897.13 DPWH
03-01-2011

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS
OFFICE OF THE SECRETARY
MANILA

FEB 21 2011

DEPARTMENT ORDER)
No. 10)
Series of 2011 03-01-11)

SUBJECT : DPWH Standard Specification for Chevron Signs, Item 620

In line with the mandate of the Department of providing effective standards for application in the implementation of various infrastructure projects and in view of the need of setting standard specifications for chevron signs, the attached **DPWH Standard Specification for Chevron Signs, Item 620,** is hereby prescribed, for the guidance and compliance of all concerned.

This specification shall form part of the revised edition of the DPWH Standard Specifications (Volume II – Highways, Bridges and Airports).

This Order shall take effect immediately.

ROGELIO L. SINGSON
Secretary

WIN1U00484

Encl. As stated.

VMG/rpc

ITEM 620 – DPWH STANDARD SPECIFICATION FOR CHEVRON SIGNS

620.1 Description

This Item shall consist of furnishing and installing chevron signs in accordance with this Specification and to the details shown on the Plans, or as required by the Engineer.

620.2 General

620.2.1 Function

The chevron signs shall be used to guide drivers through a change in horizontal alignment of the road such as curves and less than sharp turns. Chevron signs shall also be used to supplement any of the advance warning signs, the horizontal alignment signs (W-types) or the standard guide posts and delineators.

620.2.2 Design

The chevron sign shall be a vertical rectangle. No border shall be used on the chevron sign.

The point of the arrow or chevron shall indicate the direction of travel. They shall be visible for at least 150 m to provide the road user with adequate time to react to the change in alignment. The minimum lateral offset of the chevron sign shall be 1.8 m from the edge of pavement.

The chevron signs shall be installed on the outside of the curve, set up aligned with the approaching traffic at right angle to a driver's line of sight. Two-sided chevron signs may be used on two-lane, two-way roads to guide drivers travelling in both directions.

It is recommended that the spacing of the chevron signs should allow the driver to see at least three (3) signs in view while negotiating the curve, until the change in alignment eliminates the need for the signs. (See Figure 2)

Chevron signs shall be mounted clear of roadside vegetation and clearly visible under headlight illumination by night. Chevrons should be installed 1.5m above the ground in the rural areas and 2.2m in the urban areas. The recommended spacing for the chevrons within a curve are shown in Table 620.1.

Table 620.1 - Recommended Spacing for Chevron Signs

Advisory Speed Limit (kph)	Radius (m)	Chevron Spacing (m)
≤ 20	≤ 60	12
30-50	60-120	24
60-70	120-210	36
80-90	210-300	48
> 90	> 300	60

The above spacing distances shall apply to points within the curve. Approach and departure spacing distances shall be twice those shown above. (See Figure 3 for sample illustration of the above data)

620.2.3 Types of Chevron Signs

Two (2) types of chevron signs are provided for in this Item and each type shall be used as called for on the plans. The typical sizes are shown in Table 620.2.

Table 620.2 - Types of Chevron Signs

	Type		Typical Size	Application
a.	HM-1A	-	450mm x 600mm	≤ 60 kph design speed with no visible problem
b.	HM-1B	-	600mm x 800mm	> 60 kph design speed and/or with no visibility problem (e.g. fog)

620.3 Material Requirements

620.3.1 Sign Panels

It shall conform to the requirements of Subsection 605.2.1, Sign Panels of Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

620.3.2 High Performance Reflective Sheeting

The reflective sheeting shall be weather resistant and show no appreciable cracking, blistering, crazing or dimensional change after two (2) years of unprotected outdoor exposure.

The reflective sheeting shall have high reflectivity normal to vehicle headlight dependent on the angle of incidence. The reflective material shall be sharp, no glare, and directed towards the light source of approved angle of incidence.

The reflective sheeting shall perform effectively for a minimum of seven (7) years from date of fabrication.

The reflective sheeting must retain at least 70% of its original brightness for regular and fluorescent sheeting respectively at the end of seven years. All chevron signs used for the road projects should be warranted by the sheeting manufacturer for above-stated performance.

Chevron signs shall be dated at the time of installation in order to initiate the 7-year performance warranty. A sign-dating sticker that indicates the manufacturer's name, material type/brand name with the month and year of installation should be placed at the back of the sign face.

