PROFESSOR MAHESH TANDON

BRIEF CURRICULUM VITAE

Prof Mahesh Tandon is an international expert in the field of Structural Engineering. Many of the structures designed by Prof Tandon and his firm Tandon Consultants Pvt Ltd have been widely acclaimed and have received recognition in India as well as internationally.

He has to his credit a number of major design projects in Prestressed Concrete, Reinforced Concrete and Structural Steel in India, Malaysia, Thailand, Russia and several countries in the Middle East, South East Asia and Europe. These include major bridges, long span roofs, tall buildings and monumental structures.

His projects employ state-of-the-art technologies and the latest available techniques in design and construction. His structures have been described as highly creative, futuristic, aesthetic, environmentally sensitive and innovative. He has spearheaded the development of many codes of practice on Concrete and on Bridge Structures in India.

Some of his major projects include the Viaducts, Bridges, Stations and Underground Constructions of the Delhi Metro, Bangalore Metro and Chennai Metro; the Bangalore-Electronic City Elevated Expressway, several Flyovers and Interchanges in the cities of Delhi, Hyderabad,Bangalore and Guwahati at important road crossings, and the structures of Kuala Lumpur Light Rail, Delhi-Gurgaon Expressway, Delhi-Badarpur Expressway and several projects for the Commonwealth Games 2010. Monumental Building projects include the Indira Gandhi National Centre for the Arts in New Delhi and the Khalsa Heritage Memorial Complex at Anandpur Sahib, Punjab. *For more details* refer attached brochure titled ' Significant Projects' of Tandon Consultants.

A few of the major assignments undertaken and positions held in the last 10 years were:

a) NHAI Expert for Major Bridge Collapses (Chambal 2010, Naini 2013 etc)
b) World Bank Expert for Mohakali Flyover, Dacca, Bangalesh (2009)
c) Govt. of Srilanka Bridge Expert for ADB Project (2008)
d) Chairman, Review & Assessment Committee of IIT Madras, Civil Engg. Deptt. (2008)
e) Indo-US Govt. Committee for Earthquake Safety for Delhi Life-line Buildings (2005)
f) President, Indian Concrete Institute (2003-2005)
g) Chairman, National Information Center for Earthquake Engineering

Major Awards/Honors/Keynote lectures in the recent past were:

a) Indian Institute of Bridge Engineers: Eminent Engineer Award (2012)
b) AICTE-INAE Distinguished Visiting Professor at IIT Kanpur & IIT Roorkee (2005-2011)
c) Indian Institution of Engineers, India: Honoured for Eminence and contribution to Engineering (2011, 2006)

d) Structural Engineer of the year (Archi Design), 2006
e) Indian Concrete Institute: Lifetime Achievement Award (2003).
f) Keynote speaker and awarded invited papers at various international conferences in India, US, Japan, Italy, Canada, UK, Portugal. *For more details* refer attachment

Membership of Academic/Professional Organisations:

a) Fellow, Indian National Academy of Engineering
b) Fellow, Institute of Engineers
c) Fellow, American Society of Civil Engineers
d) Fellow, Indian Institution of Bridge Engineers
e) Fellow, Indian Association of Structural Engineers

Prof Tandon has made significant contributions in the development of a culture for innovation in structural engineering both within and outside his organization by sharing his expertise and experience . His special areas of interest also include motivating the next generation to adopt Civil Engg as their profession and vocation in life.

Tandon Consultants were co-hosts and organizers along with IIT Kanpur for the month long Summer Camps during 2001-2010 for 60 selected students from all over India to promote inter-cultural living and experience the diversity of our country, apart from exposure to Civil Engineering. INAE were one of the sponsors of this venture.

EDUCATIONAL QUALIFICATIONS :

- B.E. (Civil Engg), University of Roorkee, India, 1962
- M.S. (Civil Engg), University of Hawaii and Illinois, USA, 1965
- Diploma for Civil Engineering and Intercultural Living, East West Centre, Hawaii, USA, 1965
- Post Graduate Certificate of Business Management, St.Xavier's Social Institute of Industry, India, 1967

PROFESSOR MAHESH TANDON

KEYNOTE PAPERS/ADDRESSES,PUBLICATIONS

KEYNOTE PAPERS/ADDRESSES (*SELECTED)*

2013

Bridges and Flyovers for Commonwealth GamesUKERI Concrete Congress March 2013

Remedial Measures for Bridges: Case StudiesACCE Bangalore Aug2013

Grade Seperator at GhazipurIABSE ING Sept 2013

Analytical Study ofAdequacy of the Existing Bridges to Carry Over-weight Vehicles using Multi-axle Hydraulic Trailers FIB Mumbai Feb 2014

Infrastructure Projects for Commonwealth GamesFIB Mumbai Feb 2014

Sustainability Dimension in Bridge & Flyover Projects: Case Studies Structural Engineering World Congress DelhiSept 2013

PREFABRICATED/PRECAST CONSTRUCTION IN BRIDGESTRACCS INTERNATIONAL CONFERENCE GHAZIABAD DEC2013

Planning and Design of Major Urban Traffic Interchanges in DelhiICI-IWC Hyderabad Oct 2013

2012

Strategies For Bridge Repairs, Rehabilitation, RetrofittingRedecon 2012

2011

Concrete Structures For The Common Wealth Games 2010 In Delhi

State of the Art – Bridges in India: Karnataka Engineer's Association 15-16 Sept, Mysore

Tall Concrete Buildings in Urban Environment: *CEMCON 2011ICI PUNE*

2010

Bridge Technologies for Rapid Construction and Other Issues- The Road Ahead: *CRRI Annual Get-together*

Innovations in Bridge Engineering- IEI, GOA

2009

Green Projects: Examples of A Building and A Bridge: CONMAT'09, Japan

2008

Fascinating World of Bridges,Madhav Institute of Technology & Science National Convention of Civil Engg. 2008

Bridge Construction Technologies Used in Recent BOT Projects,ICI-IWC'08, New Delhi

Construction Technologies Employed for Large Viaduct**,** Advances in Concrete and Construction**,** ICACC-2008, Hyderabad

Seismic Design of Bridges – State of the Art,REDECON, Bangalore 2008

2007

Urban Transportation Structures in Delhi: Aesthetics& Technologies,SEWC 2007, Bangalore

2006
Viaduct of Delhi Metro**,** FIB 2006, Naples, Italy

2005
Concrete Triumphs in Aesthetic Structures**,** Ecstasy In Concrete, ICI-Asian Conference Mumbai, Sep 2005

Design of Earthquake Resistant Bridges, Earthquake Effects and Concrete, ICI UP Allahabad Centre, Sept 2005

The Fascinating World of Bridge Structures**,** Summer Camp, IIT Kanpur, June 2005

KansaiInternationalAirport:CivilEngineeringMonument of the Millenium, Summer Camp, IIT Kanpur, June 2005

Economical Design of Earthquake Resistant Bridges**,** Annual Lecture for Indian Society of Earthquake Technology, IIT Roorkee, Mar 2005

Construction Aspects of Standardised Bridge Design**,** Conference on Bridging AssamRivers, Guwahati, Feb 2005

Construction Management Challenges of the Delhi Metro Rail Project,Lectures for Civil Engineering Courses 100 and 452, Jan 2005

SpectacularBridges, Lecture for Civil Engineering Course 452, Jan 2005

The Artful Design of Integral Bridges, Special Lecture at IIT Kanpur for the Engineers of Assam PWD, Guwahati, Jan 2005

Recent IntegralBridges**,** International Workshop on Innovative Bridge Deck Technologies, Canada Jan 2005

Earthquake Resistant Design of Bridges**,** Association of Consulting Civil Engineers, Hyderabad, Jan 2005

Earthquake Resistant Bridge Design**,** CEMCON 2005, Pune Jan 2005

2004
Construction Technologies for Bridges in Urban EnvironmentACI Silver Jubilee Mumbai Dec2004
Structures of the Delhi Metro*, Asian Concrete Federation, 28-30 October 2004, Chiang Mai, Thailand.*

Glimpses of Structural Design of Delhi Metro, 29th Conference on Our World of Concrete, Singapore, Aug 2004

Technical Hurdles Of Implementing Infrastructure Projects, Third International Symposium, on New technologies for Urban Safety of Mega Cities, 18 October 2004, Agra.

Some Recent Outstanding Concete Structures, Indian Concrete Institute Chennai, Sept 2004

Economical Design of Earthquake Resistant Bridges, Seminar on Construction and Design of Rural Roads and Bridges, Govt of Assam PWD, Guwahati April 2004

2003
ConcreteBridges& their Environment, ICI, Allahabad Centre, 13 December2003, Allahabad

Concrete Learning, Celebrating the Completion of 200 Ambuja Cement Workshops, 22 November 2003, Mumbai

Planning and Design of Flyovers, Indian Association of Structural Engineers, 28 July 2003, New Delhi

Bridge Planning and Aesthetics, Training Programme on Analysis and Design of Bridges, Central Road Research Institute, 21 July 2003

State-of–the-Art Design Of Structures Subjected To Earthquakes, IndianNationalAcademy Of Engineering National Seminar On Disaster Management And Mitigation, 20-21 June 2003, Chennai

Seismic Design And Detailing Of Bridges In Accordance With Interim Guidelines Of Indian Roads Congress, 14-15 June 03, Pondicherry

Segmental Construction For Kuala Lumpur's Light Rail, 3rd International Conference On New Dimension In Bridges, Flyovers, Overpasses & Elevated Structures 8 – 10 April 2003 Malaysia

Aesthetics And Technologies For Urban Bridges, 3rd International Conference On New Dimension In Bridges, Flyovers, Overpasses & Elevated Structures 8 – 10 April 2003 Malaysia

Fascinating World of Bridges and Flyovers, Cognizance 2003 A Venture of IIT Roorkee& Microsoft, 28 Mar 03, Roorkee

Delhi Flyovers On The Fast Track,Indian Concrete Institute, Karnataka Centre, 21 Feb 03 Bangalore

Aesthetics and Creativity in Concrete, Indian Concrete Institute, Raipur 11 Feb 03

2002
Earthquake Resistant Design Of Structures - State Of The ArtTwelfth Symposium On Earthquake Engineering, IITRoorkee, 16 Dec 2002

Flyovers: Aesthetics and Appropriate Technologies, *All India Seminar On Improving Transportation In Congested MetropolitanCityOrganised By American Society Of Civil Engineers India Section, Kolkata, 13 &14 Dec 2002.*

Emerging Trends in Planning, Designing, And Construction Aspects. Structural Design Seminar on Revision of National Building Code (NBC).Organised by The Institution of Engineers (India), New Delhi September 2002.

Engineering Challenges of Concrete Structures, Concrete Day Celebrations, Indian Concrete Institute, Allahabad, September 2002

New Dimensions in Concrete Structures, Concrete Day Lecture, Indian Concrete Institute, Bangalore, September 2002

Flyovers In The City Of Ahmedabad, Ahmedabad Municipal Corporation, July 2002

National Wind Tunnel -A State-Of-The-Art Facility. Emerging Technologies Systems & Resources for the Construction Industry *Organised By*: CIDC, INDSTT & CDC July 2002.

Challenges In Structural Engineering Summer Camp 2002 IIT KanpurJune 2002

Aesthetics and Technological Advances in Urban Delhi's New Bridges. Seminar of Flyovers in Delhiorganised by PWD, Delhi, April 2002

Emerging Trends in Construction Industry,Thapar Institute of Engineering and Technology, Patiala, March 2002

Urban Delhi's New Generation of Bridges, FIB Day, Chennai, February 2002

Earthquake Resistant Design of Bridges, IRC, Cochin, January 2002

Art and Science of Bridge Engineering, AligarhMuslimUniversity, Aligarh, January 2002

2001
Earthquake Resistant Buildings: An Overview for Space Structure Promotion Foundation (India), New Delhi December 2001

Technology for Durable Concrete, Concrete Day, organised by Indian Concrete Institute, Maharashtra Centre, Maharashtra State Centre, Institution of Engineers, Mumbai 2001

Design of Concrete Bridges for Delhi Metro in India, 2001 Annual Convention and Exposition Houston, Texas, USA, October 2001

Fast Track Construction of Delhi Flyovers, ACCE Lecture, Hyderabad, September 2001
Art and Science of Bridge Engineering: Conceptual Design. Conceptual Approach to Structural Design, Singapore, August 2001

Concrete Bridges. Concrete Special Applications, Singapore, August 2001

Spectacular Concrete Prestressed Bridges, National Conference on Trends in Prestressed Concrete, IIT Chennai, Dedicated to Prof N. Rajagopalan, June 2001

Art and Science of Bridge Engineering- An Introduction, NITHE, Orientation Programme for Managers of NHAI, April 2001

2000
Revised Indian Concrete Code IS:456-2000 National Workshop Department Of Civil Engineering, IIT, Kanpur, 4-5 November 2000

Foundation Training ProgrammeFor AEE's of The MOST, MOST Specifications For Bridges New Delhi, June 2000

PUBLICATIONS (SELECTED)

1. Bridges

Box Girders Subjected to Torsion	Parts I& II, Indian Concrete Journal, Feb, Mar '76.
Problems of Design of Long Span Bridges	Presentation by Experts, Golden Jubilee Celebrations of Indian Roads Congress, Lucknow, Jan 1985.
Precast Segmental Flyovers in UAE	The Tenth International Congress of FIP, in New Delhi, Feb 1986
The Indian Experience in the Maintenance and Rehabilitation of Some Major Concrete Bridges	Second International Colloquium on Concrete in Developing Countries, Jan 1988.
State of the Art - Earthquake Resistant Design of Bridges	Bridge and Structural Engineer, IABSE, Sept 1989.
Bridge Longevity - Designer's Role	National Seminar on Longevity of Bridges, Institution of Engineers, Oct 1989
Prestressed Concrete Viaducts for Railway Line in Algeria	Parts I & II, Indian Concrete Journal, March & April, 1990.
Flyover Construction using Precast Pretensioned Concrete Girders	International Conference on Bridges and Flyovers, Hyderabad, Feb 1991.
Mass Produced Precast Pretensioned Girders for Flyover Constructions	International Conference on Bridges and Flyovers, Singapore, June 1991.
Some Crimes in Bridge Aesthetics and How Not to Commit Them	The Bridge and Structural Engineer, March 1991.
Pier and Abutment Caps	International Seminar on Bridge Sub-Structure and Foundations, Bombay, Jan 1992.
Considerations in Seismic Design of Bridges	Indian Concrete Journal, November 1994 ***ADJUDGED BEST PAPER OF THE YEAR.***
ArchBridge over DodanNallah	School of Civil Engineering, UniversitiSainsMalaysia, Ipoh, Malaysia, October 1994
DodanNallahArchBridge	Indian Roads Congress, Bhubaneshwar, Nov 1994 ***ADJUDGED BEST PAPER OF THE YEAR.***
ArchBridge at DodanNallah	First International Conference of ArchBridges, Bolton, UK, September 1995
Flyovers, Interchanges and Curved Bridges in Urban and Rural Areas : Design and Planning Aspects	Keynote Paper, Indian Roads Congress, Lucknow, Nov 1995. Keynote Paper, National Conference on Modern Trends in Bridges and Flyovers Vishakapatnam, Aug 1996.

