

जा. शक्तिभा 7/11/19

SN-884

Abhay Kumar
अभय कुमार
Director/B&S/CB-II
निदेशक/पुल एवं संरचना/सी0बी0-2



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
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No. CBS/PSBC

Dated: 04.11.2019

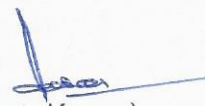
Principal Chief Engineer:

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. Northeast Frontier Railway, Maligaon, Guwahati - 781 061
9. North Western Railway, Jaipur - 302 001
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 & Corrigendum Slip No. 6 to IRS Bridge Sub-Structures and Foundation Code (Second Revision-2013)
Ref.: Railway Board's letter No. 2015/CE-III/BR/Sub-Structure Code
Dated:30.10.2019

In terms of above reference, an Addendum & Corrigendum Slip No. 6 to IRS Bridge Sub-Structures and Foundation Code (Second Revision-2013) regarding insertion of new clause/ modification of existing clause No. 1.2, 1.5 I(f), 5.12.1,5.12.2(a), 5.12.2(b), 5.12.2(c), 5.12.3, 5.12.5, 5.12.6, 5.12.7, 5.12.8 and 5.16.2.7(b) is enclosed for information and necessary action please.

Encl: As above.



(Abhay Kumar)
Director/B&S/CB-II
for ED/Structures/RDSO

(D) Commissioner of Railway Safety:

1. Central Circle, 2nd Floor, Churchgate Station Building Mumbai - 400020
2. Eastern Circle, Multistoreyed Building of Eastern Railway, 12th Floor, Strand Road, Kolkata - 700001
3. Northern Circle, near Centre for Railway Information System, Safdarjung Railway Station, New Delhi - 110021
4. North Eastern Circle, DRM Compound, Northern Railway, Hazratganj, Lucknow - 226001
5. Northeast Frontier Circle, 12 Strand Road, Multistoreyed Building of Eastern Railway, Kolkata - 700001
6. Southern Circle, 7 Seshadri Road, Gandhi Nagar, Bangalore - 560009
7. South Central Circle, Opp. Rail Nilayam, Sarojini Devi Road, Secunderabad - 500 071
8. South Eastern Circle, 14 Strand Road, Multistoreyed Building of Eastern Railway, Kolkata-700001
9. Western Circle, 2nd Floor, Churchgate Station Building Annexe, Maharishi Karve Road, Mumbai-400020.

(E) Railway PSUs & Others:

1. The Managing Director, RITES LTD, RITES Bhawan, Plot No.1, Sect.29, Gurgaon (Haryana) - 122001
2. The Managing Director, IRCON, Palika Bhawan, Sector-XIII, R.K. Puram, New Delhi - 110066
3. The Chairman & Managing Director, Konkan Railway Corporation Ltd., Belapur Bhavan, Plot No. 6, Sector-II CBD Belapur, Navi Mumbai - 400 614
4. The Managing Director, Rail Vikas Nigam Ltd., 1st floor, August Kranti Bhawan, Bhikaji Coma Place, Africa Road, R.K. Puram, New Delhi - 110 016
5. The Managing Director, DFCCIL, 5th Floor, Pragati Maidan, Metro Station Building Complex New Delhi - 110001
6. The General Manager, Delhi Metro Rail Corporation Ltd., NBCC Place, Bhisma Pitamah Marg, Pragati Vihar, New Delhi - 110003


(Abhay Kumar)
Director/B&S/CB-II
For ED/structures/RDSO

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(Railway Board)

INDIAN RAILWAY STANDARD
CODE OF PRACTICE FOR THE DESIGN OF SUB-STRUCTURES & FOUNDATIONS OF BRIDGES
(Bridge Sub-Structures & Foundations Code)

ADOPTED-1936
FIRST REVISION -1985
SECOND REVISION- 2013

ADDENDUM & CORRIGENDUM SLIP No. 6 dated: 04.11.2019

i) Insert a new sub clause at the end of clause 1.2 as under:

1.2.1 In the structural design of substructures, earthquake forces shall be in accordance with IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code) adopted-2017.

ii) Existing clause 1.5 I (f) be modified to read as under:

(f) IS: 1893 Part 1-2002 – Criteria for earthquake resistant design of structures.

iii) Existing clause 5.12.1 be modified to read as under:

5.12.1 For Earthquake Resistant Design of Railway Bridges, Clause 4.1, 4.2.1 and 6(b) of IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code) shall be referred to for general principles.

Note: In zones IV and V, suitably designed reinforced concrete piers and abutments shall be used and where use of mass concrete/masonry substructures becomes unavoidable, a minimum surface reinforcement as per formula given below may be provided vertically on each face of the pier/abutment and surface reinforcement not less than 5 kg/m^2 may be provided horizontally to improve the ductility of the substructure. Spacing of such reinforcement shall not exceed 500mm center to center.

$$P_s = \frac{0.2F_r}{F_y} \times 100\%$$

Where,

P_s = Percentage steel area on each face of masonry/mass concrete

F_r = Modulus of rupture of masonry/mass concrete

F_y = Yield strength of steel

iv) Existing clause 5.12.2 (a) be modified to read as under:

(a) Horizontal & vertical seismic forces due to self-weight of the substructure applied at the centre of mass as per clause 7.3.1 and 9.2 of IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code).

v) Existing clause 5.12.2 (b) be modified to read as under:

(b) Hydrodynamic forces as specified in clause 10 and Dynamic earth pressure due to earthquake as per clause 22 of IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code).

(c) Existing clause 5.12.2 (c) be modified to read as under

(c) Horizontal and vertical seismic forces due to dead load of superstructure and live load as specified in IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code) applied at the centre of their mass and considered to be transferred from superstructure to substructure through the bearings.

(d) Existing clause 5.12.3 be modified to read as under:

5.12.3 Seismic safety of bridge in longitudinal, transverse & vertical directions shall be as per clause 4.2.2 of IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code). Assuming the horizontal seismic forces to act either parallel or perpendicular to direction to traffic.

(e) The clauses 5.12.5 and 5.12.6 are deleted.

(f) Existing clause 5.12.7 be modified to read as under:

5.12.7 Effect of saturation on lateral earth pressure shall be as per clause 23 of IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code).

(g) Existing clause 5.12.8 be modified to read as under:

5.12.8 Liquefaction or differential settlement shall be as per clause 21.1 & 21.2 of IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code).


In loose sands or poorly graded sands with little or no fines, the vibrations due to earthquake may cause liquefaction or excessive total and differential settlement. In Zone III, IV and V founding of bridges on such sands shall be avoided unless appropriate methods of compaction or stabilization are adopted.

(h) Existing clause 5.16.2.7(b) be modified to read as under:

Hydrodynamic forces as specified in clause 10 of IRS Code for Earthquake Resistant Design of Railway Bridges (Seismic Code) and forces due to Water Current (WC) as per clause 5.9 shall not be considered to occur simultaneously while checking the foundations and substructures of existing bridges for load combinations III of clause 5.13 (c).

BY ORDER

LUCKNOW
Dated: 04.11.2019


(V.K. Srivastava)
Executive Director/Structures
B&S Directorate
R.D.S.O., Lucknow