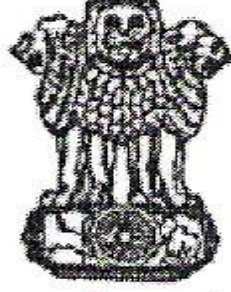


भारत सरकार
Government of India
रेल मंत्रालय
MINISTRY OF RAILWAYS



सत्यमेव जयते

Functional Specification for Rubberised Surface at Level Crossings

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FUNCTIONAL SPECIFICATION FOR RUBBERIZED SURFACE AT LEVEL CROSSINGS

1. SCOPE:

There is need of maintaining the road surface in good condition in order to minimize the road accidents on level crossings. Present conventional system of providing bituminous surface on level crossing requires frequent maintenance and in case of overhauling, tamping etc. at level crossing the road surface needs to be repaired. Frequent traffic blocks are difficult in present scenario particularly on busy routes. In addition to above, check rail is also provided at level crossings which add extra cost and maintenance to the level crossing. To overcome these difficulties, level crossings surfaces of rubberised material are considered as the solution.

2. MATERIAL OF PANELS:

Surfacing panels to be laid at level crossings may be manufactured with Virgin/ Natural/Synthetic/Recycled Rubber or Polymer based materials.

3. SERVICE CONDITIONS

Operating Regime on Indian Railways:

(a) Prescribed Axle load

S.no	Type of traffic	Axle Load
1	Goods Train	25T
2	Passenger Train	22T

(b)Speed Criteria

S.no	Type of Traffic	Speed	Remark
1	Goods Train	100 kmph	(Proposed)
2	Passenger Train	160 kmph	(Existing)
3	Passenger Train	200 kmph	(Proposed)

- i. Ambient temperature: (-) 5⁰C to (+) 50⁰C
- ii. Rail temperature: (-) 15⁰C to (+) 76⁰C
- iii. Humidity:100%
- iv. Rainfall: Fairly heavy as per Indian conditions

- v. Atmospheric condition: Very dusty and heavy fog
- vi. Electrified traction: Overhead electric (25KV AC or 1500 V DC)
- vii. Road Axle Load (Max): Class AA loading as per IRC classification (IRC class AA loading consists of either a tracked/chained vehicle without spikes of 70 tonnes or a wheeled vehicle of 40 tonnes).

4. ACCEPTANCE CRITERIA:

- i. The firm shall be manufacturer/supplier of Rubberised or Polymer based panels to be used for surfacing at level crossings. This firm will be called system provider.
- ii. The system provider located abroad can supply through its authorised representative firm /licence firm located in India. For this purpose, exclusive "Agreement" or "Memorandum of Understanding" should be executed by the system provider with the authorized representatives/licence firm located in India.
- iii. The system provider should offer the panels of proven technology and working satisfactorily on Indian / other World railway system at level crossing gates. Certificates of having proven record for a minimum 05 years issued by the concerned Railway system shall be furnished.
- iv. The system provider (OEM) shall possess sound technical credentials along with necessary infrastructure viz. Qualified manpower, machinery etc. for undertaking execution of work of surfacing at level crossings on Indian Railways for the quality finished work. Moreover the OEM will provide proper training to the Indian/other countries personnel for installation and maintenance purposes.
- v. The system provider shall submit performance report from any railways whether Government /Private or both in support of fulfilment of above mentioned criteria as per Annexure-I along with tender offer. The rail gauge/cant can vary in the foreign countries performance. The performance of the material will be accessed purely on the basis of the parameters given in Para 3(b) i to vii.
- vi. The system provider shall submit detailed specifications with test results of the proven product. Similar proven product has to be supplied.
- vii. Design shall be as per relevant codes of practice such as BIS , EN, IRS, IRC, ASTM and UIC with latest revision/edition). If for any item/work, above mentioned codes are not relevant, best available Engineering practice / International codes shall be mentioned.

5. PERFORMANCE REQUIREMENTS OF RUBBER BASED SURFACES AT LEVEL CROSSINGS:

Rubberised or Polymer based surface shall fulfil following functional requirements:

