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सत्यमेव जयते

भारत सरकार – रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ – 226011
Government of India-Ministry of Railways
Research Design & Standards Organisation
Lucknow- 226011

No. CBS/PBR Dated 22-06-2017

Principal Chief Engineer:

1. Central Railway, Mumbai CST-400 001.

2. Eastern Railway, Fairlie Place, Kolkata-700 001.
3. East Central Railway, Hazipur-844 101.
4. East-Coast Railway, Bhubaneshwar-751 016.
5. Northern Railway, Baroda House, New Delhi- 110 001.
6. North-Central Railway, Allahabad-211 001.
7. North Eastern Railway, Gorakhpur-273 001.
8. North-Western Railway, Jaipur-302 001.
9. Northeast Frontier Railway, Maligaon, Guwahati-781 011.
10. Southern Railway, Park Town, Chennai-600 003.
11. South Central Railway, Rail Nilayam, Secunderabad-500 371.
12. South East Central Railway, Bilaspur-495 004
13. South Eastern Railway, Garden Reach, Kolkata-700 043
14. South-West Railway, Hubli-580 023.
15. Western Railway, Mumbai-400 020.
16. West-Central Railway, Jabalpur-482 001.

Sub: Addendum and Corrigendum Slip No.-48 to IRS Bridge Rules.
Ref: Railway Board Order No.2016/4/CE-III/BR/BSC/84/Seminar/Pt dated 05.06.2017

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In reference to above, Addendum and Corrigendum Slip No.- 48 dated 22-06-2017 to IRS Bridge Rules is being sent for your information and necessary action please.

Encl.: Copy of A&C Slip No. 48
to Bridge Rules.

(A K Dadarya)
Executive Director (B&S)
R.D.S.O., Lucknow

Copy to :

I OSD/ME for kind information of Member Engineering, Railway Board, Rail Bhavan, New Delhi-110001.

II The Chief Commissioner of Railway Safety, N.E. Railway Office Compound, Ashok Marg, Lucknow-226002.

III Additional Member (Civil Engg.), Railway Board, Rail Bhavan, New Delhi-110001.

IV Additional Member (Works), Railway Board, Rail Bhavan, New Delhi-110001.

V Director, IRICEN, Pune-410001.

VI Executive Director Civil Engg.(B&S), Railway Board, Rail Bhavan, New Delhi-110001.

VII The General Manager (C), N.F. Railway, Maligaon, Guwahati-781001.

VIII Chief Engineer, Metro Railway, Jawahar Lal Nehru Road, Kolkata-700 071.

IX Chief Administrative Officer (Constn.)/CAO (Const.):

i) Central Railway, New Administrative Building, Mumbai CST-400 001.
ii) Eastern Railway, 14, Strand Road, Kolkata-700 001.
iii) East Central Railway, Mahendru Ghat, Patna-04 (Bihar).
iv) East Coast Railway, Bhubaneshwar-751 016 (Orissa).
v) Northern Railway, Kashmere Gate, Delhi-110 006.
vi) North Central Railway, Allahabad-211 001 (U.P.).
vii) North Eastern Railway, Gorakhpur-273 001.
viii) Northeast Frontier Railway, Maligaon, Guwahati-781 011.
ix) North Western Railway, Jaipur-482 001 (Rajasthan).
x) Southern Railway, Egmore, Chennai-600 003.
xi) South Central Railway, Rail Nilayam, Secunderabad-500 371.
xii) South Eastern Railway, Garden Reach, Kolkata-700 043.
xiii) South East Central Railway, Bilaspur-495 004.
xiv) South Western Railway, 18, Miller Road, Bangalore-560 046.
xv) Western Railway, Churchgate Station Building, Mumbai-400 020.
xvi) West Central Railway, Jabalpur-482 001 (M.P.).
xvii) Metropolitan Transport Project (Railways), Egmore, Chennai-600003.
xviii) Metro Railway, Metro Rail Bhavan, 33/1, Chowringhee Road, Kolkata.

X Chief Bridge Engineers:

i) Central Railway, Mumbai CST-400 001.
ii) Eastern Railway, Fairlie Place, Kolkata-700 001.
iii) East Central Railway, Hazipur-844 101.
iv) East-Coast Railway, Bhubaneshwar-751 016 (Orissa).
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-781 011.
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.

