



कार्यालय ज्ञाप

इस कार्यालय के ज्ञाप संख्या 380/02-गु0नि0(अधि0)/2017-20 दिनांक 31/08/2020 द्वारा मार्गों के Road Safety के अन्तर्गत Traffic Signage, Markings and Other Appurtenances के कार्य कराये जाने अथवा आपूर्ति किए जाने हेतु सप्लायर फर्मों द्वारा भारत सरकार के सड़क परिवहन एवं राजमार्ग मंत्रालय द्वारा जारी Specifications for Roads & Bridges के Section 800 एवं Section 1000, Materials for Structures तथा IRC: 67-2012 (Code of Practice for Road Signs) का अनुपालन करने के संबंध में दिशानिर्देश जारी किए गए थे। वर्तमान में IRC द्वारा उपरोक्त Code को पुनरीक्षित कर IRC: 67-2022 (Code of Practice for Road Signs) जारी किया जा चुका है। Metal Beam Crash Barriers के सम्बन्ध में भी भारत सरकार के सड़क परिवहन एवं राजमार्ग मंत्रालय द्वारा गाइडलाइन्स जारी की गयी हैं। अतः उक्त के दृष्टिगत, दिनांक 31/08/2020 को जारी उपरोक्त कार्यालय ज्ञाप को संशोधित करते हुए Road Signs एवं Metal Beam Crash Barriers की गुणवत्ता सुनिश्चित करने हेतु एतद्वारा निम्नलिखित दिशानिर्देश जारी किए जाते हैं:-

1. **Road Signs:** कार्यस्थल पर Road Signs का कार्य कराये जाने से पूर्व IRC: 67-2022 (Code of Practice for Road Signs) के Clause 6.7 (Retro Reflective Sheeting) तथा Clause No. 6.9 (Warranty and Durability) के अनुसार निम्नलिखित कार्यवाही अनिवार्य रूप से सुनिश्चित की जाए:-

A. Clause 6.7

1. A certificate of having the sheeting tested as per ASTM D 4956 for coefficient of retro reflection, day time color, color fastness and luminance, shrinkage, flexibility, liner removal, adhesion, impact resistance, specular gloss and fungus resistance, night time color, 3 years outdoor weathering and its having passed these tests obtained from International/ Government Laboratory/ Institute by the manufacturer of the sheeting. In case the certificate is obtained from international agency, it should also be obtained from Indian agency within 3 years of launching of product by the manufacturer including actual outdoor weathering in Indian conditions.
2. Alternatively, a certificate confirming to ASTM D 4956 specification on artificial accelerated weathering requirements from a reputed laboratory in India can be accepted provisionally. In such a situation, a performance guarantee which would be released after the receipt of certificate meeting the requirement of 3 years outdoor weathering of the sheeting may also be accepted.

B. Clause 6.9

1. For satisfactory field performance including stipulated retro- reflectance of the retro-reflective sheeting, the Contractor shall obtain from the manufacturer of the reflective sheeting, and submit in original to the Engineer in charge,
 - i. A ten-years warranty for micro-prismatic class C grade sheeting,
 - ii. Seven years warranty for class B grade sheeting and
 - iii. Five years warranty for class A grade

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take necessary Action

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The warranty shall be inclusive of the screen printed or cut out letters/legends and their bonding to the retroreflective sheeting. The Warranty shall be in original having a unique number with date and shall be addressed to the Engineer in charge with the project details including details of the sign boards installed. Warranty issued by any party other than the sheeting manufacturer shall not be accepted.

2. Contractor/ supplier should furnish the lot numbers and certification that the signs and materials supplied against the assigned work meets all the stipulated requirements and carry the stipulated warranty and that the contractor / supplier is the authorized convertor of the particular sheeting.
3. As a part of source approval (to assure the quality of product prior to supply), contractor shall obtain from the manufacturer of sheeting a prequalification warranty stating that the material they are offering will have the warranty as mentioned above and the certificate shall be submitted to the Engineer in charge.
4. In the case of digitally printed sign boards, the coefficient of retro reflection after the stipulated warranty period shall be minimum 80 percent of the initial value of the printed sign as per Clause 6.8 of IRC: 67-2022 (Code of Practice for Road Signs). Match components system warranty for the components like retro reflective sheeting, overlay films and digital inks shall be provided by the manufacturers.

