Curriculum Vitae of P.G.Venkatram

1. Name of Staff : **P G Venkatram**
2. Date of Birth : 28/12/1959
3. Nationality : Indian
4. Educational Qualification:
   - B.Tech in Civil Engineering, Indian Institute of Technology, Madras, 1981
   - M.S. in Civil Engineering, Carnegie – Mellon University, Pittsburgh, Pennsylvania, U.S.A. 1984

5. Membership of Professional Societies:

   - Fellow of Institution of Engineers (India)
   - Fellow of The Indian Association of Structural Engineers
   - Member of International Association of Bridge and Structural Engineers
   - Fellow of Indian Institution of Bridge Engineers
   - Member of Maharashtra India Chapter of American Concrete Institute
   - Member of India Section of American Society of Engineers
   - Member of Indian Road Congress

Membership of Technical Committees:

   - Indian Roads Congress B-2 Committee – Loads & Stresses Committee
   - Indian Roads Congress B-4 Committee – Reinforced, Prestressed & Composite Concrete Committee
   - Indian Roads Congress B-5 Committee – Steel & Composite Structures Committee (Past member)
   - Expert Committee on Best Practices in Road Construction – Ministry of Road Transport & Highways
   - Empanelled Bridge Expert for Inspecting and Analyzing causes of Bridge Failures by National Highways Authority of India

6. Publications:

   - Anpara Chimney", Structural Engineering International, V.1, No.3, 1991
   - "Design Aspects of Substructures and Foundations of Second Thane Creek Bridge", Proceedings of *International Seminar on Bridge Substructure and Foundations*, Bombay, India, January 1992.
   - "Two railway bridges across Vasai Creek, Bombay India", 14th IABSE Congress Delhi - Report, December 1992

- "Some Aspects Connected with minimising/modifying Enabling Structures and equipment in Construction", Proceedings of *Seminar on "Enabling Works in Construction"*, Ahmedabad, India, October 2000
- "On Planning and Design Aspects of Fast Track Construction of Bridges*", Bridge & Structural Engineer, Vol.31, No.1*, February – March 2001
- "Viaducts for Light Rail Transit System II, Kuala Lumpur", Proceedings *of National Conference on "Trends in Prestressed Concrete"*, Chennai, India, June 2001
- "Approach Viaducts for an ROB", ICI Journal, July-September 2002
- "Aspect of Designs and Detailing in Precast Segmental bridge construction", Proceedings of *FIB Symposium 2004 on "Segmental Construction in Concrete"* , New Delhi, India, November 2004
- "Design of buried box type structures" , Proceedings of *National Seminar On "Recent Developments In Earth Retaining Structures For Bridges And Flyovers" ,* Hyderabad, India, February 2006.
- "Case Study – Design and Behaviour of piles in Alluvial deposits", Proceedings of *IGS Conference*, Chennai, India, December 2006
- "Innovations in Design of Bridges", Proceedings of the *RILEM – ICI Workshop*, Chennai – September 2008
- "Retaining Structures in Hilly Regions – A Case Study", Proceedings of *ING-IABSE Seminar on Retaining Structures*, Chennai – April 2009
- "Design and Construction of viaduct to Mumbai International Airport", Proceedings of International Conference organised by FEUP (Engineering Faculty of University of Porto), titled "Multi Span Large Bridges
- Rapid Urbanization and need for Master Plan & Transportation Plan, Construction Philosophy – August 2019

Lectures / Seminars/Workshops

- Seminar on Enabling Works in Construction, Ahmedabad – October 2000
- International Seminar on Trends in Prestressed Concrete, Chennai – June 2001
- Industrial Expert Lecture at IIT Madras on Bridge Design and Construction, Chennai – October 2002
- Fib Symposium on Segmental Construction in Concrete, New Delhi – November 2004
- IIT Madras invited lecture on Bridge Design and Construction – April 2005
- Seminar on Bridge Construction at Annamalai University, Chidambaram – September 2005
- Bridge Engineering Lecture on Design and Construction of Bridges at IIT Madras – April 2006
- Workshop on Steel Construction of Bridges and Flyovers, Chennai – June 2006
- ICIC – RILEM Workshop on Advances in Concrete materials, Chennai – September 2008
- Constru India 2008 – Innovations in Bridge Design and Construction, Chennai – October 2008

- Bridge Engineering Lecture on Design and Construction of Bridges at IIT Madras, Chennai – March 2009
- Pondicherry Engineering College – Impact of Construction methodology on Design of Bridges – March 2009
- ING IABSE Seminar on Retaining Structures – April 2009
- SHASTRA Lecture at IIT Madras, - Traffic Planning Aspects, Bridge Design and construction – October 2009
- Construction and Maintenance Challenges for Metro Projects in India, Hyderabad – May 2011
- Advances in Designs Construction and Maintenance of Roads and Bridges, Chennai – November 2011
- Design and Engineering Workshop on Roads and Bridges, Chennai – September 2012
- Workshop on Sustainable Technologies in Roads and Bridges, Chennai – December 2012
- IIT Madras, Bridge Engineering Lecture – April 2013
- AIStructE – Workshop on Earthquake resistant design of structures – August 2014
- Advanced Bridge Design and Constructions, New Delhi – July 2016
- ING IABSE Workshop on Code of Practice for Concrete Road Bridges, Mumbai – November 2016
- Indian Concrete Institute Workshop on Designs to IRC 112, Chennai – October 2018
- Workshop on NDT and E of Concrete, Chennai – January 2019
- ICI Workshop on design and construction of Prestressed concrete structures, April 2019
- Workshop on Condition Monitoring, Health Assessment and Rehabilitation of Concrete Bridges and Buildings, Navi Mumbai – July 2019
- Workshop on Design of Cable Stayed Bridges, Mumbai – July 2019
- Indian Concrete Institute Workshop on Foundation Designs, Chennai – July 2019
- International conference on recent trends in construction materials and structures, VIT Vellore, September 2019
- AIStructE workshop Earthquake design of structures with Seismic isolators, New Delhi, September 2019
- ICI Workshop in Collaboration with SRM Engg. College on Design of Structure to IIRC 112, Chennai, August 2020
- Sidhartha Engg. College Short term course on Bridge design and Construction, September 2020
- Samnivesha program of Civil Engineering Association of Patna IIT, February 2021 on Innovations in Bridge design and construction
- IIT, Madras, BTCM Industrial Seminar, November 2021, Learning from Failures
- IAHE Workshop on Avoidance of failures in Prestressed concrete Elevated Structures, Vishakhapatnam, October 2021

- IAHE Workshop on Avoidance of failures in Prestressed concrete Elevated Structures, Madurai, November 2021
- Training Workshop for RVNL Engineers on Quality control and failure prevention, December 2021
- Engineering Staff College of India, Training Program on Design and Construction of Bridges, March 2022
- Staff Technical Training Program of Kerala Engineering Colleges, Trichur Engg. College, March 2022
- Highways Department Training Center, Chennai Tamil Nadu, Staff Training Program on Bridge Design and Construction, May 2022
- Highways Department Training Center, Chennai Tamil Nadu, Staff Training Program on Bridge Design and Construction, June 2022
- Engineering Staff College of India, Training Program on Design and Construction of Bridges, June 2022
- IAHE Workshop on Avoidance of failures in Prestressed concrete Elevated Structures, Surat June 2021
- Enhancing Civil Engineering Proficiency, 2022, Govt. Polytechnic, Chelakkara, Kerala, June 2022
- IAHE Workshop on 16-week Foundation Training, on Quality control and quality assurance during construction of bridges, Delhi July 2021
- IAHE Workshop on Avoidance of failures in Prestressed concrete Elevated Structures, Vishakhapatnam, September 2021
- IAHE Workshop on Avoidance of failures in Prestressed concrete Elevated Structures, Madurai, November 2021
- AIStructE short term course on Design and Construction of Small and Medium Span Concrete Bridges, New Delhi, August 2022
- IAHE Workshop on Avoidance of failures in Prestressed concrete Elevated Structures, Raipur, December 2022
- Training of Engineers of Tamil Nadu Highways Department under the title “Construction, Maintenance and Quality Control of Bridges and Grade Separators”, May, 2022, June 2022, Feb 2023, May 2023 and July 2023
- Workshop on Learning from Failures and Quality Assurance in Bridge Construction, for High-Speed Rail Project, Surat, Vadodara, Ahmedabad, May 2023

