

Minutes of the 132nd Research Council (RC) Meeting

The 132nd Research Council Meeting was held on 26th and 27th of June 2024 in the Council Hall of the Institute on a hybrid mode. Accordingly, the following members attended the meeting:

1. Prof. Mahesh Tandon, RC, Chairman, Tandon Consultants Pvt. Ltd. 17, Jangpura Extension, New Delhi
Research Council Members (attended physically):

2. **Prof. K. Sudhakar Reddy**, Department of Civil Engineering, IIT Kharagpur
3. **Ms. Minimol Korula**, Head, Strategic Projects, M/s Maccaferri Environmental Solutions Pvt. Ltd.,
4. **Sh. Mayank Mathur**, Chief Scientist, Central Planning Directorate (CPD), CSIR:
5. **Prof. Manoranjan Parida**, Director, CSIR-Central Road Research Institute, New Delhi.

Research Council Members (attended online):

6. **Shri. Dharmanand Sarangi**, Director General (R), MoRT&H & Special Secretary, Govt. of India
7. **Prof. Lelitha Devi Vanajakshi**, Department of Civil Engineering, IIT, Madras
8. **Prof. R. Pradeep Kumar**, Director, CSIR - CBRI, Roorkee: Attended First Day only from Abroad.

Secretary

9. **Dr. S. Velmurugan**, Chief Scientist and Head, TES Division, CSIR - CRRI, New Delhi.

Item 1: Welcome Address by Prof. M. Parida, Director CSIR - CRRI

Prof. Manoranjan Parida welcomed RC Chairman and other RC members who are present physically as well as on online mode for the 132nd RC meeting and thereafter requested RC Chairman to deliver his opening remarks.

Item 2: Opening Remarks by Prof. Mahesh Tandon, RC, Chairman

Prof. Mahesh Tandon started his address by mentioning that he was pleased to go through the agenda of the 132nd RC Meeting wherein the various accomplishments of CSIR - CRRI since the last RC in the form of half dozen patents and 20 SCI publications have been reported. He asked the scientists to keep up the same tempo in their working style so that institute can reach much greater heights and he was pleased to note that the change in the order of research presentation slotted by bringing Bridge and Structures Engineering (BES) related presentations to Day-1 of the 132nd RC Meeting. Prof. Tandon also mentioned that he was looking forward to listen to the various research presentations lined from the scientists on both the days and he advised the scientists to have lesser text with more pictorial presentation.

2.1 Viewpoints of Prof. Sudhakar Reddy, RC Member

Prof. S. Reddy was pleased to see the accomplishments of CSIR - CRRI and he opined that the institute possesses great potential to solve many of the challenges faced by the highway professionals on the Indian roads. He advised the scientists to do more focussed research and advised the scientists to come out with innovative ideas while executing the various research works undertaken by them. He also advised scientists to identify niche areas wherein they would like to get their skills enhanced and thus undergo relevant training areas for the same. He extended his best wishes to the scientists of CSIR - CRRI to become the pioneering organisation for road research in the country.

2.2 Viewpoints of Dr. (Ms.) Minimol Korula, RC Member

Dr. Minimol was pleased to go through the circulated Agenda of the 132nd meeting and she specifically praised the good works rendered by the Geo Technical Engineering (GTE) related to Disaster Mitigation and landslides especially for the strategic sector. She suggested to undertake Life Cycle Cost Analysis for some important projects.

2.3 Viewpoints of Shri Dharmanand Sarangi, RC Member

Mr. Sarangi (*who was present online*) mentioned that due to the depleting natural resources, the research on the exploration of sustainable **new materials and waste to wealth** are the need of the hour and he is glad to see many research projects and industry sponsored projects are being pursued by CSIR - CRRI in this regard. He asked the scientists to motivate the cliental base involved to go accreditation of their products.

2.4 Viewpoints of Prof. (Ms.) Lelitha Devi, RC Member

Prof. Lelitha Devi (*who was also present online*) suggested that CSIR - CRRI scientists to dwell on the prospect taking the lead role towards the submission of mission mode joint research proposals to the various line ministries like Ministry of Road Transport and Highways (*MoRT&H*), Ministry of Housing, Urban Poverty Alleviation (*MoHUA*) and Ministry of Electronics and Information Technology (*MEITY*) in coordination with the relevant IITs. / NITs.

