SPECIFICATIONS AND NOTES APPLICABLE TO ALL GROUND MOUNTED SIGNS DRAWINGS:

DESIGN SPECIFICATIONS:

DESIGN – FOR SIGNS WHICH EXCEED THE TABULATED LENGTH (L) OR HEIGHT (H) IN TABLE 1, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF THE SIGN PANEL, SIGN SUPPORTS AND SIGN FOUNDATION, AND SUBMITAL OF SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER. DESIGN SHALL BE MADE USING THE AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS" – SECOND DRAFT, MAY 1998, OR LATER DRAFTS OF SAID SPECIFICATION. THE CONTRACTOR SHALL USE FOR THE DESIGN THE FOLLOWING DESIGN PARAMETERS:

- WIND SPEED ..... 125 MILES PER HOUR
- WIND IMPORTANCE FACTOR (IR) 1.00
- GUST EFFECT FACTOR (G) 1.14
- SNOW AND ICE LOADS NEED NOT BE USED.

WELDING – FOR WELDING REFER TO THE LATEST EDITIONS OF THE AWS STRUCTURAL WELDING CODE. FOR STEEL AND ALUMINUM REFER TO THE AASHTO STANDARD SPECIFICATION FOR WELDING STRUCTURAL STEEL HIGHWAY BRIDGES.

MATERIALS SPECIFICATIONS:

ALUMINUM MATERIALS – ALL ALUMINUM MATERIALS SHALL MEET THE REQUIREMENTS OF THE ASTM B-209 ALLOYS, 5052 H-32, 5052 H-36, 5052 H-38, 5086 H-34, 5154 H-36 OR 6061 T-6. SHEETS AND PLATES SHALL MEET THE REQUIREMENTS OF B-209. EXTRUDED TUBE, BARS, RODS AND SHAPES SHALL MEET THE REQUIREMENTS OF B-221. STANDARD STRUCTURAL SHAPES SHALL MEET THE REQUIREMENTS OF B-308. SIGN PANEL SHEETS ARE TO BE DEGREASED, ETCHED AND NEUTRALIZED. NO STENSILING SHALL BE PERMITTED ON SHEETS. ALUMINUM WELDING RODS SHALL MEET THE REQUIREMENTS OF ALUMINUM ASSOCIATION FILLER WIRE.

STRUCTURAL STEEL – ALL STRUCTURAL STEEL SHALL MEET THE REQUIREMENTS OF AASHTO M 223 GRADE 36 (ASTM A 572, GRADE 36) OR AASHTO M 270 GRADE 36 (ASTM 709, GRADE 36).

REINFORCEMENT STEEL – ALL REINFORCEMENT STEEL SHALL CONFORM TO THE AUTHORITY'S STANDARD SPECIFICATION 602.

ALUMINUM BOLTS, NUTS, AND LOCK WASHERS – ALUMINUM BOLTS SHALL MEET THE REQUIREMENTS OF ALUMINUM ASSOCIATION ALLOY 024-T4 (ASTM F468M). THE BOLTS SHALL HAVE AN ANODIC COATING AT LEAST 0.005 MM THICK AND BE CHROMATE SEALED. LOCK WASHERS SHALL MEET THE REQUIREMENTS OF ALUMINUM ASSOCIATION ALLOY 7075-T6 (ASTM B221M). NUTS SHALL MEET THE REQUIREMENTS OF ALUMINUM ASSOCIATION ALLOY 6061-T6 OR 6262-T9 (ASTM F467M).

STEEL BOLTS, NUTS, AND WASHERS – ALL BOLTS, NUTS AND WASHERS, EXCEPT THOSE USED IN THE HINGE, FUSE AND BASE CONNECTIONS, SHALL BE CLASS 9.8 MANUFACTURED ACCORDING TO THE GEOMETRIC SPECIFICATIONS INCLUDED IN ANSI B18.2.3.5M USING MATERIAL CONFORMING TO ASTM F568 CLASS 9.8 (900 MPa TENSILE STRENGTH AND 720 MPa YIELD STRENGTH). THREADS SHALL CONFORM TO ANSI B1.13M CLASS 6g. BOLT HEADS SHALL BE MARKED WITH THE SYMBOL "9.8" AND THE MANUFACTURER'S IDENTIFICATION SYMBOL AS SPECIFIED IN ASTM F568 SECTION 9. ASTM F569 CLASS 9.8 BOLTS ARE ESSENTIALLY EQUIVALENT TO SAE J429 GRADE 5 BOLTS.

