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# FINAL SPEED CERTIFICATE FOR OPERATION OF COACHES OF 16 COACH FORMATION OF TRAIN SET WITH NEW DESIGN PROPULSION SYSTEM & BOGIES (VANDE BHARAT TRAIN SET)

| No. | TS/SC/Operation | Date | As signed |
|---|---|---|---|

**महाप्रबंधक (इंजीनियरिंग),**

1. मध्य रेलवे, छत्रपति शिवाजी महाराज टर्मिनस, मुंबई – 400 001
2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता – 700 001
3. उत्तर रेलवे, बडौदा हाउस, नई दिल्ली – 1100 01
4. पूर्वोत्तर रेलवे, गोरखपुर - 27 3001
5. पूर्वोत्तर फ्रन्टियर रेलवे, मालीगांव गुवाहाटी – 781 011
6. दक्षिण रेलवे, अनेक्सी, पार्क टाउन चेन्नई – 600 003
7. दक्षिण मध्य रेलवे, रेल निलायम, सिकंदराबाद – 500 025
8. दक्षिण पूर्व रेलवे, गार्डन रीच, कोलकाता – 700 043
9. पश्चिम रेलवे, चर्च गेट, मुम्बई – 400020
10. उत्तर मध्य रेलवे, सूबेदारगंज, प्रयागराज – 211 011
11. उत्तर पश्चिम रेलवे, जयपुर – 302 006
12. पूर्व मध्य रेलवे, हाजीपुर – 844 101
13. पूर्वतटीय रेलवे, बीडीए रेंटल रेलवे कॉमप्लेक्स, भुवनेश्वर – 751 017
14. दक्षिण पश्चिम रेलवे, हुबली – 580 023
15. पश्चिम मध्य रेलवे, जबलपुर - 482 001
16. दक्षिण पूर्व मध्य रेलवे, बिलासपुर – 495 004

**Sub:** Final speed certificate for operation of Coaches of 16 coach formation of Train Set with new design propulsion system & bogies (Vande Bharat Train Set), up to a maximum speed of 160 kmph over Indian Railways on track maintained as per provisions of Indian Railways Permanent Way Manual, June-2020, containing track geometry standards under para 522.

**Ref**: (i) Railway Board letter no. 2019/M(C)/202/3/Pt dated 11.08.2021 & 13.08.2021.
(ii) Railway Board letter no. 2022/CEDO/SD/RS/08 dated 29.06.2022.

## 1. IMPORTANT PARAMETERS RELATED TO TRAIN-18 ROLLING STOCK

| | | | | | |
|---|---|---|---|---|---|
| **Type** | *Final / Provisional / Oscillation Trial / COCR/ Movement and Oscillation/ Mock Trial* | Operation | *Validity/ Period or Permanent* | IR / Sectional | Permanent |

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|---|---|---|---|---|---|---|---|
| **Stock Name** | Train Set with new design propulsion system & bogies (Vande Bharat Train Set) | | **Maximum Designed Axle Load** | 17 t | | **Transportation code** | **Max. Axle Load (t)** |
| | | | | | | **TSDTC** | 13.61 |
| | | | | | | **TSTC** | 15.38 |
| | | | | | | **TSMC** | 15.77 |
| | | | | | | **TSMC2** | |
| | | | | | | **TSNDTC** | 13.39 |
| | | | | | | **TSNDTC2** | |

**GA Drg. No., Payload & Transportation code of coaches of Train Set with new design propulsion system & bogies (Vande Bharat Train Set)**

| S N. | Group/ Type of coach | Layout Drawing no. | Transportation code | Payload (t) | Remarks |
|---|---|---|---|---|---|
| 1. | Driving Trailer Coach (DTC) | TS/DTC-9-0-001 | TSDTC | 4.327 | -- |
| 2. | Motor Coach (MC/MC2) | TS/MC-9-0-001 | TSMC | 6.48 | Same coaches except change over switch in MC2 |
| | | TS/MC2-9-0-001 | TSMC2 | | |
| 3. | Trailer Coach (TC) | TS/TC-9-0-001 | TSTC | 6.48 | |
| 4. | Non-Driving Trailer Coach- Executive Class (NDTC/EC /NDTC/EC2) | TS/NDTC/EC-9-0-001 | TSNDTC | 4.416 | Same coaches except $180^0$ rotation |
| | | TS/NDTC/EC2-9-0-001 | TSNDTC2 | | |

