

INFRASTRUCTURE

RDSO carries out its activities through a sprawling campus spread over 159 hectares which houses amongst other things a number of laboratories well equipped with research and testing facilities for development, testing and design evaluation of various railway related equipment and materials. Some of these are:

i) **Air Brake Laboratory** is equipped with facilities for simulating operation of air brakes on freight trains up to 132 wagons and 3 locomotives as also for simulation of passenger trains up to 30 coaches.



ii) **Brake Dynamometer Laboratory** has facilities to develop and test brake friction materials for locomotives, coaches and wagons. This laboratory, being unique of its kind in India, has also been used by R&D organisations of Ministry of Defence like DMRL, DRDL and HAL for indigenisation of brake pads for defence aircrafts.



iii) **B&S Laboratory** has a 6m x 14m heavy duty testing floor for testing of composite sleepers under static and impact loads. The lab also has non-destructive testing equipments for testing compressive strength and quality, crack width, reinforcement details of concrete members. Estimation of residual fatigue life and assessment of vibration characteristic/natural frequency of the bridges are also integral part of this instrumentation.



iv) **Fatigue Testing Laboratory** for testing prototype locomotive and rolling stock bogies, springs and other railway equipment subjected to stress and fatigue so as to ascertain their expected service life.



- v) **Geo-technical Engineering Laboratory** is equipped with facilities for determining strength parameters of soil in lab and field condition. The state-of-the-art Sub-surface Interface Radar (SIR) system, Laser based soil particle analyser, and computerised consolidation test apparatus have been installed in the lab. The lab also has computerised Static Tri-axial Shear apparatus for determining the strength of soil as well as the design of embankment.



- vi) **Metallurgical & Chemical Laboratory** is capable of destructive and non-destructive testing of metals, polymers, composites, petroleum products and paints. The M&C laboratory has Scanning Electron Microscope, Direct reading spectrometer, Ultrasonic Flaw Detector and other non-destructive examination equipment, polymer and composite evaluation facilities, thermal analyser, corrosion engineering evaluation facilities including weatherometer, static 760 hour AR test rig for grease testing, V2F dynamic test rig for grease testing, lube oil filter evaluation rig, Cetane rating machine & 50t machine for rubber deflection characteristics.



- vii) **Psycho-Technical Laboratory** facilitates the assessment of critical psycho-motor, cognitive & personality attributes of critical safety category staff such as Station Masters, ALPs, Motormen and High-Speed Train Drivers. The lab has equipments like CFF (Critical Flicker Fusion Apparatus), Speed Anticipation Reaction Tester, Pullman Spiral Acquisition and Analysis and Personality Tests like Rorschach Ink Blot Test, MMPI, Thematic Apperception Test (TAT) and NEO-PI(R) etc. The Psycho-Technical Directorate also has indigenously developed Computer Aided Drivers Aptitude test (CADAT) for screening of loco pilots prior to their deployment on Trains having speed more than 110Kmph.



- viii) **Signal Testing Laboratory** is capable of testing of all types of signalling equipment such as safety signalling relays, block instruments, power supply equipment, point machines, signalling cables, electro-mechanical signalling equipment/ components etc. There is an exclusive environmental testing section equipped with environmental testing facilities. These include programmable heat, humidity & cold chambers, mould growth, dust, rain chambers. Signalling Equipment Development Centre has been set up in the Signalling Lab. In this Centre, working signalling equipment & systems have been set up. The working systems

include SSI, universal axle counter, VLSI axle counter, AFTCs, block instruments etc. In addition, equipment developed by RDSO, such as signalling relays, poly-carbonate lenses, LED signal lamps, triple pole double filament lamps, power supply equipment etc. have also been displayed.



- ix) **Track Laboratory** for testing full scale track panels under realistic dynamic load patterns and fatigue testing of welded rail joints. Stresses at various locations of track components under simulated load conditions are measured and recorded for analysis. This has helped in rationalising and optimising design of track



structures for Indian conditions. The facility of fatigue testing of welded rail joints is also available. Special rail tensioning system for application of longitudinal forces on rail samples to simulate the thermal forces has been indigenously developed, installed and commissioned in track lab. This system, with capacity of up to 150 tonne in static condition, is being used to conduct testing of different rail samples.

- x) **Mobile Test Facilities** for recording of track parameters, locomotive power and conducting oscillograph trials for evaluating vehicle-track interaction and also for monitoring track conditions:



- **Oscillograph Cars** for recording track and vehicle parameters and track and vehicle interaction studies.
- **OHE inspection Car** for testing and recording parameters of overhead traction equipment.
- **Emission Test Car** for measuring the Exhaust emissions of Diesel Locomotives homed at different Diesel Sheds over Indian Railways.
- **Track recording Car** for measurement of track alignment, unevenness, twist, variation of gauge etc.



of track alignment,

xi) **Laboratory for training on testing of AMI and Effluent for Bio-Toilet - Centre of Excellence at CAMTECH**

Bio-Toilet effluent requires periodic testing to monitor performance of IR-DRDO Bio Digester. Presently we are dependent on DRDO/DRDE Gwalior for this training to Railway staff.

A new Bio-Toilet Laboratory for training on testing of AMI and Effluent for IR-DRDO Bio-Toilets being used on Indian Railways is being developed at CAMTECH Gwalior as a Center of Excellence. This is the first Lab of its kind in the entire country.



The New Bio-Toilet lab at CAMTECH will make Indian Railways self-sufficient in imparting training in providing on hand practical training on testing of Anaerobic Microbial Inoculum (AMI) Bacteria and Effluent testing to IR staff engaged in maintenance of Bio-Toilets provided in passenger trains in Indian Railways.