In this regard, Prof. Parida informed that the Memorandum of Understanding (*MoU*) signed with the various IITs / NITs (*including some of the state funded Universities / Institutions*) in the recent past will be effectively used.

2.5 Viewpoints of Dr. Mayang Mathur, RC Member

Mr. Mathur was very much impressed with the ongoing research as well as remarked on the MoUs signed by CSIR with academic institutes in the country and the amount of revenue generated through Technology Transfer and the patents filed in the recent past. In this regard, he lauded the good leadership extended by Prf. Parida. Mr. Mayank also envisaged for the active participation of CSIR - CRRI Scientists in the One Week Theme (*OWOT*) under the theme “Civil, Infrastructure and Engineering (*CIE*)” in September, 2024.

Item 3: Confirmation of the Minutes of the 131st RC Meeting

Dr. S.Velmurugan, Secretary RC, informed that the minutes of the 131st RC meeting held during 28th and 29th of November 2023 was circulated to all the RC members. Since there were no comments received, it was proposed by Director, CRRI for its approval and the minutes were taken as approved.

Item 4: Presentation of Action Taken Report

Dr.S. Velmurugan Secretary RC, presented the “Action Taken Report” based on the comments and suggestions on different R&D projects by RC members during the 131st RC Meeting. The presentation included the compliance to the generic suggestions from RC members and he mentioned that the reply to the specific comments on the R&D projects presented will be replied by the concerned Project Leaders. He also mentioned that 19 projects are slotted for presentation on both the days spread across the seven R & D Divisions of the institute.

Item 5: An Overview of the R & D Seed Fund (*RDSF*) Projects approved by CSIR

Dr. P.S. Prasad, Head, Project Monitoring and Evaluation (*PME*) Division tabled the six projects which were recently approved for funding by CSIR having an overall outlay of Rs. 1.0 crores which is having equal distribution of the above outlay *i.e. ranging from Rs. 16 to 17 Lakhs to each of the above*.

1. Characterization of Asphalt Film Thickness and its Impact on Bituminous Mixtures *by Dr. Rajiv Kumar*
2. Assessing the Suitability of Reclaimed Asphalt Pavement (RAP) as Coarse Aggregate with Nanomaterial as Construction Material in Concrete Road Construction *by Sh. Romeil Sagwal*
3. Investigating the Emergency Evacuation of Behaviour of Residents in Plain Terrain in case of Natural Disaster like Flood *by Dr. Ramesh Chandra Majhi*
4. Cyclic Interfacial Response of Geosynthetic Reinforcement with Marginal / Industrial Waste Materials for Highway Applications *by Dr. Ravi Shankar*
5. Feasibility of using Reclaimed Asphalt Pavement (*RAP*) in High Performance Bituminous Mixes (*Hiper*) for Sustainable Road Construction *by Dr. Safaraz Ahmed*
6. A Framework for Life Cycle Assessment of Hot and Cold Recycling Technology *by Dr. S. Deepa*

It was also informed by Head (*PME*) that the projects listed will be presented by the Project Leaders in the subsequent RC meetings inviting invaluable suggestions from the RC members.

Item 6: Report of Director, CSIR - CRRI

Prof. Parida Director, CSIR - CRRI provided an overview of the various accomplishments since the 131st RC Meeting:

