

R.N. RAIKAR
BE, FIE, FIV, FI Struct E (Lon), FPCI (USA), MPCI (USA), F.C.S.C.E. (Cen)
Chairman



STRUCTWEL DESIGNERS & CONSULTANTS PVT. LTD.

ARCHITECTS • ENGINEERS • R & D • LABORATORIES

Navi Mumbai Office & R & D Unit
Structwel, Plot No. 15, Sector 24,
Off Sion Panvel Highway,
Turbhe, Navi Mumbai - 400 705.

Tel.: 2784 1010 (7 Lines) Fax : 91-22-2784 1007
E-mail : structwel@vsnl.net
Web : www.structwel.com
ISO 9001:2000 Certified

FROM CHAIRMAN'S DESK
Welcome to **STRUCTWEL**, a professional consulting firm since 1967.

STRUCTWEL offers practically innovative sound solutions for long durability and minimum maintenance of structures. It is a fine blending of engineering and materials and hence our contributions are "trend-setting". Strong technical team at **STRUCTWEL**, with cordial and friendly work environment, creates better structures.

Specially developed **empathy** for structures reveals damaging parameters and in turn offers enhanced serviceability through precise corrective measures. We have acquired this insight through Structural Engineering and Material Chemistry. A wide data is acquired by our in-house material-testing laboratory and by non-destructive field-testing through series of investigations on variety of structures. Our exclusive expertise in this field enriches your structures.

Material chemistry with age related properties is an attribute to Heritage Structures and we have gone a big way in Conservation of such structures. Management skills and system based action plans ensure timely schedules, quality and cost control in our Turn Key Projects.

We contribute to codal updates through our widely acknowledged background. It is specialized Forensic Engineering, an advance civil engineering. It has our pioneering contributions.

These friendly structures all over, radiate with serviceability happiness due to our association.

R.N. Raikar
R.N. RAIKAR
CHAIRMAN

GOREGANI (LABORATORY)
Tel: 2572 09 91
Tele-Fax: 91 - 22 - 2578 4440

WAKH (LABORATORY)
Tel: 2446 93 49
Tele-Fax: 91 - 22 - 2444 28 49

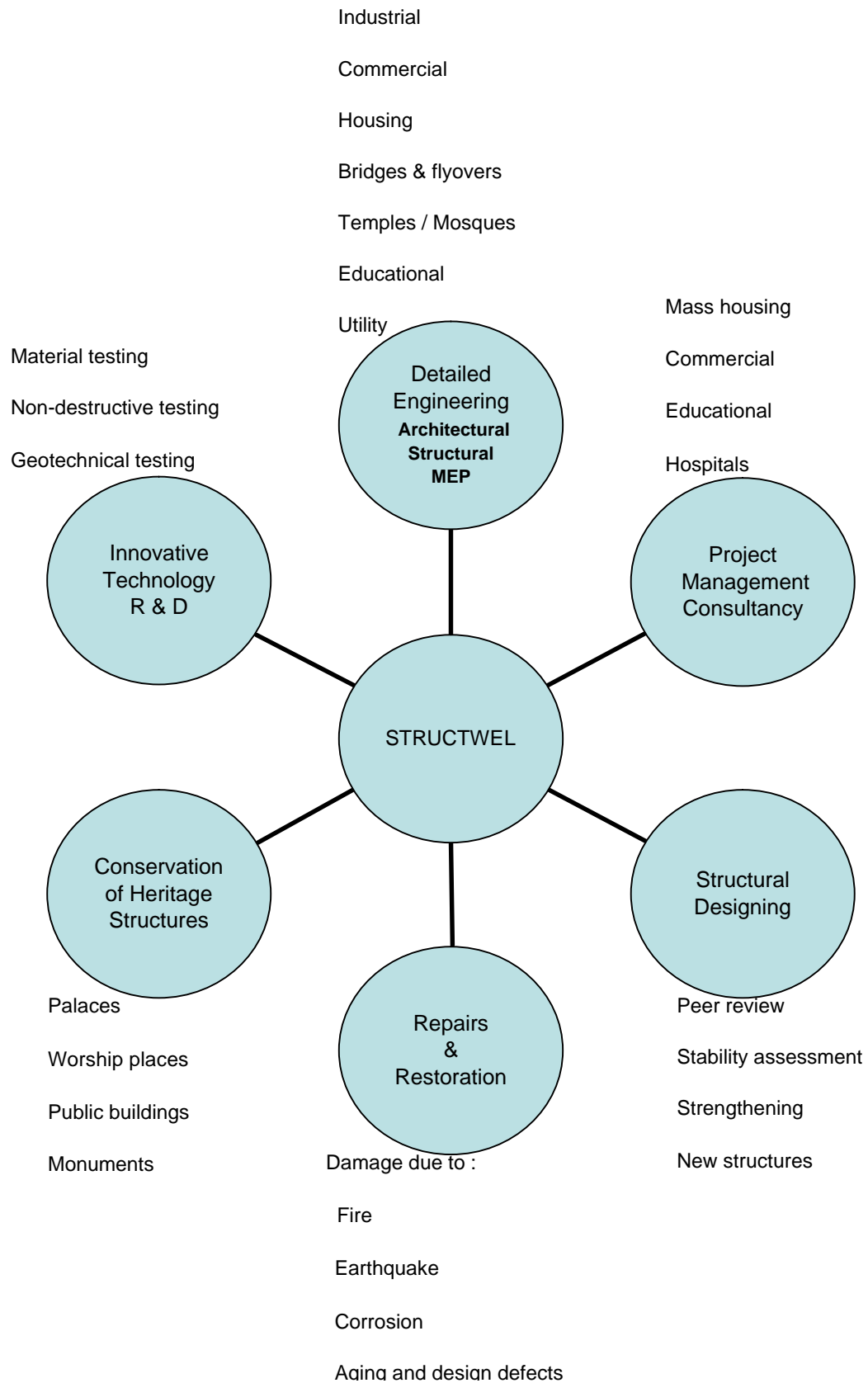
THANE (LABORATORY)
Tel: 2547 32 77
Tele-Fax: 91 - 22 - 2547 32 92

CSRL - STRUCTWEL LAB (PUNE) PVT. LTD.
Tel: 91 - 20 - 2351 15 91 / 2351 15 07
Fax: 91 - 20 - 2351 17 21

Growth of STRUCTWEL

- Company was launched, 1967.
- **STRUCTWEL** becomes private limited company, 1978.
- Branch office at Pune, Maharashtra, 1981.
- Branch office at Vashi, Navi Mumbai, 1984.
- Office at Vashi gets R & D recognition, 1988.
- In-house material testing laboratory started at R & D Unit, Vashi, 1988.
- **STRUCTWEL** opens other laboratories at Mahim, Mumbai in 1998, at Pune, Maharashtra in 2001, at Thane, Maharashtra in 2003 and at Goregaon, Mumbai in 2004.
- R & D Units at Vashi and Pune receive Accreditation (ISO / IEC 17025) from NABL, Govt. of India, in 2000 and 2003 respectively.
- **STRUCTWEL**, Turbhe Office certified with **ISO 9001:2000** since year 2004.
- **STRUCTWEL** shifts from Vashi to Turbhe to an entire building having basement, ground floor and upper three storeys. 2007.
- **STRUCTWEL** opens a R&D Unit and Laboratory at Dubai, UAE. 2007.
- **STRUCTWEL** opens a laboratory at Kalyan, Thane in 2007.

Services offered by STRUCTWEL



Welcome to **STRUCTWEL**

STRUCTWEL DESIGNERS & CONSULTANTS PVT. LTD. (STRUCTWEL) was established as a proprietary concern in 1967, by Mr. R.N.Raikar, a Chartered Civil Engineer. Mr. Raikar is credited for his original contributions to Investigation Engineering and Corrective Innovations in the study of structural failures, both Industrial and Infrastructural in nature.

STRUCTWEL over the multitude of years has grown into reputed consultancy concern, which offers services of interdisciplinary in nature covering Architecture, Engineering and Project Management. Having started as a Specialist in major Civil Engineering Projects including complex restoration assignments, the firm has in the years, developed capabilities to offer Total Project Services.

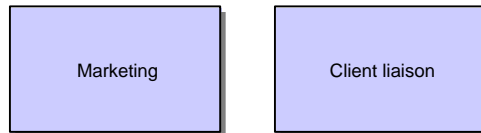
STRUCTWEL has established first material testing laboratory at Vashi, Navi Mumbai, in 1988. This is a laboratory Accredited by the NABL (National Accreditation Board for Testing and Calibration Laboratories, Department of Science & Technology) which is assessed and accredited in accordance with the standard ISO/IEC 17025.

Areas of Consultancy

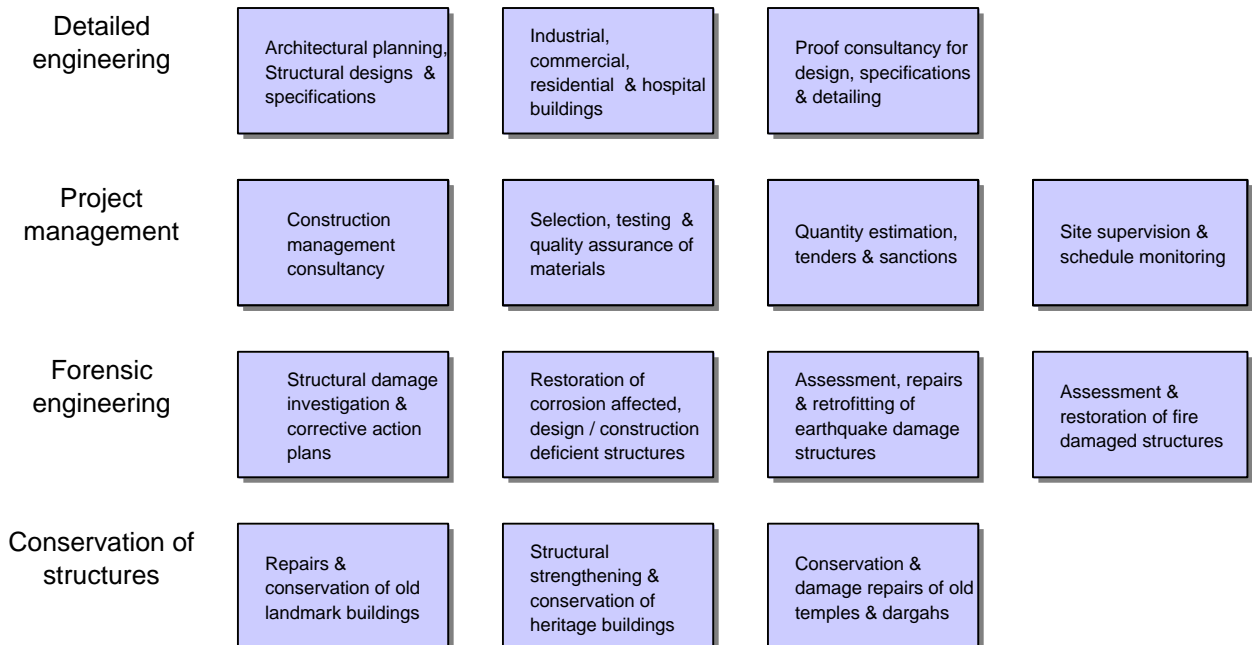
- Specialized Services for New Construction
- Health Assessment of Existing Structures
- Investigations and Failure Analysis
- Testing and Instrumentation Expertise
- Construction Materials Evaluation
- Repairs and Rehabilitation
- Heritage Conservation
- Research and Development

Functional Organisation Chart

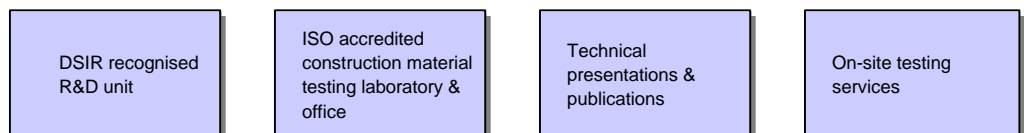
Business promotion



Operations



Technology development & services



Finance & administration



Mr. Ramesh N. Raikar **Chairman**

B.E. Civil (Pune,1962), F.I.STRUCT.E (U.K.)

F.I.E.(India)

F.A.C.I. (USA)

F.C.S.C.S. (Canada)

Honorary Member, A.C.I. (USA)



Founder member of Structwel Designers (1967) and Chairman and Managing Director of Structwel Designers & Consultants Pvt. Ltd. from 1978. Chairman of the company Since 2004.

