

Himachal Pradesh
Public Works Department

No:- PW -M&P-Road Safety/2021- 15716 -15816 Dated :- 31.03.2021

To

The Engineer-in- Chief (Project)
HPPWD Shimla-2

All the Zonal Chief Engineers,
In HPPWD(i/c NH, PMGSY & HPRIDC)

All the Superintending Engineers,
In HPPWD (i/c NHs)

All the Executive Engineers,
In HPPWD (i/c NHs)

Subject: - Road Safety Works.

Road accidents are the most dangerous threat to the health and lives of people around the world. Road safety has been very important issue of the recent years and the State Govt. have taken various steps towards Road Safety with the aim to prevent the causes of accidents and reduce the severity of their consequences. The traffic signs as a part of Road Safety Works on roads aren't merely aesthetic but they provide valuable information to drivers and other road users. They are there to warn about the potential dangers and to give important instructions that will keep drivers, passengers and other road users safe.

It is noticed that many traffic sign boards, road markings and delineator posts installed in various sections across the State differ much in standards and quality. Self-designed formats and non conformity to the IRC specifications is also noticed. Since many of road safety items are highly specialized in nature, there is need to be vigilant in ensuring specification and quality, right from the preparation of estimate till completion of the job. In addition to this it is also important that the contractors/agency executing the job have sufficient expertise and experience in the job.

In view of the above and in order to ensure quality, standards and uniformity in carrying out road safety related works across the state, the guidelines are hereby annexed at Annexure-A for strict compliance during the execution of such works on various roads in HPPWD.

Engineer-in -Chief
HPPWD Shimla-2

Copy to :-

- (i) The Addl. Chief Secretary (PW) to the Govt. of Himachal Pradesh for information.
- (ii) The Executive Engineer (IT) of this office with the direction to upload the same on the official web site of the department.

Engineer-in Chief
HPPWD Shimla-2

Guidelines for Road Safety Works

INTRODUCTION

The traffic signs on roads aren't merely aesthetic but they provide valuable information to drivers and other road users. They're there to warn about the potential dangers and to give important instructions that will keep drivers, passengers and other road users safe. They represent rules that are in place to keep us safe, and help to communicate messages to drivers and pedestrians that can maintain order and reduce accidents. Neglecting them can be dangerous. Most signs make use of pictures, rather than words, so that they are easy to understand and can be interpreted by people who speak a variety of languages.

It is noticed that many traffic sign boards, road markings and delineator posts installed in various sections across the State differ much in standards and quality. Self-designed formats and non conformity to the IRC specifications is also noticed. Since many of road safety items are highly specialized in nature, the authority responsible for execution need to be vigilant in ensuring specification and quality, right from the preparation of estimate till completion of the job. In addition to this it is also important that the contractors/agency executing the job have sufficient expertise and experience in the job.

In view of the above and in order to ensure quality, standards and uniformity in carrying out road safety related works across the state, the following guidelines are issued for strict compliance during various stages of the job.

GENERAL

1. Road Signs: - All road signs shall be as stipulated in **IRC : 67-2012**.
2. Road Markings: - All road markings shall be as stipulated in **IRC: 35-2015**.
3. Direction Boards:- Shall be provided as per traffic and transportation requirement and their specification should be as stipulated in **IRC: 67-2012**.
4. Traffic safety barriers:- Wherever required Traffic safety barriers shall be provided as per **IRC: 119-2015**.
5. Pedestrian Crossing and facilities: Shall be provided as stipulated in **IRC:103-2012**.
6. Traffic Calming Measures: Shall be provided as stipulated in **IRC: 99-2018**.
7. Work Zone Safety: - Shall stipulate as per **IRC-SP 55-2014**.
8. In highly hazardous locations/black spots, solar powered roads studs should be preferably used as per **Para 5.6 of IRC: 35-2015**.
9. All roads safety installations shall be maintained properly for visibility/utility by periodic restoration works like cleaning, repainting, jungle clearance, rectification of damages.
10. Carriageway edge drops shall not be allowed.
11. All activities on footpaths shall be curbed.
12. Any vandalism to any road furniture including crash barriers and hand rails shall be reported and penal action shall be initiated against those who cause damage or disfigurement to road safety installations.