- External Cash Flow (*ECF*) generated since 2019 - 20 has registered gradual increase which has reached its peak of Rs. 36.4 crores in 2023-24. He also mentioned that efforts will be put forth by the scientists to touch the figure of Rs. 40 crores (*envisaged by Dr. Mathur*) in the present financial year provided the institute is able to garner such big scale projects as in 203-24.
- During the couple of years 'the number of Contract R & D projects has registered consistent rise as compared to the Consultancy Projects' in line with the mandate fixed by RC.
- The list of MoUs / Agreements Signed with Industry / Academia active as of today is 24 nos. which includes one international organisation namely, Russian Road Federation. MoUs signed since the last RC is 10 nos. with about 3 project specific MoUs signed since the last RC aimed at the smooth completion of identified tasks in each one of the above referred medium scale projects
- The number of publications in the present period of reporting in SCI / Reputed Journals has registered increase from 20 to 34 nos. since the last RC. Out of the above, 24 of them are in SCI Journals registering significant increase.
- Bird's eye view of the various projects completed and which are in the verge of completion was also presented.
- IGS Forensic Geotechnical Engineering Award 2024 was bestowed for the project titled, "Failure Analysis and Remedial Measures for Beach Road, Kerala" pursued by Dr. Parwati G.S., Dr. Vasant Havangi and Dr A.K. Sinha and Dr. Mariya Dayana of GTE Division. Dr. Siksha Swarup got the unique recognition and thus received Letter of Invite as a Special Guest from Controller General of Patents, Designs and Trademarks Government of India to attend the 75th Republic Day Celebration - 2024. Dr. Siksha was also bestowed with Best Paper Award during the Young Scientist Conference 2024 as part of the International Science Festival organised at Faridabad in January 2024, Dr. Ambika Behl received felicitation from Indian Plastic Institute for her work on "Use of Waste Plastics in Road Construction". Also Dr. Ambika Behl received the "Ambassador of Change" for her work on Environment Friendly Road Technologies at the Climate Financing the Circular Economy Conference instituted by National Highways for Electric Vehicles and Ease of Doing Business. Also the recognition received by scientists like Dr. Naveet Kaur and Dr. Rajeev Goel, Dr. G.S. Parwathi and Sh. S.S. Garwarhar in various forums was also highlighted.
- Also the training program and the certification programs and the Customized conducted by CSIR - CRRI in various disciplines was also presented.
- Also visit of more than dozen dignitaries to the institute during the various important days was showcased to the RC members.

Item 7: Presentation of Research Projects:

Bridge Engineering and Structures Area (BES)

S. No.	Name of the Project and Project Leader	Comments / Suggestions of the RC members
7.1	“Facility creation for the Condition Assessment and Testing for the Structural Safety Audit of Bridges in the form of Mobile Bridge Inspection Unit (FCP512405)” Presented by Sh Nitish Goyal, Principal Scientist, BES Division	<p>This project was reckoned as the needed research in the present day context.</p> <ul style="list-style-type: none"> ➤ Geographical extend of usage of the present MBIU and the proposed procurement ➤ What is the possibility of integrating MBIU with Drone Technology Bridge Non-Destructive Assessment?
7.2	Development of Design Guidelines, Testing and Implementation Methodologies for Bridge Deck Water Proofing (BDWP) over Bridge Deck Overlays, Presented by Sh Nitish Goyal Chief Scientist and Head BES Division	<ul style="list-style-type: none"> ➤ Whether the provision of the above Water proofing treatment proposed as a substitution to the Mastic / Bituminous Layer on the Bridge Deck? ➤ What is your views on giving the Accreditation for the products which are coming for Bridge Deck? When is the final report expected out of this study? ➤ Whether the study results are applicable for Bridge Deck only or also for Bridge Deck Overlays? ➤ When is the Dissemination Workshop scheduled?
7.3	“Creation of Comprehensive Independent Testing Facilities for Bridge Expansion Joints at CRRI (GAP-4486)”, Sponsored by MoRT&H, Presented by S.S. Garwarhar, Chief Scientist, BES Division	<ul style="list-style-type: none"> ➤ Has M/s. METCO have come out with the definite solutions to resolve the hydraulics related issues encountered in the installation under Package -2? ➤ When are the sensors expected to be delivered? ➤ Time Extension sought till 30.9.2024 for the completion of the project.
7.4	“Condition Assessment and suggestions for remedial measures of Major and Minor bridges of Odisha Road Network using Modern Test Procedures of Bridges”, Sponsored by Odisha Works Department (OWD); Presented by Sh. G.K. Sahu, Chief Scientist, BES Division	<ul style="list-style-type: none"> ➤ What are the various strategies of rehabilitation proposed for the different types of distresses including bearings on the above inspected Bridges? ➤ It is essential to disseminate the study findings in the upcoming PIARC Conference at Bengaluru in September 2024.
7.5	“Design and Drawings of Pier, Pier foundation, Foundation of Circular dome as well as Pre-Engineered Building (PEB) structures for Installation of Telescope at Hanle, Ladakh (CNP-2929)” Sponsored by ISRO Telemetry, Tracking and Command Network (ISTRAC) Presented by Dr. Pardeep Kumar, Principal Technical Officer, BES Division	<ul style="list-style-type: none"> ➤ What is the depth of the foundation envisaged? ➤ Get the design vetted from the design consultant ➤ Is the zero settlement possible?