7. Employment Record:

Period	**Organisation**	**Designation**	**Location**
January 2022 onwards	L&T Infrastructure Engineering Ltd.	Advisor, Technical Services, Bridges	Chennai, India
September 2020	Indian Institute of Technology,	Professor of Practice in Bridge	Chennai,

onwards	Madras	Engineering	India
December 2019 December 2021	L&T Infrastructure Engineering Ltd.	Chief Technology Officer	Chennai, India
Sep 2014 – December 2019	L&T Infrastructure Engineering Ltd.	Chief Executive	Chennai, India
June 2011 – Sept 2014	L&T-RAMBØLL Consulting Engineers Limited	Chief Executive	Chennai, India
Dec 2009 – June 2011	L&T-RAMBØLL Consulting Engineers Limited	Chief of Operations	Chennai, India
June 2008 – Dec 2009	L&T-RAMBØLL Consulting Engineers Limited	Chief of Operations & Head of Department – Bridges & Structures	Chennai, India
July 2007 – May 2008	L&T-RAMBØLL Consulting Engineers Limited	Head of Department – Bridges & Structures	Chennai, India
July 2003 – June 2007	L&T-RAMBØLL Consulting Engineers Limited	Chief Consultant - Bridges	Chennai, India
Mar 2000 – June 2003	L&T-RAMBØLL Consulting Engineers Limited	Senior Project Consultant – Bridges	Chennai, India
1996 – 2000	HSS Integrated Sdn. Bhd., Petaling Jaya, Malaysia	Head of Bridges Dept.	Malaysia
1994 –1996	HSS Integrated Sdn. Bhd., Petaling Jaya, Malaysia	Senior Bridge Engineer	Malaysia
1994	STUP Consultants Ltd., Bombay, India	Associate Principal Consultant	Bombay, India
1992 – 1994	STUP Consultants Ltd., Bombay, India	Senior Consultant	Bombay, India
1988 - 1992	STUP Consultants Ltd., Bombay, India	Senior Design Engineer	Bombay, India
1985 – 1988	STUP Consultants Ltd., Bombay, India	Design Engineer	Bombay, India
1984 – 1985	STUP Consultants Ltd., Bombay, India	Asst. Design Engineer	Bombay, India
1981 – 1982	TATA Consulting Engineers	Engineer Trainee	Bangalore, India

Works Undertaken

Project Name	**Delhi Vadodara Expressway Project – Package 11**
Year	2020 - on-going
Location	Haryana
Client	L&T Constructions Ltd., TIIC, Mumbai
Position Held	Project Advisor
Project Features	The Project consists of 11.63 km of 8 lane expressway. The major components of this project are the 1.2 km of elevated stretch over the tiger reserve forest serving as **an animal underpass** and the 2.5 km of **animal overpass** which provides animal access over the expressway in the form of 5 x 500 m long man-made tunnel like structures. The **animal underpass** is a segmental box girder of 50 m span with a deck width of 21 meters for each carriageway with normal damping elastomeric bearings functioning like an isolation bearing for seismic and other actions. The **animal overpass** is a two-span integral portal like structure with pretensioned girders at 1.5 m spacing. All the foundations are open foundations. There are a number of other minor structures
Activities Performed	Guidance to Project Manager / Team Leader in project scoping process. Advising team in development / review of concept designs for two projects. Attending major meetings with clients. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues

Project Name	**Delhi Vadodara Expressway Project – Package 10**
Year	2020 - on-going
Location	Haryana
Client	DMIA – NYATI LLP, Hyderabad
Position Held	Project Advisor
Project Features	The Project consists of 26.45 km of 8 lane expressway. The major components of this project are the 1.8 km of elevated stretch over the backwaters of the Chakan Dam, which also serves as an animal underpass. This animal underpass is a segmental box girder of 50 m span with a deck width of 21 meters for each carriageway with normal damping elastomeric bearings functioning like an isolation bearing for seismic and other actions. There are a number of other minor structures
Activities Performed	Guidance to Project Manager / Team Leader in project scoping process. Advising team in development / review of concept designs for two projects. Attending major meetings with clients. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues

Project Name	**Package III & IV of Dwaraka Expressway, Gurgaon, Haryana**
Year	Completed July 2023
Location	Gurgaon, Haryana
Client	L&T Constructions, TIIC, Mumbai
Position Held	Project Advisor
Project Features	The Project consists of 12.5 km of 8 lane elevated expressway and service roads under this expressway. Additionally, it has two interchanges and underpasses and foot over bridges and 125 m span two lane steel through truss bridge. The main 8 lane elevated expressway has a typical span of 40 m and has expansion joints at 200 m interval. The structures are designed as simply supported for gravity loads and continuous in longitudinal direction for seismic and other longitudinal effects. In addition, the structure is designed with the superstructure seismically isolated from the substructure through suitably designed normally damping reinforced elastomeric bearings.
Activities Performed	Guidance to Project Manager / Team Leader in project scoping process. Advising team in development / review of concept designs for two projects. Attending major meetings with clients. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues

Project Name	**Detailed Design for Elevated Metro Viaduct and Four lane elevated road on Common substructure along NH7 in Nagpur**
Year	2016 - 2019
Location	Nagpur, Maharashtra
Client	NCC Ltd., Mumbai
Position Held	Project Advisor
Project Features	The Project consists of the design of two level main elevated corridor carrying Metro at the higher level and a 4-lane highway at the lower level along the Wardha Road stretch of the Nagpur Metro Corridor. The structure consists of simply supported metro deck and Roadway deck on common substructure. The typical spans are 25 and 28 meters long. The foundation system consists of pills and isolated footings depending upon the presence of rock at shallow or deeper levels. The overall length of this common corridor is 3500 m. Super structure for the metro deck is segmental cast and assembled box girder and the highway structure is segmental constructed single cell box spine and with the carriageway widened with attachment of precast wings with insitu stitch with the spine. The spans were erected by span by span method. Preparation of tender documents
Activities Performed	Advising team in development / review of concept designs for two projects. Troubleshooting technical issues related to design and construction related problems at site. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues

Project Name	**Detailed Engineering for DFCC-Western Corridor Special Steel Bridge Packages 15A, 15B &15C- JNPT – Vadodara Section and Rewari – Dadri Section of Western Dedicated Freight Corridor (Phase-2)".**
Year	2015 – 2022
Location	Delhi, Gujarat, Maharashrta
Client	L&T Constructions Heavy Civil IC., Chennai
Position Held	Project Advisor
Project Features	The Project consists of the design of 12 major Bridges consisting of 45 m, 60 m and 75 m through steel truss spans with unballasted rail tracks for Bridges across major rivers, such as Yamuna, Hindon, Narmada, Tapi, Damanganga, par and Ulhas Creek. One of the Bridges also had 45 m steel underslung truss in composite action with concrete deck supporting Ballasted tracks. The bridges were all designed for the 32.5 tons axel loading of the Dedicated Freight Corridor.
Activities Performed	Guidance to Project Manager / Team Leader in project scoping process. Advising team in development / review of concept designs for two projects. Attending major meetings with clients. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues

Project Name	**Detailed Design Consultancy services for 9 (Nine) stations on North-South Corridor of Nagpur Metro (5 Elevated Stations excluding viaduct in station portion, 2 Elevated stations including viaduct in station Portions and 2 No At-grade sections)**
Year	2015 - 2021
Location	Nagpur, India
Client	NMRCL., Nagpur
Position Held	Project Advisor
Project Features	The Project consists of the design of 9 stations of Nagpur Metro Reach 1. The stations are of 3 types viz. At grade, elevated with concourse in shadow of hte railway deck and elevated off-road concourse
Activities Performed	Guidance to Project Manager / Team Leader in project scoping process. Advising team in development / review of concept designs for two projects. Attending major meetings with clients. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues.