ESTIMATE STAGE:-

1. Estimate shall be prepared after conducting a thorough road safety audit. The requirement of items shall be assessed as per actual requirement at each location and taking into consideration of the existing items, which could be repaired / renovated. In case any existing items are to be replaced, it shall be ensured that the old item is removed from the site promptly and shall be properly accounted and if unusable, that shall be surveyed and auctioned.
2. Selection of each Road Safety item shall be as per the recommendations for those items by MORTH/IRC.
3. Mandatory sign board shall be of circular shape and cautionary signs shall be of triangular shape. Triangular or circular signs drawn on rectangular board shall not be allowed. Definitions plates for uncommon signs can be placed if required along with the above signs.
4. Type of retro reflective sheeting shall be clearly mentioned in the specification of the respective item for sign boards and as per MORTH specification and IRC guidelines.
5. Location of installation shall be as per MORTH/IRC recommendations. However, minor changes can be made at site to ensure enhanced visibility, utility and also to avoid clustering.
6. Road markings shall be strictly as per MORTH/IRC in design, specification and quality.
7. The following details shall be strictly included in the proposal submitted for Administrative Sanction of road safety related works:
 - Detailed report mentioning the necessity of the proposal, accident history, details of safety related works executed in the stretch in the past, the current condition in case of sign boards, crash barriers etc. and site photographs of the location etc.
 - Details of location/stretch of road including Name and classification (NH/SH/MDR/ODR/Village road etc) of road, start & end chainage and length of stretch on which the proposal is submitted.
 - Exact location of each road furniture proposed. [Chainage, side (LHS/RHS) etc.]
 - The concerned EE, AE and JE shall certify that **“The items included in this estimate/proposal have been verified at site and are absolutely necessary for enhancement of road safety in that location/stretch and these items do not duplicate with any similar items included for or proposed to be included in any duplicate with any similar items included for or proposed to be included in any ongoing/arranged/proposed works for the same location/stretch of road.”**
 - Statement substantiating the specific reason for non inclusion/ insufficiency of the proposed road safety items in the ongoing road works.
 - Reference to relevant IRC code shall be mentioned in the specifications for each item, where ever applicable.

BIDDING STAGE

Guarantee/Warranty certificates shall be strictly insisted for items for which guarantee/warranty certificates are required as per relevant IRC/MORTH specification.

EXECUTION STAGE

1. It shall be ensured that work is executed as per relevant and latest MORTH specification/IRC codes.
2. It shall be ensured that all the components/elements of the sign boards and road markings are in the strict compliance to MORTH/IRC quality. Installation of substandard boards/road marking will invite punitive actions against all officers involved.
3. Standard lay out, signs, size, font and spacing for the text etc. shall be followed exactly as per MORTH/IRC. Self design and lay out by departmental staff or installation agency shall be completely eliminated.

I SIGN BOARDS:-

1. The sign boards shall be installed exactly at the orientation specified in MORTH/IRC.
2. Provide mandatory and regulatory signs boards as per Table 14.4 of **IRC:67-2012**.
3. The placement of the signboards/delineator posts shall be at the distances as provided in MORTH/IRC. However, minor modifications can be made to improve visibility, utility and clustering of signs. i.e. Locate the signs at a minimum of $0.6 \cdot V$ meters apart (Where V is the 85th percentile speed in km/ h (**Para 4.8, Page 7, IRC : 67-2012**)).
4. Provide gantry mounted signs as per Para 4.2, Page-6 of IRC:67-2012.
5. Specific care shall be taken to ensure that no hindrance is caused to vehicular/pedestrian movements due to erection of sign boards.
6. No sharp corners shall be allowed for sign boards.
7. Provide colour pattern for direction information signs as per Table 8.3 of IRC:67-2012.
8. The sign posts shall be painted in 250 mm wide bands, alternately black and white. The lowest band next to the ground shall be in black.
9. Curved/Overhang type posts shall be preferred in roads having foot paths, rather than placing the vertical post on the foot path.
10. Maintenance of signs must be carried out as per Para 12.1 to 12.4 of IRC: 67-2012.
11. "U-Turn Ahead" sign should be positioned on the median in advance of a U -turn and to ensure required sight distances as per Para 17.10 & Table 17.1 of IRC: 67-2012.