Item 8: Presentation of Research Projects (Contd.):

Pavement Engineering Area (PE) Area

S. No.	Name of the Project and Project Leader	Comments / Suggestions of the RC members
8.1	“Universal Aging Protocol for Bitumen and Asphalt Mixtures based on Climate Change Effect with Artificial Intelligence (CLP 4742)”, International Sponsored Project by International S & T Affairs Directorate (ISTAD); Presented by Dr. Abhishek Mittal, Senior Principal Scientist	<ul style="list-style-type: none"> ➤ What types of preliminary data have been completed? ➤ Whether hiring of the Project Staff completed? ➤ How it can be recognised as universal aging protocol using the mixture chosen? ➤ Whether you will be working varying combination of binders? ➤ Whether any validation will be done with the field conditions ➤ Whether this international collaborative project was peer reviewed by CSIR before awarding and Who are the Committee Members? ➤ Whether ISTAD has formulated an External Monitoring Committee for the Review of the Project? If so, the comments of such Committee should be communicated to RC and vice versa
8.2	“Cold Recycling of Tunnel Muck for Road Construction (GAP-4708)” Sponsored by NMHS; Presented by Dr. Siksha Swarup, Principal Scientist, FP Division	<ul style="list-style-type: none"> ➤ Are there any distinct differences in the varying sites selected for laying? ➤ Are you doing the associated tensile strain tests? ➤ Whether checking the durability of engineering muck; What are the upper and lower limits of Engineering muck considered? ➤ What is the size of the muck considered in the study including the lower limit? ➤ What is the time span of Performance Evaluation and what are the data that will be collected during the above phase?
8.3	“Development of Bio-binder for Construction of Flexible Pavement (MLP-0659)” , Funded by CSIR; Presented by Dr. G. Bhrath, Senior Scientist, FP Division	<ul style="list-style-type: none"> ➤ What type of performance data would be collected at the various sites selected? ➤ What type of binders ➤ Whether aging will be studied ➤ What type of Agricultural Waste will be studied?
8.4	“Development of Fatigue Performance Model for the Full Depth Recycling (FDR) Pavement Layer (FBR-040302)” ; Funded by CSIR; Presented by Dr. Bhrath G, Senior Scientist, FP Division	<ul style="list-style-type: none"> ➤ What are the various laboratory based tests are being done? During the two span, what are the various assessment will be done ➤ How many combination of material being considered in the study? ➤ Are you performing fatigue failure assessment?