Advances in Bridge Engineering - New Materials and its Utilisation.	National Get-Together on Road Research and its Utilisation. CRRI, Jan 1996
Bridge Engineering-Recent Advances	Annual Lecture of Indian Concrete Institute, Roorkee, Sept 1996.
Earthquake Resistant Bridge Construction	Invited Talk. Indian Society of Earthquake Technology Symposium on Earthquake Effects on Structures, Plant and Machinery. Asoka Hotel, New Delhi, Nov 1996.
TollBasedMulti-LaneBridges,Flyovers and ROB's	Institution of Engineers, Delhi. FIP, Nov 1996 Panel Discussion on Design and Management of Toll Based Facilities. IRC, Nagpur, Jan 1997.
Bridge Engineering Recent Advances	Keynote Paper, National Seminar on Flyovers, and RoadOverBridges in Urban Areas : Planning, Design and Execution, Indian Institute of Bridge Engineers, Hyderabad, Aug 1997.
FastTrackBridge Construction Technology	Expert Speaker, International Seminar on New Trends in Highway Construction, VigyanBhavan, New Delhi, Nov 1997.
Design Of Foundation For Multispan ArchBridgeOverRiver Sungai Dinding	IABSE Colloquium on "Foundations for Major Bridges: Design & Construction", New Delhi, Feb 1999.
Bridge Construction Technologies Suited To BOT Projects	Second National Conference on Construction–Infra-structure 2000, New Delhi, March 1999.
Structural Conceptions Of Some Recent Flyovers In Delhi	Indian Institution of Bridge Engineers Seminar on, "Innovations in Bridge Engineering", VigyanBhawan, New Delhi, May 1999.
Implementation of a New Bridge Management Organisation in India	**I**ndian Institution of Bridge Engineers Seminar on,"Innovations in Bridge Engineering", VigyanBhawan, New Delhi, May 1999.
Innovative Conceptions of Some Flyovers in Delhi	Civil Engineering & Construction Review; August 1999
Bridges in Urban Environment	Keynote Lecture, International Conference on Structural Engineering, Institution of Engineers (India) Roorkee&Ghaziabad Centre, Sept 1999
Design Loadings for Cable-Stayed Bridges	International Conference on Cable Stayed Bridges, Hyderabad, Nov 1999
53 Grade Cement: Double-Edged Sword	National Seminar on Concrete for Infrastructure, Indian Concrete Institute, Maharashtra, Oct 1999
Durability Concerns Of 53 Grade Cement	ING-IABSE Seminar on "Durability of Structures" at Aurangabad, Feb 2000

Cracking Of Concrete By Usage Of High Strength Ordinary Portland Cement	Keynote Address: All India Seminar on Materials & Machines for Construction, Lucknow, Feb 2000
Design Concepts & Construction Technologies For Recent Bridges & Viaducts	Acceptedfor inclusion in Conference 2000 Proceedings, Egypt, Mar 2000 - not published
National Wind Tunnel - A State-of-the-Art Facility	Indian Concrete Journal, April/May 2000
Sharply Curved Continuous Prestressed Bridge for Clover Leaves at IP Estate, N.Delhi	Indian Concrete Journal, 2000
"Emerging Trends in Bridge Design and Construction".	The Association of Consulting Civil Engineers (India), National Seminar; Contech 2000, Bangalore, May 2000
"Bridge Design & Construction: PresentWorld Scenario"	NIE Golden Jubilee-Torsteel Endowment Lecture National Institute of Engineering, Mysore, May 2000
"Bridge Structures for Delhi's Metro Rail"	Railway Engineering - 2000, Commonwealth Institute, Kensington, London, UK, July 2000.
"Prestressed Voided Slab for Curved Bridge at IP Estate, New Delhi"	Civil Engineering & Construction Review; Aug 2000.
"Two Leaved Clover Flyover in New Delhi	Indian Concrete Journal, August 2000
"Bridge Design & Construction – Present World Scenario"	National Conference on"Advances on Concrete Technology (ACT 2000), ICI Patiala Centre Sept 2000. Keynote Paper for Seminar on Infrastructure Scenario in 21s^{t} Century, Lucknow, October 2000.
"Earthquake Resistant Design of Bridges"	62nd Annual General Session, IRC Cochin, Jan 2002. ***ADJUDGED BEST PAPER OF THE YEAR***
"The New Bridge Structures Of Delhi: Improved Aesthetics & Technology"	FIB Conference Osaka, Japan, October 2002
"Aesthetics and Technologies for Urban Bridges"	3rd Intl Conf On New Dimensions In Bridges (Flyovers, Overpasses And Elevated Structure) Malaysia, April 2003
"Segmental Construction for Kuala Lumpur's Light Rail"	Keynote paper for 3rd Intl Conf On New Dimensions In Bridges (Flyovers, Overpasses And Elevated Structure) Malaysia, April 2003
"Seismic Design & Detailing of Bridges in accordance with Interim Guidelines of IRC"	IRC, May 2003

"State of the Art Design of Structures subjected to Earthquake"	National Seminar on Disaster Management & Mitigation, SERC, Chennai, June 2003
"Glimpses of Structural Design of Delhi Metro"	29th Conference on Our World of Concrete, Singapore, Aug 2004.
"Technical Hurdles of Implementing Infrastructure Projects"	3rd Symposium On New Technologies For Urban Safety Of Mega Cities In Asia, ICI, Agra Oct 2004
"Construction Technologies For Bridges In Urban Environment"	India Chapter Of ACI-Silver Jubilee Bonanza (Concrete World Engineering & Material), Mumbai Dec 2004
"Structures of Delhi Metro"	Keynote paper for Conference of Asian Concrete Federation, Thailand, Oct 2004
"Recent Integral Bridges"	International Workshop On Innovative Bridge Deck Technologies, Canada Jan 2005
"Economical Design of Earthquake Resistant Bridges"	Annual Lecture for Indian Society of E'quake Technology, IIT Roorkee, Mar 2005
"Concrete Triumphs in Aesthetic Structures	Ecstasy In Concrete, ICI-Asian Conference Mumbai, Sep 2005
Small Segments Employed for Flyover of Delhi	FIB 2006, Naples, Italy
Architectural and Environmental Friendly Design for Urban Bridges	FIB 2006, Naples, Italy
Anti-Quake, Anti-Terrorism Concepts Featured in Integral Flyovers	ICRACM Bakht Symposium, 2006
Integral Bridges Introducing Anti-Quake,Anti-Terrorism Concepts In Bridge Engineering	ACF 2006
Practical Applications of Seismic Design of Bridges	IIT ROORKEE 2006
Construction Technologies For Urban Infrastructure	Seminar on Concrete Technology and Construction 2007
Structure and AestheticsIn Bridges & Flyovers	R V College of Engineering, Chennai, 2007
Flyovers in Urban Environment	National Conference at PSGCollege of Technology, Coimbatore, 2007
Bridge Design & Construction:Present World Scenario	IIBE 2008

The Delhi Metro – Marvel of Infrastructure	NBM&CW, March 2008
2. Tall Structures	
Wind Effects on Structures-Looking at and beyond someInternational Codes of Practice	The Bridge and Structural Engineer, Aug 1983
Codification of Dynamic Response of Buildings to Wind Action	Engineering Design Journal Special Issue on Design Aspects of Special Wind Effects on Structures", Sept 1983.
Energy Structures	ACI Fall Convention, New York, Oct 1984.
Multiflue Chimneys- The Indian Experience	National Seminar of Tall Reinforced Concrete Chimneys, New Delhi, April 1985.
Tall Structures in Steel and Concrete	Seminar on Tall Structures and Use of Prestressed Concrete in Hydraulic Structures. Indian National Group, International Association for Bridge and Structural Engineers (IABSE), Srinagar, May 1984.
Practical Design Aspects of Wind Induced Dynamic Response of Tall Reinforced Concrete Chimneys	Asia Pacific Symposium on Wind Engineering Roorkee, Dec 1985.
Salient features of the Indian WindLoading Code and its Background	Symposium on Experimental Determination of Wind Loads on Civil Engineering Structures, New Delhi, Dec 1990.
Low Speed Closed Circuit Wind tunnel at IIT, Kanpur: Aerodynamics Aspects and Structural Engineering Features **Challenges of Design of Recent Tall Chimneys**	Ninth International Wind Engineering Conference on Wind Engineering, New Delhi, 1995 *Workshop On* High Rise Buildings 25-26 April 2008, Hyderabad
3. Large Span Structures	
Prestressed Roof Structure for the Indian Airlines Hangar at Bombay.	Seminar on Problems of Prestressing, IABSE (ING), Madras, 1970.
Interesting Design and ConstructionAspects of the Kuwait Jumbo Jet Hangar	Conference on the Engineering and Construction of Aircraft Hangars, Singapore, July 1981.
Large Span Structures for Aircraft Hangars	Seminar on Industrial Structures, IABSE (ING). Chennai, Dec 1996.
Large Span Hangar Structures	International Seminar on Space Structures, Space Structures Promotion Foundation (India), Delhi, May 1999.
4. Offshore Structures	
Fourth Oil Berth at Butcher Island of the Jetty and Berthing StructureDesign and Construction Featuresat Butcher Island near Bombay I & II.	First National Conference in Dock and Harbour Journal, March & April 1986. Engineering, Bombay, Dec 1985. Indian Concrete ***ADJUDGED BEST PAPER OF THE YEAR***

5. Repairs, Modification and Rehabilitation of Structures

Use of Epoxy Components forCrack Sealing Under Pressure	Indian Concrete Journal, Aug 1968.
Modifications to the Prestressed Concrete Suspended Cantilever Roof of the Indian Airlines Hangar	Conference on Engineering and Construction of Aircraft Hangars, Singapore, July 1981.
The Indian Experience in the Maintenance and Rehabilitationof some Major Concrete Bridges.	Second International Colloquium, Bombay, January 1988

6. Special Structures

Design and Construction Aspects of Prestressed Concrete BuriedPipelines,),	Course on Design of Concrete Shell Structures organised by the Institution of Engineers (India and Tor Steel Research Foundation in India, Bangalore, Feb 1981.
Low Speed Closed Circuit Wind Tunnel at IIT, Kanpur - Aerodynamic Aspectsand Structural Engineering Features	9th International Conference on Wind Engineering, New Delhi, Jan 1995
Approximate Analysis and Design of Closed-Circuit Wind Tunnel in India.	6th International Colloquium on Concrete in Developing Countries, Lahore, Pakistan, Jan 1997

7. Foundation Engineering

Evaluation of Bearing Capacity of Foundations by Penetrometer Tests	ACI-Institution of Engineer's Workshop, Bombay, June 1981

8. Shells

Buckling Strength of Thin Shell Forms in Concrete	Second Structural Engineering Conference, Bangkok, Dec 1982
Practical Aspects of Improved Buckling Strength of Concrete Shells and Spatial Forms.	Bangalore, November 1988.

