

## Section - 4

### Technical Specifications

#### 4.1 Materials:

The material for signages recommended above shall be non- reflective matt finish. The surface shall be processed to prevent glare. Some suggested materials for signage include Aluminium Composite Panel (ACP), acrylic, Concrete, Steel, wood etc. The frame of the sign boards should be sturdy and corrosion resistant. The material for fabrication of the frame box should preferably be powder coated aluminium sheet or fibreglass. The signages meant to be installed without any shelter or roof above should be designed as to prevent entry of water inside, even under heavy rains. Weatherproof polymer lining should be used. The general technical specifications of the material which are for guidance only and are not mandatory of the material for different type of signage boards are outlined below:

##### 4.1.1 Elliptical Illuminated Boards:

All the elliptical signage shall be illuminated. The display sheet shall be of unbreakable translucent polycarbonate sheet of 2mm to 3mm thickness. The approved colour text and graphics shall be printed / router cut on monomeric calendered vinyl of 100 µm thickness and shall be firmly pasted on display sheets. The text / graphics matter visibility shall not be less than 160 deg.

The Top Profile of Elliptical Board shall preferably be made up of Aluminium Alloy (6063-T6) Extruded profile anodised to 15 µm +/- 3 µm. The profile nominal wall thickness shall be 2 mm. The reflective metallic silver PU particle coated granules shall be provided on the internal face of the profile. The edges of the profile shall be rounded. The profile shall have a suitable slot at an angle of 80-84 degree to firmly hold the polycarbonate sheet to its required shape. Bottom, top and side Profile shall be made of the same material having 2mm to 5mm wall thickness. The frame of elliptical boards shall preferably be made of Extruded Anodised hollow aluminium profile of size not less than 1.2 mm thickness and anodized to minimum 15µm thickness (Grade AC-15) in approved colour. Anodizing coating shall be as per IS: 1868 or latest amendment.

##### 4.1.2 Aluminium Composite Panel (ACP) Boards:

Board material Aluminium Composite Panel of 4mm total thickness sheet with 0.5mm thick aluminium foil skin on both sides along with minimum 25-micron PVDF coating on top coil and polymer/epoxy coating on Back Coil of 4 to 7 microns. The sheet shall be fixed on aluminium substructure of required size fixed with stainless steel fastenings system and making 25mm grooves and applying non staining and non-streaking sealant with Baker rod. ACP boards can be used with either Vinyl Sheet or Retro reflective sheet.

##### 4.1.3 Aluminium Sheets:

Aluminium sheets used for sign boards shall be of smooth, hard and corrosion resistant aluminium alloy conforming to IS 736 material designation 24345 or 1900. The sheets shall be used with digitally printed reflective vinyl graphic.

## **4.2 Adhesives:**

Two types of adhesives can be used to paste the base sheeting with top surface sheet. Pressure sensitive adhesive of the aggressive tack type requires no heat, solvent or other preparation for adhesion to a smooth clean surface. Tack free adhesive activated by heat requires heat for making a durable bond between materials. The heat is generally applied in a heat vacuum applicator. The adhesive thus formed shall have a durable bond to smooth, corrosion and weather resistant surface of the base plate such that it shall not be possible to remove the sheeting from the sign base material in one piece by use of sharp instrument. The surface preparation and application process shall be in accordance with the manufacturer's specifications.

## **4.3 Fabrication:**

The base material shall be first removed of any grease, oil, scale/dust or any other contaminants with the help of either acid or hot alkaline to obtain a smooth plain surface before the application of top surface sheet. If the base material surface is rough, approved surface primer shall be used. After cleaning, the materials shall not be handled, except by suitable device or clean canvas gloves, between all cleaning and preparation operation and application of top surface material.

Complete sheets of the material shall be used on the signs except where it is unavoidable. At splices, sheeting with pressure sensitive adhesives shall be overlapped not less than 5 mm. Sheeting with heat activated adhesives may be splices with an overlap not less than 5 mm or butted with a gap not exceeding 0.75 mm. The material shall cover the sign surface evenly and shall be free from twists, cracks, and folds. Cut- outs to produce legends and borders shall be bonded with the sheeting in the manner specified by the manufacturer.

## **4.4 Text, Pictograms and Arrows:**

The information on the sign boards shall either be screen printed or of cut outs. Screen printing shall be processed and finished with materials and in a manner specified by the sheeting manufacturer. Cut-outs shall be of materials as specified by the sheeting manufacturer and shall be bonded with the sheeting in the manner specified by the manufacturer.

\* \* \* \* \*

## Annexure A

### Do's and Don'ts

(Refer Para 2.1 and 2.5)

Examples of rightly (designated with ✓) and wrongly (designated with ✗) ranged text on signs:

#### i. Alignment:

Alignment and ranging must follow the direction of arrows. That is, if the arrow is pointing *Right*, then the text must be aligned to the *Right*. Change in gradient/ramp location shall be informed by sign in advance especially in fast moving spaces.

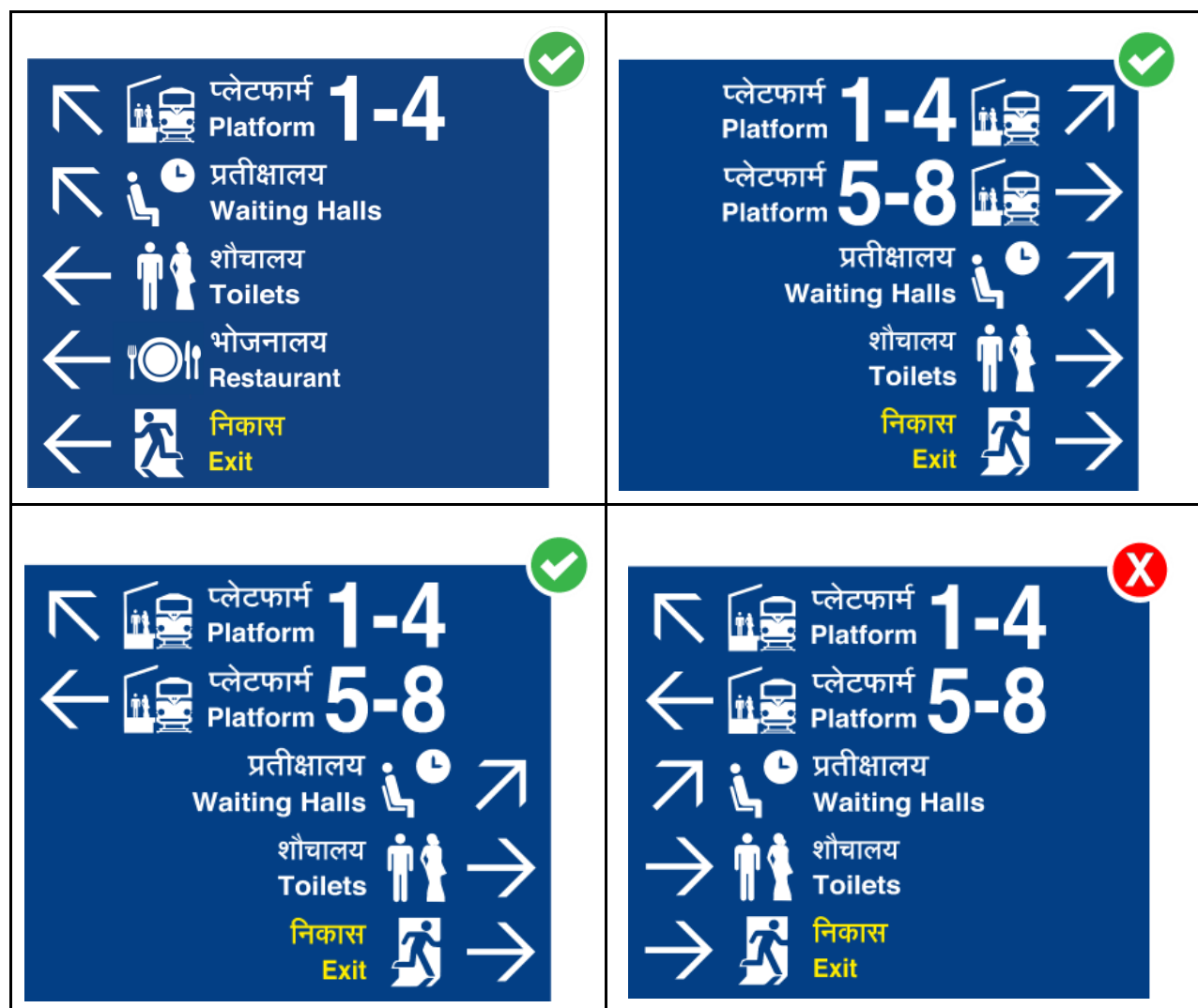


Figure 19: Example of Right and Wrong Text Layout

## ii. Information Hierarchy:

A hierarchy of importance should be followed within the station premises correlating with the station users' needs.