| SN | Group/ Type of coach | Bogie General Arrangement Drawing no. |
|---|---|---|
| 1. | Driving Trailer Coach (DTC) | TS/MC-0-0-001 |
| 2. | Motor Coach (MC/MC2) | TS/MC-0-0-001 |
| 3. | Trailer Coach (TC) | TS/MC-0-0-001 |
| 4. | Non-Driving Trailer Coach- Executive Class (NDTC/EC / NDTC/EC2) | TS/MC-0-0-001 |

| | | | |
|---|---|---|---|
| **Bogie Arrgt. (Fabricated/Casted)** | Fabricated | **Gauge** | BG |

| | | | | | |
|---|---|---|---|---|---|
| **Type of Bogie** | Y Frame | **Type of Coupler** | Semi-permanent head and balanced draft gear & each DTC is provided with CBC on driving end. | **Wheel Dia. (mm)** | New: 952 mm; Worn: 877 mm |

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| **Rake / Train consist for Operation** | 16 Car rake of Train Set with new design propulsion system & bogies (Vande Bharat Train Set). |

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| **Max. Permissible Speed** | Empty | 160 kmph | Loaded | 160 kmph |

| 1.1 | INTRODUCTION |
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| 1.1.1 | Train Sets with new design propulsion system & bogies (Vande Bharat Train Set) have been designed as per RDSO spec RDSO/PE/SPEC/EMU/0196-2019 (Rev.0) along-with addendum/corrigendum, for maximum operational speed of 160 kmph. Train Set with new design propulsion system & bogies (Vande Bharat Train Set) is relatively lighter & has 50% powering with under slung propulsion equipments. The coaches of Train set are being manufactured as per the layout drawings approved by Railway Board vide letter no. 2019/M(C)/202/3/Pt dated 11.08.2021. Railway Board further allotted separate transportation codes vide letter no. 2019/M(C)/202/3/Pt dated 13.08.2021 for above coaches. |
| 1.1.2 | **Salient feature of Train Set with new design propulsion system & bogies (Vande Bharat Train Set) Coaches:**<br>(i) Optimized & lighter bogie & propulsion system in comparison to those in earlier train sets in service.<br>(ii) The speed potential of Train set coaches for operation is 160 kmph.<br>(iii) The coaches of Trainset are provided with bogie having fully suspended type of traction motors & bolster less bogie, coil springs in primary suspension and air spring in secondary suspension.<br>(iv) The DTC coaches on both ends are fitted with center buffer coupler (CBC) on driving end side while all other coaches and other side of DTC coaches are fitted with semi-permanent head coupler with balanced draft gear arrangement.<br>(v) The brake system fitted on Train set is microprocessor controlled Electro Pneumatic (EP) brake system. |
| 1.2 | RDSO has conducted oscillation and EBD (Emergency Braking Distance) trials on prototype rake of 16-coach formation of Train Set with new design propulsion system & bogies (Vande Bharat Train Set), manufactured by ICF/Chennai for a maximum operational speed of 160 Kmph on track maintained as per provisions of Indian Railway Permanent Way Manual, June-2020, containing track geometry standards under Para 522. Formation during trials was DTC + MC + TC + MC2 + MC + TC + MC2 + NDTC/EC + NDTC/EC2 +MC2 + TC + MC + MC2 + TC + MC + DTC.<br><br>(i) Oscillation trials of prototype rake of 16-coach formation of Train Set with new design propulsion system & bogies (Vande Bharat Train Set), manufactured by ICF/Chennai were conducted upto a maximum test speed of 115 kmph over **Sanehwal – New Morinda (SNL - NMDA)** section of Northern Railway on track maintained as per standard specified under Para 522 of Indian Railway Permanent Way Manual, June-2020. The test results as contained in RDSO's report no. RDSO/2022/TG/MT–1900/F/Rev.0/Amendment-Nil Dated: 25.08.2022, indicate satisfactory riding and stability characteristics in inflated condition of air springs in empty and loaded condition on straight track, station yard and curved sections on track up to the test speed of 115 kmph.<br><br>(ii) Oscillation trials of prototype rake of 16-coach formation of Train Set with new design propulsion system & bogies (Vande Bharat Train Set), manufactured by ICF/Chennai were conducted upto a maximum test speed of 180 kmph over **Nagda - Kota- Sawai Madhopur (NAD-KOTA-SWM)** section of West Central Railway on track maintained as per standard specified under Para 522 of Indian Railway Permanent Way Manual, June-2020. The Oscillation test results as contained in RDSO's report no. RDSO/2022/TG/MT– 1901/F/Rev.0/Amendment-Nil Dated: 30.08.2022, indicate satisfactory riding and stability characteristics in inflated condition of air springs in empty and loaded condition on straight track, station yard and curved sections on track up to the test speed of 180 kmph. |