Structural Engineer with special interest and empathy for structures in distress.

Since 1967 he has investigated more than 1,000 failures and serviceability problems involving a variety of building components, materials and structures.

Over the years he has achieved the expertise in repairs to structures, damaged due to corrosive and aggressive chemical environment, design / workmanship deficiency, and damaged due to fire, cyclone and earthquake.

He has developed expertise in scrutiny of plans and specifications for preventive maintenance and durability. His long standing experience in the field, often offers him invitation for peer review that includes second opinion for special structures/ projects.

In-house R & D Unit and Non-destructive testing laboratory was started under his guidance in 1984.

His keen interest in dissemination of knowledge has engaged him in organising several conferences, seminars in India and abroad. He has been special invitee speaker as chief guest, key note addressee and member/ chairman on panel discussion.

He has documented his experience in following publications in the form of books.

Technology of Building Repairs (1973).

Learning from Failures (1987, RP 2002).

Diagnosis and Treatment of Structures in Distress (1994).

Durable Structures Through Planning for Preventive Maintenance (1994).

Some of the honours and awards bestowed on him during his carrier.

- o All India Senior Structural Design Competitions. Silver Medals, 1966 and 1967.
- o ACI Chapter activity Award (USA), 1983.
- o Association of Consulting Engineers (India) Award, 1990.
- o Special Recognition Award for Leadership Role in the Concrete Industry in India by CANMET / ACI, 1994.
- o Vishveshvaraiya Construction Excellence Award in category of Engineer of the Year by ICMR, 2003.
- o ACI, USA awarded ACI Honorary Membership, 2004.

Mr. Chetan R. Raikar

Managing Director

B.E. Civil (SPU, Gujarat, 1986)

M. I. E. (India)

M. I. I. B. E. (India)

M. I. H. S. (India)

M. I. S. S. E. (India)

M. A.C.I. (USA)



Specialised Professional Training

Material Testing and NDT at IIT, Mumbai.

Advanced NDT Applications at AL Technologies (S) Pte Ltd, Singapore.

Advanced Cement Testing at Research Lab. of ACC, Thane.

Laboratory Assessor's Training Course at Mumbai. (ISO 17025)

ISO Assessor's Training Course at Pune. (ISO 9001 - 2000)

Workshop on Conservation of 17th Century Painted Stucco Detailing in Slovenija. (2006)

Civil engineer with great management capability. Leading a staff of over 160 .

His prime interest is in structural repairs and conservation of Heritage Structures. He has successfully restored and renovated over twenty five old prestigious heritage and archaeological buildings in India.

He has been solely responsible for developing first material testing laboratory in private sector of *STRUCTWEL* to receive accreditation based on ISO/IEC 17025:2005 by NABL. With his able guidance, the laboratory conducts more than 358 tests covering the whole gamut of building materials. His team on the wheels can reach any remote site in India and perform all field tests.

He also has extensive experience in general repairs and restoration of industrial, commercial and housing complexes and is continuing with it.

He is associated with various educational institutions in terms of teaching.

He became Jt. Managing Director of Structwel Designers & Consultants Pvt. Ltd. in 1997 and since 2004 he has become company's Managing Director.

Awards and Achievements.

- o Young Member Award for Professional Achievement by ACI (USA), 1999.
- o Governor's nominee on the Buildings & Works Committee, University of Mumbai.
- o Laboratory Assessor certified by N.A.B.L., Ministry of Science & Technology, Government of India, New Delhi, since 1999.
- o Two patents to his credit for innovations in laboratory testing machine development.
- o More than forty technical presentations at national and international conferences.
- o ISO lead auditor 2004.

Directors of STRUCTWEL

Mr. V. N. Raikar
B.E. (Pune) 1964
M.I.E. (India)
Director (Advisory)



Over 35 years as Developer and Industrialist.
Responsible for construction of several multistoreyed residential, commercial and industrial buildings at various cities in Maharashtra.
He is also developing agricultural and educational project at Kamshet in Maharashtra.
Engineering with multifaceted accomplishments.

Mrs. U. R. Raikar
B.Sc. (Mumbai) 1960
M.Sc. (Mumbai) 1962
Director (Systems & Management)



Over 35 years of experience as computer expert..
Responsible for computers and its applications.
Software and hardware developments in **STRUCTWEL**.
Computer management for entire technical and administrative support.

Mr. K. R. Raikar
B.E.(Mumbai), 2002
M.S. (USA), 2003
A.I.E.(I), M.A.C.I.(USA)
M.I.S.S.E.(I)
Executive Director



Specialised Professional Training
ISO (9001-2000) Auditor Course, at Mumbai, 2004.
Advance course on Computer Analysis of Structures, 6 months, at Mumbai 2004.
Bridge Design at S.E.R.C., Chennai, 2005.
Contract Management at Mumbai, 2006.
Civil engineer with management capability. Leading large number of projects.
He joined STRUCTWEL in 2002 after completion of Masters in Structures and Materials with specialisation in Bridges. His prime interest is in the field of bridge repairs and retrofitting. He has successfully restored and repaired more 20 bridges in India.
He has several Industrial and Commercial Projects to his credit for Total Project Management.
He has successfully completed stability assessment of over 100 structures.

Top Management Team

Mr. J. C. Kadam
B.E. (Karad) 1991
Sr. Exec. (Projects)



Joined **STRUCTWEL** in 1993.
He Handles most of the projects at **STRUCTWEL**, Vashi.
Construction management of repair structures is the main area of his specialisation.
He has experience in executing various residential projects as well as repair works. The work involves damage surveys, estimation and preparation of tenders for new buildings and for repair works of old structures, processing bills etc.
He is involved in survey, assessment and retrofitting of earthquake affected structures in Gujarat, a huge project managed by **STRUCTWEL**.

Mr. M. S. Naik
B.E. (Pune) 1984
D. C. T. (AU) 1996
Exec. (R & D)



He joined **STRUCTWEL** in 1996.
He is managing the laboratories of **STRUCTWEL** with the help of trained staff. He also has expertise in construction technology.
Worked on large number of sites and gained knowledge in the field of construction materials and their behavior, quality assurance and quality control at sites.
At **STRUCTWEL** he has successfully established the work set-up for large number of material tests in laboratory as well as at sites.

Mrs. M. D. Gokhale
B.E. (Mumbai) 1988
Exec. (Design)



She joined **STRUCTWEL** in 2001.
She is a reliable support in peer review jobs at **STRUCTWEL**.
She has experience in RCC design and quantity surveying of Bridge Projects, residential and public buildings and structural design of Cement Plants.
At **STRUCTWEL**, in addition, she has specialised contribution in earthquake affected structures.

Top Management Team

Mr. Shyamal Saha
B.Sc. (Burdwan) 1991
DME (West Bengal) 1994
Exec. (Projects)



He joined **STRUCTWEL** in 2005.
He is specialised in Project Management. Fabrication of Equipments, tanks, etc. Erection of Heavy Equipments, Erection (Static and Rotating). Fabrication & Erection of Piping. HVAC and Fire fighting.

Mrs. Pamela Dev
G.D. Arch. (Chandigarh) 1993
B. Arch. (Mumbai) 1999
Exec. (Architecture)



She joined **STRUCTWEL** in 2006.
Her job involves Architectural planning, understanding client requirements, preparation of presentation drawings, working drawings, corrective supervision, contractors bill scrutiny etc.
She also handles design development and drawings of restoration/ renovation of hospitals, Residential, commercial, industrial and heritage buildings.

Mr. Kranti Bhushan
B.Sc., D.C.E. 1990
Head
(Business Development)

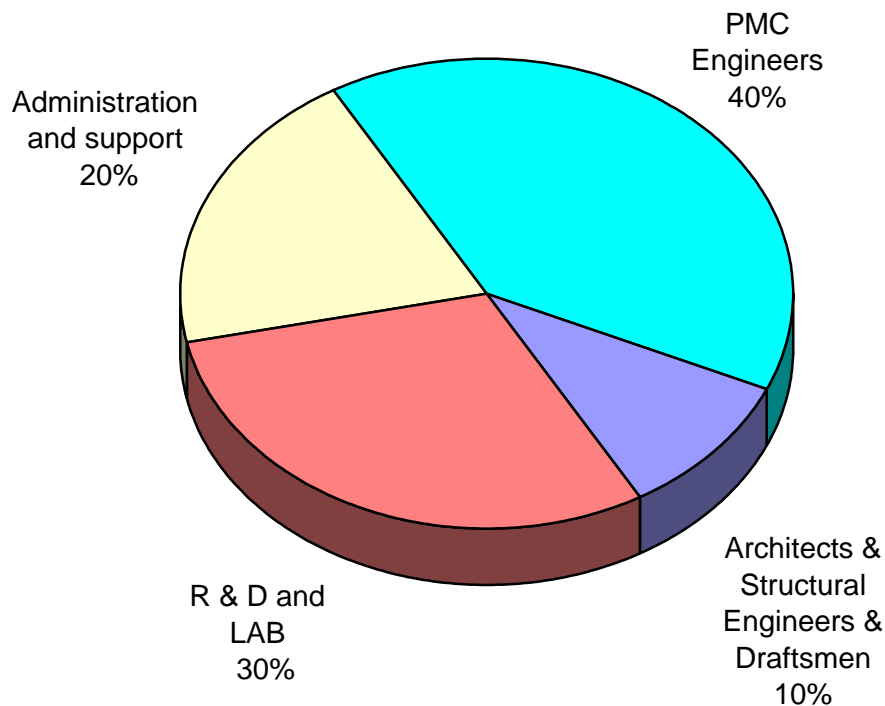


He joined **STRUCTWEL** in 2006.
He has over 15 years of experience in Marketing and Business Development related to Architecture and Construction Industry. Heads the Marketing team of Structwel, interacts and liasions with the Clients.

Management Team at *STRUCTWEL*

- Staff of over 180 personnel is harnessed in various disciplines of *STRUCTWEL*.
- Personnel are distributed over all branches of *STRUCTWEL*.
- Staff members are assigned according to project requirement.
- In-built staff training for skills and expertise update in techniques & technology is provided.
- Key personnel on management are constantly exposed to national and international environment through conferences and meetings.

Staff Distribution by Activities



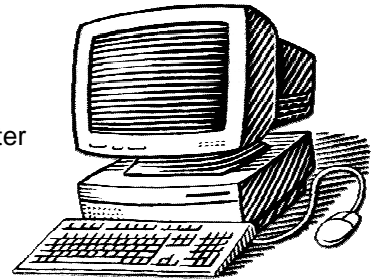
Together we build

Together we grow

Computer Facility

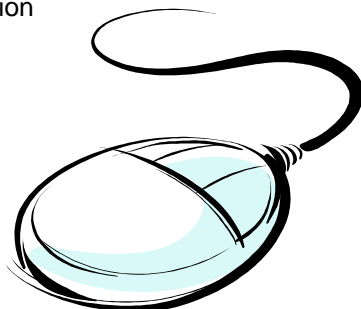
Computers in harness

- ▶ **STRUCTWEL** has a strong, efficient and **well connected** computer support at all offices.
- ▶ All computers are loaded with job oriented application packages and are connected in LAN and WAN.
- ▶ Personnel working on computers are well trained on their respective application software to produce fast and accurate results.
- ▶ Hard copies are obtained on dot matrix printers, B&W and colour inkjet printers, B&W and colour laser printers, A0 colour plotters, A4 colour scanners and A0 B&W scanner.



