

भारत सरकार (GOVERNMENT OF INDIA)
रेल मंत्रालय (MINISTRY OF RAILWAYS)
रेलवे बोर्ड (RAILWAY BOARD)

No. 2019/CE-II/TS/25t

New Delhi, Dated: 23.07.2024

General Manager
All Zonal Railways

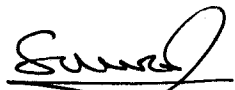
Director General,
RDSO, Lucknow

Sub: Operation of 25t axle load over selected routes of IR.

Ref: (i) Board's letter of even no. dated 01.09.2020
(ii) Board's letter No. 2023/48/CE-III/BR/3000MT (E-3448988)
dated 04.06.2024
(iii) RDSO's letter No. CBS/25t Axle Load dated 20.04.2009

The detailed instructions for operation of 25T axle load over selected routes of IR and feeder routes of DFC were issued vide Board's letter under reference (i). Now, Board (MI, MTRS, MOBD and Chairman & CEO) has approved operation of 25T axle load at 45 Kmph in partial relaxation of clause 2(a) of letter under reference, for a period of one year on routes mapped for providing 50 Nos. WILD, which are under procurement. List of 53 locations (including 3 for USBRL) where WILD is planned to be installed is annexed. Installation of WILD is to be monitored by respective zonal railways at General Manager's level.

All other conditions mentioned in the letters under reference must invariably be complied. Further, the effect of running of 25t loading on residual fatigue life of bridges shall be studied as per reference (iii) above and suitable restriction if any, may be imposed before operation of 25t axle load.


23.7.24
(Saurabh Jain)
Director Civil Engg (Plg)
Railway Board

DA: As above

Copy to:

- (1) PSO to Chairman & CEO, MI, M/TRS & M/O&BD
- (2) PPS to DG/Safety
- (3) PED/Br., PED/TT(M), EDME(Mod.) & EDCE(P)

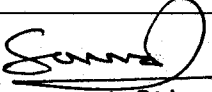
Annexure to RB's Letter no. 2019/CE-II/TS/25t dated 23.07.2024

SN	ZR (Allotted WILD)	Zone SN	Location/Section/Division
1	CR - 01	1	Borkhedi-Butibori (UP)/NGP*
2	ECR - 03	1	Bhabua Rd.-Muthani (UP)/DDU*
3		2	Bhabua Rd.-Muthani (Rev.)/DDU*
4		3	Barwadih/Chianki-Kechki (UP)/DHN*
5	ECoR - 13	1	Pendurthi-Kottavalasa (DN Line 3)/WAT
6		2	Bobbili - Sitanagarm (DN)/WAT
7		3	Sason - Sarla (UP)/SBP
8		4	Attabira - Godbhaga (DN)/SBP
9		5	Singapuram Rd-Kantabanji (DN)/SBP
10		6	Bajipara - Kendrapara Rd (UP)/KUR
11		7	Hindol - Sadashibapur (UP)/KUR
12		8	Hindol - Sadashibapur (DN)/KUR
13		9	Gangadharpur- Kuhuri (DN)/KUR
14		10	Kuhuri- Gangadharpur (DN)/KUR
15		11	Jagdarpur-Nakthisemra (DN)/WAT
16		12	Singapuram Rd-Rayagada (UP)/KUR
17		13	Raghunathpur- Banbihari (UP)/KUR
18	ER - 04	1	Ranigang - Kalipahari (UP-II)/ASN
19		2	Kalipahari - Ranigang (DN-I)/ASN
20		3	Kumardubi - Mugma (UP)/ASN
21		4	Kalipahari-Raniganj (DN)/ASN*
22	SCR - 01	1	Rayalacheruvu-Jakkalacheruvu (DN)/GTL
23	SECR - 04	1	IB (DN)/BSP-JSG/BSP
24		2	Champa (UP)/JSG-BSP/BSP
25		3	Marauda-Risama (Single Line)/R*
26		4	Paniajob-Dongargarh (UP)/NGP*
27	SER - 17	1	Markona (UP)/KGP-BHC/KGP
28		2	Benapur (DN)/BHC-KGP/KGP
29		3	Dhalbhumgarh (UP)/KGP-TATA /KGP
30		4	Sardiha (DN)/TATA-KGP/KGP
31		5	MMV-3 rd line (DPS/JSG-TATA/ADRA)/CKP
32		6	Padapahar New (DN)/BJMD-DPS/CKP
33		7	Jaroli A- Cabin/DPS-JRLI/CKP
34		8	Bhalulata (UP)/RKSND-BNDM/CKP
35		9	Dumetra (LTK end)/KRBU- BNDM/CKP
36		10	Gamharia (UP)/GMH-CNI/CKP
37		11	Kuarmunda (DN)/BRMP-ROU/CKP
38		12	Jhantipahari (UP)/MDN-ADRA/ADRA
39		13	Lodhma (UP)/NXN-THE/RNC
40		14	Panskura (DN)/KGP-PKU-HLZ/KGP
41		15	Bokaro (UP)/KSX-RJB/ADRA
42		16	Nimdih (DN)/CNI-ADRA/ADRA
43		17	Rajkarswan-Sini (DN)/CKP*
44	SR - 01	1	Tiruttani-Arakkonam (UP)/MAS*
45	SWR - 03	1	RNJP-TNGL/UBL
46		2	HPT-TNGL/UBL
47		3	JRU/BBNH-RDG/BAY