Project Name	**Cable Stayed Bridge across River Mandovi at Panaji, Goa including approaches on NH-17, between Pundalik Nagar Junction and Merces Circle**
Year	2014 - 2019
Location	Goa, India
Client	L&T Heavy Civil IC, Chennai
Position Held	Project Director
Project Features	The Project consists of the design of the main Bridge across the Mandovi River, which consisted of 5 Cable stayed spans of covering an overall length of 610 meters. The other components of the project included elevated grade separators of 4 lanes and two lanes covering an overall length of 2500 m. Super structure for

	all the components were precast segmental externally strutted box girders erected by span-by-span method, except the Cable stayed portion which was constructed by balanced cantilever method
Activities Performed	Advising team in development / review of concept designs for two projects. Troubleshooting technical issues related to design and construction related problems at site. Review of technical designs and concepts to ensure its integration with construction methodology proposed by contractor. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues.

Project Name	**Six Laning of 192.000 to Km 198.000 between Vadodara Surat Sections of NH-8 including construction of new four lane extradosed bridge across river Narmada in the state of Gujarat".**
Year	2014 - 2017
Location	Bharuch, India
Client	L&T Constructions Heavy Civil IC, Chennai
Position Held	Project Director
Project Features	The Project consists of the design of the main Bridge across the Narmada River, which consisted of 9 Extradosed spans of 145 meters covering an overall length of 980 meters. The other components of the project included two flyovers, cross drainage works, one Toll plaza structures and about 6 kms of 6 lane road
Activities Performed	Guidance to Project Manager / Team Leader in project scoping process. Advising team in development / review of concept designs for two projects Attending major meetings with clients. Troubleshooting technical issues related to design and construction related problems at site

Project Name	**Western Dedicated Freight Corridor Project – CT P1 & CT P2 (Package 1 & 2) Rewari to Iqbalgarh Section as Design Consultants for Design Package 1 (DP1) – Rewari to Ajmer Section**
Year	Nov 2013- 2022
Location	Rajasthan, India
Client	L&T Construction Heavy Civil IC, Chennai
Position Held	Project Advisor
Project Features	The Project consists of the design 567 structures consisting of pipe culverts, minor Bridges, Major Bridges, Rail flyovers, Road under Bridges, Road Overbridges, Pedestrian underpasses as a part of the 630 km long package 1 & 2 of the DFCC western corridor. The design work of almost completed except for one structure and the construction is on-going
Activities Performed	Advising team in development / review of concept designs for two projects. Troubleshooting technical issues related to design and construction related problems at site

Project Name	**Detailed design for 57 Elevated Stations of Hyderabad Metro Rail.**
Year	2012 – 2016
Location	Hyderabad, India
Client	L&T Constructions Buildings and Factories IC, Chennai
Position Held	Project Director
Project Features	The Project consists of the design of the Concourse and Platform structures for the 57 Stations in the project. The concourse consists of a 20 m wide deck built **by spine and wing construction** to enable speedy construction in narrow road corridors. The Stations consists of 9 spans covering a length of about 135 m
Activities Performed	Guidance to Project Manager / Team Leader in project scoping process. Review of technical designs and concepts to ensure its integration with construction methodology proposed by contractor.

Project Name	**Design of 12 Km stretches of outer ring road between Vikaspuri to Mukarba Chowk**
Year	2011 – 2016
Location	New Delhi
Client	PWD, Govt. Of Delhi
Position Held	Project Director
Project Features	The Project consists of nearly 8 km of 6 lane elevated road along the selected corridor. The design being adopted is the **spine and wing construction** in order to standardise the construction and efficient utilisation of the road space
Activities Performed	Guidance to Project Manager / Team Leader in project scoping process. Advising team in development / review of concept designs for two projects. Attending major meetings with clients. Review of technical designs and concepts to ensure its integration with construction methodology proposed by contractor

Project Name	**Design of Structures in 60 Km stretch of Pimpalgaon-Nasik - Gonde along NH-3**
Year	2009 – 2012
Location	Nashik, Maharashtra
Client	L&T Heavy Civil IC, Chennai
Position Held	Project Director
Project Features	The Project consisted of 7 flyovers all of which were uniquely designed as **Integral Bridges** with Precast Girders with partially precast deck slab. The major component of the project was the 5.2 km long elevated 4 lane corridor through the city of Nashik. This structure had the distinction of carrying 4 lane traffic on a **single externally strutted Box girder** resting on central pier
Activities Performed	Advising team in development / review of concept designs for two projects. Attending major meetings with clients. Troubleshooting technical issues related to design and construction related problems at site Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues

Project Name	**Detailed Engineering Design for widening of existing 4 lane road to 6 lane divided road for 44.4 km long section from Chennai to Tada (Km 11.0 to Km 54.4) of NH-5 in the State of Tamil Nadu (DBFO Project)**
Year	2008 – 2011
Location	Tamilnadu
Client	L&T Infrastructure Operating Company, Chennai.
Position Held	Project Advisor
Project Features	The project consists of widening of the existing 4 lane divided road into an access controlled 6 lane tolled expressway. The complete scope included supervision of topographic surveys, soil investigations, carrying out the traffic studies and physical surveys to establish the existing condition of the road pavement adn structures, detailed design of the roads and bridge structures in the project. The Project had 43 km of 6 lane main carriageway, same length of service roads on either side of the main carriageway. Along this stretch of the roads there were on Major Bridge, 10 Minor Bridges, 6 flyovers, 8 Vehicular underpasses, 5 Pedestrian underpasses and 5 grade separators
Activities Performed	Advising team in development / review of concept designs for two projects. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues.

Project Name	**Detailed design consultancy services for Nine Elevated Stations (including viaduct portion within the station and transition span on either side of the stations) for Reach R4 Bangalore Metro Rail Project Phase-I**
Year	2008 - 2013
Location	Bangalore
Client	Bangalore Metro Rail Corporation Limited, Bangalore
Position Held	Team Leader
Project Features	The project involves design and detailing additional 5 elevated stations along the reach R4 of the Bangalore Metro. The scope included the carrying out of Topographic surveys, Soil investigations and preparation of Specifications and tender documents in addition to Detailed Engineering, Architectural works and associated Electrical and Mechanical works
Activities Performed	Review of technical designs and concepts to ensure its integration with construction methodology proposed by contractor. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues

Project Name	**Detailed structural design of Access Link from Western Express Highway to Chhatrapathi Shivaji International Airport (CSIA), Mumbai**
Year	2008-2013
Location	Mumbai
Client	L&T ECCD, Chennai
Position Held	**Project Director**
Project Features	The project involves design and detailing a Grade separated Junction at Western

