

## RESEARCH AND DEVELOPMENT ESTT (BRO)



Shri Sanjiv Sharma, CE (Civ)

### BRIEF HISTORY

Research and Development Establishment has been raised vide BRDB letter No. BRDB/06/171/2011/GE-1 dated 18 May 2011. It was initially raised at 47 TF (Guwahati) under administrative control of CE (P) Dantak. However the Estt has finally moved from Guwahati (47 BRTF/ Dantak) to Shillong (Ex HQ CE(P) Setuk Loc) and functioning from Shillong since 02 May 2012 with a sanctioned strength of 40 (12 Officers + 28 PBORs).

### ROLE

The role of R &D Estt is :-

- To work to achieve self reliance in the BRO with a view to tackle the difficulties/problems encountered in the field during and after execution of works and in its maintenance.
- To bring awareness in BRO units about latest developments in road construction so as to take on all challenges in the field of road construction keeping pace with the fast developing technology.
- Adopting new and innovative technology in construction and maintenance of roads with the aim of quality, time saving, durable and economic construction.
- To find solution to the problems being encountered by the executives through collaboration with established players in these fields from National and International arena.
- Harness technology and specifications and modify these to suit BRO's requirement from several establishments of similar nature in Govt /Public domain.

## ACHIEVEMENTS

To conform with the role, the establishment conducted various trial in support of the Projects in their respective AOR :-

- Trial of the soil stabilisation product TerraSil (a nanotechnology based organo-silane which is water soluble and easy to apply) has been carried out in two spells on road Khuangphah - New Vaikhawtlandg - Kawlbem in the stretches km 24.350 to km 24.420 and km 32.290 to km 33.530 under (P) Pushpak by 74 RCC under the supervision of Mr Gaurav Gogne, Asst General Manager of M/s Zydex Industries in the presence of R&D Rep. and the performance of the work is under watch by the Project executives.
- Construction of Cementitious Base Layer for Surfacing Wk using another product ZeoCrete undertaken on roads Damchu-Chukha and Bjemina-Chimithangkha under Project Dantak and the performance is being watched by the Project.
- Trial of the product EvoCrete (Cementitious Soil Modifier, the latest generation "in-situ-as-is" Soil Modification Technology for creation of all load capable pavements, parking bays, landing bases, quick access roads), which can do away with the requirement of base and sub-base courses on road pavements thereby an effective technology to save time and cost overrun is being carried out on Road Botsa-Bokajan under Project Sampark.
- Geotextiles, especially Jute Geotextiles, a very useful and widely used product in road construction, in view of the special technical attributes of the product such as drapability, inertial strength, ecological efficiency being bio-degradable, low maintenance, customizable fabric, fineness, commercial advantages like easy availability and economical has been very effective in slope protection and tried by (P) Himank even in sub zero temperature.
- Trial of Vetiver Grass; popularly termed amongst engineers as "living soil nail", has a strong fibrous root system with the 'innate power' to penetrate through soils mixed with stone or pebbles and through asphalt layer has been successfully carried out on DKMM road for arresting perennial slide by (P) Sewak. The performance is under watch.
- Trial of micro surfacing done by ELSAMEX in Project Chetak and the performance is under watch by the Project. CE (P)Pushpak is

proposing for micro surfacing on roads Kawnpui-Durtlang-Aizwal and Hnathial-Sangau-Saiha road.