9. Prestressing

Prestressing Steels and Systems	Course on LimitState Design of Prestressed Concrete Structures, Cement Research Institute of India, Dec 1981.
Prestressing Steels	Seminar on Special Cements and Special Steels in India, Indian Concrete Institute, New Delhi Centre, IIT, Delhi, July 1997
	Seminar on Low Relaxation Steels, New Delhi, Oct 1997. Convenor's Address

10. Buildings

Precasting Techniques for UniqueRoof of Color Picture Tube Factory	FIP International Congress on Prestressed Concrete held in Hamburg, Germany, June 1990
Roof Structure of Electronics Factory	International Colloquium on Concrete in Developing Countries held in Beijing, China, May 1990.
Precast Roof of Electronics Factory	Structural Engineering International Journal of IABSE published inZurich, Switzerland, August 1991.
Design of ImmigrationOfficesBuilding for British High Commission, New Delhi	Indian Concrete Journal, March 1996.
Amari Atrium Bangkok, Thailand	FIP International Congress on Challenges for Concrete in the next millenium, held in Amsterdam, Netherlands, May 1998.
Reinforced Concrete Buildings Engineered For Earthquake Resistance	Keynote Address. National Seminar: User & Environment Friendly Construction Technology & Methods Nainital, May 1999. Published in ICI Journal, July-Sept 1999
Earthquake Resistant Engineered Buildings	Seminar on "Lessons for Architects & Engineers From Recent Indian Earthquakes", Roorkee, Jan 2000















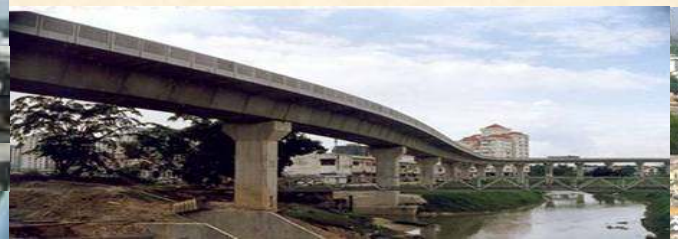

Tandon Consultants Pvt Ltd

Structural Engineering Specialists

CREATIVITY · EXPERTISE · QUALITY

ISO 9001-2008 Certified

SIGNIFICANT PROJECTS

"Our design technology may be 10 years ahead…
… but our work ethics remains 50 years behind"

JUL 2013

ABOUT US

Tandon Consultants Pvt Ltd (TCPL) was established in 1986 to undertake specialist consultancy services in the field of structural engineering.

TCPL is a premier consultancy organisation in India which specialises in the design of large and complex structures and consists of carefully trained professionals geared to produce high quality work of international standards. The keywords that symbolise its professional work are:

CREATIVITY . EXPERTISE . QUALITY

TCPL has spread its operations beyond the Indian borders and taken up assignments in several countries including Germany, Thailand, Nepal, Maldives, Malaysia, Singapore and Russia. Many of its projects have received national as well as international acclaim for their design and exceptional innovations.

TCPL's designs utilise computer software developed in-house as well as state-of-the-art program packages acquired from within and outside India. TCPL has done pioneering work in the development of customized structural engineering software especially suited to Codes of Practice of India, Malaysia, and U.K.

The experts of TCPL form a well-knit group that represents a vast reservoir of experience in Structural Engineering both within and outside the country. The organisation prides itself for its informal culture where interaction is motivated by common ideals, aspirations and professional goals. The physical environment of the office has been specially designed to promote creative and free thinking.

Fields of Specialisation:

- Detailed Design Engineering
- Metro & Railway Structures above and below ground
- Proof Checking of Design
- Computer Software Development
- Feasibility Studies
- Special Repair and Rehabilitation Schemes
- Construction Techniques
- Value Engineering
- Quality Audit

Areas of Expertise:

- Bridges, Flyovers & Urban Transportation Structures
- Tunnels & Underground Structures
- Tall Structures
- Long Span Structures
- Precast / Prestressed Structures
- Monumental Buildings

TANDON CONSULTANT S PVT LTD
STRUCTURAL ENGINEERING SPECIALISTS

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Fax: 91 11 24316057
Email: tandon@tcpl.com ; tcpl_123@yahoo.com
Website: www. tcpl.com

LIST OF SIGNIFICANT AWARDS

2013:

- Indian Concrete Institute Award (Most Outstanding Prestressed Concrete Structure) at 3-Level Grade Separator at Ghazipur Intersection on NH-24 Bypass
- Central Public Works Department – The Arch Shaped Suspended Pedestrian Bridge on Barapullah Road near Jawaharlal Nehru Stadium (Special Award for Innovation & Design)
- Institute for Steel Development & Growth Award - Foot over Bridge at 3-Level Grade Separator at Ghazipur Intersection, New Delhi

2012:

- Indian Building Congress Award- Infrastructure Projects for Common Wealth Games
- Indian Concrete Institute Award (Innovative Application of Special Concrete Award) – Approaches to Signature Bridge
- Institute for Steel Development & Growth Award - Grade Separator at Mukarba Chowk
- Construction Industry Development Council (Vishwakarma Award) - Grade Separator at Ghazipur on NH-24
- Construction Industry Development Council (Vishwakarma Award) - Grade Separator at Mukarba Chowk

2011:

- Indian Concrete Institute Award (Most Outstanding Prestressed Concrete Structure) – Barapulla Elevated Corridor
- Indian Concrete Institute Award (Most Outstanding Concrete Structure) - Badarpur Elevated Corridor
- Central Public Works Department – Barapulla Elevated Corridor
- Construction Industry Development Council (Vishwakarma Award) - Barapulla Elevated Corridor
- Construction Industry Development Council (Vishwakarma Award) - Badarpur Elevated Corridor
- CNBC TV18 (Infrastructure Award) - Badarpur Elevated Corridor

2010:

- Association of Consulting Civil Engineers (Innovative Design Award) - Grade Separator at Mukarba Chowk
- Central Public Works Department – Grade Separator at Mukarba Chowk

2009:

- Indian Concrete Institute Award (Most Outstanding Concrete Structure) - Khalsa Heritage Complex
- Indian Building Congress Award (Excellence in Built Environment) - Khalsa Heritage Complex
- Indian Institution of Bridge Engineers (National Award for Most Outstanding Bridge) - Superstructure in PSC-Punjagutta Flyover at Hyderabad
- Indian Institution of Bridge Engineers (National Award for Most Outstanding Bridge) - Bangalore Hosur Elevated Expressway

2008:

- Indian Concrete Institute (Best Structure Built in UP) - Bridge Across River Ganga at Allahabad
- Association of Consulting Civil Engineers (Innovative Design Award) - Khalsa Heritage Complex

2006:

- FIB Congress (Nominated for the Outstanding Structures Award) - Elevated Viaducts of Delhi Metro
- Archidesign Award - Structural Engineer of the year

2005:

- Indian Institution of Bridge Engineers (National Awards) - Elevated Rail Corridor for Delhi Metro
- Indian Institution of Bridge Engineers (National Awards) - Dudhar Bridge on Jammu Udhampur Rail Link

CONTD…

LIST OF SIGNIFICANT AWARDS

2004:
Consulting Engineers Association of India - Excellence in Engineering Consultancy Services

2003:
Indian Roads Congress Medal (Best Paper) - Precast Concrete Segmental Flyovers of Delhi

2002:
- Indian Road Congress Medal (Best Paper) - 'Earthquake Resistant Design of Bridges'

2001:
Association of Consulting Civil Engineers (Innovative Design Award) -Clover Leaves at ITO

1999:
Alumni Association of College of Engineering, Pune - S.B. Joshi Smruti Puruskar

1996:
- Indian Institution of Bridge Engineers (National Award for Most Outstanding Bridge) - Dodan Nallah Arch Bridge

1994:
- Indian Road Congress Medal (Best Paper) - Dodan Nallah Arch Bridge
- Indian Concrete Journal (Best Paper) - Dodan Nallah Arch Bridge
- Association of Consulting Civil Engineers – for Dodan Nallah Arch Bridge

1993:
- Association of Consulting Civil Engineers (Innovative Design Award) - Samtel Colour Factory, Ghaziabad

1991:
Institution of Engineers (India) Prestressed Concrete Engineering Design Award

1986:
Indian Concrete Journal (Best Paper) - Design and Construction Jetty and Berthing Structure near Mumbai

Honours Conferred on Prof Mahesh Tandon

- Eminent Engineer Awarded to Prof Mahesh Tandon at 12th International Seminar of Indian Institute of Bridge Engineers - 2012
- Honoured by the Institution of the Engineers (India) in recognition of his eminence and contributions to the profession of Civil Engineering – 2011
- Archidesign Award - Structural Engineer of the Year 2006
- Honoured by the Institution of the Engineers (India) in recognition of his eminence and contributions to the profession of Civil Engineering – 2006
- Indian Roads Congress Medal 2003 for Paper - Precast Concrete Segmental Flyovers of Delhi
- Indian Concrete Institute Life Time Achievement Award 2003
- Indian Road Congress Medal 2002 for Best Paper on Construction Aspects - Titled 'Earthquake Resistant Design of Bridges'
- Alumni Association of College of Engineering, Pune S.B. Joshi Smruti Puruskar, 1999
- Indian Concrete Journal Prize for Best Paper Published in 1994 - Dodan Nallah Arch Bridge
- Institution of Engineers (India) Prestressed Concrete Engineering Design Award, 1991
- Indian Concrete Journal Ist Prize for Best Paper published on salient design and construction aspects of the berthing structurein, 1986

SIGNIFICANT PROJECTS

BARAPULLA ELEVATED CORRIDOR- COMMONWEALTH GAMES-2010, NEW DELHI

GRADE SEPARATOR AT GHAZIPUR INTERSECTION ON NH-24 BYPASS, DELHI

SIGNATURE BRIDGE, WAZIRABAD, DELHI

BADARPUR ELEVATED CORRIDOR, NEW DELHI

BRIDGE & APPROACHES OVER RIVER YAMUNA, WAZIRABAD, DELHI

MUKERBA CHOWK TRAFFIC INTERCHANGE

SEGMENTAL FLYOVERS ON AMBEDKAR ROAD, MUMBAI

KUALA LUMPUR PUTRAJAYA HIGHWAY PACKAGE-3: MAIN LINE AND PACKAGE -5: RAMPS, MALAYSIA

BANGALORE-HOSUR EXPRESSWAY

EXTRA-DOSED BRIDGE CROSSING RING ROAD, DELHI

BANGALORE STATION – 7 ELEVATED STATIONS-SECTION R3 (YESHWANTHPUR–SWASTIK)

KHALSA HERITAGE COMPLEX , ANANDPUR SAHIB, PUNJAB

ALLAHABAD BYPASS BRIDGE OVER RIVER GANGA, ALLAHABAD

DELHI - GURGAON EXPRESSWAY ON NH-8

PANCH SHEEL CLUB FLYOVER, NEW DELHI

MADHUBAN CHOWK UNDERPASS, NEW DELHI

AIIMS GRADE SEPATOR, NEW DELHI

BRIDGES OF JAMMU-UDHAMPUR RAIL LINK, NORTHERN RAILWAY

SEGMENTAL FLYOVERS, DELHI

CLOVER LEAVES NEAR ITO CROSSING, DELHI

VIADUCTS & BRIDGES AT KUALA LUMPUR, MALAYSIA

NATIONAL WIND TUNNEL, KANPUR

LIGHT RAPID TRANSIT SYSTEM F FOR KUALA LUMPUR

HANGAR KOLKATA & CHENNAI AIRPORTS

ATRIUM HOTEL, BANGKOK

PALM COURT APARTMENTS, BANGKOK

SAMTEL COLOR LTD, GHAZIABAD, UP

ARCH BRIDGE, DODAN NALLAH, HIMACHAL PRADESH

RADISSON HOTEL, NEW DELHI

BUILDINGS OF BRITISH HIGH COMMISSION, NEW DELHI

CENTRAL SECRETARIAT - GURGAON CORRIDOR (UNDERGROUND CONSTRUCTION), NEW DELHI

CENTRAL SECRETARIAT - BADARPUR CORRIDOR (UNDERGROUND CONSTRUCTION), NEW DELHI

INCREMENTALLY LAUNCHED BRIDGE OVER RIVER YAMUNA, NEW DELHI

ELEVATED VIADUCT FROM TIS HAZARI TO RITHALA, NEW DELHI

VIADUCTS & STATIONS FROM BARAKHAMBA ROAD TO DWARKA, NEW DELHI

DHAULA KUAN INTERCHANGE, NEW DELHI

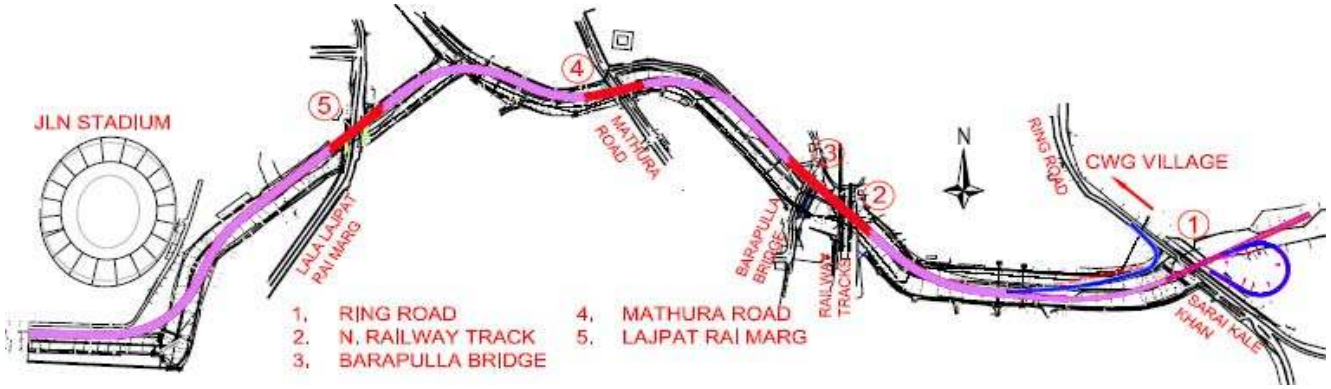
PUNJAGUTTA FLYOVER, HYDERABAD

INTERNATIONAL CONTAINER TRANSSHIPMENT TERMINAL, PORT CONNECTIVITY, COCHIN

JIA BRIDGE, HIMACHAL PRADESH

INDIRA GANDHI MEMORIAL HOSPITAL, MALE

CHIMNEYS



BARAPULLA ELEVATED CORRIDOR: COMMONWEALTH GAMES-2010, NEW DELHI

BARAPULLA ELEVATED CORRIDOR: COMMONWEALTH GAMES-2010, NEW DELHI

Commissioned by the PWD Government of Delhi for the Commonwealth Games (CWG 2010), the elegant design of Barapulla Elevated Corridor was envisaged as a dedicated signal-free access to transport participants from the Games *Village* to the Main *Venue* (Jawahar Lal Nehru Stadium). Located along the existing Barauplla Nallah drain, the 4.5 km long viaduct consisting of 2 separate structures of 10m width each for the up and down traffic has an important legacy value for the east-west traffic.