The reflective sheeting shall consist of full cube micro-prismatic lens sheeting with an interlocking diamond seal pattern with pre-coated adhesive backing protected by a removable liner. The minimum reflective brightness value of reflective sheeting shall be in accordance with the following table.

Table 620.3 - Reflective Brightness of Traffic Signs Surfaces

	Observation Angle[2] (degrees)		
	0.2^0	0.5^0	1.0^0
For -4^0 Entrance Angle[1]			
White	570	400	120
Yellow	425	300	90
Red	114	80	24
Green	57	40	12
Blue	26	18	5.4
Fluorescent Yellow	340	240	72
Fluorescent Yellow Green	460	320	96
Fluorescent Orange	170	120	36
For 30^0 Entrance Angle[1]			
White	215	150	45
Yellow	160	112	34
Red	43	30	9
Green	21	15	4.5

Blue	10	6.8	2
Fluorescent Yellow	130	90	27
Fluorescent Yellow Green	170	120	36
Fluorescent Orange	64	45	14
For 45^0 Entrance Angle[1]			
White	100	50	25
Yellow	75	37	19
Red	20	10	5
Green	10	5	3
Blue	4.5	1.5	0.8
Fluorescent Yellow	60	30	15
Fluorescent Yellow Green	80	40	20
Fluorescent Orange	30	15	7

All units are expressed in terms of cd/lux/sq.m.

[1] Entrance Angle - The angle from the illumination axis to the retro-reflector axis. The reflector axis is an axis perpendicular to the retro-reflective surface.

[2] Observation Angle - The angle between the illumination axis and observation axis.

620.3.3 Post and Attachments

It shall conform to the applicable requirements of Subsection 605.2.3, Posts and Frames. (See Figure 1 for typical/prescribed design)

Posts required for the erection of signs shall be made of galvanized steel pipes not less than 75mm (outside diameter) x 3.25mm thick, or other sections of equivalent strength. Aluminum alloy may be used. Plastics may be considered, provided they have been suitably evaluated.

Attachments shall provide for the positive and robust connection of signs to their mounting posts. Consideration shall be given to distributing attachment loads, e.g., by the provision of suitably shaped saddles and clamps or brackets for a round post.

620.3.4 Nuts and Bolts

It shall conform to the requirements of Subsection 605.2.4, Nuts and Bolts, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

620.3.5 Concrete Foundation Blocks

It shall conform to the requirements of Subsection 605.2.5, Concrete Foundation Blocks, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

620.4 Construction Requirements

620.4.1 Excavation and Backfilling

It shall conform to the requirements of Subsection 605.3.1, Excavation and Backfilling, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

620.4.2 Erection of Posts

It shall conform to the requirements of Subsection 605.3.2, Erection of Posts, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

620.4.3 Sign Panel Installation

It shall conform to the requirements of Subsection 605.3.3, Sign Panel Installation, Item 605 – Road Sign, DPWH Standard Specifications, Volume II.

620.5 Method of Measurement

The quantities of chevron signs shall be the number of such sign of the size specified, including the necessary posts and supports, erected and accepted.

620.6 Basis of Payment

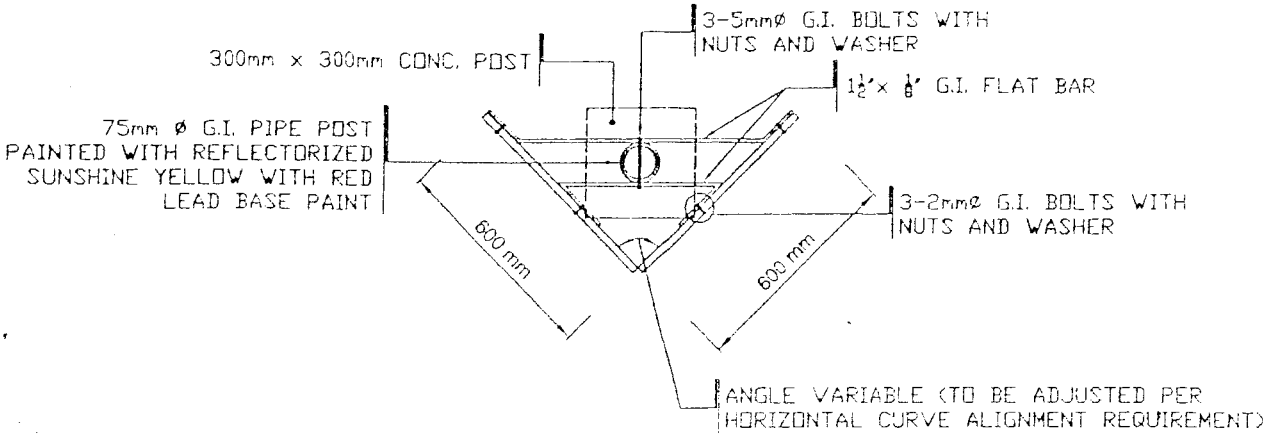
The quantities measured as determined in Section 620.5, Method of Measurement, shall be paid for at the contract unit price shown in the Bid Schedule which price and payment shall be full compensation for furnishing and installing chevron signs, for excavation, backfilling and construction of foundation blocks, and all labor, equipment, tools and incidentals necessary to complete the item.