उपरोक्त के अतिरिक्त IRC: 67-2022 (Code of Practice for Road Signs) की अन्य समस्त विशिष्टियों का भी शत-प्रतिशत अनुपालन किया जाना अनिवार्य होगा।

2. **Metal Beam Crash Barriers** की गुणवत्ता सुनिश्चित करने हेतु निम्नलिखित का अनुपालन सुनिश्चित किया जाए:

A. IRC:119-2015 (Guidelines for Traffic Safety Barriers) के Appendix – II (Specifications for Safety Barriers) के अनुसार:

1. All steel elements including posts, W-Beam sections, channel sections, bolts, nuts, hardware and other steel fittings shall be galvanized or painted with an approved paint.
2. If galvanized, all elements shall be free from abrasion, rough or sharp edges, and shall not be kinked, twisted or bent. Damaged galvanized surfaces, edges of holes and ends of steel sections cut after galvanizing shall be cleaned and re-galvanized.
3. The posts and W-Beam sections shall be assembled true to alignment and camber as shown in the drawings.
4. The metal safety barriers shall be compliant with test acceptance criteria of European EN 1317-2 standard or NCHRP 350 for containment levels of N2, H1 and H2 or NCHRP 350 for containment levels TL-3 and TL-4. The manufacturer shall provide all applicable crash test reports that confirm the barrier to have passed the crash tests conducted by an international accredited crash testing laboratory having all the needed testing facilities.

B. भारत सरकार के सड़क परिवहन एवं राजमार्ग मंत्रालय द्वारा जारी Specifications for Roads & Bridges (Fifth Revision) के Clause 811.3.1.2 के अनुसार:

The "W" beam, the thrie-beam, the posts, spacers and fasteners for steel barriers shall be galvanized by hot dip process (Zinc coated, 0.55 kg per square meter; minimum single spot) unless otherwise specified. The galvanizing on all other steel parts shall confirm to the relevant IS Specifications. All fittings (bolts, nuts, washers) shall confirm to the IS:1367 and IS:1364. All galvanizing shall be done after fabrication.

- C. भारत सरकार के सड़क परिवहन एवं राजमार्ग मंत्रालय द्वारा जारी सरकुलर संख्या RW/NH-29023/02/2019-S&R(P&B), दिनांक 01.01.2020 (प्रति संलग्न) के बिन्दु (B): "Guidelines for Metal Beam Crash Barrier (Semi Rigid) to be installed on National Highways" का अनुपालन भी सुनिश्चित किया जाए।
- D. ठेकेदार द्वारा Metal Beam Crash Barriers के manufacturer से फैक्टरी के Industrial/Commercial क्षेत्र में स्थापित होने से संबंधित सर्टिफिकेट प्राप्त कर प्रस्तुत किया जाना अनिवार्य होगा।

उपरोक्त के अतिरिक्त Crash Barriers हेतु IRC:119-2015 (Guidelines for Traffic Safety Barriers) की अन्य समस्त विशिष्टियों का भी अनिवार्य रूप से अनुपालन सुनिश्चित किया जाए।

यह आदेश तत्काल प्रभावी होंगे।

संलग्न: MORTH के सरकुलर संख्या RW/NH-29023/02/2019-S&R(P&B),
दिनांक 01.01.2020 की प्रति।