(iii) EBD trials of prototype rake of 16-coach formation of Train Set with new design propulsion system & bogies (Vande Bharat Train Set), manufactured by ICF/Chennai were conducted upto a maximum test speed of 160 kmph over **Nagda - Kota- Sawai Madhopur (NAD-KOTA-SWM)** section of West Central Railway on track maintained as per standard specified under Para 522 of Indian Railway Permanent Way Manual, June-2020. The EBD test results as contained in RDSO/2022/TG/MT – 1902/F/Rev.0/Amendment-Nil Dated: 02.09.2022 indicate satisfactory Emergency Braking Distance (Wet rail & Dry rail) test in loaded condition. The Emergency Braking Distances (EBD) in different conditions and speeds, in brief, are tabulated below:

| **Condition** | **Mode of Brake application** | **Test Speed (Kmph)** | **Braking Distance (in meters)** | |
|---|---|---|---|---|
| | | | Range | **Max. value** |
| **Wet Rail** | Emergency Mode through master controller | 160 | 768.43---802.81 | **802.81** |
| | Emergency Mode through emergency push button | 160 | 793.10---846.92 | **846.92** |
| | By moving Driver's brake valve into Emergency position | 80 | 336.38---347.59 | **347.59** |
| **Dry Rail** | Emergency Mode through master controller | 160 | 782.63--805.06 | **805.06** |
| | Emergency Mode through emergency push button | 160 | 743.02--855.89 | **855.89** |
| | By moving Driver's brake valve into Emergency position | 80 | 307.97--318.43 | **318.43** |

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| 2.0 | Based on results of above trials, it is certified that Coaches of 16 coach formation of Trainset with new design propulsion system & bogies, are fit for operation up to maximum speed of 160 kmph over Indian Railways on track maintained as per standard specified under Para 522 of Indian Railway Permanent Way Manual, June- 2020, subject to following conditions: |

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| **2.1** | **TRACK STRUCTURE DETAILS AND SPEED:** |

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| 2.1.1 | **For speed up to 110kmph** |
| 2.1.1.1 | The track shall be to a minimum standard of 52kg (72UTS) rail laid on PSC sleeper with 1540 Nos./Km on 250mm ballast cushion below the sleepers which may consist of 100mm clean and rest in caked up condition, on compacted and stable formation. |
| 2.1.1.2 | For track maintained to lower standard than that mentioned above, the Chief Engineer shall decide the lower maximum permissible speed on the basis of maintenance condition. In this connection, instructions issued by Railway Board letter no.65/WDO/SR/26 dt 19/20.10.1966 may be seen. When the Chief Engineer considers that the road bed is not compacted or there is improper drainage, he may suitably restrict the maximum permissible speed depending upon the local conditions. |
| 2.1.1.3 | The maximum permissible speed on curves shall be decided on the basis of the existing provisions of the Indian Railways Permanent Way Manual, June-2020. Maximum cant deficiency permitted would be 100mm, subject to provision of Para 404 of IRPWM, June – 2020. |
| 2.1.1.4 | The welds shall be protected by joggled fish plates as per provisions of USFD Manual and Indian Railways Permanent Way Manual, June 2020, and other policy instructions of |