The innovative design concept was geared for high speed construction (time available: 20 months) using precast prestressed segmental techniques (no. of segments 3000) for most of the alignment including obligatory spans (upto 85.0 m). Standardisation was the key to cost-optimisation while decreasing the expansion joints in the deck led to increased riding comfort. Flexibility in design for accommodating modifications in alignment, span arrangement and foundation configuration contributed greatly in avoiding relocation of underground and overhead utilities.

Delhi is a city of archeological monuments and a highly sensitive approach is required to be taken for their preservation. Each of the major crossings presented difficult challenges. For instance, the block-time for the Northern Railway tracks was limited to a mere 2 hours on alternate days, while the deck level had to be raised to 20m to provide an uninterrupted view of the Khan-i-Khana Tomb on Mathura Road. Sharp curvatures and skew crossing characterised the alignment to avoid crossings above the ancient Barapulla Bridge and to ensure that the elevated corridor can be built without showing on shutting down traffic.

Awards :

- ***Central Public Works Department – The Arch Shaped Suspended Pedestrian Bridge on Barapullah Road near Jawaharlal Nehru Stadium (Special Award for Innovation & Design) 2013***
- ***Construction Industry Development Council Vishwakarma Award 2011 Under the Category 'Best Project'***
- ***Central Public Works Department First Prize for Projects completed During the year 2010 - 2011***
- ***Indian Concrete Institute Award for Outstanding Prestressed Concrete Structure in the Country for the year 2011***

GRADE SEPARATOR AT GHAZIPUR INTERSECTION ON NH-24 BYPASS, DELHI

The 3-level grade separator was constructed on the critical intersection of NH-24 & Road no.56 in East Delhi and was before the Commonwealth Games 2010. A flyover is aligned along NH-24 and an Underpass perpendicular to it. The existing rotary at ground level was retained but modified to suit the structural arrangement.

The 800m long flyover consists of 2 separate carriageways of 4 lanes each. The “twin-leaf” substructure is monolithic to the superstructure to constitute an “ integral” bridge. Cast-in-situ balanced cantilever construction was adopted to yield 4-span and 3-span modules.

The 680m long Underpass is constructed using diaphragm walls along its periphery. Tension piles were used with the base slab to counteract uplift due to the high water table. The portion of the Underpass crossing the rotary was covered with a deck slab cast into the diaphragm walls.

Pedestrian bridges (3 nos.) consisting of steel arch with a span of 70m suspending the walkway for crossing major arterial roads at Ghazipur, DelhiS

Awards

- Institute for Steel Development & Growth Award - Foot over Bridge at 3-Level Grade Separator at Ghazipur Intersection, New Delhi-2013
- Indian Concrete Institute Award (Most Outstanding Prestressed Concrete Structure) at 3-Level Grade Separator at Ghazipur Intersection on NH-24 Bypass-2013
- Construction Industry Development Council Vishwakarma Award 2012

SIGNATURE BRIDGE AT WAZIRABAD, DELHI

To be built over River Yamuna in North Delhi, the 575m long Signature Bridge will have a single inclined pylon of 150m height and a 251m span. Apart from providing a much needed additional crossing between the left and right bank of the river, it will be an iconic bridge of the city.
The foundations are being designed as caissons seated in rock in the fairly high seismic zone in which the city is located

BADARPUR ELEVATED CORRIDOR, NEW DELHI

Constructed on BOT basis this 4.4km long 2x3 lane elevated highway is located on Delhi-Agra Section of NH-2. It crosses 5 major intersections has 2 toll plazas and is characterized by unusual geometrics, which has earned for itself a nick name “jalebi chowk”

Precast segmental construction was the predominant techniques used for spans varying from 28m to 46m. The 11.8m wide segments (2200 nos.)had the governing weigh of 60t

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Awards :

- ***CNBC TV18 Infrastructure Award 2011***
- ***Construction Industry Development Council Vishwakarma Award 2011***
- ***Indian Concrete Institute Award for Outstanding Concrete Structures for the year 2011***

BRIDGE & APPROACHES OVER RIVER YAMUNA, WAZIRABAD, DELHI

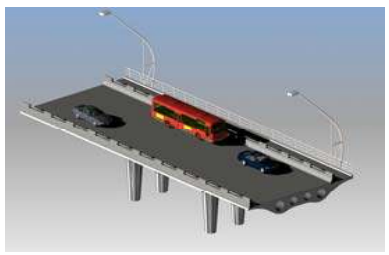
BRIDGE & APPROACHES OVER RIVER YAMUNA, WAZIRABAD, DELHI

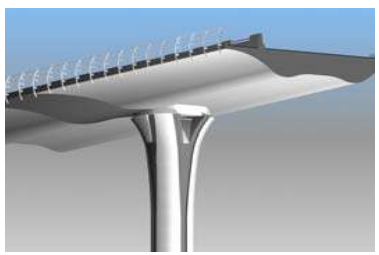
Structural design consultancy for Wazirabad approaches flyovers located on the western and eastern bank of Yamuna River, Delhi which involves nearly 50000 sqm of open portion of elevated flyover, 25000 sqm of closed portion of viaduct , 90000 sqm of embankment. It is proposed to adopt precast segmentally constructed, four span continuous curved box girder of 164.5m length as a standard continuous unit. However the length & nos. of spans in a continuous unit will be varied depending on site constraints. Wide precast superstructure deck will be further split into a spine box girders & side frame cantilevers. Cantilever construction or span by span construction method using launching girder will be employed.

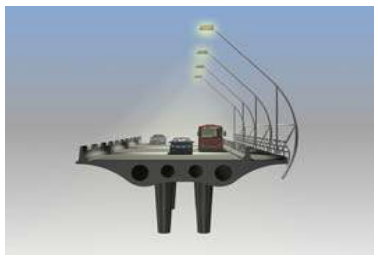
Awards

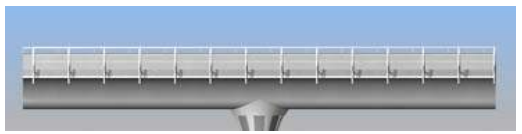
- Indian Concrete Institute Award (Innovative Application of Special Concrete Award) – Approaches to Signature Bridge

MUKERBA CHOWK TRAFFIC INTERCHANGE, DELHI









ARCHITECTURAL VIEWS


B1


B2


B3


B4

MUKERBA CHOWK TRAFFIC INTERCHANGE, DELHI

Built by the Public Works Department, NCT of Delhi, the gigantic traffic interchange at Mukerba Chowk, is located on the outskirts of Delhi. This complex junction facilitates signal-free movements in all directions at the intersection of the historic Grand Trunk Road (National Highway No. 1) and the Outer Ring Road. Traffic studies (year 2000), revealed that the mixed traffic had reached 3, 30,000 PCUs/day making it the most heavily trafficked junction in the country.

The path-breaking 8-lane main flyover consists of a continuous steel box girder (B1) with a composite concrete slab. The superstructure has been widened to 10-lanes to incorporate bus-stops (B4) at deck level that cater to facilities like ramps, stairs and escalators for vertical movement and under-bridges for cross-overs for passengers.

The aesthetically designed slip road and loop structures are of integral concrete bridge construction, allowing for the elimination of bearings and expansion joints. The structures have specially designed features for earthquake resistance (B2) as well as those that cater to poor soil conditions that have a high liquefaction potential.

The Mukerba Chowk intersection which was conceived as a green project threw up design challenges in the form of the city's garbage dump and several *nallahs existing* at the site. Use of flyash, blast furnace slag cement, segregation of motorized vehicles from cyclists and pedestrians, integrating the existing features at site (archeological monument, burial ground, and sub-station) and creation of innovative and aesthetic structural designs (B3) were some of the highlights of project.

Awards

- **Construction Industry Development Council Vishwakarma Award 2012**
- **Association of Consulting Civil Engineers Award 2010 for Innovative Design**
- **CPWD Director General Award of Excellence (2009-10) First Prize**

SEGMENTAL FLYOVERS ON AMBEDKAR ROAD, MUMBAI

SEGMENTAL FLYOVERS ON AMBEDKAR ROAD, MUMBAI

The flyovers on Ambedkar Road span across crossings at Sion Hospital, Hindmata Junction and King Circle.

The total length of open portion of the flyovers is 3030m and width of dual carriageway of 4 lanes is 2x8.436m. The Superstructure is constructed using Precast Segmental Technique with internal bonded tendon. 35.0m spans were adopted for the continuous 5 span and 3 span modules

Large diameter water pipelines and other utilities posed a big challenge to the design and construction in the congested traffic artery. Pile foundations in uncertain sub-strata consisting of disintegrated rock added to the difficulties encountered during the execution.

KUALA LUMPUR PUTRAJAYA HIGHWAY
PACKAGE-3: MAIN LINE AND PACKAGE -5: RAMPS

KUALA LUMPUR PUTRAJAYA HIGHWAY
PACKAGE-3: MAIN LINE AND PACKAGE -5: RAMPS

The 26km long highway connects Kuala Lumpur to the new capital city of Putrajaya. A large variety of bridges structures are necessitated due to the complex highway geometrics and integration of ramps with the main-line. The superstructures include precast T-beam/slab, voided slab and box girder types some of which are integral to the piers. The sub-structures include different shapes of piers and portals some of which are constructed by precast segmental techniques. The foundations include single large diameter pile of 2.2m, caisson pile and precast prestressed spun piles.

BANGALORE-HOSUR ELEVATED EXPRESSWAY

BANGALORE-HOSUR ELEVATED EXPRESSWAY

The 10km long 4-lane Bangalore – Hosur Elevated Expressway Project on NH-7 is one of the most heavily trafficked sectors (1,25,000 PCUs/day) in the country. The elevated structure starts from Silk Board Junction and ends at Electronic City. The work was awarded on BOT Basis by National Highways Authority of India to a consortium of companies as JV partners.

The 16.3m wide deck of the bridge superstructure consists of State-of-the-Art precast prestressed segmental 2-cell box girder construction and several complicated interchange structures and ramps connected to the main expressway. The typical span arrangement between expansion joints of the main bridge is 29.0m+6*34.0m+29.0m=262.0m. Pedestrian crossings (4 nos.) have been designed by 'box pushing' to avoid inconvenience to existing traffic at ground level. Additionally, two flyovers cross the alignment at different locations are also included in the project.

Awards

- **Institution of Bridge Engineers National Award 2008 for Superstructure in PSC**

EXTRA-DOSED BRIDGE CROSSING RING ROAD, NEW DELHI

The Extradosed Bridge of Delhi Metro at Moolchand is an important crossing over Ring Road. It has a span arrangement of 51.0m+65.5m+51.0m making a total length of 157.5m with a curved alignment (R=100m).

The 2.0m deep 10m wide box girder deck was constructed by precast segmental construction with an axial suspension of stay cables from 8.0m high pylons.

No disturbance of traffic was permitted during construction at this heavily trafficked junction adjacent to which a flyover and underpass already exist.

Awards

- **Indian Concrete Institute Award (Innovative Application of Special Concrete Award 2012) – Approaches to Signature Bridge**

3D-View of Kuvempu Station

3D-View of Mahalaxmi Station

3D-View of Rajaji Station

3D-View of Malleswaram Station

BANGALORE STATION – 7 ELEVATED STATIONS-SECTION R3 (YESHWANTHPUR-SWASTIK)

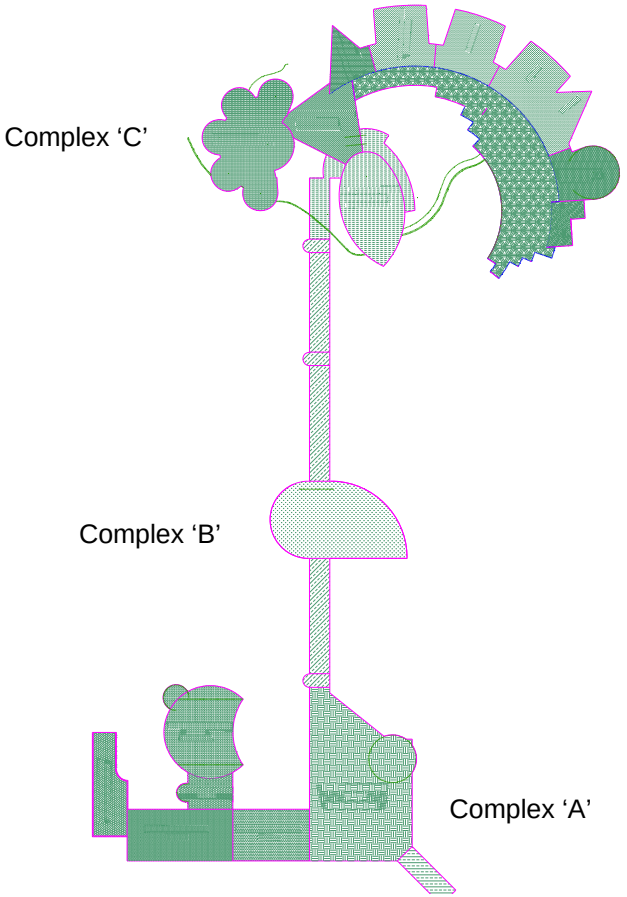
Bangalore Metro Rail project comprises four arms emanating from Majestic square underground station. These four arms are termed as four packages of consultancy called R1 (East of Majestic Square), R2 (West of Majestic Square), R3 (North of Majestic Square) and R4 (South of Majestic Square). Station package R3, comprises seven stations namely:

1. Yeshwanthpur
2. Soap Factory
3. Mahalakshmi
4. Rajaji Nagar
5. Maleshwaram
6. Kuvempu Road and
7. Swastik

Out of the above stations, Swastik being off road station, shall be made in conventional cast-in-situ structure. All other stations being over the existing narrow roads, need to employ precast concrete solution to minimize construction time and inconvenience to the running traffic during construction.