Our software of choice

- | | |
|---|---|
| ▶ Architectural and structural drafting and planning | Architectural Desktop, AutoCAD LT |
| ▶ Structural analysis and design | STAAD.Pro, STRUDS |
| ▶ P M C | MS Project |
| ▶ Land surveying | Road Master |
| ▶ Material testing, geotechnical testing, automation of laboratory, on-line reporting from soil and cube testing machines | Software developed in-house for automation of Lab. Activities, Tailor made software |
| ▶ Accounts and payroll | Tally, Software developed in-house |
| ▶ Office management and administration | MS Office, FoxPro, VB, Power Point, Software developed in-house, Internal Messaging Software. |
| ▶ All small and large engineering problems, documentation | Tailor made software developed in-house |



EXPERIENCE

**Project Management Consultancy
RETAIL**

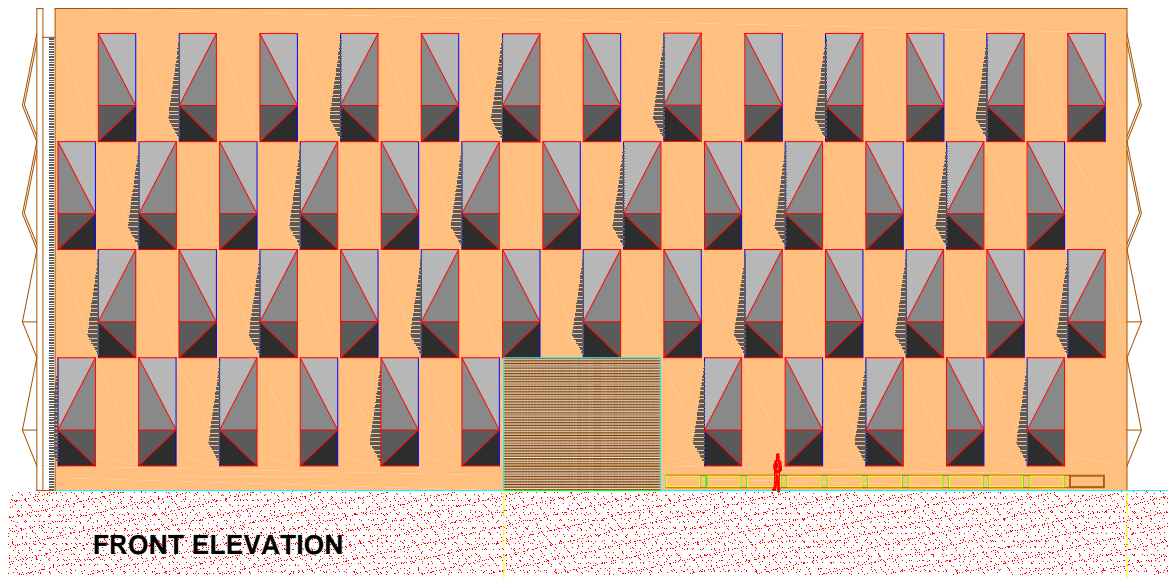


METRO JUNCTION

- Metro Junction, Mega mall at Kalyan. Developed by Westfield Retail Pvt. Ltd. is going to be the main shopping hub for Kalyan, Dombivli and Ulhasnagar.
- **STRUCTWEL** is providing PMC services including structural designing for this complex.
- The mall will have a Hypermarket, Multiplex, Entertainment center and a Temple also.
- Total Built Up Area : 6,00,000 Sq.ft.
- Cost of Project : Rs. 50 Crores.

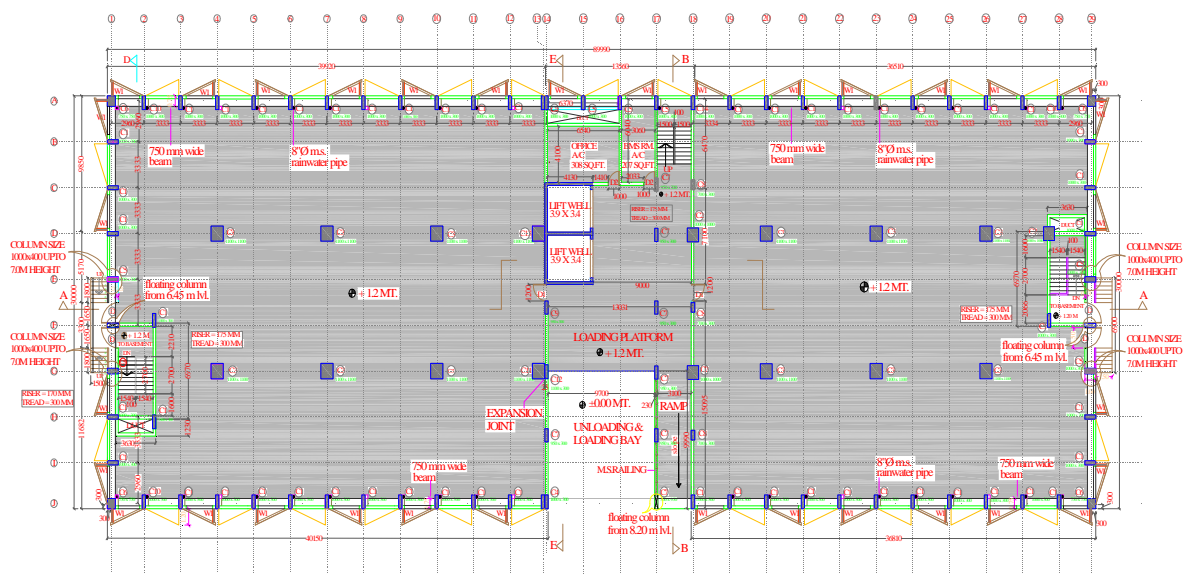
**Please feel free to contact our offices
to discuss your project or visit our
website at <http://www.structwel.com>**

**Project Management Consultancy
WAREHOUSING**



WRITER CORPORATION

- Greenfield warehouse project for Writer Corporation, in Navi Mumbai.
- BUA : 60,000 Sq.ft.
- Cost of Project : 15 Crores.
- **STRUCTWEL** is providing Project Management Consultancy services including architecture and structural design.
- The project is in final stage of completion.



GROUND FLOOR PLAN

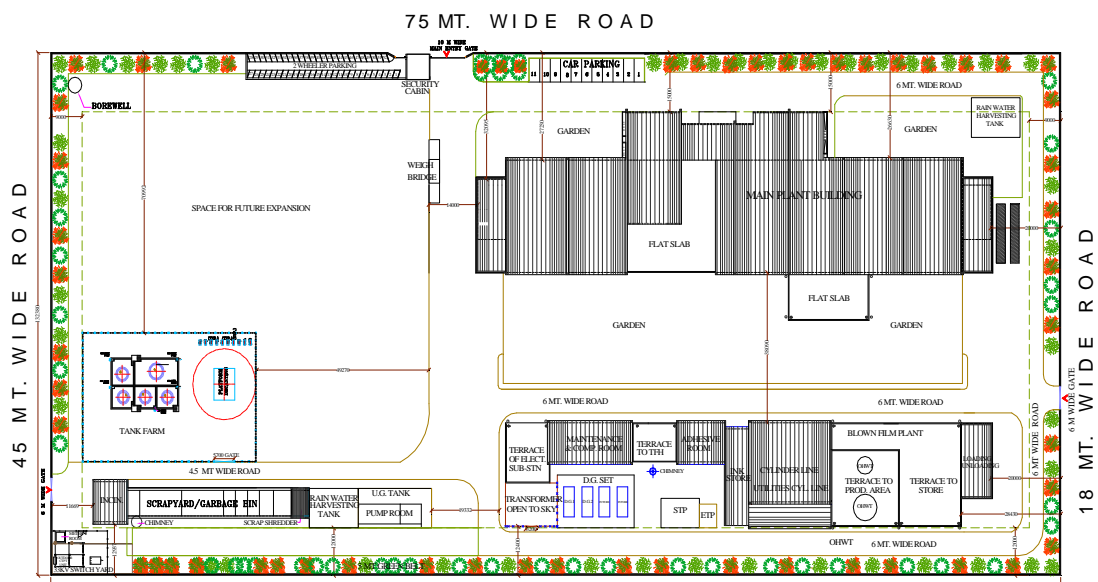
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**Project Management Consultancy
INDUSTRIAL**



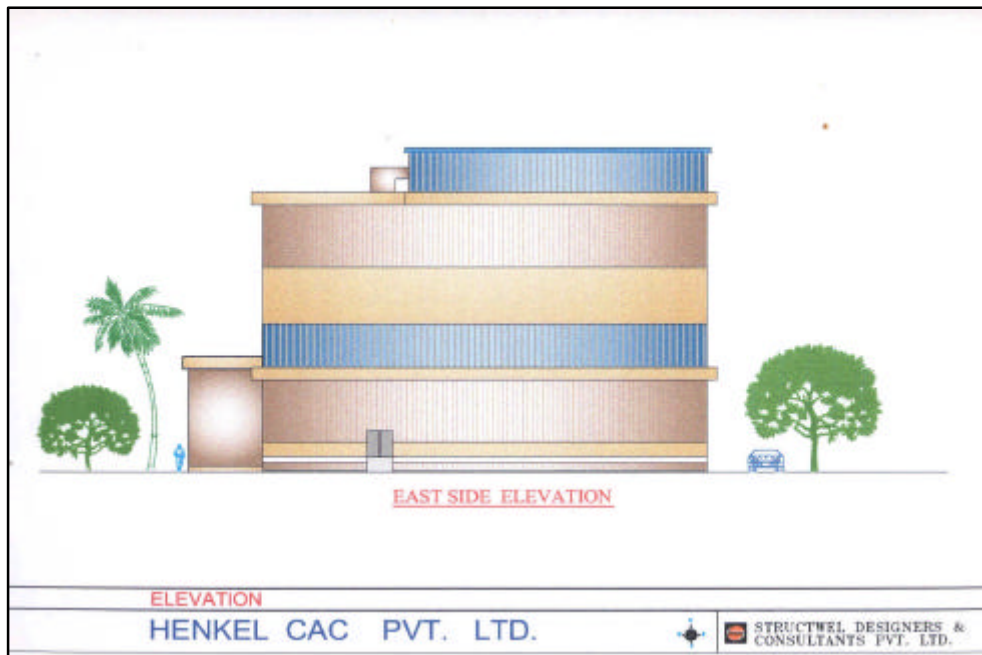
PAPER PRODUCTS LIMITED

- PPL, Rudrapur
- The Paper Products Limited is the largest manufacturer of flexible packaging material in India.
- Project Management Consultancy services including detailed engineering for Structural, mechanical & electrical Services.
- Total area under construction is 80,000 sq.ft.
- Greenfield project located in Rudrapur, Uttaranchal.



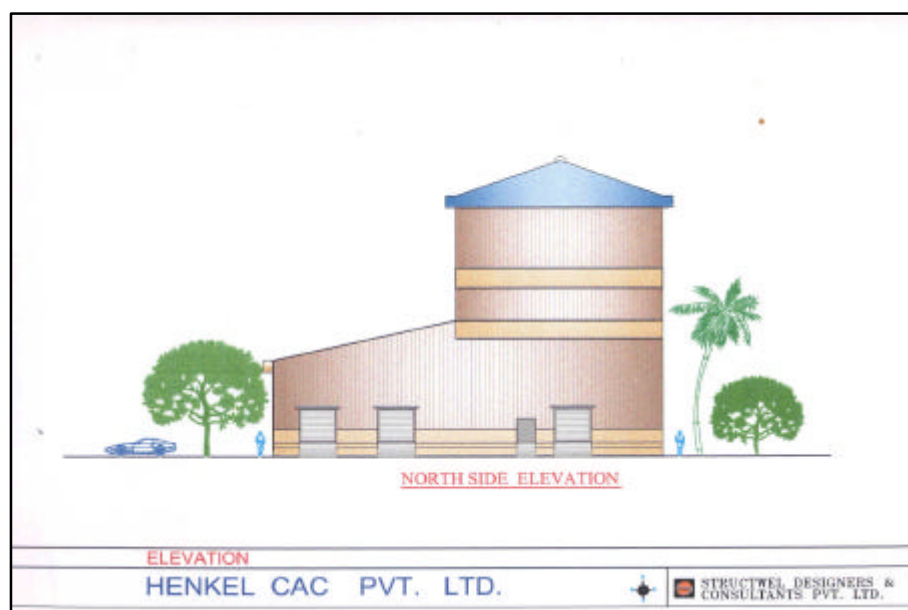
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**Project Management Consultancy
INDUSTRIAL**



HENKEL CAC PVT. LTD.

- Located in TTC Industrial Area, Navi Mumbai.
- 26 meter high Industrial unit. G+2 floors with Basement and a Mezzanine.
- Greenfield Project.
- Project Management Services including detailed engineering provided by **STRUCTWEL**.



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Project Management Consultancy

Housing Complexes



Job 1 :Gr+7 storeyed building under Redevelopment Scheme of MHADA at Wadala, Mumbai.
Cost : Rs. 3.20 Crores.