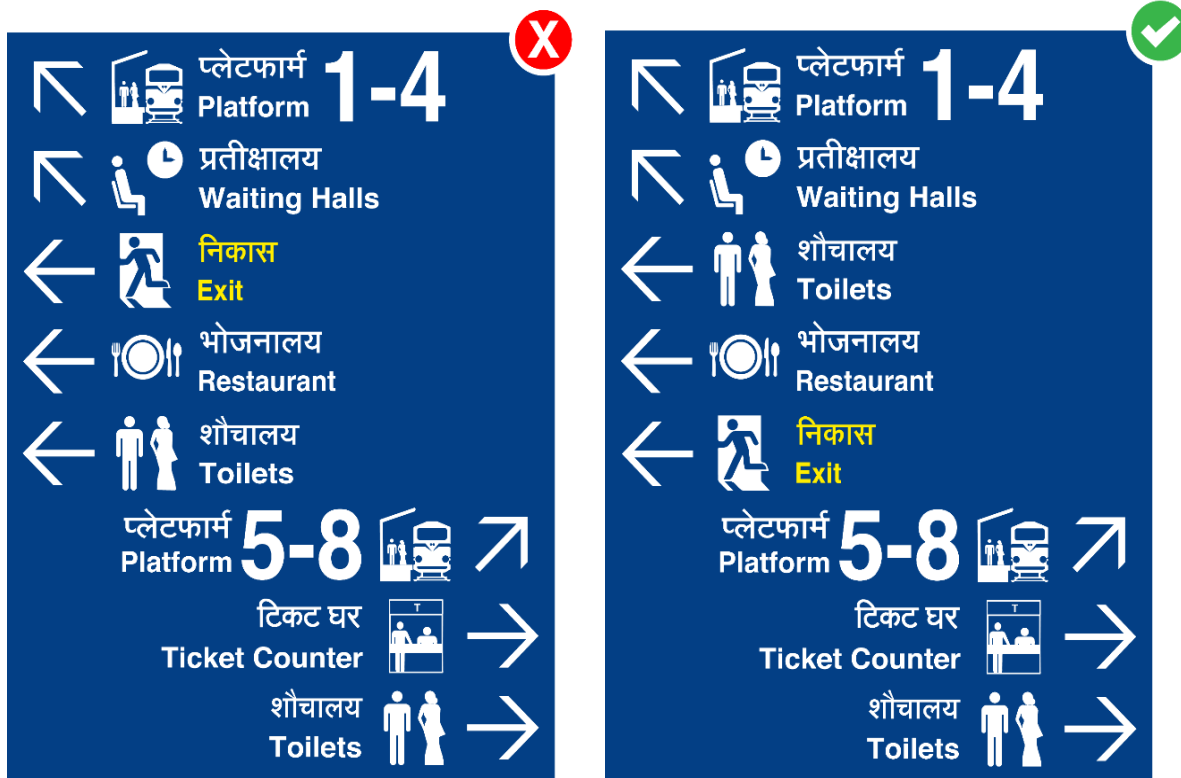


Figure 20: Examples of right and wrong informational hierarchy

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## Annexure B

### Pictograms

(Refer Para 2.6)

The visual depiction of the pictogram icons is given in the table below. The Pictograms illustrated here are shown in monochrome and colour may be suitably changed as per the colour scheme mentioned in Para 2.4. The vector images of the illustrated below pictograms can be directly downloaded from Railway Board Website.

				
Platform	Ticket Counter	Assistance	Information	Lost and Found
				
Gents Toilet	Ladies Toilet	Divyangjan Friendly Toilets	Ladies Divyangjan Toilet	Gents Divyangjan Toilet
				
Divyangjan Water Tap	Drinking water fountain	Wheel Chair Assistance	Accessible Ramp	Tourist Info.
				
Waiting Hall	Executive Lounge/AC Waiting Hall	Squat	Drinking Water	Lift



Wi-Fi Zone



CCTV



EV Charging



A.T.V.M



A.T.M.



Vision Impaired



Hearing impaired



Limited walking capability



Pedestrian



Sahyog Counter



Escalator



Escalator - Up



Escalator - Down



Travelator



Cloak Room



Stairs



Stairs - Up



Stairs - Down



Accessible Emergency Exit



Railway Offices



Fire Extinguisher



Litter



Caution wet floor



Recycle



Taxi



Bus



Bicycle



Two-Wheeler



Three-Wheeler



Parking



Station Manager



Pedestrian



Mobility Assistance



No Smoking



Baby Care



Meeting point



Retiring Room/  
Dormitory



Running room /  
TTE Lobby



Mobile Charging



Priority seating



Priority Seating



Soap Dispenser



Hand Dryer



O.R.H.



Book Stall



Restaurant



Exit

If a representative icon is not available in the list, then reference shall be drawn from Industry wide used good icons and used with approval of concerned DRM.

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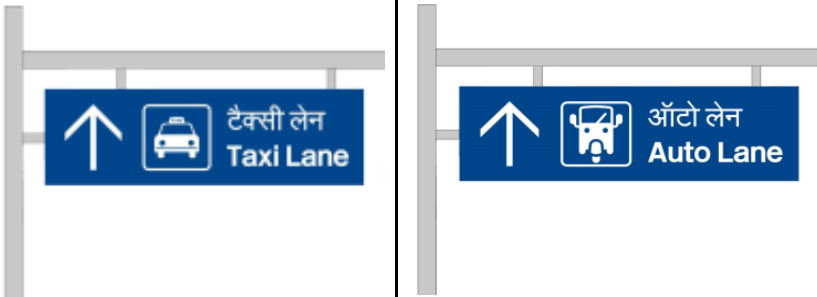
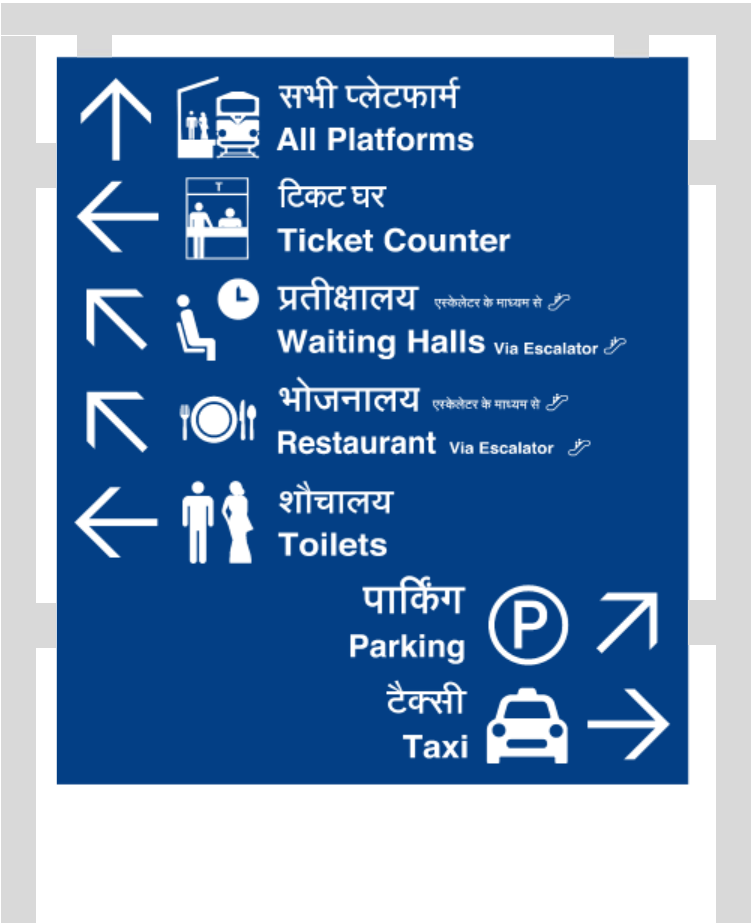
## Annexure C


