

**CURRICULAM VITAE OF Dr.CHIDAMBARAM KAMARAJ.**

E-mail: [kamarajcrr@gmail.com](mailto:kamarajcrr@gmail.com), [kamaraj.crr@nic.in](mailto:kamaraj.crr@nic.in)

**Mobile: +919841293435**

1. **NAME:** Dr. CHIDAMBARAM KAMARAJ
2. **DATE OF BIRTH:** 13.01.1967
3. **NATIONALITY :** Indian
4. **CURRENT POSITION :** Senior Technical Officer-3, Pay matrix 12
5. **ADDRESS FOR COMMUNICATION:** 1/333, FA-1, Gajalakshmi Apartment,  
Indira Gandhi Main Street,  
Karapakkam, Chennai-600097.
6. **OFFICIAL ADDRESS:** Flexible Pavements Division,  
Central Road Research Institute,  
P.O.CRRI, Mathura Road,  
New Delhi - 110020, India.
7. **PRESENT EMPLOYER:** The Director,  
Central Road Research Institute,  
P.O.CRRI, Mathura Road,  
New Delhi - 110020, India.
8. **CONTACT NUMBER:** +91 8130709616, 9841293435
9. **EDUCATIONAL QUALIFICATIONS:**

Class/ Degree	Board/ University	Year of Passing	Division	Grade
Ph.D	College of Engineering Guindy, Anna University, Chennai	January 2019		
M.E (Civil)	College of Engineering Guindy, Anna University, Chennai	April 2010	First Division	CGPA 7.78/10
B.Tech (Civil)	Indira Gandhi National Open University (IGNOU), New Delhi	June 2007	Second Division	CPI 2.91/5.0
Advance Diploma in Construction Management (ADCM)	Indira Gandhi National Open University (IGNOU), New Delhi	December 1999	First Division	CPI 3.5/5.0
Diploma in Civil Engineering (DCE)	State Board Of Technical Education, Tamil Nadu	April 1987	First Division	73 %

**CPI = Cumulative Percent Index**

## 10. THESIS WORK

1. **PhD Thesis:** "Studies on Performance Characteristics of Bituminous Mix Using Proteinous and Non-Proteinous Wastes of Leather Industry, (Unpublished), Department of Civil Engineering, Anna University, Chennai (January, 2019).
2. **M.E Thesis:** "Development of New Cementitious Binder Using Ternary Mix for Fresh Concrete", (Unpublished), Structural Engineering Division, Department of Civil Engineering, Anna University, Chennai, June 2010.
3. **B.Tech Thesis:** "Mechanistic Evaluation of Premature Failure of A Major National Highway", Indira Gandhi National Open University (IGNOU), New Delhi, 2007.

## 11. AREA OF SPECIALIZATION:

- Pavement Engineering Including Materials testing, road construction and quality control of road projects.
- Utilization of Tannery solid waste in Road Construction.
- Use of locally available materials, industrial wastes in road construction.

## 12. HONORS AND AWARDS:

- I was sponsored for pursuing my PhD at College of Engineering Guindy, Anna University Chennai from 2012 to 2017.
- Received **commendation certificate** during the 65<sup>th</sup> Annual session of Indian Roads Congress (IRC) held at Bangalore during January 2005. The award was for the best paper published in the Journal of Indian Roads congress. Paper No 495 "Performance Based Mix Design Using Super-pave Gyrotory Compactor (SGC)" by Dr.Sunil Bose, R.Sridhar, **C.Kamaraj** and Rakesh Meena, Vol.64-2 Sep 2003.
- Received **IRC Medal** during the 67<sup>th</sup> Annual session of IRC held at Panchkulla (Haryana) during November 2006. The award was for the best paper published in the Journal of Indian Roads congress. Paper No 517 "Investigation of Moisture Induced Damage to Bituminous Pavement and Effect of Field Performance – A Case Study" by Dr.Sunil Bose, R.Sridhar, **C.Kamaraj**, Grish Sharma and Gajendra Kumar, Vol.66-3 Oct 2005.

