P4	P5	P5	P7	P7	P7	P8	-	-	-	-		
	17'	P3	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-		
23'	7'	P1	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P6	P7		
	8'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P5	P6	P7	P7		
	9'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P5	P7	P7	P8		
	10'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P9		
	11'	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10		
	12'	P2	P2	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10		
	13'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10		
	14'	P2	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10	P10		
	15'	P3	P3	P4	P4	P5	P6	P7	P7	P8	-	-	-	-		
	16'	P3	P3	P4	P5	P5	P7	P7	P8	P9	-	-	-	-		
	17'	P3	P3	P4	P5	P7	P7	P8	-	-	-	-	-	-		
24'	7'	P1	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7		
	8'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P5	P6	P7	P7		
	9'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P5	P7	P7	P8		
	10'	P1	P2	P2	P3	P3	P4	P4	P5	P5	P7	P7	P8	P10		
	11'	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10		
	12'	P2	P2	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10		
	13'	P2	P3	P3	P4	P5	P5	P6	P7	P7	P8	P10	P10	P10		
	14'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10	-		
	15'	P3	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-		
	16'	P3	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-		
	17'	P3	P4	P5	P5	P7	P7	P8	P9	-	-	-	-	-		
25'	7'	P1	P1	P2	P2	P3	P3	P3	P4	P4	P5	P6	P7	P7		
	8'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7		
	9'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P6	P7	P7	P8		
	10'	P1	P2	P2	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10		
	11'	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P8	P10	P10		
	12'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10		
	13'	P2	P3	P3	P4	P5	P5	P7	P7	P7	P8	P10	P10	P10		
	14'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-		
	15'	P3	P3	P4	P5	P5	P7	P7	P8	P9	-	-	-	-		
	16'	P3	P3	P4	P5	P6	P7	P7	P8	-	-	-	-	-		
	17'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-		
26'	7'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P6	P7	P7		
	8'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7		
	9'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P9		
	10'	P1	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10		
	11'	P2	P2	P3	P3	P4	P4	P5	P7	P7	P7	P8	P10	P10		
	12'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10		
	13'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10	-		
	14'	P3	P3	P4	P4	P5	P7	P7	P8	P10	P10	P10	-	-		
	15'	P3	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-		
	16'	P3	P4	P4	P5	P7	P7	P7	P9	-	-	-	-	-		
	17'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-		
27'	7'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P6	P7	P7		
	8'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P6	P7	P7	P8		
	9'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10		
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	11'	P2	P2	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10		
	12'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10		
	13'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-		
	14'	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10	-	-		
	15'	P3	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-		
	16'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-		
	17'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-		
28'	7'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7		
	8'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7	P8		
	9'	P1	P2	P2	P3	P3	P4	P4	P5	P5	P7	P7	P8	P10		
	10'	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10		
	11'	P2	P2	P3	P3	P4	P5	P5	P7	P7	P8	P9	P10	P10		
	12'	P2	P3	P3	P3	P4	P5	P7	P7	P7	P9	P10	P10	P10		
	13'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-		
	14'	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-		
	15'	P3	P3	P4	P5	P6	P7	P7	P8	-	-	-	-	-		
	16'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-		
	17'	P3	P4	P5	P6	P7	P7	P9	-	-	-	-	-	-		
29'	7'	P1	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7		
	8'	P1	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7	P8		
	9'	P1	P2	P2	P3	P3	P4	P5	P5	P6	P7	P7	P9	P10		
	10'	P2	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10		
	11'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10		
	12'	P2	P3	P3	P4	P4	P5	P7	P7	P8	P9	P10	P10	-		
	13'	P2	P3	P3	P4	P5	P6	P7	P7	P8	P10	P10	P10	-		
	14'	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-		
	15'	P3	P3	P4	P5	P7	P7	P8	P9	-	-	-	-	-		
	16'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-		
	17'	P3	P4	P5	P7	P7	P8	-	-	-	-	-	-	-		
30'	7'	P1	P1	P2	P2	P3	P3	P4	P4	P6	P6	P7	P7	P8		
	8'	P1	P2	P2	P3	P3	P3	P4	P5	P6	P7	P7	P7	P8		
	9'	P1	P2	P3	P3	P3	P4	P5	P5	P7	P7	P7	P9	P10		
	10'	P2	P2	P3	P3	P3	P4	P5	P5	P7	P8	P9	P10	P10		
	11'	P2	P3	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10		
	12'	P2	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-		
	13'	P3	P3	P3	P4	P5	P5	P7	P8	P9	P10	P10	-	-		
	14'	P3	P3	P4	P5	P5	P7	P7	P8	P10	P10	P10	-	-		
	15'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-		
	16'	P3	P4	P5	P5	P7	P7	P8	-	-	-	-	-	-		
	17'	P3	P5	P5	P7	P7	P8	-	-	-	-	-	-	-		

LEGEND:

P1 = W6 x 9
P2 = W6 x 12
P3 = W6 x 15
P4 = W8 x 18
P5 = W8 x 21
P6 = W10 x 22
P7 = W10 x 26
P8 = W14 x 30
P9 = W18 x 35
P10 = W18 x 40



SIGN ON THREE POSTS
SKETCH B

NOTE:

1. SEE SHEETS 2 AND 3 FOR SIGN POST SELECTION NOTES AND SIGNS ON TWO POSTS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

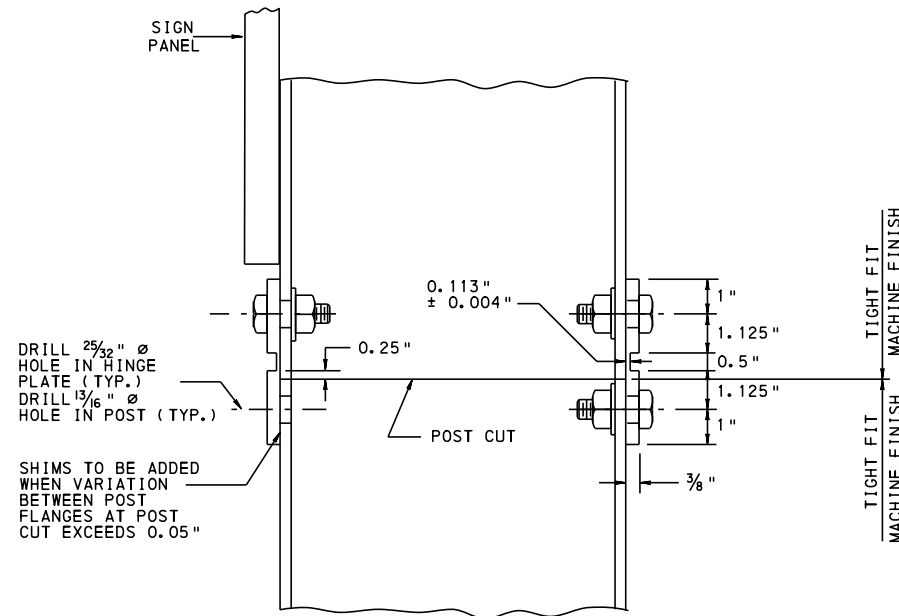
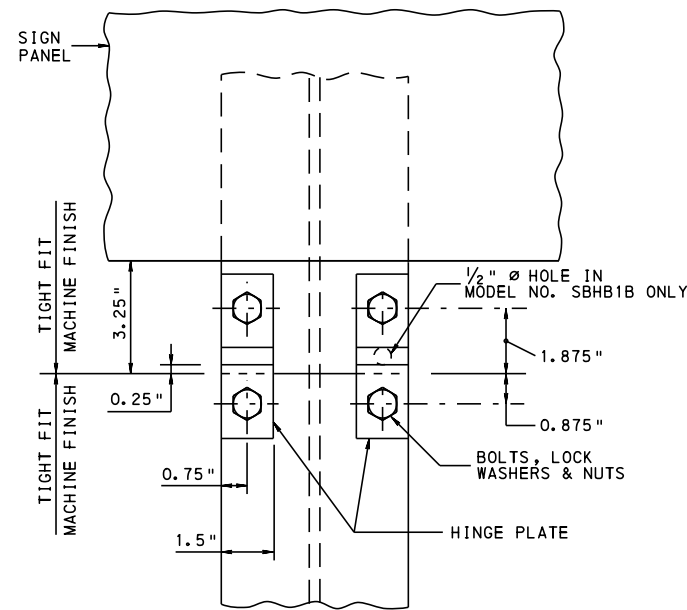
POST-MOUNTED SIGNS,
TYPE A

POST SELECTION TABLE

RECOMMENDED JUN. 13, 2013
CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

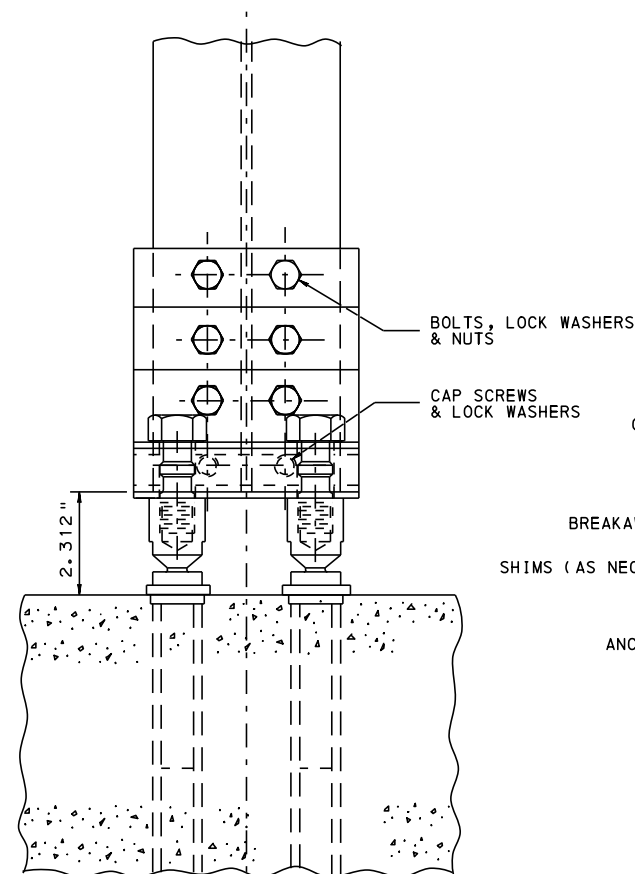
SH. 4 OF 8
TC-8702A



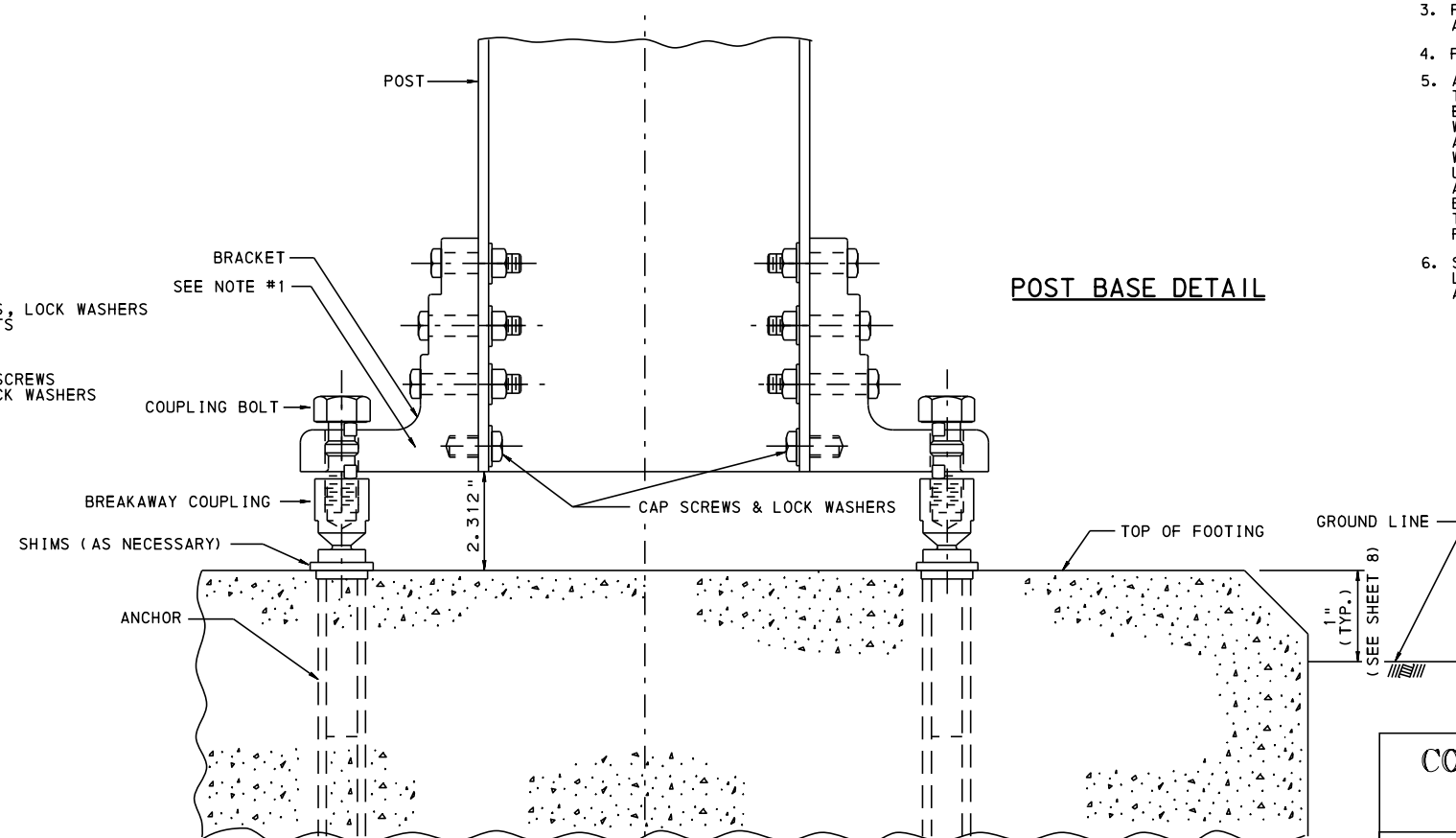
POST HINGE DETAIL

NOTES:

1. THE BRACKET NUMBER IS STAMPED ON THE BRACKET.
2. BOLT THE BRACKETS TO POST, THEN PLACE POST AND CONNECTED BRACKET TO BREAKAWAY COUPLING.
3. FOR BRACKET, BREAKAWAY COUPLING, COUPLING BOLT, AND SHIM DETAILS, REFER TO SHEET 6.
4. FOR FOOTING AND ANCHOR DETAILS, REFER TO SHEET 8.
5. ALL BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. FASTENERS, EXCEPT FOR SPECIAL BOLT AND COUPLING, ARE INSTALLED WITH LOCKWASHERS. FASTENERS, INCLUDING SPECIAL BOLT AND COUPLING, SHOULD BE SECURED AS TIGHT AS POSSIBLE WITH CONVENTIONAL WRENCHES. DO NOT USE A PIPE WRENCH. USE LOWER WRENCH FLATS TO TIGHTEN COUPLINGS INTO ANCHORS. TIGHTEN SPECIAL BOLTS WHILE HOLDING COUPLINGS BY THE UPPER WRENCH FLATS WITH AN ADDITIONAL WRENCH TO PREVENT AN INDUCED TORQUE STRESS ACROSS THE NECKED PORTION OF THE COUPLING.
6. SHIMS BETWEEN THE COUPLINGS AND ANCHORS SHOULD BE LIMITED TO TWO SHIMS UNDERNEATH ANY ONE COUPLING AND THREE SHIMS UNDERNEATH ANY TWO COUPLINGS.



FRONT VIEW



POST BASE DETAIL

SIDE VIEW

BREAKAWAY ASSEMBLIES

TO BE FROM A SUPPLIER LISTED IN BULLETIN 15.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE A

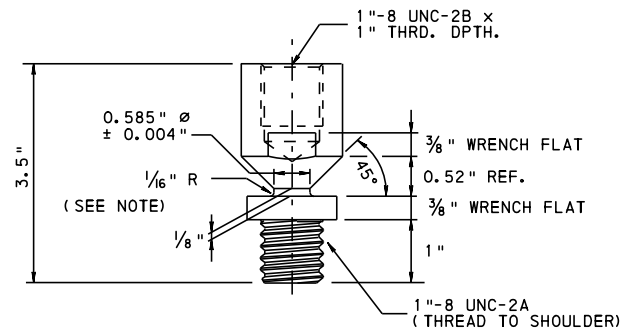
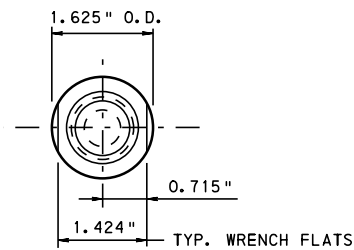
POST BASE AND
HINGE DETAILS

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Stephen C. Rowe
CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

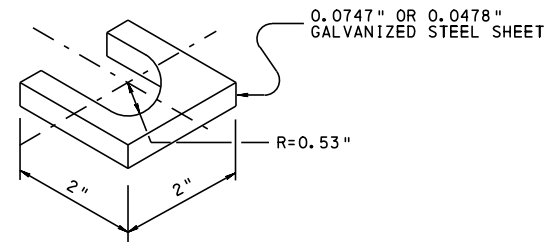
RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SHT. 5 OF 8

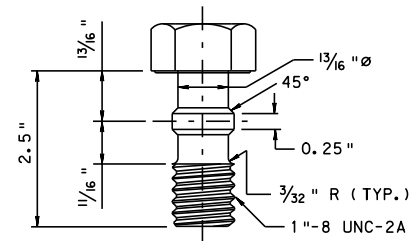
TC-8702A



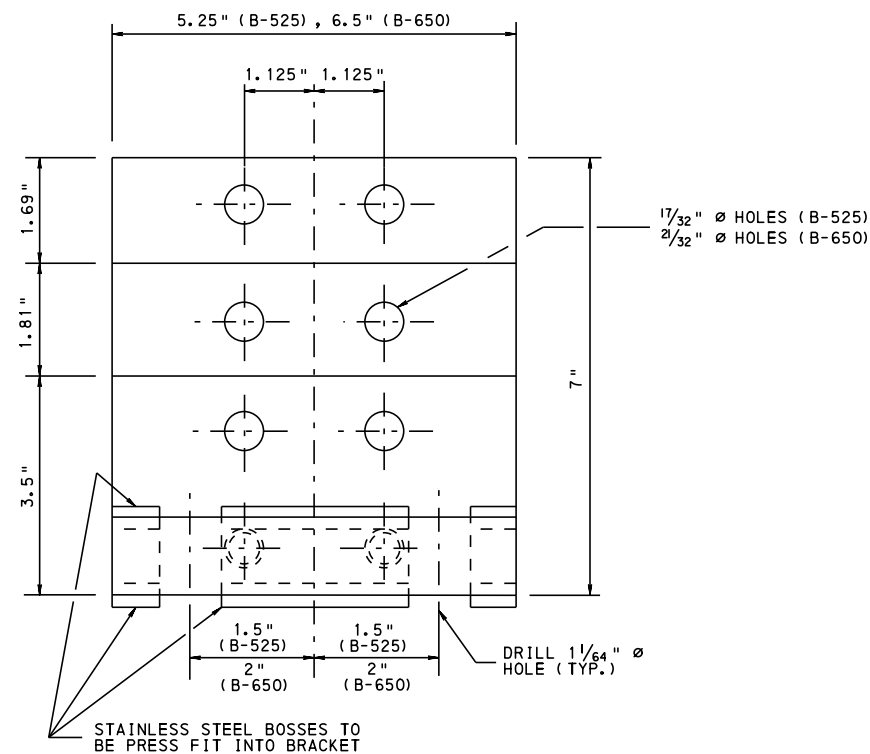
BREAKAWAY COUPLING DETAIL
NOTE: DO NOT PLACE TORQUE ACROSS NECK PORTION OF COUPLING.



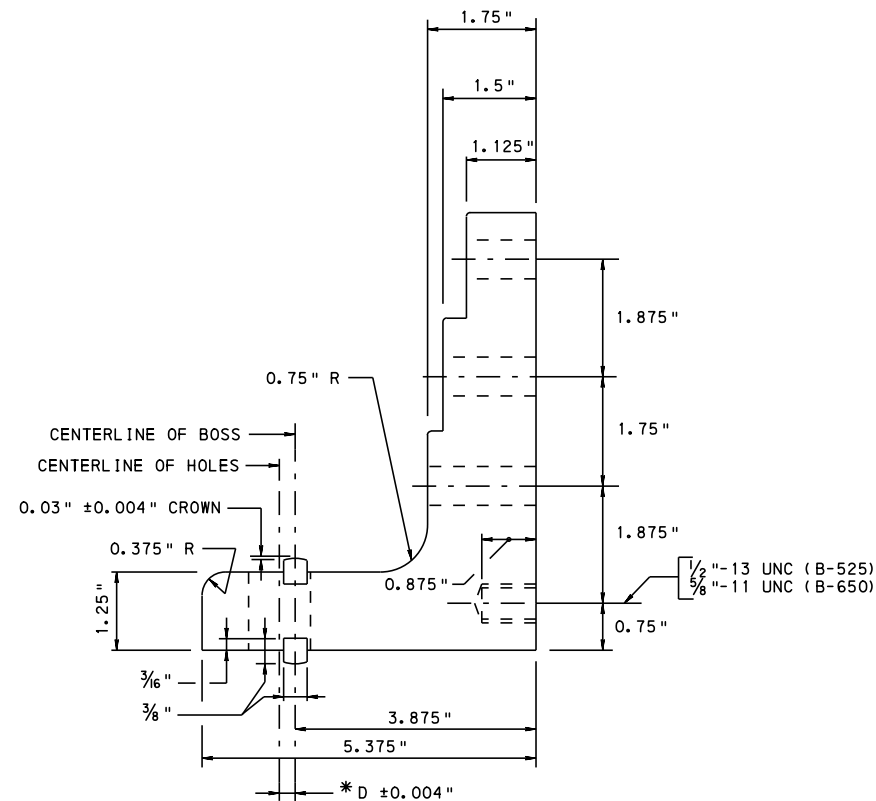
SHIM DETAIL



COUPLING BOLT DETAIL



BRACKET DETAIL



* SELECT BRACKET FROM THE BRACKET SELECTION TABLES ON SHEET 7, THEN SELECT THE VALUE FOR DIMENSION "D" FROM TABLE A.

BRACKET NO.	D (INCHES)
1	0.100"
2	0.150"
3	0.200"

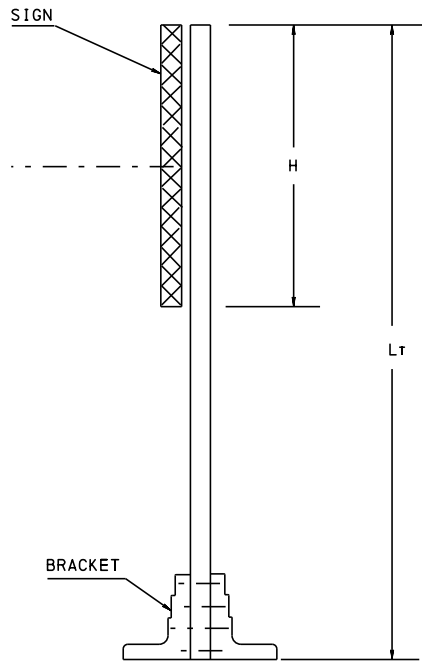
TABLE A

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

**POST-MOUNTED SIGNS,
TYPE A**

**BREAKAWAY COUPLING AND
BRACKET DETAILS**

RECOMMENDED JUN. 13, 2013 CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 6 OF 8 TC-8702A
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W6 POST

POST LENGTH "Lt" (FEET)

	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'	33'	34'
4'																								
5'																								
6'																								
7'																								
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15'																								
16'																								
17'																								
18'																								
19'																								

W8 POST

POST LENGTH "Lt" (FEET)

	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'	33'	34'
4'																								
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17'																								
18'																								
19'																								

B-525 BRACKET TABLES

W10 POST

POST LENGTH "Lt" (FEET)

	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'	33'	34'
4'																								
5'																								
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16'																								
17'																								
18'																								
19'																								

W18 POST

POST LENGTH "Lt" (FEET)

	11'	12'	13'	14'	15'	16'	17'	18'	19'	20'	21'	22'	23'	24'	25'	26'	27'	28'	29'	30'	31'	32'	33'	34'
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19'																								

B-650 BRACKET TABLES

NOTES FOR SELECTION OF BRACKET NUMBER:

- FOR EACH POST, DETERMINE VALUES OF "Lt" AND "H" AS INDICATED IN SKETCH.
H = MAXIMUM HEIGHT OF SIGN (FEET).
Lt = DISTANCE BETWEEN THE TOP OF FOOTING AND THE TOP OF SIGN (FEET) FOR EACH POST.
- ENTER TABLE WITH "H" AND "Lt" TO SELECT THE REQUIRED BRACKET FOR THAT POST.
- FOR SIZES OF "H" AND "Lt" BETWEEN THOSE VALUES ON THE TABLE, USE THE NEXT HIGHEST VALUE.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE A

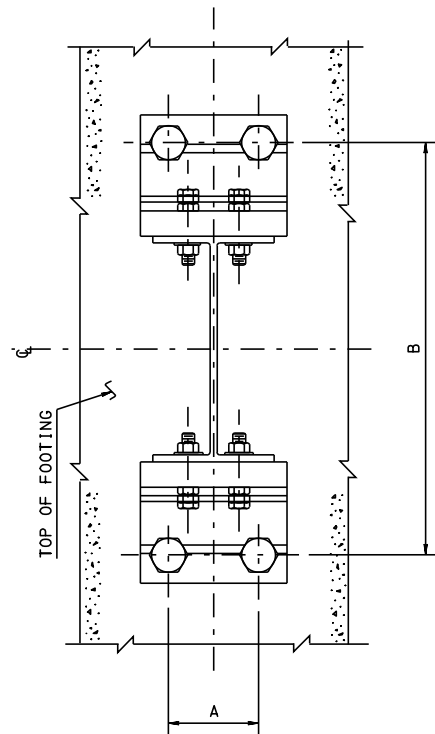
BRACKET SELECTION TABLES

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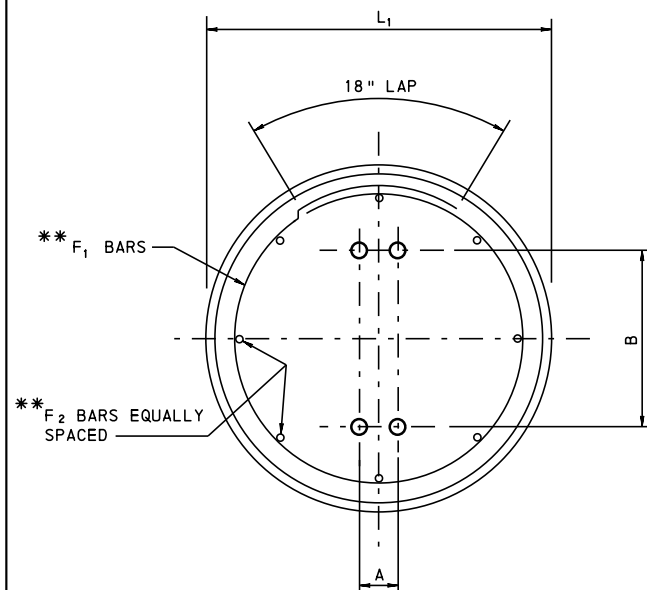
RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SHT. 7 OF 8

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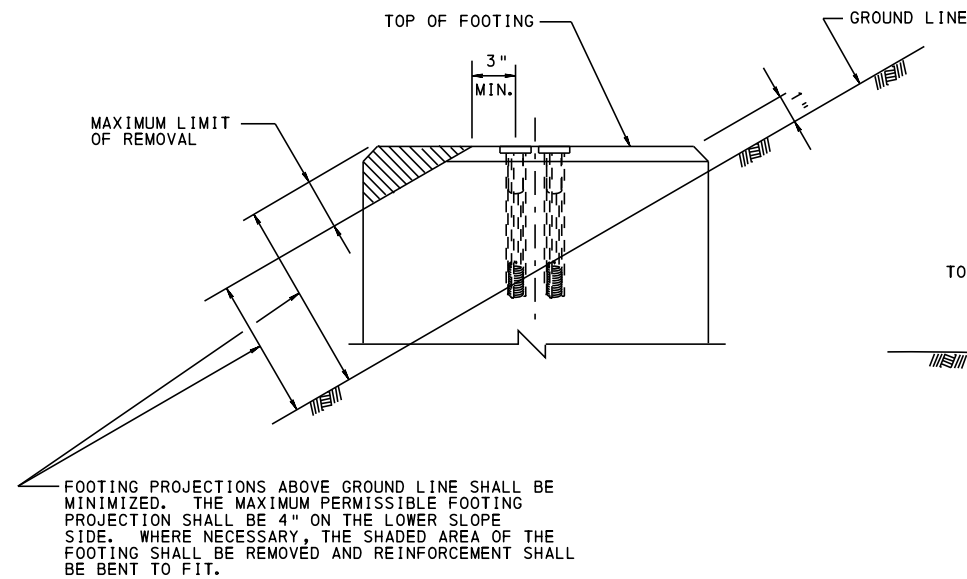


PLAN

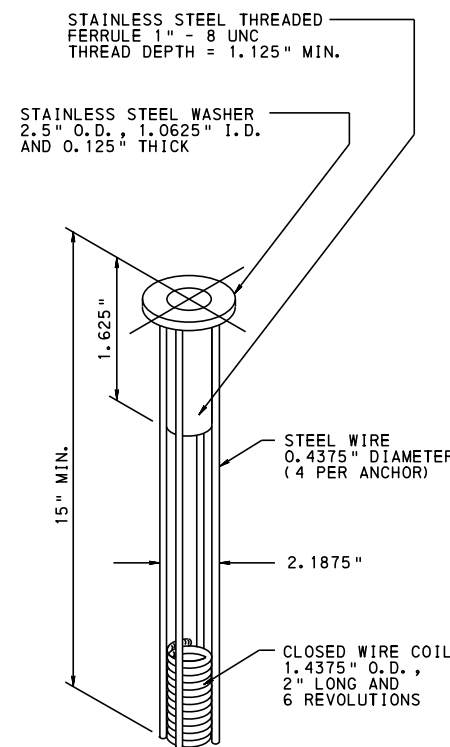
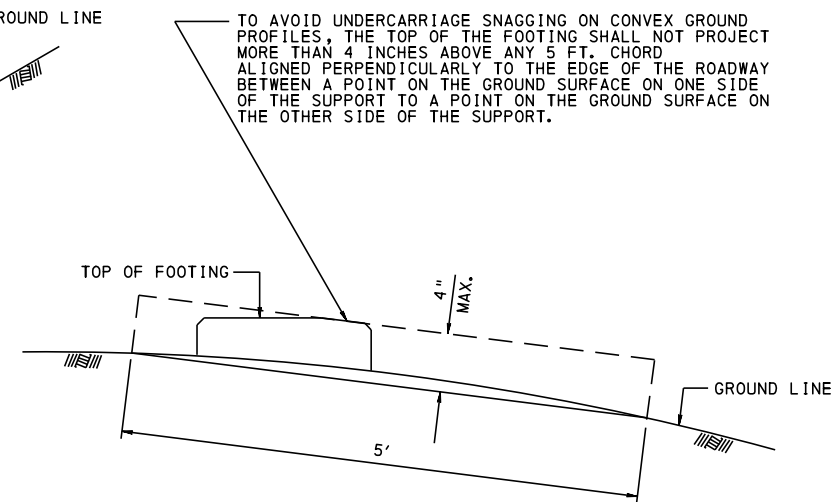


TOP VIEW

** SEE FOOTING SELECTION TABLE FOR REBAR SIZE AND QUANTITY.



SIDE VIEW



ANCHOR

(SEE NOTE 2)

POST SIZE	L ₁ * (FEET)	DEPTH K ₁ (FEET)	REINF. STEEL F ₁	REINF. STEEL F ₂
W6	2.5	7.50	8-#4	8-#7
W8		8.50	9-#4	8-#7
W10	3.0	9.00	10-#4	10-#7
W14		9.50	10-#4	12-#7
W18	3.5	9.50	10-#4	12-#7

* DIAMETER IF CIRCULAR OR MINIMUM SIDE IF SQUARE OR RECTANGULAR

FOOTING SELECTION TABLE

SOIL PROPERTIES:

FOUNDATION DESIGN IS BASED ON BROMS' METHOD USING THE FOLLOWING SOIL PROPERTIES:

TYPE OF SOIL = LOOSE-MEDIUM SAND
UNIT WEIGHT OF SOIL (γ) = 120 PCF
ANGLE OF INTERNAL FRICTION (ϕ) = 25°.