Payment will be made under:

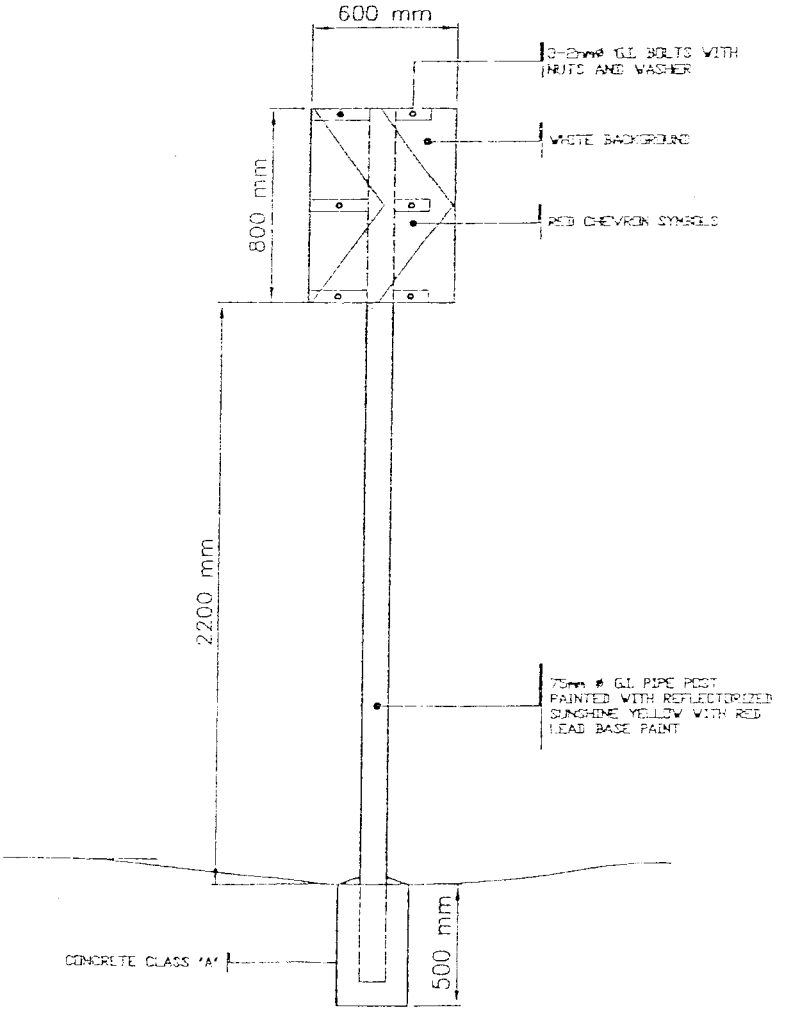
Pay Item Number	Description	Unit of Measurement
620	Chevron Signs	Each

References:

1. Road Signs and Pavement Markings Manual, 2009 Edition, Highway Safety Design Standards, DPWH
2. DPWH Standard Specifications for Highways, Bridges and Airport, Volume II, 2004 Edition
3. Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition, Federal Highway Administration, U.S. Department of Transportation
4. Internet Article: Guiding Motorists through Turns and Curves, Technology Transfer Center, New Hampshire, U.S.A.
5. Vulcan Signs Website, Vulcan, Inc.