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| | Railway Board. The maintenance of Rails & Rail joints shall be ensured as per provision of Indian Railways Permanent Way Manual, June 2020. In addition, wherever condition warrants on account of corrosion on rail/ weld collar, wear on rail, cupping of welds etc. necessary precautions shall be taken for fish plating/ joggled fish plating. |
| 2.1.1.5 | Zonal Railway may ensure further detailed examination of track as deemed fit based on age cum condition basis, overdue renewal and condition of formation etc. as per provisions of the Indian Railways Permanent Way Manual, June – 2020 regarding permanent way renewals and may suitably restrict maximum speed of operation based on such examination. |
| 2.1.1.6 | Track geometry standards shall be maintained to as per provisions of Indian Railways Permanent Way Manual, June-2020, containing track geometry standards under Para 522. |
| 2.1.2 | **For speed more than 110kmph and up to 130kmph** |
| 2.1.2.1 | The track shall be to a minimum standard of 52kg (90UTS) rail laid on PSC sleeper with 1540 Nos./Km on 250mm ballast cushion below the sleepers which may consist of 100mm clean and rest in caked up condition, on compacted and stable formation. |
| 2.1.2.2 | For track maintained to lower standard than that mentioned above, the Chief Engineer shall decide the lower maximum permissible speed on the basis of maintenance condition. In this connection, instructions issued by Railway Board letter no.65/WDO/SR/26 dt 19/20.10.1966 may be seen. When the Chief Engineer considers that the road bed is not compacted or there is improper drainage, he may suitably restrict the maximum permissible speed depending upon the local conditions. |
| 2.1.2.3 | The maximum permissible speed on curves shall be decided on the basis of the existing provisions of the Indian Railways Permanent Way Manual, June – 2020. Maximum cant deficiency permitted would be 100mm, subject to provision of Para 404 of IRPWM, June - 2020. |
| 2.1.2.4 | The welds shall be protected by joggled fish plates as per provisions of USFD Manual and Indian Railways Permanent Way Manual, June 2020, and other policy instructions of Railway Board. The maintenance of Rails & Rail joints shall be ensured as per provision of Indian Railways Permanent Way Manual, June 2020. In addition, wherever condition warrants on account of corrosion on rail/ weld collar, wear on rail, cupping of welds etc. necessary precautions shall be taken for fish plating/ joggled fish plating. |
| 2.1.2.5 | Zonal Railway may ensure further detailed examination of track as deemed fit based on age cum condition basis, overdue renewal and condition of formation etc. as per provisions of the Indian Railways Permanent Way Manual, June – 2020 regarding permanent way renewals and may suitably restrict maximum speed of operation based on such examination. |
| 2.1.2.6 | Track geometry standards shall be maintained to as per provisions of Indian Railways Permanent Way Manual, June-2020, containing track geometry standards under Para 522. |
| 2.1.2.7 | Track geometry shall be monitored once in three months by Track Recording Car, once a month by OMS and once in six month by Oscillograph Car. |
| 2.1.2.8 | All turnouts shall be fixed heel curved switches laid on PSC sleeper layout with CMS crossings. |
| 2.1.2.9 | Sleeper on bridges (other than ballasted deck) would be steel channel/H-beam/Composite sleepers. |
| **2.1.3** | **For speed more than 130kmph and up to 160kmph** |
| 2.1.3.1 | The track shall be to a minimum standard of 60kg (90UTS) rail laid on PSC sleeper with 1660 Nos./Km on 300mm ballast cushion below the sleepers which may consist of 150mm clean and rest in caked up condition, on compacted and stable formation. |
| 2.1.3.2 | For track maintained to lower standard than that mentioned above, the Chief Engineer shall decide the lower maximum permissible speed on the basis of maintenance condition. In this connection, instructions issued by Railway Board letter no.65/WDO/SR/26 dt 19/20.10.1966 may be seen. When the Chief Engineer considers that the road bed is not compacted or there is improper drainage, he may suitably restrict the maximum permissible speed depending upon the local conditions. |
| 2.1.3.3 | The maximum permissible speed on curves shall be decided on the basis of the existing provisions of the Indian Railways Permanent Way Manual, June – 2020. Maximum cant deficiency permitted would be 100mm, subject to provision of Para 404 of IRPWM, June – |