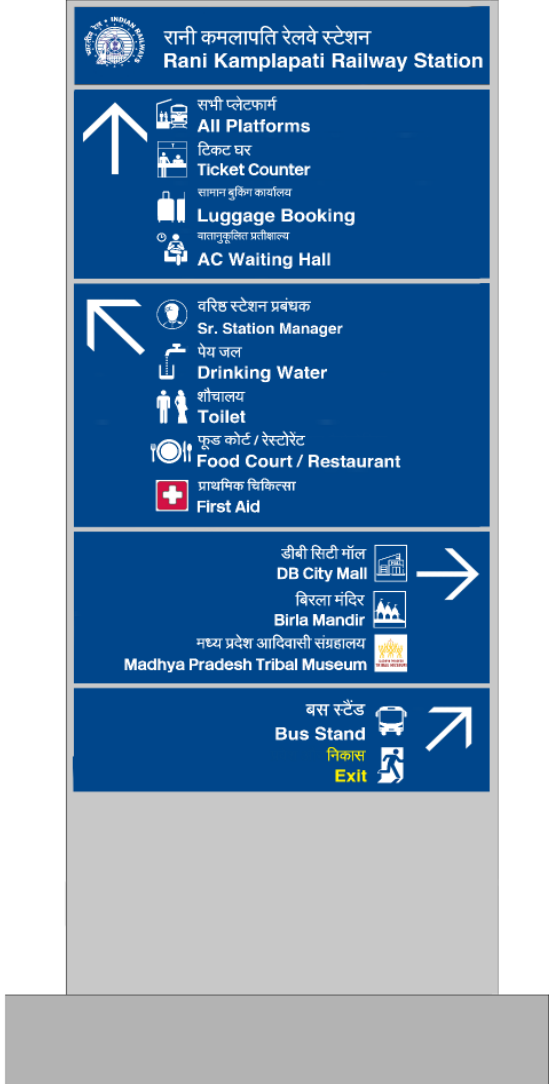
## Signages for a Small/Medium Size Station

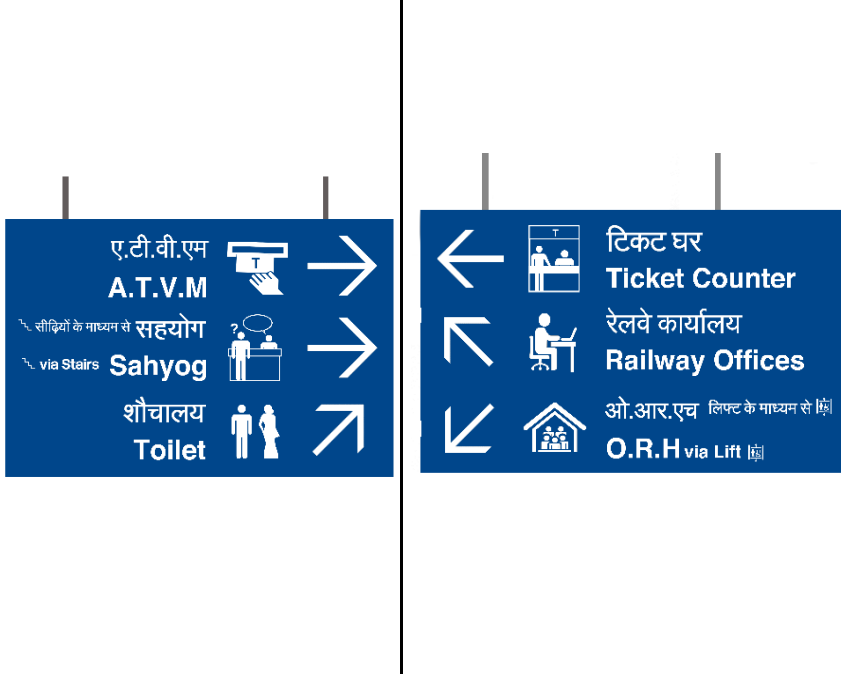


Indicative type of boards and their positioning for a small/medium station is illustrated as under. The location, type of board and graphic are indicative for the purpose of guidance only, actual type of board, location and matter on sign board may be decided based on the station specific requirements like space availability, location of various utilities, viewing distances etc. However, the graphics should be developed as per the guidelines in this document:




Board Positioning and Board Type	Board Drawing
Signage board proportions showing text/line spacing	
Station name sign on Gantry at each main entrance to circulating area Type: C2	
Station name sign on Gantry at each main entrance to circulating area (When used with lane identification) Type C2	


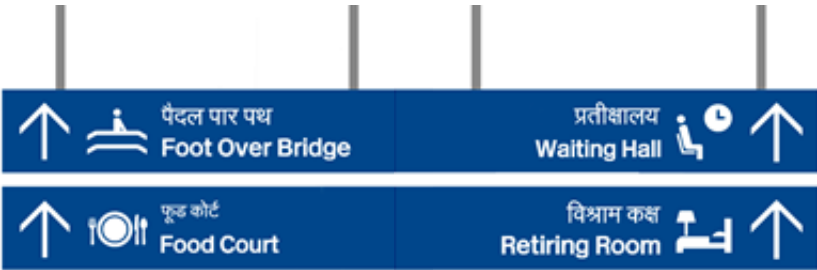








<p>Lane identification on the LHS side of each lane, flag type on pole mounted (indicating Lanes for Taxi/ Auto/ Drive through/ Bus/ Private Car, etc.)</p> <p>Type: C2</p> <p>Size: Length (value as required) X Height 300mm</p>	
<p>Pedestrian signage in circulating areas indicating Entry Gates to station concourse, FOBs/ Escalator, Railway Offices/ utilities in circulating area (like PRS, Parcel booking etc.), Parking, Pre-paid auto/taxi, Bus Stop, Exit etc.</p> <p>Type: C1</p> <p>Size: As per number of Information, character height 100 mm as per para 3 of Section 2 but not exceeding 2.5 m in height.</p>	


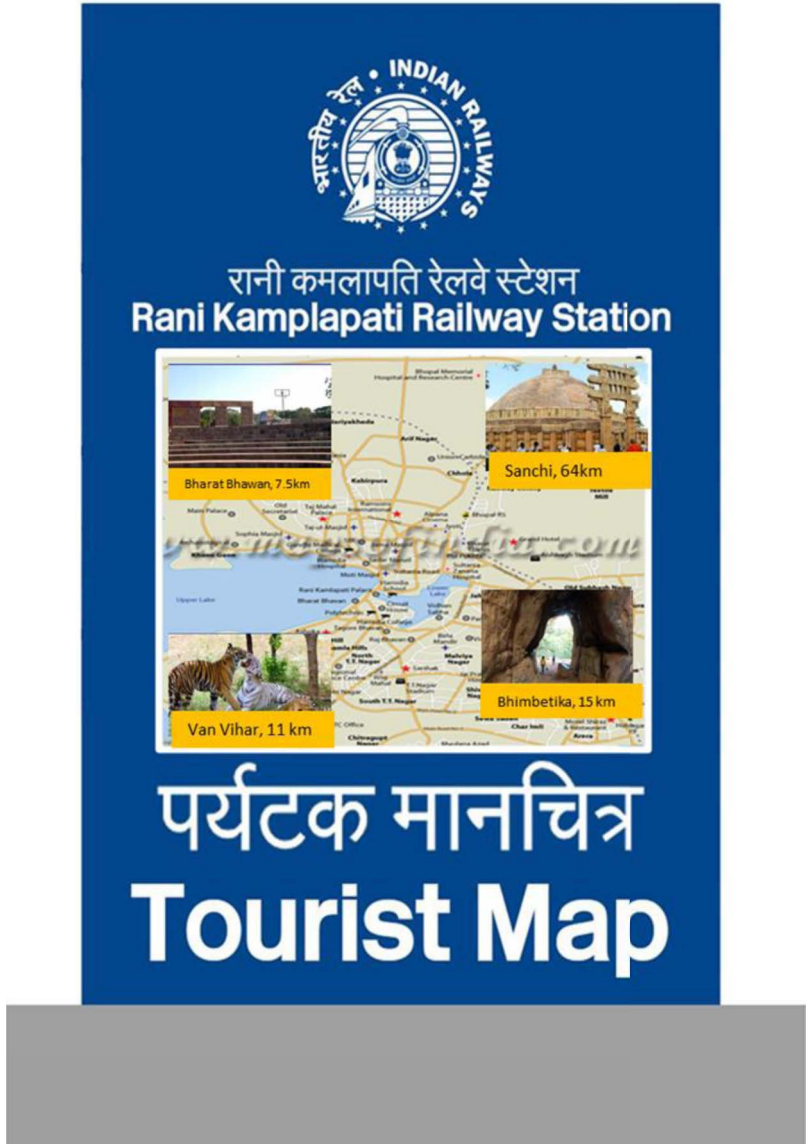
<p>Entry gate no. at Concourse entry, FOB no. at FOB/Escalator entry</p> <p>Type: C2</p> <p>Size: Length (value as required X Height 400mm</p>	
<p>Floor mounted Pylon sign boards having identification and directional information placed in concourse:</p> <p>Type: C1 when erected outside station building and F3 or F1 when erected inside station building or in platforms.</p> <p>Size: Based on number of information on board, Text size as per Para 3 of Section 2 but not exceeding 3 m in height.</p> <p>Positioning: It shall be decided such that it does not conflict with the free movement of passengers.</p>	