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23.7.24

Annexure to RB's Letter no. 2019/CE-II/TS/25t dated 23.07.2024

SN	ZR (Allotted WILD)	Zone SN	Location/Section/Division
48	WCR - 03	1	Tikariya (TYK)-Datna (STA) UP/JBL
49		2	Pagdhal (PGL)-Itarsi (ET) (DN) BPL
50		3	Sumer(sumr)-Bhopal (MIDDLE)/BPL
51	USBRL/NR - 03	1	Samba (UP)/PTK - JAT
52		2	Salal (UP)/SVDK - BAHL
53		3	Anantnag (UP)/ANT – BGBA
* WILDs for replacement			


23.7.24

भारत सरकार (GOVERNMENT OF INDIA)

रेल मंत्रालय (MINISTRY OF RAILWAYS)

रेलवे बोर्ड (RAILWAY BOARD)

No. 2019/CE-II/TS/25t

New Delhi, dated 01.09.2020

(16) → General Manager
All Zonal Railways

(61) → Director General
RDSO
Lucknow

Sub: Operation of 25 ton axle load over selected routes of IR and feeder routes of DFC

Ref: i) Board's letter no. 2013/TT-1/27/15 dated 28.07.2020
ii) Board's letter no. 2018/CE-II/TS/25T dated 14.03.2018

Board during meeting held on 22.07.2020 has approved the immediate restarting of 25 ton axle load operation with such rolling stock as fit/certified for 25 ton axle load on 7 notified routes spread over 4 Zonal Railways (ECoR, SER, SECR & SWR). Based on Board's approval, Traffic Transportation dte of Board vide letter under reference (i) above (copy enclosed), has issued instruction for restart of 25 ton axle load on selected routes of IR.

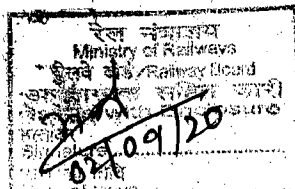
2. The matter has been further deliberated in Board by multi disciplinary committee (Civil, Mechanical and Traffic) and it has been decided that as an interim measure, speed of 45 kmph can be permitted for 25 ton axle load wagon on 60 kg 90 UTS rail on 7 notified routes and DFC feeder routes with following safety regulations:

(a) WILDs need to be installed on priority and detachment / maintenance protocols on critical alarms as per JPO to be followed. 25 ton axle load wagon can run on the above routes on 60 kg 90 UTS rail at 45 kmph, if WILD is installed and in working condition.