NOTES:

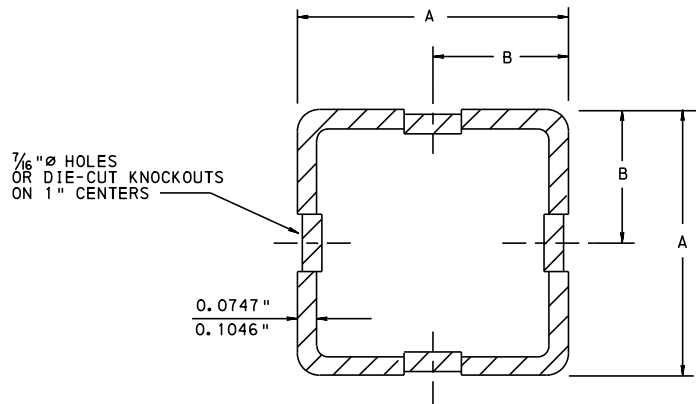
- ENTER FOOTING SELECTION TABLE WITH REQUIRED POST SIZE AND FIND REQUIRED FOOTING VALUES AS SHOWN IN DETAILS.
- THE ANCHOR SHALL BE 304 STAINLESS STEEL WITH 1045 STEEL ROD AND 1008 COIL.
- FORM THE TOP 1 FT. OF THE FOOTING.
- USE CLASS "A" CEMENT CONCRETE IN ALL FOOTINGS.
- ACTUAL DIMENSIONS "A" & "B" SHOULD BE OBTAINED FROM THE MANUFACTURER OR MEASURED FROM THE ASSEMBLED BRACKETS PRIOR TO PLACEMENT OF ANCHORS. APPROXIMATE DIMENSIONS ARE AS FOLLOWS:
A (LATERAL SPACING OF ANCHORS)
3" FOR B-525 USED ON W6 & W8 POSTS.
4" FOR B-650 USED ON W10, W14 & W18 POSTS.
B (LONGITUDINAL SPACING OF ANCHORS)
BRACKET #1 - DEPTH OF POST SECTION PLUS 7 15/16".
BRACKET #2 - DEPTH OF POST SECTION PLUS 8 1/16".
BRACKET #3 - DEPTH OF POST SECTION PLUS 8 1/8".
- TO INSURE PROPER SPACING AND ALIGNMENT OF ANCHORS, IT IS RECOMMENDED THAT ALL ANCHORS BE HELD IN PLACE BY A RIGID MACHINED TEMPLATE WHILE THE CONCRETE IS PLACED AND CURED.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE A

FOOTING DETAILS

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SIGN POST				ANCHOR POST				ANCHOR SLEEVE *				SPLICE SLEEVE			
SIZE	DIMENSION		THICK.	SIZE	DIMENSION		THICK.	SIZE	DIMENSION		THICK.	SIZE	DIMENSION		THICK.
	A	B			A	B			A	B			A	B	
1.75"	1.75"	0.875"	0.0747"	2.00"	2.00"	1.000"	0.1046"	2.25"	2.25"	1.125"	0.1046"	1.50"	1.50"	0.750"	0.0747"
2.00"	2.00"	1.000"	0.0747"	2.25"	2.25"	1.125"	0.1046"	2.50"	2.50"	1.250"	0.1046"	1.75"	1.75"	0.875"	0.0747"
2.25"	2.25"	1.125"	0.0747"	2.50"	2.50"	1.250"	0.1046"	3.00"	3.00"	1.500"	0.1875"	2.00"	2.00"	1.000"	0.0747"

* ONLY REQUIRED FOR INSTALLATIONS IN CONCRETE.

SQUARE STEEL POSTS SYSTEM A

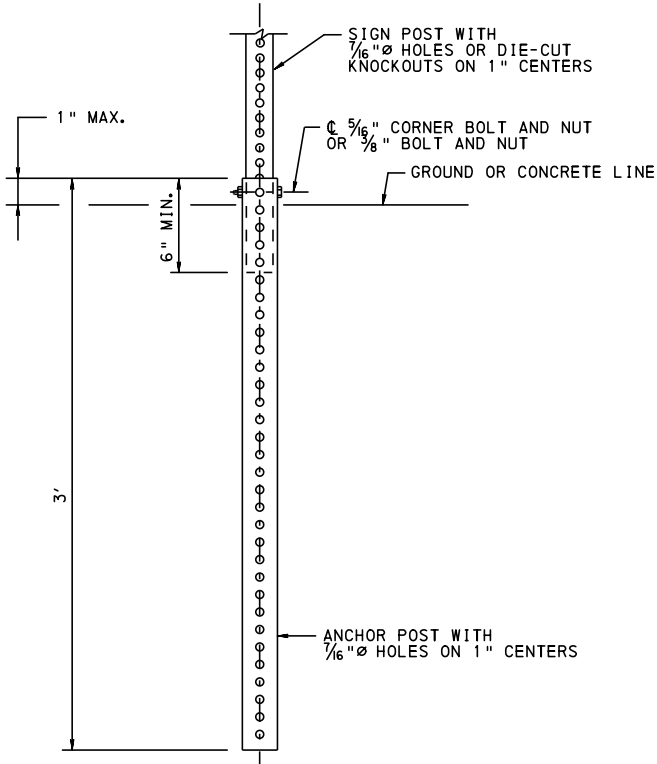
0.1046" AND 0.0747" - 60 KSI

INSTALLATION INSTRUCTIONS:

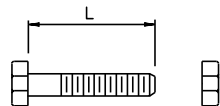
1. DETERMINE THE PROPER SIZE AND NUMBER OF SIGN POSTS FROM THE APPROPRIATE GRAPH ON SHEET 2.
2. PUNCH OUT APPROPRIATE KNOCKOUTS AND ATTACH THE SIGN.
3. DETERMINE THE PROPER SIZE ANCHOR POST FROM THE SQUARE STEEL POSTS TABLE ON THIS SHEET.
4. DRIVE THE ANCHOR POST INTO THE GROUND, USING THE APPROPRIATE SIZE DRIVE CAP, UNTIL ONLY ONE HOLE REMAINS ABOVE THE GROUND OR FINISHED ELEVATION OF THE CONCRETE.
5. PUNCH OUT THE SIXTH KNOCKOUTS FROM THE BOTTOM OF THE SIGN POST.
6. SLIDE A MINIMUM OF 6" OF THE SIGN POST INTO THE ANCHOR POST.
7. ATTACH THE SIGN POST TO THE ANCHOR POST WITH ONE 5/16" CORNER BOLT AND NUT (OR ALTERNATELY ONE 3/8" BOLT AND NUT) THROUGH THE TOP HOLE OF THE ANCHOR POST.
8. TIGHTEN THE BOLT AND NUT BY THE TURN-OF-NUT METHOD. BRING NUT TO A SNUG CONDITION TO ENSURE THAT ALL PARTS ARE BROUGHT TOGETHER INTO FULL CONTACT WITH EACH OTHER, THEN TIGHTEN AN ADDITIONAL 1/2 TURN.

INSTALLATION IN CONCRETE:

INSTALL AS NOTED ABOVE, BUT PLACE A 18" LONG ANCHOR SLEEVE OUTSIDE THE ANCHOR POST SO THAT THE TOPS OF THE ANCHOR POST AND ANCHOR SLEEVE ARE EVEN. SELECT THE PROPER SIZE ANCHOR SLEEVE FROM THE SQUARE STEEL POSTS TABLE ON THIS SHEET.



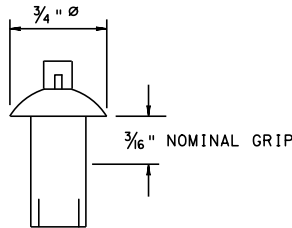
INSTALLATION DETAIL



SIGN POST SIZE (INCHES)	DIMENSION L (INCHES)
1.75	3.0
2.00	3.0
2.25	3.5

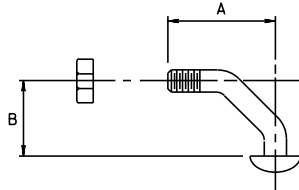
3/8" - 16 UNC ANCHOR BOLTS & NUTS

CADMIUM PLATED STEEL,
ZINC PLATED STEEL OR
ALUMINUM



3/8" DRIVE RIVET

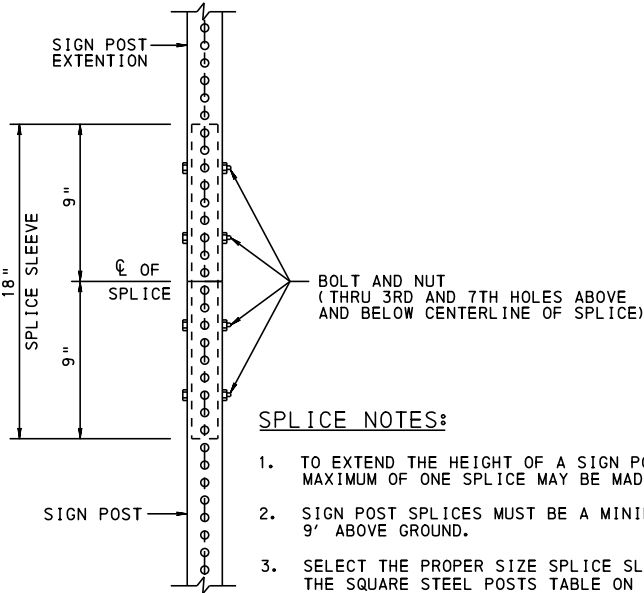
CADMIUM PLATED STEEL,
ZINC PLATED STEEL OR
ALUMINUM



SIGN POST SIZE (INCHES)	DIMENSION (INCHES)	
	A	B
1.75	1.343	0.969
2.00	1.562	1.188
2.25		

5/16" - 18 UNC CORNER BOLTS & NUTS

CADMIUM PLATED STEEL,
ZINC PLATED STEEL OR
ALUMINUM



SPLICE NOTES:

1. TO EXTEND THE HEIGHT OF A SIGN POST, A MAXIMUM OF ONE SPLICE MAY BE MADE.
2. SIGN POST SPLICES MUST BE A MINIMUM OF 9' ABOVE GROUND.
3. SELECT THE PROPER SIZE SPLICE SLEEVE FROM THE SQUARE STEEL POSTS TABLE ON THIS SHEET.

SPLICE DETAIL

NOTES:

1. MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PUB. 408.
2. SIGN POSTS AND SPLICE SLEEVES SHALL HAVE 7/16" DIAMETER HOLES OR DIE-CUT KNOCKOUTS ON 1" CENTERS ON ALL FOUR SIDES. ANCHOR POSTS AND ANCHOR SLEEVES SHALL HAVE 7/16" DIAMETER HOLES ON 1" CENTERS ON ALL FOUR SIDES.
3. BOLTS AND NUTS SHALL BE ASTM A 307, GRADE B.
4. DRIVE RIVETS MAY BE USED TO FASTEN SIGN BLANKS TO THE SIGN POST.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE B

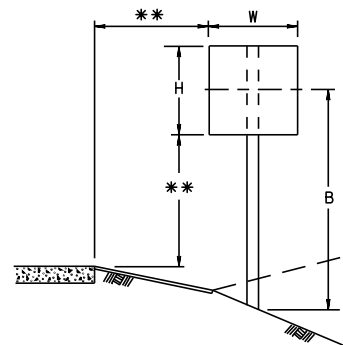
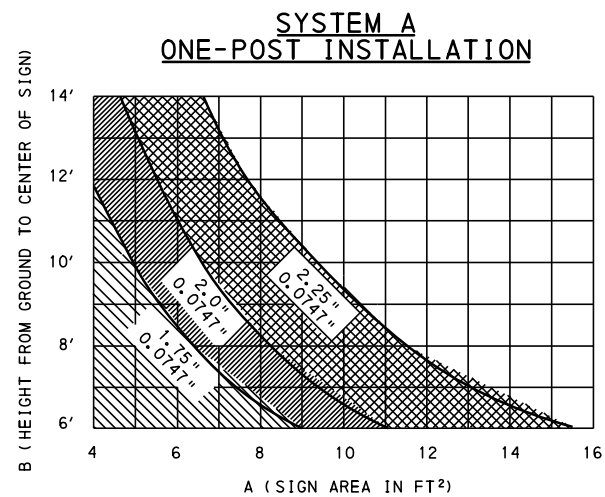
STEEL SQUARE POSTS (SYSTEM A)
ERECTION DETAILS

RECOMMENDED JUN. 13, 2013
CHIEF, TRAFFIC ENGINEERING AND
PERMITS SECTION

RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

SHT. 1 OF 9

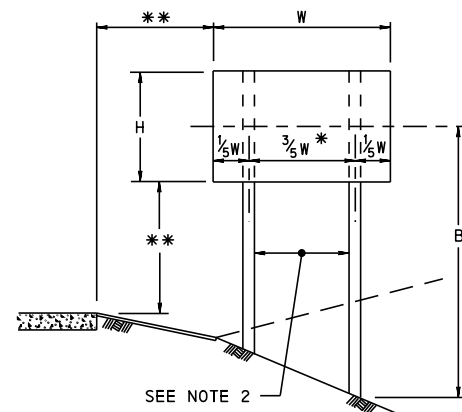
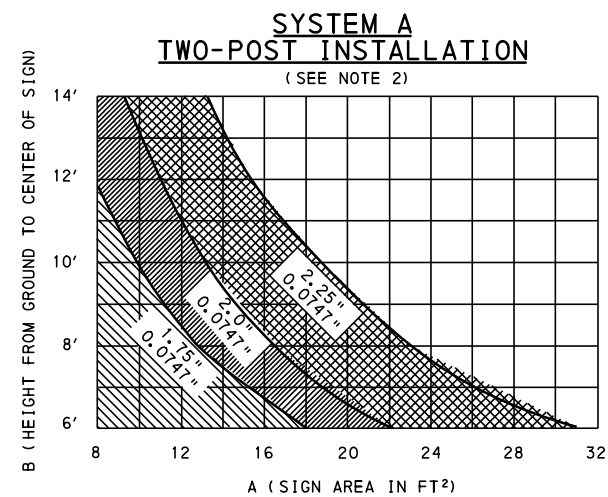
TC-8702B



* WHEN ERECTING STANDARD WARNING OR REGULATORY SIGNS THAT ARE PREPUNCHED, THIS DISTANCE IS THE DISTANCE BETWEEN THE HORIZONTAL HOLES.

** SEE SHEET 9 FOR SIGN LOCATION/INSTALLATION DETAILS.

A = SIGN AREA (SEE TABLE).
A = W x H FOR SQUARE OR RECTANGULAR SIGNS,
WHERE: W = WIDTH OF SIGN
H = HEIGHT OF SIGN



SIGN AREA TABLE

SQUARE OR RECTANGULAR SIGNS						IRREGULAR SHAPED SIGNS	
SIZE (In. x In.)	AREA (FT ²)	SIZE (In. x In.)	AREA (FT ²)	SIZE (In. x In.)	AREA (FT ²)	SIGN (In. x In.)	AREA (FT ²)
8"x48"	2.7	30"x15"	3.1	72"x12"	6.0	YIELD (R1-2) 36"x36"	3.9
12"x18"	1.5	30"x24"	5.0	72"x24"	12.0	YIELD (R1-2) 48"x48"	6.9
12"x24"	2.0	30"x30"	6.3	72"x36"	18.0	YIELD (R1-2) 60"x60"	10.8
12"x30"	2.5	30"x36"	7.5	72"x48"	24.0	NO PASSING PENNANT (W14-3) 48"x36"	5.6
12"x36"	3.0	30"x48"	10.0	72"x60"	30.0	RAILROAD WARNING (W10-1) 36" DIA.	7.1
12"x48"	4.0	30"x60"	12.5	96"x24"	16.0	SCHOOL (S1-1) 30"x30"	4.7
18"x15"	1.9	36"x36"	9.0	96"x48"	32.0	SCHOOL (S1-1) 36"x36"	6.8
18"x18"	2.3	36"x48"	12.0	120"x12"	10.0	STOP (R1-1) 24"x24"	3.3
18"x24"	3.0	36"x54"	13.5	120"x15"	12.5	STOP (R1-1) 30"x30"	5.2
18"x36"	4.5	48"x48"	16.0	120"x24"	20.0	STOP (R1-1) 36"x36"	7.4
18"x48"	6.0	48"x60"	20.0	120"x30"	25.0	STOP (R1-1) 48"x48"	13.2
21"x15"	2.2	60"x12"	5.0	144"x12"	12.0	INTERSTATE ROUTE MARKER (M1-1) 24"x24"	3.2
24"x24"	4.0	60"x24"	10.0	144"x18"	18.0	INTERSTATE ROUTE MARKER (M1-1) 30"x24"	4.0
24"x36"	6.0	60"x42"	17.5	144"x24"	24.0	INTERSTATE ROUTE MARKER (M1-1) 36"x36"	7.2
24"x48"	8.0	60"x60"	25.0	144"x30"	30.0	INTERSTATE ROUTE MARKER (M1-1) 45"x36"	9.0

NOTES:

1. TO DETERMINE THE POST SIZE ENTER THE GRAPH WITH THE VALUES OF A AND B. THE SHADED AREA INDICATES THE APPROPRIATE POST SIZE REQUIRED.
2. 2.25" POSTS SHALL HAVE 7 FT. CLEARANCE BETWEEN EACH OTHER MEASURED FROM INSIDE POST EDGE TO INSIDE POST EDGE. "WHEREAS" POST INSTALLATIONS. 2" AND 2.5" POSTS MAY HAVE LESS THAN 7 FT. CLEARANCE BETWEEN EACH OTHER WHEN USED IN TWO-POST INSTALLATIONS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS, TYPE B

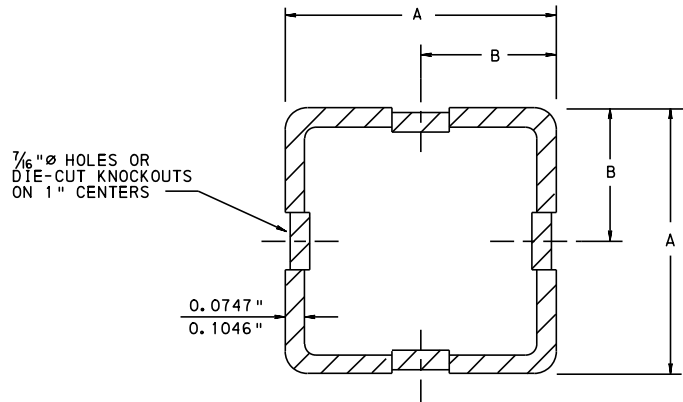
STEEL SQUARE POSTS (SYSTEM A) SELECTION TABLES

RECOMMENDED JUN. 13, 2013
[Signature]
 CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013
Stephen J. Trimmer
 CHIEF, HIGHWAY SAFETY AND
 TRAFFIC OPERATIONS DIVISION

SHT. 2 OF 9

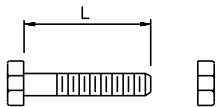
TC-8702B



SIGN POST				ANCHOR POST				ANCHOR SLEEVE *				SPlice SLEEVE			
SIZE	DIMENSION		THICK.	SIZE	DIMENSION		THICK.	SIZE	DIMENSION		THICK.	SIZE	DIMENSION		THICK.
	A	B			A	B			A	B			A	B	
1.75 "	1.75 "	0.875 "	0.0747 "	2.00 "	2.00 "	1.000 "	0.1046 "	2.25 "	2.25 "	1.125 "	0.1046 "	1.50 "	1.50 "	0.750 "	0.0747 "
2.00 "	2.00 "	1.000 "	0.0747 "	2.25 "	2.25 "	1.125 "	0.1046 "	2.50 "	2.50 "	1.250 "	0.1046 "	1.75 "	1.75 "	0.875 "	0.0747 "

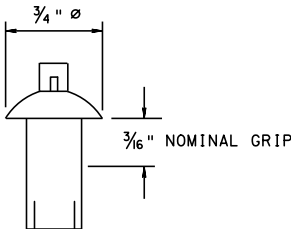
* REQUIRED FOR ALL POST INSTALLATIONS

SQUARE STEEL POSTS
SYSTEM C
0.0747 " - 60 KSI
0.1046 " - 33 KSI

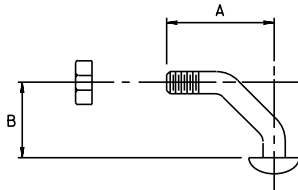


SIGN POST SIZE (INCHES)	DIMENSION (INCHES)
1.75	3.0
2.00	

3/8 " - 16 UNC
ANCHOR BOLTS & NUTS
CADMIUM PLATED STEEL,
ZINC PLATED STEEL OR
ALUMINUM



3/8 " DRIVE RIVET
CADMIUM PLATED STEEL,
ZINC PLATED STEEL OR
ALUMINUM



SIGN POST SIZE (INCHES)	DIMENSION (INCHES)	
	A	B
1.75	1.343	0.969
2.00	1.562	1.188

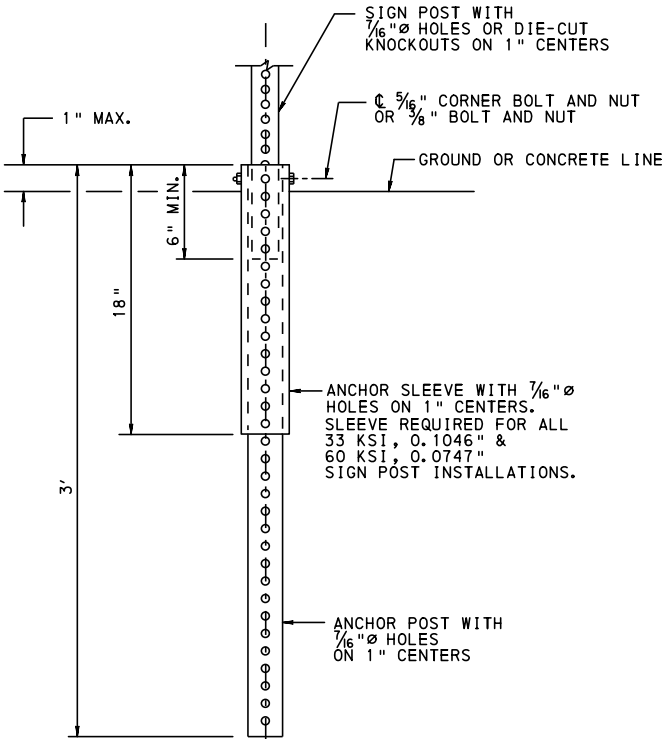
5/16 "- 18 UNC
CORNER BOLTS & NUTS
CADMIUM PLATED STEEL,
ZINC PLATED STEEL OR
ALUMINUM

INSTALLATION INSTRUCTIONS:

1. DETERMINE THE PROPER SIZE AND NUMBER OF SIGN POSTS FROM THE APPROPRIATE GRAPH ON SHEET 4.
2. DETERMINE THE PROPER SIZE ANCHOR POST AND ANCHOR SLEEVE FROM THE SQUARE STEEL POSTS TABLE ON THIS SHEET.
3. DRIVE THE ANCHOR POST AND ANCHOR SLEEVE INTO THE GROUND SIMULTANEOUSLY, USING THE APPROPRIATE SIZE DRIVE CAP, UNTIL ONLY ONE HOLE REMAINS ABOVE THE GROUND OR FINISHED ELEVATION OF THE CONCRETE.
4. SLIDE A MINIMUM OF 6" OF THE SIGN POST INTO THE ANCHOR POST.
5. ATTACH THE SIGN POST TO THE ANCHOR POST AND SLEEVE WITH ONE 5/16" CORNER BOLT AND NUT (OR ALTERNATELY ONE 3/8" BOLT AND NUT) THROUGH THE TOP HOLE OF THE ANCHOR POST AND SLEEVE.
6. TIGHTEN THE BOLT AND NUT BY THE TURN-OF-NUT METHOD. BRING NUT TO A SNUG CONDITION TO ENSURE THAT ALL PARTS ARE BROUGHT TOGETHER INTO FULL CONTACT WITH EACH OTHER, THEN TIGHTEN AN ADDITIONAL 1/2 TURN.

INSTALLATION IN CONCRETE:

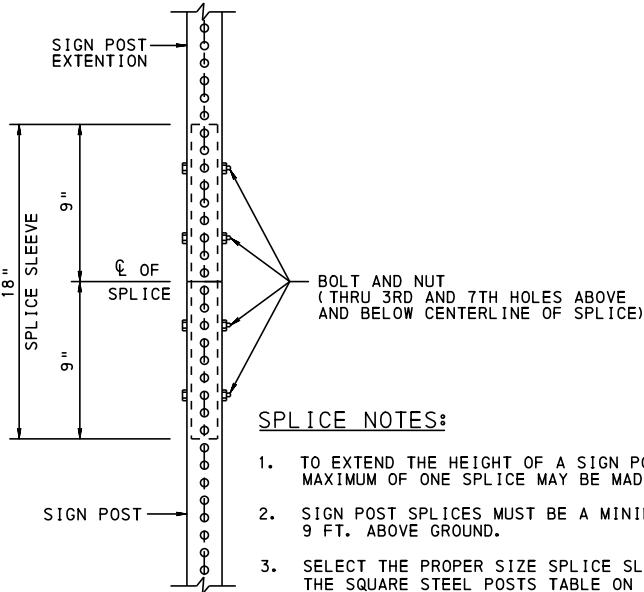
INSTALL AS NOTED ABOVE.



INSTALLATION DETAIL

NOTES:

1. MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PUB. 408.
2. SIGN POSTS AND SPlice SLEEVES SHALL HAVE 7/16" DIAMETER HOLES OR DIE-CUT KNOCKOUTS ON 1" CENTERS ON ALL FOUR SIDES. ANCHOR POSTS AND ANCHOR SLEEVES SHALL HAVE 7/16" DIAMETER HOLES ON 1" CENTERS ON ALL FOUR SIDES.
3. BOLTS AND NUTS SHALL BE ASTM A 307, GRADE B.
4. DRIVE RIVETS MAY BE USED TO FASTEN SIGN BLANKS TO THE SIGN POST.



SPlice NOTES:

1. TO EXTEND THE HEIGHT OF A SIGN POST, A MAXIMUM OF ONE SPlice MAY BE MADE.
2. SIGN POST SPlices MUST BE A MINIMUM OF 9 FT. ABOVE GROUND.
3. SELECT THE PROPER SIZE SPlice SLEEVE FROM THE SQUARE STEEL POSTS TABLE ON THIS SHEET.

SPlice DETAIL

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE B

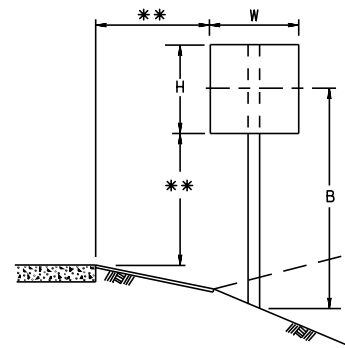
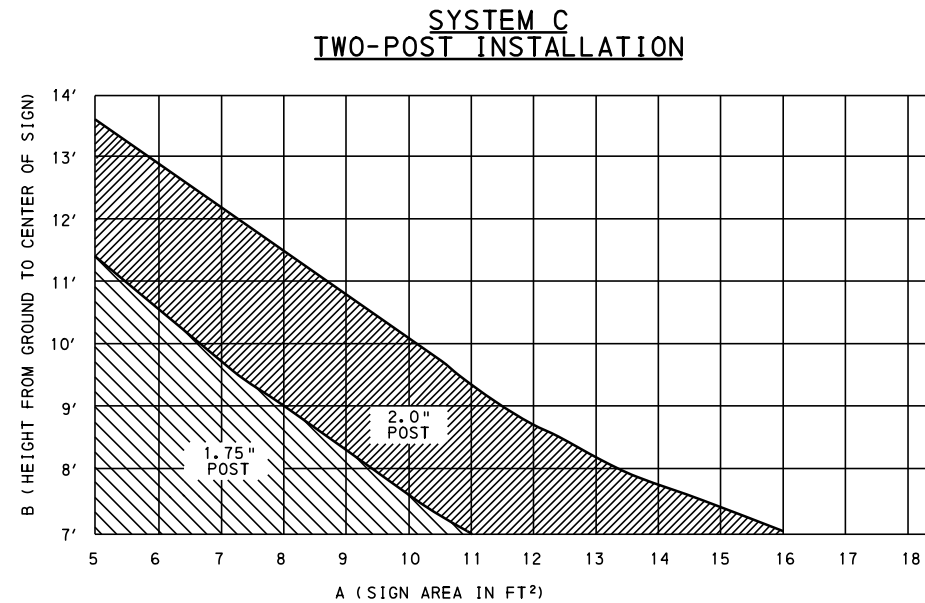
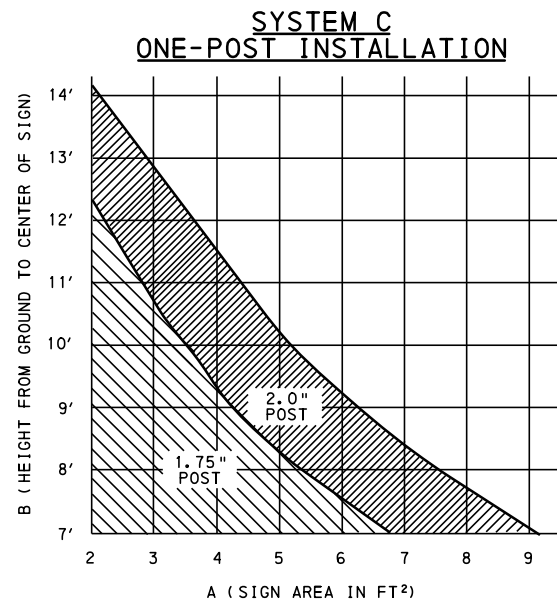
STEEL SQUARE POSTS (SYSTEM C)
ERECTION DETAILS

RECOMMENDED JUN. 13, 2013
CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

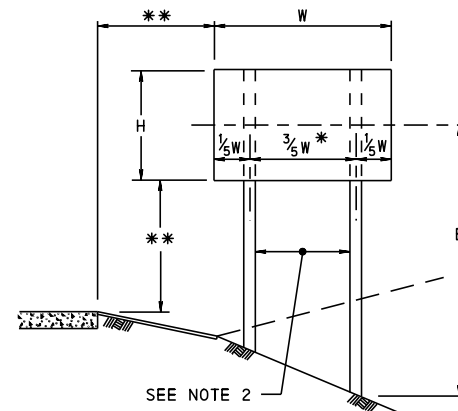
SHT. 3 OF 9

TC-8702B



- * WHEN ERECTING STANDARD WARNING OR REGULATORY SIGNS THAT ARE PREPUNCHED, THIS DISTANCE IS THE DISTANCE BETWEEN THE HORIZONTAL HOLES.
- ** SEE SHEET 9 FOR SIGN LOCATION/INSTALLATION DETAILS.