The Project is a Redevelopment Scheme floated by MHADA. The scheme included demolition of ground floor structures and reconstructing multi floor RCC buildings, known as Transit Camps, to accommodate the tenants, shifted to these buildings due to dilapidated condition of their buildings or collapsed buildings in city of Mumbai. This scheme started in year 1993, under which four buildings are constructed, 3 (Gr+5) and 1 (Gr+7) to accommodate 668 tenements. The buildings are provided with basic infrastructure including drainage and water supply system, properly planned road network and a recreation ground. Since the land is reclaimed area, the buildings are provided with pile foundation with piles penetrating almost up to 10 mts. depth.

Job 2 : Mass Housing projects at Sanpada, Navi Mumbai, for CIDCO of Maharashtra Ltd.

Middle Income Government Housing, built by pre-cast techniques.



Sector 4, 1011 Tenements.
Cost of Project :Rs.1044 Lacs, 1994



Sector 23, 24 & 25, 464 Units.
Cost of Project: Rs.781 Lacs, 1998

Other Structures

- Construction of Pratik Nagar, 37 multistoreyed buildings with infrastructure development at Pune, Mittal Builders, Rs. 30 Crores. 1994 - 1996
- Multistoreyed Township project, 4 buildings with modern amenities, in phases at Wadala Transit Camp. MHADA. Rs. 5.4 Crores. 1993 - 2001.
- Four multistoreyed buildings (gr+4 and stilt +7), Ameya, RBI., Rs. 2.5 crores, 1995-2000.
- Construction of Residential complex for Jyoti Co-op.Hsg.Society on Plot No. 12, Sector 21, Kharghar, Navi Mumbai, Stilt+ 5 floors, Built -up Area: 20,000 sq.ft, Rs. 100 Lacs, 2003 - 2004.
- Construction of Raikar Park Residential & Commercial Complex at Roha, Dist. Raigad, (Gr+2)-6 Buildings, Cost of project : Rs.420 Lacs
- Housing project for TISS at Deonar , Mumbai, 2002 - 2004, Rs.90 Lacs

MANY MORE

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1

Project Management Consultancy

Commercial, Educational and Hospitals

Job : Repairs & remodeling of Maharashtra Institute of Educational Planning and Administration Campus buildings, Aurangabad.

Cost : Rs. 1.06 Crores. **Duration :** 12 months



2

100 year old main buildings were constructed in stone masonry with jack arch slab. Other buildings had G.I. sheet roofing. Jack arch slab was replaced with RC slab. Keeping elevation as is, lime plaster was replaced by cement mortar plaster. New door shutters were provided. photos 1,2&3 show old structure, ongoing remodeling efforts and finished product.

Scope of work

Architectural Planning, designing, detailing and preparation of master plan.

Structural designing and special repairs and restoration techniques' applications for maintaining the heritage values.

Infrastructural planning and designing.

Tender preparation, cost estimation.

Complete execution of construction work.

Total Project management Consultancy.



3

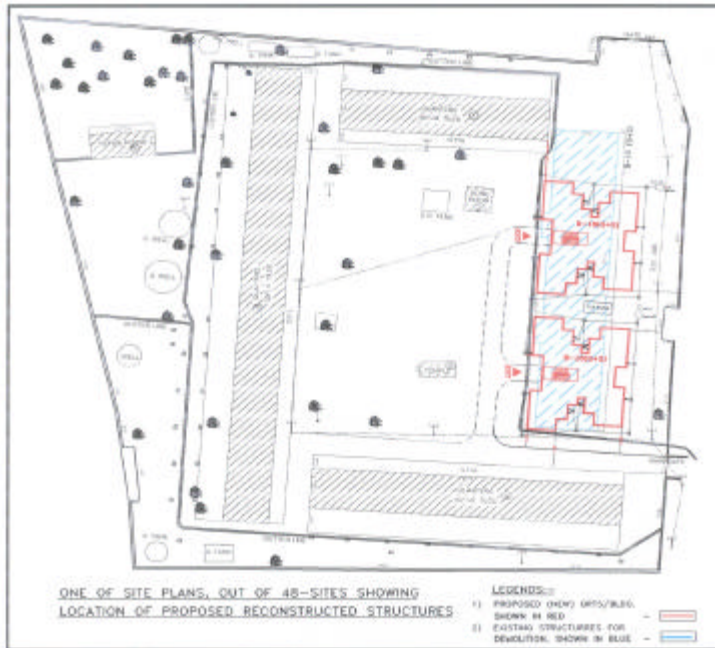
Other Structures

- Godown for grain storage at Turbhe, Navi Mumbai. For NAFED. 1992-1993. Rs. 45 Lacs.
- Hosiery Plant at Taloja. For Pushpak Hosiery Export Pvt. Ltd. 1993-1994. Rs. 6.9 cores.
- Pharmaceutical unit, 15,000 Sq.Ft. at Navi Mumbai. Hemkish Chemicals. 1997.
- Three prestigious MTNL Projects of Telephone Exchange cum Administrative offices at Thane, Navi Mumbai and Mumbai. 1996 - 2001. Rs. 11.5 Crores.
- Construction of Factory Building and ancillary structures for Paper Products Ltd. at Silvassa, Dadra & Nagarhaveli. 1998. Rs. 3.97 Crores.
- Construction of Institute Building and Hostel at deodar, Mumbai. For T.I.S.S. 1998 - 2001. Rs. 2 Crores.
- Construction of factory building at MIDC, TTC, Turbhe, Navi Mumbai. For Converter Adhesives & Chemicals Ltd. 2001 - 2003. Rs. 10 Crores.
- Expansion of Hospital Building for Shushrusha Citizen's Cooperative Hospital Ltd., Mumbai. 2001 - 2004. Rs. 3.2 cores.
- Construction of Factory Building and ancillary structures for Paper Products Ltd. at Hyderabad. 2002-2003. Rs. 5.99 Crores.

MANY MORE

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Detailed Engineering - Architectural & Structural
 Industrial, Commercial, Educational, Housing, Bridges & Flyovers,
 Temples, Mosques & Utilities.



Job : Detailed engineering for reconstruction of 73 buildings in 7 districts in Gujarat.

Cost : Rs. 21 crores.

Duration : 9 months

An earthquake measuring 6.9 Richter scale occurred on 26th Jan. 2001 in Gujarat State. As a repercussion, large number of buildings were damaged to various levels of severity. Very Badly damaged structures were considered for total demolition and reconstruction.

Detailed engineering of proposed reconstruction work of residential and non-residential buildings affected by earthquake in 7 districts namely Kutch, Jamnagar, Rajkot, Patan, Amreli, Junagadh and Porbandar was funded by World Bank and was awarded to **STRUCTWEL**. The same was completed in period of nine months to the satisfaction of Gujrat State Police Housing Corporation Ltd., Gujarat Government Undertaking.

Scope of work

Structures to be demolished were surveyed, evaluated and drawings were prepared for record.

The reconstruction was required for total 562 residential units (in 63 buildings) and 10 non-residential buildings.

Architectural planning, designing, detailing with master plan including Local Body approvals was done.

Structural designing with adequacy for Seismic provisions provided.

Infrastructural planning and designing was offered.

Preparation of detailed estimates & BOQ's, Bid documents in World Bank standard formats for 15 packages were submitted.

Services like Bid Examination, Evaluation & Recommendation of Bidders were provided.

Other Structures

- Gr.+ 2 Huge structure for Gathering Hall, Health Centre, Patpedhi etc. at Turbhe, Navi Mumbai for Maharashtra Rajya Mathadi Transport & General Kamgar Union, Mumbai. 1995. Rs. 3.25 Crores.
- Development of spiritual complex at Nanij, Ratnagiri. Sri Sadguru Narendra Maharaj Trust. 1998. Rs.10 Crores.
- Gopalkrishna Gokhale Bridge, Andheri. Restoration Consultancy. 1998.
- Raikar Park, a Commercial Complex at Roha, Raigad. 1999. Rs. 4.2 Crores.
- Infrastructure works and construction of Camp for 15000 labours at Amby Valley, Khandala. For Sahara India Commercial Corporation. 2002. Rs. 15 Crores.
- Reconstruction of Dargah Sharief of Hazrat Makhdum Faquih Ali at Mahim, Mumbai. 2004.
- Residential Complex at Byculla, Mumbai for Central Railways. 7 buildings, stilt + 12 flrs. 2004. Rs. 20 Crores.

MANY MORE

Detailed engineering for all repairs and restoration projects accepted by **STRUCTWEL are done in-house.**

Please feel free to contact our offices to discuss your project or visit our website at <http://www.structwel.com>

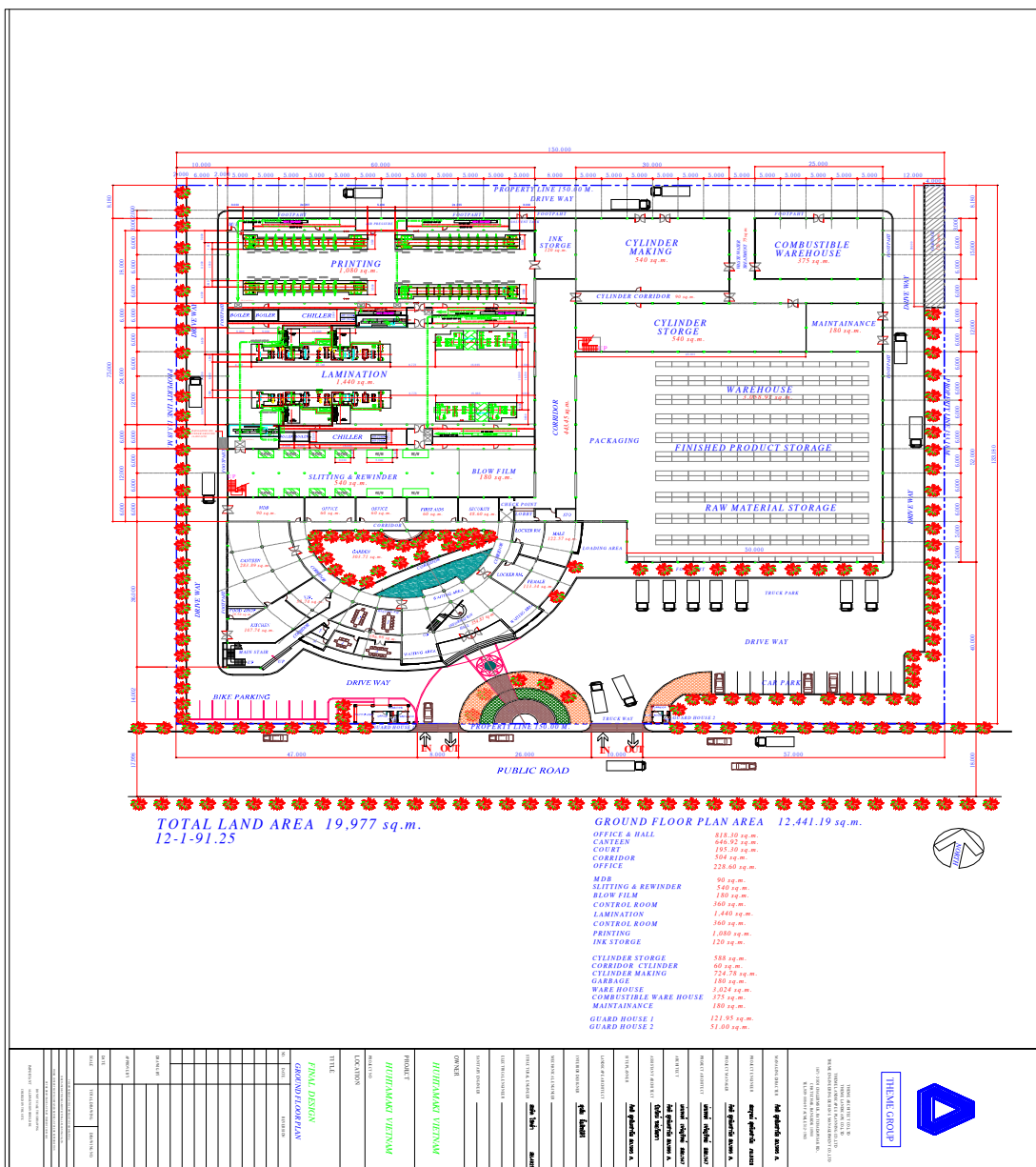
Investigative Consultancy for Flexible Packaging Plant structure of M/s. Huhtamaki Vietnam Plant at Vietnam

The Flexible Packaging Plant of M/s. Huhtamaki was commissioned more than 18 months back successfully. The problem of fungus growth on walls and ceiling was observed during early part of service life.