XI The General Manager, Delhi Metro Rail Corporation Ltd., NBCC Place, Bhishma Pitamah Marg, Pragati Vihar, New Delhi-110003.

XII The Chief Commissioner of Railway Safety, N.E. Railway Office Compound. Ashok Marg, Lucknow-226002.

XIII Commissioner of Railway Safety:

i) Central Circle, 2nd Floor, Churchgate Station Building Mumbai-400020.

ii) Eastern Circle, Multistoreyed Building of Eastern Railway, 12th Floor, Strand Road, Kolkata.

iii) Northern Circle, near Centre for Railway Information System, Safdarjung Railway Station, New Delhi.

iv) North Eastern Circle, DRM Compound, Northern Railway, Hazratganj, Lucknow

v) Northeast Frontier Circle, 12 Strand Road, Multistoryed Building of Eastern Railway, Kolkata.

vi) Southern Circle, 7 Seshadri Road, Gandhi Nagar, Bangalore.

vii) South Central Circle, Secunderabad.

viii) South Eastern Circle, 14 Strand Road, Multistoryed Building of Eastern Railway, Kolkata.

ix) Western Circle, 2nd Floor, Churchgate Station Building Annexe, Maharishi Karve Road, Mumbai-400020.

XIV The Director General, Railway Staff College, Vadodara-390004.

XV The Managing Director, RITES LTD, RITES Bhawan, Plot No.1, Sect.29, Gurgaon (Haryana)-122001.

XVI The Managing Director, IRCON, Palika Bhawan, Sector-XIII, R.K. Puram, New Delhi-110066.

XVII The Chairman & Managing Director, Konkan Railway Corporation Ltd., Belapur Bhavan, Plot No. 6, Sector-II CBD Belapur, Navi Mumbai-400 614.

XVIII The Managing Director, Rail Vikas Nigam Ltd., C-2/10, Safdarjang Development Area, Arvindo Marg, New Delhi- 110 016.

IX The Managing Director, DFCCIL, 5th Floor, Pragati Maidan Metro Station Building Complex, New Delhi-110001.

XX ED/Str/RDSO, Dir/SB-I/RDSO, Dir/SB-II/RDSO, Dir/T&I/RDSO, Dir/CB-I/RDSO, Dir/CB-II/RDSO, Jt. Dir/Insp/RDSO, SSE/B&S Library/RDSO.

Enc.: 1 Copy of A&C Slip No. 48
to Bridge Rules

P.S. 22/6/17

(A K Dadarya)
Executive Director (B&S)
R.D.S.O., Lucknow

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)
BRIDGE RULES
(IN SI UNITS)

RULES SPECIFYING THE LOADS FOR DESIGN OF SUPER-STRUCTURE AND SUB-STRUCTURE OF BRIDGES AND FOR ASSESSMENT OF THE STRENGTH OF EXISTING BRIDGES

Adopted – 1941
Revised – 1964
Reprinted in 2014
(Incorporating Correction Slips 1 to 46)

Addendum and Corrigendum Slip No. 48 dated 22.06.2017

Add new clauses as follows:

1.1.1 All structures near railway track shall be checked for accidental impact from derailed trains as per clause 2.16.4 of these rules.

2.1 (o) Forces due to accidental impact from any vehicles such as road vehicles, ships or derailed train vehicles etc using the bridge.

2.16 Forces due to accidental impact from any vehicles such as road vehicles, ships or derailed train vehicles etc using the bridge

2.16.1 The forces due to accidental impact from vehicles shall be taken either by the bridge structure or any separate arrangement suitably designed to withstand these forces. The impact forces to be considered shall be reasonably expected forces and the bridge design/ arrangement shall ensure that the bridge span does not collapse under these forces.

2.16.2 The forces due to accidental impact from road vehicles shall be as per provisions of relevant road authorities.

2.16.3 In bridges nominated/ regularly used for navigation purposes, the forces due to accidental impact from ships or other water borne vehicles shall be as per provisions of relevant maritime authorities.