- i. The manufacturer/supplier should ensure that surfacing system supplied including all parts, components etc. used are free from manufacturing defects in material & workmanship and should be of the good quality. The material shall conform to the contract specifications.
- ii. The components/spare parts of the level crossing surface should be easily available & in a reasonable time.
- iii. It should be durable, hard, high load bearing and capable to carry heavy vehicular traffic at level crossings mentioned at Para 3 above.
- iv. It should be skid resistant and should not crack/splinter/crumble. It should be reasonably chemically inert and should not get affected with temperature variations. It should possess high electrical resistivity.
- v. It should provide levelled surface for movement of road vehicles capable of withstanding Class AA loading mentioned at Para 3 above.
- vi. Surfacing system should not involve provision of any check rail for movement of wheel flange of rolling stocks and yet shall have arrangement to successfully facilitate passing of wheel flange. It should not require any special sleepers for track under level crossing surface. The functional specifications will be valid for IR Pan India.
- vii. It should not show high instantaneous permanent deflection under road traffic and should have uniform long term settlement not exceeding 10 mm under service for 05 years irrespective of type of road traffic.
- viii. The panel should be of reasonable size and weight so that they can be handled easily without requirement of any additional mechanical device and at the same time should not get entangled with any hanging part of rolling stock, in the panels should be especially protected from any entanglement leading to accident.
- ix. Installation of panels and their removal during overhauling should not be difficult and much time taking so that minimum traffic block is required in these operations. It should only require simple training for staff for its maintenance. It would be preferable if panels or any other element of level crossing can be handled by two persons & simple mechanical equipment and in no case should require more than 04 persons and special equipment e.g. crane, compressor, generator etc. However, IR will technically prefer to have full panels between the two rails

- x. The design of road surface for level crossing should be such that the length/ width of the road can be increased/ decreased without hampering the existing system and fit snugly against the rail sealing the track structure from moisture and debris.
 - xi. Fall of heavy and practically reasonably sharp objects should not damage the surfaces at level crossing from practical considerations.
 - xii. It should allow fast drainage of surface water.
 - xiii. It should be easily available for replacement/maintenance purpose.
 - xiv. Minimum service life of panels and associated components should be 10 years. Safety of level crossing should be ensured and it should be theft proof, anti-sabotage and vandal proof.
 - xv. The proposed system should be easy to repair and expeditious to restore in case of damage due to derailment. The time & material requirement for repair should be clearly defined along with detailed procedure of repair. Metallic parts associated with the panels can be repaired if feasible but damaged rubber panels will have to be replaced only
 - xvi. Rubberised or Polymer based blocks should provide smooth transition between the road and the crossing. Rubber is moulded to fit snugly against the rail sealing the track structure from moisture and debris.
 - xvii. As per para 902 of IRPWM, Classification of Level Crossings –
 - (1) The classification of level crossings shall be based on the volume of rail and road traffic and visibility conditions.
 - (2) The classification of level crossings shall be as under;
 - (a) 'Special.. for roads: TVUs greater than 50,000
 - (b) 'A' class.. for roads: TVUs between 50,000 & 30,000 Or Line capacity utilization 80% (on single line) and number of road vehicles greater than 1000
 - (c) 'B' class...for roads: TVUs between 30,000 and 20,000 and number of road vehicles greater than 750
- 'B' Class is further subdivided as following :
- B1 class...for roads TVUs between 30,000 and 25,000
- B2 class...for roads TVUs between 25,000 and 20,000

6. DOCUMENTS:

The manufacturer/supplier shall submit the following document:

- i. Detailed specification of the material of the surface.
- ii. Testing procedure of material of the surface with mention of reference code.
- iii. Laying procedure at level crossings with diagrams/drawings, component/part number, component specification etc. along with necessary explanatory notes and comments.

- iv. Certificates of tests carried out on surface material as per the relevant standards.
- v. Quality Assurance Plan covering the necessary tests on surface material, laying methodology and repair/replacement procedure.
- vi. Performance report.
- vii. Environmental conditions where installed which includes temperature/humidity/rainfall etc.
- viii. The approximate cost of the surface for level crossing per square meter of rubberised or polymer based area.

7. WARRANTY

- i. The warranty shall be of 60 months and shall be applicable from the date of laying and commissioning of the surface in level crossing.
- ii. Failing of any part of the surfacing system for satisfactory performance or proving unsatisfactory in service due to defective design, material or workmanship within warranty period, shall be replaced by the manufacturer/supplier at his own expense.

8. REFERENCE SPECIFICATION

The specification which shall be used for material of surface panels shall be submitted by the firm. The specification used shall be as per performance of the product. Acceptance values should be as per relevant international codes.

9. ANNUAL MAINTENANCE CONTRACT (AMC)

The firm should be able to tie up for Annual Maintenance Contract (AMC) for a period of minimum 60 months beyond the warranty period of 60 months for the level crossing surface.

10. FIELD PERFORMANCE

Field performance will be monitored by Indian Railways through laid down scheme.

Performance report of rubberised surface for level crossing

SN	Item	Particulars
1.	Name of the country and railway where surface was installed	
2.	Type of the surface laid	
3.	Type of track structure ballasted / ballast less	
4.	Total no. of level crossings & total quantity/sqm installed along with location, TVU and duration after laying	
5.	Acceptance criteria of the agency who got it installed, if available	
6.	Problems faced during installation & service life.	
7.	Performance certificate of the product	
8.	Any other comments	