## 13. MEMBERSHIP OF PROFESSIONAL SOCIETIES

- Indian Geo-technical Society (IGS), and
- Indian Roads Congress (IRC).

## 14. PROFESSIONAL EXPERIENCE:

Having 29 years of professional experience at Central Road Research Institute, New Delhi, India From 15.10.1990 to till date in the area of Flexible Pavement design; Characterization of pavement materials; Construction and supervision and quality checking of road works.

## 15. TRAINING:

Have been imparting training to the serving highway engineers from various road departments/ agencies in the refresher courses organized by Central Road Research Institute, New Delhi, India from time to time. Have

attended a number of training programs and workshops/ conferences conducted by various highway organizations for enhancement of knowledge.

**16. COUNTRY VISITED:**

**Adelaide, Australia: Attended 23<sup>rd</sup> ARRB Conference – Research Partnering with Practitioners, 2008.**

**17. DETAILS OF WORK EXPERIENCE:**

I have been actively involved on the following Major R&D Projects/ Activities.

**A. Sponsored Research Projects: Active Team Member**

1. Criteria for the Choice of Type of Bituminous Surface Courses for Flexible Pavements under Different Conditions. (Sponsored Research Project, R-8, MOST), 1991.
2. Field Trails on Use of Rubber and Polymer Modified Binder In Bituminous Road Construction. ((Sponsored Research Project, R-54, MOST), 1993.
3. Maintenance Cost Study for Pavements under Different Conditions. (Sponsored Research Project, R-16, MOST), 1994.
4. Use of Geofabric to Control Reflective Cracking in Bituminous Overlay Construction on Allahabad-Varanasi Section of NH-2 near Allahabad. (Sponsored Research Project, R-63, MOST), 1999.
5. Use of Natural Rubber in Bituminous Pavements. (Sponsored Research Project, SSP- 4404, Rubber Board, Kerala), 2003-2006.
6. Use of Copper slag in Road Construction, SSP , 2002
7. Use of Natural Rubber and Polymer in Structural Layers of Flexible Pavements. (Sponsored Research Project, SSP-4406, NHAI, New Delhi),
8. Rubber Modified Bitumen in Different Climatic Conditions. (SSP 4408), 2004.
9. Performance of Natural Rubber Modified Bitumen (NRMB) vis-à-vis Crumb Rubber Modified Bitumen (CRMB) in Different Climatic Conditions (SSP 4432), 2004.
10. Demonstration of Micro-surfacing using Imported Machine Available with Assam PWD and Natural Rubber Latex Modified Emulsion. (SSP 4412), 2005-2006
11. Field Trail using Multigrade Bitumen at Drass, J&K. (SSP 1288), 2005-2006.
12. Field Studies on Stone Mastic Asphalt (SMA) for Development of Specification, (SSP- 4437), 2006 **(Project Leader)**.
13. Performance Evaluation of Test Section Laid with Stone Matrix Asphalt (SMA) surfacings under NDMC Area, (OLP 0442), 2007 **(Project Leader)**.
14. Design and construction supervision of Hot-mix recycling of existing bituminous layer of Road No 64, (SSP 4480), 2008 **(Project Leader)**.
15. Zero Emission Research Initiative for Solid Wastes from Leather (ZERIS) under Chemical Sciences cluster by CSIR\_CLRI under 12th Five Year Plan **(CSC0103)**, 2012-2017 **(Work Package Leader, WP-05 and WP-12)**.
16. Sustainable road pavements in high altitude region using Geo-Synthetics, **(GAP-4581)**, July 2018-

17.Characterization of C&D waste for Feasibility in road constructions applications as filler and granular sub-base, (**SSP 4596**), February 2019.