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| | 2020. |
| 2.1.3.4 | The welds shall be protected by joggled fish plates as per provisions of USFD Manual and Indian Railways Permanent Way Manual, June 2020, and other policy instructions of Railway Board. The maintenance of Rails & Rail joints shall be ensured as per provision of Indian Railways Permanent Way Manual, June 2020. In addition, wherever condition warrants on account of corrosion on rail/ weld collar, wear on rail, cupping of welds etc. necessary precautions shall be taken for fish plating/ joggled fish plating. |
| 2.1.3.5 | Zonal Railway may ensure further detailed examination of track as deemed fit based on age cum condition basis, overdue renewal and condition of formation etc. as per provisions of the Indian Railways Permanent Way Manual, June – 2020 regarding permanent way renewals and may suitably restrict maximum speed of operation based on such examination. |
| 2.1.3.6 | All the turnouts in facing direction shall be laid with thick web switches with provision of clamp type lock. All the crossings shall be CMS crossing. All other turnout shall be of fixed heel curved switch type with CMS crossing. |
| 2.1.3.7 | Track geometry standards shall be maintained to as per provisions of Indian Railways Permanent Way Manual, June-2020, containing track geometry standards under Para 522. |
| 2.1.3.8 | All the SEJs shall be of improved type. |
| 2.1.3.9 | Sleeper on bridges (other than ballasted deck) would be steel channel/H-beam/Composite sleepers. |
| 2.1.3.10 | Track geometry shall be monitored once in two months by Track Recording Car, once a month by OMS and once in four month by Oscillograph Car. |
| 2.1.3.11 | Improvement on track geometry parameters on the route of operation of the train to be carried out as required. |

| **2.3** | **BRIDGE STIPULATIONS:** |
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| 2.3.1 | The clearance refers to “Standard RDSO Spans” bridges with standard design of girders, slabs, pipe culverts, piers and abutments etc. issued by RDSO for BGML, RBG, MBG and 25t-2008 standard loadings. |
| 2.3.2 | Superstructures & bearings of “Special Spans” (designed and constructed by Zonal Railways based on site requirements), Arches and sub-structures (including foundation) of all bridges (Standard RDSO spans and Special Spans) are to be got examined by the Chief Bridge Engineer and certified safe with respect to current Indian Railway standard codes with up to-date correction slips. |
| 2.3.3 | The clearance is subject to the following parameters of Train Set with new design propulsion system & bogies (Vande Bharat Train Set) coaches: |

| **Rolling Stock Coaches** | **Maximum tractive effort/axle (KN)** | **Maximum braking force/axle at rail level in (KN)** | **Designed Axle Load Capacity** | **CG height from rail level** |
|---|---|---|---|---|
| DTC | Not Applicable | 16.9 | 17 t | not exceeding 1830 mm |
| TC | Not Applicable | 19.13 | | |
| MC/ MC2 | 25.0 | 20.43 | | |
| NDTC/EC / NDTC/EC2 | Not Applicable | 17.85 | | |

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| 2.3.4 | (a) In Empty condition, all Standard RDSO spans of BGML, RBG, MBG and 25t-2008 loading are fit for proposed speed of 160 kmph.<br><br>(b) In Loaded condition, all Standard RDSO spans of BGML, RBG, MBG and 25t-2008 loading are fit for proposed speed of 160 kmph. |
| 2.3.5 | Location of bridges on which speed restrictions are imposed shall be notified by the Railways and incorporated in the working timetable |
| 2.3.6 | The above clauses have been arrived at considering bridges are in physically sound condition. In case, the bridges are not in satisfactory physical condition, necessary speed restriction to be imposed by Chief Bridge Engineer of Zonal Railway on condition basis. |

| 2.4 | **SIGNALLING STIPULATION:** |
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| 2.4.1 | Provisions of GR, SR, IRSOD, SEM & all extant instructions issued from time to time as applicable shall be complied with. |
| 2.4.2 | While running through a station yard, speed of the Rolling stock shall be restricted to the maximum permissible speed as per standard of interlocking provided at the station or any other speed restriction whichever is severe. |
| 2.4.3 | In case of Train having EBD of more than 1 km and non-provision of second distant signal/ 4 Aspect automatic signalling in the section, action as per Para 7.8.9 of IRSEM (issue July 2021) shall be taken and suitable speed restriction may be imposed so that EBD of 1 km may be achieved to stop the Train at Home signal ( ON position). |