**Signed by Deepak Kumar
Yadav**

(इं० दीपक कुमार यादव)
प्रमुख अभियन्ता

Date: 24-08-2023 13:11:23

पत्रांक:- 1/33068/2023

दिनांक:- 24 / 08 / 2023

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित :-

- 1-मुख्य अभियन्ता मुख्यालय अधिष्ठान/नियोजन, विभागाध्यक्ष कार्यालय लो०नि०वि० देहरादून।
- 2-मुख्य अभियन्ता स्तर-I/II, क्षेत्रीय कार्यालय/रा०मा०, लो०नि०वि०, देहरादून/हल्द्वानी/पौड़ी/अल्मोड़ा।
- 3-वरिष्ठ स्टाफ आफिसर, नियोजन-I/II/III/IV, अधिष्ठान-I/II/III एवं क्वालिटी कन्ट्रोल, विभागाध्यक्ष कार्यालय लोक निर्माण विभाग देहरादून।
- 4-समस्त अधीक्षण अभियन्ता,वां वृत्त, लो०नि०वि०, ।
- 5-समस्त अधिशासी अभियन्ता, विभागाध्यक्ष कार्यालय, लोक निर्माण विभाग देहरादून।
- 6-समस्त अधिशासी अभियन्ता प्रान्तीय/निर्माण/अस्थाई/रा०मा०/ए०डीबी० खण्ड, लो०नि०वि०.....
- 7-अधिशासी अभियन्ता, (आई०टी०), विभागाध्यक्ष कार्यालय, लो०नि०वि०, देहरादून को उक्त पत्र की प्रति विभागीय वेबसाइट पर अपलोड करने हेतु प्रेषित।

प्रमुख अभियन्ता

RW/NH-29023/02/2019-S&R(P&B)
Government of India
Ministry of Road Transport & Highways
Zone-S&R (P&B)
Transport Bhawan, 1, Parliament Street, New Delhi -110001.

To,

Dated: 01st January, 2020

1. The Chief Secretaries of all the State Governments/ UTs.
2. The Chairman, National Highways Authority of India, G-5 & 6, Sector-10, Dwarka, New Delhi-110 075.
3. The Managing Director, NHIDCL, PTI Building, New Delhi-110001.
4. The Principal Secretaries/ Secretaries of all States/ UTs Public Works Department/ Road Construction Department/ Highways Department (dealing with National Highways and other centrally sponsored schemes).
5. All Engineers-in-Chief and Chief Engineers of Public Works Department of States/ UTs/ Road Construction Department/ Highways Departments (dealing with National Highways and other centrally sponsored schemes).
6. The Director General (Border Roads), SeemaSadakBhawan, Ring Road, New Delhi-110 010.
7. All CE-ROs, ROs and ELOs of the Ministry.

Subject: - (A) Guidelines for providing type of Median on National Highways Network; and

(B) Guidelines for Metal crash barrier (Semi Rigid) to be installed on National Highways.

A. Type of Median

It has been observed that raised medians are being provided along most of the National Highways/Expressways. As per Manual of Specifications & Standards for Expressways (IRC:SP:99-2013), only depressed or flush median is to be provided on Expressways. Such types of medians are essential on high speed corridors for safety of the road users. The IRC guidelines for 4 / 6 laning of highways permit use of raised median for open country areas also. Since the multi-lane highways being designed as partially controlled highway for higher speeds, raised median may be a safety hazards and may cause severe accidents/fatalities once the errant vehicle strike the raised median.

2. As such, while proposing the median for the divided multilane highways / expressways following may be followed invariably:

- (i) Only depressed or flush median shall be provided on all the Expressways. No Raised median / kerbs shall be provided on Expressways.
- (ii) In future, all multi-lane highways shall be provided with depressed/flush median depending upon availability of land. No raised/kerb median shall be provided especially in the open country/rural stretches of National Highways. In case of flush

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- type medians; provision of crash barrier and antiglare measures shall also be provided for safety consideration and headlight glare respectively.
- (iii) In case of narrow medians (2m or less wide), as generally provided in urban areas, New Jersey type concrete crash barriers shall be used along with anti-glare screen.
- (iv) In already developed multi-lane expressway/highways with raised median especially in open country / rural areas these shall be replaced by depressed/flush median. Alternatively, crash barrier may be provided along raised median in such a way that the face of the crash barriers is flushed with the face of the raised median.