<p>Signage indicating various utilities, offices etc. located in concourse (like Ticket Window, ATVM, Enquiry, Food court, Toilets, Railway offices, retiring rooms, ORH etc.)</p> <p>Type: F3 if double sided (Hanging etc.); F4 if single sided (wall mounted etc.)</p> <p>Size: As per number of information, character height as per Para 3 of Section 2. One Board size not exceeding 1 m in height.</p>	
<p>Signage indicating way leading from concourse to platform, FOB etc, for train boarding</p> <p>Type: F3 if double sided (Hanging etc.) F2 if single sided (wall mounted etc.)</p> <p>Size: Length (Value as required) X Width 400m</p>	
<p>Signage related to DO's DON'Ts in concourse (like no smoking/no spitting etc.)</p> <p>F2 single sided (wall mounted etc.)</p> <p>Size: Length (Value as required) X 300mm</p>	


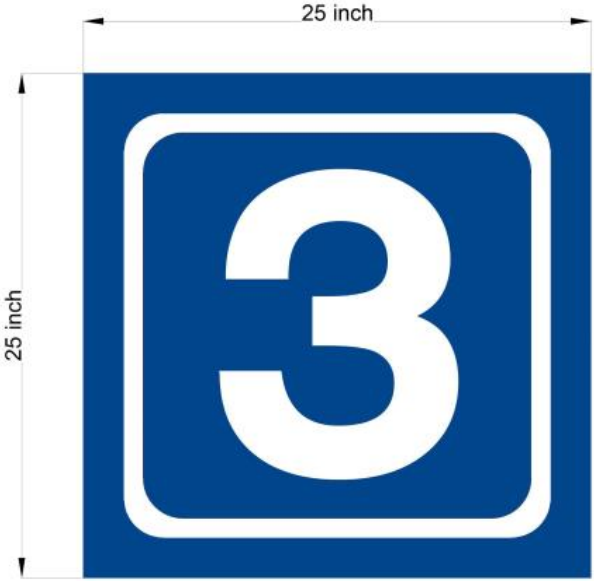
<p>Signage for security check near the DFMD/X-Ray baggage scanner</p> <p>Type: F3 if double sided (Hanging etc.) F4 if single sided (wall mounted etc.)</p> <p>Size: Length (Value as required) X 300mm</p>	
<p>Signage for prohibited items near the DFMD/X-Ray baggage scanner (The list is indicative)</p> <p>Type: F2</p> <p>Size: As per information on boards but not to exceed 2.5 m in height</p>	
<p>Entry board to platform entry with PF no.</p> <p>Type: F4 or F3 (depending whether its single sided or double)</p> <p>Size: Length (Value as required) X 400mm</p>	

<p>In front of entry from concourse to end PF (to be hanged from PF shelter, Parallel to track) indicating utilities, offices etc. to the left and to the right of entry</p> <p>Type: F4</p> <p>Size: not to be exceed 1.2m</p>		
<p>On all PFs, in middle of PF shelter, perpendicular to track, roof hanging sign indicating utilities, offices, exit/transfer (with exit name/FOB and availability of escalator/lift) etc. ahead, at every 100 metres</p> <p>Type: F4 or F3 (depending whether its single sided or double)</p> <p>Size: As per number of information, character height 100mm as per Para 3 of Section 2. The number of information shall not exceed 4 numbers per sign board.</p>		
<p>Office/Utilities name board near entry gate of such utilities wall mounted</p> <p>Type: F4</p> <p>Size Length (as per value required) X Width 300mm</p>		

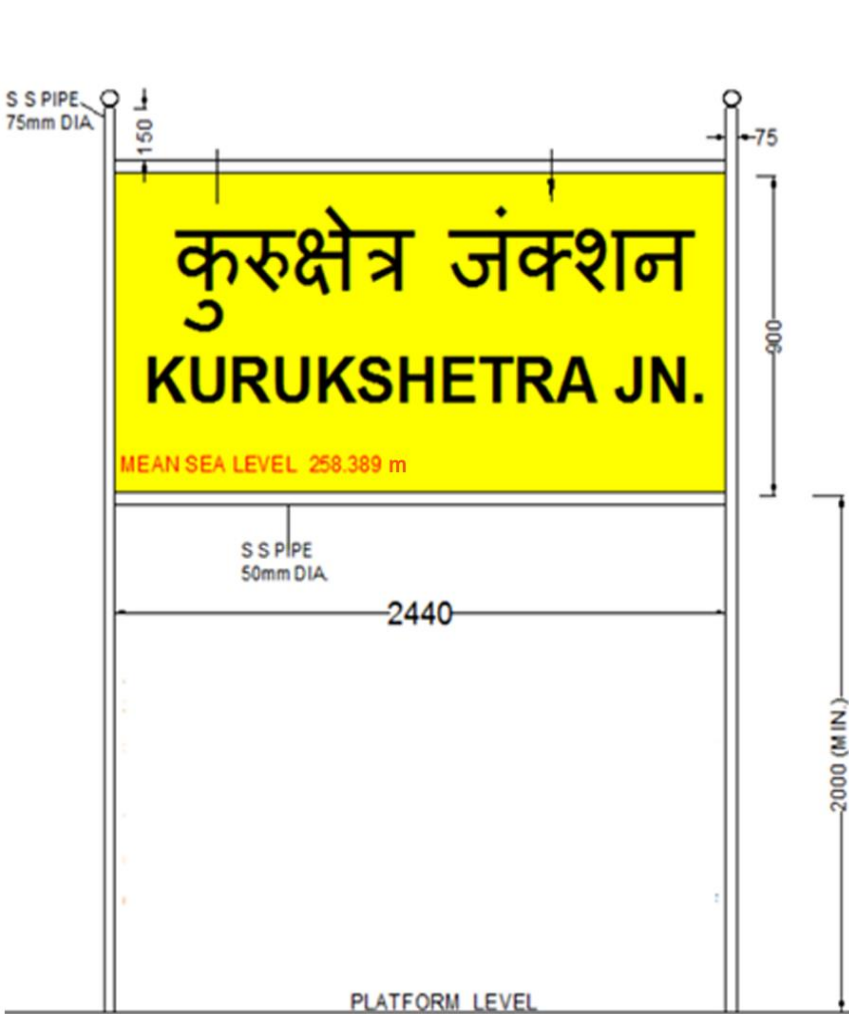
<p>General information boards (like helpline no., complaint no., Wheel Chair availability, first aid etc.) and prohibition boards (like no smoking/no spitting etc.) on platforms.</p> <p>Type: F2</p> <p>Size: As per information on boards but not to exceed 2.5 m in height</p>	 <p>The board is blue with white text and icons. It contains four sections:          <ul style="list-style-type: none"> <li>Top: सामान्य सूचना बोर्ड / General Information Board</li> <li>Bottom Left: हेल्पलाइन XXXX / Helpline XXXX (with phone icon)</li> <li>Bottom Right: व्हीलचेयर सहायक / Wheelchair Assistance (with wheelchair icon)</li> <li>Bottom Left (below helpline): शिकायत XXXX / Complaint XXXX (with phone icon)</li> <li>Bottom Right (below wheelchair): प्राथमिक चिकित्सा / First-Aid Availability (with red cross icon)</li> </ul> </p>
<p>Boards indicating water booth and toilet on PF</p> <p>Type: F3</p> <p>Size: Length (Value as required) X Height 300mm</p>	 <p>Two blue rectangular signs. The top sign says 'पेय जल / Drinking Water' with a water tap icon and a right arrow. The bottom sign says 'शौचालय / Toilet' with a male/female icon and a right arrow.</p>
<p>At entry to FOB staircase/escalator from PF indicating PFs and exit on RHS and LHS</p> <p>Type: F4</p> <p>Size: Length (Value as required) X Height 600mm</p>	 <p>Two blue rectangular signs. The left sign shows 'प्लेटफॉर्म 3-5 / Platform 3-5' with a left arrow and a train icon, and 'निकास पहाड़गंज / Exit Paharganj' with a left arrow and a person walking icon. The right sign shows 'प्लेटफॉर्म 1-2 / Platform 1-2' with a right arrow and a train icon, and 'अजमेरी गेट निकास / Ajmeri Gate Exit' with a right arrow and a person walking icon.</p>
<p>On FOB (perpendicular to FOB), indicating PF number, along with ramp/ escalator/ lift indication, on either side and exit ahead with exit name</p> <p>Type: F4</p> <p>Size: Length (Value as required) X Height 400mm</p>	 <p>Three blue rectangular signs. The first sign shows 'प्लेटफॉर्म 1 / Platform 1' with a left arrow and a train icon, and 'Via Ramp' with a ramp icon. The second sign shows 'प्लेटफॉर्म 2-5 / Platform 2-5' with an up arrow and a train icon. The third sign shows 'निकास / Exit' with a right arrow and a person walking icon.</p>