8.5	<p>“Feasibility Study of using Module Developed from End-of-Life Plastic for Road and Allied Construction (SSP-4758)”, Sponsored by Bharat Petroleum Corporation Limited (BPCL), Presented by Sh. Gagandeep Singh, Principal Scientist</p>	<ul style="list-style-type: none"> ➤ What is the uniqueness of the configuration of the plastic layer constructed by BPCL? What is the uniqueness of this study compared to the Pilot study of BPCL? ➤ What are the various aspects that will be tried in the test section envisaged to be constructed within CSIR-CRRI premises? ➤ Are we developing the models using the End-of-Life Plastic material used in this study? ➤ Since the wheel loads emanating from the Fuel Station will be lesser than main carriageway? How this will be constructed for?
8.6	<p>“Implementation of Warm Mix Asphalt Technology to Construct Asphalt Roads in Colder / High Altitude Regions (GAP-4735)”, Sponsored by NHIDCL, Presented by Dr. Rajiv Kumar, Scientist, FP Division</p>	<ul style="list-style-type: none"> ➤ Try to consider a range compaction for comparison purposes. ➤ What do you mean by the Short and Long Term performance of test sections? ➤ What is the road configuration envisaged? ➤ What is the level of traffic envisaged on the above test sections?
8.7	<p>“Field Evaluation of Mechanical Performance of Waste Plastic Road in Comparison to Conventional Roads (SSP-4755)”, International Sponsored Project by Alliance to End Plastic Waste (AEPW), Presented by Dr. Ambika Behl, Sr. Principal Scientist / Sh. Gagandeep Singh, Principal Scientist, FP Division</p>	<ul style="list-style-type: none"> ➤ What is the commonality amongst the three international organisations? ➤ Are they considering the prevailing climatic conditions? ➤ Are the performance evaluation parameters considered same across the three international organisations? ➤ Sought RC concurrence to engage the Post-Graduation instead of Ph.D. student due to the time span of the Project is only 2 years? ➤ Why the time lag in the Project execution?
8.8	<p>“Condition Assessment Using Modern Data Collection Techniques and preparation of Annual Maintenance Plan Using HDM-4 for Odisha PWD Roads (SSP-4733)” Sponsored by Odisha Works Department (OWD); Presented by Dr. Pradeep Kumar, Chief Scientist, PED Division</p>	<ul style="list-style-type: none"> ➤ How the voluminous road inventory data emanating from the present and past are used?

Item 9: Presentation on Research Projects (Contd...):

Traffic Engineering and Transportation Planning (TTP) Area

S. No.	Name of the Project and Project Leader	Comments / Suggestions of the RC Members
9.1	"Intelligent Solutions for Road Safety through Technology & Engineering (iRASTE), Telangana (SSP-4710)" , Sponsored by IIIT Hyderabad, Presented by Dr. Ch. Ravisekhar, Chief Scientist, TPE Division	<ul style="list-style-type: none"> ➤ How the objective on Grey Spots was addressed? ➤ How the data on Driver Inattentive data is used in the study? ➤ It is better to have half-day workshop for dissemination of the study findings ➤ How the demography data has been used in the study?
9.2	"CSIR Mission Mode Project on AI Enabled Technologies and Systems (AITS) - (HCP 0042)" , Funded by CSIR; Presented by Dr A. Mohan Rao, Senior Principal Scientist, TES Division	<ul style="list-style-type: none"> ➤ What do you mean by Psychological data? ➤ Have you hired any drivers for the above data collection? ➤ How do you collect the above data in the case of buses? ➤ What do you mean by drivers subjected to drowsiness? ➤ What algorithm used here? Is Machine Learning based or any other contactless means? ➤ This experiment is expected to yield only limited data on drowsiness. Kindly clarify. Did we use some other data for training? ➤ Why both the data on heart beat and alert feed are independent? Will these be integrated? Certain algorithm need to be developed. ➤ Whether the accuracy of the ECG data can be relied upon as it seems to be collected in a contactless manner with the subject.
9.3	"Development of Automatic Vehicle Counting and Classification Software (AVCC) using Deep Learning Techniques for Motor and Non-Motorized Vehicles - (FTC040509)" Funded by CSIR; Presented by Dr. Ch. Ravisekhar, Chief Scientist, TPE Division	<ul style="list-style-type: none"> ➤ Whether it is possible to add any new vehicle type? ➤ Whether headway can be automatically measured? ➤ Whether the calibration and validation of the deduced speeds serve as outputs? ➤ Why it is taking so much time to process despite running on Yolo-5 environment? ➤ What is the utility of the grid? ➤ How the performance was quantified? ➤ Whether occlusion has any bearing on the accuracy? ➤ Need for the conduct of the Workshop to get widespread acceptability
9.4	"National Greenhouse Gases Inventory for Road Transport Sector (BTR1 & BUR4) Fourth National Communication (SSP-4751)" Sponsored by Ministry of Environment and Forest & Climate Change; Presented by Dr. Mukti Advani, Senior Principal Scientist, TPE Division	<ul style="list-style-type: none"> ➤ Primary data should be collected and should be used to validate the estimation ➤ What type of secondary data would be taken from various CRRRI secondary source like Indo-HCM, URTRAP, etc. ➤ Whether other modes of transport would be considered and who would be handling them? ➤ If there is data discrepancy across the nations observed, will it be addressed?