A = SIGN AREA (SEE TABLE).
A = W x H FOR SQUARE OR RECTANGULAR SIGNS,
WHERE: W = WIDTH OF SIGN
H = HEIGHT OF SIGN



NOTES:

1. TO DETERMINE THE POST SIZE, ENTER THE GRAPH WITH THE VALUES OF A AND B. THE SHADED AREA INDICATES THE APPROPRIATE POST SIZE REQUIRED.
2. 2" AND 1.75" POSTS MAY HAVE LESS THAN 7 FT. CLEARANCE BETWEEN EACH OTHER WHEN USED IN TWO-POST INSTALLATIONS.

SIGN AREA TABLE							
SQUARE OR RECTANGULAR SIGNS						IRREGULAR SHAPED SIGNS	
SIZE (in. x in.)	AREA (FT²)	SIZE (in. x in.)	AREA (FT²)	SIZE (in. x in.)	AREA (FT²)	SIGN (in. x in.)	AREA (FT²)
8"x48"	2.7	30"x15"	3.1	72"x12"	6.0	YIELD (R1-2) 36"x36"	3.9
12"x18"	1.5	30"x24"	5.0	72"x24"	12.0	YIELD (R1-2) 48"x48"	6.9
12"x24"	2.0	30"x30"	6.3	72"x36"	18.0	YIELD (R1-2) 60"x60"	10.8
12"x30"	2.5	30"x36"	7.5	72"x48"	24.0	NO PASSING PENNANT (W14-3) 48"x36"	5.6
12"x36"	3.0	30"x48"	10.0	72"x60"	30.0	RAILROAD WARNING (W10-1) 36" DIA.	7.1
12"x48"	4.0	30"x60"	12.5	96"x24"	16.0	SCHOOL (S1-1) 30"x30"	4.7
18"x15"	1.9	36"x36"	9.0	96"x48"	32.0	SCHOOL (S1-1) 36"x36"	6.8
18"x18"	2.3	36"x48"	12.0	120"x12"	10.0	STOP (R1-1) 24"x24"	3.3
18"x24"	3.0	36"x54"	13.5	120"x15"	12.5	STOP (R1-1) 30"x30"	5.2
18"x36"	4.5	48"x48"	16.0	120"x24"	20.0	STOP (R1-1) 36"x36"	7.4
18"x48"	6.0	48"x60"	20.0	120"x30"	25.0	STOP (R1-1) 48"x48"	13.2
21"x15"	2.2	60"x12"	5.0	144"x12"	12.0	INTERSTATE ROUTE MARKER (M1-1) 24"x24"	3.2
24"x24"	4.0	60"x24"	10.0	144"x18"	18.0	INTERSTATE ROUTE MARKER (M1-1) 30"x24"	4.0
24"x36"	6.0	60"x42"	17.5	144"x24"	24.0	INTERSTATE ROUTE MARKER (M1-1) 36"x36"	7.2
24"x48"	8.0	60"x60"	25.0	144"x30"	30.0	INTERSTATE ROUTE MARKER (M1-1) 45"x36"	9.0

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

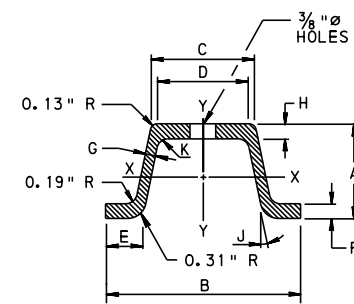
POST-MOUNTED SIGNS,
TYPE B

STEEL SQUARE POSTS (SYSTEM C)
SELECTION TABLES

RECOMMENDED JUN. 13, 2013
John C. Rowe
CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

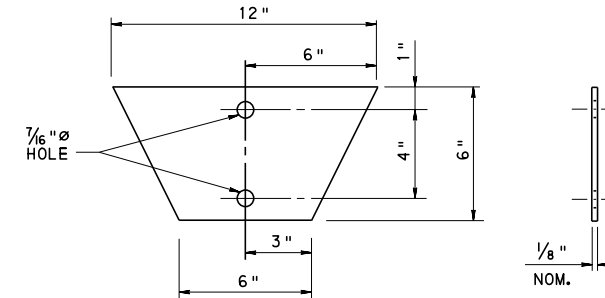
RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SHT. 4 OF 9
TC-8702B



STEEL POST DIMENSIONS											
* WEIGHT LBS/FT.	DIMENSIONS (INCHES)										
	A	B	C	D	E	F	G	H	J	K	
2.5	1.56	3.13	1.25	1.06	0.63	0.16	0.13	0.15	12.5°	0.13	R
4.0	1.75	3.50	1.67	1.41	0.72	0.25	0.18	0.23	11.5°	0.19	R

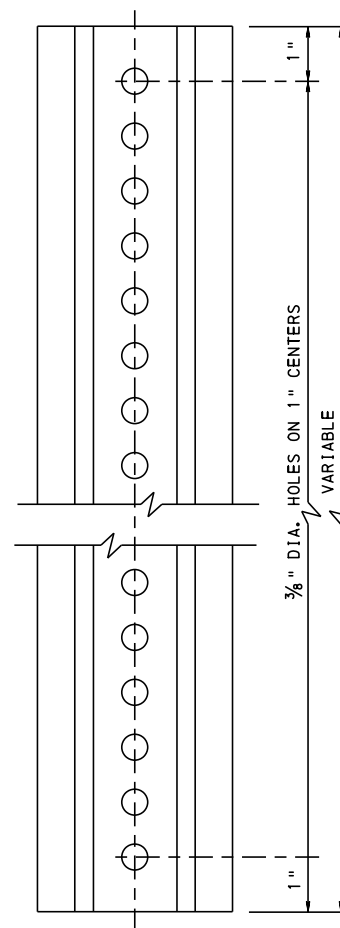
* ±3.5%



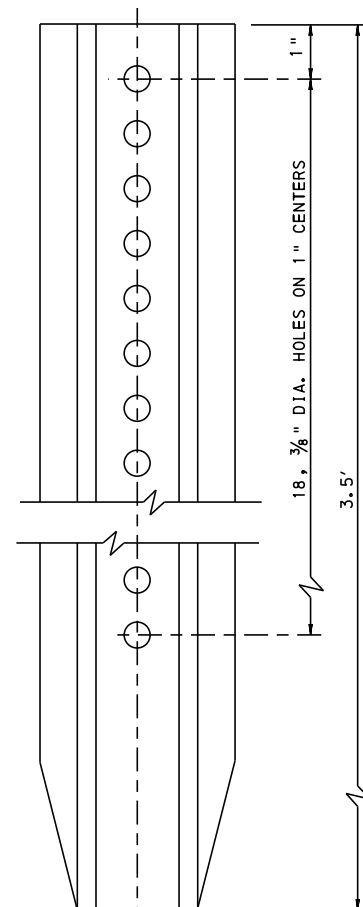
ANCHOR PLATE

NOTES:

1. MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PUB.408.
2. FORMED-CHANNEL SIGN MOUNTS SHALL BE MILD STEEL.
3. ANCHOR BOLTS SHALL BE 5/16" - 18 UNC x 1.5" FULLY THREADED, GRADE 9 HEX HEAD. A FLANGED ANCHOR BOLT MAY BE SUBSTITUTED FOR THE STANDARD ANCHOR BOLT AND FLAT WASHER.
4. WASHERS SHALL BE 5/16" GRADE 9 PLATED.
5. LOCKNUTS SHALL BE 5/16" - 18 UNC THREADS, HEX HEADED.
6. ANY OTHER DEPARTMENT APPROVED BREAKAWAY CONNECTION APPROVED FOR THIS KIND OF POST MAY BE SUBSTITUTED FOR THE UNIVERSAL SPACER.
7. SEE SHEET 6 FOR SPACER AND ANCHOR BOLT DETAILS.

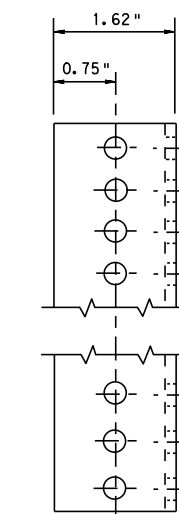
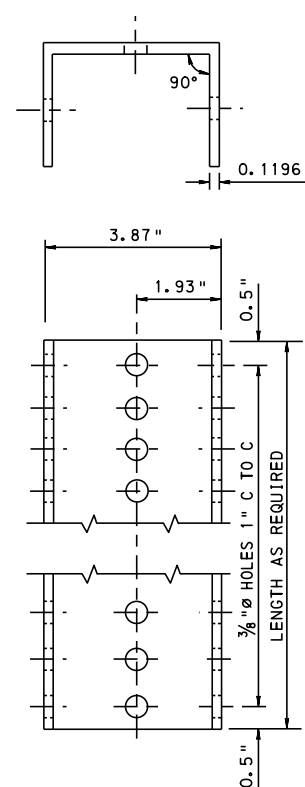


SIGN POST



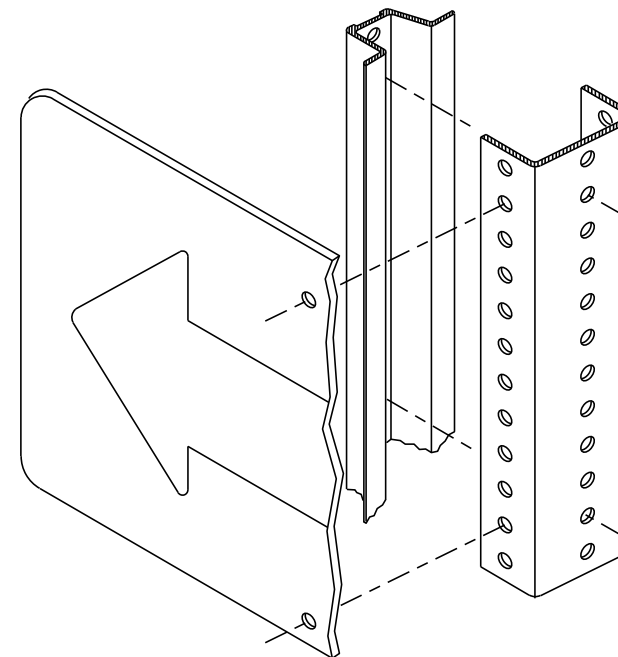
FIRST AND FIFTH HOLES
TO BE ELONGATED SLOTS
3/8" x 0.5"

ANCHOR POST



FORMED-CHANNEL SIGN MOUNT

USE WHEN IT IS NECESSARY TO MOUNT SIGNS ON THE SIDE
OF A CHANNEL BAR POST IN ADDITION TO THE NORMAL
SIGN MOUNTING LOCATION ON THE FLANGED FACE.



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE B

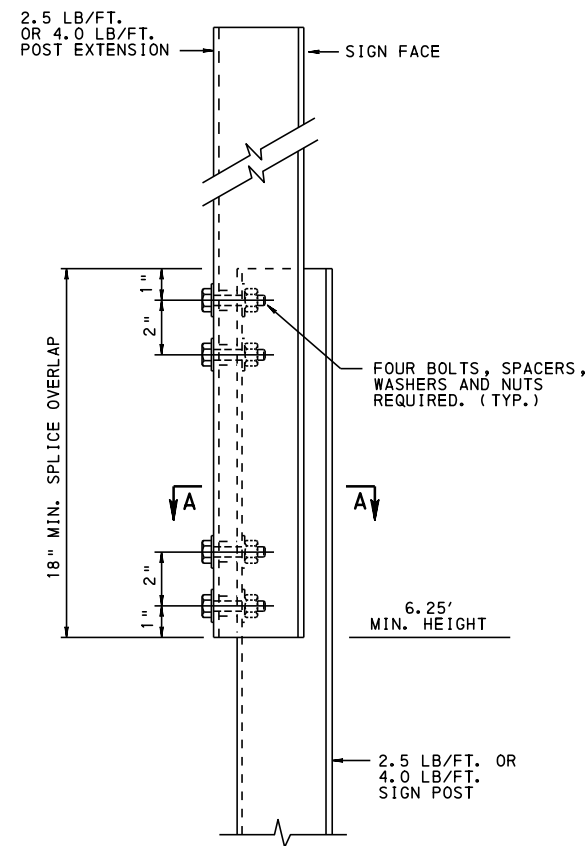
CHANNEL BAR POSTS
(ROLLED STEEL RAILS)
MATERIAL DETAILS

RECOMMENDED JUN. 13, 2013
Stephen C. Rowe
CHIEF, TRAFFIC ENGINEERING AND
PERMITS SECTION

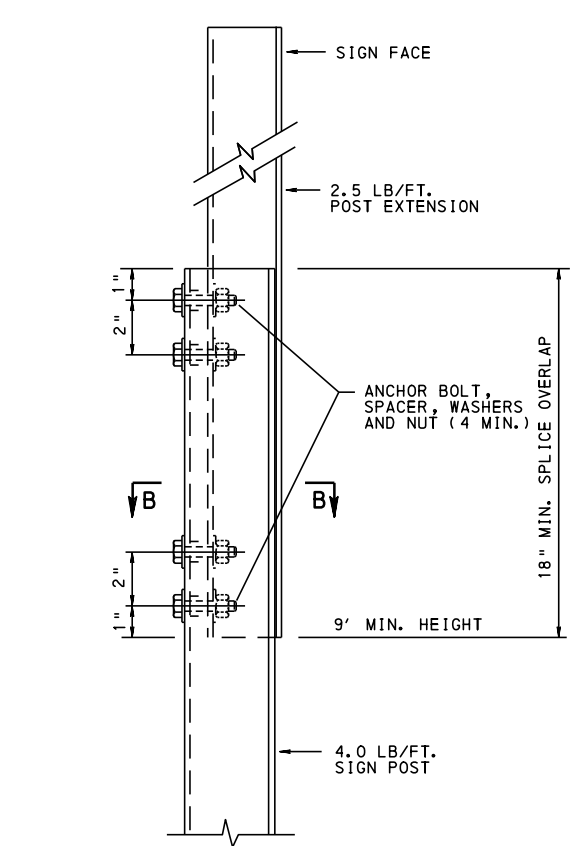
RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

SHT. 5 OF 9

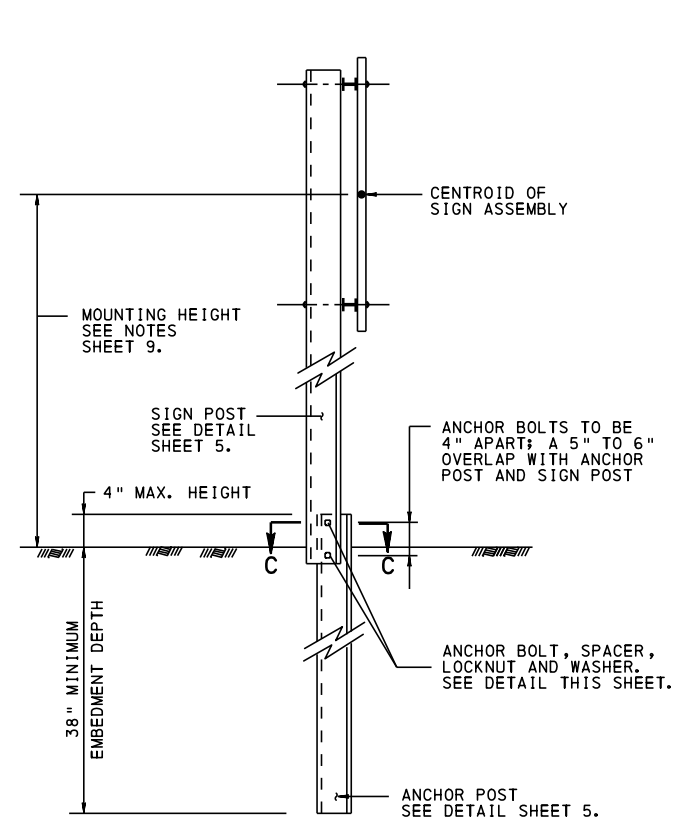
TC-8702B



**POST EXTENSION
SPLICE DETAIL A**
FOR USE IN EXTENDING SIGN POSTS



**ALTERNATE POST EXTENSION
SPLICE DETAIL B**
FOR USE IN EXTENDING SIGN POSTS



INSTALLATION DETAIL

ANCHOR SPLICE INSTALLATION INSTRUCTIONS:

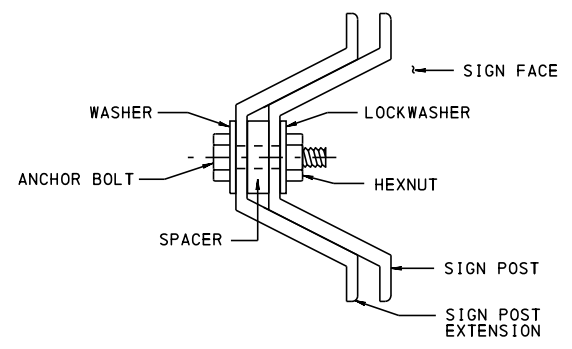
1. DETERMINE THE PROPER SIZE SIGN POST AND ANCHOR POST FROM THE APPROPRIATE GRAPH ON SHEET 7. USE 2.5 LB/FT. ANCHOR POSTS WITH 2.5 LB/FT. SIGN POSTS AND 4.0 LB/FT. ANCHOR POSTS WITH 4.0 LB/FT. SIGN POSTS.
2. REMOVE A SHOVEL OF SOIL AT THE POST LOCATION TO ALLOW FOR FINAL ATTACHMENT OF THE SIGN POST TO THE ANCHOR POST.
3. DRIVE ANCHOR POST WITH A DRIVE CAP TO WITHIN APPROXIMATELY 12" ABOVE GROUND LEVEL. PLACE ONE BOLT AND WASHER IN FIFTH HOLE FROM THE END OF THE EXPOSED ANCHOR POST. SECURELY TIGHTEN SPACER ONTO BOLT.
4. DRIVE ANCHOR POST TO 4" ABOVE GROUND LEVEL. PLACE REMAINING BOLT AND WASHER IN FIRST HOLE FROM THE END OF POST AND SECURELY TIGHTEN SPACER ONTO BOLT. (BOLTS 4" APART).
5. NEST TOP SIGN POST OVER PROTRUDING ANCHOR POST BOLTS THROUGH FIRST AND FIFTH HOLES OF TOP SIGN POST. THIS WILL RESULT IN A 5" TO 6" OVERLAP.
6. PLACE A LOCKNUT ON EACH BOLT (A STANDARD LOCKWASHER AND NUT MAY BE USED IN LIEU OF THE LOCKNUT). TIGHTEN BOLTS AND NUTS BY TURN-OF-NUT METHOD. BRING NUT TO A SNUG TIGHT CONDITION TO ENSURE THAT ALL PARTS ARE BROUGHT TOGETHER INTO FULL CONTACT WITH EACH OTHER, THEN TIGHTEN AN ADDITIONAL 1/2 TURN.
7. RESTORE SOIL AROUND THE ANCHOR POST.

INSTALLATION IN SOFT SOIL:

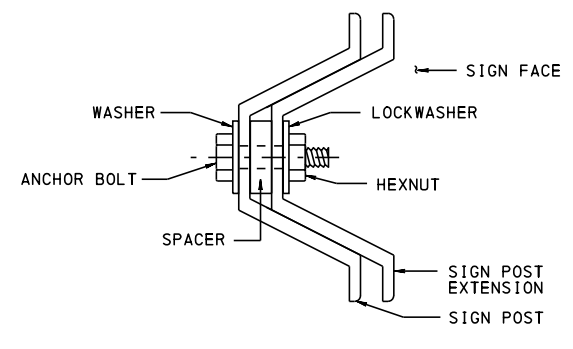
1. USE THE ANCHOR PLATE IN AREAS WITH SOFT SOIL. BOLT THE TOP ANCHOR BOLT 1" BELOW THE BOTTOM ANCHOR POST BOLT, (6 TO 7 HOLES FROM THE END OF THE ANCHOR POST).

POST EXTENSION SPLICE NOTES:

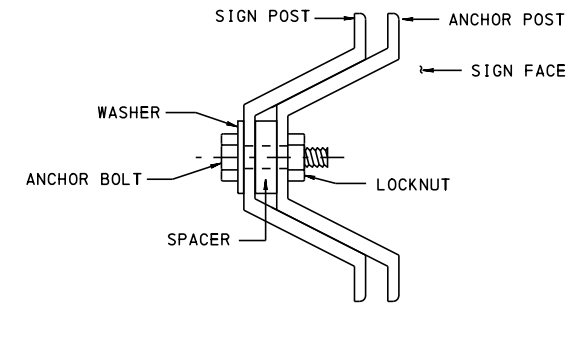
1. TO EXTEND THE HEIGHT OF A SIGN POST, A MAXIMUM OF ONE SPLICE MAY BE MADE.
2. FOUR ANCHOR BOLTS WITH SPACERS, WASHERS, LOCKWASHERS AND NUTS ARE REQUIRED (LOCKNUTS MAY BE USED IN LIEU OF STANDARD LOCKWASHERS AND NUTS). SEE THIS SHEET FOR ANCHOR BOLT SYSTEM.
3. POST EXTENSION SPLICE DETAIL A IS PREFERRED OVER POST EXTENSION SPLICE DETAIL B. WHEN DETAIL A IS USED, 2.5 LB/FT. POSTS SHALL USE A 2.5 LB/FT. POST EXTENSION POST FOR SPLICE EXTENSIONS; 4.0 LB/FT. POSTS SHALL USE A 4.0 LB/FT. POST EXTENSION POST FOR SPLICE EXTENSIONS. WHEN DETAIL B IS USED, POST EXTENSION SPLICES SHALL BE MOUNTED ON THE BACK (NON-IMPACT) SIDE OF THE SIGN POST. SPLICES SHALL BE MADE AT A MINIMUM HEIGHT OF 6.25 FT., MEASURED TO THE BOTTOM OF THE SPLICE.
4. POST EXTENSION SPLICE DETAIL B IS PERMITTED FOR USE TO PROVIDE A FLUSH SIGN MOUNT SURFACE FOR 4.0 LB/FT. POSTS. WHEN DETAIL B IS USED, 2.5 LB/FT. POST EXTENSION SPLICES MAY BE NESTED ON THE FRONT OF A 4.0 LB/FT. POST. SPLICES SHALL BE MADE AT A MINIMUM HEIGHT OF 9 FT., MEASURED TO THE BOTTOM OF THE SPLICE.



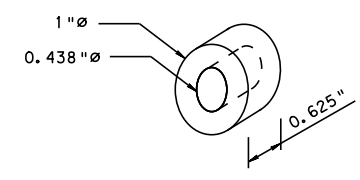
SECTION A-A



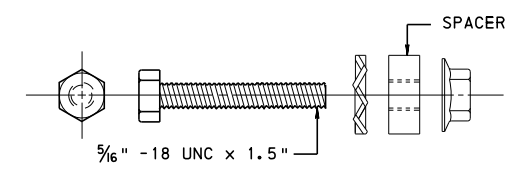
SECTION B-B



SECTION C-C

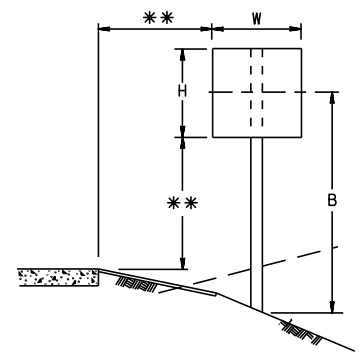
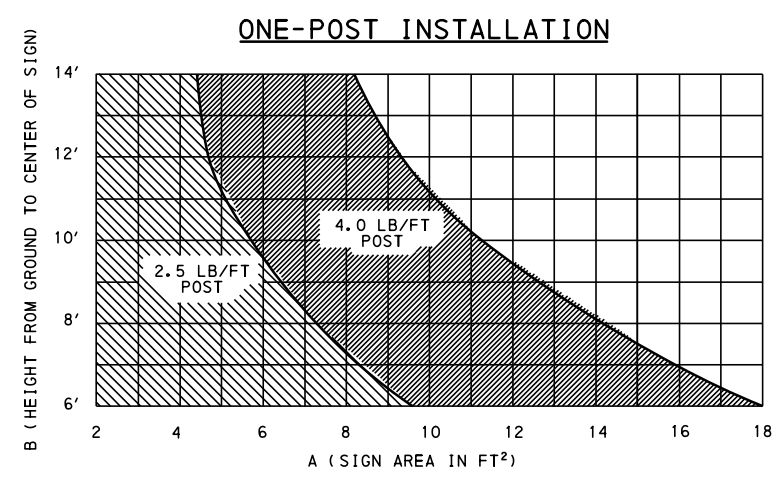


SPACER DETAIL
ZINC PLATED

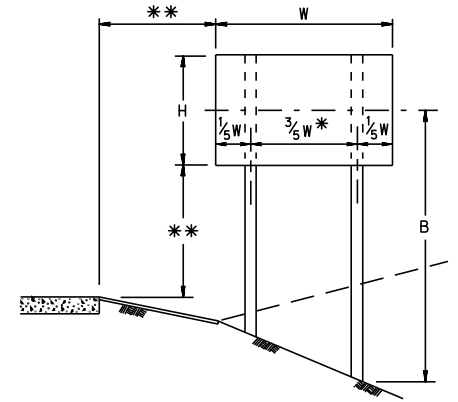
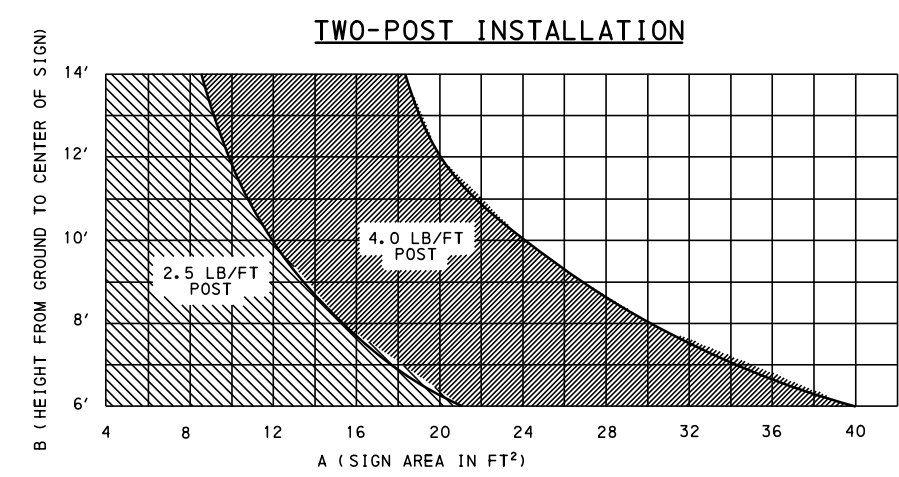


**ANCHOR BOLT,
WASHER, SPACER AND LOCKNUT**
ANCHOR BOLTS TO BE 1.5", GRADE 9, HEX HEAD.

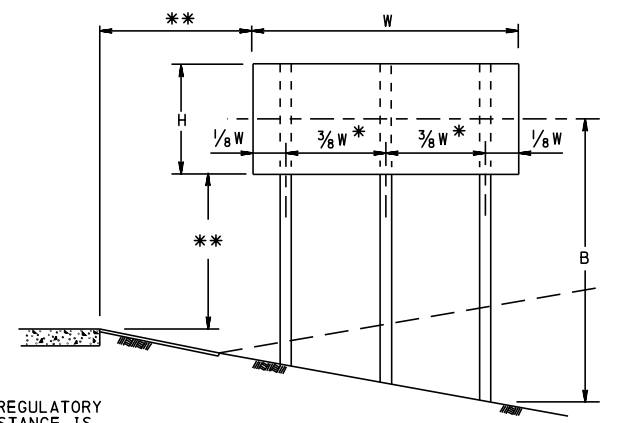
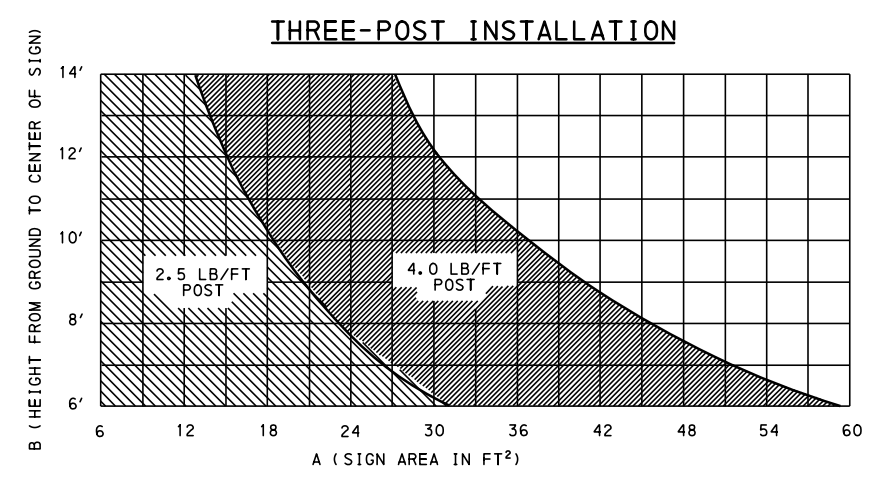
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
POST-MOUNTED SIGNS, TYPE B		
CHANNEL BAR POSTS ERECTION DETAILS		
RECOMMENDED JUN. 13, 2013 <i>Stephen C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 6 OF 9 TC-8702B



A = SIGN AREA (SEE TABLE).
A = W × H FOR SQUARE OR RECTANGULAR SIGNS,
WHERE: W = WIDTH OF SIGN
H = HEIGHT OF SIGN



* WHEN ERECTING STANDARD WARNING OR REGULATORY SIGNS THAT ARE PREPUNCHED, THIS DISTANCE IS THE DISTANCE BETWEEN THE HORIZONTAL HOLES.
** SEE SHEET 9 FOR SIGN LOCATION/INSTALLATION DETAILS.



NOTES:

1. TO DETERMINE THE POST SIZE, ENTER THE GRAPH WITH THE VALUES OF A AND B. THE SHADED AREA INDICATES THE APPROPRIATE POST SIZE REQUIRED.
2. 2.5 LB/FT. AND 4.0 LB/FT. POSTS MAY HAVE LESS THAN 7 FT. CLEARANCE BETWEEN EACH OTHER WHEN USED IN TWO-POST AND THREE-POST INSTALLATIONS.