B. Metal Crash Barrier (Semi-Rigid)

3. To avoid major/fatal accident on Highway network, crash barriers of appropriate type are installed at accident prone locations especially at locations like valley sides of hilly roads, high embankments, sharp/blind curves etc. These are very useful in containing, redirecting and absorbing impact energy of the hitting vehicles and reducing the severity of the accidents. The selection of barrier is driven by no. of factors such as performance capability, deflection of the barrier on impact, site condition, compatibility, installation and maintenance cost etc. To reduce the severity of the accident, the vehicle should remain upright after the impact. When the vehicle hits the crash barrier, it is generally preferred that the crash barrier should not deflect for a distance more than the space available for the deflection. The crash barriers should have adequate height & length so that the crash barrier is able to withstand the impact of the vehicle without the entire crash barrier getting thrown off.
4. The location of various types of road side/median crash barriers and type of crash barrier (i.e. concrete/new jersey, semi-rigid/metal, flexible/wire rope barrier) shall be decided as per the relevant IRC guidelines and technical feasibility.
5. The detailed guideline and specification for erecting various traffic safety barriers have been stipulated in IRC 119-2015 'Guidelines for traffic safety barriers'. This guideline also covers the W-Beam and Thrie Beam type of semi rigid steel barrier. However, the detailed performance criteria have not been specified in this guideline. It has been decided that before erecting semi rigid crash barrier on National Highway, it should be crash tested 'Road restraint system' and should meet the requirements of EN 1317 Part-2: Performance classes, impact test acceptance criteria and test methods for safety barriers and vehicle parapets and/or to the requirement of the American Manual for Assessing Safety Hardware (MASH). The manufacturer or the contractor shall demonstrate the compliance of these requirements by submission of videos of actual crash testing along with authenticated crash test reports. The crash tests must have been conducted in accredited crash test laboratories/ institutions.
6. The selection, design, installation and maintenance of the crash barrier must consider the operation of the barrier as the entire system. This should also include all addition components such as transition, end terminals etc. All road safety barrier installed on the road network must be installed and maintained by qualified personnel. The primary criteria for the approval of the crash barrier is that it must have been successfully crash tested and result evaluated in accordance with EN 1317 part-2 and/or MASH.
7. There are various factors that play a major part in determining the type of barrier to be proposed for a particular situation/ stretch. The density of the traffic and traffic compositions are to be considered for specifying the containment level of the crash barrier to be provided. The suggestive guidelines in this regard are as under:-

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Containment level and working width depending upon the site condition may be specified in the tender document/ scope of the work as per the following suggested value:-

Type of Crash barrier	Terrain	Working Width(*)	Containment level	Remarks
Thrie Beam (single sided/ double sided on median)	Hilly	W3 ($W_N \leq 1.0m$) Or W4 ($W_N \leq 1.3m$)	H2 as per EN 1317 - part 2 OR TL4 as per MASH	<u>Containment Level H2:-</u> Car of 900 kg, Speed 100 Kmph, Impact angle 20 degrees and, Bus of 13,000Kg, speed 70 Kmph, impact angle 20 degrees <u>Containment Level TL4:-</u> Car of 1100 kg, Speed 100 Kmph, Impact angle 25 degrees and, Pick up of 2270 kg, speed 100kmph, impact angle 25 degrees and, Single unit truck 10,000kg, speed 90 kmph, impact angle 15 degrees
	Plain/ rolling	W4 ($W_N \leq 1.3m$) Or W5 ($W_N \leq 1.7m$)		
W- Beam (single sided/ double sided on median)	Hilly	W3 ($W_N \leq 1.0m$) Or W4 ($W_N \leq 1.3m$)	H1 as per EN 1317 - part 2 OR TL4 as per MASH	<u>Containment Level H1:-</u> Car of 900 kg, Speed 100 Kmph, Impact angle 20 degrees and, Bus of 10,000Kg, speed 70 Kmph, impact angle 15 degrees <u>Containment Level TL4:-</u> Car of 1100 kg, Speed 100 Kmph, Impact angle 25 degrees and, Pick up of 2270 kg, speed 100kmph, impact angle 25 degrees and, Single unit truck 10,000kg, speed 90 kmph, impact angle 15 degrees
	Plain/ rolling	W3 ($W_N \leq 1.0m$) Or W4 ($W_N \leq 1.3m$) Or W5 ($W_N \leq 1.7m$)		

(* to be specified depending upon site condition requirement)

Note:

It is important to note that the working width (W_m) mentioned above is the maximum lateral distance between the face of the barrier system before impact and the maximum dynamic lateral position of the barrier system or extreme point of the vehicle during impact unlike the dynamic deflection (D_m) which is the maximum lateral distance between the face of the barrier system before impact and the maximum dynamic lateral position of the face of the barrier system after impact.