12. Provide the sizes and dimensions of cautionary signs and their sighting distances as per Table 15.1 of IRC: 67-2012.
13. Provide size of letter based on design speed as per Table 11.1 of IRC:67-2012.

II. ROAD MARKINGS

(a) Restrictions

- The stretch in which parking is to be restricted has to be delineated with yellow kerb painting coupled with the provision of yellow edge line.
- Restrictions like Keep Clear marking can be effected on road stretches located in front of schools and hospitals by providing zig-zag markings and this can be further supplemented by painting the kerb using yellow colour marking for the length intended to be kept clear of traffic along with proper sign. Restriction signs should be provided at 50m interval.

(b) Object Markings

Objects within/adjacent to the carriageway are physical obstructions which constitute a serious hazard to the traffic flow and shall be adequately marked to facilitate safe driving by ensuring better visibility during night.

1. Objects within the carriageway (Refer Fig 14.1, IRC: 35 -2015):-
 - (a) On the face of the obstruction, shall be marked by not less than six alternate black and yellow stripes of not less than 300 mm wide sloping downwards at an angle of 45 degrees towards traffic.
 - (b) On structures with restricted vertical clearance, the markings of vertical black and yellow stripes of width not less than 300 mm shall be marked.
 - (c) Kerbs of raised channelizing islands, Central island and central median shall be marked with alternate vertical black and white strips of width 500 mm.
2. Objects adjacent to carriageway:-
 - a. On the face shall be marked with at least six alternate black and white stripes of not less than 300 mm sloping downwards at an angle of 45 degrees towards the traffic.
 - b. Electrical poles close to the carriageway shall be marked with alternate horizontal black and white stripes not less than 100 mm wide up to a height of 1.25 m above the road level. The stripes shall be uniform and not less than 100 mm wide.
 - c. Object making on trees shall be up to a height of 1.25 m above the road level with 300mm band with black paint in the middle of 1.25m height to enhance the visibility.
 - d. All objects within 2.4 m from shoulder/kerb shall be painted. In addition, object markers of 1.2m height above traffic lane shall be placed in front of the object.
 - e. Kerbs of all islands, concrete barrier, bridges and flyovers shall be painted with 500 mm wide vertical black and white stripes.



- f. The kerbs shall be painted with yellow colour in sections having restrictions like **No Parking** or **No Stopping**.
3. Special care shall be taken to ensure that signs and markings like Object Hazard Marker (OHM), **chevron/ladder road markings** etc. are designed and placed as per the correct orientation (e.g OHM for hazard on left/hazard on right is different and shall be placed correctly as per Fig.15.76 & 15.77 of IRC:67-2012). If traffic is allowed to pass on either side the triangular island, Two Hazard Marker as per Fig: 15.78 of IRC:67-2012 shall be used.

(c) **Stop line**

- The stop lines at intersections shall be equidistant from the centre of intersection
- (i) Single stop line
 - Provided in traffic signal and ahead of pedestrian crossing.
 - 200 mm wide on urban roads and 300mm wide on rural roads.
 - (ii) Double Stop Line
 - Provided at junctions controlled by “STOP” signs
 - Consists of two continuous lines each 200 mm wide a spacing of 300 mm apart with “STOP” sign and word message “STOP” encrypted on carriageway. (Fig.6.1 IRC: 35-2015).

(d) **Ghost island**

- Width of Ghost island should be between 2.5m and 3.5m as per clause 9.4.5 of IRC: 35-2015.