(b) Compulsory weighment of every rake along with action on overloaded wagons/rakes as per protocols of JPO issued on weigh bridges (2009) vide letter dated 29.07.2008 must be ensured. In all cases of un weighed rakes, except for the exempt category rakes, the existing instruction of running at restricted speeds upto next EIMWB should be strictly followed and these should be part of WTT in case not already so on any Zone. Also, whenever overloading is detected, load adjustment should be compulsorily done and certified so by the station/yard in charge of the location where load adjustment has been done.

(c) Adequate powering of train must be ensured and monitored by Zonal Railways.

GM of the Zonal railways shall identify the routes on which 25 ton axle load wagon can run, having 60 kg 90 UTS rail and other pre-requisite as mentioned in Para-2 above. Fitness of bridges should also be checked for running at 45 kmph. However, these routes will be notified by Railway Board on the recommendation of Zonal Railways.



02.09.2020


02.04.2009

कृपा समी रेलवे को जारी करें
02.09.2020

②

4. For increasing the speed beyond 45 kmph, detailed study is required regarding the type of rail, rail wheel interaction analysis and fitness of bridges for operation of 25 ton axle load. RDSO is advised to carry out detailed study involving Track, Bridges & Wagon Dte. and come out with clear cut recommendation within a month for finalizing further road map for running of 25 ton axle load wagon beyond 45 kmph.

This issues with the approval of Board (ME).


(Pradeep Nagar)
Director Civil Engg. (PIg)
Railway Board

DA: as above

Circulation in Board

✓ PED/TT(M), ✓ EDME/Freight, ✓ PED/Bridge. ✓ ML





GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No. 2023/48/CE-III/BR/3000 MT (E-3448988)

New Delhi dated 04.06.2024

**Principal Chief Engineer,
All Zonal Railways.**

Sub: Residual Fatigue assessment of steel bridges for running of Heavier Axle loads.

- Ref:**
1. RDSO letter No. CBS/25t Axle Load dated 15.03.2023 – Suitability of bridges for running 25t loading – 2008 at 100 kmph on DFC feeder routes and 25t identified routes.
 2. RDSO letter No. CBS/25t Axle Load dated 20.04.2009 – Guidelines for checking the suitability of existing drawings of BGML/RBG/MBG/HM loading for 25t loading – 2008.
 3. RDSO report on Assessment of Residual Fatigue Life of Br. No.-586 near Koraput, East Coast Railway (BS-107).
 4. RDSO Guidelines for Assessment of Residual Fatigue Life of steel girder bridges (BS-91).
 5. RDSO Guidelines BS 106 R2 -Guidelines for Instrumentation of Bridges. (Rev- 2)

Steel Girder Bridges are subjected to heavy fluctuating stresses causing fatigue in steel. This may lead to the failure of member or connection at the stress level much below the maximum stress for which the member/connection has been designed under static loads. The phenomenon of fatigue was not correctly understood earlier and most of the old bridges have been designed without adequate safeguards against fatigue. IRS Steel Bridge Code-1962 contained provisions for fatigue which were based on stress ratio concept and have been rendered obsolete as new fatigue provisions based on concepts of stress range, GMT factor, configuration of truss, loading & design life etc. have been introduced in 2012. With increase in axle loads & speeds, the bridge is subjected to **cycles of higher stress ranges** and fatigue life of individual members/ components gets consumed early, affecting overall residual fatigue life of the bridge. Heavier axle loads such as 25 t loading, CC+6+2 and CC+8+2 have already been permitted on some of the routes. Few cases of failure of bridge components in recent past have been reported on such routes in one of the railway where annual GMT has suddenly increased.

2. Therefore, all the bridges, more than 50 years old, need to be assessed for their residual fatigue life. The estimation of residual fatigue life of a bridge depends on the

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04/06/2024

accuracy of past traffic data and future projections. The initial assessment can be made with simplified approach as given Annexure -G (for Fatigue) in IRS Steel Bridge Code (Reprint -2017). Guidelines / instructions for making **residual fatigue life assessment** are already given by RDSO vide Ref. (1), (2) & (3) above.