SIGN AREA TABLE							
SQUARE OR RECTANGULAR SIGNS						IRREGULAR SHAPED SIGNS	
SIZE (In. x In.)	AREA (FT²)	SIZE (In. x In.)	AREA (FT²)	SIZE (In. x In.)	AREA (FT²)	SIGN (In. x In.)	AREA (FT²)
8"x48"	2.7	30"x15"	3.1	72"x12"	6.0	YIELD (R1-2) 36"x36"	3.9
12"x18"	1.5	30"x24"	5.0	72"x24"	12.0	YIELD (R1-2) 48"x48"	6.9
12"x24"	2.0	30"x30"	6.3	72"x36"	18.0	YIELD (R1-2) 60"x60"	10.8
12"x30"	2.5	30"x36"	7.5	72"x48"	24.0	NO PASSING PENNANT (W14-3) 48"x36"	5.6
12"x36"	3.0	30"x48"	10.0	72"x60"	30.0	RAILROAD WARNING (W10-1) 36" DIA.	7.1
12"x48"	4.0	30"x60"	12.5	96"x24"	16.0	SCHOOL (S1-1) 30"x30"	4.7
18"x15"	1.9	36"x36"	9.0	96"x48"	32.0	SCHOOL (S1-1) 36"x36"	6.8
18"x18"	2.3	36"x48"	12.0	120"x12"	10.0	STOP (R1-1) 24"x24"	3.3
18"x24"	3.0	36"x54"	13.5	120"x15"	12.5	STOP (R1-1) 30"x30"	5.2
18"x36"	4.5	48"x48"	16.0	120"x24"	20.0	STOP (R1-1) 36"x36"	7.4
18"x48"	6.0	48"x60"	20.0	120"x30"	25.0	STOP (R1-1) 48"x48"	13.2
21"x15"	2.2	60"x12"	5.0	144"x12"	12.0	INTERSTATE ROUTE MARKER (M1-1) 24"x24"	3.2
24"x24"	4.0	60"x24"	10.0	144"x18"	18.0	INTERSTATE ROUTE MARKER (M1-1) 30"x24"	4.0
24"x36"	6.0	60"x42"	17.5	144"x24"	24.0	INTERSTATE ROUTE MARKER (M1-1) 36"x36"	7.2
24"x48"	8.0	60"x60"	25.0	144"x30"	30.0	INTERSTATE ROUTE MARKER (M1-1) 45"x36"	9.0

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

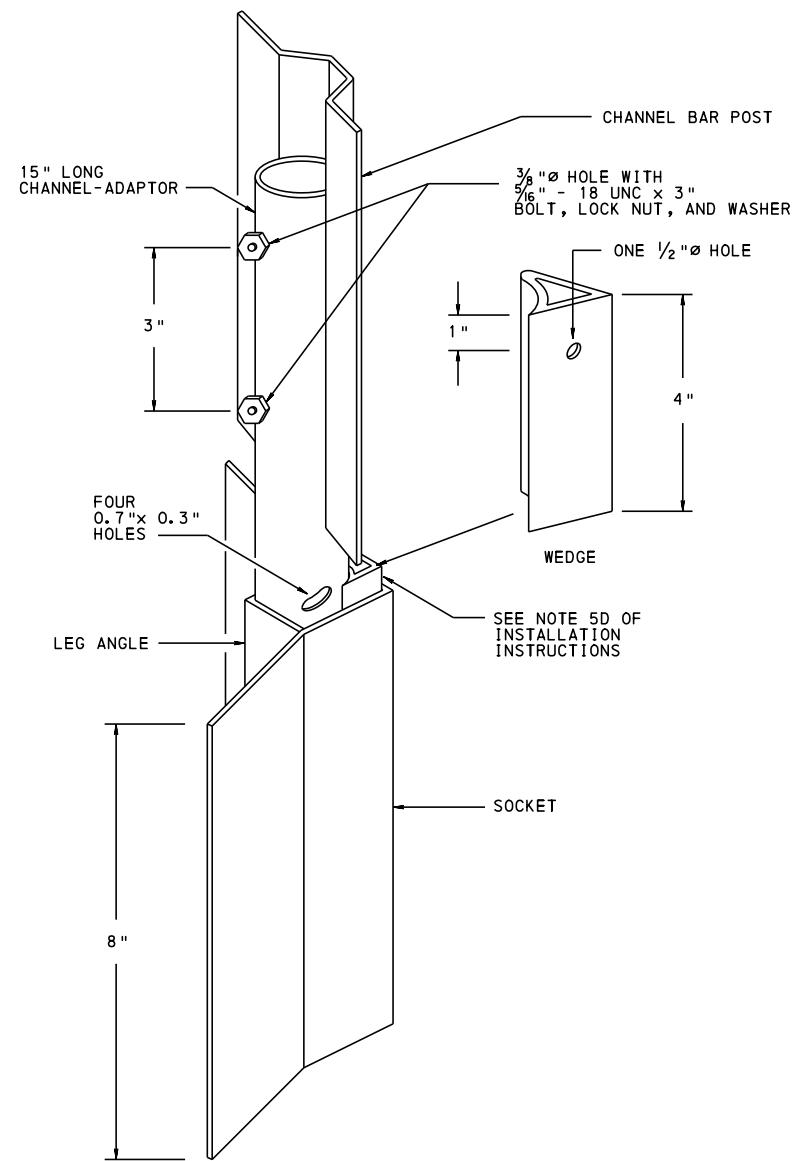
POST-MOUNTED SIGNS,
TYPE B

CHANNEL BAR POSTS
SELECTION TABLES

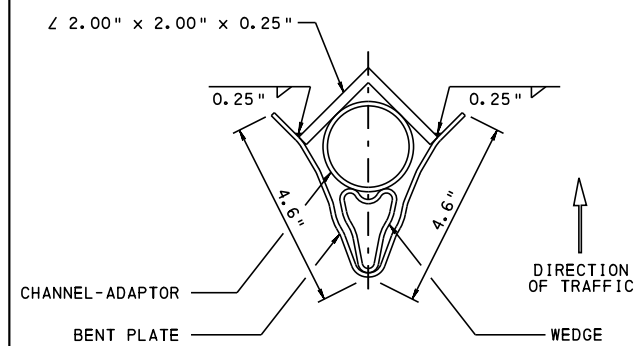
RECOMMENDED JUN. 13, 2013
John C. Rowe
CHIEF TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
CHIEF HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SH. 7 OF 9
TC-8702B

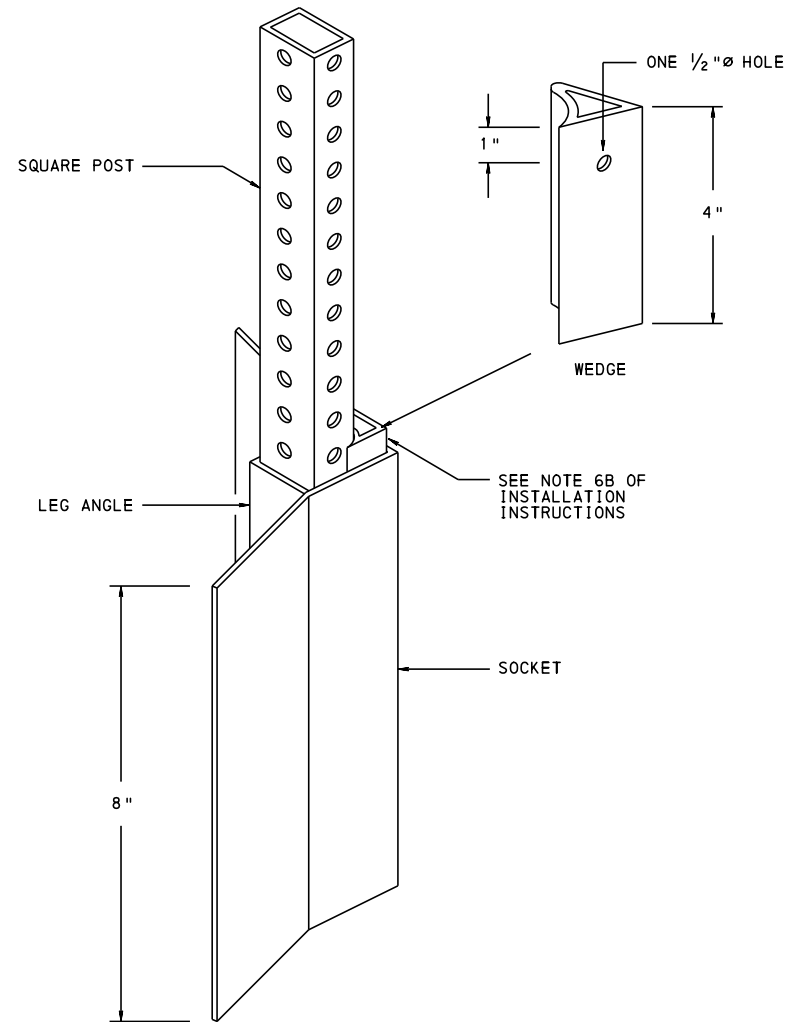


ELEVATION

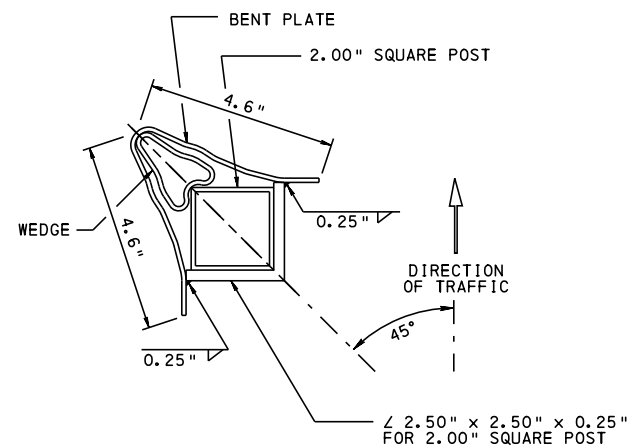


PLAN

CHANNEL BAR POST - SOCKET SYSTEM

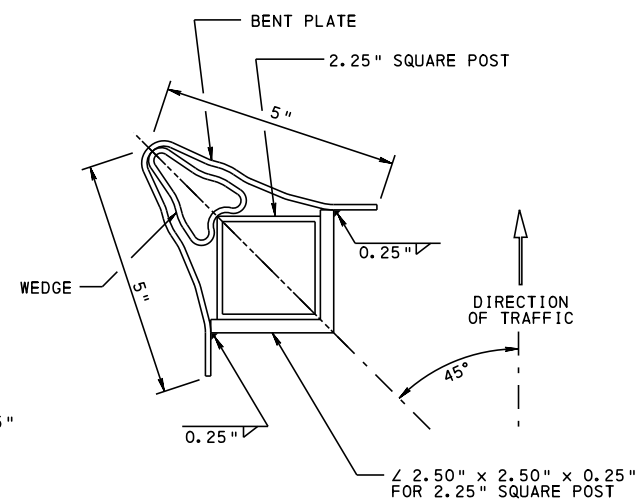


ELEVATION



PLAN

SQUARE POST - SOCKET SYSTEM



PLAN

NOTES:

INSTALLATION INSTRUCTIONS:

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE B

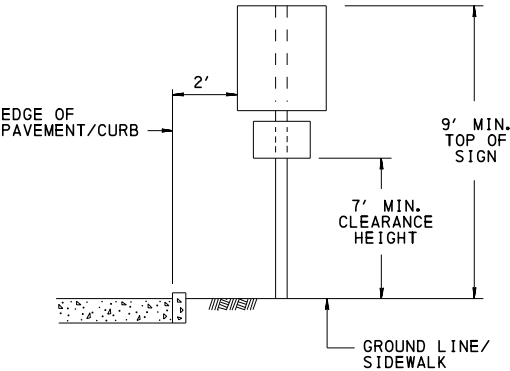
SOCKET SYSTEM FOR
CONCRETE INSTALLATIONS

RECOMMENDED JUN. 13, 2013
CHIEF, TRAFFIC ENGINEERING AND
PERMITS SECTION

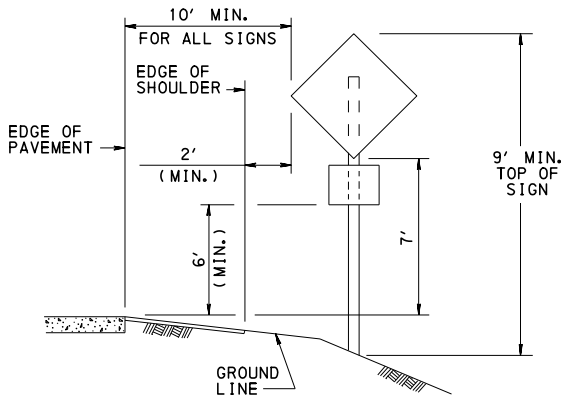
RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

SHT. 8 OF 9

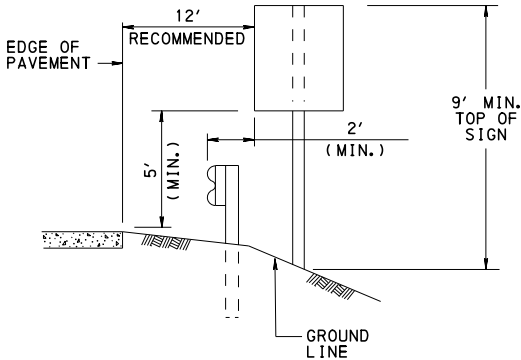
TC-8702B



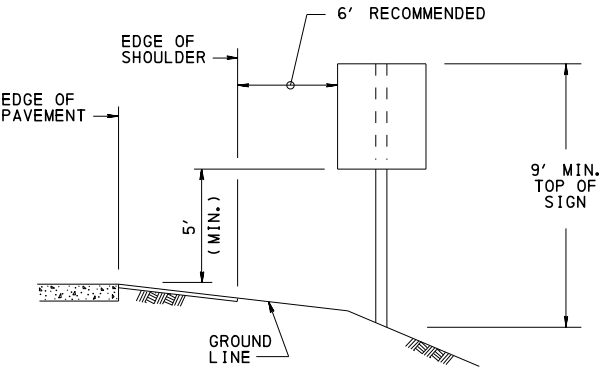
BUSINESS OR RESIDENTIAL AREA



FREEWAY / EXPRESSWAYS



RURAL AREA
CONVENTIONAL HIGHWAY (NO SHOULDER)



RURAL AREA
CONVENTIONAL HIGHWAY (WITH SHOULDER)

NOTES:

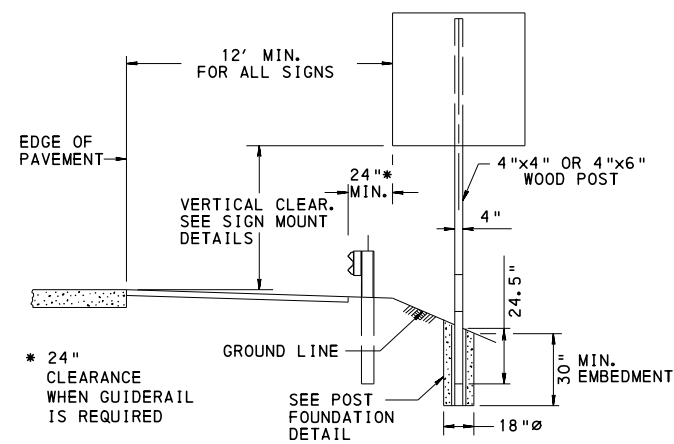
SIGN CLEARANCE HEIGHT

1. CLEARANCE HEIGHT SHALL BE MEASURED FROM THE BOTTOM OF THE SIGN TO A LEVEL LINE PROJECTED FROM THE NEAR EDGE OF ROADWAY. THIS MAY RESULT IN A SIGN HEIGHT GREATER THAN THE MINIMUM HEIGHT REQUIRED WHEN MEASURED FROM THE GROUND LEVEL TO THE BOTTOM OF THE SIGN. IN BUSINESS AND URBAN AREAS THE CLEARANCE HEIGHT SHALL ALSO BE MEASURED FROM THE BOTTOM OF THE SIGN TO THE GROUND LEVEL OR SIDEWALK AREA TO REDUCE THE POSSIBILITY OF PEDESTRIANS COLLIDING WITH THE SIGN.

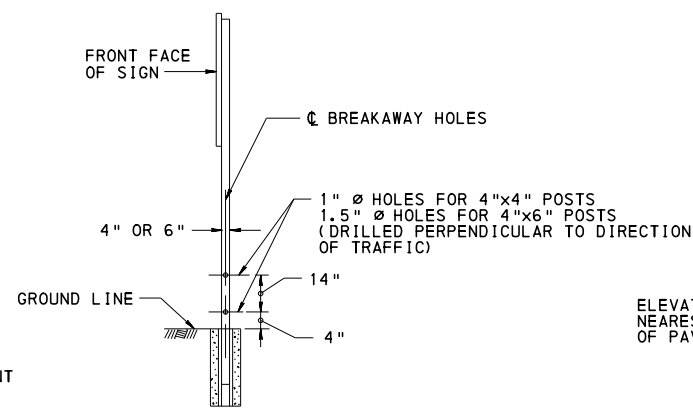
LATERAL SIGN CLEARANCE

2. SIGNS SHOULD BE PLACED AS FAR AS PRACTICAL FROM THE EDGE OF THE ROADWAY TO REDUCE THE POSSIBILITY OF VEHICLES HITTING THE SIGNS. WHEN GUIDE RAIL IS PRESENT, SIGNS WILL BE PLACED BEHIND THE GUIDERAIL.
3. ROUTE MARKER SIGNS WITH AUXILIARY SIGNS (NORTH, SOUTH, ETC.) SHALL BE CONSIDERED A SINGLE SIGN ASSEMBLY. THE CLEARANCE HEIGHT IS MEASURED FROM THE BOTTOM OF THE LOWEST AUXILIARY SIGN TO A LEVEL LINE PROJECTED FROM THE NEAR EDGE OF ROADWAY.
4. BUSINESS OR URBAN AREAS
- A. IN BUSINESS, COMMERCIAL OR RESIDENTIAL DISTRICTS, OR WHERE PARKING AND/OR PEDESTRIAN MOVEMENTS ARE LIKELY, OR WHERE THE SIGN MAY BLOCK VISIBILITY, THE BOTTOM OF ALL SIGNS (INCLUDING AUXILIARY SIGNS) SHALL BE A MINIMUM OF 7' ABOVE GROUND AND THE NEAR PAVEMENT EDGE.
- B. LATERAL CLEARANCE RECOMMENDED IS 2' BEHIND CURB. IF SIDEWALK WIDTH IS LIMITED, OR WHEN EXISTING UTILITY POLES ARE CLOSE TO THE CURB A 1' CLEARANCE IS PERMISSIBLE. SIGNS SUPPORTS SHOULD NOT PROTRUDE INTO SIDEWALK AREA
5. RURAL AREAS
- A. CONVENTIONAL HIGHWAYS. ALTHOUGH 7' MINIMUM SIGN HEIGHT CLEARANCE IS RECOMMENDED, IN RURAL DISTRICTS WHERE THE CONDITIONS LISTED IN NOTE 4A ARE NOT LIKELY, SIGNS MAY BE MOUNTED AT A MINIMUM CLEARANCE HEIGHT OF 5'. IF A SUPPLEMENTAL SIGN IS INSTALLED BELOW THE MAIN SIGN, THE CLEARANCE HEIGHT OF THE SUPPLEMENTAL SIGN MAY BE 4'.
- WHEN GUIDERAIL OR CONCRETE BARRIERS ARE PRESENT A 2' LATERAL CLEARANCE IS RECOMMENDED.
- WHEN SHOULDERS ARE NOT PRESENT IT IS RECOMMENDED THAT SIGNS BE PLACED 12' FROM THE EDGE OF ROADWAY. WHERE SHOULDERS ARE PRESENT A 6' LATERAL CLEARANCE IS RECOMMENDED.
- B. FREEWAY AND EXPRESSWAYS. DIRECTIONAL SIGNS SHALL BE HAVE A MINIMUM CLEARANCE HEIGHT OF 7'. HOWEVER, IF A SUPPLEMENTAL SIGN IS INSTALLED BELOW THE MAIN SIGN, THE SUPPLEMENTAL SIGN MAY HAVE A CLEARANCE HEIGHT OF 6', PROVIDED THAT A 7' CLEARANCE HEIGHT IS MAINTAINED FOR THE MAIN SIGN.
- ALL ROUTE MARKER, REGULATORY, AND WARNING SIGN ASSEMBLIES SHALL MAINTAIN A 6' CLEARANCE HEIGHT TO THE BOTTOM OF THE SIGN ASSEMBLY (INCLUDING AUXILIARY SIGNS).
- 2' MINIMUM LATERAL CLEARANCE IS REQUIRED BEHIND UNMOUNTABLE CURB OR ROADWAY SHOULDER.
- 10' MINIMUM LATERAL CLEARANCE FROM THE EDGE OF THE NEAREST TRAVEL LANE IS RECOMMENDED.
6. ON CONVENTIONAL ROADS A 2-FOOT LATERAL OFFSET IS PERMITTED WHEN IT IS IMPRACTICAL TO LOCATE THE SIGN WITH THE PRESCRIBED OFFSET.
7. A LATERAL OFFSET OF 1 FOOT FROM THE FACE OF THE CURB MAY BE USED IN BUSINESS, COMMERCIAL OR RESIDENTIAL AREAS WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.
8. OVERHEAD SIGN SUPPORTS AND POST-MOUNTED SIGN AND OBJECT MARKERS SUPPORTS SHOULD NOT INTRUDE INTO THE USABLE WIDTH OF A SIDEWALK OR OTHER PEDESTRAIN FACILITY.

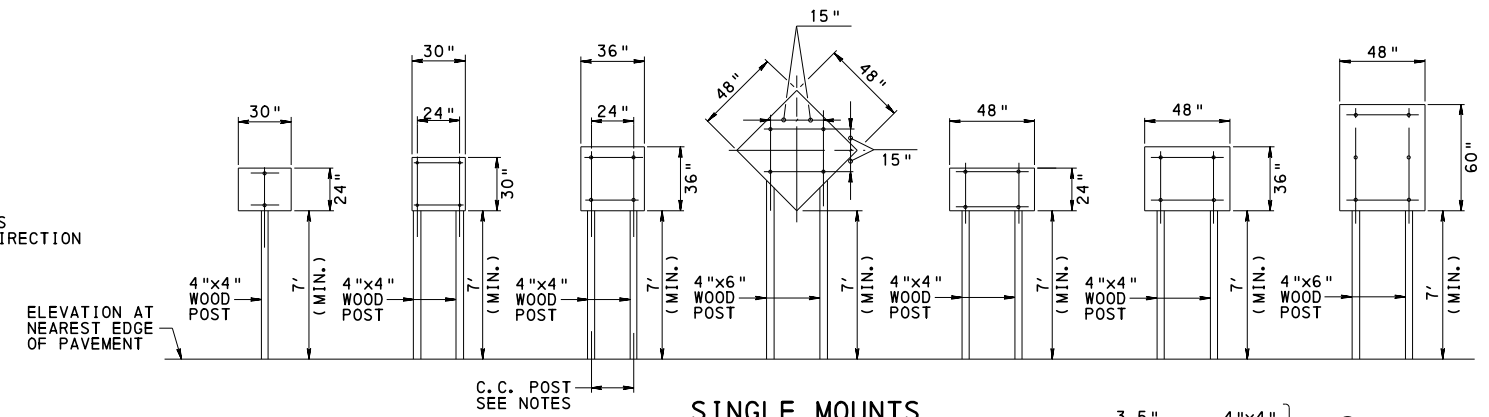
COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
POST-MOUNTED SIGNS, TYPE B		
SIGN LOCATION/INSTALLATION DETAILS		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 9 OF 9 TC-8702B



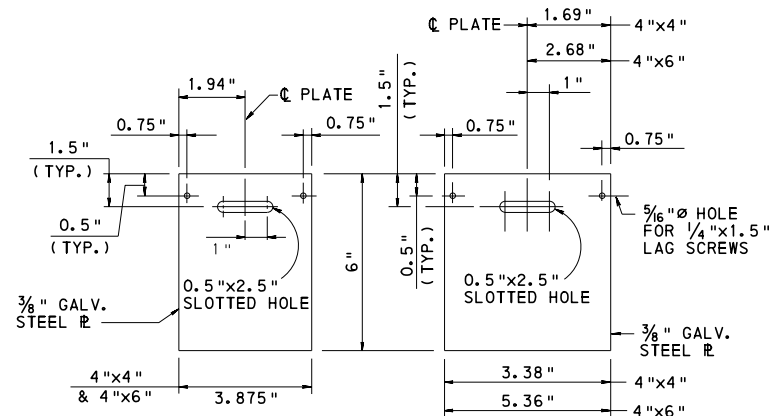
ELEVATION VIEW



END VIEW

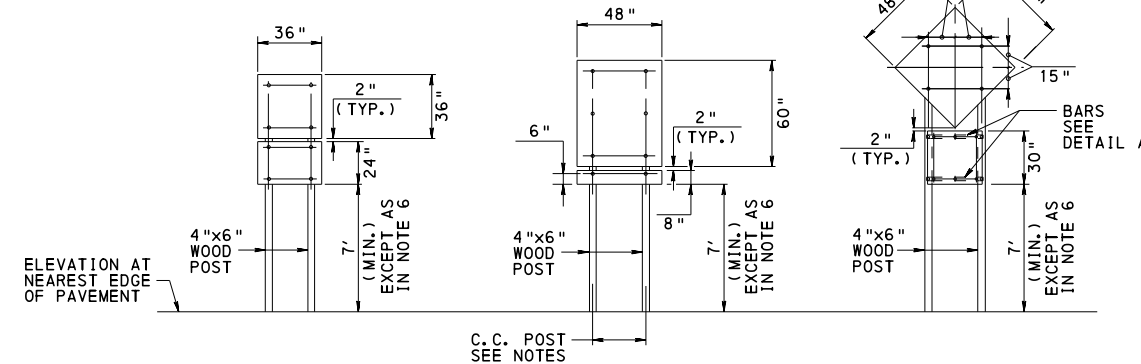


SINGLE MOUNTS

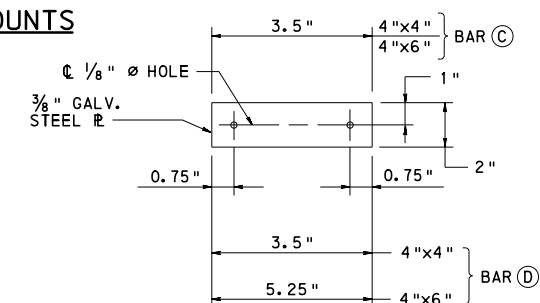


SHIM PLATE (A)

SHIM PLATE (B)



MULTIPLE MOUNTS

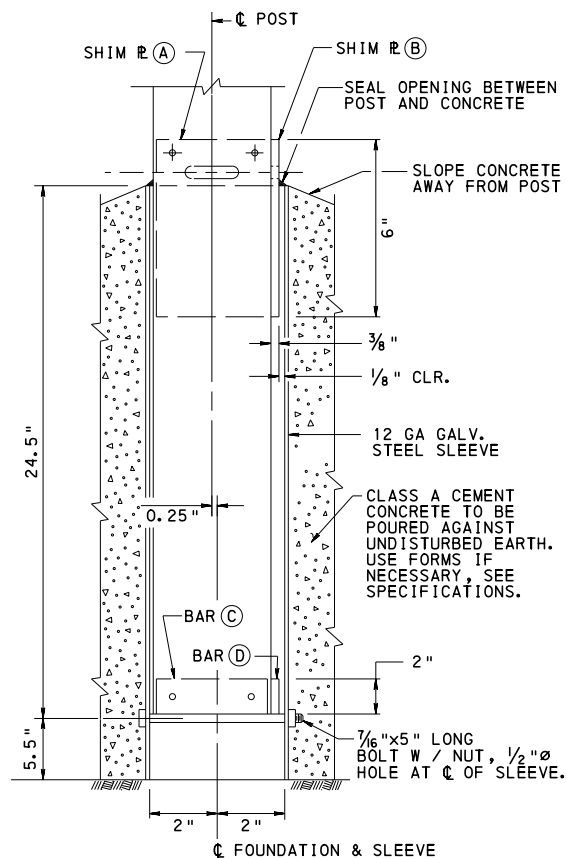


NOTE:
NAIL SHIM BARS TO POST TO
HOLD BARS IN PLACE WHILE
POST IS BEING PLACED.

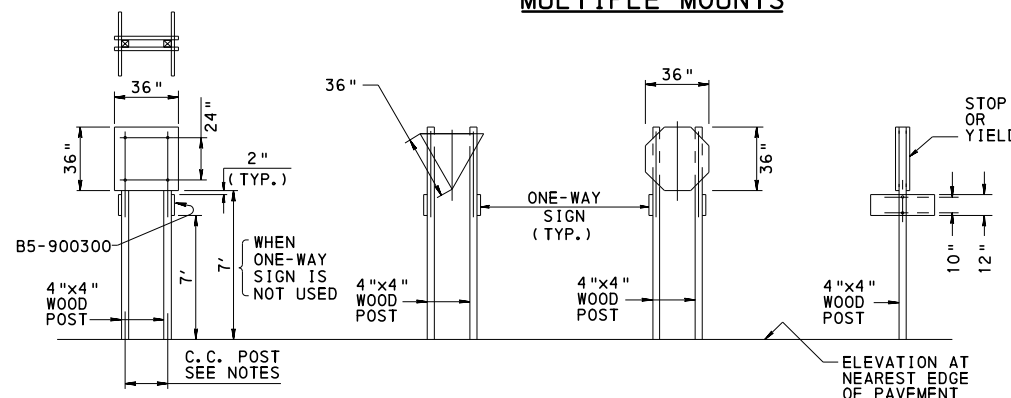
SHIM PLATE (C)
SHIM PLATE (D)

NOTES:

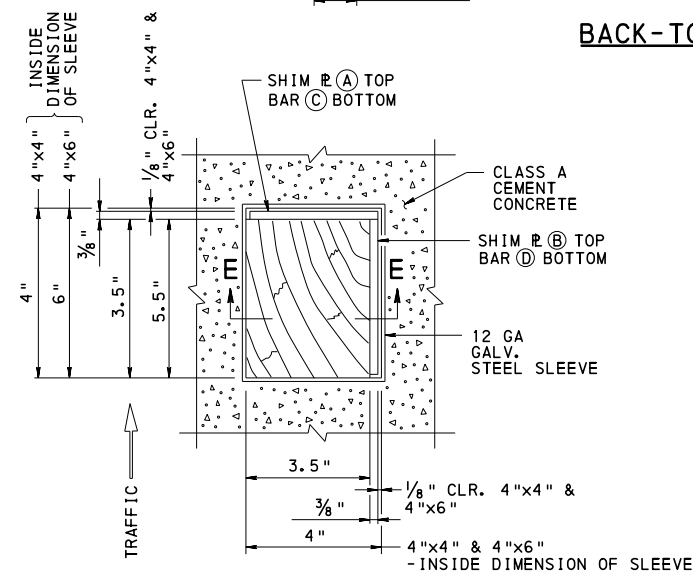
1. MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PUBLICATION 408, UNLESS OTHERWISE NOTED.
2. DETERMINE THE CENTER TO CENTER POST DIMENSIONS ON TWO-POST INSTALLATIONS BY THE BOLT HOLE SPACING ON THE SIGN BLANKS.
3. FOR DETAILS OF BOLTS AND SIZE REQUIRED, SEE SHEET 2 OF 2.
4. GALVANIZE ALL STEEL SLEEVES IN ACCORDANCE WITH ASTM A 123 / A 123M.
5. STEEL USED FOR SLEEVES AND SHIMS SHALL HAVE A MINIMUM YIELD STRENGTH OF 36 KSI.
6. IF A SUPPLEMENTAL SIGN IS INSTALLED BELOW THE MAIN SIGN, THE BOTTOM OF THE SIGN ASSEMBLY MAY BE 6" ABOVE THE NEAR EDGE OF THE PAVEMENT. HOWEVER, IN BUSINESS, COMMERCIAL & RESIDENTIAL DISTRICTS, OR WHERE PARKING AND/OR PEDESTRIAN MOVEMENTS ARE LIKELY, OR WHERE THE SIGN MAY BLOCK VISIBILITY, THE BOTTOM OF ALL SIGNS (INCLUDING AUXILIARY SIGNS) SHALL BE A MINIMUM OF 7' ABOVE GROUND.
7. ON CONVENTIONAL ROADS A 2-FOOT LATERAL OFFSET IS PERMITTED WHEN IT IS IMPRACTICAL TO LOCATE THE SIGN WITH THE PRESCRIBED OFFSET.
8. A LATERAL OFFSET OF 1 FOOT FROM THE FACE OF THE CURB MAY BE USED IN BUSINESS, COMMERCIAL OR RESIDENTIAL AREAS WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.
9. OVERHEAD SIGN SUPPORTS AND POST-MOUNTED SIGN AND OBJECT MARKERS SUPPORTS SHOULD NOT INTRUDE INTO THE USABLE WIDTH OF A SIDEWALK OR OTHER PEDESTRAIN FACILITY.