	Expressway, a six lane Tunnel below the Proposed Taxiway catering to the World's largest Aircraft A380 with a load of 780 Tons and an elevated six lane access bridge of approximately 1200 m length leading to the forecourt of the terminal building. The Elevated bridge has a 27.2m wide deck built by the **segmental spine beam construction** methodology
Activities Performed	Guidance to Project Manager / Team Leader in project scoping process. Advising team in development / review of concept designs for two projects. Attending major meetings with clients. Troubleshooting technical issues related to design and construction related problems at site

Project Name	**Extension of Secondary Runway at Chennai Airport, Chennai. SH:Consultancy service for construction of RCC/Prestressed concrete bridge across River Adayar**
Year	2008-2011
Location	Mumbai
Client	Airports Authority of India, Chennai
Position Held	Project Director
Project Features	The project involves design and detailing a 200 m long and 410 m wide Bridge across Adyar River carrying the secondary runway of the Chennai Airport, designed for Airbus A380 aircraft loading. The scope included topographic survey, soil investigations, design basis, detailed designs, detailed estimates and tender document preparation for an Item – rate (Re-measured) contract. The structure consisted of a beam and slab deck integral with piers on open foundations. The deck had two types of designs classified as full strength (for Runway adn taxiway strips) and half strength (for portions between the strip between runway and taxiway).
Activities Performed	Advising team in development / review of concept designs for two projects. Attending major meetings with clients. Troubleshooting technical issues related to design and construction related problems at site. Review of technical designs and concepts to ensure its integration with construction methodology proposed by contractor

Project Name	**Construction of 3 additional clover leaves at Sarita Vihar Flyover including Slip road, approach road, footpath, cycle track and underpass (RUB) to connect road No. 13-A to Road No. 13**
Year	2007 - 2013
Location	New Delhi
Client	Delhi development Authority, New Delhi
Position Held	Project Director
Project Features	The project involves design and detailing additional 3 leaves of a Full cloverleaf on to and existing 6 lane Grade separator. Additionally the Project consists of a 6 lane vehicular underpass below Railway lines of more than 200 m length built by Cut & cover method using soldier piles technique. The Facility also incorporates at grade and below ground network of carriageways for the non-motorised traffic (pedestrian and bicycles). The scope included the carrying out of Topographic surveys, Soil investigations and preparation of Specifications and tender documents in addition to Detailed Engineering

Activities Performed	Advising team members, high end technical discussions with engineers, solving site related issues.

Project Name	**Detailed design of 4 ROBs as part of the Development of access controlled 4/6 lane in Kundli-Manesar-Palwal expressway in Haryana**
Year	2007- Ongoing
Location	Haryana
Client	KMP Expressways Ltd., Gurgaon (A Subsudiary of DS Constructions Ltd.)
Position Held	Team Leader
Project Features	The Project consists of design and detailing of 4 numbers of 6 lane Grade separators in locations in Haryana to replace the existing level crossing. The superstructure arrangements of the railway spans are post-tensioned girder and slab arrangement. The approach structures are designed in an Integral arrangement with the substructure with raft foundations to cater for poor soil conditions. Each carriageway of the bridges are designed for worst of 3 lanes of Class A & one lane of Class 70R in combination with 1 lane of Class A loading. The scope also included Design and Detailing the bridges and approaches
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings. Interfacing with construction team and assist in solving site problems related to design

Project Name	**Detailed design of three Road Over Bridges in Bihar at LC No.33, 43 & 52/I – Package No.XIII**
Year	2006-2013
Location	Bihar
Client	IRCON International Ltd., Patna
Position Held	Team Leader
Project Features	The Project consists of design and detailing of 3 numbers of 2 lane Grade separators in locations in Bihar to replace the existing level crossing. The superstructure arrangement of the railway spans is Bowstring girders in steel (60 m spans) and the approaches are girder and slab arrangement (25 m Span). The approach structures are designed in an Integral arrangement with the substructure. The bridges are designed for 2 lanes of Class A & Class 70R loading. The scope also included Design and Detailing the bridges and approaches including the service roads as applicable
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings. Interfacing with construction team and assist in solving site problems related to design

Project Name	**Detailed design of Five Bridges on Kristiansand -Grimstad Section on E18 Expressway in Norway**
Year	2006 -2007
Location	Norway
Client	RAMBOLL, Norway
Position Held	Team Leader
Project Features	The Project consists of an approximately 39 km of expressway to be implemented in the PPP model with Bilfinger Berger as the contractor and the Norwegian Roads Directorate as the Govt. partner. The lead consultant was Ramboll, Norway. The

	Scope of services rendered from Chennai office of LTR were the designs of 4 Bridges, one cycle bridge, one slab bridge and other two minor bridges. All the bridge structures were of integral arrangement. The designs were compliant to Employers requirements and Norwegian standards
Activities Performed	Advising team members, high end technical discussions with engineers, solving site related issues and guiding team of engineers.

Project Name	**Onshore Terminal Project (KGD6 Development) in Gaditnoga Village, Kakinada, Andhra Pradesh**
Year	2006 – 2008
Location	Andhra Pradesh
Client	Reliance Industries Ltd. Mumbai , through L&T Ltd. Kakinada
Position Held	Team Leader
Project Features	The Project consists of the design and detailing of one flyover and one steel Bow string girder and a Haul road from Jetty to the Onshore terminal to bring oversized project equipment. The Span of the Steel bowstring girder is 60 m and the flyover is an integral continuous bridge in Reinforced concrete construction of length nearly 500 m. The foundations consist of 350 mm Square RCC precast driven piles
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings

Project Name	**Carry out detailed design and drawings of proposed Rail Bridge adjacent to existing Jubilee Bridge on Nihatl-Bandel Section of Eastern Railway near Kolkata**
Year	2005-Ongoing
Location	West Bengal
Client	Reliance Industries Ltd. Mumbai , through L&T Ltd. Kakinada
Position Held	Senior Bridge Engineer
Project Features	The Project consists of the design and detailing of one Steel Through truss Bridge fro Railway loading, across Hoogly River. The span configuration is 90 _ 155 + 90 Bow string girder and a Haul road from Jetty to the Onshore terminal to bring oversized project equipment. The Span of the Steel bowstring girder is 60 m and the flyover is an integral continuous bridge in Reinforced concrete construction of length nearly 500 m. The foundations consist of 350 mm Square RCC precast driven piles
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings

Project Name	**Detailed Design for Airside & Landside Facilities at Hyderabad International Airport**
Year	2005 – 2008
Location	Andhra Pradesh
Client	Hyderabad International Airport Ltd. , Bangalore
Position Held	Team Leader
Project Features	Consultancy services for Feasibility study/Detailed Engineering for construction of a major bridge across river Godavari. Overall length of project is 60Kms. The Project road section reduces the distance between two major cities of the state by almost 80 km.
Activities	The role was that of **Team leader** leading a team of structural engineers, carrying

Performed	out the designs and detailing of all the structures in the above scope. These structures primarily consisted of Drainage structures below the Taxiways, Apron Drains, Firetraps, Oil-water separators, culverts below the access road etc. The major structure in this project was a two tier terminal building access bridge. The structural arrangement of this bridge and its approaches was a set of voided beams integral with circular columns founded on spread footings resting on the soft disintegrated rock strata

Project Name	**Detailed design for Airside & Landside Facilities at Bangalore International Airport**
Year	2006-2008
Location	Karnataka
Client	Bangalore International Airport Ltd. , Bangalore
Position Held	Team Leader
Project Features	The Project consists of the design and detailing of all the airside and landside facilities including Runways, taxiways, Access roads
Activities Performed	The role was that of **Team leader** carrying out the designs and detailing of all the structures in the above scope. These structures primarily consisted of Drainage structures below the Taxiways, Apron Drains, Fire traps, Oil-water separators, culverts below the access road etc..