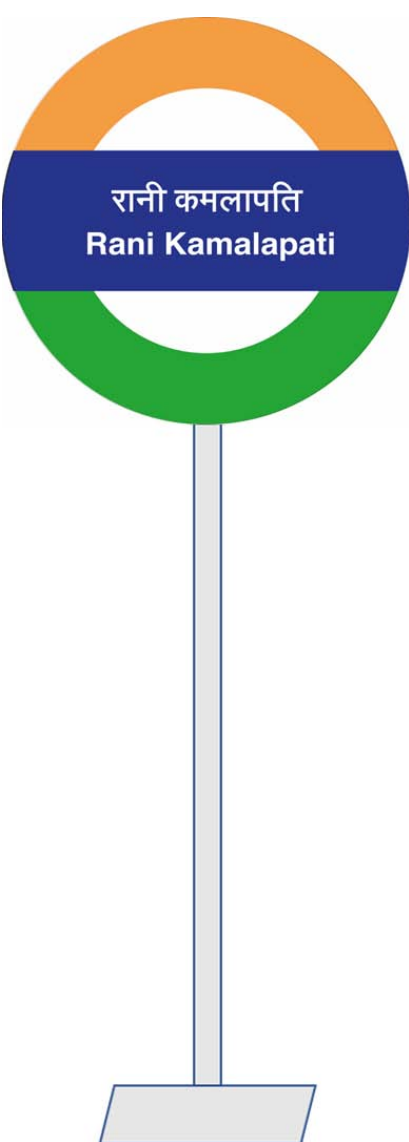


<p>Exit indication with exit name on FOB wall, parallel to FOB in front of each staircase/escalator landing on FOB</p> <p>Type: F4</p> <p>Size: Length (Value as required) X 400mm</p>	
<p>Tourist map/area map in arrival lobby/ in front of terminal landing of each FOB</p> <p>Type: F3</p> <p>Size: Height 2.5 m X Width 1.2m</p>	



<p>Round (four-sided board) pole mounted sign in circulating area for pre-paid taxi/auto, parking, pick up point etc.</p> <p>Type: E6</p> <p>Size: Length 600mm X Height 600mm</p>	
<p>Platform Number Board (Hanging from Platform Shelter, Double Sided) To be provided at every 100 m</p> <p>The boards shall be suitably staggered horizontally to give a clear direction from a distance.</p> <p>Type: F3 or F4 (depending whether its single sided or double)</p> <p>Size: Length 25-inch X Height 25-inch</p>	



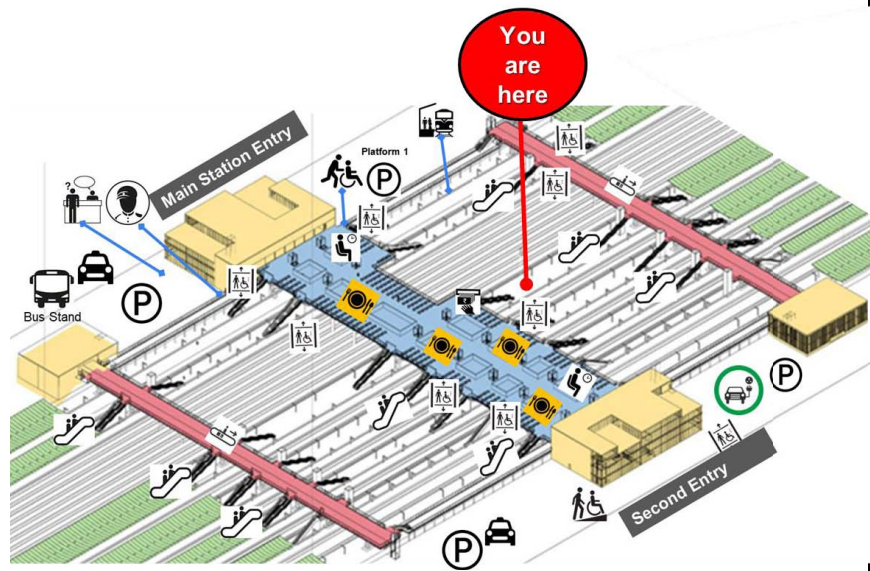
<p>Station Name Board (Primary)</p>	
<p>Type: Special</p>	
<p>Size: As mentioned</p>	
<ol style="list-style-type: none"> <li>1. To be provided at both ends of each PF at right angle to track.</li> <li>2. Name in local language, Hindi &amp; English (<b>all in same font size</b>)</li> <li>3. Size of primary character text shall be 300mm.</li> <li>4. Where boards are provided parallel to track due to narrow PF, station name on both sides</li> <li>5. Height of the board may be increased from 900mm as per site requirement.</li> <li>6. Secondary Station Name Board to be provided at an intermediate location at a very long PF at right angle to track.</li> </ol>	

Station Name Board (Tertiary)		
<p>Type: F4</p> <ol style="list-style-type: none"> <li>1. Size of board 1m diameter.</li> <li>2. Local Language on top, Hindi in middle and English at bottom (in case Hindi is local language, it may be used at top as well as in middle)</li> <li>3. Size of primary character text shall be 75 mm</li> <li>4. The central horizontal axis of the board should be at a height of 2m above the platform surface.</li> <li>5. Number of Boards at Stations shall be such that at least one name board is visible from any compartment of a standing train but provided such that it is not conflicting with the natural movement of pedestrians.</li> <li>6. The boards shall be either pole mounted, wall mounted or attached to Platform shelter stanchion.</li> <li>7. Colour scheme shall be as per the Tricolour Flag of India.</li> </ol>		 

Orientation Map Boards at  
Concourse and Platform  
areas.

Type: F4 or F2

Size: Station Specific



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## Annexure D\*

### Signage Used at CSMT for Identification of Different Lines

(Refer para 2.8)



Figure 21: CSMT: Front Gate Elevation

\* The reference provided is only for guidance and Railways are required to provide signage board based on station specific requirement.





Figure 22: CSMT: Circulating Area

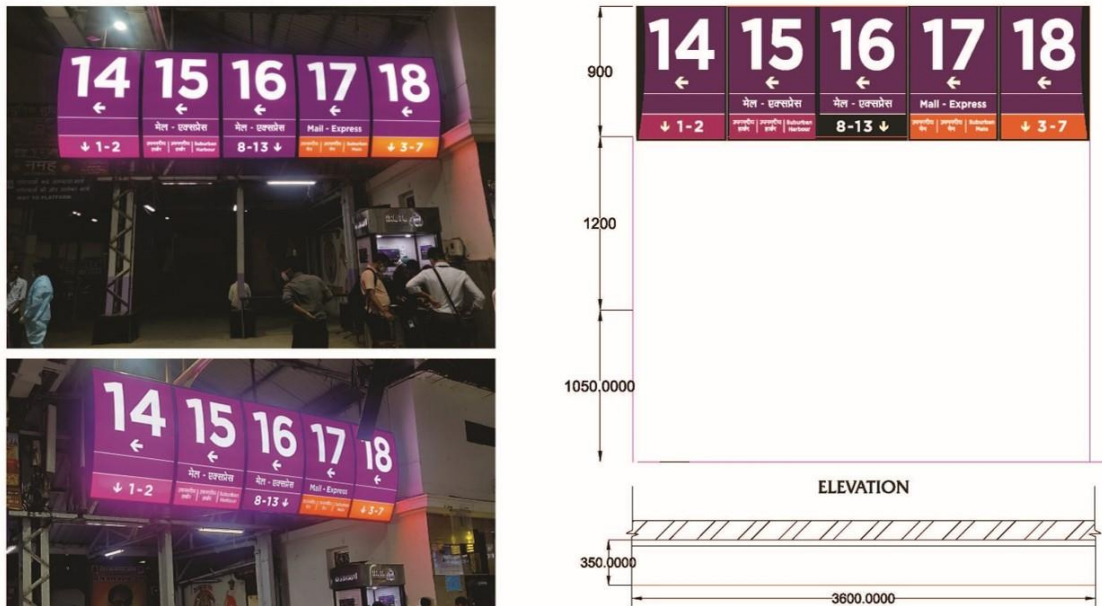


Figure 23: CSMT: Direction Boards



*Figure 24: CSMT Individual Platform Boards*

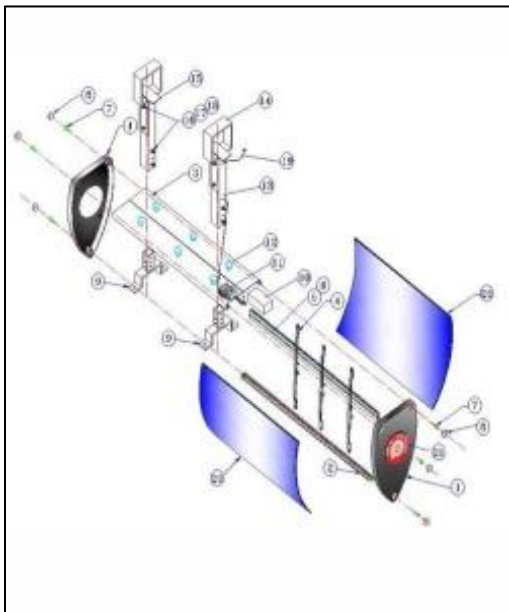
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## Annexure E \*

### Specifications of Signages Provided at CSMT Station

#### 1. Technical Specification for Elliptical / Parabolic Signage Boards

Display Board shall be Full Elliptical (FE) / Half Elliptical (HE) / Semi Elliptical (SE). All the elliptical signage shall be illuminated. The display sheet shall be of unbreakable 040 translucent polycarbonate sheet of 2 mm thickness. The text / graphics matter visibility shall not be less than 160 deg. The approved colour text and graphics shall be printed / router cut on monomeric calendared vinyl of 70 µm thickness and shall be firmly pasted on display sheets. The mounting arrangement shall be hanging, wall mounting, ceiling mounting, pole mounting or floor mounting and as per site requirement. The signage shall have the integral mounting arrangements with sturdy structural frame and ACP cladding on the back side of the signage to avoid rusting and entry of dust. The LED board shall have uniform illumination with 4- 8 W / sq. ft and with brightness more than ambient light. Suitable size end cap of 1.5 mm thick SS 304 should be provided.