**B. In-House Research Projects: Participated as Active Team Member in the following In-House Research Projects:**

1. Development of Mix Design Procedures for Bituminous Macadam Mixes Using Large Sized Aggregates.
2. Mechanistic Approach for Investigation of the Premature Failure of Highway Pavements.
3. Effect of Gradation and Compactive Efforts on Dense Bituminous Macadam Mixes Using Modified Marshall Method.
4. Design of Stone Mastic Asphalt (SMA).
5. Effect of Gradation on Permeability of Granular Sub-base Mixes.
6. Design of Porous Asphalt Mix.
7. Design of Cold Mix Asphalt Mixes in Structural Layers of Flexible Pavements (Using Cationic Emulsion).

**C. List of Publications:** Co-author/ Author on the following research papers published in National/ International Journals/ Conferences/ Seminars.

1. Parashar, B.L., **C.Kamaraj**, and Arya, I.R., "Roads in Black Cotton Soil Area – Problems and Solution" National Seminar on Bituminous Roads: Design and Construction Aspects, Indian Roads Congress, August 25-26, 1994.
2. Parashar, B.L., **C.Kamaraj**, and Arya, I.R.," The Performance of Semi-Dense Concrete Surfacing", National Seminar on Emerging Trends in Highway Engineering, Centre for Transportation Engineering, Bangalore University, Bangalore, March 10-11, 1995.
3. Arya, I.R., and **C.Kamaraj**, "Large Stone Hot Mix Asphalt – State of Art", Indian Highways, Vol.24, No.3, March 1996.
4. Arya, I.R., Harit, M.C., Priyadarshi, S.S., and **C.Kamaraj**, "Evaluation of Distressed Pavements for their Rehabilitation", International Seminar on Highway Rehabilitation and Maintenance, Indian Roads Congress, Nov 1999.
5. Arya, I.R., **C.Kamaraj** and Agia Ram", Maintenance Cost Study on Flexible Pavements under Different Conditions in India", Highway Research Bulletin, Indian Roads Congress, Number 61, Dec 1999.
6. Dr. Bose S., Harit, M.C., Saluja, P.K., **C.Kamaraj**, Singh, Manvinder and Dr.Batra, V.S." New Methodology for Design of Bituminous Macadam Mixes", National Seminar on Transportation In 21<sup>st</sup> Century, Department of Civil Engineering, TIET, Patiala, Feb 23-24, 2001.
7. Dr.Bose, S., Harit, M.C., **C.Kamaraj** and Singh, Manvinder, "Development of Mix Design Procedures for Bituminous Macadam Mixes for Roads and Highways," Highway Research Bulletin, Indian Roads Congress, Number 65, Dec 2001. **Special Research Presentation during the Annual session of IRC, Kochi, January, 2002.**