KHALSA HERITAGE COMPLEX, ANANDPUR SAHIB, PUNJAB

KHALSA HERITAGE COMPLEX, ANANDPUR SAHIB, PUNJAB



The Khalsa Heritage Complex is a landmark project, commissioned by the Punjab Government to depict the 500-year history of Sikhs and 300 years of the establishment of the Khalsa.

The 60 acre barren site, situated in front of the main Anandpur Sahib Gurudwara has been transformed into two Complexes of innovatively designed buildings separated by a multi-span arch bridge over an aesthetically landscaped artificial lake with a coffee shop in the middle. The Main Auditorium, Library and Archives from Complex A, while the Heritage Museum Permanent Exhibit and Grant Entrance are housed in Complex B.

The big structural challenge was to concretize the fantasy-like imagination of the Architects and the emergence of visually arresting shapes like a crown, a flower, a boat bear testimony to the creativity and aesthetics of its creators.

Awards

- **Indian Building Congress Award for Excellence in Built Environment Award 2009**
- **Indian Concrete Institute Award for Most Outstanding Concrete Structure Award 2009**
- **The Association of Consulting Civil Engineering Award 2008 for innovative design of structures**

ALLAHABAD BYPASS BRIDGE OVER RIVER GANGA, ALLAHABAD

ALLAHABAD BYPASS BRIDGE OVER RIVER GANGA, ALLAHABAD

The 1013m long bridge across the River Ganga near Allahabad is located on the Khaga-Varanasi section of National Highway No. 2 Separate structures were designed for 2 lanes each for the up and down traffic. The span arrangement selected was 63.2m + 4x95m + 63.2m = 506.4m. Two such units with expansion joints (modular strip/box steel type) at the midway point make up the bridge length. Shock Transmission Units (STUs) were incorporated for countering earthquake forces in an efficient manner.

Precast segmental construction was used for the superstructure with a parabolic soffit to get a high quality product with excellent finish and fast erection speed. Independent underslung launching trusses of 230m length were used for erection and placement of segments (governing weight 80t) employing portal gantries. Jack-down well-sinking was employed for the foundations for speeding up construction and for greater control over tilt and shift.

Awards

- **Indian Concrete Institute, Allahabad Centre Award 2008 for the Best Structure Built in UP**

DELHI-GURGAON EXPRESSWAY ON NH-8

DELHI-GURGAON EXPRESSWAY ON NH-8


A


B


C


D

Precast Pre-tensioned girders integrated with cast-in-situ deck slabs and diaphragms were used on a large scale for the superstructure of the 2 x 4 lanes of the access-controlled expressway incorporating several grade separators aggregating 11 km of stilted structure.

Constructed to the orders of the National Highways Authority of India, this BOT project is characterized by high quality, superior form-finished concrete with an eye on simple structural elegance, durability, economy and standardization.

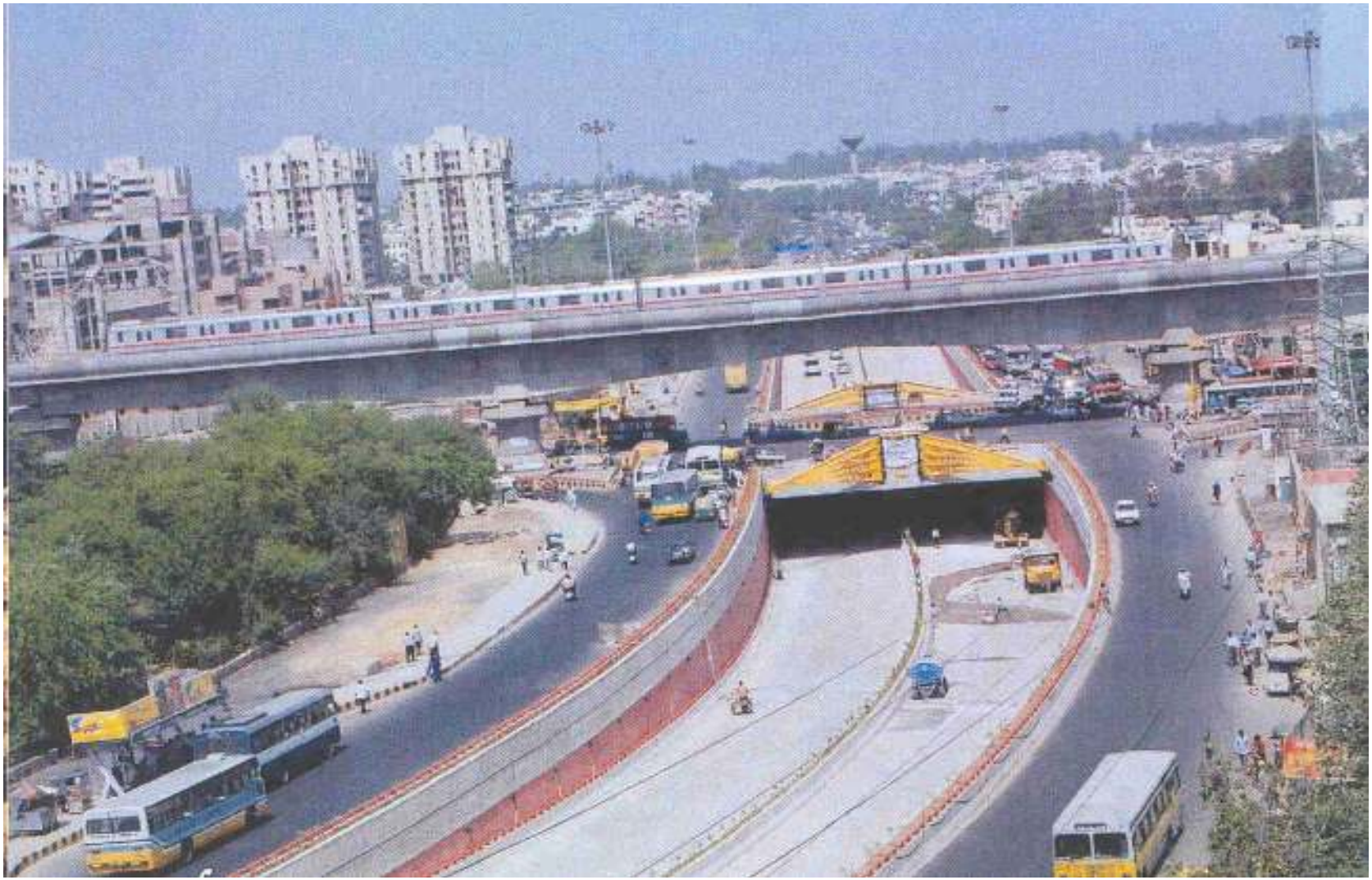
The requirement of precasting *1800* girders was met through a casting yard comprising 14 beds and a process of steam-curing to obtain a time cycle of *upto 4 girders a day.* Specially fabricated low-bedded trailors were deployed to transport the 30 m long girders (weight 60 t) to the site and a pair of Goliath cranes operating in tandem was then used for their erection (A). A pair of 150t tyre-mounted mobile cranes was also engaged at designated locations for the purpose (B). The erection methodologies are shown in the insets.

Special highlights of the designs were the “integral” sharply curved (radius 50 m) prestressed cast-in-situ box girder continuous decks for the “horse-shoe loop” connections towards the international (C and D) and domestic terminals of the IGI airport of Delhi. Also, post-tensioned precast girders of 40 m length (weight 120t) were employed for obligatory spans at major crossings. The concept of hanging girders was exploited advantageously to maximize road usage for ground level traffic (photos opposite).

PANCHSHEEL CLUB FLYOVER, NEW DELHI

PANCHCHEEL CLUB FLYOVER, NEW DELHI

PWD, Delhi commissioned the seven span continuous Integral Flyover, with 190m long stilted portion, on Ring Road Intersection at Panchcheel Club. The superstructure is reinforced concrete voided slab type deck which is made integral (monolithic) with the piers. Coupled with other three similar integral bridges at Kalkaji Temple, Moti Nagar & Punjabi Bagh Club Intersections on outer Ring Road and Ring Road, New Delhi they are landmarks in this historic city and fore-runners of many similar bridge projects. The flyovers were designed for seismic (zone IV) and duly account for superstructure.



MADHUBAN CHOWK UNDERPASS, NEW DELHI

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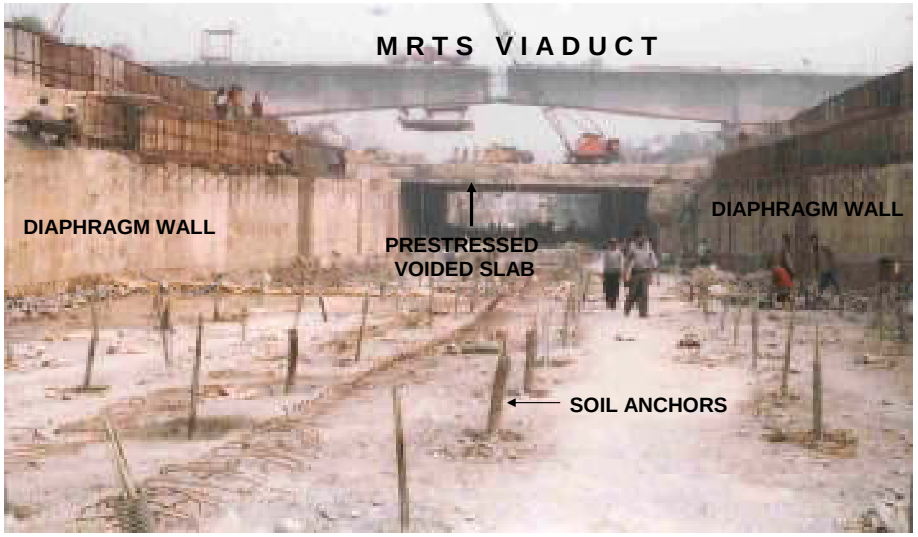
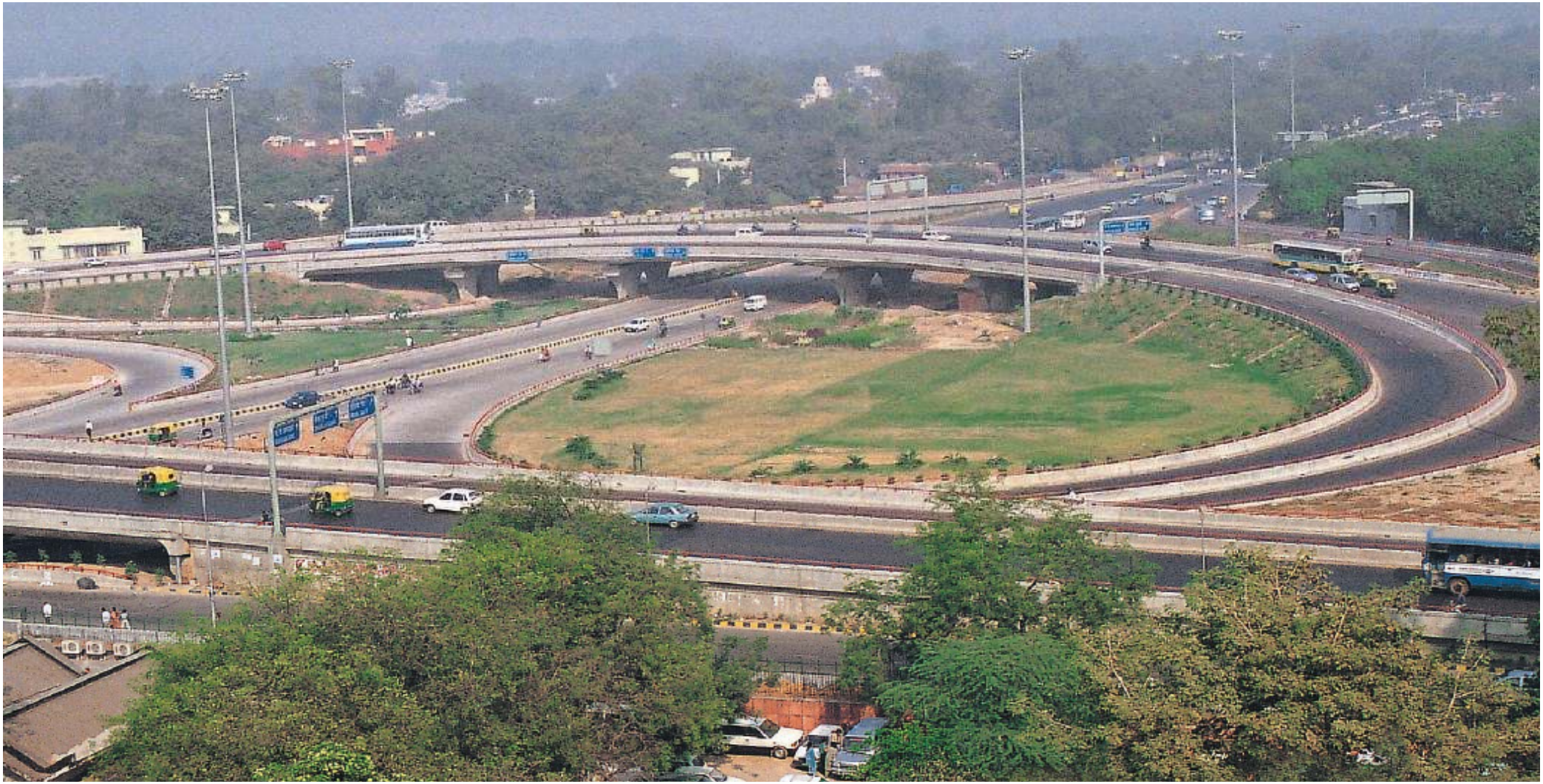
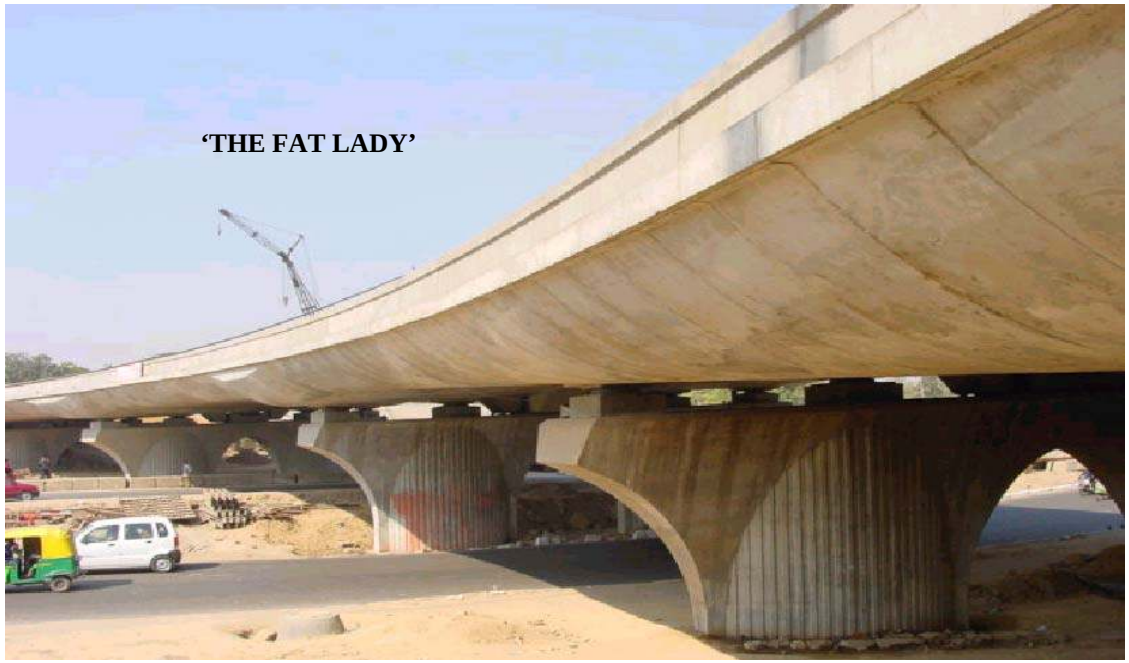