III. PEDESTRIAN FACILITIES:-

(a) **Footpath**

1. Provide physical characteristics as per para 5.3 of IRC: 103.2012.
2. Full width of foot path should be maintained consistently, even behind bus shelters & in front of shops.
3. The minimum 1.8m (width) x 2.2 m (height) walking zone should be clear of all obstructions both horizontally and vertically as per para 6.1.3 of IRC: 103-2012
4. The clear height acceptable is 2.2 for entire width of the footpath walking zone as per para 6.1.4 of IRC: 103-2012
5. The minimum width should be 1.8 m or more on roads with right of way of 10 m and above as per para 6.1.5 of IRC: 103-2012.
6. If the right of way is less than 10m or in area with light pedestrian traffic 1.5 m width is acceptable.
7. Provide pedestrian guard rails as per para 6.1.9 of IRC: 103-2012 at the following situations :-



- a. Hazardous locations on straight stretches.
 - b. At Junctions/Intersections.
 - c. Schools/Colleges
 - d. Bus stops, Railway stations etc.
 - e. Overpass subways etc.
 - f. Central reserves/medians.
8. Set back of pedestrian guard rail from edge of carriageway – 150 mm.
 9. Height of pedestrian guard rail – 1100 mm high from the median level, to be painted with canary yellow colour.
 10. Guard rails on footpaths should be rounded to prevent injuries.
 11. The obstructions on footpaths shall be distinguished as per para 6.1.10 of IRC: 103-2012.
 12. Provide kerb elements as per para 6.2 of IRC: 103-2012. Kerb height for footpath shall be 150 mm, for median 250 mm.
 13. Provide continuity and consistency of foot paths as per para 6.3 of IRC: 103-2012
 14. Provide tactile pavers to guide persons with vision impairment as per para 6.4 of IRC:103-2012.
 15. Provide level changes as per para 6.5 and maintenance as per para 6.6 of IRC: 103-2012.
 16. Provide components of pedestrian crossing as per para 6.7.3 of IRC: 103-2012.
 17. Provide ramp (min width 1200 mm) and steps as per para 6.8 of IRC: 103-2012.
 18. Provide street furniture, bollards and lighting as per para 6.11, 6.12 and 6.13 of IRC: 103-2012
 19. Provide School zone improvement as per para 6.15 of IRC: 103-2012.

(b) **Pedestrian Crossing:-**

(a) Pedestrian cross marking should invariably be preceded by a 'STOP' line at intersections. At unsignalised pedestrian crossing, stop line shall be set back 2 to 3 m from the start of zebra crossing marking.

In a signalized intersection, zebra crossing shall be 1m ahead of primary signal and Stop line shall be placed 1 m ahead of the start of zebra crossing. When pedestrian crossing is absent, provide single stop line not less than 1.25m and not more than 9m from the nearest carriageway edge of intersecting road and extend to all approach lanes.

(b) Width of pedestrian crossing depends on pedestrian volume but should have a minimum width of 3 m (as per para 6.7.2 of IRC: 103-2012).

IV. DELINEATORS:-

1. Provide reflectors as per para 6.1 of IRC: 79-1981

2. Installation and maintenance should be done as per para 7.1 & 7.2 and 8.1 of IRC: 79-1981.

(a) Roadway Indicators

3. Provide reflectorised type delineator post as per para 3.4 of IRC: 79-1981
4. Post can be of circular, rectangular or triangular cross-section. (Fig. 1 of IRC: 79-1981) however the side, facing traffic should not be less than 10 cm.
5. Placement and spacing of delineator posts should be as per para 3.8-3.13 of IRC: 79-1981.

V. ROAD STUDS:-

1. The right colour shall be chosen for reflective studs/hazard markers.

e.g. colour of retro reflective surface facing traffic.

Left edge – Red

Traffic lane marker & centre of carriageway – White

Median side edge line – Yellow

Crossable edge line – Green

1. Colour and Spacing of studs shall be as per Table referred below:

(a) Road studs for undivided carriageways

Refer Table 5.1 of IRC 35-2015.