8. Dr.Bose,S., **C.Kamaraj** and Harit, M.C., “ Mechanistic Evaluation of Premature Failure of A Major National Highway”, Proceedings of the International Conference on Advances in Civil Engineering (ACE 2002), IIT, Kharagpur, Vol.II, Allied Publishers Ltd, New Delhi, Jan 3-5, 2002.
9. Dr.Sood, V.K., Dr.Jain, P.K, **C.Kamaraj** and Narender Kumar, “ Studies on Stone Mastic Asphalt Using Polymer Impregnated Cellulose Pellets for Construction of Urban Arterial Road” Seminar on Integrated Development of Rural And Arterial Road Network for Socio-Economic Growth, IRC, New Delhi. 5-6<sup>th</sup> December, 2003, Vol.II.
10. Dr.Pundhir, N.K.S., Dr.Bose, S., **C.Kamaraj**, Singh, M.P., “ Construction of Roads using Marginal Aggregate Available in the State of Mizoram, N.E.Region”, Seminar on Integrated Development of Rural And Arterial Road Network for Socio-Economic Growth, IRC, New Delhi. 5-6<sup>th</sup> December, 2003, Vol.II.
11. Dr. Jain, P.K., **C.Kamaraj**, Sanjay Deori and Prof.Sikdar, P.K., “Evaluation of High Performance Rubber Modified Bituminous Mixes for Structural Layers of Flexible Pavements”. **8<sup>th</sup> International Conference on Application of Advance Trends in Transportation Engineering (AATT), 26-28 May 2004, Beijing, China.**
12. Dr.Bose, S., Sridhar, R., **C.Kamaraj** and Rakesh Meena, “Performance Based Bituminous Mix Design Using Super-Pave Gyrotory Compactor”, Paper No-495, Journal of Indian Roads Congress, September, 2003, Vol-64(2). **Discussion paper during 64<sup>th</sup> Annual Session of IRC held at Ahmedabad, January 8<sup>th</sup> to 11<sup>th</sup> , 2004.**
13. **C.Kamaraj**, Gajendra Kumar, Girish Sharma, Dr.P.K.Jain and Venkanna Babu, “Laboratory Studies On The Behaviour Of Stone Matrix Asphalt Vis-À-Vis Dense Graded Bituminous Mixes Using Natural Rubber Powder (Wet Process)”, Highway Research Board, Highway Research Bulletin, Vol.No 71, December 2004, Indian Roads Congress.
14. Dr.P.K.Jain, J.B.Sen Gupta, **C.Kamaraj**, Mrs.Shanta Kumar and Gajendra Kumar, “Studies on Use of Amine Type Adhesion Promoter Doped Bitumen to Prevent Failure of Bituminous Courses by Water and Salts”, Conference On Transportation Engineering held at Tapar Institute of Engineering and Technology, Patiala, February 2005.
15. Dr.Bose, S., Sridhar, R., **C.Kamaraj**, Sharma, Girish and Gajendra Kumar, “Investigation of Moisture Induced Damage to Bituminous Pavement and Effect of Field Performance – A Case Study,” Paper No-517, Journal of Indian Roads Congress, Oct 2005, Vol-66(3). **Discussion paper during 66<sup>th</sup> Annual Session of IRC held at Bhubaneswar, Nov. 11<sup>th</sup> to 15<sup>th</sup> , 2005.**
16. **C.Kamaraj** and Dr.P.K.Jain, “Design of Stone Matrix Asphalt- An Overview” Indo-Belarus Workshop on High Performance Bituminous Materials, Oct 18-19<sup>th</sup> 2005, CRRI, New Delhi.
17. Dr.P.K.Jain, J.B.Sengupta, Mrs.Shanta Kumar and **C.Kamaraj**, “Sustainable Use of Recycled High Density Polyethylene Waste in Road Construction”, **4<sup>th</sup>**