3. **Bridges on High GMT routes (say > 40 GMT)** shall be assessed on priority to ensure availability of sufficient residual fatigue life of bridge components. Appropriate instrumentation and health monitoring may be planned in consultation with RDSO as per the requirement based on the outcome of the assessment.

4. Further action shall be planned for re-girdering/ rebuilding based on the outcome of the above assessment.


(Ravindra Kumar Goel)

Principal Executive Director/Bridge
Ph. No. 011-478-45452

Copy to:-

1. DG, IRICEN for information please.
2. PED/Infra-II and ED/B&S RDSO for guiding the railways in assessment of residual fatigue and compiling the results for taking further necessary action.
3. CBEs/All Zonal Railways for information and necessary action please.



पीयूष अग्रवाल
कार्यकारी निदेशक/पुल संर०
Piyush Agarwal
Exe. Director/B&S

भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
मानकनगर, लखनऊ - 226011

Government of India-Ministry of Railways
Research Designs & Standards Organisation
Manak Nagar, Lucknow- 226011
Telefax : 0522-2450398

No.CBS/25t Axle load

Dated: 20.4.2009

Principal Chief Engineer,

- i) Central Railway, Mumbai CST-400 001.
- ii) Eastern Railway, Fairlie Place, Kolkata-700 001.
- iii) East Central Railway, Hajipur-844 101.
- iv) East-Coast Railway, Bhubaneshwar-751 016.
- v) Northern Railway, Baroda House, New Delhi-110 001.
- vi) North-Central Railway, Allahabad-211 001.
- vii) North Eastern Railway, Gorakhpur-273 001.
- viii) North-Western Railway, Jaipur-302 001.
- ix) Northeast Frontier Railway, Maligaon, Guwahati-781 061.
- x) Southern Railway, Park Town, Chennai-600 003.
- xi) South Central Railway, Rail Nilayam, Secunderabad-500 371.
- xii) South East Central Railway, Bilaspur-495 004.
- xiii) South Eastern Railway, Garden Reach, Kolkata-700 043.
- xiv) South-West Railway, Hubli-580 023.
- xv) Western Railway, Mumbai-400 020.
- xvi) West-Central Railway, Jabalpur-482 001.

Sub: Guidelines for checking the suitability of existing drawings of BGML/RBG/MBG/HM loading for "25t loading-2008".

Ref: i) Railway Board's letter No.2006/CE-I/BR-III/12 dated 24.3.2009 — 85/A
ii) This office letter of even no. dated 24.3.2009 — 85

1. RDSO has checked the suitability of superstructure and bearing of standard spans of steel bridges for "25t loading-2008" drawing designed to BGML; RBG, MBG and HM loading. The check has been conducted based on following criteria as approved by Railway Board vide letter referred above :

- a) Coefficient of Dynamic Augment (CDA) has been taken for maximum permissible speed of 75 kmph.
- b) EUDL approach has been adopted to check the suitability of the existing steel bridges designed to IRS Bridge Rules 1941 (Revised in 1964). Other design parameters such as permissible stress, cycles of fatigue etc will remain the same for which these bridges were originally designed.
- c) Wind pressure has been taken as 100 kg/m² as per clause 3.5 IRS Bridge Rules (Second Reprinted in 2008).
- d) Dispersion of longitudinal force through track away from the loaded length has been taken as 25% of total longitudinal force subject to minimum of 16t as per clause No.2.8.3.1 and 3.4 of IRS Bridge Rules (Second Reprinted in 2008).