- Trial of ZycoSoil (a bitumen additive for anti stripping) has been carried out on Road Jailsalmer-Srimohangarh-Bsjju by (P) Chetak and on JNM road by (P) Swastik.
- Trial of ZycoThern (a warm mix compound) has been carried out by Zydex Industries at -10°C atmospheric temperature on road on Koyul-Photile-Chisumle-Zursar under Project Himank and the performance of the product is under watch by the Project.
- The Estt is also monitoring performance of following trial conducted by various firms in AOR of Project Dantak :-
  - Trial on slope protection work carried out by Maccaferri Environmental Solutions by construction of Para Mesh Breast Wall (Reinforced Soil Wall Syst) with Gabion Facia Units (Terra Mess Units) and high strength geogrid (Par Link, grade 200) as primary raft. Rest of the slope covered with coir fibre (BioMac CC, 450 g/sqm) blanket for facilitating re-vegetation over the slope on road Phuentsholing-Thimphu.
  - Trial of Geo synthetic Breast Walls using geo-synthetic bags carried out by M/s Flexitech International to mitigate the problem of dynamic landslide on road Confluence-Drugyel-D'zong.
  - Rockfall structure using mesh, cable nets, barriers and fences constructed by M/s Enviro Infra Developer on road Phuentsholing-Thimphu, to reduce damage to road pavement besides safety of commuters.
  - Reinforced earth retaining/Breast walls comprising of modular alternating layers of granular backfill & high soil reinforcement has been undertaken to address to problem of restd space, difficult site condition and poor foundation soil along the fragile road stretches on road Phuentsholing-Thimphu by M/s Enviro Infra Developer Pvt Ltd.
  - Green break technology. A demo with EXEL (Powderdet LD) detonators carried out on road Damchu-Chukha re-alignment by ORICA and Rabdhuen Pvt Ltd with a view to compare the conventional method using detonating fuse and EXEL (Powderdet LD) which has a specific advantage of more output with very less disturbance in monotonous strata.

➤ This Estt made use of Application of space technology for selection of new road alignment using Remote Sensing of inputs and analysis by engaging NESAC (North East Space Application Centre)for the following roads :-

(a) Road Dumro-Samebasti under (P) Brahmanik.

(b) Road Seppa-Sarli in (P) Arunank also which is now under progress.

➤ Representative of R&D is a member of MDEG (Multi Disciplinary Expert Group) constituted at Dte GBR for induction of new technologies in BRO and the MDEG has already submitted reports for various products viz, ZeoCrete, Recycled rubber pads and Virgin HDPE mats, LIDAR technology for survey and preparation of DPR, Reinforced Earthen Walls, Cold mix technology with tailor made high performance polymer modified bitumen emulsion, Geogrid slope protection and reinforced earthen walls, EvoCrete etc.

➤ Some of the suggestions made during last three years to the BRO Units/Formation, for better maintenance of roads and bridges are briefed below:-

- Landslide location at Km 149 on road Seling-Champai under (P) Pushpak visited by rep of R&D along with OC 74 RCC and suggested remedial measure to arrest the slide.
- Remedial measures for mitigation of slide at Khanthang bridge approach suggested to (P) VTK based on the inputs received from the Project.
- Geological studies through Geological Survey of India, Shillong for mitigation of landslides at various location on JNM road in Sikkim under (P) Swastik is in progress.
- Temporary measures for mitigation of land and rock slide at MS-17 on JNM road in Project Sikkim suggested to (P) Swastik.
- Views of R&DE on use of RAP (Reclaimed Asphalt Pavement) and dispensing with the practice of Applying Tack coat over Prime coat in BRO submitted to HQ DGBR.
- Appropriate suggestion and apt methodology for working on bituminous and concrete works in sub-zero temperature in their AOR sought for by (P) Vijayak given to them.

- Suitable suggestion for tackling a typical solution for surfacing on swampy area on road Bakasar-Mavasari given to (P) Chetak.

### INTERACTION WITH OTHER DEPARTMENTS

- In order to mitigate the problem received from various projects, this Establishment is in constant liaison with the following department so to get the best possible solution and recommend it to the projects for implementation: -

- (i) NESAC, Shillong.
- (ii) Geological Survey of India.
- (iii) IIT Guwahati.

### VISITS

- ADG(East) - Dr SS Porwal, VSM ADG (East) visited the Estt on 26 May 2016.
- PCDA BR - Mr RK Nayak, IDAS, PCDA (BR) visited the Estt on 24 May 2016.
- DDG Med - Brig Sanjay Bagchi visited the Estt from 06 Apr to 08 Apr 2016.

### BROWWA ACTIVITIES

- Regular BROWWA meet is conducted to inform the families on the latest policies and to educate them on various day to day topics relevant to their lives. Also opportunities are given to the families to show case their talent.

### TREE PLANTATION

- The Estt undertook tree plantation drive on 17 Aug 2016 inside the R&DE campus. All personnel actively participated in the event and planted various trees.

### HONOUR & AWARDS

- GS 167149H UDC DY Ratnam was awarded DGBR commendation card on BRO day in year 2015.