Fungus growth is noticed on walls, ceilings and chilled water pipeline throughout the plant and in office areas. The same is observed in areas having environment control like air conditioning, forced air ventilation etc. It is also observed in areas where no environment control is exercised.

Fungus growth is a matter of serious concern, since the Flexible Packaging produced in the Factory is of Food Grade Quality.

The investigation comprised of inspecting all the enclosures of the Factory premises and the Office block and inspecting the chilled water pipeline through the cut outs provided in false ceiling. External areas including the flat terraces were inspected closely to identify areas of concern with short term and long term serviceability in mind.



Detailed Engineering - Architectural & Structural Industrial

Job : Construction of factory buildings and ancillary structures including infrastructure for Paper Products Ltd.

Costs : Rs. 8 crores at Hyderabad
: Rs. 5 crores at Silvassa

The client is a multinational in the packaging industry. **STRUCTWEL** has carried out the Architectural and Structural designing for various structures along with Project Management Consultancy at its Hyderabad, Silvassa and Thane Units in various phases.



Paper Products Ltd., Hyderabad Unit Structures designed by us

- Raw material Stores
- Extension to main plant building
- Cylinder Line Area
- Barracks for Security
- Ink Store Extension
- Compound wall
- Locker room cum canteen block

Paper Products Ltd., Silvassa unit

Structures designed by us

- Tandem Co- extrusion plant
- Blown film plant
- Extension to blown film plant at a later stage
- Storage for Poly Materials
- Equipment Foundations



Other Structures

- Construction of factory building of CAC Ltd. at MIDC, TTC, Turbhe, Navi Mumbai, 2001
Cost of project: 3.66 crores
- Hosiery Plant at Taloja. For Pushpak Hosiery Export Pvt. Ltd. 1993-1994. Rs. 6.9 cores.
- Pharmaceutical unit, 15,000 Sq.Ft. at Navi Mumbai. Hemkish Chemicals. 1997.
- Construction of extension to Tushaco Pump Pvt. Ltd. factory at Daman, 2003
Cost of project: 25 lacs
- Construction of Factory Building on Plot No. C – 321, TTC Industrial Area, Pawane Village for Vishal Chemicals Cost of project: 21 lacs
- Construction of Metalizer, work shop bldg., and worker's change room at Paper Products Ltd., Thane., 1995 - 1996. Cost of project: 50 lacs
- Construction of substation bldg. and transformer bldg. at Glaxo Ltd., Worli, Mumbai.
- Internal planning for factory premises at Amlia near Silvassa for Everest Hologvision Ltd.

MANY MORE

Please feel free to contact our offices to discuss your project or visit our website at
<http://www.structwel.com>

Detailed Engineering - Architectural & Structural Residential - High Rise



• Development of Residential Complex for CIFCO Properties at Borivli, Mumbai

Architectural planning and designing, Structural designing, Infrastructure planning and Project Management Consultancy services.

Cost of project : Rs.260 Lakhs
4 buildings – Gr+5 to Gr+12 floors
Built -up Area: 90,000 sq.ft

• Development of Residential Complex as officer's quarters for Central railway at Byculla, Mumbai

The Contract is for structural design of 7 multistoreyed buildings (Stilt+12 floors) . Structwel has completed the structural design work. Construction of two buildings are completed and others are in progress.



Other Structures

Architectural & Structural

- Construction Residential bldg. on plot No.12, Sector -4, Khargar, Navi Mumbai (stilt + 9 storeys)

Structural

- G + 20, Twin Towers at Plot No. 24, Sector 7, Khargar for Vikas Construction
- Badwar Park - a Housing Complex at Cuffe Parade, Mumbai for Western & Central Railways, 2 buildings each of Gr+18 storeys
- Bus station cum Residential Complex at Walkeshwar, Mumbai for BEST, 17 storey building Structural consultancy for slender tower structure with basement.

MANY MORE

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**Detailed Engineering - Architectural & Structural
Commercial**

Job 1 : Telephone Exchange buildings (3 nos.) for Mahanagar Telephone Nigam Ltd.

Architectural and structural designing for three exchange buildings including infrastructure planning.

- 1) Telephone Exchange Building with Administration block, RLU shed at Nerul, Navi Mumbai. **(Fig. 1)**

Cost of project : Rs.427 Lakhs
The structure is Gr+3 floors
Built -up Area: 50,000 sq.ft



- 2) Office cum Telephone Exchange building at Currey Road , Mumbai. **(Fig.2)**

Cost of project : Rs.450 Lakhs
The structure is Gr+5 floors
Built -up Area: 54,000 sq.ft



- 3) Office cum Telephone Exchange building at MIDC area in Thane

Cost of project : Rs.262 Lakhs
The structure is Gr+3 floors
Built -up Area: 33,000 sq.ft



Job 2 : Multistoried parking at Kalyan for Kalyan Dombivli Municipal Corporation. **(Fig.3)**

The parking with a capacity of 750 two wheelers was constructed near Kalyan Railway Station with Basement ground and first floor level parking facilities for the convenience of commuters

Architectural & Structural design of the structure was done by STRUCTWEL

Other Structures

- Commercial building for the administrative offices of the bank with ground and seven upper floors for The Maharashtra State Co.op Bank Ltd.,1985 1986
- Major Public Council Complexes consisting of Utility, Commercial, Health Centre, Shopping, Admin, Fire Brigade structures, Recreation Centers etc. for Ambarnath Municipal Corporation
- Commercial Complex with modern amenities and communication systems with large parking basement,(Gr+7 flrs) at Deonar, Mumbai, 2000
- Hotel Pearl at Chembur (G + 5 flrs.), 1992 - 1994
- Construction of commercial building at Kurla for Touchwood Real Estate Pvt. Ltd.

MANY MORE

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Detailed Engineering - Architectural & Structural Hospital & Institutional



Shushrusha Hospital at Dadar, Mumbai

The work consisted of Structural Strengthening and repairs to the existing structure, construction of 1 additional floor, extension of all existing floors, and provision of additional lift.

The existing structure had 5 floors. Phasewise repairs and interior work was carried out with minimum disturbance to the hospital functioning.

The complete realignment of the existing facilities in all the floors of the hospital was done.



The following facilities were designed:

- State of the art ICCU
- Operation theatre with laminar flow A/C
- Deluxe rooms
- General ward with Central oxygen suction
- Kidney Dialysis unit
- Out patient section
- Paediatric and Neo-natal care ward

Other Structures

- Construction of Fibre Technology Institute at Chembur, Mumbai on plot admeasuring 36,000 Sq.Mt for Shri Vasantdada Patil Pratisthan, Chembur, Mumbai.
- Educational Campus Development for Maharashtra Institute of Educational Planning and Administration (MIEPA) at Aurangabad. Additions, alterations & Restoration of 2 Buildings with proposed New Hostel Building in Phase-I & other buildings in Phase-II.
- Extension to Andhra School Building at Wadala

MANY MORE

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Structural Designing

Peer Review



Job : Backward analysis report for earthquake resistance for Sandoz House at Worli, Mumbai.

Duration : One month.

Backward analysis was done for the assessment of structural stability of the building.

Since it is a flat slab structure, a tailor made structural analysis to consider various salient provisions in the assessment was developed.

Finite element model was created using STAAD-Pro 2004.

Detailed analysis was carried out using limit state method of analysis and design.

Close mesh analysis was considered desired in view of the intricacy of the structure.

The fact that earlier investigations had created certain hesitation about its safety and therefore this second opinion was demanded.

Other Structures

- Petroleum Ministry Administrative Block of Sultanate of Oman for Hydromatic Construction Co. LLC, Ruwi, Sultanate of Oman. 1994.
- Kolhapur Sugar Mill, UG tank structure. Design Scrutiny. For Beri Architects & Engineers Pvt Ltd. 1995.
- Gr.+1 Structure inadvertently constructed for 3 more floors. For Kutumbale & Asso., 1995.
- Samadhi Mandir and other structures at Sri Sai Baba Mandir, Shirdi. Proof consultancy. 1996.
- Preheater tower & cement silo structure design scrutiny. At Mahu, Indore. For Kutumbale. 1996.
- 28 buildings at Sanpada-II for design scrutiny. For CIDCO of Maharashtra Ltd. 2001.

MANY MORE

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An anion plant structure is about 24 years old. It is in structural steel framing for columns, beams, roof members and part of flooring in steel grating.

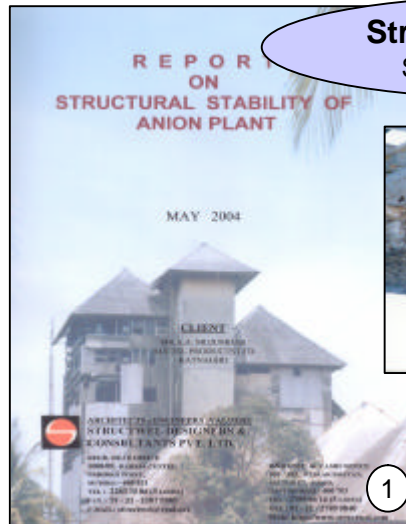
Over the years, structure has undergone repairs and maintenance to the structural members.

Open web pattern for the columns and floor beams offers extreme limitations and demands quality maintenance.

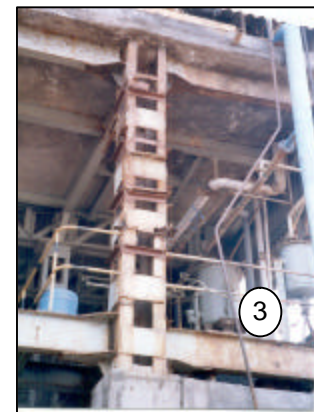
Thorough inspection of all three wings of the plant revealed corrosion damaged structural members. (photos 2,3&4).

Analysis of the observations concludes to :

- 1.No more repairs or strengthening to existing damaged members.
- 2.Removal of unwanted structural steel, offers streamlined framing with appropriate framing joints.
- 3.Additional strength and protection by concrete encasement.



Structural Designing
Stability Assessment



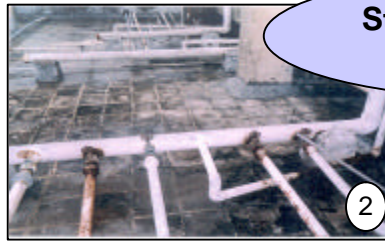
Job : Structural stability assessment of a chemical plant at Ratnagiri. **Duration :** one week.

Other Structures

- Structural Assessment of fire damage at Delhi Tourism & Transportation Development Office at New Delhi. 2003.
- Fire damage assessment for Stable Bleaching Powder Plant at Grasim Chemical Division, Nagda, M.P. 2003.
- Structural stability assessment of floor settlement at administrative building at Hindustan Lever Ltd. at Village Amli, Silvassa, Gujarat. 2003.
- Structural Stability Report for BPCL office Building at Ballard Estate, Mumbai. 2003.
- Structural stability assessment of Anion Plant at Ratnagiri. For Auctel Products Ltd. 2004.
- Structural assessment of Computer Science Building for I.I.T. Powai, Mumbai. 2004.
- Structural stability assessment of Adelphi Building at MK Road, Mumbai. 2004.
- Structural stability report of EDP Factory Building & Office Block of Raychem RPG Ltd., Vasai, Thane. 2004.
- Structural stability & conditional assessment of Spring Mills Flats for Bombay Dyeing, Mumbai. 2005.
- Structural stability of Trade World building (Wing A) at Kamala Mills for N.S.D.L, Mumbai. 2006.

Over 200 Stability Reports to our credit.

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Structural Designing Strengthening



The structure was constructed in phases & completed in 13 years due to various reasons. Therefore structural damages were noted at the time of occupancy in 1994. In 2001 a visual inspection was carried out by **STRUCTWEL** on invitation and later in 2003 this detailed report was prepared.

Salient Points

- Thorough and detailed visual inspection of total built up area of 1,25,000 sq.ft. was made by our expert and experienced engineers. (photos 2,3&4). Same was depicted by distress mapping.
- Non destructive and semi destructive testing of various structural members was performed and reported by **STRUCTWEL** laboratory experts. (photo 5).
- A detailed report covering history of construction, structural inspection and emerging observations, causes of distress, in-situ testing reports and recommendations was submitted.



Job : Consultancy services for repairs and strengthening of court building at Surat, Gujrat.

Duration : 6 months.