(b) Road studs for Divided carriageways

Refer Table 5.2 of IRC 35-2015.

(c) Road studs in one way ramp or slip road

Refer Table 5.3 of IRC -2015

(d) Crossable continuous line like acceleration/deceleration lanes, Green studs at 8m spacing shall be provided.

(e) At Zebra crossings, studs shall be provided at 0.5 m spacing. This can be achieved by providing studs at 4 corners of each block.

2. Provide spacing of road studs as per Table 9.1 of IRC SP : 73-2015.

VI. TRAFFIC SAFETY BARRIERS/CRASH BARRIERS:-

W-Beam Crash Barrier

1. Place crash barriers on edge as per para 4.11 of IRC : 119-2015.
2. The approach end should be flared and anchored.
3. The offset between face of the barrier and support should not be less than 0.6 m, or if the support has a concrete base it should not be less than 0.50 m.
4. Steel posts and the blocked out spacer are channel sections 75mm x 150 mm size, 5mm thick.
5. Vertical rail shall be 700 mm above the ground and 1100 mm below the ground at a spacing of 2 m c/c.
6. For Typical details refer Fig. 11 of IRC: 119-2015.

7. Minimum length of safety barrier shall be 50 m. At hazardous location, 2/3rd of length shall be before hazard and 1/3 rd after hazard. The overall design, length and foundation shall meet specifications in Annexure-II of IRC: 119-2015.
8. Provide reflectors to enhance night visibility.
9. Carry out end treatment as per para 4.10 of IRC 119-2015.
10. Maintenance of crash barriers should be done as per para 6.2 of IRC: 119-2015..

VII. WORK ZONE TREATMENT:-

- Provide work zone treatment as per para 9.9 of IRC SP: 73-2015.

VIII. CERTIFICATES:-

Test certificate and warranty for retro reflective sheeting/thermoplastic road marking etc. as per clause 6.7 of IRC: 67.2012 and as per clause 803 of MORTH specification shall be obtained and reviewed. Original certificates shall be kept in the records of the Divisional Office .

The following are some of the important certificates specified by MORTH/IRC

- a. **For retro reflective sheeting-** A certificate from sheeting manufacturer of having the retro reflective sheeting tested for co-efficient of retro reflection, day time luminance, shrinkage, flexibility, linear removal, adhesion, impact resistance, specular gloss and fungus resistances, 3 year outdoor weathering etc. and its having passed these tests from an approved laboratory as per Clause 6.7 of IRC: 67-2012.
- b. **For thermoplastic paint and glass beads-** Test reports as per clause 803.4 of MORTH Specifications and certificate that the materials are in conformity to all requirements of specifications. Test reports from manufacturers of glass beads to be obtained from an approved laboratory as per clause 803.4.2.
- c. **Warranty**
 1. Sign boards- 7 years warranty for high intensity grade as per clause. 801.3.11 of MORTH specifications. (TYPE-IV) 10 years warranty for micro prismatic sheeting (TYPE-XI)
 2. Roads Studs- 2 years warranty for satisfactory field performance including stipulated retro-reflectance and 2 years warranty for satisfactory field performance of finished road marking as per clause 804.7.3.

C. COMPLETION STAGE

1. A register of sign boards & road furniture shall be maintained in each section with the following details.
 - a. Type of board/furniture.
 - b. Reference Number.
 - c. Location- Road name, exact chainage, offset from carriageway edge etc.
 - d. Date of installation.
 - e. Warranty period (warranty certificate shall be filed safely with copy in Section, Sub Division & Division files).



- f. Name & details of contractor.
- g. Site photograph of the rectified black spots, highly accident prone locations and monthly accident data (Fatalities/Grievous/Injuries/Minor injuries) collected from concerned Police station must be forwarded to the Road Safety Cell of the office of Engineer-in- Chief HPPWD .