At the intersection of Outer Ring Road and Road no.41 at *Madhuban Chowk,* New Delhi, two major fast-track projects were constructed simultaneously. A vehicular underpass was opted for Outer Ring Road by DTTDC while the viaduct of the DMRC runs perpendicular to it. Sequencing of activities for these two fast track projects in a restricted area, use of appropriate construction techniques and limited disturbance to existing traffic during construction were some of the problems overcome by innovative designs.

The 6-lane 555m long underpass for DTTDC is constituted by 18m deep diaphragm walls on the sides connected by a base-slab. Permanent prestressed soil-anchors are used to stabilize the structure against uplift caused by the high water table in the area. A 60m long prestressed voided slab monolithic with the diaphragm walls spans across 24m width of the underpass to facilitate traffic movement at ground level. Of the several special viaduct structures of Line 1 of DMRC, one of them is the 2-track, 3-span (38.5m + 55m + 38.5m) bridge constructed by free-cantilevering technique, ensuring no disturbance to traffic at ground level. The central span straddles across the underpass with piers supported on the central verge of Road no.41. Special attention was devoted to aesthetics, durability and earthquake resistance.



AIIMS GRADE SEPARATOR, NEW DELHI



Built to the orders of the PWD, Govt of Delhi, the grade separated interchange at the AIIMS-Safdarjung crossing has given back a green lung to the city. Located at the intersection of Ring Road and Aurobindo Marg junction, the landscaped interchange is signal free and of low height which not only reduces atmospheric and noise pollution but also enhances the quality of the environment.

The bridges and structures being the most visible elements have been specially designed to blend aesthetically into the milieu. The continuous decks with smooth flowing lines and contours impart a strikingly attractive character and openness to the scheme. The spill-through abutments are immersed into the landscape, giving the impression of bridges emerging gracefully out of the ground. State-of-the-art earthquake resistant construction with unobtrusive features are amongst the highlights of the structural design.

BRIDGES OF JAMMU-UDHAMPUR **RAIL LINK**

BRIDGES OF JAMMU-UDHAMPUR RAIL LINK

The Jammu-Udhampur Rail Link project was constructed to the orders of Northern Railway over a stretch of 53.6 km.
The alignment passes through breathtaking scenery of mountains and streams in the undulating Shivalik Ranges which inspired the engineers to evolve structural conceptions reflecting the beautiful environs.

Unstable geological formations and high earthquake forces were some of the problems that had to be overcome in the structural design. Special studies and designs relating to seismic aspects were carried out. Long-span prestressed concrete box girder superstructures supported by tall piers and constructed with different techniques at various sites were selected as the most appropriate solution for the prominent bridges described below:

	Name of Bridge	Span Configuration, m	Remarks
A	Tawi	71.4+102+71.4	Three span continuous bridge constructed by free cantilevering.
B	Dudhar	64+92+64	
C	Ringhal	56+80+56	
D	Sardan	4nos. X 45.2 + (45+63+63+43.2) + 5nos. X 45.2	Four span continuous bridge constructed by free cantilevering in the centre flanked by simply supported spans on both sides.
E	Viaduct E-22	11nos. X 18.7	Simply supported spans.
F	Viaduct E-18	40nos. X 29.7	Simply supported precast spans launched into position.

Awards

- **Institution of Bridge Engineers National Award 2005 for Superstructure in PSC**

Segmental Flyovers
Delhi

Segmental Flyovers Delhi

The following flyovers using epoxy-glued concrete segments joined together with internal prestressing were constructed in the city of Delhi:

I) Flyover on Rao Tula Ram Marg (Moti Bagh) Ring Road Junction
ii) Flyover on Africa Avenue Ring Road Junction
iii) Flyover on Savitri Cinema Outer Ring Road Junction
iv) Flyover on H R Sethi Marg (Nehru Place) Outer Ring Road Junction
v) Ring Road-Lawrence Road Intersection at Britannia Chowk
vi) Ring Road- B-Avenue Intersection.

Special attention was devoted to the development of visually arresting aesthetic features of the project. Carefully shaped spine beams of the superstructure resting on elliptical piers of fluted texture were the main highlights.

The 6-lane superstructure consists of precast prestressed segmental construction of five continuous spans of 26.1 + 31.05 + 41.4 + 31.05 + 26.1 m. The precast segments were manufactured at a centralised casting facility located in the contractor's compound from where they were transported to site and erected in position by light assembly trusses.

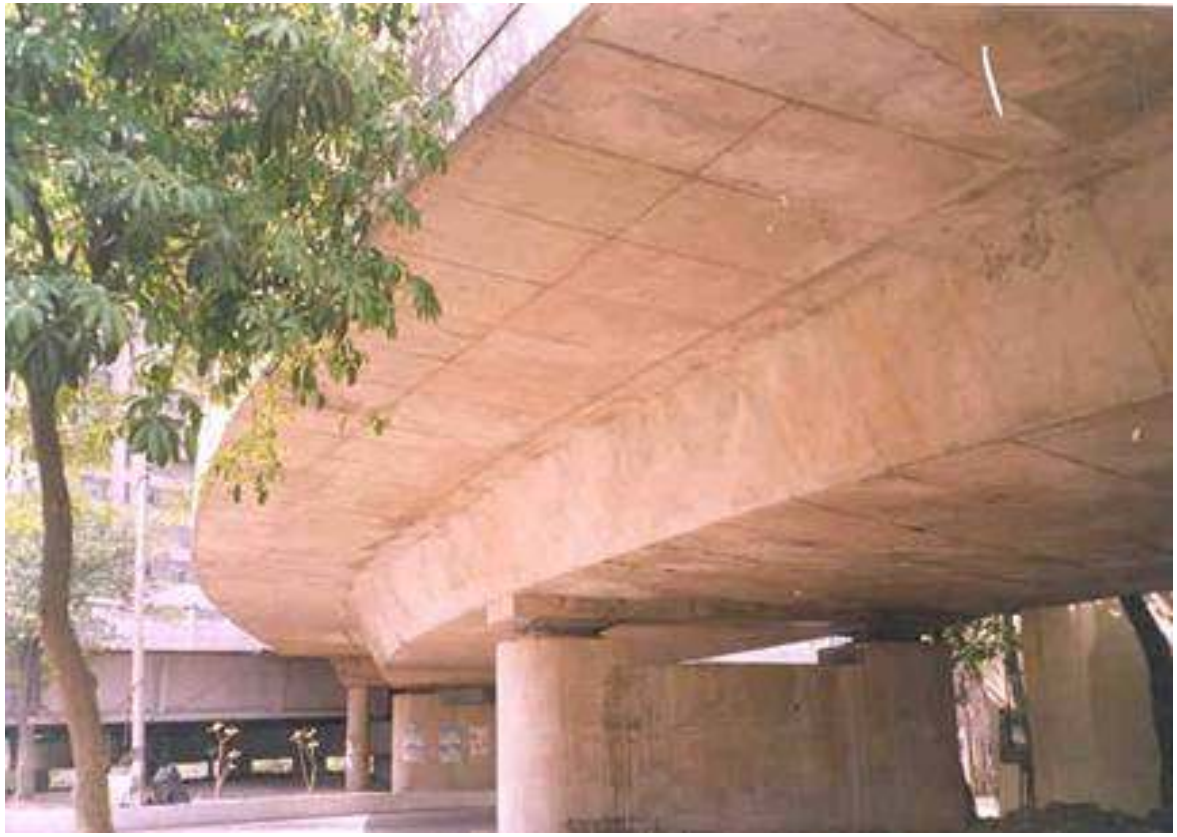
Apart from fast track construction (16 weeks per flyover for the superstructure) other environment friendly aspects included: minimising on-site concreting and causing no disturbance to traffic during construction.

Awards

- **Indian Road Congress-Best Paper Published in 2003**
- **Precast Concrete Segmental Flyovers of Delhi**

CLOVER LEAVES NEAR ITO CROSSING, DELHI

CLOVER LEAVES NEAR ITO CROSSING, DELHI



To alleviate the heavy congestion of traffic at the ITO crossing, two clover leaves and slip roads have been constructed connecting Vikas Marg at the lower level to the IP Estate Flyover (on Ring Road) at the upper level. The total length of the elevated clover leaves is 513.0m.

A sleek low-profile continuous 4-span structure (4 x 25.0 = 100.0m) with a prestressed voided slab section for each structure was selected after careful analysis of several alternatives. Through innovative concepts it was possible to incorporate the following unusual features :

. Sharply curved geometrics (radius 48.0m) to suit site constraints which generated tilted deck with cross-slopes of upto 7%

. Low height of piers, which precluded the use of pier cap from aesthetic considerations

. Reduction in superstructure depth so as to achieve a span/depth ratio of 20:1 to create a slim deck

. Connection of Clover Leaves with the existing flyover by a separate structural element which integrated the two structures architecturally

Awards

- **Institution of Bridge Engineers National Award 1998 for Superstructure in PSC**
- **Association of Consulting Civil Engineers Award 2001 for Innovative Design**

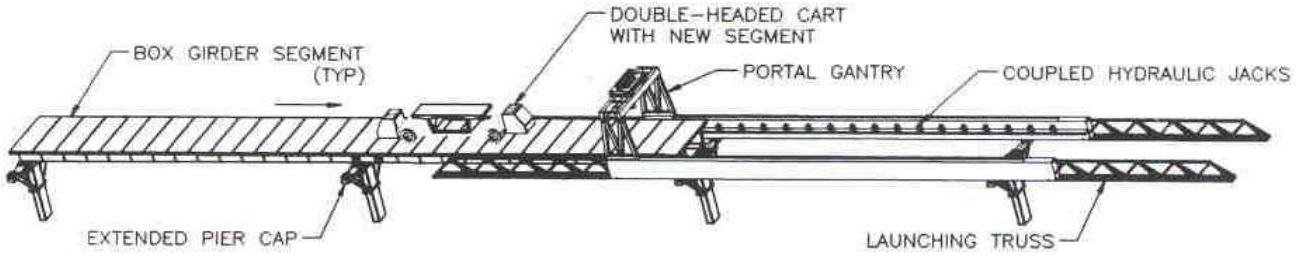
VIADUCTS & BRIDGES AT NEW INTERNATIONAL AIRPORT, KUALA LUMPUR, MALAYSIA

Continuous multi-cellular decks and complex geometrics characterise the 2 viaducts and 7 bridges at the New International Airport at Kuala Lumpur. Single circular columns support the 16.0m wide decks with flat soffit. Architectural aspects constituted important structural challenges in the analysis and design of these structures.

