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No. GE/GEN/185-Vol-I

Date: 17.09.2020

## All PCEs & CAOs

Indian Railways

**MD, KRCL**, Belapur Bhawan, Sector-11, CBD Belapur, Navi Mumbai-400614

**Chairman and MD**, IRCON International Limited, C-4, District Center, Saket, New Delhi-110017

**MD, RVNL**, Plot No. 25, First Floor, August Kranti Bhawan, Bhikaji Kama Place, RK Puram, New Delhi-110066

**MD, DFCCIL**, 5<sup>th</sup> floor, Pragati Maidan, Metro Station Building Complex, Delhi-110001

**MD, RITES**, RITES Bhawan, 1, Sector-29, Gurugram, Haryana-122001

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CAO/Const.), Metro Railway, Mumbai & Chennai

**Director General**, IRICEN Pune

**Director General**, NAIR, Vadodara

**GM(Engg.)**, Metro Railway, Kolkata

**MD/ CONCOR**, New Delhi

**Chief Project officer, DMRC**, NBCC Building, Pragati Vihar, New Delhi

**Chief Commissioner of Railway Safety**, Lucknow

**Sub:** "Comprehensive Guidelines and Specifications for Railway formation - Specification No. RDSO/2020/GE: IRS-0004, Sept.-2020"

**Ref:** Railway Board letter no. 2011/CE-II/Form/Spec dated 14.09.2020.

In compliance to Railway Board's instructions, the Comprehensive Guidelines and Specifications for Railway Formation have been prepared by RDSO by merging of various existing guidelines earlier issued by RDSO from time to time & updating/adding of the recent technical developments in related areas including use of Geosynthetics in railway formation. The Guidelines have been approved by Railway Board vide letter under reference above (copy enclosed).

1. The "Comprehensive Guidelines and Specifications for Railway Formation", Specification no. RDSO/2020/GE: IRS-0004 consists of 10 Chapters and 14 Appendices, covering various aspects for execution of Earthwork in Indian Railway Formation in Construction and Open Line including Design of formation, Slope Stability Analysis, Applications of Geosynthetics in Formation, Quality assurance tests, Fitment of existing formation for 25T axle load (at 100Kmph) & passenger train operation for 160Kmph etc.

2. It will supersede earlier guidelines/instructions for Earthwork issued by RDSO i.e. "Guidelines for Earthwork in Railway Project" GE: G-1, July 2003, "Guidelines and Specifications for Design of Formation for Heavy Axle Load" GE: G-0014 Nov. 2009, RDSO letter no. RS/G/108/Heavy Axle Load dated 19.10.15/26.10.16 and "Rationalisation of Formation Layer Thickness on Indian Railway Track" Specification No. RDSO/2018/GE: IRS-0004(D) Part-IV, July 2019.

As per instructions of Railway Board in the letter under reference:

3. North Central Railway & Western Railway are requested to carry out field validation for fitment of existing formation for passenger train operations at 160 kmph and South Eastern Railway & East Coast Railway are requested to carry out field validation for fitment of existing formation for 22.9t/25t axle load operation at 100 kmph.
4. Any deviation in the guidelines/specifications based on logic/local conditions can be permitted with approval of PCE/CAO(C) only.

The above mentioned approved Guideline are sent herewith in soft copy for adoption in the field. Provisions in these guidelines will apply to new works. However, the application of these guidelines may be explored in ongoing works also. Any difficulty in adoption of the new specification may please be reported to RDSO. It is also requested that its implementation may please be monitored closely for two years and send feedback to RDSO for improvement, if any.

Soft copy of the Comprehensive Guidelines and Specifications has also been uploaded on RDSO 'Railnet' website (10.100.2.12) under 'Geotechnical Engineering Directorate' under head 'Guidelines and Specifications'. Hard copies shall be sent in due course.

DA: as above.

  
17/09/2020  
(Ashok Kumar)

Exe. Director/Geotech. Engg.

Copy to: PED/CE/P, Railway Board for kind information.

