

**Annexure-II****Achievements in last Five Financial Years**

<b>Sl. No.</b>	<b>Financial Year</b>	<b>Broad area of Achievement</b>	<b>Title of achievement</b>	<b>Description of Achievement</b>	<b>Likely Benefit</b>	<b>Current status of implementation</b>
1.	2014-15	Economy	Economical Construction of Railway Embankment in Urban Areas using Reinforced Earth Wall & Reinforced Steep Slope-Development of methods.	In urban areas where cost of land is high and those areas where adequate land is not available for the construction of railway embankment, Reinforced Earth Wall and Reinforced Steep Slope structures can be adopted in place of conventional embankment with normal side slopes. A consultancy project titled as „Economical Construction of Railway Embankment in Urban Areas using Reinforced Earth Wall & Reinforced Steep Slope-development of Methods“ was done with IIT/Kanpur.	This project will be helpful in reduction of land requirement for construction of embankment. DFCCIL is planning for using Reinforced Earth Wall in both the corridors. RVNL and some of Zonal Railways are also adopting this technology.	Guidelines has been circulated to Zonal Railways in September 2014 for trial use in railway sidings.
2.	2015-16	Asset Reliability	Issue of Working Procedure for use of Nuclear Gauges to measure in- situ dry density and moisture content in earthwork	As per RDSO Guidelines (GE:G-1), field dry density is to be tested by Sand Replacement Method/Core Cutter Method, which are lengthy and time consuming. Nuclear Density Moisture Gauge will give faster and accurate results regarding determination of field dry density.	This will facilitate accelerated construction of new banks	A detailed and self-contained “Test Procedure” for using Nuclear Density Moisture Gauge for in-place measurement of Dry Density was issued on 20.07.2015, for Rewari–Iqbalgarh Section of Western Corridor of Dedicated Freight Corridor (DFCCIL)
3.	2016-17	Asset Reliability	Issue of Guidelines for Design/Construction of formation on	Guidelines for Design/Construction of Formation for Indian Railways are mostly covered in the documents “Guidelines for Earthwork in Railway Projects GE:G-1,	The Guidelines are useful for Zonal Railways in Design and Construction of formation to be	Guidelines issued to Zonal Railway on 26.10.2016.

			Indian Railway track	July 2003” & “Guidelines & Specifications for Design of Formation for Heavy Axle Load, GE:G-0014, November 2009”. All new formations are to be constructed for 25t axle load, therefore provisions regarding design of formation contained in GE:G-1 were superseded by those in GE:G-0014. However, difficulties were being reported from the field in adopting these Guidelines, as some of the provisions of aforesaid two documents are overlapping. Moreover necessity was felt to simplify the provisions of formation design with special emphasis on the blanket layer due to difficulties experienced by field officials. Therefore, provisions on design of formation have been formulated based on international practices and the same have been approved by Railway Board.	constructed for 25t axle load.	
4.	2016-17	Asset Reliability	Re-issue of “Specification of Track Ballast”(IRS:GE-I,Jun’2016)	“Specification of Track Ballast” (IRS:GE-I, June’ 2004) has been re- issued on 24.06.2016 with approval of Railway Board covering all previous correction slips till date.	Specification will be useful to all Railway personnel desirous to consult the integrated specification encompassing all correction slips issued till date.	“Specification of Track Ballast”(IRS:GEI,June’2016) issued to all zonal Railways on 24.06.2016
5.	2017-18	Asset Reliability	Method Statement for Investigation, Planning and Execution of Cuttings in Soil for Railway Projects	Guidelines for cutting in Railway Formation GE: G-2 issued in August 2005 is exhaustive. Many Railways have expressed the need for Method Statement for execution of cuttings in soil. Accordingly, a document titled “Method Statement for Investigation, Planning and Execution of Cuttings in Soil for Railway Projects” has been prepared.	Method statement will be useful to all Railway officials to carry out systematically the procedure for the Investigation, Planning and Execution of Cuttings in Soil for Railway Projects at	Method Statement circulated on dated 23.09.2017) to all zonal railways.
6.	2018-19	Asset Reliability	Induction of new technology-	A detailed and self-contained “Test Procedure” for using Nuclear Density	DFCCIL will be benefitted by using	Issued to DFCCIL

			Nuclear Moisture Density Gauge	Moisture Gauge for in-situ measurement of Compaction was issued to Dedicated Freight Corridor (DFCCIL) for Rewari-Dadri Section of Western Corridor.	Nuclear Moisture Density Gauge in these sections, as it will accelerate the progress of construction of new embankment.	
7.	2018-19	Asset Reliability	Specification for Non-Woven Geotextile to be used as separator/filtration layer for railway formation.	Specification has been issued to Zonal Railways for trial application in field.	Non-woven geotextile can be provided at blanket subgrade interface or blanket prepared subgrade interface for purpose of separation and filtration for better performance of track structure	Issued to Zonal Railways /PSUs, for trial application in field.
8.	2018-19	Asset Reliability	Specification for Geo-composite Drain (Vertical) to be used behind Bridge abutment/Retaining wall.	Specification has been issued to Zonal Railways for trial application in field.	The geocomposite drain can be used as a replacement of graded filter (in the form of boulders and gravels) behind the bridge abutments or retaining walls.	Issued to Zonal Railways /PSUs, for trial application in field.
9.	2018-19	Asset Reliability	Specification for Geo-composite Drain (Horizontal) to be used at the base of the embankment for Railway formation.	Specification has been issued to Zonal Railways for trial application in field.	In case of embankments over soft soils and in the areas with high water table, a separator-cum-drainage layer of geo-composite drain will prevent fouling of subgrade and reduces excess pore water pressure in the bank thereby increasing it's stability.	Issued to Zonal Railways /PSUs, for trial application in field.
10.	2019-20	Asset Reliability	Rationalization of Formation layer thickness on Indian Railway track.	Document has been issued to Zonal Railway for implementation in field.	This document will help in reducing the thickness of formation layers, which will lead to cost saving and expedite the progress of the construction projects.	Issued to Zonal Railways.