PLAN



ELEVATION

FIGURE 1 - Detailed drawing for two (2) adjacent Chevron alignment on one (1) Instead of two (2) G.I. pipe posts

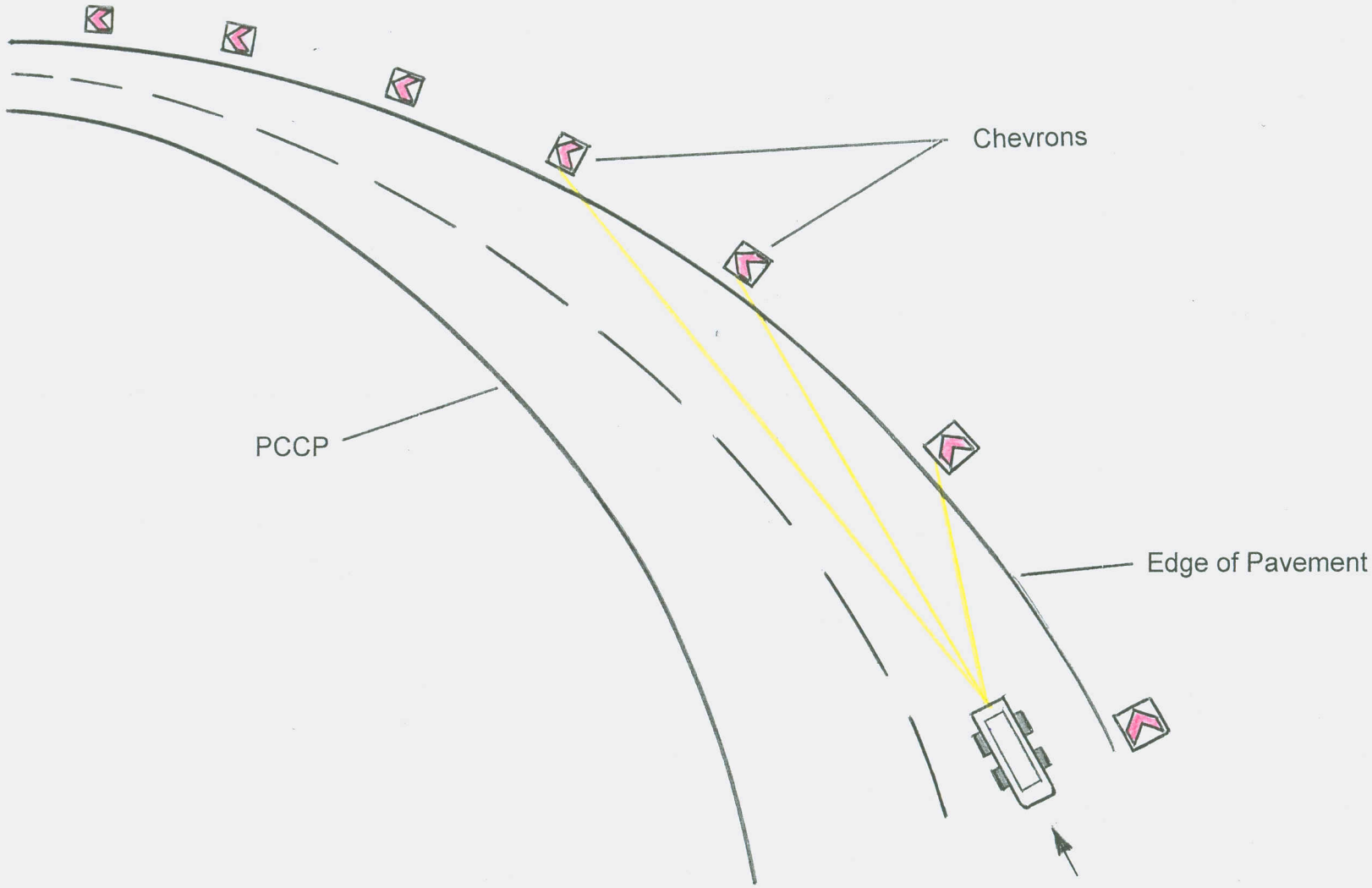


FIGURE 2 - Showing that the spacing of the Chevron Signs allow the driver to see at least three (3) signs in view while negotiating the curve until the change in alignment eliminates the need for the signs as contained in the 4th paragraph of Section 620.2.2, Design for Item 620 – Chevron Signs