**Asia Pacific Conference on Transportation and Environment, 8-10 Nov 2005, Xian, China.**

18. Dr.N.K.S.Pundhir, **C.Kamaraj** and Dr.P.K.Nanda,"Copper Slag – An Industrial Waste in Bituminous Mixes", Journal of Scientific and Industrial Research (JSIR), Vol.64, Dec 2005, **(A Scientific Citation Index (SCI) Journal)**.
19. **C.Kamaraj**, Dr.P.K.Jain, Dr.V.K.Sood and Prof.P.K.Sikdar, "Design of Stone Matrix Asphalt Using Different Stabilizing Additives. Journal of Indian Roads Congress, April 2006, Vol-67(1).
20. Dr.P.K.Jain, Prof.P.K.Sikdar, Mrs.Shanta Kumar and **C.Kamaraj**, "Studies On Correlation of Rheology and Performance Characteristics of Mixes of Modified Binders for Roads in High Temperature Areas", Highway Research Bulletin, No 74, April 2006, Indian Roads Congress.
21. Dr.S.Bose, **C.Kamaraj** and Dr.P.K.Nanda, "Stone Mastic Asphalt – A Long Life Pavement Surface", International Seminar on Innovations in Construction and Maintenance of Flexible Pavements, Agra, 2-4 Sep 2006, Indian Roads Congress.
22. Dr.P.K.Jain , **C.Kamaraj** and Dr.P.K.Nanda, "Maintenance of National Highway using Micro-Surfacing Technology in North Eastern State – A case Study" International Seminar on Innovations in Construction and Maintenance of Flexible Pavements, Agra, 2-4 Sep 2006, Indian Roads Congress.
23. R. Sridhar, **C. Kamaraj**, Dr.Sunil Bose, Dr.P. K. Nanda and Manvinder Singh, "Effect of Gradation and Compactive Efforts on the Properties of Dense Bituminous Macadam Mixes" , S& T and Industrial Research, Journal of Scientific and Industrial Research (JSIR), Vol. 66, No 1, January 2007. **(A Scientific Citation Index (SCI) Journal)**.
24. **C.kamaraj**, B.M.Sharma ,P.K.Nanda and S.C.Raghav "Stone Mastic Asphalt – An Overview", National Conference on Road Making, Methods, Materials and Machines for Economy, Quality and Speed, Sponsored by All India Council for Technical Education and Co-Sponsored by Govt. of M.P.Departt. of Public Works held at Lakshmi Narain College of Technology, Bhopal, April 21-23, 2007.
25. Dr.Vasant G.Havanagi, Sudhir Mathur, P.S.Prasad and **C.Kamaraj**, "Feasibility of Copper Slag-Fly Ash Soil Mix as a Road Construction Material", **Transportation Research Record (TRR) Volume 1989, Transportation Research Board (TRB), 9<sup>th</sup> International Conference on Low Volume Roads, Austin, Texas,USA, June 24-27, 2007, (A Scientific Citation Index (SCI) Journal)**.
26. B.M.Sharma and **C.Kamaraj**, "Construction And Performance Evaluation Of Experimental Sections Laid On Urban Roads Using Stone Matrix Asphalt Mixtures", **23<sup>rd</sup> ARRB Conference – Research Partnering with Practitioners, Adelaide Australia, 2008.**
27. **C.Kamaraj** and B.M.Sharma, "Laboratory Study To Determine The Feasibility Of Use Of Chalk Powder (A By Product Of Ammonium Nitrophosphate Plant) As Filler In Stone Matrix Asphalt Mixes", International Conference on