Project Name	**Project Management Services for Construction Greenlands Flyovers at Hyderabad**
Year	2005 – 2008
Location	Andhra Pradesh
Client	Municipal Corporation of Hyderabad, Hyderabad
Position Held	Project Manager
Project Features	The Project consisted of the Project management services for the Greenlands Junction for which feasibility studies was carried out in an earlier project. The scope of work included preparation of the Tender Documents for an EPC contract, Technical and Financial evaluation of the bids received, Proof checking the contractor's designs and Site supervision & Project management with a team of engineers based at site. The main role was that of contract administration on behalf of Municipal Corporation of Hyderabad. The project was implemented by the EPC contractor with Precast post tensioned beams of typical 22m spans with cast in-situ Box girders at the Obligatory road junction crossing
Activities Performed	Review and approval of technical designs and drawings Attending review meetings with clients and proof checking agencies. Guidance on review and interpretation of contract requirements. Advice on action to resolve contractual issues

Project Name	**Consultancy Services for construction of two Pedestrian Subways at Moolchand Intersection, New Delhi**
Year	2005 – 2006
Location	New Delhi
Client	Delhi Tourism & Transportation Development Corporation Ltd., New Delhi
Position Held	Team Leader – Design
Project Features	The project consisted of 3 pedestrian subways with two located near the Moolchand Junction on Ring Road in New Delhi and the third near the Prembari Pul on the Outer Ring Road in New Delhi. The structure consisted of RCC slab integral with

	Diaphragm wall construction for the portion below the roadway. The approaches to these subways were by means of stairs, escalators and Ramps suitable for physically challenged
Activities Performed	Review and approval of technical designs and drawings Attending review meetings with clients and proof checking agencies

Project Name	**Feasibility Study for five flyovers at (a) Nagarjuna Circle – Punjagutta – Rajiv Statue Junction (2) Greenlands (3) RTC 'X" Roads (4) Nalgonda 'X' Roads and (5) Chandrayangutta in Hyderabad**
Year	2004 – 2005
Location	Andhra Pradesh
Client	Municipal Corporation of Hyderabad, Hyderabad.
Position Held	Team Leader
Project Features	The Project consisted of a single study covering 5 junctions with an aim to provide Grade separate solutions to ease the traffic congestion at these locations. The Junctions included in the project were Greenlands Junction, Rajiv Gandhi – Panjagutta – NFC circle junction, RTC – Cross roads junction, Nalgonda – Cross roads junction & Chandrayanagutta Junctions. The scope of work included traffic study, topographic surveys, soil investigations, feasibility study, and project cost estimates
Activities Performed	Development of Concept designs. Attending review meetings with clients and proof checking agencies

Project Name	Carrying out Survey, Geotechnical Investigation, Preparation of GADs and Bill of Quantities, Detailed Designing and Quality Control for following Road Over Bridges (ROBs) in Bihar at following locations: a) Tilaiya ROB in lieu of Level Crossing No.47 between Tilaiya Manjhwe station b) Manpur ROB in lieu of Level Crossing No.67-Aat Km 462/19-20 between Manpur – Bandhua Station c) Gaya Kastha ROB in liue of Level Crossing No.1 d) Gaya ROB in Lieu of Level Crossing No.2 between Gaya Kastha Station – Package VI.
Year	2004-2006
Location	Bihar
Client	IRCON International Ltd., Patna
Position Held	Team Leader
Project Features	The Project consists of design and detailing of 4 numbers of 2 lane Grade separators in and around Gaya town in Bihar to replace the existing level crossing. The superstructure arrangement of the railway spans is Bowstring girders in steel (60 m spans) and the approaches are girder and slab arrangement (25 m Span). The bridges are designed for 2 lanes of Class A & Class 70R loading. The scope also included Topographic Survey, Geotechnical Investigations, Design and Detailing the bridges and approaches including the service roads as applicable
Activities Performed	Advising team members, high end technical discussions with engineers, solving site related issues and guiding team of engineers

Project Name	**Detailed design for Access Road to Subansiri Hydro Electric Power Station, Arunachal Pradesh**
Year	2004-2005
Location	Arunachal Pradesh
Client	L&T Ltd, ECC Division.
Position Held	Team Leader
Project Features	The Project consists of design and detailing of 7 km of single lane road, to provide access to the Hydro electric Power Station during construction and subsequently to be taken over by Owner as public road. The road is designed to Hill Road Standards for ODR category. The structures are designed for Class A & Class 70R loading. The scope also included Topographic Survey, Geological mapping, Design and Detailing of new road & upgradation of existing road of 2 km, including strengthening of 2 steel bridges
Activities Performed	Advising team members, high end technical discussions with engineers, solving site related issues and guiding team of engineers

Project Name	**Detailed design and Project Management Services for Reclamation Bund for Onshore Platform at Kakinada, Andhra Pradesh**
Year	2003
Location	Andhra Pradesh
Client	Reliance Industries Ltd., Mumbai
Position Held	Team Leader
Project Features	The Project consisted of Design of approximately 4 km of reclamation bund of about 5 m height in an area with very soft marine clay strata on the surface. The scope included design of soil improvement measures with band drains of Geotextiles, settlement prediction, preparation of construction, monitoring and measurement specifications. The extended scope included periodic monitoring of the work, measurement and evaluation of the design performance
Activities Performed	Advising team members, high end technical discussions with engineers, solving site related issues and guiding team of engineers

Project Name	**Design and Construction of flyover from Dwarka Dwar to Cantonment area including ramps, ground level roads, drains & Electrification in Delhi**
Year	2002 - 2008
Location	Delhi
Client	Larsen & Toubro Ltd, ECC- Division, Chennai
Position Held	Team Leader
Project Features	The project consists of a road 3.9 Km. long including a vehicular subway catering for 6-lane traffic built by diaphragm wall technology. The underpass structure had covered portion with Diaphragm walls and prestressed voided slab roof. The open portion of the underpass consists of cantilever Diaphragm walls. The road is a 6 lane divided road designed to 60 kmph speed, with busbays and 2 major junctions. The scope included alignment design, Geotechnical Engineering, Drainage Design and the design of the vehicular underpass, street lighting, junction lighting & Underpass de-watering arrangement
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings Attending review meetings with clients and proof checking agencies.

Project Name	**Bridges between Km 142 & 151 on the Laole – Qazigund – Section of the Udhampur – Srinagar – Baramulla Railway Project**
Year	2003-2011
Location	Jammu & Kashmir
Client	IRCON International Ltd., New Delhi
Position Held	Team Leader
Project Features	The project consists of 14 Major Bridges and 5 minor Bridges in this stretch. The superstructure is to be steel Plate Girders / Through truss as appropriate for the spans ranging from 20 ft. to 200 ft. The substructures are in height range of 8 m to 42 m in this hilly terrain. They are all to be constructed by Slipform method. The scope included design of all substructure, foundations, designed for 3 directional earthquake event and a blast load of 300 kg at a distance of 20 m. Construction stage assistance to the client was also included.
Activities Performed	Review and approval of technical designs and drawings. Attending review meetings with clients and proof checking agencies. Interfacing with construction team and assist in solving site problems related to design

Project Name	**Detailed design for Access Road to Rolep Hydro Electric Power Station, Sikkim**
Year	2003-Ongoing
Location	Sikkim
Client	Amalgamated Transpower (India) Ltd., New Delhi
Position Held	Team Leader
Project Features	The Project consists of design and detailing of 24 km of single lane road, to provide access to the Hydro electric Power Station during construction and subsequently to be taken over by Sikkim PWD as public road. The road is designed to Hill Road Standards for ODR category. The structures are designed for Class B & Class 24 R loading. The scope also included Topographic Survey, Geological mapping, Design and Detailing of new road & upgradation of existing road of 7 km, including strengthening of 6 steel bridges and 1 concrete bridge