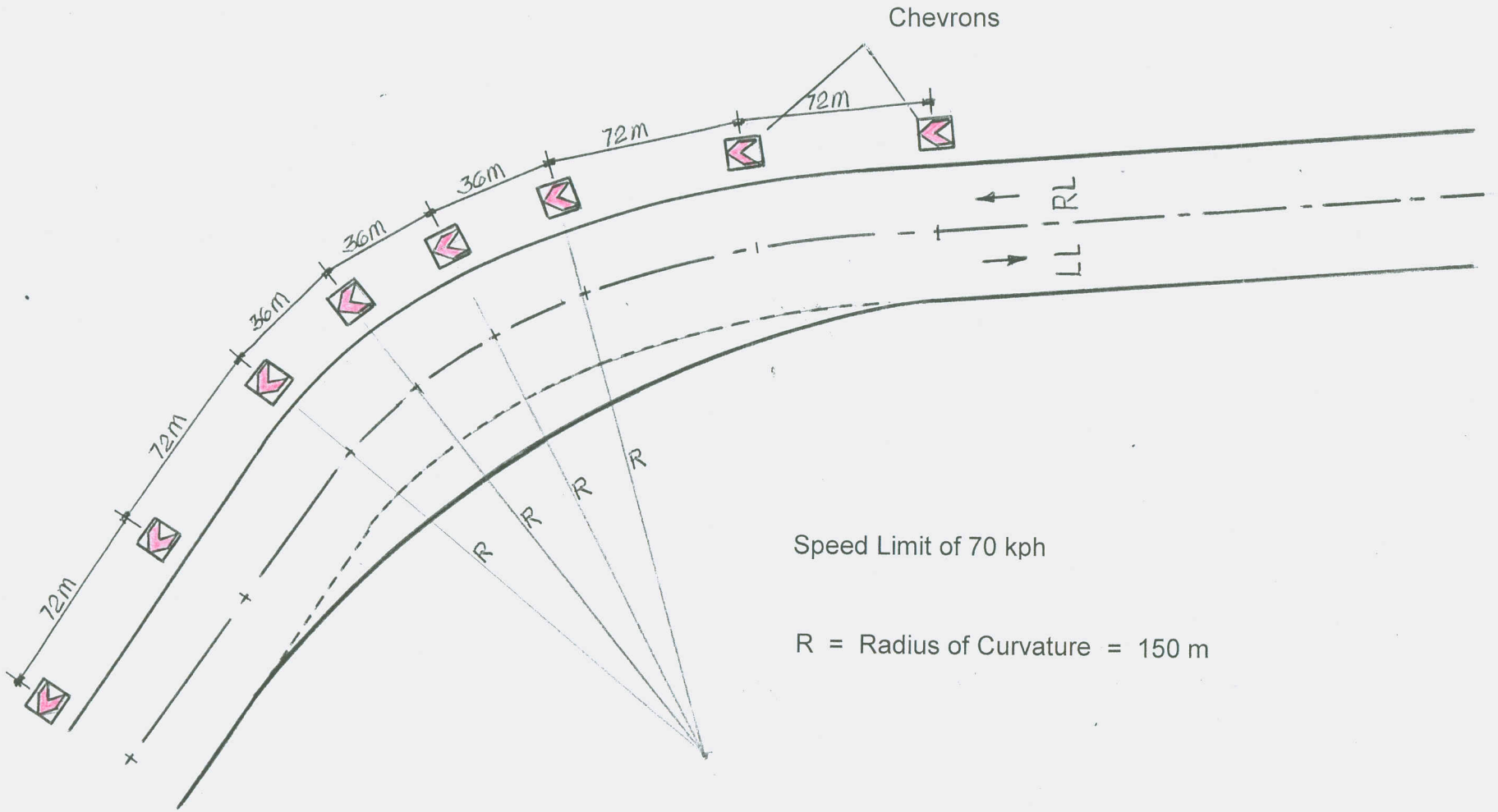


FIGURE 3 - The recommended spacing distances for the Chevron Signs within the curve and approach/ departure of the road as shown in Table 620.1 – Recommended spacing for Chevron Signs and as contained in the 6th paragraph of Section 620.2.2, Design for Item 620 – Chevron Signs