- Materials for the Future, ICMF-2008, 17-19 January 2008, Golden Jubilee Celebrations, Government Engineering College, Thrissur.
28. Dr.P.K.Jain, A.K.Jain and **C.Kamaraj**, "Pavement Preservation Utilizing Cost Effective Modified Bitumen Seals – A Pilot Study", **23<sup>rd</sup> ARRB Conference – Research Partnering with Practitioners, Adelaide Australia, 2008.**
  29. P.K.Jain, M.N.Nagabhushana, Sanjay Deori And **C. Kamaraj** "Performance of Natural Rubber Modified Bitumen in India - A Pilot Study" Published in 4th Eurasphalt & Eurobitume Congress with the theme ASPHALT – ROADS FOR LIFE, 21st – 23rd May 2008, Copenhagen, Denmark,
  30. Dr.P.K.Jain and **C.Kamaraj**, "Performance Study of Rubber Modified Bitumen in Structural Layers of Flexible Pavements – A Case Study", Highway Research Journal, Highway Research Board, Indian Roads Congress, Vol. 2, No.1, January-June 2009.
  31. P.K.Jain, M.N.Nagabhushana, Y.V.Rao and **C.Kamaraj** "Performance of Modified Binders in High Precipitation Areas- Synthesis of Pilot Studies" p.p 3-63—3-76, Published in Proc. Seminar on 'Roads in High Precipitation Areas' , IRC , February 19-2010, Guwahati
  32. **C.Kamaraj**, P.K.Jain, B.M.Sharma, S.Gangopadhyay, "A Sustainable Bituminous Pavement for Urban Arterial Road – A Case Study", **11<sup>th</sup> International conference on Asphalt pavements, Nagoya, Japan, August 1-6, 2010.**
  33. S.Gangopadhyay, A.B.Mandal, C.Rose, P.Devadas Manoharan, Indhumathi Nambi, S.N.Jaisankar, U.Mani, **C.Kamaraj**., "Utilization of Chrome Shavings as an Alternate Filler in Micro surfacing for Pavement Preservation: An Approach for Leather Industry Solid Waste Management", 44<sup>th</sup> LERIG (2010) Conference on BIO-TAN, Jan 29 – 30, **2010**, Chennai, India.
  34. **C.Kamaraj**, M.N.Nagabhushana, P.K.Jain, B.M.Sharma, S.Gangopadhyay, Prashant and M.S.Amarnath, "Laboratory Investigation on the Performance of Warm Mix Based Thin Stone Matrix Asphalt Mix for Urban Roads" **24 ARRB Conference – Building on 50 years of road and transport research, Melbourne, Australia, 2010.**
  35. S. Gangopadhyay, A.B.Mandal, Devadas Manoharan, C.Rose, U.Mani and **C.Kamaraj**, "Sustainable blended cement for reduction of carbon foot print derived from leather fleshing as constituent material for road construction", International Seminar on Reducing Carbon Footprint in Road Construction organized by **World Road Association and Indian Roads Congress, New Delhi, 17 – 19 February 2011.**
  36. G.Malarvizhi, N.Senthil and **C.Kamaraj**, "A study on Recycling of Crumb Rubber and Low Density Polyethylene Blend on Stone Matrix Asphalt", International Journal of Scientific and Research Publications, Vol.2, No 10, October 2012.
  37. P. Vilvakumar, N. Senthil, S. Lakshmi, **C. Kamaraj** and S. Gangopadhyay, "A Study On The Performance Of Sugarcane Fibre in Stone Matrix Asphalt ", Indian Highways, June 2013.

38. **C.Kamaraj**, Dr.P.K.Jain, B.M.Sharma, Dr.S.Gangopadhyay “Design, Construction and Performance of Stone Matrix Asphalt (SMA) - Field Test Section”, Highway Research Journal, Jan-June, 2013.
39. Dr.G.Malarvizhi, **C.Kamaraj**, Athira P K, Dr.P.K.Jain, Dr.S.Gangopadhyay, Design of Open-Graded Frictional Course (OGFC) in Pavements With Polymer Modified Bitumen, International Journal of Applied Engineering Research ISSN 0973-4562 Volume 10, Number 8 (2015) pp. 20067-20079.
40. Ganapathi Malarvizhi, Sabermathi R, **Chidambaram Kamaraj**, Laboratory Study on Nano Clay Modified Asphalt Pavement, International Journal of Applied Engineering Research ISSN 0973-4562 Volume 10, Number 8 (2015) pp. 20175-20190.
41. C.R.Karthiga, **C.Kamaraj**, S.Lakshmi, C.Rose , Chrome – Tanned Leather Buffing Dust as Bitumen Modifier for the Design of Dense Graded Bituminous Concrete, International Journal of Applied Engineering Research, ISSN 0973-4562 Vol. 10 No.62 (2015), pp 326-331.
42. **C. Kamaraj**, S.Lakshmi, C. Rose, U. Mani, Edwin Paul, A.B. Mandal, S. Gangopadhyay, Experimental Study on Micro Surfacing using Chrome Shaving Impregnated with Modified Bitumen Emulsion, Journal of Scientific & Industrial Research Vol. 75, June 2016, pp. 378-382
43. **C. Kamaraj**, S. Lakshmi; C. Rose; C. Muralidharan, Wet Blue Fiber and Lime from Leather Industry Solid Waste as Stabilizing Additive and Filler in Design of Stone Matrix Asphalt, Asian Journal of Research in Social Sciences and Humanities Vol. 7, No. 11, November 2017, pp. 240-257.
44. **C.Kamaraj**, Thabiba SMF, Siva Sankari P, S.Lakshmi, C.Rose, C.Muralidharan, Characterization of Leather Buffing Dust Modified Bituminous Binder For Flexible Pavement, China Leather, Vol 47, No 1, Jan 2018, pp 35-41.
45. Lakshmi,S, **Kamaraj,C**, Sridhar Raju, Rose,C & Muralidharan,C 2018, ‘Utilization of Chrome Shavings in Cold Bituminous Mixture’, International conference on Pavements and Computational Approaches (ICOPAC 2018), pp 62-71, Excel India Publishers, November 2018, New Delhi.