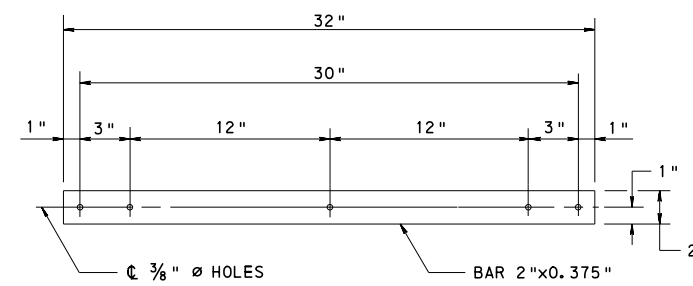
SECTION E-E (SHOWN)



BACK-TO-BACK MOUNTS



FOUNDATION DETAIL



BAR
DETAIL A

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE C

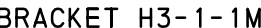
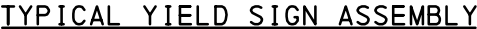
ERECTION DETAILS

RECOMMENDED JUN. 13, 2013
CHIEF, TRAFFIC ENGINEERING AND
PERMITS SECTION

RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

SHT. 1 OF 2

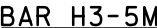
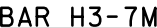
TC-8702C



* SEE TC-8702E FOR FOUNDATION DETAIL.

BOLTS ARE STAINLESS STEEL OR ALUMINUM, $\frac{5}{16}$ " WITH
FLAT WASHERS, LOCK WASHERS AND NUT. LENGTH AS
SHOWN IN THE BOLT TABLE.

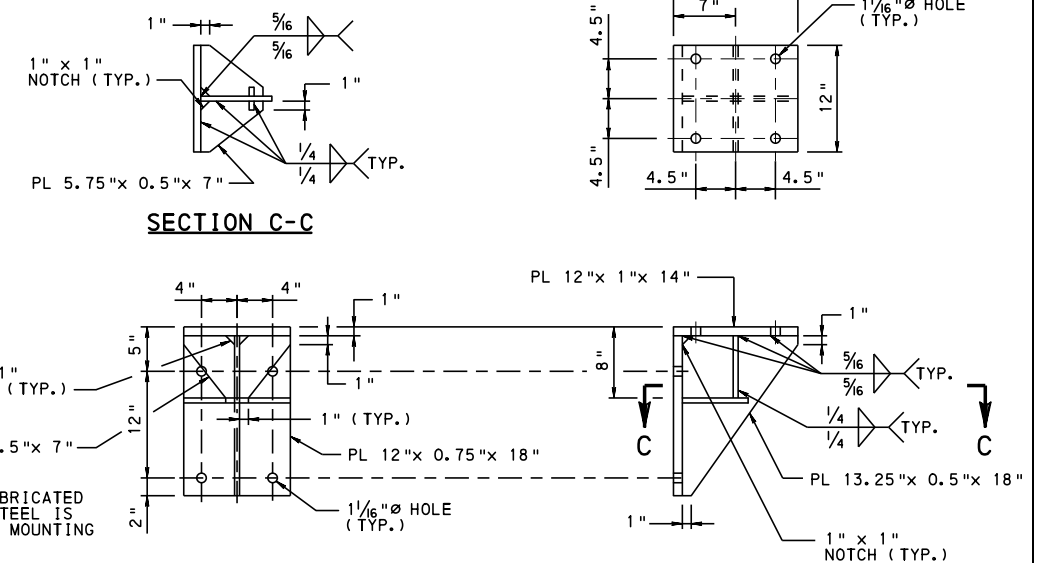
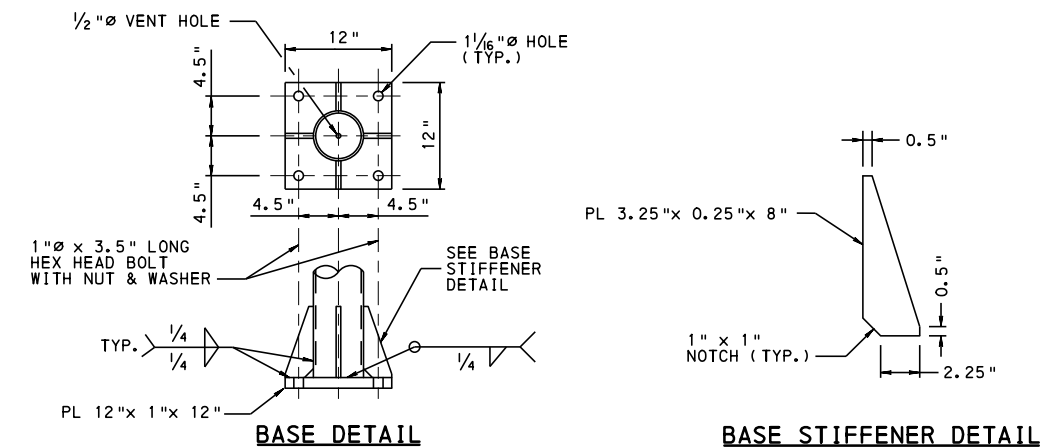
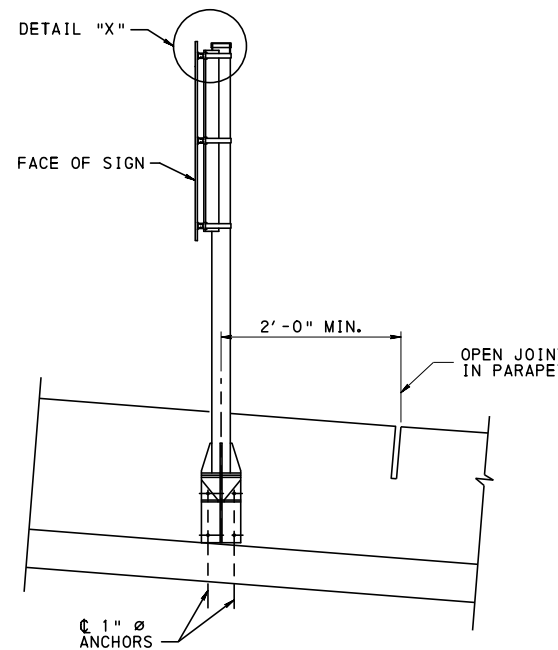
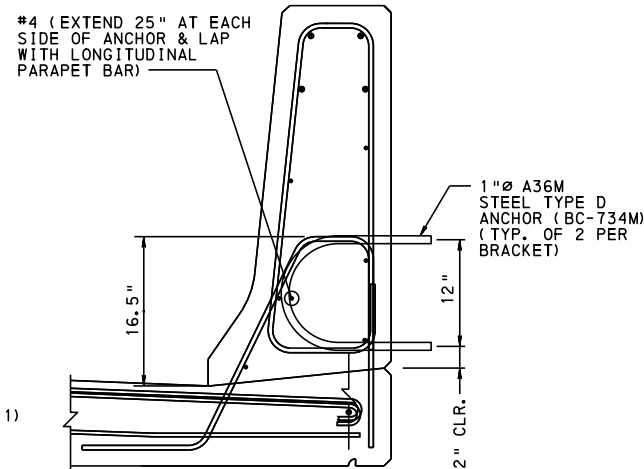
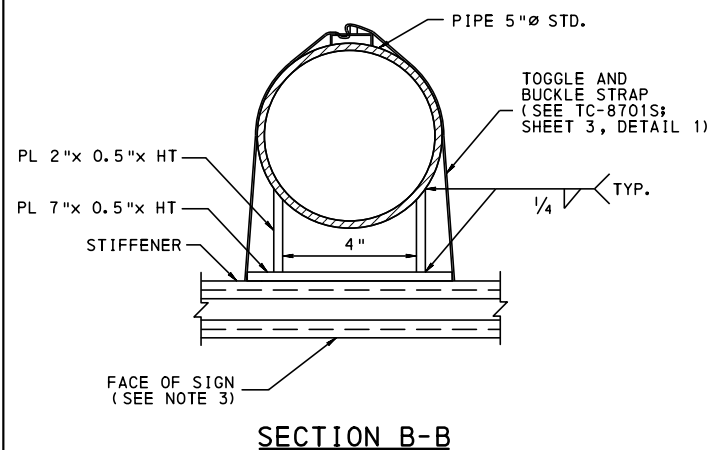
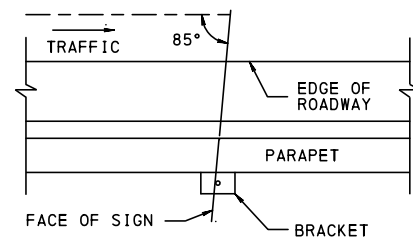
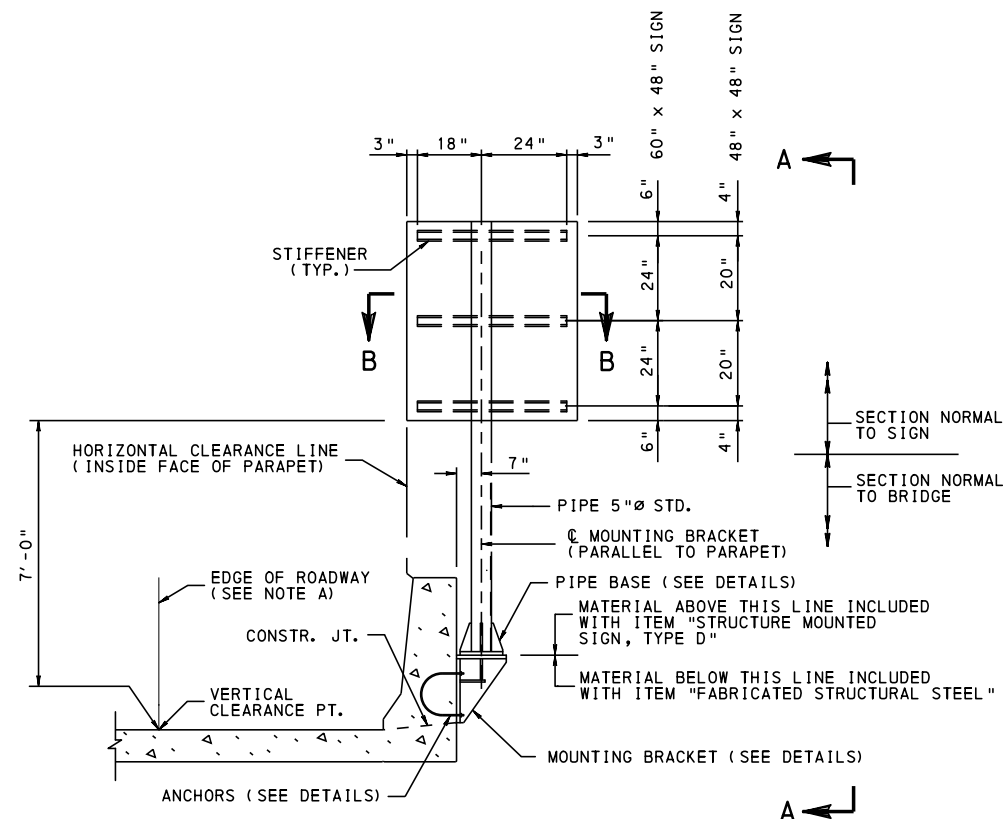
3. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PUBLICATION 408, UNLESS OTHERWISE NOTED.
4. A 3/8"x3" LAG SCREW MAY BE USED IN LIEU OF A BOLT THROUGH THE POST AS ILLUSTRATED.
5. USE A FLAT ALUMINUM OR NYLON WASHER ON THE FACE OF ALL SIGNS.
6. DRILL BREAKAWAY HOLES IN POSTS AND ERECT AS SHOWN ON SHEET 1 OF 2.
7. STAMP BRACKET/BAR NUMBER IN 0.375" HIGH LETTERS AND NUMBERS IN POSITIONS AS SHOWN.



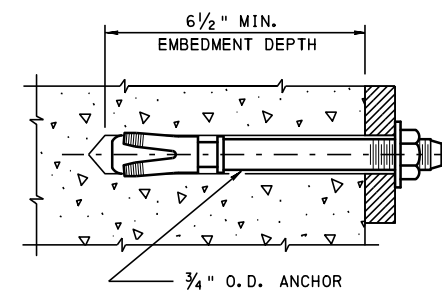
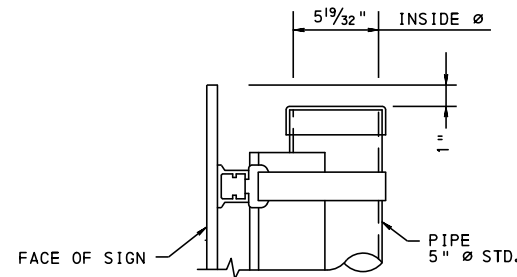
ERECTION DETAILS

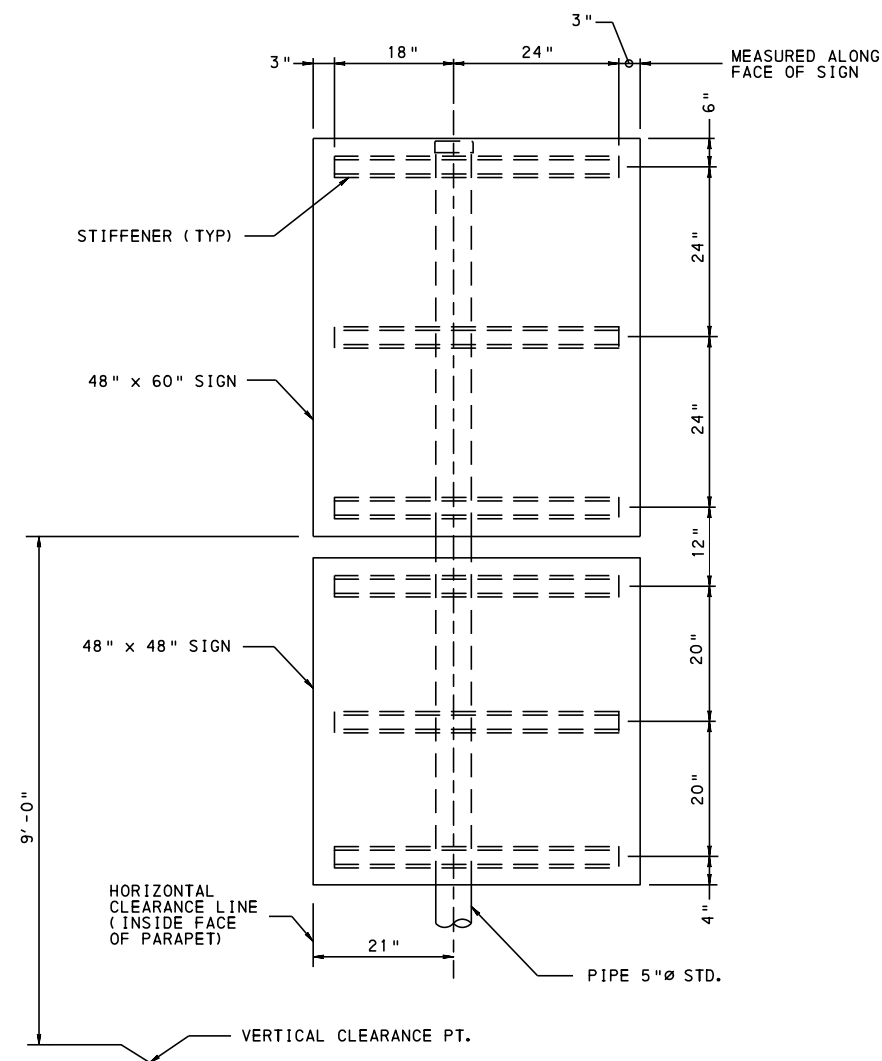
SHT. 2 OF 2

TC-8702C



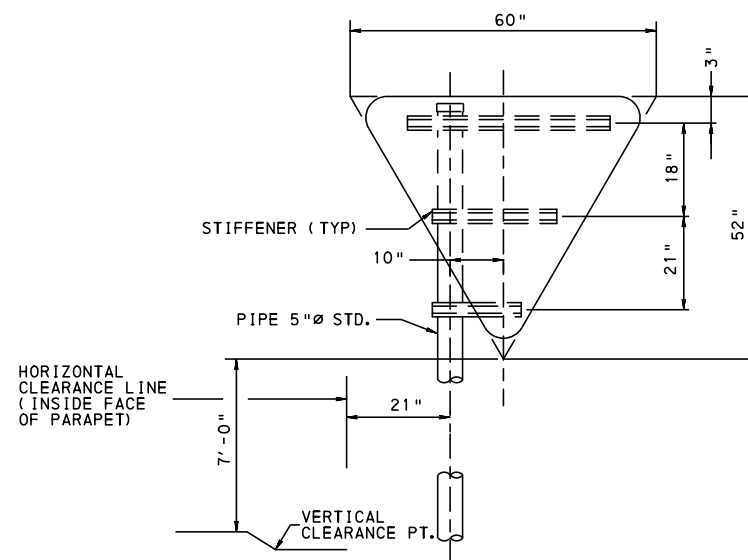
- NOTES:**
1. MATERIALS AND WORKSMANSHIP SHALL BE IN ACCORDANCE WITH PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PUBLICATION 408, UNLESS OTHERWISE NOTED.
 2. ALL STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH PUBLICATION 408.
 3. THE STIFFENERS AND STIFFENER HARDWARE SHALL CONFORM TO SECTION 1103.03(d) AND TO STANDARD DRAWING TC-8701S. THE RIVETS USED TO FASTEN THE FLAT SHEET ALUMINUM TO THE STIFFENER SHALL CONFORM TO SECTION 1103.11(g) AND SHALL BE SPACED AS INDICATED IN SECTION 1103.03(e).
 4. STEEL PIPE SUPPORTS TO BE ASTM A 53, UNLESS OTHERWISE NOTED. ALL OTHER STRUCTURAL STEEL TO BE AASHTO M 270, ASTM A 709 GRADE 36, UNLESS OTHERWISE NOTED. ALL BOLTS TO BE AASHTO ASTM A 325, TYPE 1, UNLESS OTHERWISE NOTED.
 5. FOR DESIGN OF SIGN PANELS AND ATTACHMENT HARDWARE, SEE TRAFFIC STANDARD.
 6. ALL WELDS TO CONFORM TO LATEST ANSI/AASHTO/AWS SPECIFICATIONS.





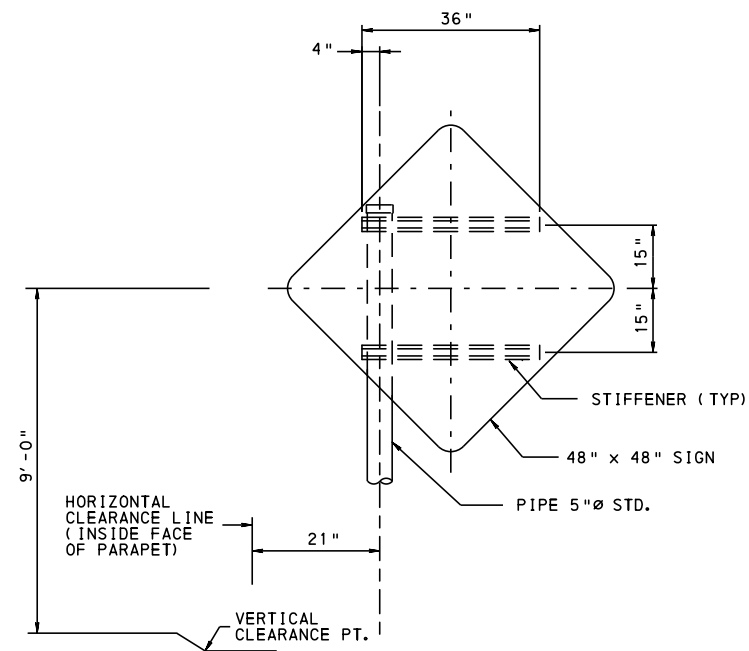
DOUBLE RECTANGULAR SIGN

(PARTS NOT SHOWN ARE SIMILAR TO SINGLE RECTANGULAR SIGN)



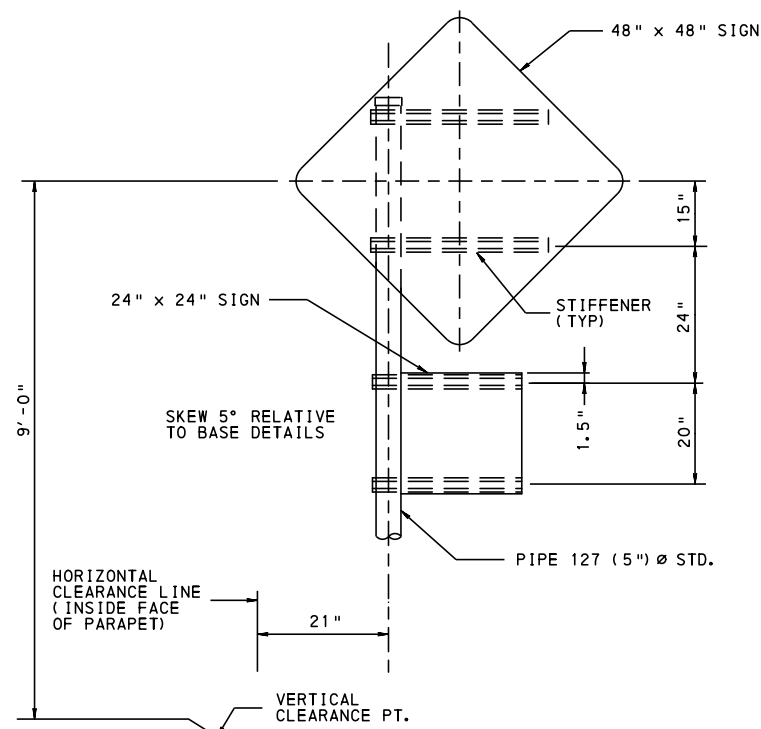
TRIANGULAR SIGN

(PARTS NOT SHOWN ARE SIMILAR TO SINGLE RECTANGULAR SIGN)



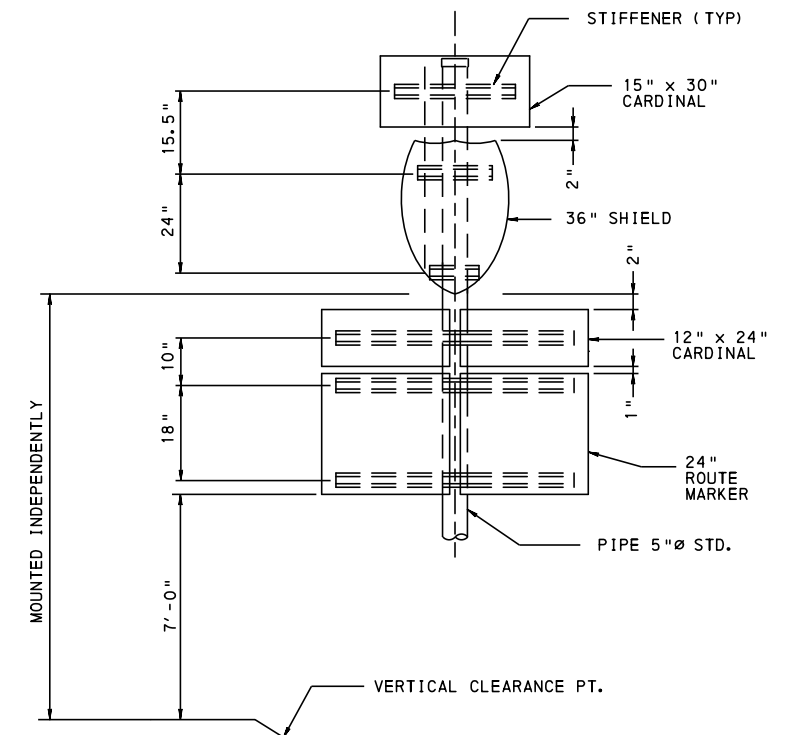
DIAMOND SIGN

(PARTS NOT SHOWN ARE SAME AS SINGLE RECTANGULAR SIGN)



DIAMOND SIGN WITH RECTANGULAR SIGN

(PARTS NOT SHOWN ARE SIMILAR TO DIAMOND SIGN AND RECTANGULAR SIGN)



DOUBLE ROUTE MARKER WITH 36" SHIELD

(PARTS NOT SHOWN ARE SIMILAR TO SINGLE RECTANGULAR SIGN)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS,
TYPE D

ERECTION DETAILS
(STRUCTURE CONNECTIONS)

RECOMMENDED JUN. 13, 2013

CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013

CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SHT. 2 OF 2

TC-8702D

DESIGN CRITERIA:

1. DESIGN BASED ON 2001 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS INCLUDING 2002 INTERIM SPECIFICATIONS WITH THE FOLLOWING DESIGN CRITERIA:
- BASIC WIND SPEED (V) = 90 MPH (3-SECOND GUST)
 - WIND IMPORTANCE FACTOR (I_w) = 0.71 (10 YEAR DESIGN LIFE)
 - FATIGUE IS NOT CONSIDERED FOR ROADSIDE SIGNS.
2. EMBEDMENT OF FOOTINGS IS BASED ON FIGURES 13-3 AND 13-4 AS OUTLINED IN THE AASHTO SPECIFICATIONS.

POST SELECTION TABLE - ONE POST								
W (FT)	L _B (FT)	HEIGHT "H" (FT)						
		2	3	4	5	6	7	8
2	6	P1	P1	P1	P1	P1	P2	P2
	7	P1	P1	P1	P1	P1	P2	P3
	8	P1	P1	P1	P1	P2	P2	P3
	9	P1	P1	P1	P1	P2	P3	P3
	10	P1	P1	P1	P2	P3	P3	P3
3	6	P1	P1	P1	P2	P3	P3	P3
	7	P1	P1	P1	P2	P3	P3	P3
	8	P1	P1	P1	P2	P3	P3	P3
	9	P1	P1	P2	P3	P3	P3	P3
	10	P1	P1	P2	P3	P3	P3	-
4	6	P1	P1	P3	P3	P3	-	-
	7	P1	P1	P3	P3	P3	-	-
	8	P1	P1	P2	P3	P3	-	-
	9	P1	P2	P3	P3	P3	-	-
	10	P1	P2	P3	P3	P3	-	-
5	6	P1	P3	P3	P3	-	-	-
	7	P1	P3	P3	P3	-	-	-
	8	P1	P3	P3	P3	-	-	-
	9	P1	P2	P3	P3	-	-	-
	10	P1	P3	P3	P3	-	-	-
6	6	P2	P3	P3	-	-	-	-
	7	P2	P3	P3	-	-	-	-
	8	P2	P3	P3	-	-	-	-
	9	P3	P3	-	-	-	-	-
	10	P3	P3	-	-	-	-	-
7	6	P3	-	-	-	-	-	-
	7	P3	-	-	-	-	-	-
	8	P3	-	-	-	-	-	-
	9	P3	-	-	-	-	-	-
	10	P3	-	-	-	-	-	-
8	6	P3	-	-	-	-	-	-
	7	P3	-	-	-	-	-	-
	8	P3	-	-	-	-	-	-
	9	P3	-	-	-	-	-	-
	10	P3	-	-	-	-	-	-

LEGEND:

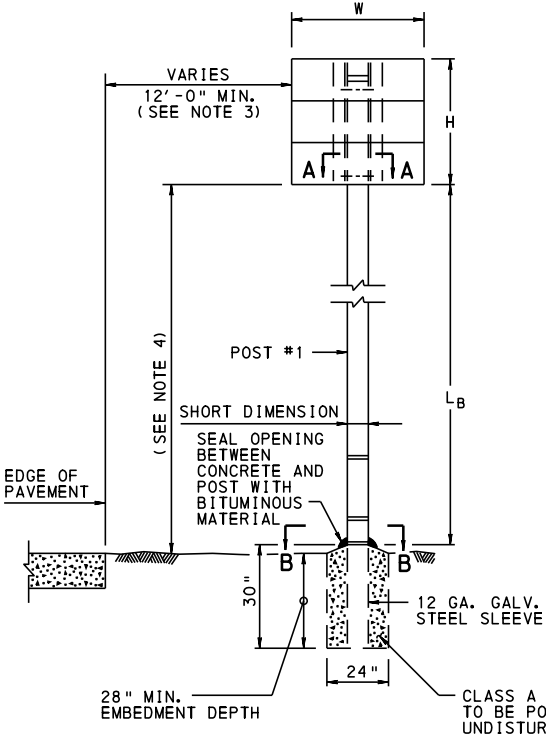
P1 = 4"x6" POST
P2 = 6"x6" POST
P3 = 6"x8" POST
* USE TWO POSTS (SEE SHEET 2)

POST SELECTION EXAMPLE

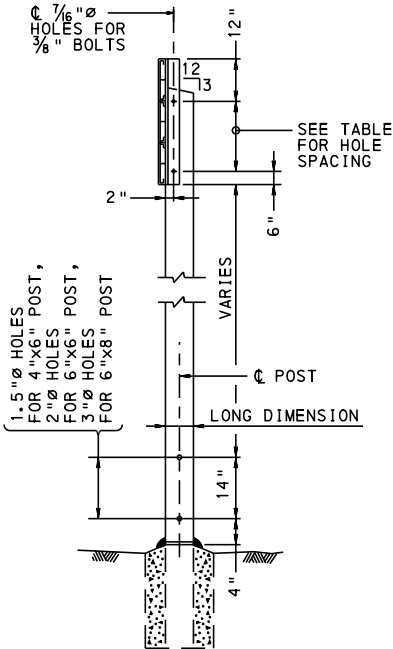
FOR A SIGN WHERE
W = 2'-0"
H = 2'-0"
L_B = 11'-0"
ONE P1 = 4"x6" WOOD POST IS REQUIRED.



PLAN VIEW



SIGN ELEVATION



END VIEW

ANGLE CONNECTION BOLT SPACING	
H (FT)	SPACES
2	1 AT 6"
3	2 AT 9"
4	2 AT 15"
5	3 AT 14"
6	3 AT 18"
7	4 AT 16.5"
8	6 AT 13"

TABLE FOR HOLE SPACING

SIGN POST SELECTION NOTES:

1. DETERMINE VALUES OF "W", "H", AND "L_B" AS INDICATED IN THE SIGN ELEVATION.
W = MAXIMUM WIDTH OF SIGN.
H = MAXIMUM HEIGHT OF SIGN.
L_B = MAXIMUM DISTANCE BETWEEN TOP OF A FOOTING AND BOTTOM OF SIGN.
2. FOR SELECTION OF POSTS, ENTER TABLES WITH VALUES OF "W", "H" AND "L_B".
3. FOR A SIGN SIZE BETWEEN THOSE VALUES OF "W", "H" AND "L_B" IN THE TABLE, USE NEXT HIGHEST (FT) VALUE.
4. USE THE LONGEST POST TO SELECT ALL POST SIZES.