Item 10: Presentation on Research Projects:

Geo Technical Engineering (GTE) Area

S. No.	Name of the Project and Project Leader	Comments / Suggestions of the RC Members
10.1	"Sustainable Geocomposite Drainage-Root Barrier (MLP0656)" , Funded by CSIR; Presented by Ms Parvathi G.S., Principal Scientist, GTE Division	<ul style="list-style-type: none"> ➤ How the clogging aspects addressed in the study? ➤ How the drainage and durability aspects addressed? ➤ How the bio-degradation aspects addressed? ➤ Which type of soil is used in the study corridor? What are the associated tests done? ➤ What is the significance of the Index Puncture test performed in this study? ➤ At times Median verge is used for providing piers; Whether this will have bearing on the Culverts provided on any Divided Carriageway?
10.2	"Development of Biodegradable Prefabricated Vertical Drain by Molding Technique - A Sustainable Solution for Road Construction over Soft Soil (FBR-040302)" , Funded by CSIR; Presented by Dr. Maria Dayana, Scientist, GTE Division	<ul style="list-style-type: none"> ➤ Any field studies done to support the nature / synthetic PVD in Indian conditions. ➤ Study shall make comprehensive analysis in terms of clogging and durability. ➤ Are you comparing natural and synthetic PVDs? ➤ Have you done any Laboratory based tests ➤ Pros and cons of the proposed material to be addressed.

Item 11: RC Meeting with Scientists

Prof. Mahesh Tandon, Chairman RC welcomed all Scientists and invited them to give their views for improving R&D environs in the Institute. He remarked that the seven R & D Divisions are doing a commendable job. At the same time, he expressed his concerns on the depleting scientific staff especially in areas like Bridge Engineering and Structures as well as Traffic Engineering and Transportation Planning (TTP) Area presented by the RC Secretary / Director, CRRI. He hoped that needful is being done by the Administration of CSIR - CRRI in coordination with Recruitment and Assessment Board (RAB) of CSIR to expedite the recruitment of the 23 Scientists envisaged at present.

Dr. Sampath enquired whether there is any centralized portal is maintained by CSIR in the evnt of any Scientist wants to register their interest for pursuing joint research in the emerging areas like Artificial Intelligence / Machine Learning (AI/ML). In this regard, it was replied by Dr. Mayang that no such portal exists as of now at CSIR. Dr. Sampath was advised to look into the websites of the sister Laboratories and then zero down on the list of scientists based on their work profile and list of publications. Dr. Mayang also mentioned that he too can render associated help if he is provided with the list of emerging areas.

Dr.Ch. Ravisekhar sought for the centralized AI / ML based soft computing facility considering the fact Academy of Scientific and Industrial Research (AcSIR) students and few of the scientists from Traffic Engineering and Transportation Planning (TTP) Area are working on the above. Prof. Parida suggested that the starting point can be utilization of TTP area for the above purposes which was agreed to be pursued by Dr. Ravisekhar. He also requested for the opening of the Lab beyond office hours for AcSIR and Project Staff. This was agreed by Prof. Parida; however, he mentioned that the concerned guide and the respective Project Leaders shall need to take permission / take responsibility for such opening beyond office hours. Such openings cannot be for overnight stay in the Laboratory due to restriction of A.C. usage and security at night.

Dr. Aakash Walia mentioned about the paucity of the accommodation for the scientists and thus forcing the scientists to prefer affordable housing at far off places like Noida causing wastage of time in commuting. Prof. Parida informed about the ongoing work at the Multi-Storied Scientist Apartments and the delay in the renovation of Type D and E quarters numbering 17 since 2019. Alternatively, it was suggested by Prof. Parida that some steps will be taken by CRRI Administration in consultation with the Works Committee of the institute for the conversion of the Type B Quarters which are vacant for the past 4 years.

At the end, Prof. Mahesh Tandon was impressed with the level of interaction that have happened during the last 2 days. The meeting ended with the Vote of Thanks to the **RC Chair, Prof. Mahesh Tandon and other RC Members** extended by Director, CSIR - CRRI and Secretary, RC.