NATIONAL WIND TUNNEL FACILITY, IIT KANPUR

A state-of-the-art national wind tunnel facility was setup at the Indian Institute of Technology (IIT), Kanpur. The facility caters to aerospace as well as industrial applications. The interchangeable test section (3m x 2.25m) of the wind tunnel can be subjected to a wind speed of 90m/sec. Advanced structural analysis including finite element techniques were utilised to design this elegant thin shell concrete structure located in the heart of the IIT Kanpur.

LIGHT RAPID TRANSIT SYSTEM FOR KUALA LUMPUR



LIGHT RAPID TRANSIT SYSTEM FOR KUALA LUMPUR

A Light Rail Transit (LRT) system project was construction in the city of Kuala Lumpur. When completed, it was the world's longest fully-automated driverless train system in the world. The project involved elevated, on ground, as well as, underground sections.

Special construction and design features are depicted in the photographs for the 22 km long elevated portion of the LRT System II. The opposite page exhibits the completed structures and a typical precast box-girder segment brought to site from the centralised casting yard. The temporary extension of pier cap for superstructure erection by launching trusses is shown in the sketch above which demonstrates the construction methodology.

The superstructure construction was done by precast segmental techniques using “external" prestressing and "dry" joints. The project was implemented as a privatised venture. The speed of superstructure construction was about one km per month.

HANGARS AT KOLKATTA & CHENNAI AIRPORTS

HANGAR KOLKATTA & CHENNAI AIRPORTS

Indian Airlines (now Air India) constructed new Hangars at Kolkata and Chennai Airports to house their rapidly expanding fleet of aircrafts.

The work involved the evolution of the conceptual designs, making detailed structural designs, drawings and specifications and providing technical know-how during construction. Apart from evolving the design of structural steel enclosure for accommodating aircrafts in the Hangar and integrating a contiguous reinforced concrete service building with it, state-of-art analysis and design techniques were employed to optimize the structural form and configuration taking into account the requirements of a wind sensitive structure.

HANGAR AT KOLKATTA

The scheme consists of a Hangar with clear plan dimensions of 75.25m* 73.48m, its door housing with plan dimensions of 100m* 5.27m and a three storeyed annexe building of 2300 sqm. The clear heights of the Hangar at the eaves and ridge level are 14.0m and 24.0m respectively. It was designed to accommodate simultaneously one airbus A300 and one airbus A320 aircrafts. The photograph shows the erection of the 100.0m long truss of the door housing.

HANGAR AT CHENNAI

The scheme consists of a Hangar with clear plan dimension of 63.0m* 60.75m, its door housing with plan dimensions of 74.63* 5.75m, and an L-shaped two storeyed annexe building of 2100 sqm. The clear heights of the Hangar at the eaves and ridge level are 12.0m and 20.0m respectively. It was designed to accommodate one airbus A300 or two airbus A320 aircrafts at one time. The photograph shows the interior of the Hangar soon after its commissioning.

Hangar at
Kolkatta

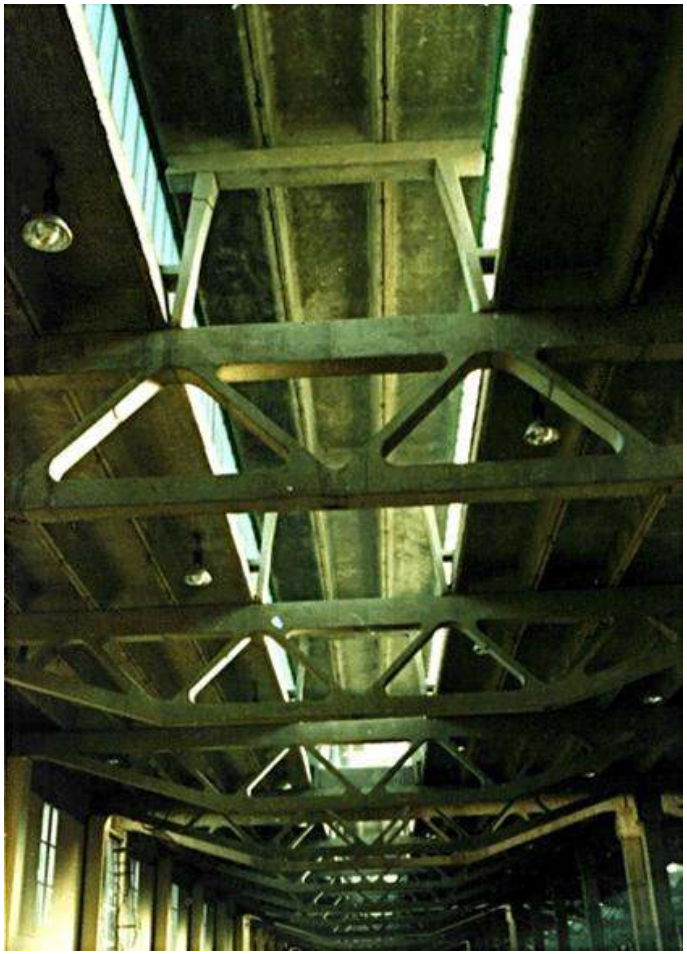
Hangar at
Chennai

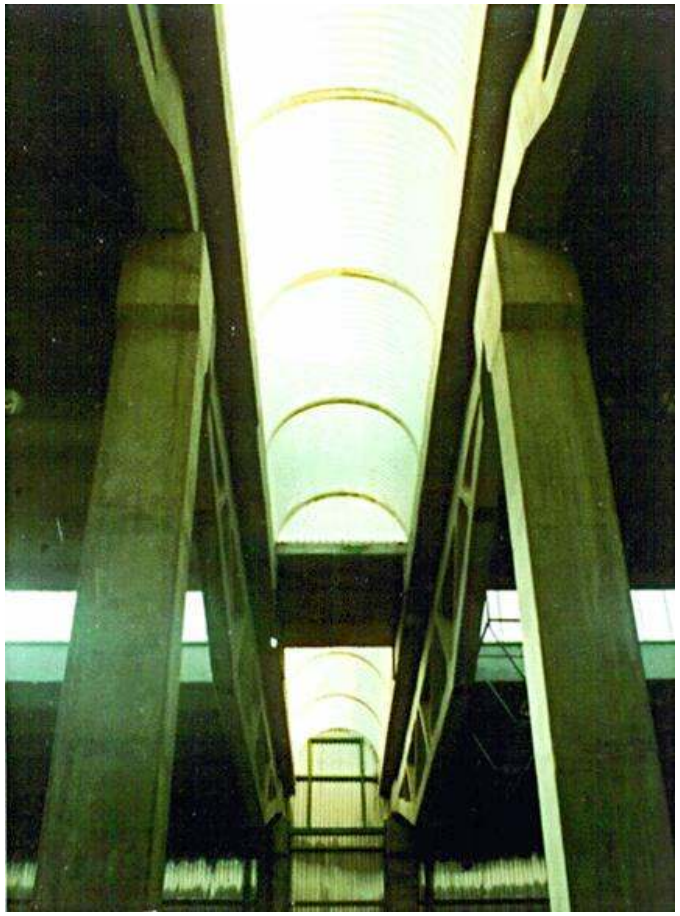
ATRIUM HOTEL, BANGKOK

The prestigious 600-room Atrium Hotel is located on New Petchburi Road in the heart of the city of Bangkok. The project includes a commercial complex on the same site with common recreation facilities, restaurants, car parking and roof-top helipad. The building consists of 25 floors above ground in addition to 3 basements and a huge atrium topped by an arced glass roof. Due to the treacherous sub-surface conditions of water-logged soft clay, bored cast-in-situ piles of upto 1.5 m dia and 60 m length have been provided. Prestressed (post- tensioned) concrete slabs of only 230 mm average thickness span across column grids of 8.2 m * 9.7 m with cantilevers upto 4.9 m. Designing for the large nos. of perforations due to passage of ducts through the slab presented a significant challenge.

PALM COURT APARTMENTS, BANGKOK

The luxurious serviced apartments building is located on Soi Saladaeng in the centre of Bangkok city. The project comprises 25 floors above ground in addition to 3 basements. It consists of fully furnished and generously equipped serviced apartments as well as common recreational, security, car-parking, health club and conference facilities. Prestressed (post-tensioned) concrete slabs were employed to reduce the total height of the building, to obtain uncluttered ceilings in the living areas and to incorporate 4.5 m long cantilevers from the outermost row of columns.





COLOUR PICTURE TUBE PLANT, GHAZIABAD, UTTAR PRADESH

This prestigious industrial construction with a built-up area of 35,00X5 sqm houses the Colour Picture Tube Plant of M/s Samtel Color Ltd. set up in collaboration with M/s Mitsubishi Electric Corporation of Japan.

The main plant building has a column grid of 21 25m x 10 0m and a roof consisting of site-produced precast and prestressed concrete elements devised to be conveniently cast, transported, handled and erected by methods and equipments appropriate to Indian conditions Elimination of cost and time over-runs and the creation of a structure with striking visual features, arresting aesthetics and functional flexibility were some of the highlights of the project.

Awards

- **Association of Consulting Civil Engineers (India) AWARD 1993 for Innovative design**

ARCH BRIDGE OVER DODAN NALLAH, HLMACHAL PRADESH

Built in scenic mountain ranges and snow-capped peaks to the order of the Himachal Pradesh PWD, this open-spandrel concrete arch bridge lies near Dharamsala in the Kangra Division. Bridge aesthetics was one ol the major concerns during the evolution of the conceptual design and in selecting the thickness, disposition and proportions of the concrete elements The high embankments on either side of the bridge induce pressures on abutments corresponding to 20m earth fill To affect overall economies in the 40 m effective span arch bridge all the main structural elements (i e arch, spandrel columns, deck slab and abutment walls) have been made monolithic Though this induces complications in structural analysis, aspects of durability and maintenance-free service conditions are heightened considerably as a result.

Awards

- **Institution of Bridge Engineers National Award 1996 for Excellent Aesthetics Matching with Environment**

RADISSON HOTEL, NE W DELHI

The first Radisson Hotel in New Delhi was opened near the Indira Gandhi International Airport. The 5 star 300-room hotel complete with health club, swimming pool, discotheque, food court, coffee shop, business centre, banquet hall, sports bar, pool bar and squash court etc. has an attached Commercial Centre making a total of 40,000 sqm built-up area.

The project comprised 2 basements and 6 floors above ground. The structure incorporates special ductile detailing for earthquake resistance. It has over 30 transfer girders apart from large span and heavily loaded areas catering to 600mm thick earth fill for landscaping and movement of fire tenders.

BUILDINGS OF THE BRITISH HIGH COMMISSION, NEW DELHI

Two buildings, namely, the Immigration Office and Medical Centre were added to the British High Commission located in New Delhi's prestigious diplomatic enclave (Chanakyapuri.)

The structural design was essentially based on BS: 8110 at the same time taking account of the provisions of IS: 456. Some of the special features of the structural design included the concepts for avoiding disproportionate collapse by localising accidental damage and the concept of robustness of the structure to enable improved response to external forces.

CENTRAL SECRETARIAT-GURGAON CORRIDOR

The 3.45 km section comprising Contract BC-16 of Delhi Metro is constituted of 4 nos. underground stations (Race Course, Jorbagh, INA and AIIMS) and tunnels. All the stations were constructed by cut and cover method using “top-down” method. The length of each station is 318m & width is 21m including 20m workshaft areas of both ends for launching & retrieval of tunnel boring machines. The stations consist of island platform with trains on both sides.

CENTRAL SECRETARIAT- BADARPUR CORRIDOR

The 5.42 km section comprising Contract BC-24 of Delhi Metro is constituted 3 nos. underground stations (Khan Market length 239m width 20m, JLN Stadium length 300m width 20m and Jangpura length 285m width 20m) and cut and cover as well as bored tunnels were constructed in extremely difficult and sensitive areas. The stations were constructed generally by “top-down” construction. The Jangpura station is located below the flowing waters of the Nallah Drain. The launching and retrieval shafts formed a part of the station structure except near Udyog Bhawan where a full-fledged 60m long launching shaft was installed in the geologically difficult rocky strata which is sloping both transverse to as well as along the alignment.

One of the most important bridge structures in Delhi Metro's elevated corridor is the 652.6m long Bridge across Yamuna River, connecting the populated areas on the east and west banks. The bridge is incrementally launched from the east bank (pier P14) over 12 spans of 46.2m making a continuous length of 554.4m. The bridge has a longitudinal gradient of 0.654% with the higher end located on the east bank. The prestressed concrete box girder consists of internal prestressing permanent cables while those required for the temporary phase are external to the concrete. One single box girder supports two unballasted tracks for the "up" and "down" traffic. The tractive/braking forces and also the entire longitudinal seismic force are transferred to the restrained pier P14. The transverse seismic force is transferred at each pier location through Pot Bearings.

Awards

- **Institution of Bridge Engineers National Award 2000 for Innovative Construction Engineering Including Temporary Works**

INCREMENTALLY LAUNCHED BRIDGE OVER RIVER YAMUNA , NEW DELHI

ELEVATED VIADUCT FROM TIS HAZARI TO RITHALA, NEW DELHI

The Elevated Viaduct of the Shahadara-Rithala Line of Delhi Metro has typical standard spans varying between 21.6m and 29.1m determined mainly by the site constraints at ground level for the placement of foundations and piers. The length of standard segments is 2.5m.
All precasting was done at a centralised casting yard. The alignment is characterized by sometimes-tight curvatures as it snakes through some of the most crowded areas of the city. It has several breaks at the location of stations.