Other Structures

- Nurses quarters, KEM Hospital, Mumbai. Pile foundation with unusual depth variation. 1997.
- Repairs & strengthening to Bharatiya Vidya Bhavan Head Office Building, Mumbai. 1999.
- Structural repairs to Pharmacy College Building at Ulhasnagar, Thane. 1999.
- Structural strengthening and extension to School Building for Andhra Education Society, Wadala, Mumbai. 1999.
- Repairs and strengthening to earthquake affected Health Care Buildings (total 1393 nos.) in ten districts of Gujrat. 2002.
- Repairs and strengthening to earthquake affected Government Polytechnic Buildings (total 10 nos.) at Bhuj in Kutch district of Gujrat. 2002.
- Repairs and strengthening to earthquake affected 12 large non-residential and 19 residential • Buildings at Rajkot and Jamnagar districts of Gujrat. 2002.
- Repairs and strengthening with seismic designs to District Court Building at Surat in Gujrat. 2003.
- Repairs & strengthening of factory building for Colgate Palmolive (I) Ltd., Mumbai. 2003.
- Strengthening and Extension of Shushrusha Hospital, Mumbai. 2003.
- Repairs and strengthening of Pump house structures and other structures at Mahul, Mumbai. For Bharat Petroleum Corporation Ltd., 2000 - 2004.
- Road widening of Kalawad Gate at Wellington Crescent Building, Jamnagar Municipal Corporation., Jamnagar, Gujrat. 2004.

MANY MORE

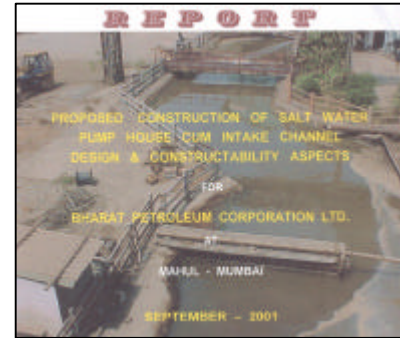
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Structural Designing New Structures

B.P.C.L. wanted to augment the capacity of their salt water channel including its desilting with additional Pump House. The Pump House is in very close proximity of various other structures dealing with water bodies. Therefore its constructability aspects need critical scrutiny. 5.5 meter deep pump house was proposed by the side with a piled coffer dam construction. Both the existing channel and proposed pumping capacity to be confluenced together. Channel water was rerouted through bunding. Piling operation was controlled so as to maintain the structural stability of all the structures around. One of the existing reservoirs was just half a meter away. It is a challenging assignment involving hydrodynamics, sensitive design inputs and master construction scheduling.

Entire project was designed, detailed and supported by hydrological calculations and explaining intricate construction sequences and precautions. The concept was presented to the specially appointed committee of BPCL seniors. Thorough brainstorming session offered some more detailed engineering inputs. This is most complicated underground project right in proximity with high volume and high velocity salt water channel in use all the time for several years. It is marine environment i.e huge underground water flows. It was completed in time with cost provisions and with efficiency expected and stipulated.



Job : Salt Water Pump House Cum Intake Channel at B.P.C.L., Mumbai. Constructability Aspects.
Duration : 3 months.

Other Structures

- Dairy Plant at Taloja, for Amrut Milk Products. Designing for large spans. 1994.
- Union Office Building with large spans for Maharashtra Rajya Mathadi Transport. 1995.
- Residential Complex, 2 Gr+5, 1 Gr+7, 1 Gr+12 buildings at Borivali. For CIFCO. 1996.
- Residential Complex at Byculla. 7 stilt+12 buildings. For Central Railways. 1997.
- Pharmaceutical Unit, 15,000 Sq.Ft. For Hemkish Chemicals. 1997.
- Flexible Packing Plant at Silvassa. For Paper Products Ltd. 1998
- Factory Building and ancillary structures at Hyderabad. For Paper Products Ltd. 2000.
- Three Telephone Exchange cum Office buildings at different locations. for MTNL. 1996 -2001.
- Shivprasad Coop. Housing Society, Pune for Architect M R Parpudi. 2001.
- Mr. Ajgaokar Bungalow at Juhu, Mumbai. 2002.
- Bhakt Nivas & other structures at Sadguru Narendra Maharaj Trust at Nanij, Ratnagiri. 2002.
- Punitganga Coop. Housing Society at Kandivali, Mumbai for architect M R Parpudi. 2003.
- Residential Building for Satguru Developers. for Architect M R Deshpande. 2003.
- Residential Building Stilt+9 at Kharghar. For Shaktikunj Coop. Society. 2004.
- Main Building for Tandem Line, Expansion to Blown Film Plant. Paper Products Ltd. 2004.
- Ten 7 Storeyed buildings of Yash Paradise at Airoli, Navi Mumbai. 2004.
- Various Residential and non residential load bearing and RCC structures for Gujarat Police Housing Corporation Ltd. at seven districts in Gujarat. 2004.

MANY MORE

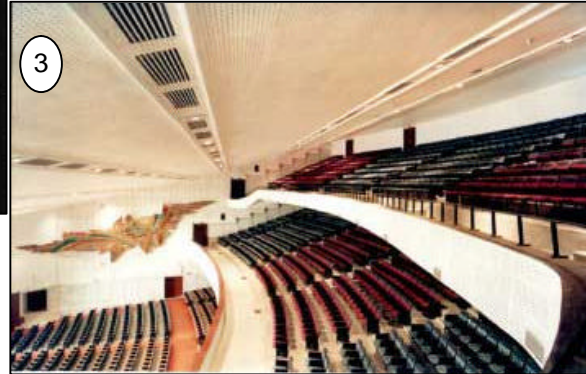
Please feel free to contact our offices to discuss your project. Visit our website at <http://www.structwel.com>



Job : In-situ restoration of fire damaged Shanmukhanand Auditorium, Mumbai.
Cost : Rs. 90 Lacs. **Duration :** 12 months

Repairs & Restoration

Damage due to fire



STRUCTWEL could be best experienced and expert consultancy firm available to deal with fire damaged structures. Restoration of wide range of fire damaged reinforcement concrete and steel structures is our strong forte. Behavioural response of these structures are markedly different and therefore in-depth understanding, pulse knowledge and empathy is desired to assess the level of fire damage and left over strength. This striking balance alone permits to decide corrective measures at most minimal cost and with retained strength as before.

Fire path, load and traverse are crucial to assess. Thermal properties of various different materials, fire stagnation, ducting, duration, damage observations needs collective assessment to get a feel of fire damage. This needs to be confirmed with select and yet specialised non-destructive testing.

Couple of the world's largest auditoriums in RCC and also in structural steel have been repaired by **STRUCTWEL**. Extensively fire damaged steel structure for industrial unit is yet another remarkable contribution. Philosophy and pathology need be diligently blended in fire damaged structures.

3500 capacity, thirty three year old Auditorium with two tier balconies was severely damaged due to onset of fire in 1990. (Photos 1&2). 105 minutes duration of fire resulted in major damage to structural steel roofing that was repaired in place by controlled energy dissipation. Reuse of sheeting in final position gave time and cost benefit. The entire job was to the clients satisfaction. Photo 3 shows restored auditorium with interior fittings.

Other Structures

- Hindustan Petroleum, Mumbai 1991.
- Hotel Oberoi, Mumbai, 1992.
- Vigyan Bhavan, CPWD, Delhi, 1993.
- Starch & Sugar Factory, Sindkheda, West Khandesh, 1994.
- Hindustan Lever Ltd, Orai, U.P., 1998.
- T.G. Foundation and allied structures, Tata Chemicals, Mithapur, Gujrat, 2002.
- Delhi Tourism & Transportation Office, New Delhi, 2003.
- Caustic Soda Plant, Nagda (MP) 2003.

MANY MORE

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Repairs & Restoration
Damage due to earthquake



1



5



4

Job: Health Care Centers, Kutch, Gujarat.
Cost : Rs.450 Million **Duration:** 3 months



2



3

Other Structures

- Latur earthquake area, Aurangabad, Govt. of Maharashtra., 1994, approx. Rs.30 Million.
- Ordnance Factory, Jabalpur, Defense Dept., Govt. of India., 1997.
- Residential & non-residential buildings at Rajkot & Jamnagar, Gujarat, World bank Project., 2001, Rs.80 million.
- Health Care Buildings in ten districts in Gujarat, World Bank Project, 2002, approx. Rs.450 million.
- Govt. Polytechnic Buildings at Bhuj, Kutch, Gujarat, World Bank Project, 2002, Rs.18 million.
- K.D. Polytechnic Complex at Patan district of Gujarat, 2002, Rs. 35 Lacs.

MANY MORE

On 26 Jan 2001, disastrous earthquake (6.9 Richter scale) took place at Bhuj in Kutch district of Gujarat. In Jan 2002, 1393 units of Health Care Buildings from 10 earthquake affected districts of Gujarat were surveyed for damage levels. Units included General / District Hospitals, Health centers, Sub centers and related staff quarters.

Repairs, strengthening, retrofitting or reconstruction was suggested as remedial measure based on the survey data findings. Further documentation on detailed estimates, bill of quantities, technical specifications, structural and working drawings, preparation of bidding papers as per European Commission Norms were submitted to Gujarat Govt. for further line of action.

Photos 1 to 4 show different damage levels. photo 5 depicts survey management.

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Job : Repair and strengthening of a factory building. , Mumbai.
Cost : Rs.160 Lacs. **Duration** : 17 months.



Other Structures

- Gujarat State Fertiliser Corporation, Baroda. 1991, Rs. 30 Lacs.
- Rashtriya Chemical Fertiliser Ltd., Chembur Mumbai. 1991, Rs. 50 Lacs.
- Brabourne Stadium, Mumbai. 1995, Rs.300 Lacs.
- Institution Bldg., Mumbai University, 1998 - 1999, Rs. 160 Lacs.
- Pharmacy College Building, Thane. 1999, Rs. 30 Lacs.
- Wilson Building, Glaxo India Ltd., 1998 - 2000, Rs. 100 Lacs.
- Main Building, Duphar Interfran Ltd., Thane, 1999 - 2000, Rs. 150 Lacs.
- Bharat Petroleum Corporation Ltd., Mumbai. 2001-2003, Rs. 500 lacs.

MANY MORE

The structure surveyed is built strong, well-maintained and meticulously designed during early sixties.

The structure faces the brunt of aggressive environment including saline and humid climate and lashing rains due to its seafront location. User requirements with chemical effluents and spillovers, steam and wash water seepages, localised heavy storage of raw materials, products, machinery and use of fork-lifts causing dynamic loading, resulted in major spread over damages. These damaging factors effective for more than three decades have caused minor to major distress levels in the structure. Photos 1 & 2 show the extent of corrosion in reinforcement resulting in collapse of one of the external chajjas and spalling of plaster and cover concrete from ceiling with light topping. NDT tests and distress mapping at the site concluded the line of action for the repairs.

Special techniques like micro-concrete, epoxy/ polymer mortar repairs, recasting and strengthening of few members were used to achieve satisfying results.

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Repairs & Restoration

Damage due to Aging, Design defects



Job : Repairs to damage due to aging of Jal Bhushan, Governor's Bungalow at Raj Bhavan, Mumbai.

Cost : Rs. 80 Lacs. **Duration :** 3 months



One of the most difficult structures repaired for stability, strength and durability. Structure has old age, assorted mode, methods and materials of construction and also to face aggressively corrosive environment of Mumbai sea-face due to its choice location.

The original 130 years old ground storeyed construction is with random rubble masonry, steel joists and Madras flooring, which is non-integral with the building. Structure received horizontal and vertical extensions before 50 years and 36 years back. Structure received close monitoring and regular maintenance and repairs over the years.

Other Structures

- 2 no. of ESRs, 25 lacs litre capacity, damaged due to design deficiency, at CBD, Belapur, 1996.
- American Centre, USIS, Churchgate. Repaired for design deficiency. 1997.
- Repairs to ESRs 2.5 lacs litres at Sector 10A, Navi Mumbai, damage due to construction deficiency. 1997.
- More than 80 yr old Bldgs. of Seva Sadan Society, Mumbai. 1999. Rs. 53.5 Lacs.
- More than 90 year old Bharatiya Vidya Bhavan. Mumbai. 1999. Rs. 85 Lacs.

MANY MORE

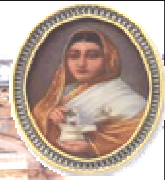
Unexpected localised fall of soffit materials from ceiling attracted red alert and **STRUCTWEL** was invited to set right the damage and to ensure structural safety, stability and long term durability through repairs. Holistic assessment was carried out for the entire building for its framing system, available load paths, possible alternate load paths, individual and collective strength assessments of various building elements, their load transfer areas, their stability, residual material strength, induced load levels etc. Peculiarly building also has capillary traverse in ground floor walls.