2.16.4 The design of structures for accidental impact from derailed trains shall be done as follows:

2.16.4.1 Structures to be checked for accidental impact from derailed trains:

2.16.4.1.1 Structures which need special measures to be taken regarding derailed vehicles:

i. Buildings with regular occupancy offices/ residences including amenities at railway stations. (Occupancy more than 10)
ii. Buildings likely to be crowded usually or occasionally such as Shopping areas, theatres, auditorium etc.

iii. Structures supporting tracks, railway etc carrying passengers.
iv. Structures carrying hazardous chemicals like oil, gas etc.
v. Any other structure where risk analysis indicates a need for taking measures to protect the structures against derailment loads.

2.16.4.1.2 The structures which usually don't need any special measures to be taken regarding derailed vehicles:

i. Fencing/ boundary walls etc.
ii. Masts, poles etc for railway use such as indicators, OHE/signal structures etc.
iii. Platform cover shelters and other structures which do not normally have people on them.
iv. Warehouses and parking lots which are thinly occupied. (Occupancy less than or equal to 10)

2.16.4.2 **Distance upto which the Structures shall be considered vulnerable:** The structures shall be considered vulnerable for a distance specified below:

Maximum Speed of Trains	Perpendicular distance of structure from center line of nearest track (Including duly protected ends of tracks) upto which structures shall be considered vulnerable
<=100 KMPH	4.1m + Maximum height of vehicle/3
>100 KMPH, <= 160 KMPH	5.1 m + Maximum height of vehicle/3
For track curvature exceeding 0.5 deg, an additional clearance of 1 m shall be provided	

Note: 1. For vehicles travelling at different speeds, the distance of vulnerability shall be worked out separately for different vehicles.
2. The height upto which the distance of structure is to be measured shall be upto the top of vertical part of the Maximum Moving Dimension diagram for the route.

2.16.4.3 Design Measures for structures which are within distance specified in para 2.16.4.2:All structures within the distance specified in para 2.16.4.2 are vulnerable to damage due to being hit by derailed vehicles. These structures shall be suitably designed as specified below:

2.16.4.3.1 The structures considered vulnerable as per clause 2.16.4.1 but located near tracks having maximum speed 100 KMPH shall be considered adequately protected if the structure is supported on a platform (Can be an extension of foundation) with minimum height 0.76m above rail level, minimum length 3.6mand minimum thickness 0.8m, which extends minimum 1.2m below the surrounding ground and if the columns/ piers of the structure are minimum 0.5m (measured from all possible directions of train impact) behind edge of the platform. It is desirable that the end of platform so provided is having proper shape (such as shape of cut-water of piers) to guide and deflect the derailed vehicle away from the structure.

2.16.4.3.2 For locations with train speeds less than 50 KMPH, the structures considered vulnerable as per clause 2.16.4.1 shall be considered adequately protected if guard rail as per para 275 (1) of IRPWM is provided under the structure starting from a distance 30 m ahead of the structure (To be measured from the start of guard rail to the start of structure) in the direction of travel of trains.

2.16.4.3.3 The sub-structures not considered protected as per clauses 2.16.4.3.1 and 2.16.4.3.2

shall be designed as follows:

i) The sub-structures shall preferably be wall type. Wall type sub-structure is defined as any structure with length to width ratio more than 4, length to height ratio more than 2 and minimum width of structure of 0.8 m.

ii) If wall type sub-structures are not possible, individual columns/ walls may be designed by carrying out risk analysis based on sectional speeds, their loads and the use of the structure. The stability of the structure with one or more columns removed shall be checked with the specified dead and live loads as an ultimate load case.

iii) The wall type piers shall be designed for following impact loads (considered as ultimate load case with a load factor of 1.0), applied at 2 m above rail level:
a) Along the direction of travel: Maximum load of 50m train length x k; or
b) Perpendicular to the direction of travel: Maximum load of 15m train length x k

Note:

1. The train load may be taken from EUDL for shear force.
2. Both the loads shall be applied separately.
3. k shall be as given in table below:

Speed (KMPH)	Curvature	k
≤50	<0.5 deg	0.5
≤50	>0.5 deg	0.6
>50,≤100	<0.5 deg	1.0
>50,≤100	>0.5 deg	1.2
>100,≤160	<0.5 deg	1.2
>100,≤160	>0.5 deg	1.5

BY ORDER

22/6/17

(A K Dadarya)
Executive Director (B&S)
R.D.S.O., Lucknow