NOTES:

1. MATERIALS AND WORKMANSHIP IN ACCORDANCE WITH PENNSYLVANIA DEPARTMENT OF TRANSPORTATION PUBLICATION 408, UNLESS NOTED OTHERWISE.
2. POST #1 IS ALWAYS ADJACENT TO ROADWAY, WHETHER SIGN IS LOCATED ON LEFT OR RIGHT.
3. AT LOCATIONS WITH UNMOUNTABLE CURB, GUIDE RAIL OR BARRIER, PLACE THE NEAR EDGE OF THE SIGN AT LEAST 2'-0" BEHIND THE CURB FACE, GUIDE RAIL OR BARRIER. AT LOCATIONS WITH GUIDE RAIL OR BARRIER, IT IS DESIRABLE TO PLACE POST #1 BEYOND THE DEFLECTION DISTANCE OF THE GUIDE RAIL OR BARRIER. PRIOR TO FABRICATION, DETERMINE ACTUAL LATERAL PLACEMENT IN THE FIELD WITH THE APPROVAL OF THE ENGINEER.
4. BUSINESS OR URBAN AREAS
A. IN BUSINESS, COMMERCIAL OR RESIDENTIAL DISTRICTS, OR WHERE PARKING AND/OR PEDESTRIAN MOVEMENTS ARE LIKELY, OR WHERE THE SIGN MAY BLOCK VISIBILITY, THE BOTTOM OF ALL SIGNS (INCLUDING AUXILIARY SIGNS) SHALL BE A MINIMUM OF 7'-0" ABOVE GROUND AND THE NEAR PAVEMENT EDGE.
RURAL AREAS
B. CONVENTIONAL HIGHWAYS. ALTHOUGH 7'-0" MINIMUM SIGN HEIGHT CLEARANCE IS RECOMMENDED, IN RURAL DISTRICTS WHERE THE CONDITIONS LISTED IN NOTE 4A ARE NOT LIKELY, SIGNS MAY BE MOUNTED AT A MINIMUM CLEARANCE HEIGHT OF 5'-0". IF A SUPPLEMENTAL SIGN IS INSTALLED BELOW THE MAIN SIGN, THE CLEARANCE HEIGHT OF THE SUPPLEMENTAL SIGN MAY BE 4'-0".
C. FREEWAY AND EXPRESSWAYS. SIGNS SHALL HAVE A MINIMUM CLEARANCE HEIGHT OF 7'-0". HOWEVER, IF A SUPPLEMENTAL SIGN IS INSTALLED BELOW THE MAIN SIGN, THE SUPPLEMENTAL SIGN MAY HAVE A CLEARANCE HEIGHT OF 6'-0", PROVIDED THAT 7'-0" CLEARANCE HEIGHT IS MAINTAINED FOR THE MAIN SIGN.
5. LOCATE SIGNS TO AVOID PLACING SUPPORTS IN DRAINAGE DITCHES.
6. SEE SHEET 2 FOR TWO-POST INSTALLATION.
7. SEE SHEET 3 FOR THREE-POST INSTALLATION.
8. SEE SHEET 4 FOR SECTIONS AND ERECTION DETAILS.
9. SEE SHEET 5 FOR TEMPORARY DIRECT BURIAL TWO-POST INSTALLATION.
10. FOR DETAIL OF SIGN PANELS AND ATTACHMENT HARDWARE, SEE TRAFFIC STANDARD TC-8701E OR TC-8701S.
11. TWIST-IN TOGGLE STRAPS MAY BE USED ON FLAT SHEET ALUMINUM SIGNS WITH STIFFENERS IN ACCORDANCE WITH TC-8701S AND PUB. 408.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS, TYPE E

WOOD POSTS
SELECTION TABLES
ERECTION DETAILS

RECOMMENDED JUN. 13, 2013
CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SHT. 1 OF 5

TC-8702E

POST SELECTION TABLE - TWO POSTS						
W (FT)	L _B (FT)	HEIGHT "H" (FT)				
		2	3	4	5	6
6	6	P1	P1	P1	P1	-
	7	P1	P1	P1	-	-
	8	P1	P1	P1	-	-
	9	P1	P1	-	-	-
	10	P1	P1	-	-	-
	11	P1	-	-	-	-
	12	P1	-	-	-	-
	13	P1	-	-	-	-
7	6	P1	P1	P1	-	-
	7	P1	P1	P1	-	-
	8	P1	P1	-	-	-
	9	P1	P1	-	-	-
	10	P1	-	-	-	-
	11	P1	-	-	-	-
	12	P1	-	-	-	-
	13	-	-	-	-	-
8	6	P1	P1	P1	-	-
	7	P1	P1	-	-	-
	8	P1	P1	-	-	-
	9	P1	-	-	-	-
	10	P1	-	-	-	-
	11	P1	-	-	-	-
	12	-	-	-	-	-
	13	-	-	-	-	-
9	6	P1	P1	P2 *	P3 *	P3 *
	7	P1	P1	P2 *	P3 *	P3 *
	8	P1	P2 *	P3 *	P3 *	P3 *
	9	P1	P2 *	P3 *	P3 *	P3 *
	10	P1	P2 *	P3 *	P3 *	-
	11	P1	P3 *	P3 *	P3 *	-
	12	P2 *	P3 *	P3 *	-	-
	13	P2 *	P3 *	P3 *	-	-
10	6	P1	P1	P2 *	P3 *	P3 *
	7	P1	P1	P3 *	P3 *	P3 *
	8	P1	P2 *	P3 *	P3 *	P3 *
	9	P1	P2 *	P3 *	P3 *	-
	10	P1	P3 *	P3 *	P3 *	-
	11	P2 *	P3 *	P3 *	-	-
	12	P2 *	P3 *	P3 *	-	-
	13	P3 *	P3 *	-	-	-

* SEE NOTE 1.

LEGEND:

P1 = 4"x6" POST
P2 = 6"x6" POST
P3 = 6"x8" POST

POST SELECTION EXAMPLE

FOR A SIGN WHERE

W = 6'-0"
H = 2'-0"
L_B = 13'-0"

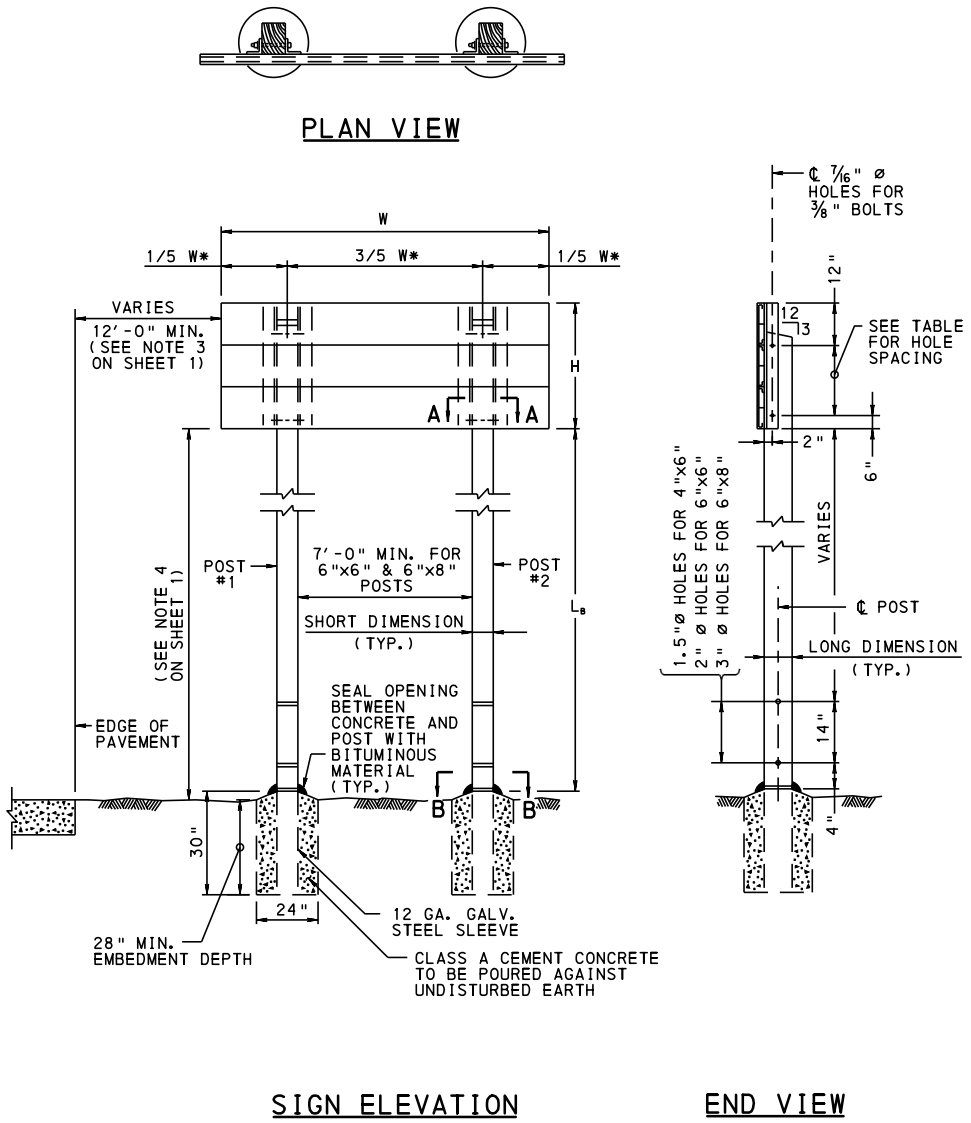
TWO P1 = 4"x6" WOOD POSTS ARE REQUIRED.

POST SELECTION TABLE - TWO POSTS						
W (FT)	L _B (FT)	HEIGHT "H" (FT)				
		2	3	4	5	6
11	6	P1	P1	P2 *	P3 *	P3 *
	7	P1	P2 *	P3 *	P3 *	P3 *
	8	P1	P2 *	P3 *	P3 *	-
	9	P1	P3 *	P3 *	P3 *	-
	10	P2 *	P3 *	P3 *	-	-
	11	P2 *	P3 *	P3 *	-	-
	12	P3 *	P3 *	-	-	-
	13	P3 *	P3 *	-	-	-
12	6	P1	P2 *	P3 *	P3 *	P3 *
	7	P1	P2 *	P3 *	P3 *	-
	8	P1	P2 *	P3 *	P3 *	-
	9	P2 *	P3 *	P3 *	-	-
	10	P2 *	P3 *	P3 *	-	-
	11	P2 *	P3 *	-	-	-
	12	P3 *	P3 *	-	-	-
	13	P3 *	P3 *	-	-	-
13	6	P1	P2	P3	P3	-
	7	P1	P2	P3	P3	-
	8	P1	P3	P3	-	-
	9	P2	P3	P3	-	-
	10	P2	P3	P3	-	-
	11	P3	P3	-	-	-
	12	P3	P3	-	-	-
	13	P3	P3	-	-	-
14	6	P1	P2	P3	P3	-
	7	P1	P2	P3	P3	-
	8	P2	P3	P3	-	-
	9	P2	P3	P3	-	-
	10	P2	P3	-	-	-
	11	P3	P3	-	-	-
	12	P3	P3	-	-	-
	13	P3	-	-	-	-
15	6	P1	P2	P3	P3	-
	7	P1	P2	P3	P3	-
	8	P2	P3	P3	-	-
	9	P2	P3	P3	-	-
	10	P3	P3	-	-	-
	11	P3	P3	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-

POST SELECTION TABLE - TWO POSTS						
W (FT)	L _B (FT)	HEIGHT "H" (FT)				
		2	3	4	5	6
16	6	P1	P2	P3	P3	-
	7	P2	P3	P3	-	-
	8	P2	P3	P3	-	-
	9	P2	P3	-	-	-
	10	P3	P3	-	-	-
	11	P3	P3	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-
17	6	P1	P3	P3	-	-
	7	P2	P3	P3	-	-
	8	P2	P3	-	-	-
	9	P3	P3	-	-	-
	10	P3	P3	-	-	-
	11	P3	-	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-
18	6	P1	P3	P3	-	-
	7	P2	P3	P3	-	-
	8	P2	P3	-	-	-
	9	P3	P3	-	-	-
	10	P3	P3	-	-	-
	11	P3	-	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-
19	6	P2	P3	P3	-	-
	7	P2	P3	P3	-	-
	8	P2	P3	-	-	-
	9	P3	P3	-	-	-
	10	P3	-	-	-	-
	11	P3	-	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-
20	6	P2	P3	P3	-	-
	7	P2	P3	-	-	-
	8	P3	P3	-	-	-
	9	P3	P3	-	-	-
	10	P3	-	-	-	-
	11	P3	-	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-

NOTES:

1. POSTS IN THE SELECTION TABLE WITH AN "*" MUST HAVE A MINIMUM CLEAR SPACING OF 7'-0" BETWEEN POSTS BY INCREASING THE 3/5 W SPACING. THE REMAINING SIGN WIDTH "W" SHOULD BE EQUALLY DISTRIBUTED TO THE OVERHANGS.
2. SEE SHEET 1 FOR ADDITIONAL NOTES.
3. SEE SHEET 4 FOR SECTIONS AND ERECTION DETAILS.



ANGLE CONNECTION BOLT SPACING	
H (FT.)	SPACES
2	1 AT 6"
3	2 AT 9"
4	2 AT 15"
5	3 AT 14"
6	3 AT 18"

TABLE FOR HOLE SPACING

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS, TYPE E

WOOD POSTS
SELECTION TABLES
ERECTION DETAILS

RECOMMENDED JUN. 13, 2013
CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

SHT. 2 OF 5
TC-8702E

POST SELECTION TABLE - THREE POSTS						
W (FT)	L _B (FT)	HEIGHT "H" (FT)				
		2	3	4	5	
22	6	P1	P2*	P3*	P3*	
	7	P1	P3*	P3*	-	
	8	P2*	P3*	P3*	-	
	9	P2*	P3*	-	-	
	10	P3*	P3*	-	-	
	11	P3*	P3*	-	-	
	12	P3*	-	-	-	
	13	P3*	-	-	-	
	14	P3*	-	-	-	
	15	P3*	-	-	-	
	16	-	-	-	-	
23	6	P1	P2	P3	P3	
	7	P2	P3	P3	-	
	8	P2	P3	P3	-	
	9	P2	P3	-	-	
	10	P3	P3	-	-	
	11	P3	P3	-	-	
	12	P3	-	-	-	
	13	P3	-	-	-	
	14	P3	-	-	-	
	15	-	-	-	-	
	16	-	-	-	-	
24	6	P1	P2	P3	P3	
	7	P2	P3	P3	-	
	8	P2	P3	P3	-	
	9	P3	P3	-	-	
	10	P3	P3	-	-	
	11	P3	P3	-	-	
	12	P3	-	-	-	
	13	P3	-	-	-	
	14	P3	-	-	-	
	15	-	-	-	-	
	16	-	-	-	-	
25	6	P1	P3	P3	-	
	7	P2	P3	P3	-	
	8	P2	P3	-	-	
	9	P3	P3	-	-	
	10	P3	P3	-	-	
	11	P3	-	-	-	
	12	P3	-	-	-	
	13	P3	-	-	-	
	14	P3	-	-	-	
	15	-	-	-	-	
	16	-	-	-	-	
26	6	P1	P3	P3	-	
	7	P2	P3	P3	-	
	8	P2	P3	-	-	
	9	P3	P3	-	-	
	10	P3	P3	-	-	
	11	P3	-	-	-	
	12	P3	-	-	-	
	13	P3	-	-	-	
	14	-	-	-	-	
	15	-	-	-	-	
	16	-	-	-	-	

* SEE NOTE 1.

LEGEND:

P1 = 4"x6" POST
P2 = 6"x6" POST
P3 = 6"x8" POST

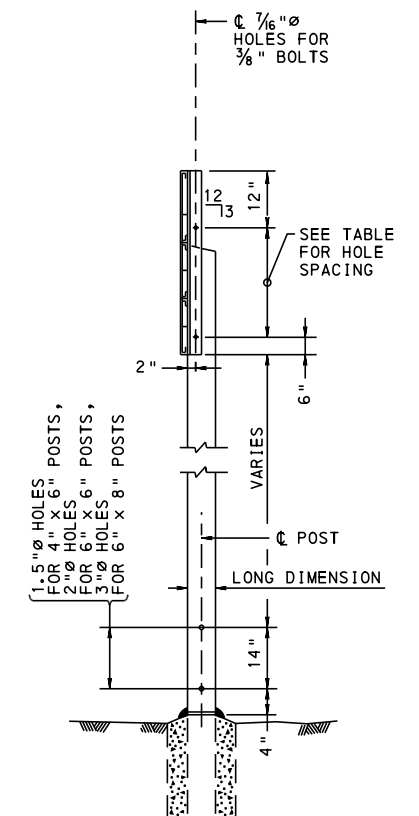
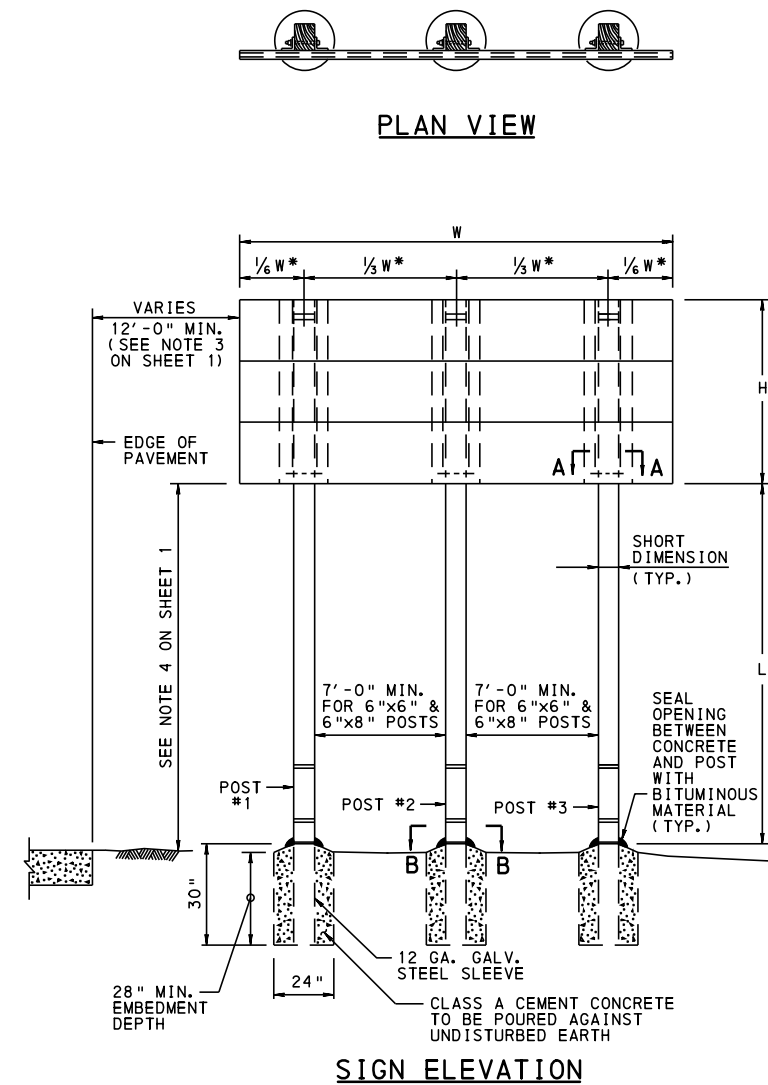
POST SELECTION TABLE - THREE POSTS					
W (FT)	L _B (FT)	HEIGHT "H" (FT)			
		2	3	4	5
27	6	P2	P3	P3	-
	7	P2	P3	P3	-
	8	P2	P3	-	-
	9	P3	P3	-	-
	10	P3	P3	-	-
	11	P3	-	-	-
	12	P3	-	-	-
	13	P3	-	-	-
	14	-	-	-	-
	15	-	-	-	-
28	6	P2	P3	P3	-
	7	P2	P3	P3	-
	8	P3	P3	-	-
	9	P3	P3	-	-
	10	P3	-	-	-
	11	P3	-	-	-
	12	P3	-	-	-
	13	P3	-	-	-
	14	-	-	-	-
	15	-	-	-	-
29	6	P2	P3	P3	-
	7	P2	P3	-	-
	8	P3	P3	-	-
	9	P3	P3	-	-
	10	P3	-	-	-
	11	P3	-	-	-
	12	P3	-	-	-
	13	-	-	-	-
	14	-	-	-	-
	15	-	-	-	-
30	6	P2	P3	P3	-
	7	P2	P3	-	-
	8	P3	P3	-	-
	9	P3	P3	-	-
	10	P3	-	-	-
	11	P3	-	-	-
	12	P3	-	-	-
	13	-	-	-	-
	14	-	-	-	-
	15	-	-	-	-

POST SELECTION EXAMPLE

FOR A SIGN WHERE

W = 22' - 0"
H = 2' - 0"
L_B = 15' - 0"

THREE P3 = 6"x8" WOOD POSTS ARE REQUIRED.



ANGLE CONNECTION BOLT SPACING	
H (FT)	SPACES
2	1 AT 6 "
3	2 AT 9 "
4	2 AT 15 "
5	3 AT 14 "

TABLE FOR HOLE SPACING

NOTES:

1. POSTS IN THE SELECTION TABLE WITH AN "*" MUST HAVE A MINIMUM CLEAR SPACING OF "0" BETWEEN POSTS BE INCREASING THE "W" SPACING. THE REMAINING SIGN WIDTH "W" SHOULD BE EQUALLY DISTRIBUTED TO THE OVERHANGS.
2. SEE SHEET 1 FOR ADDITIONAL NOTES.
3. SEE SHEET 4 FOR SECTIONS AND ERECTION DETAILS.

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS, TYPE E

WOOD POSTS
SELECTION TABLES
ERECTION DETAILS

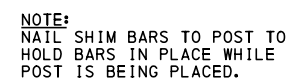
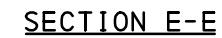
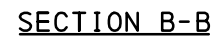
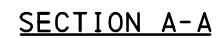
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 CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

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 TRAFFIC OPERATIONS DIVISION

SHT. 3 OF 5

TC-8702E



SHIM BAR (C)
SHIM BAR (D)



1. STEEL USED FOR SLEEVES AND SHIMS SHALL HAVE A MINIMUM YIELD STRENGTH OF 36 KSI.
2. STAINLESS STEEL BOLT, LOCKWASHER AND NUT SHALL BE AISI TYPE 304 STEEL AND MEET ASTM A320.

POST-MOUNTED SIGNS, TYPE E

WOOD POSTS
ERECTION DETAILS

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SHT. 4 OF 5

TC-8702E

POST SELECTION TABLE - TWO POSTS						
W FT	L _B FT	HEIGHT "H" IN FT				
		2	3	4	5	6
6	6	P1	P1	P1	P1	-
	7	P1	P1	P1	-	-
	8	P1	P1	P1	-	-
	9	P1	P1	-	-	-
	10	P1	P1	-	-	-
	11	P1	-	-	-	-
	12	P1	-	-	-	-
	13	P1	-	-	-	-
7	6	P1	P1	P1	-	-
	7	P1	P1	P1	-	-
	8	P1	P1	-	-	-
	9	P1	P1	-	-	-
	10	P1	-	-	-	-
	11	P1	-	-	-	-
	12	P1	-	-	-	-
	13	-	-	-	-	-
8	6	P1	P1	P1	-	-
	7	P1	P1	-	-	-
	8	P1	P1	-	-	-
	9	P1	-	-	-	-
	10	P1	-	-	-	-
	11	P1	-	-	-	-
	12	-	-	-	-	-
	13	-	-	-	-	-
9	6	P1	P1	P2 *	P3 *	P3 *
	7	P1	P1	P2 *	P3 *	P3 *
	8	P1	P2 *	P3 *	P3 *	P3 *
	9	P1	P2 *	P3 *	P3 *	P3 *
	10	P1	P2 *	P3 *	P3 *	P3 *
	11	P1	P3 *	P3 *	P3 *	-
	12	P2 *	P3 *	P3 *	-	-
	13	P2 *	P3 *	P3 *	-	-
10	6	P1	P1	P2 *	P3 *	P3 *
	7	P1	P1	P3 *	P3 *	P3 *
	8	P1	P2 *	P3 *	P3 *	P3 *
	9	P1	P2 *	P3 *	P3 *	-
	10	P1	P3 *	P3 *	P3 *	-
	11	P2 *	P3 *	P3 *	-	-
	12	P2 *	P3 *	P3 *	-	-
	13	P3 *	P3 *	-	-	-
11	6	P1	P1	P2 *	P3 *	P3 *
	7	P1	P2 *	P3 *	P3 *	P3 *
	8	P1	P2 *	P3 *	P3 *	-
	9	P1	P3 *	P3 *	P3 *	-
	10	P2 *	P3 *	P3 *	-	-
	11	P2 *	P3 *	P3 *	-	-
	12	P3 *	P3 *	-	-	-
	13	P3 *	P3 *	-	-	-
12	6	P1	P2 *	P3 *	P3 *	P3 *
	7	P1	P2 *	P3 *	P3 *	-
	8	P1	P2 *	P3 *	P3 *	-
	9	P2 *	P3 *	P3 *	-	-
	10	P2 *	P3 *	P3 *	-	-
	11	P2 *	P3 *	-	-	-
	12	P3 *	P3 *	-	-	-
	13	P3 *	P3 *	-	-	-
13	6	P1	P2	P3	P3	-
	7	P1	P2	P3	P3	-
	8	P1	P3	P3	-	-
	9	P2	P3	P3	-	-
	10	P2	P3	P3	-	-
	11	P3	P3	-	-	-
	12	P3	P3	-	-	-
	13	P3	-	-	-	-

POST SELECTION TABLE - TWO POSTS						
W FT	L _B FT	HEIGHT "H" IN FT				
		2	3	4	5	6
14	6	P1	P2	P3	P3	-
	7	P1	P2	P3	P3	-
	8	P2	P3	P3	-	-
	9	P2	P3	P3	-	-
	10	P2	P3	-	-	-
	11	P3	P3	-	-	-
	12	P3	P3	-	-	-
	13	P3	-	-	-	-
15	6	P1	P2	P3	P3	-
	7	P1	P3	P3	-	-
	8	P2	P3	P3	-	-
	9	P2	P3	-	-	-
	10	P3	P3	-	-	-
	11	P3	P3	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-
16	6	P1	P2	P3	P3	-
	7	P2	P3	P3	-	-
	8	P2	P3	P3	-	-
	9	P2	P3	-	-	-
	10	P3	P3	-	-	-
	11	P3	P3	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-
17	6	P1	P3	P3	-	-
	7	P2	P3	P3	-	-
	8	P2	P3	-	-	-
	9	P3	P3	-	-	-
	10	P3	P3	-	-	-
	11	P3	-	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-
18	6	P1	P3	P3	-	-
	7	P2	P3	P3	-	-
	8	P2	P3	-	-	-
	9	P3	P3	-	-	-
	10	P3	P3	-	-	-
	11	P3	-	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-
19	6	P2	P3	P3	-	-
	7	P2	P3	P3	-	-
	8	P2	P3	-	-	-
	9	P3	P3	-	-	-
	10	P3	-	-	-	-
	11	P3	-	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-
20	6	P2	P3	P3	-	-
	7	P2	P3	-	-	-
	8	P3	P3	-	-	-
	9	P3	P3	-	-	-
	10	P3	-	-	-	-
	11	P3	-	-	-	-
	12	P3	-	-	-	-
	13	P3	-	-	-	-

* SEE NOTE 1.

POST SELECTION EXAMPLE

FOR A SIGN WHERE

W = 6'

H = 2'

L_B = 13'

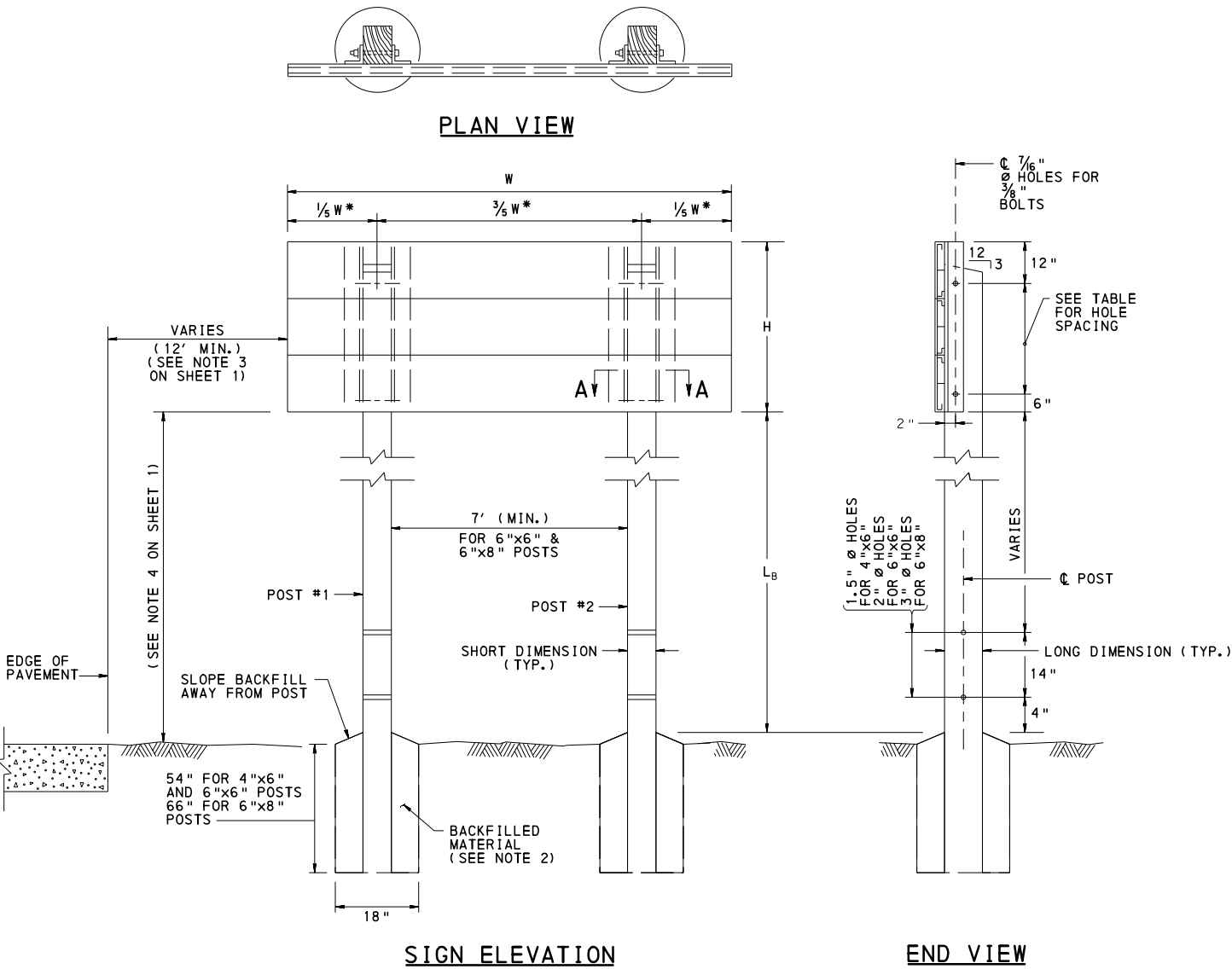
TWO P1 = 4"x6" WOOD POSTS ARE REQUIRED.