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

No. 2011/CE-II/Form/Spec

New Delhi, dated 14.09.2020

**Executive Director/GE**  
**RDSO**  
**Lucknow**

**Sub: Comprehensive Guidelines and Specification for Railway Formation**  
**Ref: RDSO's letter no. GE/GEN/185/Vol-I dated 02.07.2020**

Vide letter under reference above, the final draft of "Comprehensive Guidelines and Specifications for Railway formation" has been forwarded by RDSO for Board's approval.

Having considered the various recommendations of RDSO regarding the above Guidelines, Competent Authority has approved the above final draft for adoption in Zonal Railways with following decisions on specific issues referred by RDSO -

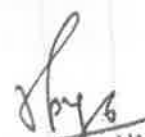
SN	Specific issues/provisions of the guidelines	Board's decision
(i)	Fitment of existing railway formation for 22.9T/25T axle load operations for speed upto 100 kmph and passenger train (19.5T axle load) operation for speed upto 160 kmph assuming 350 mm ballast cushion and 60 kg rail section (Appendix-I)	Approved.
(ii)	Provisions for Gauge conversion/doubling/Cess repair work in case of existing formation (Chapter-9)	Approved.
(iii)	Methods of Formation Rehabilitation (Chapter 10)	Approved.
(iv)	Erosion control of slopes (Chapter 8)	Approved.
(v)	Quality control of Earthwork (Chapter 7)	Approved with following modification. <ul style="list-style-type: none"><li>The note marked as "*" of Table 7.2 to be modified as under: "Additionally this test can also be done by third party (i.e IIT, NIT, Govt. Labs or any NABL approved Lab) having testing facilities, to cross check the results achieved at site. Frequency of testing in this case shall be decided/approved at the level of Chief Engineer (Con). In PSUs, frequency of such tests shall be decided as per existing delegations for testing."<ul style="list-style-type: none"><li>In Para 7.4.1.c, in case of PSU, existing provision of Equivalent authority for acceptance criteria shall continue.</li></ul></li></ul>

SN	Specific issues/provisions of the guidelines	Board's decision
(vi)	Modified checklist of certification of quality of Earthwork in Railway Projects (Appendix-M)	Approved.
(vii)	Para 2.2 (ii) for suitability of subsoil	Approved.
(viii)	Para 2.3.5 for Ground Improvement for expansive soils	Approved.
(ix)	Para 2.4.1 for Use of Geo-composite drain	Approved.
(x)	Para 2.4.4 for Geo-synthetics encapsulated Stone column	Approved.
(xi)	Para 3.4 for Cross Slope of Formation	Approved.
(xii)	Para 3.7 for Soils to be normally avoided	Approved.
(xiii)	Table 3.3 to 3.6 regarding filter criterion	Approved.
(xiv)	Chapter 4 regarding applications of geo-synthetics in railway formation and Appendix C- specification of geo-synthetic products	Approved.
(xv)	Para 5.1 regarding requirement of flatter slope	Approved.
(xvi)	Para 5.1.1 & 5.1.2 regarding provision of berm	Approved.
(xvii)	Appendix B of Illustrative Examples for providing minimum thickness of Formation Layers	Approved.
(xviii)	Newly added test procedures for Nuclear Moisture Density Gauge	Approved.
(xix)	Appendix J regarding Proforma for Reporting Unstable Formation	Approved.

RDSO shall circulate the final draft to Zonal Railways/PSUs. Zonal Railways/PSUs shall take necessary action for adoption of above guidelines and for closely monitoring the implementation for a period of two years and to furnish feedback/suggestions to RDSO for improvement, if any.

North Central Railway & Western Railway are nominated for field validation for fitment of existing formation for passenger train operations at 160 kmph and South Eastern Railway & East Coast Railway for field validation for fitment of existing formation for 22.9/25t axle load operation at 100 kmph.

Any deviation to above guidelines/specifications based on logic/local conditions can be permitted with approval of PCE/CAO(C) only.

  
 (Pradeep Nagar) 14.09.2020  
 Director Civil Engg. (Plg.)  
 Railway Board

Copy for necessary action to:

- (i) PCEs/All Zonal Railway
- (ii) CAO(C)/All Zonal Railway
- (ii) MD/KRCL, RVNL, IRCON, DFCCIL, RITES, MRVC.