#### Structure:

- |                             |                           |
|-----------------------------|---------------------------|
| 1. Elliptical Cap           | 11. Connector             |
| 2. Aluminium Corner Profile | 12. Grommet               |
| 3. Aluminium Top Profile    | 13. Square Tube           |
| 4. Bracket for Heat Sink    | 14. Hanging Bracket (Top) |
| 5. Heat Sink                | 15. Plate                 |
| 6. LED Strip                | 16. Hex Bolt M10          |
| 7. Screw M5                 | 17. Hex Nut M10           |
| 8. Screw Cap                | 18. Plain Washer M10      |
| 9. Hanging Bracket          | 19. Electric Wire         |
| 10. LED Driver              | 20. Display Sheet         |
|                             | 21. Logo                  |

*Figure 25: Technical Specification of Elliptical Board*

**\* These are for reference purpose only. The detailed specifications including material specifications shall be prepared by Zonal Railways as per specific station requirements and Good Industry Practices.**

### **1.1. Elliptical Glow Board Frame**

The frame shall be made of Extruded Anodised hollow aluminium profile of size not less than 1.2 mm thickness and anodized to minimum 15µm thickness (Grade AC-15) in approved colour. Anodizing coating shall be as per IS: 1868 or latest amendment.

### **1.2. Top Profile**

Top Profile of Elliptical Glow Board shall be made up of Aluminium Alloy (6063-T6) Extruded profile anodised to 15 µm +/- 3 µm. The profile nominal wall thickness shall be 2 mm and width approx. 170 mm/ 137 mm/ 268 mm. The reflective metallic silver PU particle coated granules shall be provided on the internal face of the profile. The edges of the profile shall be rounded. The profile shall have a slot of approx. 4.8 mm & 7mm width on both sides to hold 2/3/4 mm thick polycarbonate sheet. The slot shall be at an angle of 80-84 degree to face firmly hold the polycarbonate sheet in elliptical and parabolic curvature. The Elliptical / Parabolic curvature of the polycarbonate sheet shall be maintained by its inherent flexural tension property. It should have circular slots for M6 self-tapping cheese head screws to fix the end caps. Along the centre line of the top of this profile there shall be a 10mm x 3mm slot for press fitting the heat sink holding brackets in place with circular slot for M6 self-tapping screw should be made available. There shall also be a flat extension of 12mm to rectangular slot for additional support/fixing screws to firmly hold the heat sink holding bracket. The Total height of the central projection should be maintained to minimize obstruction to light illumination.

### **1.3. Bottom, Top and Side Profile**

Bottom, top and side Profile full/ half of the Elliptical Glow Board shall be made of extruded anodized Aluminium Alloy hollow profile (6063-T6) having 2mm to 5mm wall thickness. It should have internal ribs with approx. 1.5mm/ 2.5mm thickness and 4.5mm, 4.2mm wide slot to firmly hold the polycarbonate sheet in elliptical and parabolic curvature using its flexural tension. Total external width & Height of the bottom, top & side profile should be full of approx. 34mm x 48mm R 11.7mm / 42mm x 50mm, R 24.3mm / 42mm x 80mm, R16mm / 84mm x 80 mm, R16mm without compromising the strength and causing any obstruction to the light while giving maximum viewing area. The bottom corner shall have a curvature of approx. R11.7mm, 24.3mm and 16mm to appear in continuous flow of elliptical Curvature of polycarbonate sheet. This also shall add to aesthetic beauty of the whole Elliptical Glow Board.

### **1.4. Heat Sink Holding Bracket**

Heat Sink Holding Bracket shall be of approx. length 184mm/ 252mm/ 260mm/ 324mm/ 397mm/ 537mm/ 551mm injection moulded in Nylon 6 material & 1130mm/1156mm/861mm in MS machine formed powder coated for its strength & flexibility. The bracket shall be of 'I' cross section of sizes approx. 102mm x 15mm x 10mm/1080mm x 25mm x 5mm/ 1156mm x 50mm x 5mm/861mm x 50mm x 5mm at mid portion and it should reduce proportionately in slant at both the ends for nylon 6mm, MS 5mm. thickness without obstructing the light and without compromising on strength. The 'I' cross section nylon shall have ribs for maintaining stiffness. Both the ends of HSH brackets shall have locking clasp to press fit in 10 mm x 3mm slot of top



and bottom profile. The mid portion shall have offset of 14mm for nylon and 12 mm for MS. Central clasp shall be moulded in the Heat Sink Holding bracket to firmly hold the Heat Sink along the longitudinal axis of Elliptical Glow Board. The central clasp shall have two prong sets to hold the heat sink across its diagonal or along its sides as required. Two holes as per requirement shall be provided near the end clasps firmly. Two holes for nylon & MS shall be provided on both sides of central clasp to fix at both profiles Two holes shall be provided on both sides of central clasp to fix the mid portion of bracket to strip in the event longer bracket if required the mid portion of HSH bracket approx. 3 mm thick x 10 mm wide Aluminium strip in the event longer bracket is required or more than one Heat Sink is required for bigger size of Elliptical Glow Board.

#### **1.5. Heat Sink**

Heat Sink shall be 25-26 mm hollow anodized Aluminium Alloy (6063-T6) profile of 2mm thickness. Corners shall be flattened to form a square across flat to hold the heat sink diagonally. Heat sink must be press fit horizontally and diagonally from all 8 sides. All the four sides shall have dovetail of slots. Circular slots of dia. 2 mm shall be provided at all four internal corners to tight fit the pins of Heat Sink connector. There shall be a set of three of approx. 1.5mm thick ribs central of approx. 5mm height and two sides of approx. 2mm height. Provision for maximize the surface area to aid in faster cooling as well as for additional strength to hollow square profile.

#### **1.6. Heat Sink Connector**

Heat Sink connector shall be a moulded from polycarbonate profile of same cross-sectional dimensions as that of Heat Sink. The thickness of the connector shall be approx. 5 mm. Two semi-circular slots shall be provided on each face. Provision to pass out hot air from heat sink should be made. Four pins shall be moulded on four corners on both the faces of Heat Sink connectors to be press fitted in Heat Sink profile.

#### **1.7. Elliptical Glow Board End Cap**

End caps full / half with elliptical and parabolic shape shall be made from injection moulded polycarbonate granules 2 mm thick / SS 304 1.2 mm thick / Aluminium die casted 8 mm thick having curve on top side and internal hollow and elliptical base at bottom side with reflective internal surface. The End caps shall be perfectly opaque.