LEGEND:

P1 = 4"x6"

P2 = 6"x6"

P3 = 6"x8"



- NOTES:
- POSTS IN THE SELECTION TABLE WITH AN "*" MUST HAVE A MINIMUM CLEAR SPACING OF 7' BETWEEN POSTS BY INCREASING THE 3/5 W SPACING. THE REMAINING SIGN WIDTH "W" SHOULD BE EQUALLY DISTRIBUTED TO THE OVERHANGS.
 - DRILL OR EXCAVATE A HOLE OF SUITABLE DIMENSIONS AND DEPTH TO PLACE THE POST AT GRADE. SET THE POST AND BACKFILL TO THE GROUND LINE USING ACCEPTABLE EMBANKMENT MATERIAL, THOROUGHLY COMPACTED IN 6" LAYERS.
 - FOR POST-MOUNTED SIGNS, THE MINIMUM LATERAL OFFSET SHOULD BE 12 FT FROM THE EDGE OF THE TRAVEL WAY. IF A SHOULDER WIDER THAN 6 FT EXISTS, THE MINIMUM LATERAL OFFSET FOR POST-MOUNTED SIGNS SHOULD BE 6 FT FROM THE EDGE OF THE SHOULDER.
 - LESSER LATERAL OFFSET MAY BE USED ON CONNECTIN ROADWAYS OR RAMPS AT INTERCHANGES, BUT NOT LESS THAN 6 FT FROM THE EDGE OF THE TRAVELD WAY.
 - ON CONVENTIONAL ROADS A 2-FOOT LATERAL OFFSET IS PERMITTED WHEN IT IS IMPRACTICAL TO LOCATE THE SIGN WITH THE PRESCRIBED OFFSET.
 - A LATERAL OFFSET OF 1 FOOT FROM THE FACE OF THE CURB MAY BE USED IN BUSINESS, COMMERCIAL OR RESIDENTIAL AREAS WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.
 - OVERHEAD SIGN SUPPORTS AND POST-MOUNTED SIGN AND OBJECT MARKERS SUPPORTS SHOULD NOT INTRUDE INTO THE USABLE WIDTH OF A SIDEWALK OR OTHER PEDESTRAIN FACILITY.
 - SEE SHEET 1 FOR ADDITIONAL NOTES.
 - SEE SHEET 4 FOR SECTIONS AND ERECTION DETAILS.

ANGLE CONNECTION BOLT SPACING	
H (FT)	SPACES
2	1 AT 6"
3	2 AT 9"
4	2 AT 15"
5	3 AT 14"
6	3 AT 18"

TABLE FOR HOLE SPACING

COMMONWEALTH OF PENNSYLVANIA

DEPARTMENT OF TRANSPORTATION

BUREAU OF MAINTENANCE AND OPERATIONS

POST-MOUNTED SIGNS, TYPE E

WOOD POSTS - DIRECT BURIAL

ERECTION DETAILS

TEMPORARY USE ONLY

RECOMMENDED JUN. 13, 2013

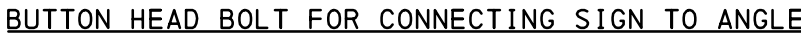
CHIEF TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013

CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

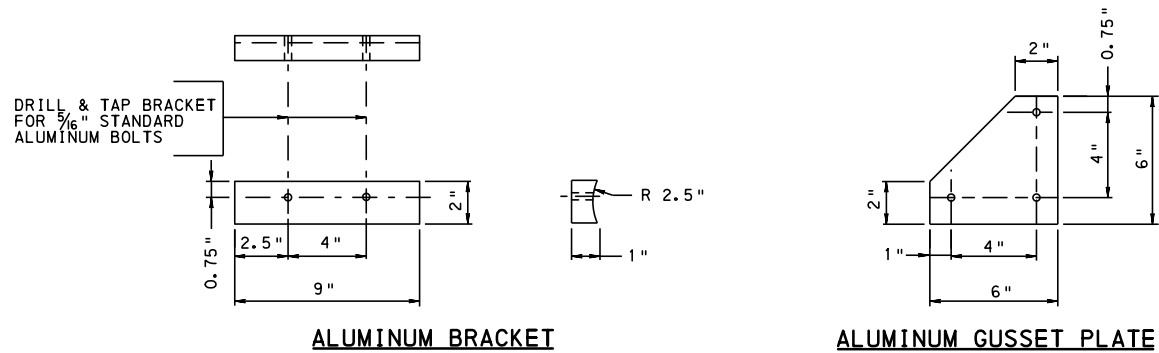
SHT. 5 OF 5

TC-8702E

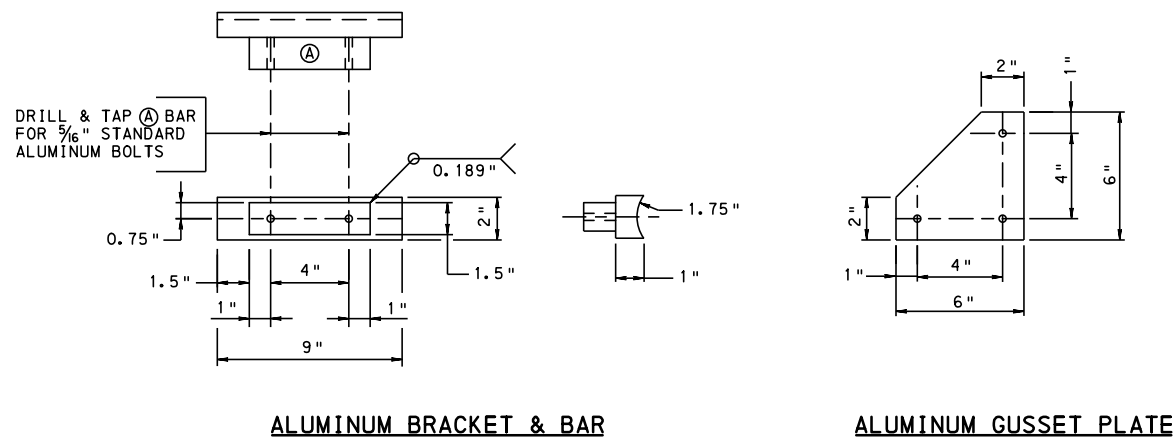


1. IT SHALL BE THE RESPONSIBILITY OF THE ENGINEER TO ACCURATELY ESTABLISH THE LOCATION OF EACH DISTANCE MARKER.
2. MEASUREMENTS TO ACCURATELY ESTABLISH THE LOCATION OF DISTANCE MARKERS IN INCREMENTS OF 1 MILE WILL BE TAKEN ALONG THE OUTSIDE EDGE OF THE PAVEMENT OF NORTHBOUND OR EASTBOUND ROADWAYS ONLY. DISTANCE MARKERS ON SOUTHBOUND OR WESTBOUND ROADWAYS SHALL BE ERECTED OPPOSITE TO THE DISTANCE MARKER LOCATIONS ESTABLISHED ON THE NORTHBOUND OR EASTBOUND ROADWAYS.

TYPICAL LOCATION OF DISTANCE MARKERS



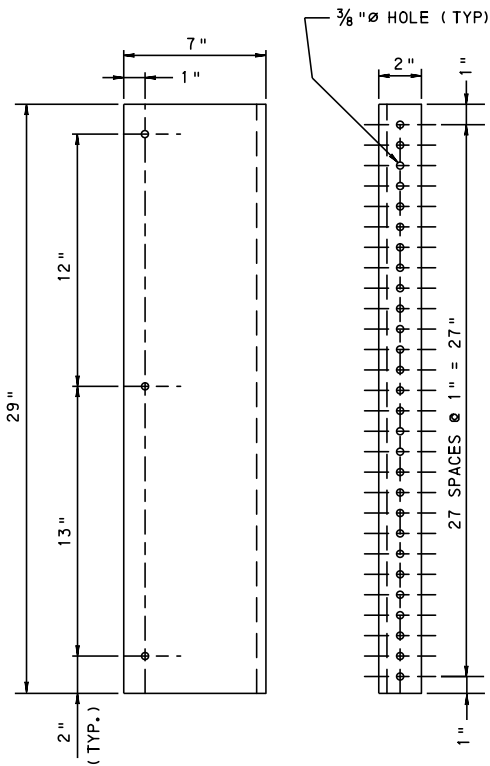
DETAILS FOR TOP RAIL



DETAILS FOR BOTTOM RAIL

NOTES:

1. ALL MATERIAL SHALL BE ALUMINUM ALLOY, UNLESS OTHERWISE NOTED, AND SHALL CONFORM TO THE APPROPRIATE ASTM DESIGNATION AND TEMPER AS SPECIFIED IN PUBLICATION 408.
2. ALL STAINLESS STEEL STRAPS AND CLAMPS SHALL CONFORM TO ASTM A167.
3. ALL MATERIALS AND WORKSMANSHIP SHALL BE IN ACCORDANCE WITH PUBLICATION 408.
4. DISTANCE MARKERS WHICH ARE NOT ON BRIDGES SHALL BE INSTALLED ON TYPE B SIGN POSTS AT A 4'-0" HEIGHT.



SIGN SUPPORT

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

DISTANCE MARKERS

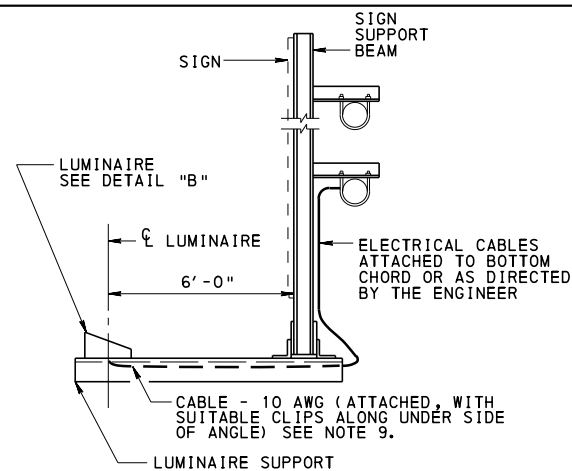
RECOMMENDED JUN. 13, 2013

 CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

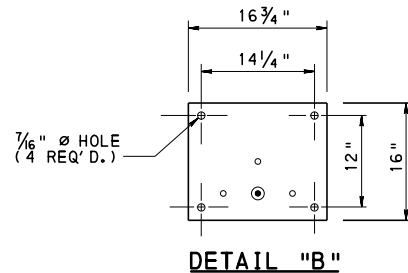
RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
 CHIEF, HIGHWAY SAFETY AND
 TRAFFIC OPERATIONS DIVISION

SHT. 1 OF 1

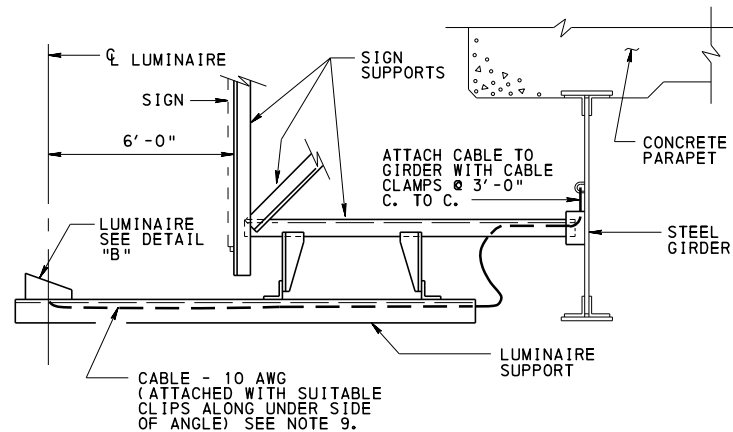
C-8710



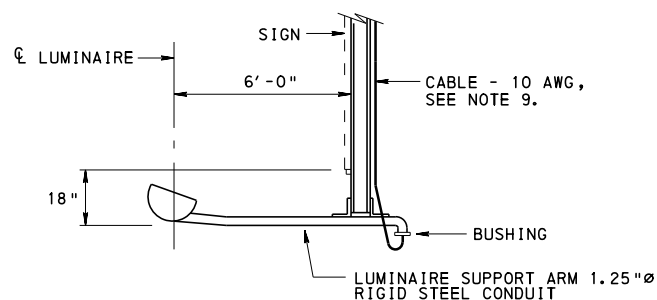
**TYPICAL BRACKET MOUNTED LUMINAIRE
ON SIGN STRUCTURE**



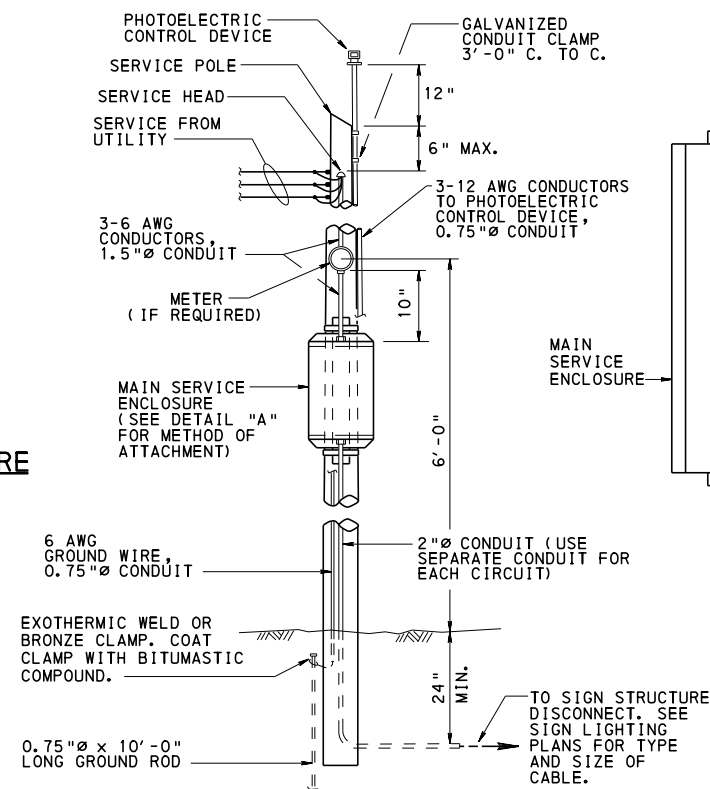
LUMINAIRE MOUNTING BRACKET



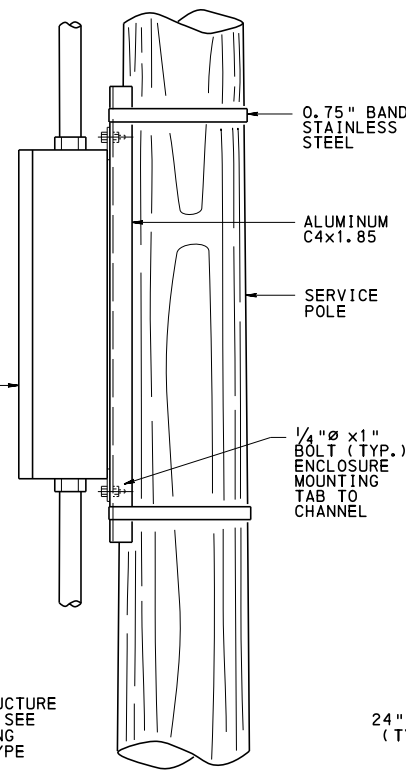
**TYPICAL BRACKET MOUNTED LUMINAIRE
ON OVERPASS BRIDGE,
BRIDGE - MOUNTED SIGN**



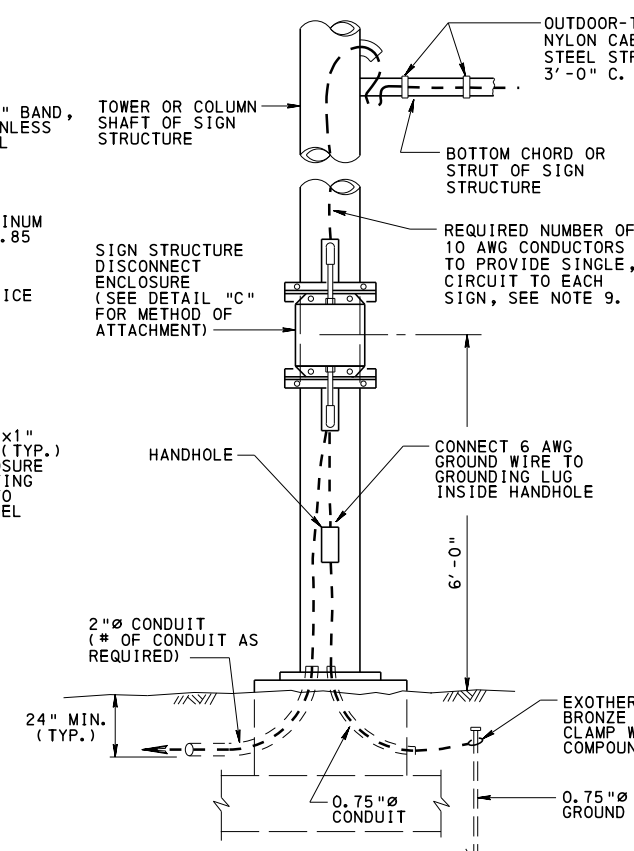
**TYPICAL CONDUIT MOUNTED LUMINAIRE
ON SIGN STRUCTURE***



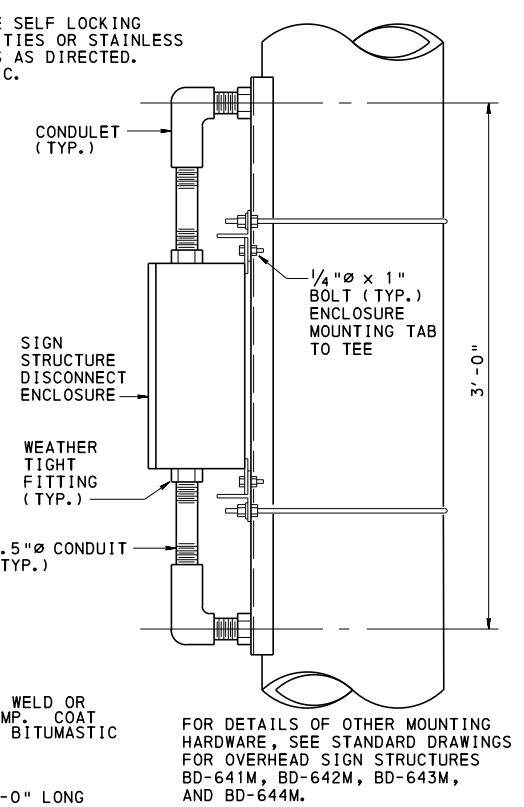
MAIN SERVICE ON SERVICE POLE



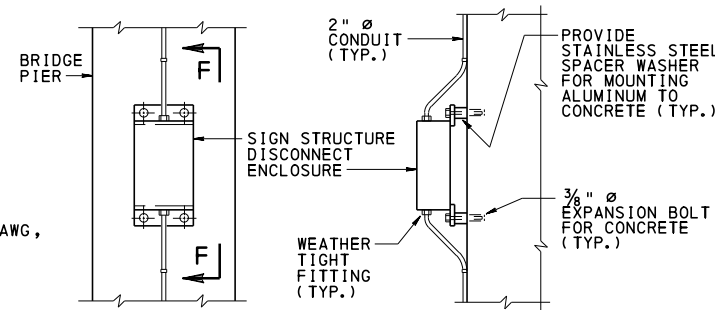
DETAIL "A"



SIGN STRUCTURE DISCONNECT



DETAIL "C"



DETAIL "G"

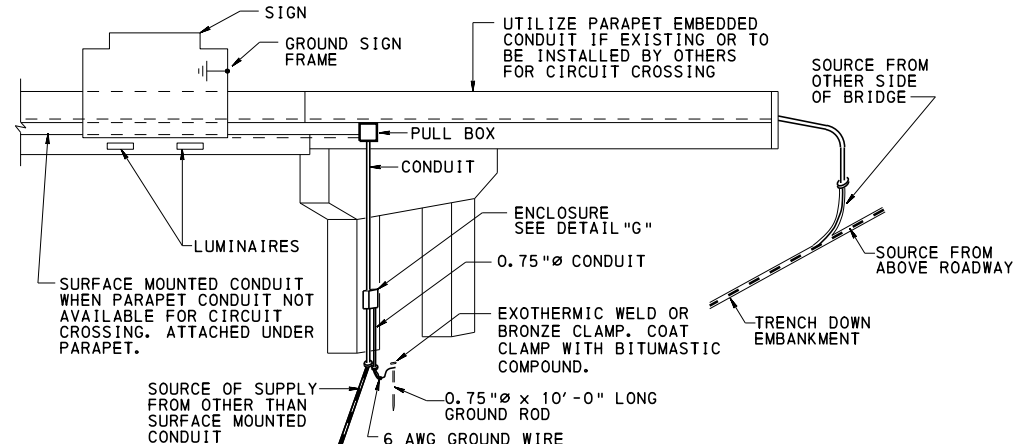
SECTION F-F

NOTES:

1. PROVIDE COPPER ELECTRIC CONDUCTORS. INCLUDE EQUIPMENT GROUNDING CONDUCTOR WITH ALL CIRCUITS. PROVIDE WITH SAME INSULATION AND SIZE AS CIRCUIT CONDUCTORS.
2. ELECTRIC COMPANY SERVICE DROPS ARE MADE TO THE SERVICE POLE, UNLESS OTHERWISE SPECIFIED, MEETING THE ELECTRIC COMPANY REQUIREMENTS. WHEN SERVICE DROP IS TO SIGN STRUCTURE, THE SIGN STRUCTURE ENCLOSURE WILL CONTAIN ALL NECESSARY SERVICE AND BRANCH CIRCUIT EQUIPMENT.
3. BOND THE EQUIPMENT GROUNDING CONDUCTOR TO THE GROUNDING LUG PROVIDED IN THE HANDHOLE OF THE SIGN STRUCTURE. DO NOT CONNECT N TO G EXCEPT AT SERVICE LOCATION.
4. GROUND THE SIGN FRAME OF OVERPASS BRIDGE-MOUNTED SIGNS.
5. SIGN STRUCTURE DISCONNECT MAY BE OMITTED WHEN THE MAIN SERVICE IS WITHIN 50 FT. OF THE SIGN STRUCTURE. PROVIDE BRANCH CIRCUIT PROTECTION WITHIN THE MAIN SERVICE ENCLOSURE.
6. MOUNT EACH REMOTE BALLAST ON THE SIGN SUPPORT STRUCTURE AND IDENTIFY THE SIGN AND LUMINAIRE SERVED. MOUNT OVER SHOULDER WHEN FEASIBLE.
7. PROVIDE ALUMINUM, STAINLESS STEEL OR GALVANIZED STEEL HARDWARE, CONDUITS, BOLTS, ETC. ASSOCIATED WITH MOUNTING ENCLOSURE FOR MAIN SERVICE AND SIGN STRUCTURE DISCONNECT.
8. FOR DETAILS OF LUMINAIRE SUPPORTS, SEE STANDARD DRAWINGS BD-641M, BD-642M, BD-643M AND BD-644M.
9. PROVIDE 10 AWG, 2 CONDUCTOR, TYPE TC CABLE FROM THE SIGN ENCLOSURE TO THE LUMINAIRES.

*** NOTE:**
LUMINAIRE MOUNTED ON CONDUIT NOT PERMITTED IF LUMINAIRE WEIGHT IS GREATER THAN 20 LB. OTHERWISE MOUNT LUMINAIRE ON ANGLE SUPPORTS.

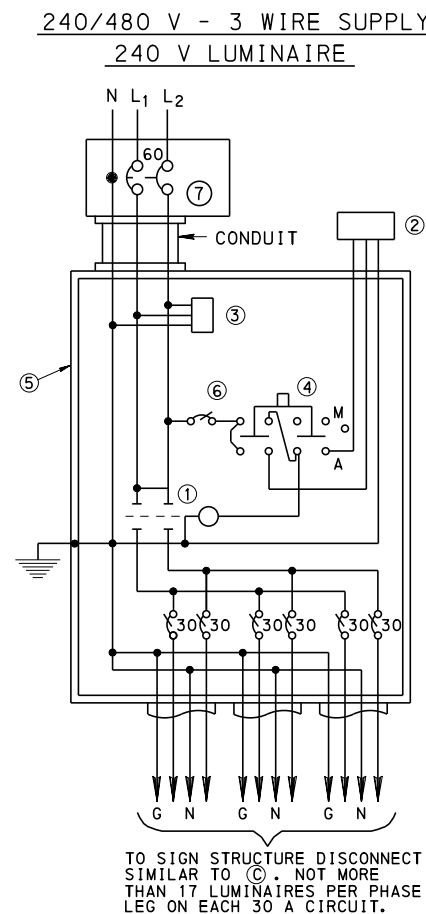
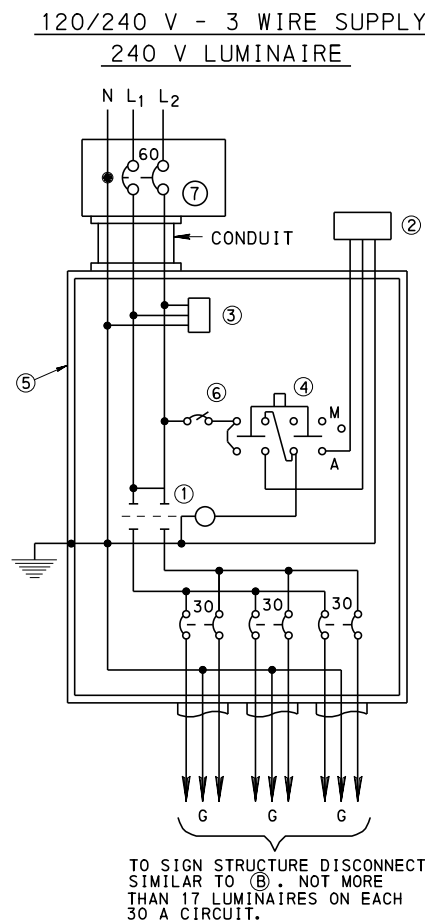
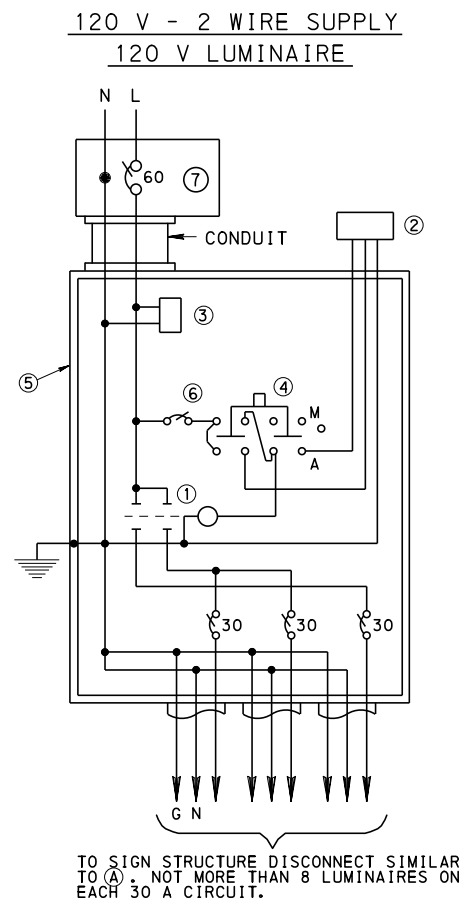
**TYPICAL CONDUIT MOUNTED LUMINAIRE
ON SIGN STRUCTURE WITH CATWALK***



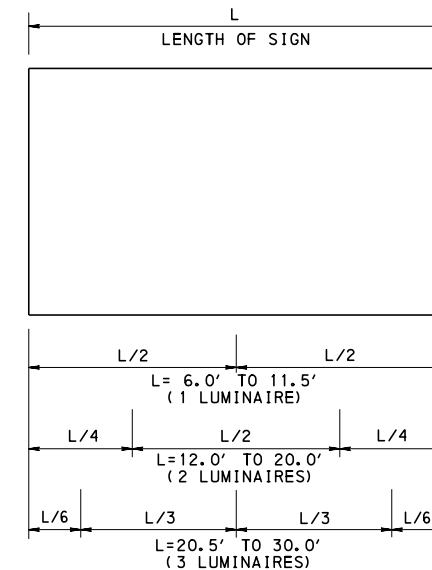
**TYPICAL SERVICE FOR LUMINAIRE
ON OVERPASS BRIDGE - MOUNTED SIGN**

**COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS**

SIGN LIGHTING



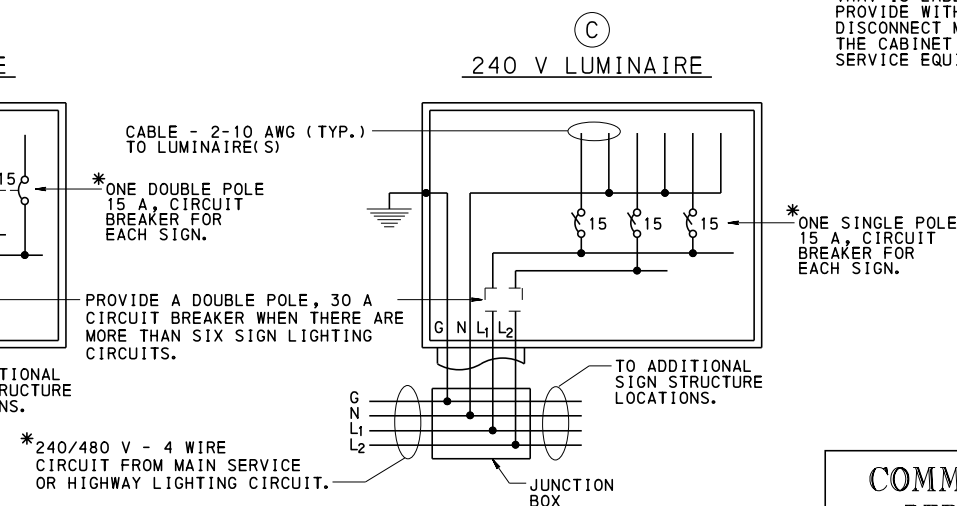
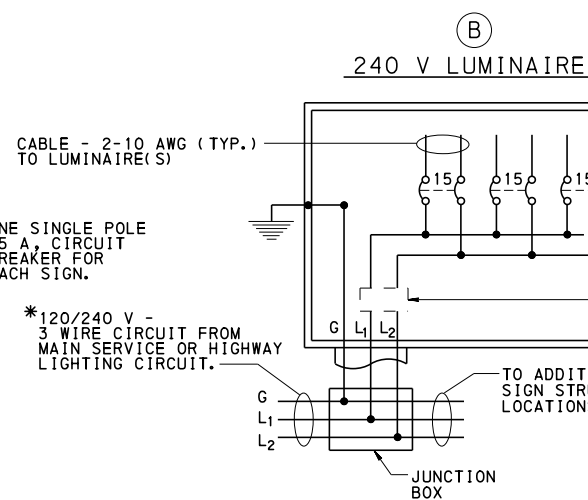
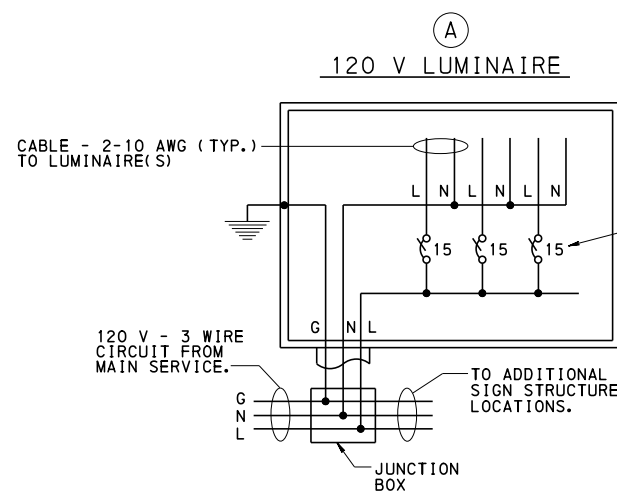
- ① TWO POLE, 60 A, LIGHTING CONTACTOR
- ② PHOTOELECTRIC CONTROL DEVICE
- ③ LIGHTNING ARRESTOR
- ④ SELECTOR SWITCH (MANUAL-OFF-AUTO.)
- ⑤ ENCLOSURE
- ⑥ 15 A, SINGLE POLE CIRCUIT BREAKER
- ⑦ SERVICE DISCONNECT



QUANTITY AND LOCATION OF LUMINAIRES

NOTES:

1. PROVIDE A CIRCUIT BREAKER FOR THE MAIN DISCONNECT UNLESS THE POWER COMPANY REQUIRES FUSES.
2. PROVIDE A MAIN DISCONNECT IN A SEPARATE NEMA 3R OR 4 ENCLOSURE THAT IS LABELED AS "SUITABLE FOR USE AS SERVICE EQUIPMENT". PROVIDE WITH A LOCKABLE COVER AND NO EXTERNAL HANDLE. THE DISCONNECT MAY BE PROVIDED INTEGRAL TO THE CONTROL CABINET IF THE CABINET IS DEAD FRONT AND LABELED AS "SUITABLE FOR USE AS SERVICE EQUIPMENT".