| 2.5 | **TRACTION INSTALLATION:** |
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| 2.5.1 | In 25kv AC traction area, Principal Chief Electrical Engineer of the concerned Railway shall have to ensure that the minimum height of contact wire and electrical clearances as stipulated in provisions of Chapter-V and V-A, Electric Traction “Schedule of Dimensions of 1676mm Gauge (BG) revised 2022” with latest Addendum & Corrigendum Slips is not violated and strictly followed to ensure its safe running. |
| 2.5.2 | In addition to above, the PCEE of the concerned Railway may impose any temporary speed restriction on the basis of personal knowledge, experience of the sectional OHE and the field conditions prevailing on the particular section. |
| 2.5.3 | It will be ensured that the cantilevers in the section have BFB Steady Arm (RI No.2390) with 25 mm Drop Bracket Assembly (RI No.2360). |
| 2.5.4 | The current collection shall be made through two number Pantograph preferably with min distance of 200m & fit for high speed operation. |
| 2.5.5 | There should not be any Crossed type OHE, otherwise PCEE of concerned Railway will impose speed restriction. |
| 2.5.6 | Modification in OHE for running 160 kmph train as advised by NCR vide letter no EL/TRD/NCR/Gatiman dated 19.11.18 may preferably be adopted in section for speed from 140 kmph to 160 kmph. |
| 2.5.7 | The 25 kV AC OHE shall have swiveling type Cantilever Assembly having tension in the conductors, regulated automatically with a presag. The presag of 50/100 mm is on the Contact Wire for a maximum span of 72 m, proportionately less for smaller spans. |
| 2.5.8 | In case of locations where 25 KV AC Porcelain Section Insulators are installed on main line and lies within first 1/10th and 1/3rd of the span, immediately after the OHE Structure and the Runners are in trailing direction, the maximum speed shall be 120 kmph. At all other locations where 25 KV AC Porcelain Section Insulators are installed, the speed shall be limited to 80 kmph. |

| 2.6 | **ROLLING STOCK:** |
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| 2.6.1 | Before starting the operation, the PCME of the concerned Railway shall arrange to certify the track worthiness and safety of the Rolling stocks. |
| 2.6.2 | In case of air spring gets deflated, the speed shall be limited to 60 kmph. |
| 2.6.3 | The Rolling Stock (Vande Bharat Trainset) shall be maintained as per maintenance manual issued by CAMTECH for Vande Bharat Trainset & other extant instructions. Brakes of coaches shall be in good working order during the operation. |

| 2.7 | **GENERAL:** |
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| 2.7.1 | All the permanent and temporary speed restrictions in force and those that may be imposed from time to time due to track, bridges, curves, signalling interlocking, any specific local conditions etc. shall be observed. |
| 2.7.2 | The profile of Driving Trailer coach (TSDTC), Motor Coach (TSMC/TSMC2), Trailer Coach (TSTC) and Non-Driving Trailer coach-Executive Class (TSNDTC / TSNDTC2) of Train set |

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| | coaches infringe clause nos. 14 of Chapter lV (A) of IRSOD (BG), revised 2004, up to ACS 27 (Clause nos. 14 of Chapter lV (A) of IRSOD (BG), revised 2022). Railway Board vide letter no. 2022/CEDO/SD/RS/08 dated 29.06.2022 has condoned the same infringement for running of commercial service in Indian Railways. |
| 2.7.3 | The track structure has been specified to standards laid down by Railway Board through letter no. 2014/CE-II/TSC/1Pt.1 dated 8th Sep 2016 for speed above 110kmph and up to 160kmph. The same has been circulated to all Zonal Railways vide letter no. CT/Tech Mission/High Speed dated 19.09.2016. The conditions stipulated in the letter shall be followed by Zonal Railway. CT-20 may also be referred for operation of train at 160kmph. |
| 2.7.4 | COCR/Route Proving Run shall be conducted before start of operation as per extant stipulations of Policy Circular No. 6. |
| 2.7.5 | Track maintained to C&M-1, Vol-I / other than C&M-1, Vol-I standard/para 607 of Indian Railway Permanent Way Manual Third Reprint 2019 in this speed certificate shall be considered as track maintained as per provisions of Indian Railways Permanent Way Manual, June – 2020, containing track geometry standards under Para – 522. |
| 2.7.6 | **For speed more than 110kmph and upto 130kmph** |
| 2.7.6.1 | Concerned Zonal Railway shall ensure provision of fencing at vulnerable location on need basis. |
| 2.7.6.2 | All the level crossings shall be manned with telecommunication facilities and preferably interlocked. |
| 2.7.7 | **For speed more than 130kmph and upto 160kmph** |
| 2.7.7.1 | All the level crossing shall be manned with telecommunication facilities and interlocked. Removal of level crossings with grade separator shall be planned. |
| 2.7.7.2 | Concerned Zonal Railway shall ensure provision of sturdy fencing all along the track |
| 2.7.7.3 | Action to be taken for relocation/modification of engineering signals in consultation with S&T and OHE department of Zonal Railways. |
| 2.7.7.4 | Stretches of existing weak formations (where permanent/temporary speed restriction is imposed), if any, shall be planned to be rehabilitated/strengthen first before permitting higher speed |
| 2.7.7.5 | Zonal Railways should also plan subways at suitable location to avoid trespass and ensure effectiveness of fencing provided. |
| 2.7.7.6 | The visibility at level crossing should be as laid down in IRPWM/Railway Board's instructions. All requirements pertaining to level crossing as laid down in IRPWM/Railway Board's instructions should be fulfilled to ensure safety at level crossing. Drainage of the level crossing and adjoining track should be in good condition. |