The 2 tracks (unballasted) are supported on a single box girder section whose deck is sloped inwards to enable controlled drainage through the pier.
The foundations are bored cast-in-situ piles constructed by hydraulic rigs. The stratum is sand-slit or silty sand with some areas susceptible to liquefaction upto a depth of 10.0m during seismic activity.

The piers are architecturally shaped, cast in a single pour to obtain the anticipated finish. The clear height of 5.5m in the carriageway portion of the ground level roadway is always available.

Awards

- **Institution of Bridge Engineers National Award 2005 for Innovative Construction Engineering Including Temporary Works**
- **Consulting Engineers Association of India Award 2005 got Excellence in Consultancy Services**

VIADUCTS & STATIONS FROM BARAKHAMBA ROAD TO DWARKA, NEW DELHI

Detailed Design Consultancy for Elevated Viaduct covers the 22 km distance from Connaught Place to Dwarka through the most crowded areas of the city. It includes 20 stations and bridge across Najafgarh Drain. Precast segmental U-girders have been adopted. Off-road buildings for the 20 stations en route have a striking appearance. Earthquake resistant features, aesthetics and durability of the viaduct and stations were given special considerations.

Awards

- **FIB Award 2006 for Outstanding Concrete Structures – Selected as a nominated structure in recognition of its positive influence and reputation and promotion of concrete structures**

DHAULA KUAN INTERCHANGE, NEW DELHI

The rather complicated grade-separated interchange at Dhaula Kuan represents the gateway to the Capital city from the airport. Due to its sheer size and importance in sociological terms, a bridge looms prominently in public consciousness and these facts cannot be ignored. Disregarding its harmonious integration into the natural or built environment can have significant repercussions, the detrimental effects of which are always significant. It has been found that at later stages, the corrections from aesthetic considerations of badly conceived solutions can only result in marginal or cosmetic improvement.

Graceful and aesthetic bridges elicit a sense of appreciation from lovers of natural beauty. Smooth and elegant flyovers earn the unmitigated gratitude of millions of urban dwellers enhancing quality of life in the cities.

The main straight bridge with 2x3-lane carriageways with footpaths are shaped with tapered wings to accentuate its slim profile. The deck consists of voided slab, 4-span continuous construction. The bold piers are dimensioned to give a sense of stability and strength.
The structurally complex shapes of the skew-cum-curved continuous decks were the highlights of the structural design

Awards

- **Institution of Bridge Engineers National Award 2005 for Innovative Excellent Aesthetics Marching with Environment**

PUNJAGUTTA FLYOVER, HYDERABAD

A 1.5 km long flyover in the heart of Hyderabad's commercial and business centre, was constructed for crossing 3 important junctions at Rajiv Gandhi, Punjagutta and NFCL. Precast Segmental construction using continuous spans for the deck was selected as the most suitable alternative to reduce disturbance to existing traffic. Surmounting challenges posed by underground utilities often dictated the design. Aesthetics, durability and environmentally sensitive shapes were conceived to suit the sensitive loaction. The main flyover is supplemented by 2 auxiliary ramps at the Punjagutta junction.

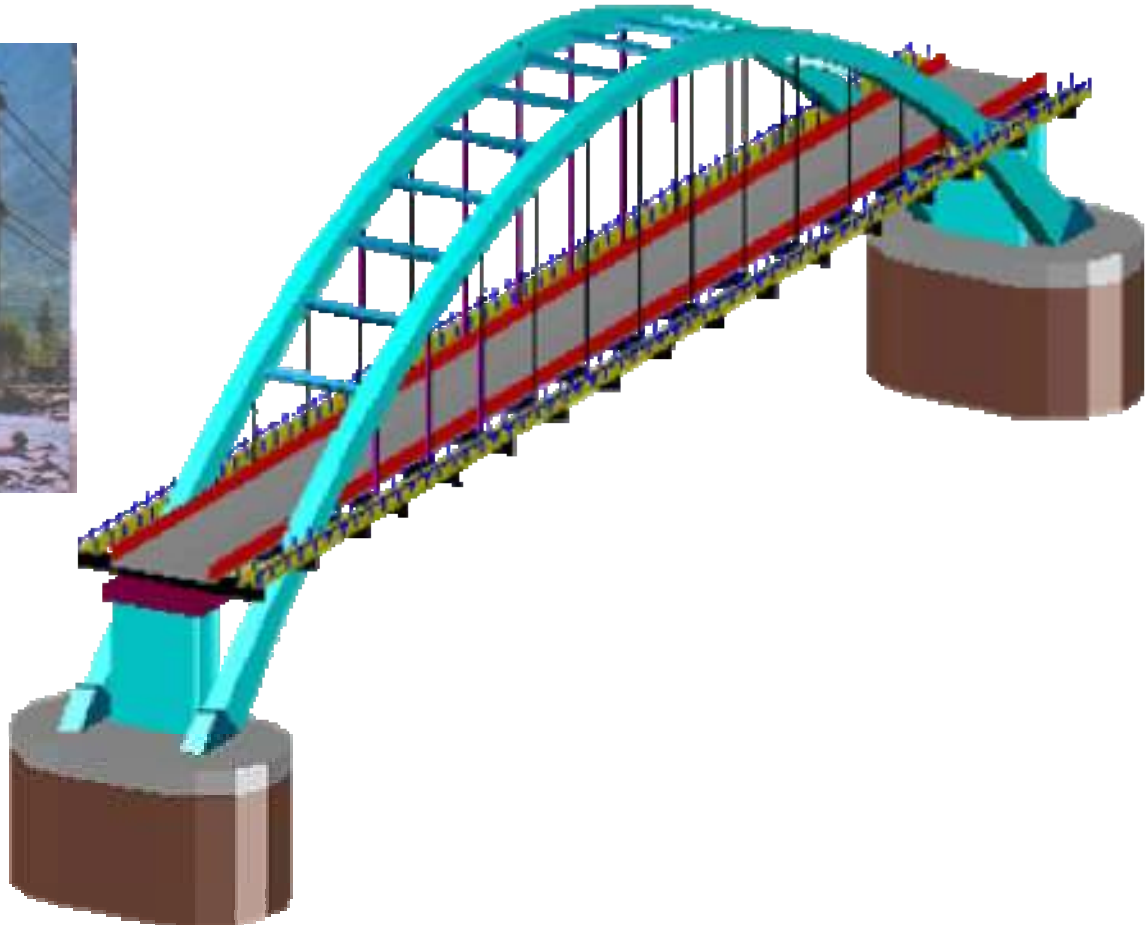
Awards

- **Institution of Bridge Engineers National Award 2010 for Superstructure in PSC**

INTERNATIONAL CONTAINER TRANSSHIPMENT TERMINAL, PORT CONNECTIVITY, COCHIN

This bridge (Bridge no. 7) is a part of the Port connectivity Link being developed by NHAI connecting various islands with NH-17.

The structural system consists of simply supported spans resting on very deep pile foundations. The superstructure has been re-engineered to make it construction friendly by employing precast segmental post tensioned girders. The girders are precast in parts and spliced together with the aid of prestressing on top of assembly girders. This greatly facilitated transportation by pontoon and handling of the girders by floating crane in the creek.



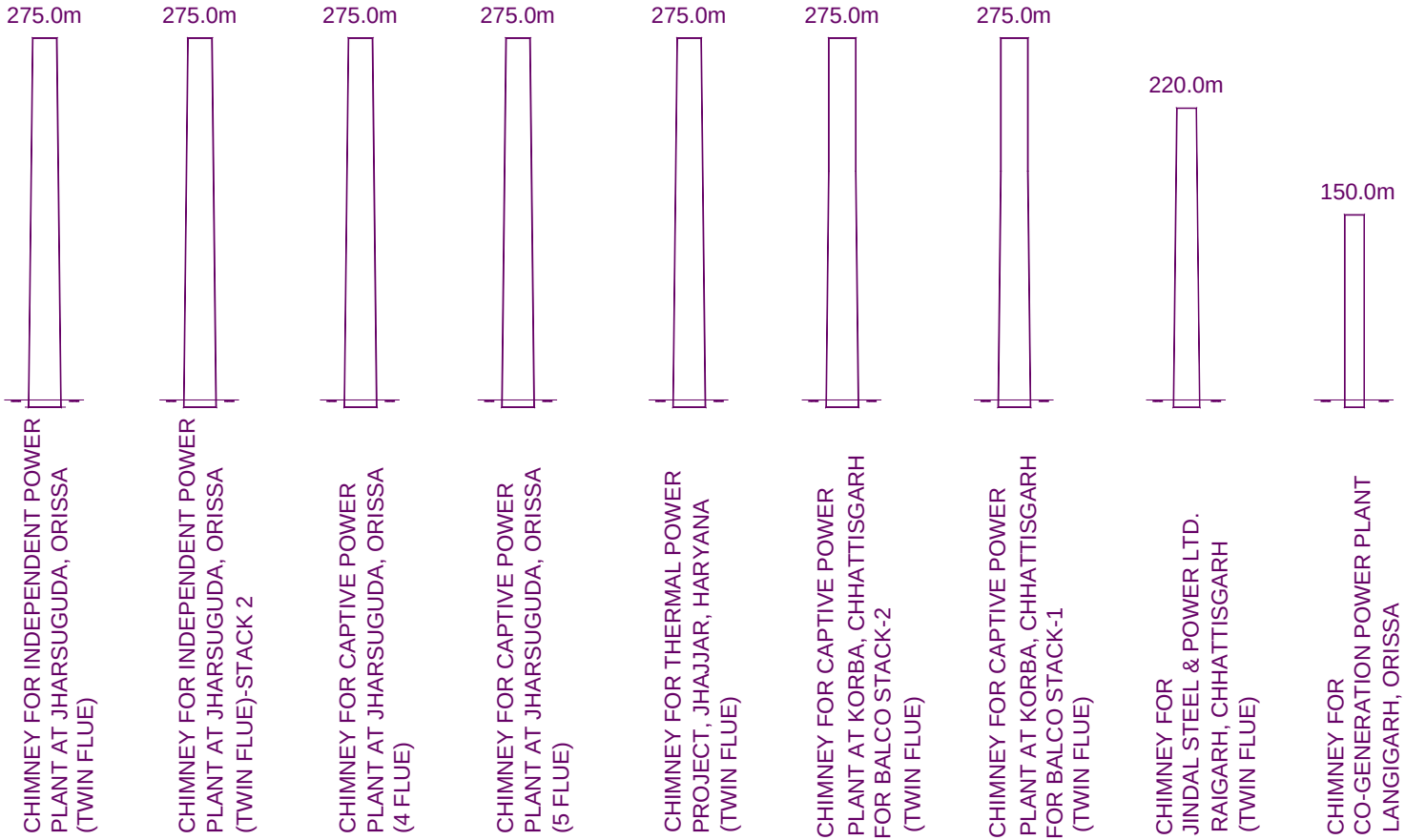
JIA BRIDGE, HIMACHAL PRADESH

Structural design consultancy for 372m long bridge with main arch span of 120m in solid RCC, with 7 nos. end spans and 5 nos end spans on either side, to be constructed near Kulu, to the orders of Himachal Pradesh, PWD. The arch supports a 2-lane deck slab and rests on 11m dia well foundations at each end.

INDIRA GANDHI MEMORIAL HOSPITAL, MALDIVES

This hospital was gifted by the Indian Government to the people of the Republic of Maldives.

This is a 200-Bedded hospital complete with diagnostic centre, out-patient department, operation theatres and housing for medical staff. Located adjacent to the sea the construction of the basement 6m below sea level was an extraordinary challenge. The structure has been designed to withstand Earthquake and Wind Forces which are relevant to the region. The top floor has been provided with a steel roof comprised of cold formed profiled roof sheeting. All the structural steel elements have been specifically protected against corrosion, in the severe exposure environment of Maldives.



CHIMNEYS

- RCC Chimney For CO Boiler, Mathura
- 90m RCC Stack, Panipat, Haryana
- Chimney For Sikka Thermal Power Station, Jamnagar District, Gujarat.
- Chimney For ATV Petrochem Ltd., Mathura.
- RCC Chimney at Jamul, Distt Raipur, M.P
- West Port, Dry Bulk Terminal Facilities, Malaysia
- Single Flue RCC Chimney, Damanjodi, Orissa
- 100m High Single Flue Chimney for Marudhar 1x135 Lignite Based Power Plant Project at Gurha Village Dist. Bikaner, Rajasthan
- 275m High 5 Flue & 4 Flue RCC Chimneys for Jharsuguda Captive Power Plant, Vedanta Aluminium Ltd, Jharsuguda, Orissa (2 Chimneys)
- 275m High Twin Flue RCC Chimney – Stack-1 & Stack 2 (Chimneys), Jharsuguda, Orrisa
- 275m Tall Twin Steel Flue RCC Chimney – Stack-2 for 4 x 300 MW Captive Power Plant for Balco Korba, Chhatisgarh
- 275m Tall Twin Steel Flue RCC Chimney – Stack-1 for 4 x 300 MW Captive Power Plant for Balco Korba, Chhatisgarh
- 150m High Multi Steel Flue RCC Chimney, for 2 x 210 MW Co-Generation Power Plant of Vedanta Aluminium Ltd. at Langigarh, Orissa.
- 86m Tall Single Flue RCC Chimney for M/s Deepak Fertilisers and Petrochemicals Corporation Ltd. at Taloja, Raigarh
- 275m Twin Steel Flue RCC Chimney at Jhajjar, Haryana
- 220m High Twin Steel Flue RCC Chimney for 2x135 MW Power Project for JPL, Raigarh
- 220m High Twin Steel Flue RCC Chimney for 2x135 MW Power Plant at Chhuri, Chattisgarh

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