The boards shall be such that the text & Graphics displayed on the Polycarbonate sheet held in these end caps should be completely visible even if it is viewed directly from the bottom or any direction; the text is very much legible. Polycarbonate cap Internal face shall be cross ribbed 2mm x 3mm to increase the strength of the end cap. Eight nos. locating pins tapering towards collar of the end cap shall be provided near the internal periphery of the end cap. These pins shall firmly hold the 3mm translucent polycarbonate sheet in elliptical / parabolic curvature. Circular cut-out of dia. approx. 80mm shall be provided for illuminated branding or opaque cap shall be provided in case of none branding. For branding translucent material fitting provision should provide without shadow on branding. 2mm x 5mm Ribs approx. 20mm inside and parallel to the external periphery shall be provided for additional strength. Riser buttons shall be provided along the internal ribs to block the cut-outs using opaque sheet screwed through these buttons. These buttons may also be used to mount the LED projector when required. Projector

fitting bracket shall be fixed to end cap to align with oval slot. Three nos. cap holding sockets shall be moulded at three corners of the End Cap. Two nos. locating pins shall be provided on each cap holding sockets and shall be provided at the bottom of these pins for additional strength. This pin shall locate in the top and bottom Aluminium profile. Two tapering ribs shall be provided to cap holding brackets for additional strength. Three through slots of approx. 17 mm x 1.5 mm shall be provided near the top of end cap for heat ventilation. Moulded Screw caps shall be provided to externally press fit in the cap holding sockets. The end cap shall be Moulded Shatter proof opaque polycarbonate as per IS 14443 or latest amended with thickness not less than 1mm and of reputed Indian make using Bayer granules. SS 304 elliptical or parabolic cap should have approx. 20 mm vertical collar at corners of suitable dia. hole to interlock with profile and structure, square bracket at bottom cap should be provided to interlock vertical square structure pipe and top cap should have cut out to thorough pass the structure pipe with the provision of ventilation. Aluminium die Casted cap top should have curvature of R 1123-1125 mm and internal hollow with wall thickness of 6-8mm with polished and primed with metallic PU gloss lacquer coated. internal 2 nos. cap holding socket shall be casted at both corners of cap to interlock with side profile, Bottom casted cap should have side curvature of - R78-79mm / 112-113 mm and hollow of approx. 100 mm with internal 2 nos. cap holding socket shall be casted at both the corners of cap to interlock with side profile. Vertical rib should provide to interlock polycarbonate sheet with inner pins support should be flushed with side Aluminium profile. Cap should have a hole with die moulded dia. approx. 12 mm grommet to pass main supply wire.

### **1.8. Podium**

Elliptical shape one piece cut, top & bottom 3mm thick with size approx. 1170 mm x 512 mm x 508 mm at R914mm at corner R 117mm / 1643 mm x 575 mm x 508 mm at R 1652mm at corner R 92.5mm of SS 304 with parabolic shape cut at centre having dia. approx. 8 mm, 2 hole on top for matching with bottom cap of Elliptical Glow Board for fixing and interlocking without welding and bottom approx. 12 mm 4 hole for foundation fitting should be provided. Provide approx. 4 mm 9 holes for ventilation at top and Backside open able door system with lock & key. SS 304 grade frame structure of size approx. 25mm x 50mm x 1.2mm square with vertical and horizontal supports covered with SS 304 sheet of 1.2mm thick with powder coated in elliptical shape machine formed matching with top of podium should provide Anchor fastener fitting provision has to be made for ground fixing.

### **1.9. ACP Cladding**

Design, fabrication & installation of 3mm thick exterior grade PVDF coated Aluminium composite panels (Timex, Alucobond) of having 0.5 mm thick Aluminium PVDF coated sheet with specific standard colour + 3 mm core material + 0.5 mm Aluminium sheet chemically treated (back sheet) bent with 5mm uniform machine grooved as per requirement, fitted on anodised Aluminium/ anodized Aluminium angle Primer with PU coated MS rectangular grid work. Grid for supporting ACP shall be of size approx. 38mm x 38mm x 1.5mm at a distance of Heat sink fixed in Elliptical Glow Board should accurately match Horizontally & Vertically along with existing structure on site. Hardware, fixtures, brackets, anchor, fasteners of SS 304 grade etc. complete duly sealed with weathering silicon (DOW / GE) for circular columns and curved beams etc. Provision of MS clamp/ bracket for fixing with existing structure vertically, horizontally or slanted without welding

and with level size alignment adjustment and interlocking provision without compromising strength and structural stability of frame should provide.

#### **1.10. Text/Graphics**

Text/Graphics shall be computer cut/printed on 100 µm Monomeric calendared Vinyl matt sheet of reputed make (Metamark / 3M)

#### **1.11. Led Ribbon Light Illumination**

Ribbon light shall be of waterproof SMD 2835. The width of Ribbon light shall be 12 +/- 1mm. This shall be slide into the dovetail grooves of the heat sink & firmly pasted on all four sides of the heat sink. The light emitted from LED ribbon light should be partially reflected from the elliptical and parabolic curvature of white glossy polycarbonate sheet multiple times. Any obstruction or low brightness at the edges of the beam should be taken care of. Uniform illumination Average 4W-8W/ Sq.ft.

#### **1.12. Sign Substrate**

Sign substrate shall be of Eco Friendly, High impact strength, shatter proof, UV resistant, Translucent, non-flammable White polycarbonate solid sheet as per IS 14448 of not less than 3mm of reputed make Bayer / Lexan / Polymac. Light transmission shall be in the range of 60% - 90%. Provide U shaped 7mm x 1mm / 4mm x 1mm / 8 mm x 2mm gasket for tight holding and interlocking polycarbonate sheet in aluminium profile.

## **2. TECHNICAL SPECIFICATION FOR FLAT SIGNAGE BOARDS**

### **2.1. NON-ILLUMINATED SIGNAGE**

#### **Non-Illuminated Double Side (Back-to-Back) Signage-**

The Modular Design Signages have its openable profile of 100mm for double side shall be made of Aluminium Extrusion (Alloy 6060) sheet of 2mm with anodizing (thickness 15-20 microns) with a weight of 0.84 kg per meter ISO:9001-2008 product with premium grade anodizing and pure polyester powder coated (colour as per Railways norms and satisfactions).

The message on 3M U 180 Cost or PRS Parmacel or Avery MP1 1105 Easy Apply White/Colour Vinyl (as specified by Railways) with Over laminate of 3M 8519 Gloss Finish or PRS Parmacel or Avery DOL 10802 with eco solvent printing pasted on Aluminium Composite Panel (ACP) Sheet (Gurind or Indo bond or Alstrong or equivalent brand) of 3mm thickness on both sides of panel.

Providing and fixing of all accessories such as spring clips, anchoring hooks, nuts, screw hooks, slots etc. The Modular Design Signage is to be suspended from the concrete (e.g., slab, beam), trusses etc. by Mild Steel (MS) Suspender pipe including all accessories like bottom plate, locking plate, adjuster, bolts etc. Hilti fastener or equivalent brand of specified diameters are to be used where anchoring is to be done with the concrete chamber. VHB (Very High Bond) double side

adhesive tape for pasting purpose where ever required. All anchors fasteners, bolts etc. to be SS304 grade. The vinyl should have a warranty of 5 Years by Vinyl Manufacturer.

#### **Non-Illuminated Single Side Signage-**

The Modular Design Signage have its openable profile of 70mm for single side shall be made of Aluminium Extrusion (Alloy 6060) sheet of 2mm with anodizing (thickness 15—20 microns) with a weight of 0.84 kg per meter ISO: 9001—2008 product with premium grade anodizing and pure polyester powder coated (colour as per Railways norms and satisfactions).

The message on 3M U 180 Cast or PRS Parmacel or Avery MP1 1105 Easy Apply White/Colour Vinyl (as specified by Railways) with Overlamine of 3M 8519 Glass Finish or PRS Parmacel or Aven/ DOL 10802 with eco solvent printing pasted on Aluminium Composite Panel (ACP) Sheet (Gurind or Indo bond or Alstrong or equivalent brand) of 3mm thickness on one side of panel and other ACP will be drilled on wall.

Providing and fixing of all accessories such as spring clips, anchoring hooks, nuts, screw hooks, slots etc. The Modular Design Signages is to be suspended from the concrete (e.g., slab, beam, trusses etc.) by Mild Steel (MS) Suspender pipe including all accessories like bottom plate, locking plate, adjuster, bolts etc. Hilti fastener or equivalents brand of specified diameters are to be used where anchoring is to be done with the concrete chamber. VHB (Very High Bond) double side adhesive tape for pasting purpose where ever required. All anchors fasteners, bolts etc. to be SS304 grade. The Vinyl should have a warranty of 5 Years by Vinyl Manufacturer.

## **2.2. ILLUMINATED SIGNAGE**

#### **Illuminated Double Side (Back-to-Back) Signage: -**

The Modular Design Signage have its openable profile of 100mm for double side shall be made of Aluminium Extrusion (Alloy 6060) sheet of 2mm with anodizing (thickness 15—20 microns) with a weight of 0.84 kg per meter ISO:9001—2008 product with premium grade anodizing and pure polyester powder coated (colour as per Railways norms and satisfactions).

The message on 3M Scotchcal 3635—20/22 Cast Blackout Vinyl or PRS Parmacel or Avery 5301 Blackout Vinyl and 3M Scotchcal 3630 Cast Coloured Vinyl or PRS Parmacel or Avery 5600 LD Translucent/Avery 5500 QM TF Coloured Vinyl (as per colour standard specified by Railways) pasted on Polycarbonate Sheet (Pioneer or Polyethers or Laxan or PC Lite or equivalent brand) of 3mm thickness is to be used on both sides of panel. Letters of the Vinyl message to be made with plotter cut self-adhesive cast colour Vinyl.