#### **D. Technical / Consultancy Projects:**

Have been actively involved on a number of consultancy project implemented for a number of road departments/ organization, refineries, consultants and contractors etc.

1. Investigation of Road in the Field of Ankeleshwar and Gandhal in Gujarat for the Design of Road Crust under ONGC Project.
2. Technical Advice for the Investigation of Roads Inside M/S IFFCO Plant Complex
3. Post Construction Technical Advice for the Investigation of Hindon Air Filed Pavements



4. Investigation of Pavement Design and Improvement of Roads for M/S Tata Fertilizer Plant Complex at Babrala (UP)
5. Investigation of Causes of Distress and Strengthening Requirement of NH-8 and NH-12.
6. Investigation of Roads Inside the Faridabad Administration Complex Area, 1995
7. Investigation of NH-10 and Suggest Remedial Measures, 1997.
8. Investigation of NH-15 and Suggest Remedial Measures, 1997.
9. Design and Quality Assurance of Flexible Pavements at Bijwasan IOC Terminal, 1997.
10. Investigation of Roads at Chambal Fertilizer and Chemical Plant, Chambal, 1998
11. Investigation for Strengthening and Improvement of DSC Road in the Reach of Village Bhangel, Noida, 1998.
12. Investigating for Causes of Distress in Bituminous Layers with Regard to Materials and Mixes on NH-1 Km 132.675 To Km 212.167, Karnal – Ambala Section, 1998.
13. Investigation for Assessing the Structural Capacity of Pavement Using Benkelman Beam Deflection Method on NH-1 Km 132.675 To Km 212.167, Karnal – Ambala Section, 1998.
14. Investigation for Causes of Distress on Bituminous Surface and Suggest Suitable Treatment before Overlay on Nh-1 Km 132.675 to Km 212.167, Karnal – Ambala Section, 1998.
15. Investigation for Strengthening and Improvement of Shanti Path between Satya Marg and Kautilya Marg under NDMC, 1998.
16. Investigation for Strengthening And Improvement of Road Stretch Between Sector 62, 63 and 64 under Noida, 1998.
17. Resurfacing of Bhagwan Dass Road Under NDMC, 1999.
18. Study of DSC Road Regarding Improving its Crust Thickness Under Noida, 1999.
19. Investigation of Distressed Pavement at IOC Marketing Terminal at Panipat and Suggesting Suitable Measures, 1999.
20. Characterization of Materials Collected from Road Pavement on NH-1 Km 132.675 to Km 212.167, Karnal – Ambala Section, 1999.
21. Investigation for Causes of Distress and Suggesting Remedial Measures for Improvement and Strengthening of C-Hexagon under NDMC, 1999.
22. Investigation and Remedial Measures for Master Plan Road No 3 In Front of Village Mammura and Flex Industries, Noida, 2000.
23. Investigation of Ranchi-Gundla Section of NH-23 for Causes of Failure and Improvement Measures, PWD, Ranchi, June 2002
24. Evaluation of CRMB Vis-À-Vis 80/100 Bitumen for Patch Work, July 2002
25. Feasibility Study for Application for Micro Surfacing of JL Nehru Marg from Delhi Gate to Crossing of LNJP Hospital, Dec, 2002.
26. Evaluation of CRMB Vis-À-Vis 80/100 Bitumen for Structural Layers of Flexible Pavements, Dec 2002