NUTS SHALL BE MANUFACTURED ACCORDING TO THE DIMENSIONS AND TOLERANCES IN ANSI B18.2.4.2M SPECIFICATIONS FOR HEX NUTS. ZINC-COATED NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291M (ASTM A536M) FOR CLASS 12 NUTS. NUT THREADS SHALL CONFORM TO ANSI B1.13M CLASS 6H.

ALL BOLTS IDENTIFIED AS A307 SHALL CONFORM WITH ASTM A307 REQUIREMENTS AND BE PROVIDED WITH CORRESPONDING NUT AND WASHER. BOLTS A307 SHALL BE EITHER GRADE A OR B AND SHALL BE HOT-DIP GALVANIZED. UNLESS OTHERWISE SPECIFIED, BOLT HEAD MAY BE EITHER HEX OR CARRIAGE.

HIGH STRENGTH STEEL BOLTS, NUTS, AND WASHERS – HIGH STRENGTH BOLTS, NUTS AND WASHERS USED IN THE BASE CONNECTION, THE HINGE PLATE AND FUSE PLATE SHALL COMPLY WITH AASHTO M 164. HIGH STRENGTH BOLTS, NUTS AND WASHERS SHALL CONFORM TO THE AASHTO M-164, TYPE I, HOT DIP GALVANIZED.

TOLERANCES – ALL ABOVE MATERIALS SHALL BE IN ACCORDANCE WITH THE GOVERNING ASTM SPECIFICATIONS.

GALVANIZING – ALL STEEL SHAPES, ANGLES, TEES AND PLATES SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111 (ASTM A123). ALL BOLTS, NUTS AND WASHERS SHALL BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A 153, CLASS C.

BASE CONNECTION – HIGH STRENGTH BOLTS L2 IN THE BASE CONNECTION SHALL BE TIGHTENED ONLY TO THE TORQUE SHOWN IN THE TABLES. OVERTIGHTENING OR UNDERTIGHTENING THE BASE CONNECTION WILL NOT BE ACCEPTED. CONTRACTOR SHALL BE RESPONSIBLE FOR APPLICATION OF THE CORRECT TORQUE.

FUSE PLATE – ALL HOLES IN THE FUSE PLATE SHALL BE DRILLED. ALL PLATES CUT SHALL BE SAW CUT. METAL PROJECTION BEYOND THE PLANE OF THE PLATE WILL NOT BE PERMITTED

SIGN FACE – ALL SIGN FACE CORNERS SHALL BE ROUNDED AS INDICATED IN THE STANDARD DRAWINGS.

TORQUE – ALL BOLTS, EXCEPT IN THE BASE CONNECTION, SHALL BE TIGHTENED ONE-SIXTH TURN BEYOND NUT IS IN FULL CONTACT WITH THE PLATE OR POST.

MATERIALS SPECIFICATIONS (CONT.):

REFLECTIVE SHEETING

1. REFLECTIVE SHEETING USED ON ALL SIGNS SHALL CONFORM TO ASTM D4956, TYPE III THE BACKING SHALL BE CLASS 1 OR 2.
2. THE SIGN BACKGROUND, LEGEND AND BORDER SHALL BE APPLIED BY THE SILK SCREEN PROCESS, BY DIRECT APPLICATION OF CUT OUT CHARACTERS, OR BY THE APPLICATION OF ELECTRONIC CUTTABLE FILM, SERIES 1170, AS MANUFACTURED BY 3M OR ELECTRONIC CUTTABLE TRANSPARENT OVERLAY FILM, SERIES 4800, AS MANUFACTURED BY STIMSONITE. REGARDLESS OF THE METHOD OF FABRICATION, THE BACKGROUND, LEGEND AND BORDER SHALL MEET THE REFLECTIVITY STANDARDS OF ASTM D4956, TYPE III.
3. NO SPLICES IN THE REFLECTIVE SHEETING WILL BE PERMITTED WHEN THE SIGN HEIGHT IS 4' OR LESS. ON SIGNS WITH HEIGHTS IN EXCESS OF 4', HORIZONTAL SPLICES WILL BE PERMITTED ON 4' SPACING, WITH THE LAST SPLICE PROVIDING FOR THE REMAINING SIGN HEIGHT. THE SPLICE UPPER PANEL SHALL OVERLAP 3/8" MAX. THE LOWER PANEL
4. REFLECTIVE SHEETING FROM DIFFERENT MANUFACTURERS SHALL NOT BE MIXED WITHIN THE SAME SIGN PANEL. SIGN PANELS FABRICATED WITH REFLECTIVE SHEETING FROM DIFFERENT MANUFACTURERS SHALL NOT BE MIXED WITHIN THE SAME SIGN SUPPORT.