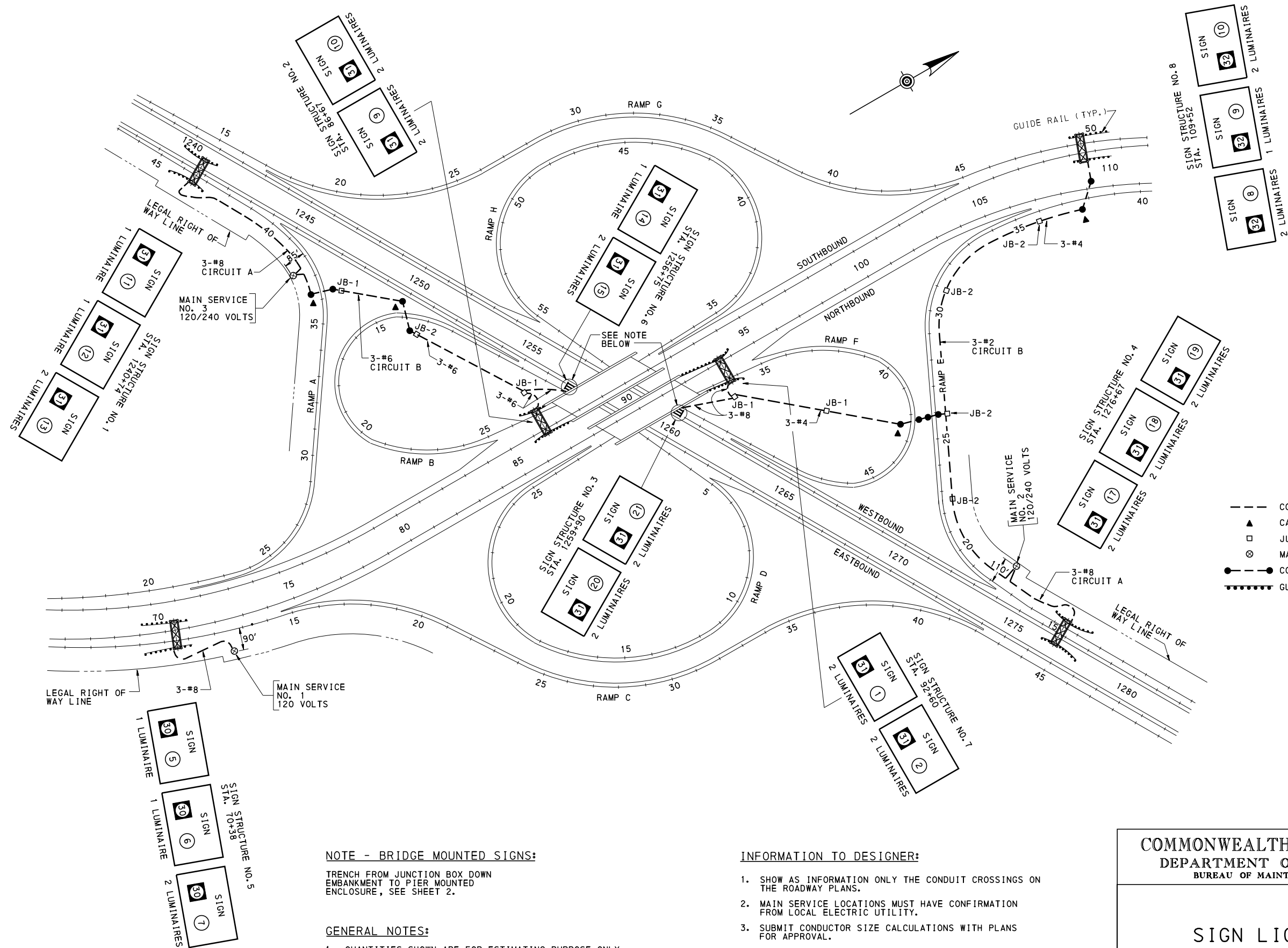


*FOR PROPER PHASE LEG CONNECTION, SEE SIGN LIGHTING PLAN OR HIGHWAY LIGHTING CIRCUIT SCHEMATIC, AS APPLICABLE.

SIGN STRUCTURE DISCONNECT (TYPICAL)

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF TRANSPORTATION
BUREAU OF MAINTENANCE AND OPERATIONS

SIGN LIGHTING



NOTE - BRIDGE MOUNTED SIGNS:

TRENCH FROM JUNCTION BOX DOWN EMBANKMENT TO PIER MOUNTED ENCLOSURE, SEE SHEET 2.

GENERAL NOTES:

1. QUANTITIES SHOWN ARE FOR ESTIMATING PURPOSE ONLY.
2. COMPLY WITH STANDARD SPECIFICATIONS PUBLICATION 408, SECTIONS 920 & 1102 APPLICABLE TO MATERIAL AND WORK ON THIS PROJECT, AND THE FOLLOWING STANDARD DRAWINGS:

RC-81M HIGHWAY LIGHTING-JUNCTION BOXES-LIGHT DUTY
RC-82M HIGHWAY LIGHTING-JUNCTION BOXES-HEAVY DUTY
RC-84M HIGHWAY LIGHTING-LIGHTING AND ELECTRIC DETAILS
TC-8715 SIGN LIGHTING

INFORMATION TO DESIGNER:

1. SHOW AS INFORMATION ONLY THE CONDUIT CROSSINGS ON THE ROADWAY PLANS.
2. MAIN SERVICE LOCATIONS MUST HAVE CONFIRMATION FROM LOCAL ELECTRIC UTILITY.
3. SUBMIT CONDUCTOR SIZE CALCULATIONS WITH PLANS FOR APPROVAL.
4. LOCATE MAIN SERVICE OUTSIDE CLEAR ZONE AS FAR FROM ROADWAY AS PRACTICAL.
5. SIGN LIGHTING MAY NOT BE REQUIRED ON ALL OVERHEAD SIGNS. SEE STANDARD DRAWING TC-8701A FOR EXCEPTIONS.
6. WHEN NOT INCLUDED IN OTHER CONTRACTS, PROVIDE FOR SEEDING AND MULCHING OF BACKFILLED TRENCH AND OTHER DISTURBED AREAS.

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**SIGN LIGHTING PLAN
(SAMPLE DRAWING)**

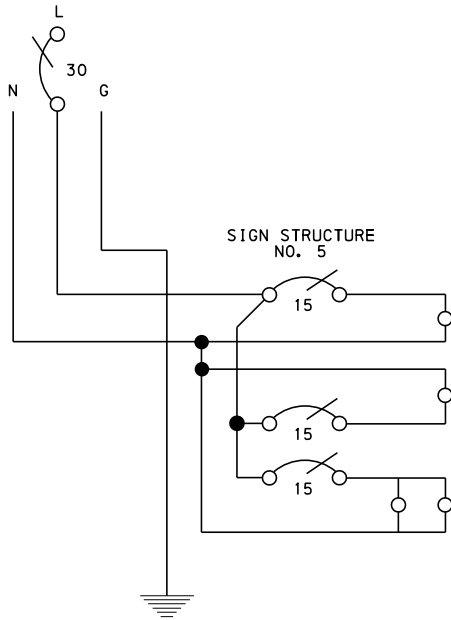
RECOMMENDED JUN. 13, 2013
John C. Rowe
CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION

RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION

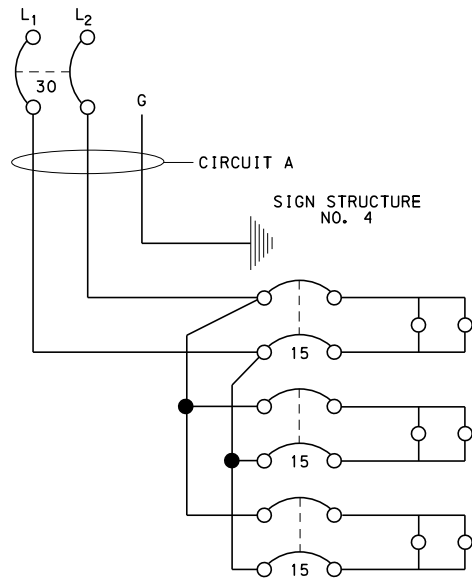
SHT. 3 OF 4

TC-8715

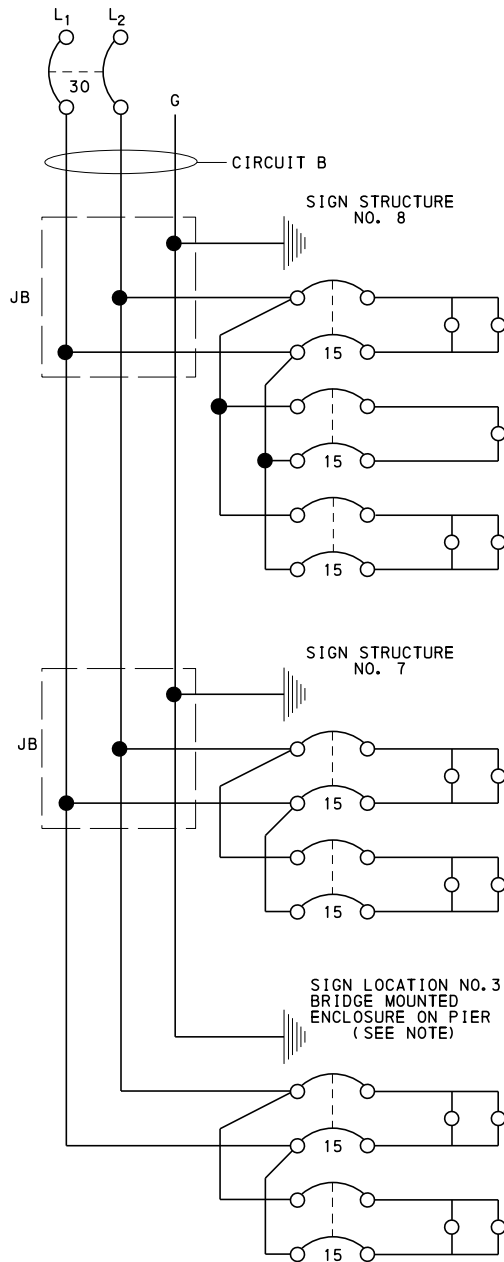
MAIN SERVICE NO.1
120 V - 2 WIRE SUPPLY



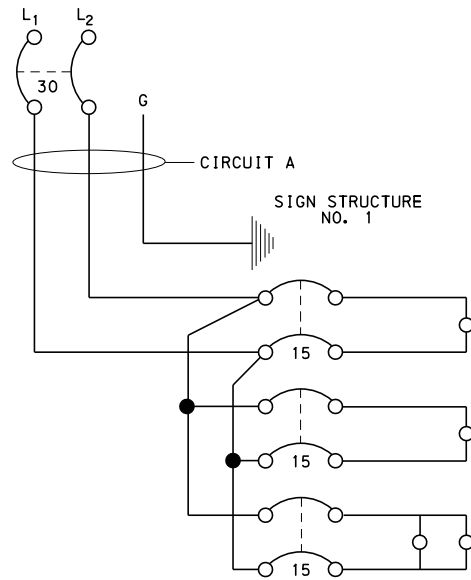
MAIN SERVICE NO.2
120/240 V - 3 WIRE SUPPLY



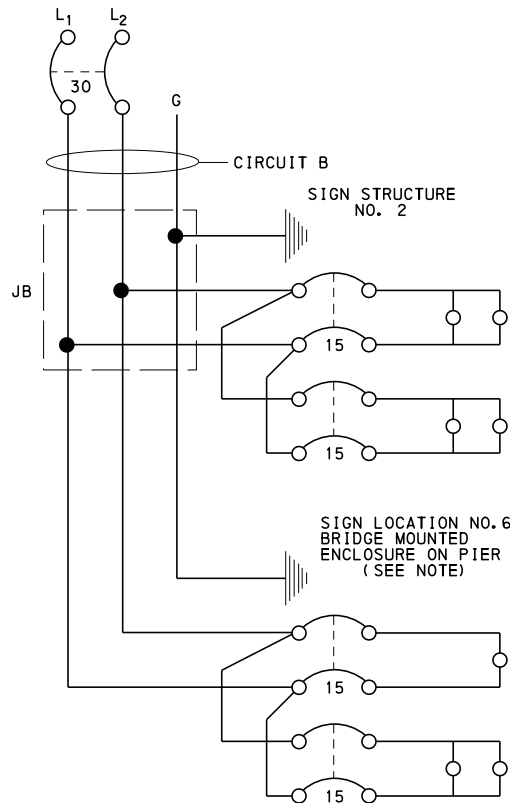
MAIN SERVICE NO.2
120/240 V - 3 WIRE SUPPLY



MAIN SERVICE NO.3
120/240 V - 3 WIRE SUPPLY



MAIN SERVICE NO.3
120/240 V - 3 WIRE SUPPLY



ESTIMATE OF REQUIRED QUANTITIES

MAIN SERVICE REQUIRED QUANTITIES	M.S.#1	M.S.#2	M.S.#3	TOTAL
SERVICE POLE	1	1	1	3
METER BASE (IF REQUIRED)	1	1	1	3
SERVICE DISCONNECT	1	1	1	3
ENCLOSURE	1	1	1	3
WEATHERHEAD & SERVICE CLOSURE	1	1	1	3
LIGHTNING ARRESTER	1	1	1	3
PHOTOELECTRIC CELL	1	1	1	3
GROUND ROD	1	1	1	3
SELECTOR SWITCH	1	1	1	3
LIGHTING CONTACTOR, 2 POLES, 60 A	1	1	1	3
CIRCUIT BREAKER, 1 POLE, 60 A	1			1
CIRCUIT BREAKER, 2 POLES, 60 A		1	1	2
CIRCUIT BREAKER, 1 POLE, 15 A	1	1	1	3
CIRCUIT BREAKER, 1 POLE, 30 A	1			1
CIRCUIT BREAKER, 2 POLES, 30 A		2	2	4
CONDUIT, FITTINGS, MISC. HARDWARE	1	1	1	3

SIGN STRUCTURE REQUIRED QUANTITIES					
SIGN STRUCTURE	ENCLOSURE	GROUND ROD	15 A 1P, C.B.	15 A 2P, C.B.	100 W LUM.
1	1	1		3	4
2	1	1		2	4
3	1*	1		2	4
4	1	1		3	6
5	1	1	3		4
6	1*	1		2	3
7	1	1		2	4
8	1	1		3	5
TOTAL	8	8	3	17	34

* BRIDGE MOUNTED SIGNS - ENCLOSURE MOUNTED ON BRIDGE PIER, SEE SHEET 1.

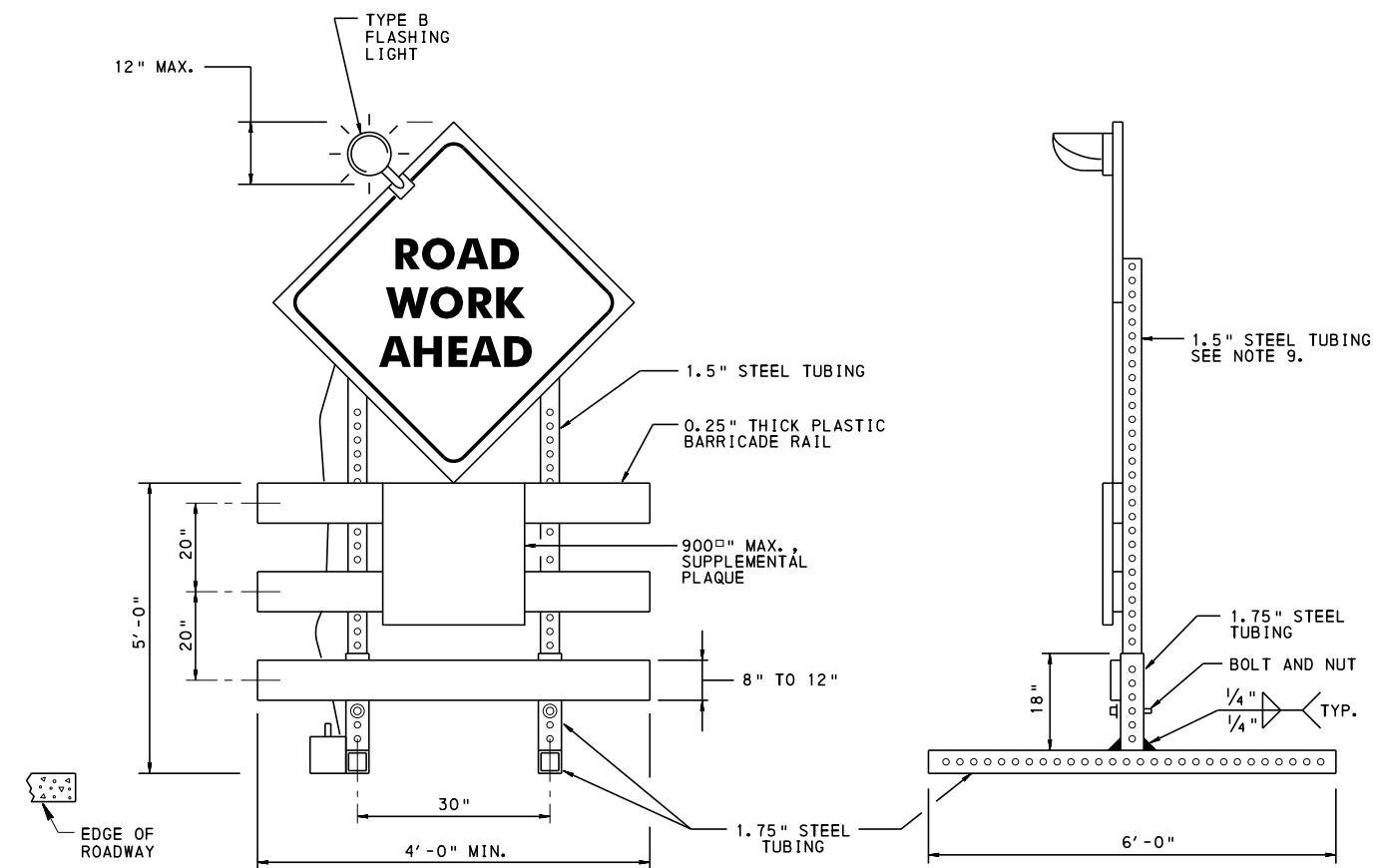
CIRCUIT REQUIRED QUANTITIES - ENTIRE		
ITEM	QUANTITY	REMARKS
AWG 2, UNDERGROUND CABLE, COPPER, 1 CONDUCTOR	2190 FT.	
AWG 4, UNDERGROUND CABLE, COPPER, 1 CONDUCTOR	6588 FT.	
AWG 6, UNDERGROUND CABLE, COPPER, 1 CONDUCTOR	4350 FT.	
AWG 8, UNDERGROUND CABLE, COPPER, 1 CONDUCTOR	5090 FT.	
AWG 10, TYPE TC CABLE, COPPER, 2 CONDUCTOR	1500 FT.	FROM S.S. ENCLOSURE TO LUMINAIRE
CABLE & CONDUIT MARKER	4 EACH	
2" Ø DIRECT BURIAL CONDUIT	5730 FT.	
TRENCH	5730 FT.	
JUNCTION BOX JB-1	3 EACH	
JUNCTION BOX JB-12	6 EACH	

NOTE:

IT MAY BE MORE DESIRABLE TO USE ONE COMMON ENCLOSURE ON NEARBY SIGN STRUCTURE COLUMN FOR BOTH THE STRUCTURE SIGN AND THE BRIDGE-MOUNTED SIGN IN LIEU OF A SEPARATE ENCLOSURE MOUNTED ON THE BRIDGE PIER AS SHOWN ON SHEET 1, IF THIS OPTION IS DESIRED, IT MUST BE CLEARLY SPECIFIED ON THIS SHEET. IN THE SAMPLE, ENCLOSURES FOR SIGN LOCATIONS 3 AND 6 WOULD NOT BE SPECIFIED AND A NOTE EXPLAINING THE OMISSION WOULD BE NECESSARY.

COMMONWEALTH OF PENNSYLVANIA
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SIGN LIGHTING
(SAMPLE DRAWING)



SKID-MOUNTED METAL SIGN SUPPORT

NOTES:

1. PROVIDE SIGN MATERIALS MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 1103.4.
2. DIAMOND, RECTANGULAR, OCTAGONAL AND TRIANGULAR SIGNS ARE PERMITTED. WHILE HAVING NO MAXIMUM AREA, THE MAXIMUM WEIGHT OF THE SIGN MAY NOT EXCEED 25 LB.
3. MINIMUM MOUNTING HEIGHT TO TOP OF ALL SIGNS IS 128".
4. SUPPLEMENTAL PLAQUE IS TO BE MOUNTED AS SHOWN.
5. BATTERY CASE MUST BE PLACED EITHER ON THE GROUND OR ATTACHED 20" MAXIMUM ABOVE THE GROUND TO THE POST OR BASE LEG.
6. SIGN SUBSTRATE MAY BE PLYWOOD, ALUMINUM, FLEXIBLE (ROLL-UP) ABS, ALUMINUM / PLASTIC LAMINATE, CORRUGATED POLYPROPYLENE OR POLYETHYLENE.
7. SANDBAG BALLAST SHALL BE PLACED ON THE END OF EACH LEG TO PROVIDE STABILITY.
8. SIGNS AND RAILS ARE TO BE ATTACHED WITH BOLTS AND NUTS.
9. IF TURNED 90°, RETROREFLECTIVE SHEETING MUST BE PLACED ON THE SIDES SO THAT THE BARRICADE IS CLEARLY VISIBLY TO APPROACHING DRIVERS.
10. MAXIMUM OF TWO TYPE B WARNING LIGHTS ON ALL SIGNS ARE ALLOWED WITH 24" SEPARATING LIGHTS ON ROAD CLOSED SIGNS.
11. FLASHING LIGHTS ARE OPTIONAL. WHEN USED, LIGHTS SHALL BE ATTACHED AS SHOWN AND LOCATED ON THE SIDE OF THE SIGN WHICH IS NEAREST TO TRAFFIC.
12. SIGNS SHALL REMAIN IN THE VERTICAL POSITION WHEN LOCATED WITHIN THE HIGHWAY RIGHT-OF-WAY.

COMMONWEALTH OF PENNSYLVANIA
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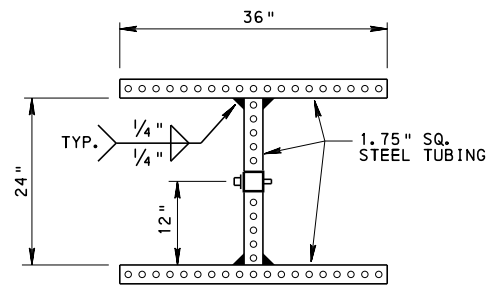
TRAFFIC CONTROL SIGNING
TYPE III BARRICADE

RECOMMENDED JUN. 13, 2013
John C. Rowe
CHIEF, TRAFFIC ENGINEERING AND
PERMITS SECTION

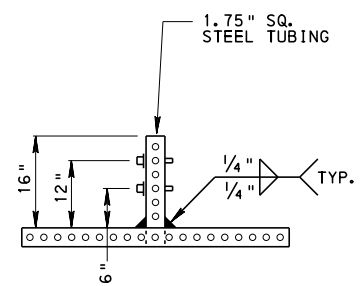
RECOMMENDED JUN. 13, 2013
Stephen J. Thumme
CHIEF, HIGHWAY SAFETY AND
TRAFFIC OPERATIONS DIVISION

SHT. 1 OF 1

TC-8716

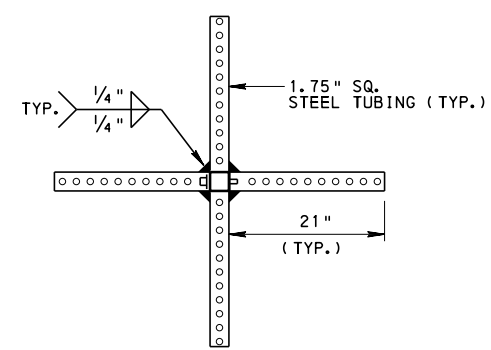


PLAN

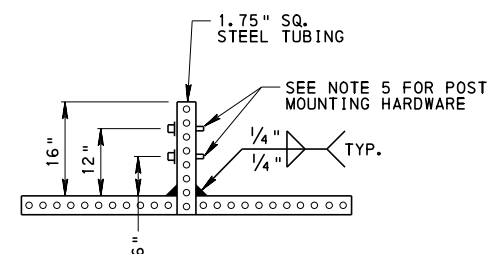


ELEVATION

"H" BASE DETAIL



PLAN

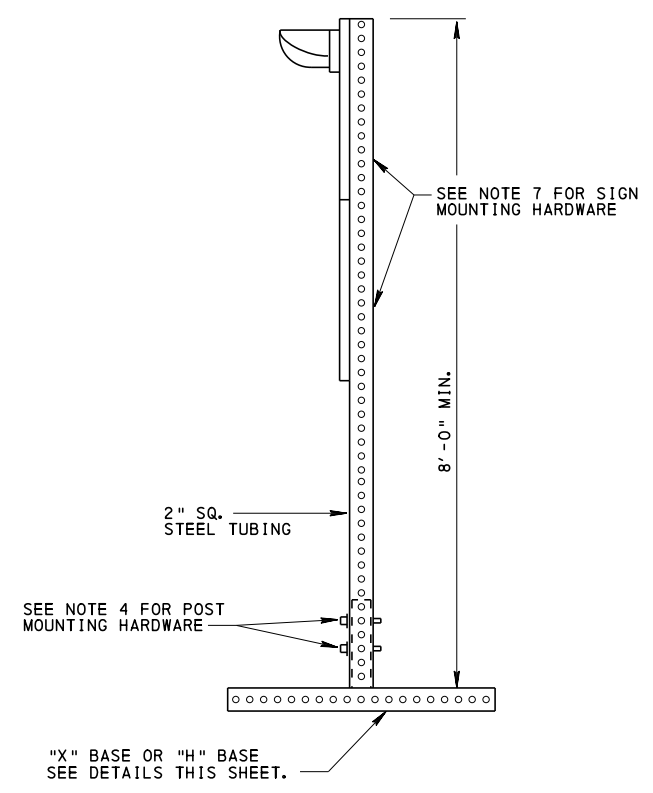
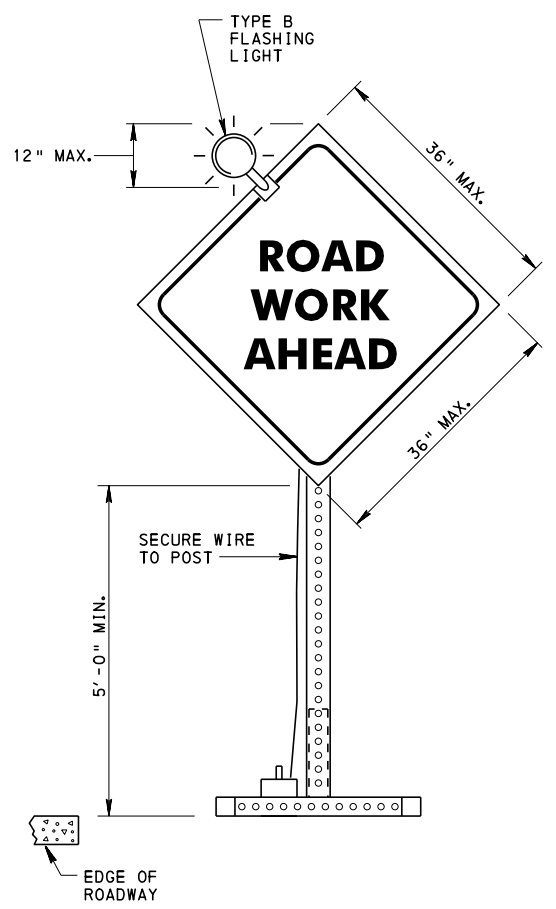


ELEVATION

"X" BASE DETAIL

NOTES:

1. PROVIDE SIGN MATERIALS MEETING THE REQUIREMENTS OF PUBLICATION 408, SECTION 1103.4.
2. DIAMOND, RECTANGULAR, OCTAGONAL AND TRIANGULAR SIGNS ARE PERMITTED. THE MAXIMUM SIGN AREA SHALL NOT EXCEED 9 sq. ft.
3. BATTERY CASE MUST BE PLACED EITHER ON THE GROUND OR ATTACHED 20" MAXIMUM ABOVE THE GROUND TO THE POST OR BASE LEG.
4. SIGN SUBSTRATE MAY BE PLYWOOD, ALUMINUM, ALUMINUM / PLASTIC LAMINATE, CORRUGATED POLYPROPYLENE OR POLYETHYLENE, MAX. WEIGHT 15 lbs.
5. POST, 2" STEEL TUBING SLIDES OVER BASE STUB, 1.75" STEEL TUBING FASTENED WITH $\frac{5}{16}$ " DIAMETER $2\frac{1}{4}$ " LONG STAINLESS STEEL OR GRADE 5 ZINC PLATED BOLTS AND NYLON INSERT LOCK NUTS. USE $\frac{3}{8}$ " STEEL AND NYLON WASHERS UNDER BOTH THE BOLT AND NUT.
6. SANDBAG BALLAST SHALL BE PLACED ON THE END OF EACH LEG TO PROVIDE STABILITY.
7. SIGN PANEL IS PLACED ON THE VERTICAL SIGN POST WITH TOP EDGE ALIGNED WITH POST TOP END AND FASTENED WITH $\frac{5}{16}$ " DIAMETER $2\frac{1}{4}$ " LONG NYLON 6/6 FULLY THREADED HEX HEADED BOLTS AND NYLON INSERT LOCK NUTS. USE $\frac{3}{8}$ " STEEL AND NYLON WASHERS UNDER BOTH THE BOLT AND NUT.
8. MAXIMUM OF TWO TYPE B WARNING LIGHTS ON ALL SIGNS ARE ALLOWED WITH 24" SEPARATING LIGHTS ON ROAD CLOSED SIGNS.
9. NCHRP 350 TEST LEVEL 3 CRASH TESTED AND APPROVED.
10. FLASHING LIGHTS ARE OPTIONAL. WHEN USED, LIGHTS SHALL BE ATTACHED AS SHOWN AND LOCATED ON THE SIDE OF THE SIGN WHICH IS NEAREST TO TRAFFIC.
11. SIGNS SHALL REMAIN IN THE VERTICAL POSITION WHEN LOCATED WITHIN THE HIGHWAY RIGHT-OF-WAY.



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF TRANSPORTATION BUREAU OF MAINTENANCE AND OPERATIONS		
TEMPORARY PORTABLE SIGN POST		
"H" BASE AND "X" BASE		
RECOMMENDED JUN. 13, 2013 <i>John C. Rowe</i> CHIEF, TRAFFIC ENGINEERING AND PERMITS SECTION	RECOMMENDED JUN. 13, 2013 <i>Stephen J. Thumme</i> CHIEF, HIGHWAY SAFETY AND TRAFFIC OPERATIONS DIVISION	SHT. 1 OF 1 TC-8717