The result of the analysis are as below:

Superstructure:

Following standard spans have been found fit for 75 kmph except 76.2m, Open Web Girder designed to RBG loading ;

S.N	Loading	Type of girder	Standard Span	RDSO Drawing No.
1	BGML	Plate Girder	12.2m	BA-11003
2	-do-	Plate Girder	18.3m	BA-11004
3	-do-	Plate Girder	24.4m	BA-11005
4	-do-	Open Web Girder	30.5m	BA-11122
5	-do-	Underslung Girder	30.5m	BA-11232
6	-do-	Open Web Girder	45.7m	BA-11102
7	-do-	Open Web Girder	61.0m	BA-11172
8	-do-	Open Web Girder	76.2m	BA-11152
9	RBG	Plate Girder	12.2m	BA-11073
10	-do-	Plate Girder	18.3m	BA-11074
11	-do-	Plate Girder	24.4m	BA-11075
12	-do-	Open Web Girder	30.5m	BA-11342
13	-do-	Underslung Girder	30.5m	BA-11402
14	-do-	Open Web Girder	45.7m	BA-11362
15	-do-	Open Web Girder	61.0m	BA-11322
16	-do-	Open Web Girder	76.2m	BA-11382
17	MBG	Plate Girder (4x10 ⁶ cycle)	12.2m	B-16009
18	-do-	Plate Girder (4x10 ⁶ cycle)	18.3m	B-16010
19	-do-	Plate Girder (4x10 ⁶ cycle)	24.4m	B-16011
20	-do-	Plate Girder (10 ⁷ cycle)	12.2m	B-16012
21	-do-	Plate Girder (10 ⁷ cycle)	18.3m	B-16013
22	-do-	Plate Girder (10 ⁷ cycle)	24.4m	B-16005
23	-do-	Open Web Girder	30.5m	BA-11462
24	-do-	Open Web Girder	45.7m	BA-11482
25	-do-	Open Web Girder	61.0m	BA-11582
26	-do-	Open Web Girder	76.2m	BA-11602/R
27	HM loading	Plate Girder	12.2m	BA-16007
28	-do-	Plate Girder	18.3m	BA-16008
29	-do-	Plate Girder	24.4m	BA-16006
30	-do-	Open Web Girder	30.5m	BA-11522
31	-do-	Open Web Girder	45.7m	BA-11502
32	-do-	Open Web Girder	61.0m	BA-11552
33	-do-	Open Web Girder	76.2m*	BA-11622

* Over-stressing upto 5% has been found in End Raker and top members of 76.2m open web girder, designed to RBG loading for maximum permissible speed of 50 kmph. Overstressing in open web girder upto 5% is permitted subject to bridge is kept under regular observation as per IRS Steel Bridge Code, clause 3.20.2.

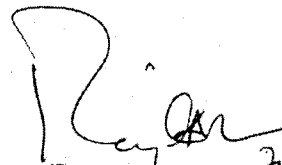
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BA 11622

45.7m
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18.3m
12.2m

BA 11462
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BA 11622

- b) Bearings of all non standard spans and substructures of all steel bridges to be checked by Zonal Railways at their end.
- c) One time inspection of all bearings and bed blocks to be done apart from scheduled inspection to ensure for their soundness and proper functioning.
- d) End Raker and top members of 76.2m open web girder, designed to RBG loading are to be kept under regular observation as per IRS Steel Bridge Code clause 3.20.2.
- e) Following critical locations/members are required to be monitored from fatigue consideration:
- Connection of cross girder with stringer.
 - Outstanding leg of the top compression flange of the stringer at its junction with web plate.
 - Rivets connecting bottom flange angle of the stringer with web at mid span.
 - Vertical members at connection with top chords.
 - Rivets connecting bottom flange of cross girders with web at mid span.
 - Rivets of splice joints of bottom flange in plate girders.
4. Physical condition of bridges is to be certified by Chief Bridge Engineer of Zonal Railways.

Encl: NIL


(Piyush Agarwal) 20/4/08

Copy to: 1. Director, IRICEN, Pune, for information please
2. EDCE/B&S, Railway Board, New Delhi-110 001 for information pl.

9/c

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