Activities Performed	Advising team members, high end technical discussions with engineers, solving site related issues and guiding team of engineers

Project Name	**Detailed design of flyover near Kaleswara Rao Market, Vijayawada**
Year	2003-2004
Location	Andhra Pradesh
Client	L&T Ltd., ECCD – HYRO, Hyderabad
Position Held	Team Leader
Project Features	The Project consists of Design and Detailing of a Grade separator crossing a road and existing Railway lines near the Kaleswara Rao Market. The structure consists of 11 spans of 40 m and one span of 20 m with 4 precast post-tensioned girders and cast insitu slab. The approaches are on RE embankment
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings. Attending review meetings with clients and proof checking agencies. Interfacing with construction team and assist in solving site problems related to design

Project Name	**Feasibility Study for Pedestrian Underpass near the city Bus stand in Aurangabad**
Year	2002 – On-going
Location	Maharashtra
Client	Maharashtra State Road Development Corporation Ltd., Mumbai
Position Held	Team Leader
Project Features	The project consisted of Pre-tender activities such as Topographic Survey, Soil Investigations, Planning, Project preparation, Preparation of specifications and Tender documents for an item rate contract. The post tender activities included Project management of the construction on behalf of the owner, MSRDC
Activities Performed	Development of Concept designs. Attending review meetings with clients and proof checking agencies.

Project Name	**Detailed design of two bridges with Steel Plate Girder deck for the External Access Road to Sawalkote Hydroelectric Power Station, Jammu & Kashmir.**
Year	2002-2012
Location	Jammu
Client	Larsen & Toubro Ltd, ECC- Division, Chennai
Position Held	Team Leader
Project Features	The Project consisted of design of a new all weather permanent access road to the HEP site as advanced work to initiate the dam construction. The total length of the Road was 18.5 Km in a very Hilly terrain. The selected alignment was an intermediate level road (I.e. neither ridge alignment not valley alignment). The new road had CD structures in excess of 80 and 5 bridges. The major bridges were in **steel concrete composite deck** with maximum spans upto 70 m. The foundations were all Open foundations
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings Attending review meetings with clients and proof checking agencies

Project Name	**Detailed Project Report for Flyover at Mahavir Chowk, Aurangabad.**
Year	2001 - Ongoing
Location	Maharashtra
Client	Maharashtra State Road Development Corporation Ltd., Mumbai
Position Held	Team Leader
Project Features	The project consisted of Pre-tender activities such as Topographic Survey, Traffic studies, Soil Investigations, Planning, project preparation, Preparation of specifications and Tender documents for Design and Build contract. The post tender activities included Proof Checking of Contractor's design and Project management of the construction on behalf of the owner, MSRDC. The structural arrangement consisted of 4 span continuous curved beam and slab layout, with contained embankment in reinforced earth
Activities Performed	Review and approval of technical designs and drawings. Attending review meetings with clients and proof checking agencies

Project Name	**Detailed Project Report for flyover at Lajpat Nagar and Srinivaspuri on the Ring Road in New Delhi for DTTDC**
Year	2001 - 2004
Location	New Delhi
Client	Delhi Tourism and Transportation Development Corporation Ltd., New Delhi
Position Held	Project Manager
Project Features	The scope included planning and detailed engineering of approximately 1 Km long 6 lane flyover. The structural arrangement consisted of precast segmental box girder, independent for each of the 3-lane carriageway in a direction. The project also included 3 pedestrian subways built by a combination of Diaphragm wall construction as well as cut and cover method
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings. Attending review meetings with clients and proof checking agencies. Interfacing with construction team and assist in solving site problems related to design

Project Name	**Detailed design for Cable Stayed Road Over Bridge at Patna**
Year	2001 - 2008
Location	Patna
Client	IRCON International Ltd., New Delhi
Position Held	Team Leader
Project Features	The project consists of a Cable stayed bridge over the railway tracks in the Patna Station yard. The man span is 65 m long, with balancing span of 45 m. The scope of work includes, soil investigations, Preliminary designs, project preparation, option study, followed by detailed design, preparation of construction methodology, specifications, Bills of quantities, tender documents, maintenance manuals and periodic supervision during construction. The finalised option is an all concrete deck, with 3 planes of cables, fully cast in-situ on temporary staging
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings. Attending review meetings with clients and proof checking agencies. Interfacing with construction team and assist in solving site problems related to

	design

Project Name	**Detailed design for Cable Stayed Pipeline Bridge at Kochi**
Year	2001 - 2002
Location	Kerala
Client	IVRCL Projects Ltd. Kochi
Position Held	Team Leader
Project Features	The project consisted of a 135 m long cable stayed bridge over the Chitrapuzha river for a pipe of 1 m dia and service walkways of 900 mm width on both sides of the pipe. The deck consisted of structural steel truss, with the stays made of pre-stretched wire ropes. The cable force and profile adjustments were achieved by means of turnbuckle arrangement. The construction sequence followed the balanced cantilever approach, with pre-fabricated truss units
Activities Performed	Development of Concept designs. Attending review meetings with clients and proof checking agencies

Project Name	**Detailed Structural Design of Bridges across Santra Creek, Paradip, Orissa**
Year	2000 - 2001
Location	Orissa
Client	Larsen & Toubro Ltd., ECC- Division, Chennai
Position Held	Team Leader
Project Features	The scope included planning, and engineering of two bridges, each 200 meters long, one for roadway and the other for carrying the product from the IOCL, Eastern India Refinery Project across the creek. The structures were beam and slab bridges of 25 m span for the Roadway Bridge and a prestressed concrete truss for the Pipeline Bridge
Activities Performed	Development of Concept designs. Review and approval of technical designs and drawings Attending review meetings with clients and proof checking agencies

Project Name	**Detailed design of 100 Bridges Project, Karnataka - Package 1**
Year	2000 - 2001
Location	Karnataka
Client	Larsen & Toubro Ltd., ECC- Division, Chennai
Position Held	Team Leader
Project Features	The whole package consisted of 39 bridges of spans raging from 6 meters to 20 meters. The construction methodology adopted was a modular precast construction from substructure to superstructure. Only the foundations and the abutment wing walls were cast in-situ. The precast superstructures included voided slabs, Segmentally cast T-beams and slabs. The precast substructure included precast pier columns in a 2 column bent integrated with the foundations with in-situ stitches. These columns were topped with precast pier caps, integrated with columns with in-situ stitches. The Bridges were on a variety of roads from **State Highways** to ODR.
Activities Performed	As Team Leader, covering the scope of design of the structures and the approaches including temporary diversion and demolition of the existing bridges.

Project Name	**Detailed Project Report for Bangalore – Salem – Madurai section of NH 7 between km 163 & 180**
Year	2000 - 2002
Location	Tamilnadu
Client	National Highway Authority of India, New Delhi
Position Held	Senior Bridge Engineer
Project Features	The project consists of approximately 17 kms of 4 laning to Expressway design standards on a stretch of National Highway No. 7
Activities Performed	The role was that of **Senior Bridge Engineer** in charge of design of all structures in this stretch. The structures comprised of one Road over Bridge and about 39 CD structures. The Road over bridge was a single span of 40 m on abutments on open foundations.

Project Name	**Consultancy Services for Construction of bridge across the River Oroorkuppam**
Year	2000 - 2001
Location	Tamilnadu
Client	Tamil Nadu Urban Infrastructure Financial Services Ltd., Chennai
Position Held	Team Leader
Project Features	The scope included Traffic studies, Alignment, Junctions at each ends, Soil investigations, Topographical Survey, Design of the structure and the preparation of Tender Documents for Construction. The Bridge is 600 m long with 4 lanes of traffic on it, and the approaches are approximately 1.8 KM total
Activities Performed	**As Team Leader** for the Planning and designing **of the new crossing over the Adyar River in Chennai, India**.