- (i) All other requirement as per the EN 1317 and /or MASH should also be met by the crash barrier including following severity performances:-
- (a) Impact Severity level as per EN -1317- ASI (Acceleration Severity Index) and THIV (Theoretical Head Impact Velocity) should be of Level A i.e. $ASI \leq 1.0$ or Level B i.e. $ASI < 1.4$ and $THIV \leq 33$ Kmph. Impact severity level A offers a

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greater level of safety for the occupants of an errant vehicle than level B and is preferred when other considerations are the same.

- (b) Occupant Risk as per MASH- Occupant Impact Velocity (OIV) and Occupant Ridedown Acceleration (ORDA) should be as follow

Occupant Impact Velocity Limits (m/s)		
Component	Preferred	Maximum
Longitudinal and lateral	9.1 m/s	12.2 m/s
Occupant Ridedown Acceleration Limits (G)		
Component	Preferred	Maximum
Longitudinal and lateral	15.0 G	20.49 G

8. The posts, spacers, beam and fasteners of crash barriers shall be galvanized by hot dip process unless otherwise specified. The galvanizing on all other steel parts shall conform to the relevant IS specifications. All fittings (bolts, nuts and washers) shall conformed to the IS1364 and IS 1367. All galvanizing shall be done after fabrication. Following are also suggested

- New Jersey/Thrie beam type crash barrier are considered appropriate for the hilly areas/where space is constrained and lesser space is available for deflection and is recommended for installation.
- Thrie beam type crash barrier may be provided for Expressways/High speed corridor.
- W Beam Crash Barrier in hilly area may only be provided if the traffic volume is very low and most of the vehicles are of lower containment level/passenger car, van.
- The placement of the barrier should be placed as far away from the travelled way as practical.
- There should be sufficient distance between the barrier and the start of the embankment slope to provide adequate support for the post for proper operation of the crash barrier. A minimum distance of 0.6m as shown in fig.1 should be provided to prevent the wheels from dropping over the edge.

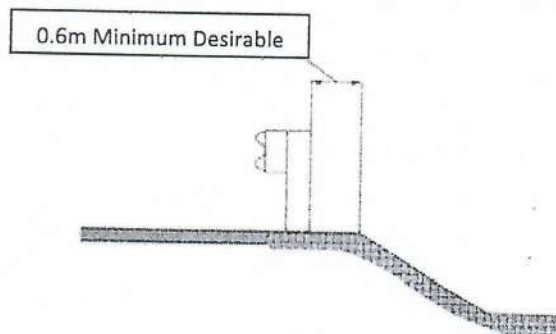


Fig 1.Recommended Barrier Placement for Optimum Performance

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- (vi) Preferably kerbs should not be present in the front of crash barrier especially in rural stretches. In case kerb are also to be provided along-with the crash barrier the kerb should be of mountable height and It should be behind crash barrier or at least face of kerb flushed with crash barrier.
9. Specifications of the crash barrier other than specified above should be in conformity with IRC: 119-2015.
10. Criteria for other type of crash barrier such as concrete crash barrier and rope crash barrier shall be as stipulated in IRC 119-2015 and other IRC guidelines/code.

Yours faithfully,

Raj Kumar
01.01.2020
(Raj Kumar)

Assistant Executive Engineer - S&R (P&B)
For Director General (Road Development) & SS

Copy to:

1. All CEs in the Ministry of Road Transport & Highways
2. The Secretary General, Indian Roads Congress
3. Technical circular file of S&R (P&B) Section
4. NIC-for uploading on Ministry's website under "What's new"

Copy for kind information to:

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2. PPS to DG (RD) & SS
3. PPS to AS&FA
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