**ENCLOSURES:** / **संलग्नक**:

1. ICF layout drawing no.
   - (i) TS/DTC-9-0-001
   - (ii) TS/MC-9-0-001
   - (iii) TS/MC2-9-0-001
   - (iv) TS/TC-9-0-001
   - (v) TS/NDTC/EC-9-0-001
   - (vi) TS/NDTC/EC2-9-0-001
2. Railway Board letter no. 2019/M(C)/202/3/Pt dated 11.08.2021 & 13.08.2021**.**
3. Railway Board vide letter no. 2022/CEDO/SD/RS/08 dated 29.06.2022.

Digitally Signed by Nitin Mehrotra
Date: 02.09.2023 20:56:38
Reason: Approved

**(नितिन मेहरोत्रा)**
**कार्यकारी निदेशक मानक / चालन शक्ति**

**<u>प्रतिलिपि:-</u>**

1. सचिव, { यांत्रिक/विधुत / इंजीनियरिंग(जी)}, रेलवेबोर्ड, रेल भवन, नईदिल्ली – 110001
2. मुख्य रेल संरक्षा आयुक्त, अशोक मार्ग, लखनऊ - 226001
3. महाप्रबंधक ( यांत्रिक/विधुत / परिचालन/ संकेत एवं दूरसंचार)
    1. मध्य रेलवे, छत्रपति शिवाजी टर्मिनस मुंबई – 400 001
    2. पूर्व रेलवे, फेयरली प्लेस, कोलकाता – 700 001
    3. उत्तर रेलवे, बडौदा हाउस, नई दिल्ली – 1100 01
    4. पूर्वोत्तर रेलवे, गोरखपुर - 27 3001
    5. पूर्वोत्तर फ्रन्टियर रेलवे, मालीगांव गुवाहाटी – 781 011
    6. दक्षिण रेलवे, अनेक्सी, पार्क टाउन चेन्नई – 600 003
    7. दक्षिण मध्य रेलवे, रेल निलायम, सिकंदराबाद – 500 025
    8. दक्षिण पूर्व रेलवे, गार्डन रीच, कोलकाता – 700 043
    9. पश्चिम रेलवे, चर्च गेट, मुम्बई – 400020
    10. उत्तर मध्य रेलवे, सूबेदारगंज, प्रयागराज – 211 011
    11. उत्तर पश्चिम रेलवे, जयपुर – 302 006
    12. पूर्व मध्य रेलवे, हाजीपुर – 844 101
    13. पूर्वतटीय रेलवे, बीडीए रेंटल रेलवे कॉमप्लेक्स, भुवनेश्वर – 751 017
    14. दक्षिण पश्चिम रेलवे, हुबली – 580 023
    15. पश्चिम मध्य रेलवे, जबलपुर - 482 001
    16. दक्षिण पूर्व मध्य रेलवे, बिलासपुर – 495 004
4. प्रवंध निदेशक कोंकण रेलवे कार्पोरेशन बेलापुर भवन ए नवी मुम्बई – 4000 14

**ENCLOSURES: / संलग्नक:**

1. ICF layout drawing no.
    (i) TS/DTC-9-0-001
    (ii) TS/MC-9-0-001
    (iii) TS/MC2-9-0-001
    (iv) TS/TC-9-0-001
    (v) TS/NDTC/EC-9-0-001
    (vi) TS/NDTC/EC2-9-0-001
2. Railway Board letter no. 2019/M(C)/202/3/Pt dated 11.08.2021 & 13.08.2021.
3. Railway Board vide letter no. 2022/CEDO/SD/RS/08 dated 29.06.2022.

**Signed**
**(नितिन मेहरोत्रा)**
**कार्यकारी निदेशक मानक / चालन शक्ति**