Project Name	**Detailed Project Report for Bridges in the Package 3 of the New Simpang Pulai to Kuala Behrang Road between Lojing & Pos Blau, Kelantan Malaysia.**
Year	1999 – 2000
Location	Malaysia
Client	JKR, Govt. of Malaysia, Kuala Lumpur, Malaysia
Position Held	Principal Engineer
Activities Performed	The role was that of a **Principal Engineer**, providing head office support during the **construction of 17 bridges** including bridges constructed by Balanced Construction method with spans of 90 meters and beams and slab bridges of 30 m spans.**.**

Project Name	**Detailed Design for Bridges on the new Rail Link to Tanjong Pelapas Port, Malaysia.**
Year	1999 - 2000
Location	Malaysia
Client	IRCON International Ltd., New Delhi
Position Held	Principal Engineer

Project Features	The project included design of 19 bridges in the new rail link. All the bridges were designed for Beam and slab construction, with precast Prestressed beams with insitu slab of spans ranging from 22m to 28m
Activities Performed	The role was that of **Principal Engineer** leading all the design efforts in the bridge design group. Some of the bridges were road bridges over the new railway line.

Project Name	**Detailed Project Report for Upgradation of Roads in Johor**
Year	1999 – 2000
Location	Malaysia
Client	JKR, Govt. of Malaysia, Kuala Lumpur, Malaysia
Position Held	Principal Bridge Engineer
Project Features	The Project in upgradation of the 36 kms of roads in the stateof Johor in Malaysia. The work invoved assessment and development of upgradation schemes for more that 24 major Bridges and a number of minor bridges. The tasks included investigations, evalutaion, condition survey, load testing, analysis of existing strength and development of proposals for the upgradation
Activities Performed	The role was that of Principal bridge Engineer.

Project Name	**Detailed Project Report for Maintenance Dredging for the Klang Multi terminal, West Port, Klang**
Year	1999
Location	Malaysia
Client	Klang Multi Terminal, West Port, Klang, Malaysia
Position Held	Principal Bridge Engineer
Project Features	The scope of works included preparing the tender document, specifications for maintenance dredging, and periodic bathymetric surveys to monitor the siltation process in the navigational channels of the North, South and the West port in Klang, Malaysia
Activities Performed	The role was that of Principal bridge Engineer

Project Name	**Proof Checking for Bridges in Perak, Malaysia over rivers Dinding, Sitiawan and Tebok Raja Samalon.**
Year	1998 - 1999
Location	Malaysia
Client	JKR, Govt. of Malaysia, Kuala Lumpur, Malaysia
Position Held	Team Leader
Project Features	The scope of work was independent design check of the spandrel Arch bridge over Dinding river and incrementally launched box girders over the other two rivers
Activities Performed	The role was that of Team Leader co-ordinating the design effort in the department and with a sub-consultant..

Project Name	**Detailed Project Report for Container Yard and Rail terminal in West Port,**

	Klang, Malaysia.
Year	1997 - 1998
Location	Malaysia
Client	KITCO Ltd., Kochi
Position Held	Principal Engineer
Activities Performed	The role was that of a Principal Engineer, providing services for the design and construction of the Container stackin yard and the rail terminal including RTG beams, Turning pads, pavements, drainage and utilities. The storage yard was on gravel beds with the RTG beams in reinforced concrete and the turning pads in structural steel.

Project Name	**Detailed design for Pedestrian Tunnel Across Jalan Ampang, Kauala Lumpur, Malaysia**
Year	1998 - 1999
Location	Malaysia
Client	Fujita Corporation, Japan for KLCC Bhd., Kuala Lumpur, Malaysia
Position Held	Team Leader
Activities Performed	The role was that of a Project manager leading a team of Engineers carrying out the design of the permanent structure and the associated traffic management during construction and protection / relocation of the underground utilities crossing the alignment of the pedestrian tunnel connecting the KLCC-LRT station concourse with the KLCC Suria Shopping concourse. The tunnel was constructed by cut and cover method.

Project Name	**Detailed Project Report for Package 3D of the North South Expressway - Central Link, Malaysia.**
Year	1997 – 1998
Location	Malaysia
Client	PLUS Bhd., Kuala Lumpur, Malaysia
Position Held	Principal Bridge Engineer
Project Features	Connecting the Central link with B15 going across the Cyberjaya and Putrajaya development
Activities Performed	The role was that of Principal Bridge Engineer in charge of designing the bridges in the package which consisted of one 4 span interchange bridge and 2.85 km long viaduct over mining ponds. The structural arrangement was all standard beam and slab over two column pier bents and pile foundations.

Project Name	**Detailed Design for Footbridge for Selayang Hospital, Selangor, Malaysia.**
Year	1997
Location	Malaysia
Client	Selayang Hospital, Kuala Lumpur, Malaysia
Position Held	Principal Bridge Engineer
Project Features	The scope included design and detailing of the footbridge and the associated ramps suitable for handicapped patients
Activities Performed	The role was that of Principal Engineer in charge of the detailed designs and the design support during construction. The structure consisted of precast

	pretensioned beams with cast insitu deck slab

Project Name	**Project Management Consultancy for Bridge over Klang River at Connaught, Klang, Malaysia**
Year	1997
Location	Malaysia
Client	JKR, Govt. of Malaysia, Kuala Lumpur, Malaysia
Position Held	Principal Bridge Engineer
Project Features	The scope also included design of additional single span bridge of 35 m length on the approach from Kuala Lumpur
Activities Performed	As Principal Bridge Engineer, the project involved assisting in solving problems connected with construction of the bridge consisting of 5 spans of 35 meters. The deck arrangement being precast beams supporting an insitu slab.

Project Name	**Detailed Design for Central Terminal Area Bridges in the new Sepang Airport, Sepang, Malaysia, for KLIAB**
Year	1995 – 1996
Location	Malaysia
Client	KLIA Bhd., Kuala Lumpur, Malaysia
Position Held	Project Manager
Project Features	The project involved design of 6 bridges and 2 viaduct access to the central terminal building and about 2000 m of earth retaining walls. The superstructure consisted of voided slab construction monolithic with the piers which were individual circular columns for the bridges and portals for the access viaduct
Activities Performed	Acted as a Project Manager for this Project.

Project Name	**Detailed Design for Bridges in Nilai township development, Malaysia.**
Year	1995
Location	Malaysia
Client	NILAI Town Development Ltd., Kuala Lumpur, Malaysia
Position Held	Principal Bridge Engineer
Activities Performed	Participated as **Principal Engineer** in charge of design of pipeline bridges and beam and slab road bridges within the development.

Project Name	**Detailed Design for LRT System two for Kuala Lumpur, Malaysia.**
Year	1995 – 1997
Location	Malaysia
Client	PUTRA Bhd., Kuala Lumpur, Malaysia
Position Held	Principal Bridge Engineer
Project Features	The work consisted of detailed design for nearly 22 km of elevated viaduct of

	span varying from 18 m to 63 m. Most of the stretch consisted of precast segmented dry jointed, externally prestressed box girders. A few of the spans were cast in-situ RC structures. The work also involved design of substructure and foundations for about 7 km of the same stretch. The project also included the design of 3 footbridges at different locations.
Activities Performed	Responsible as Team Leader for detailed design of elevated viaduct structures.

Project Name	**Detailed Project Report for Package 2C and 3A of the North South Expressway - Central Link and KLIA extension, Malaysia..**
Year	1994 - 1996
Location	Malaysia
Client	PLUS Bhd., Kuala Lumpur, Malaysia
Position Held	Principal Engineer
Project Features	The project consisted of many curved and straight beam and slab bridges of span range 18 m to 36 m with both pretensioned and post tensioned beams. The substructure and foundations too were in the scope of designs.
Activities Performed	Participated as Principal Engineer in the Bridge Design Team.