DIMENSIONS – ALL DIMENSIONS SHOWN ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

TABLE 1 – NUMBER AND SIZE OF SIGN BREAK-AWAY POSTS AND WIND BEAM NUMBER AND SECTION SIZE

		NUMBER OF BREAK-AWAY POSTS AND WIND BEAM SECTION SIZE					
		1 POST			2 POSTS		3 POSTS
		WIND BEAM Z 4 x 2.85			WIND BEAM Z 4 x 2.85		WIND BEAM Z 3 x 2.33
HEIGHT OF	NUMBER OF	SIGN LENGTH FT (MTS)*			SIGN LENGTH FT (MTS)*		SIGN LENGTH FT (MTS)*
SIGN FT (MTS)*	WIND BEAMS	4' (1.22)	8' (2.44)	13.8' (4.21)**	16' (4.88)	22.5' (6.86)**	28' (8.54)
4' (1.22)	2	W 6x12	W 6x12	W 8x18	W 6x12	W 8x18	W 6x12
8' (2.44)	3	W 6x12	W 8x18	W 10x33	W 8x18	W 10x22	W 10x22
12' (3.66)	4	W 8x18	W 10x33	W 12x40	W 10x33	W 10x33	W 10x33
16' (4.88)	5	W 10x22	W 12x40	W 12x53	W 12x40	W 12x53	W 12x40
20' (6.10)	6	W 10x33	W 12x53	W 12x53	W 12x53	W 12x53	W 12x53

* THE CONTRACTOR SHALL USE THE NUMBER OF POSTS AND POST SIZE TABULATED FOR A SIGN PANEL LENGTH (L) AND FOR A SIGN PANEL HEIGHT (H) EQUAL TO OR GREATER THAN THE ACTUAL SIGN PANEL LENGTH (L) AND SIGN PANEL HEIGHT (H).

** MAXIMUM LENGTH FOR THE NUMBER OF POSTS SHOWN.

GENERAL NOTE:

1. BREAK-AWAY POSTS ARE DIVIDED IN THREE SEGMENTS: TOP POST, SIGN POST AND STUB POST. EACH SEGMENT SHALL BE CONTINOUS IN LENGTH.
2. THE CONTRACTOR SHALL USE ON ALL BOLTS WHICH CONTACT THE REFLECTIVE SHEETING, A NYLON, NEOPRENE OR FIBER WASHER BETWEEN THE REFLECTIVE SHEETING SIGN FACE AND THE BOLT HEAD.
3. THE HOLES DRILLED IN SIGN PLATE AND WIND BEAM SHALL NOT EXCEED BOLT DIAMETER BY MORE THAN 1/16".

EFFECTIVE DATE: OCTOBER 2000

COMMONWEALTH OF PUERTO RICO
DEPARTMENT OF TRANSPORTATION AND PUBLIC WORKS
HIGHWAY AND TRANSPORTATION AUTHORITY

GROUND MOUNTED BREAK-AWAY SIGNS

SPECIFICATIONS AND POST SELECTION

RECOMMENDED BY:
DEPUTY EXC. DIR. FOR TRAFFIC AND TOLL ROADS
DATE: 21-SEP-00

APPROVED BY:
EXECUTIVE DIRECTOR
DATE: 26-IX-00

DATE	REVISION	BY
11-1999	GENERAL REVISION	I.V.
03-2000	ADDED GENERAL NOTES	I.V.
09-2000	ADDED MATERIAL SPECIFICATIONS	I.V.

STD. DWG. GMTS 1 OF 15