Structure was repaired to the entire satisfaction of the Department and His Excellency the Governor of Maharashtra. Co-operation from Client, R & B, PWD of Government of Maharashtra is note-worthy.

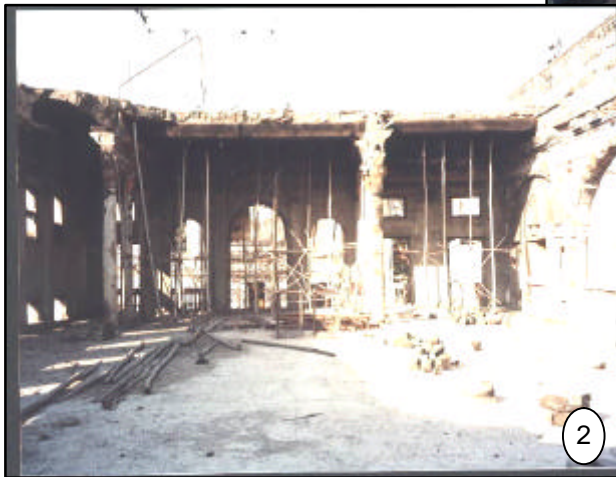
(Photos show repairs at various locations.)

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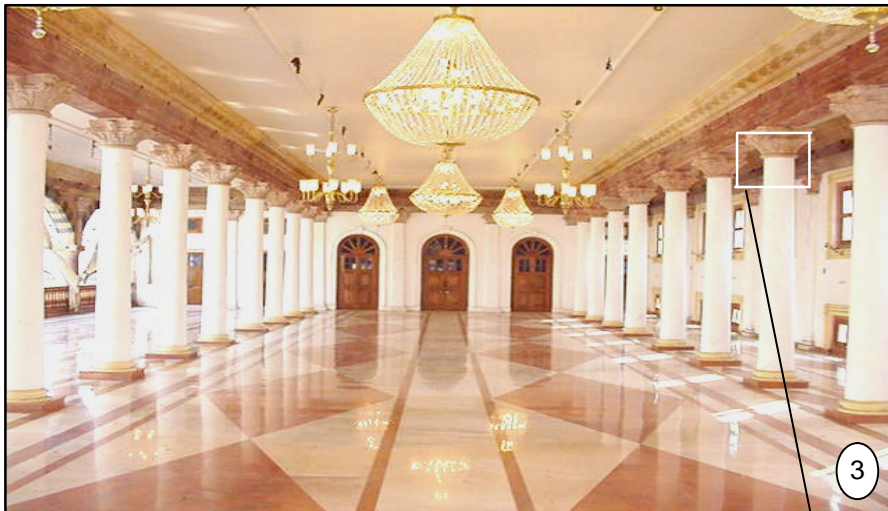
Conservation of Heritage Structures
Palaces, Worship Places, Public Buildings, Monuments



Job : Restoration of Palace of Devi Ahilyabai Holkar, Indore, M.P.
Cost : Rs.110 Lacs.
Duration : 2002 -2003



This is 235 years old structure, which was severely divested by fire in 1984. The structure has a blend French, Mogul and Hindu Palace styles of architecture, was restored to its pristine glory through intricate study, meticulous detailing and laborious inputs from skilled artisans. Photos 1&2 show exterior and interior of palace before repairs and photo 3 shows restored Darbar Hall.



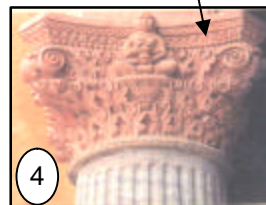
Salient Features

- Controlled demolition of dilapidated portion of the Rajwada structure.
- Carving of cornices, columns and capitals in sand stone to match original design.
- Conservation of sand stone and marble balconies.
- False ceiling, marble flooring.
- Provide Basalt steps, sand stone hand rail and balustrade.

Other Structures

- Commercial Union House, Mumbai, 1997 - 1998, Rs. 1.7 Crores.
- Standard Chartered Bank, Mumbai, 1999 - 2000, Rs. 1.5 Crores.
- Chhatrapati Shivaji Terminus, Central Railways, Mumbai, 2003-04, Rs. 4.5 Crores.
- Central Telegraph Office, BSNL, Mumbai, 2003 - 2004, Rs. 70 Lacs.
- Gateway of India, Mumbai, 2004, Rs.25 Lacs
- Haji Ali Dargah, Mumbai, 2004.

MANY MORE



Completed ornamental column capital - exact replica of old pillar

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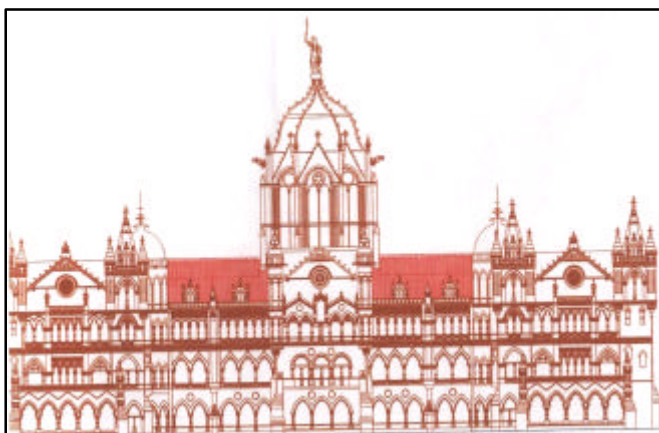
CONSERVATION OF VICTORIA TERMINUS STATION BUILDING
(CHHATRAPATI SHIVAJI TERMINUS) BUILDING



This is a World Heritage Building, being the Head Quarters of the Central Railway. It is a 1.76 lakh Sq.ft. building. This Gothic architecture built in 1888 is an aesthetic splendour and the most important landmark of the city of Mumbai.

Chhatrapati Shivaji Terminus (CST) the present day Head quarters Building of Central Railway is indeed, a treasure trove of splendours of remarkable engineering skills and architectural craftsmanship.

This magnificent monument popularly known as Victoria Terminus was designed by Architect Frederick William Stevens, FRIBA, AMICE.

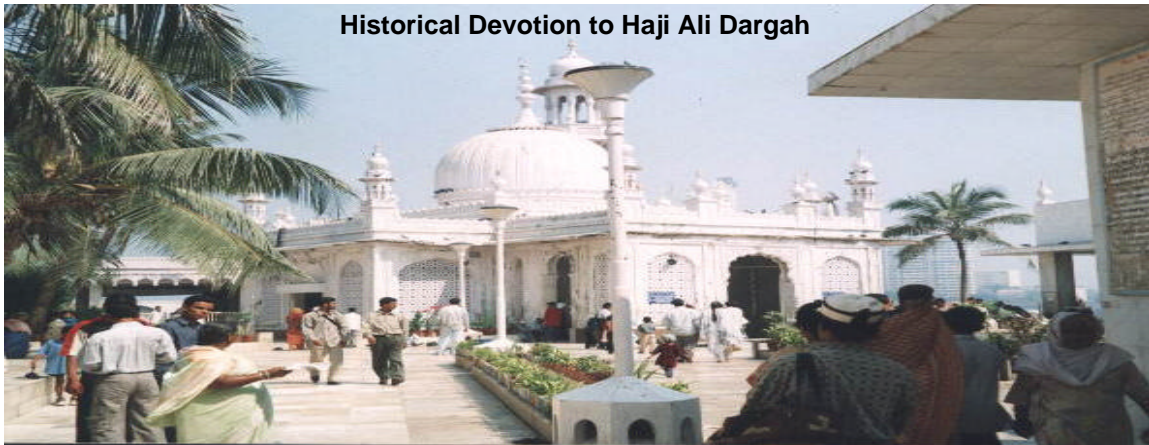


West Side Elevation

Salient Features of Works Carried Out:

- Structural repairs to wooden joists, wooden trusses, flooring.
- Conservation of stone masonry.
- Revamping of toilet area including plumbing lines.
- Waterproofing of pitched roof.
- Conservation of damaged stone features (Lime stone & sand stone).
- Overhauling of fire fighting system.

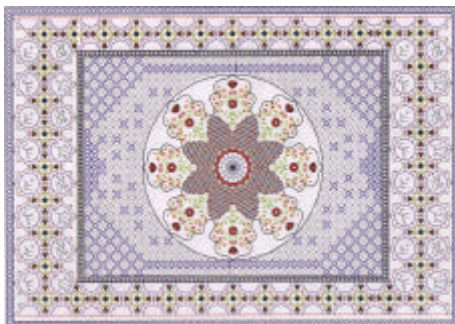
**Conservation & Reconstruction of
Haji Ali Dargah Sharief
and Masjid Structure**



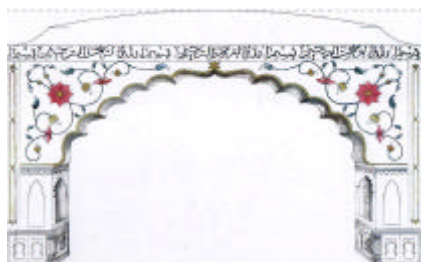
Historical Devotion to Haji Ali Dargah

Haji Ali Dargah Sharief is in existence for more than 300 years in different forms and is the tomb(mazhar) of the great saint Pir Haji Ali Shah Bukhari. There have been cases of mishap in the form of large chunks of concrete falling from heights due to extreme corrosion. Since this structure is visited by several thousand devotees every day, it became necessary to immediately take up the structure for repairs to avoid injury to human beings.

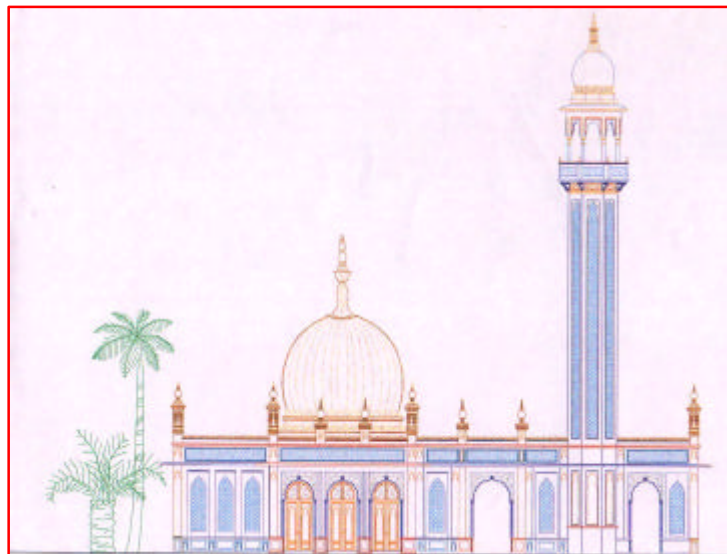
It was, therefore, proposed initially to repair the structure. With the best technology available presently to repair RCC frame structure, it was possible to repair the structure for an extended service life of only 5-10 years considering the aggressive environment it is located in and severally spread over corrosion. The cost of repairs per year of life extended is very high and the repairs proposal is unviable.



Glass work for false ceiling



Inlay work for Interiors



Proposed Elevation

It was decided to provide a new look which would be constructed using ethnic material maintaining the archaeological style, character and detailed decorative features in the structures. This would surely give pleasant experience and a happy feeling to the devotees and tourists who visit the shrine.

It was suggested to dismantle the existing structure up to plinth level and rebuild the same in marble on the existing foundations. All the rain shades (chajjas), pillars and beams would be in marble including the roof slab, the dome and cupolas (chhatris). This is to ensure that the structure does not corrode in the marine environment it is situated in. The minaret (minara) also would be reconstructed in marble. Wherever necessary, Stainless steel / brass pins would be used to ensure interlocking of stones to provide the necessary resistance to horizontal forces.