Project Name	**Detailed design for Elevated Mass Railway Transits System for MTP, Madras.**
Year	1992 - 1993
Location	Tamilnadu
Client	IRCON Ltd., New Delhi
Position Held	Senior Design Engineer
Project Features	Consisted of prestressed concrete box girder superstructures carrying broad gauge railway track. The spans ranged from 18 m to 30 m. The responsibility included design of the superstructure box girder, and bearings and aspects of erection equipment for box girders weighing upto 20 tonnes
Activities Performed	The role was that of a Senior Design Engineer

Project Name	**Detailed design for 60m cantilever span cable stayed Aircraft hangar for Indian Airlines at Bombay to accommodate airbus A300**
Year	1991 - 1993
Location	Maharashtra
Client	IRCON Limited, New Delhi
Position Held	Senior Consultant
Activities Performed	As Senior Consultant leading and carrying out the designs of the extension of the longest concrete cantilever roof in the world, to accommodate 3 Airbus 300 within its shadow. The redesign was carried out to increased ground clearance and restricted elevation of the pylons. The structure is a folded plate structure with prestressed concrete rope stays, going over pylons with Fresseynet hinges.

Project Name	**Detailed design for all steel roof structures for Hangar of Air India at Bombay,**

	consisting of steel box girders and trusses..
Year	1991
Location	Mumbai
Client	AIR India Ltd., Mumbai
Position Held	Senior Consultant
Activities Performed	As Senior Consultant designing the all steel hangar with an entrance 90m wide to accommodate Boeing 747 Jumbo Jets 2 Nos.

Project Name	**Proof Checking for Road Bridge at Colvale.**
Year	1990 - 1991
Location	Goa
Client	Ministry of Surface Transport, New Delhi
Position Held	Senior Design Engineer
Activities Performed	The role was that of Senior Design Engineer carrying out the detailed audit of the contractor's design n behalf of Ministry of Surface Transport. The structural forms of the bridge were single celled box girders upto 60 m spans.

Project Name	**Detailed design for Bridge across river Ganga at Bhagalpur**
Year	1990 - 1991
Location	Bihar
Client	UP State Bridge Corporation Ltd., Lucknow
Position Held	Senior Design Engineer
Project Features	Here, the personal responsibility included the 1200m navigational zone superstructure out of 4700m long bridge. This superstructure design consisted of 120m span prestressed concrete box girder constructed by balanced cantilever method with a central suspended span of 24.0 m and the POT-PTFE bearings to support the suspended spans over the articulations at the end of cantilever spans
Activities Performed	The Role was that of a **Senior Design Engineer**. .

Project Name	**Rehabilitation of Road Over-bridge at Mahim, Bombay**.
Year	1990
Location	Maharashtra
Client	Central Railway, Mumbai
Position Held	Senior Design Engineer
Project Features	The work included testing, field investigation, assessment of strength, redesigning and rehabilitation of a partially constructed bridge of beam and slab construction for current operational requirement
Activities Performed	The role was that of a Senior Design Engineer.

Project Name	**Feasibility Study for Road Over-bridge at Margao, Goa.**
Year	1990
Location	Goa
Client	PWD, Govt. of Goa, Margao

Position Held	Senior Design Engineer
Project Features	The work done included preparation of feasibility report, development of alternative layouts, study of cost benefit aspects and estimates for the city flyover at a busy railway level crossing at Margao, Goa
Activities Performed	The role was that of a Senior Design Engineer.

Project Name	**Detailed design for 1000m long Syphon aqueduct across the Sukkar river in Madhya Pradesh for Narmada Valley Development Authority.**
Year	1990
Location	Madhya Pradesh
Client	NVDA, Indore
Position Held	Senior Consultant
Activities Performed	As Senior Consultant leading and designing a Syphon aqueduct with a drop of 15 m over 1000 m.

Project Name	**Repair and rehabilitation of 100m tall Natural Draught Cooling Tower at Kutch Lignite Thermal Power Plant at Panandro, Gujarat**
Year	1990
Location	Gujarat
Client	Gujarat Electricity Board, Ahmedabad
Position Held	Senior Design Engineer
Activities Performed	The role was that of the Senior Design Engineer carrying out the condition survey, field testing, evaluation of the existing structure, assessment of the old design, design and detailing of the rectification measures for this NDCT.

Project Name	**Detailed design for 300m tall composite TV tower consisting of 255 m tall RCC shaft with 45 m tall structural steel mast above at Rameswaram.**
Year	1989
Location	Tamil Nadu
Client	Nabin Designers and Builders, Kolkata
Position Held	Senior Design Consultant
Activities Performed	The role was that of the Senior Design Engineer carrying out the design and detailing of this TV Tower consisting of an RCC shaft 255 m height with steel mast of 45 m height. The tower was designed for the first time with limit state concept

Project Name	**Detailed design for 75m tall Chimney for Float Glass India Ltd., at their Plant in Taloja, near Bombay**
Year	1989
Location	Maharashtra
Client	National Builders, Ahmedabad
Position Held	Senior Design Consultant

Activities Performed	The role was that of the Senior Design Engineer carrying out the design and detailing of this chimney

Project Name	**Detailed design for 96m tall chimney at the site of new factory of M/s. SM Glycols at Kurkumbh near Pune**
Year	1988
Location	Maharashtra
Client	National Builders, Ahmedabad
Position Held	Design Engineer
Activities Performed	The role was that of the Design Engineer carrying out the design and detailing of this chimney.

Project Name	**Detailed design for High level bridge on river Sardan**
Year	1988
Location	Jammu & Kashmir
Client	Ansal Constructions Ltd. New Delhi
Position Held	Design Engineer
Project Features	Located on the Jammu Udhampur Rail link consisting of simply supported 33 m prestressed concrete box girder spans over hollow rectangular piers on open foundations on rock with the pier height ranging from 15.0 m to 45.0 m with the superstructure on curves
Activities Performed	The role was that of a **Design Engineer**.

Project Name	**Detailed design for Second Road Bridge across Thane creek .**
Year	1987 – 1994
Location	Maharashtra
Client	UP State Bridge Corporation Ltd., Lucknow
Position Held	Design Engineer
Project Features	The Bridge consisted of 6 continuous span units of superstructure ranging from 205 m to 341 m continuous lengths over 4 continuous spans resting on open foundation in rock. The responsibility included the design of all foundations, superstructure items, POT-PTFE bearings and the super-structure made of single cell prestressed concrete box girder cast by balanced cantilever method to a maximum span of 107m
Activities Performed	The Role was that of a **Design Engineer**..

Project Name	**Detailed design for Railway bridges on the Vasai creek**
Year	1986 – 1988
Location	Maharashtra
Client	Bhageeratha Engineering Ltd., Kochi
Position Held	Design Engineer

Project Features	48.5m span, prestressed concrete box girders were completely precast and launched in position. The work done included the complete design and obtaining the approvals for the same from the owners consultants
Activities Performed	The role was that of a **Design Engineer**.

Project Name	**Detailed design for Railway bridges on Alleppy - Ernakulam broad gauge railway line.**
Year	1984 – 1985
Location	Kerala
Client	Bhageeratha Engineering Ltd., Kochi
Position Held	Design Engineer
Project Features	The work done included the complete design of the 33.1 m span superstructure in precast prestressed concrete box girders segmentally cast at shore and assembled at bride location. The scope included obtaining approval for the same from designated authorities
Activities Performed	The role was that of **Design Engineer**