Signage shall be illuminated from back wherever specified using Single/Multiple LED Modules each with IP 65 protection of white colour and rating of appropriate watts. Modules should be uniformly placed in a manner that at least one LED Module every 12 — 16 sq. inch of surface required illumination. Each signage should have an individual power supply adaptor for illumination of all LED installed in signage. The power supply adaptor should be placed inside signage and power supply adaptor should be connected using plugin type connector connected

to mains supply. LED to be used with five-year replacement warranty and specifications of LED module and Driver should be as per Para 2.13.

Providing and fixing of all accessories such as spring clips, anchoring hooks, nuts, screw hooks, slots etc. The Modular Design Signages is to be suspended from the concrete (e.g., slab, beam, trusses etc.) by Mild Steel (MS) Suspender pipe including all accessories like bottom plate, locking plate, adjuster, bolts etc. Hilti fastener or equivalents brand of specified diameters are to be used where anchoring is to be done with the concrete chamber. VHB (Very High Bond) double side adhesive tape for pasting purpose where ever required. All anchors fasteners, bolts etc. to be SS304 grade. The Vinyl should have a warranty of 5 Years by Vinyl Manufacturer.

#### **Illuminated (Wall Mounted) Single Side Signage: -**

The Modular Design Signages have its openable profile of 70mm for single sided shall be made of Aluminium Extrusion (Alloy 6060) sheet of 2mm with anodizing (thickness 15-20 microns) with a weight of 0.84 kg per meter ISO: 9001—2008 product with premium grade anodizing and pure polyester powder coated (colour as per Railways norms and satisfactions).

The message on 3M Scotchcal 3635—20/22 Cast Blackout Vinyl or PRS Parmacel or Avery 5301 Blockout Vinyl and 3M Scotchcal 3630 Cast Coloured Vinyl or PRS Parmacel or Avery 5600 LD Translucent/Avery 5500 QM TF Coloured Vinyl (as per colour standard specified by Railways) pasted on Polycarbonate Sheet (Pioneer or Polyleathers or Laxan or PC Lite or equivalent brand) of 3mm thickness is to be used on one side of panel and other side of panel will be of Aluminium Composite Panel (ACP) Sheet (GurInd or Indo bond or Alstrong or equivalent brand) of 3mm thickness. Letters of the Vinyl message to be made with plotter cut self-adhesive cast colour Vinyl.

Signage shall be illuminated from back wherever specified using Single/Multiple LED Modules each with IP 65 protection of white colour and rating of appropriate watts. Modules should be uniformly placed in a manner that at least one LED Module every 12 — 16 sq. inch of surface required illumination. Each signage should will have an individual power supply adaptor for illumination of all LED installed in signage. The power supply adaptor should be placed inside signage and power supply adaptor should be connected using plug—in type connector connected to mains supply. LED to be used with five-year replacement warranty and specifications of LED module and Driver should be as per Para 2.14.

Providing and fixing of all accessories such as spring clips, anchoring hooks, nuts, screw hooks, slots etc. The Modular Design Signages is to be fixed on wall by Mild Steel (MS) Suspender pipe including all accessories like bottom plate, locking plate, adjuster, bolts etc. Hilti fastener or equivalents brand of specified diameters are to be used where anchoring is to be done with the concrete chamber. VHB (Very High Bond) double side adhesive tape for pasting purpose where ever required. All anchors' fasteners, bolts etc. to be SS304 grade. The vinyl should have a warranty of 5 Years by Vinyl Manufacturer.

**2.3. ALUMINIUM CLIP - On Frame and Aluminium Composite Panel (ACP) Sheet**

**Signage: -**

3M U 180 Cast or PRS Parmacel or Avery MPI 1105 Easy Apply White/Colour Vinyl (as specified by Railways) with Over-laminate of 3M 8519 Gloss Finish or PRS Parmacel or Avery DOL 10802 with Eco Solvent Printing pasted on Aluminium Composite Panel (ACP) Sheet (Gurind or Indo bond or Alstrong or equivalent brand) of 3mm thickness and Polycarbonate Sheet (Pioneer Polyleathers or Laxan or PC Lite or equivalent brand) of 3mm thickness. Covered all around with Aluminium Extruded Openable Profile (Clip—on). Fixing of the clip—on profile and ACP sheet on the concrete wall is to be using drill machine etc. The vinyl with 5 Years Warranty by Vinyl Manufacturer.

**2.4. Retro Reflective Sheet and Aluminium Composite Panel (ACP) Sheet Signage: -**

3M DGS Reflective 4000 series or PRS Parmacel or Avery Omnicube™ T—11000 & W—11000 Series Reflective Sheet with plotter cut message of 3M DGS Reflective 4000 series or PRS Parmacel or Avery Omnicube™ T—11000 & W—11000 Series Reflective Sheet pasted on Aluminium Composite Panel (ACP) Sheet (Gurind or Indo bond or Alstrong or equivalent brand) of 3mm thickness. The Retro Reflective Sheet with 5 Years Warranty by Retro Reflective Manufacturer.

**2.5. Vinyl and Aluminium Composite Panel (ACP) Sheet Signage: -**

3M 11 180 Cast or PRS Parmacel or Avery MPI 1105 Easy Apply White/Colour Vinyl (as specified by Railways) with Over-laminate of 3M 8519 Gloss Finish or PRS Parmacel or Avery DOL 10802 with Eco Solvent Printing on it and pasted on Aluminium Composite Panel (ACP) Sheet (Gurind or Indo bond or Alstrong or equivalent brand) of 3mm thickness. The vinyl with 5 Years Warranty by Vinyl Manufacturer.

**2.6. Suspender: -**

Mild Steel suspenders rods/square pipe of size 38x38x2.6 mm including all accessories like adjuster, stoppers, sleeves, bolts, tee, etc. All Mild Steel (MS) suspender, to be Polyurethane painted, shall be Hot Dipped Galvanized after fabrication and before painting and installation.

The signage frame is to be suspended from metal supporting members or concrete e.g., slab or beam, trusses or purlins etc. with lengths as per site conditions including all accessories like adjuster, stoppers, sleeves, bolts etc. complete as per fabrication drawing. All mild steel, to be Polyurethane painted, shall be Hot Dipped Galvanized after fabrication and before painting. Entire assembly of suspension system is to be Polyester powder coated. Hilti fasteners or of equivalent brand of specified diameters are to be used where anchoring is to be done with the concrete members. The mounting surface shall be required or finished as per surrounding area complete at no extra cost.

### **3. TECHNICAL SPECIFICATION FOR CIRCULATING AREA SIGNAGE BOARDS**

- a) 3M DGS Reflective 4000 series or PRS Parmacel or Avery Omnicube™ T—11000 & W—11000 Series Reflective Sheet with plotter cut message of 3M DGS Reflective 4000 series or PRS Parmacel or Avery Omnicube™ T—11000 & W—11000 Series Reflective Sheet pasted on Aluminium Composite Panel (ACP) Sheet (Gurind or Indo bond or Alstrong or equivalent brand) of 3mm thickness. The Retro Reflective Sheet with 5 Years Warranty by Retro Reflective Manufacturer. ACP Sheet should be fixed on frame made of 25mmX3mm SS flat and provided with Stainless steel pipe frame on all four sides with pipe of 30mm to 50mm dia (depending on the size of board).
- b) Sign Board to be fixed using stainless steel pipe of 50mm to 100mm dia (depending on the size of board).
- c) All stainless-steel work shall conform to the requirements of IS:6911/1992 (equivalent BS 1449 Part 2). Stainless steel shall be low carbon chromium nickel austenitic steel type 302 or 304. The surface of stainless steel shall be in No. 4 brushed in a horizontal direction to achieve a satin polish grain.
- d) For single sided board, Backside of Aluminium sheet to be painted with two or more coats of epoxy paint over and including appropriate priming coat
- e) For “Station Welcome” board mounting arrangement may be decided as per local conditions like width of road, availability of dividers etc. However, the mounting arrangement must be suitable covered with SS sheet of appropriate thickness.

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## **References**

1. Signage Policy issued by Ministry of Railways vide letter dated 97/TG. II/39/11/Signages dated 11-03-1999
2. “Manual for Standards and Specifications for Railway Stations” issued by Ministry of Railways in June 2009
3. DMRC Signage Metro Stations dated 07-09-2017
4. Office Memorandum issued by Department of Official Languages, Ministry of Home Affairs
5. Indian Railways Works Manual
6. Guidelines on accessibility of Indian Railway Stations and facilities at stations for differently abled persons (Divyangjan) and passengers with reduced mobility.
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8. IS 9457:2005, Safety Colours and Safety signs – Code of Practise
9. Wayfinding Design Guidance Compliance (NR/GN/CIV/300/01, December 2020)
10. National Building Code of India, Volume 1, 2016
11. Accessibility Design Manual: 1-Urban Designs: 2-Signage (un.org)
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14. <https://IndianRailways.gov.in/Railwayboard/prdirectorates/uploads/pdf/IR%20logos.pdf>.

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**Ministry of Railways**  
**Government of India**