27. Evaluation of Delhi Roads for Needed Improvement and Upgradation, Delhi PWD, March 2003.
28. Post Quality Audit of Roads in Bhawana Industrial Estate, DSITC, Delhi.
29. Utilization of Waste Material from Birla Copper Industries.
30. Evaluation of CRMB, Vis-À-Vis 60/70 for Structural Layers of Flexible Pavements.
31. Evaluation of Cellulose Fibre as Additives in SMA.
32. Evaluation of Modified Binders used in Bituminous Courses on Rajamundry - Dharamavaram Section of NH-5. (Sponsored by Novaphalt Pvt.Ltd)
33. Evaluation of Quality of PMB and Mixes in Bituminous Concrete at Mahatma Gandhi Expressway. (Sponsored by NHAI, Ahmedabad)
34. Evaluation of Adhesion Promoters for prevention of Stripping Failures of Bituminous Road Surfacing. (Sponsored by AKZONOBEL Pvt. Ltd.
35. Report on Evaluation and Design of Mixes with PMB-40 and PMB-70 Modified Binders. (Sponsored by ENSEFT Pvt.Ltd)
36. Use of Milled Bituminous Material in Wet Mix Macadam. (Sponsored by National Highway Authority of India, Agra).
37. Design and Construction of Experimental Section of Stone Mastic Asphalt (SMA) mix at Two Major Intersection between KhajuriChowk and Brijpuri Chowk. PWD Division No 29, Delhi PWD, Delhi, 2006. **(Project Leader)**.
38. Investigation for Strengthening of DSC Road from Village Chellera to Hindon Bridge, New Okhla Industrial Development Authority (NOIDA), Government of Utter Pradesh, 2007, **(Project Leader)**.
39. Third Party Checking For The Work Of "I/S Of Road From Dhansa Bus Stand (Naj) To Mitraon Village In NGZ SH: Strengthening Of Carriageway", MCD, Delhi, 2007, **(Project Leader)**.
40. Third Party Checking For The Work Of "I/S Of Road No 66: Strengthening Of Carriageway", PWD, CRM Division M-213, Delhi, 2007.
41. Third Party Checking For The Work Of "I/S Of Road From Raja Dhir Sen Marg (Beautification of ISKON temple Surrounding) to Captain Gaur Marg: Strengthening Of Carriageway", MCD, Delhi, 2007, **(Project Leader)**.
42. Technical consultancy for laying of Stone Matrix Asphalt for the treatment on deck slab of palam Dabri darin, DDA, Delhi, 2018 **(Project Leader)**.
43. Strengthening of Gurudwara road in Jaitpur area, PWD, Delhi, 2018 (Project Leader).
44. Design of granular and bituminous mix for the resurfacing of runway at air port station JAMMU under Military Engineering Services (MES)-**TSP 1055 (Project Leader), June 2019.**
45. Design of granular and bituminous mix for the resurfacing of runway at air port station PURNIA (Bihar) under Military Engineering Services (MES) – **TSP 1065, (Project Leader), Dec 2019.**

**18. PATENTS:** The following patents have been awarded to me.

1. Ready To Use Patching Mixes For Repair Of Potholes' by Dr.P.K.Jain, J.B.Sengupta, Mrs.Shanta Kumar and **C.Kamaraj**
2. Improved Crumb Rubber Modified Bitumens for Special Road Applications, by Dr.P.K.Jain, **C.Kamaraj** and Mrs.Shanta Kumar
3. Development of Micro Surfacing Layer using Chrome Shavings, as Maintenance of Urban Roads and its Process thereof, C.Rose, **C.Kamaraj**, S.N.Jai Sankar, U.Mani, T.P.Sastry, S.Gangopadhyay, A.B.Mandal (**CSIR Ref: 0198NF2011**).

The information given above is correct to the best of my knowledge and belief. If given an opportunity to work in your organization, I shall deliver to the best of my ability and capability in order to meet your expectations.

**Date:**

**(C. Kamaraj)**