Conservation of The Dargah of PIR MAKHDUM SAHEB

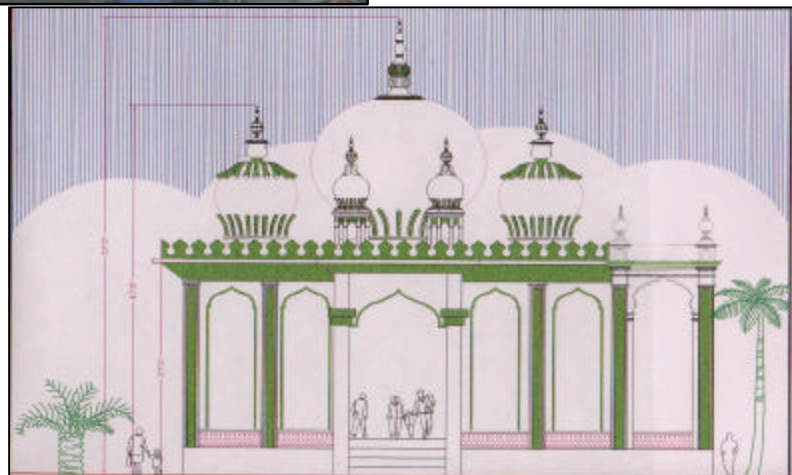


Reconstruction of Pir Makhdumshah Dargah at Mahim, Mumbai.

The Dargah of Pir Makhdumshah Saheb is in existence for more than 350 years. The mausoleum and the mosque were constructed in the late 15th century. Certain expansions were carried out in the year 1748. The Dargah is located in the heart of Mumbai City. There is a large influx of devotees irrespective of religion, specially on Fridays and on festival days to offer prayers.

There is a continuous urge among the people and the trustees to enhance the circulation space which is quite inadequate. The structure also has leakage problem at several places.

The reconstruction including structural repairs, plumbing and electrical services was suggested to rectify the above mentioned concerns. The entire structure is proposed to be constructed in white marble.



Schematic Elevation

MEP Engineering Industrial



Competence of STRUCTWEL in MEP Engineering

The Mechanical, Electrical and Plumbing engineers at Structwel offer clients a full complement of services dedicated to efficient system operation. We utilize a unique team approach, encouraging input from all parties involved in the project: the Owner, the Architect, fellow staff members, contractors and suppliers, throughout the life of the project. As a result, we develop a clearer understanding of the intent of the project, enabling us to produce a better, more livable design.

Our engineers have extensive experience designing MEP systems for new construction (Light & Medium Scale Industries and Commercial Complex) and expansion / renovations, as well as upgrades to existing MEP systems. Our careful engineering studies ensure that each system balances initial cost against operating cost to achieve a life-cycle cost-benefit ratio that meets every requirement of the owner.

Facility Consulting

- Utility & Process Piping
- Power Distribution Systems Design
- Lighting Systems Design
- Heating, Ventilating and Air Conditioning Systems Design
- Energy Management & Energy Audit
- Value Engineering
- Indoor Air Quality (IAQ) Study
- Plumbing Systems Design
- Fire Protection and Life Safety Systems Design
- Security Systems Design
- Inspection & Testing



Please feel free to contact us at
structwel@vsnl.net

Visit our website at
<http://www.structwel.com>

Material Testing Facility

About the Test House

Diagnostic investigations of structures require understanding of behavioral response of building materials during their user life. This led **STRUCTWEL** to start a reliable material testing facility.

Laboratory was set-up for testing of few construction materials in 1988 at Vashi, Navi Mumbai.

Government of India acknowledged this set-up and gave it a recognition of R & D Unit of **STRUCTWEL** in 1988.

A single unit at Vashi is now proliferated into three more branches to cater the need of twin cities of Mumbai and outside in Maharashtra. Continuous efforts on lateral expansion is going on.

Over thirty construction materials, common and specialised, are tested for their physical and chemical properties through more than 358 tests.

Non-destructive testing (NDT) is performed at sites all over India.

The Laboratory carries out field soil investigation studies.

More than thirty five types of testing machines / apparatus and over twenty types of NDT equipment are in continuous use. The laboratory is semi automated and gives computerised reports.

At **STRUCTWEL**, clients get material testing as per his codal provisions such as B.I.S., B.S., A.S.T.M. and many more.

The laboratory has been assessed and accredited as per ISO/IEC 17025 by NABL, Government of India.

LATEST MACHINES AND TESTS ARE CONSTANTLY DEVELOPED AND ADDED TO GIVE BETTER AND IMPROVED SERVICE TO THE CONSTRUCTION INDUSTRY.

Our Special Efforts

Assessment of durability of concrete as per DIN Standard.

Concrete Abrasion test, Core test Rebound Hammer test for rigid pavements.

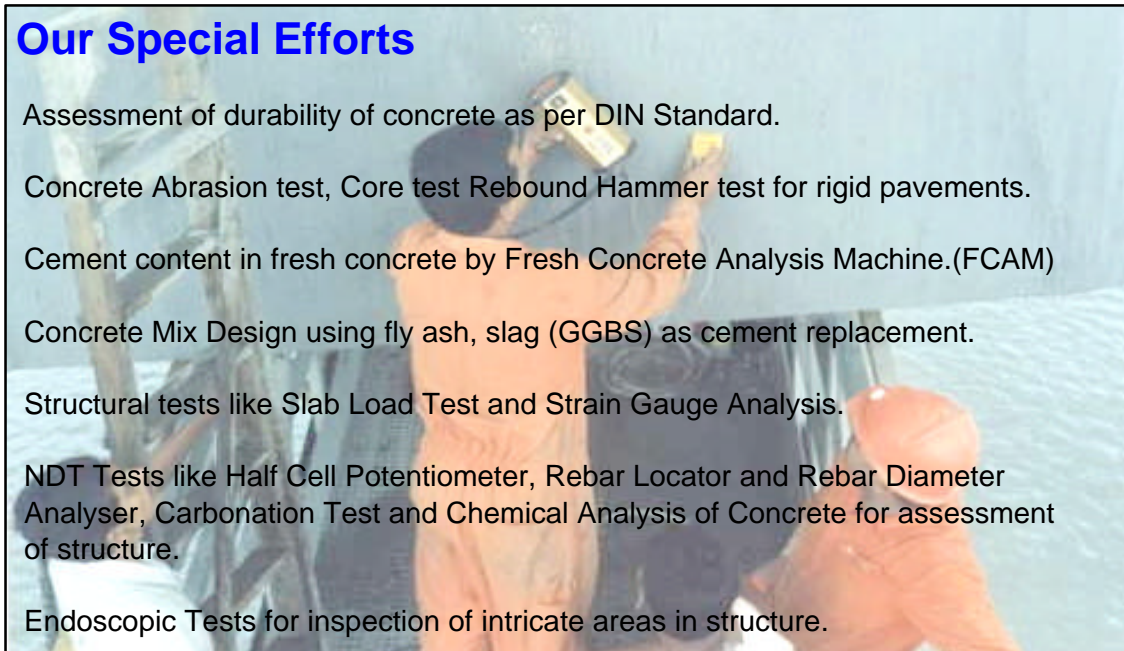
Cement content in fresh concrete by Fresh Concrete Analysis Machine.(FCAM)

Concrete Mix Design using fly ash, slag (GGBS) as cement replacement.

Structural tests like Slab Load Test and Strain Gauge Analysis.

NDT Tests like Half Cell Potentiometer, Rebar Locator and Rebar Diameter Analyser, Carbonation Test and Chemical Analysis of Concrete for assessment of structure.

Endoscopic Tests for inspection of intricate areas in structure.



Abrasion of concrete as per IS 9284. Successfully used at Pune Municipal Corporations prestigious project of construction of Rigid pavements in Pune city.



Impermeability Test was developed as per DIN To check insertion of water in concrete. One of the proven test to check the durability property of concrete.

Our Esteemed Clientele

CPWD, PWD, CIDCO, TMC, PMC, BARC, BPCL, HPCL, GODREJ PROPERTIES, RAHEJA, L&T ECC, TATA HOUSING, RMC, TERMAC, ACC RMC, L&T RMC, GODREJ, UNITECH, GRASIM, INDORAMA, L&T, ACC, SHAPOORJI PALLONJI, HCC, GAMMON
MANY MORE

Innovative Technology, R & D Material Testing

Accredited Laboratory based on ISO/IEC 17025

Physical Laboratory of **STRUCTWEL** conducts more than 300 physical and chemical tests for large number of construction materials. We are keen to put R & D efforts to develop new tests and techniques for the benefit of our clients.

Important Tests in Demand

- **Cement and Aggregate**

All Physical and Chemical Tests as per I.S.

- **Concrete**

Cubes/Cylinders compression Test, Flexural strength of Beam, Air content test, Abrasion Resistance, Permeability, Fresh concrete analysis for cement content. Concrete Mix Design using HVFA, Slag & other pozzolonic material.

- **Masonry Bricks, Paver Blocks and Concrete Blocks**

Compressive strength, Water absorption, Density, Efflorescence, Drying Shrinkage, Moisture Movement.

- **Concrete Tiles**

Abrasion, Water Absorption, Transverse, Dimension.

- **All types of Door Shutters**

Dimension, Defects of Squareness & General flatness, Local Plainness, Impact Indentation, Edge Loading, Shock Resistance, Buckling, Misuse and slamming test, screw holding test.

- **Ply Wood**

Density, Moisture content, Glue shear strength, water resistance, Tensile strength, Test for Adhesion of Plies.

- **Water - Chemical Analysis**

- **Reinforcement Steel - All Physical and Chemical Tests.**

Special Tests Available for

- **Admixture - Physical and Chemical Tests**

- **Pozzolanic Material**

Fineness, Soundness, Setting time, Lime Reactivity, Compressive strength, Specific Gravity and Chemical Tests.

- **Epoxy Resin**

Specific gravity, Working time, Compressive strength, Tensile strength, Amine Number, Epoxy content, Viscosity.

- **Bitumen - All Physical Tests.**

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Innovative Technology, R & D

Non-destructive Testing

Accredited Laboratory based on ISO/IEC 17025



↑
M Type Rebound Hammer Test used for assessment of in-situ strength of rigid pavement.

Non-destructive Testing by **STRUCTWEL**

- Schmidt Rebound Hammer
- Ultrasonic Pulse Velocity (Wood & Concrete)
- Cover Meter / Rebar Locator
- Tendon Duct Locator
- Concrete Cores (from 25 mm. to 150 mm. dia)
- Half cell potentiometer
- Endoscopic inspection
- Slab Load Test
- Strain Gauge Monitoring
- Vibration Meter
- Initial Surface Absorption
- Crack Width Measurement
- Ultrasonic thickness gauge
- GPR

Our Esteemed Clientele

CPWD, PWD, CIDCO, PMC, MSRDC, MIDC, BMC, BPCL, ONGC, JNPT, MTNL, MbPT, Airport Authority of India, Indian Railways, TATA Power, TATA Chemicals, TCS, TCE, RIL, MDL, Bombay IIT, L&T ECC, Shapoorji Pallonji, Uhde India, HLL, Thermax, Grasim Industries, Indorama, Indian Hotels Co., Punj Lloyds, Freyssinet Prestress.

MANY MORE

Non Destructive Testing (NDT) is performed to investigate present condition and strength of an existing structure in-situ. A number of instruments are currently available in market and many others are continuously developed and modified.

NDT testing gives information regarding quality and in-situ strength of concrete, position, diameter and condition of embedded reinforcement in structural members. Removal of concrete core gives detailed anatomical picture of the concrete used. Corrosion in rebars is investigated. Intricate areas of structure can be inspected with Endoscope.

STRUCTWEL possesses a large spectrum of instruments used for NDT investigations and uses them at the hands of trained experts.



↑
Endoscopic inspection to check the condition of incased wooden joists mainly in heritage structures.

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The standard penetration test to check the SBC of soil for shallow foundations, (photo 1). The plate load test to assess exact SBC of soil, (photo 2). Computerised laboratory investigation of soil, (photo 3).



Our Esteemed Clientele

CPWD, BPCL, MIDC, CIDCO, PMC, PWD, TMC, RELIANCE INDUSTRIES, Sahara India, Runwal Group, Shipping Corp. of India, KPWD, GPHC, MJP, IRR, Haffkins Institute, Indian Railways.

MANY MORE

Innovative Technology, R & D Geotechnical Testing

Accredited Laboratory based on ISO/IEC 17025

SERVICES OFFERED BY OUR GEOTECHNICAL LABORATORY

Physical Tests

- Bulk Density
- Moisture Content
- Specific Gravity
- Sieve Analysis
- Hydrometer Analysis
- Liquid Limit / Plastic Limit
- Shrinkage Limit
- Standard Proctor
- Modified Proctor & AASHO
- Consolidation
- Triaxial Compression Unconsolidated Undrained.
- Consolidated Undrained
- Unconsolidated Undrained
- Triaxial Consolidated Drained
- Unconfined Compression
- California Bearing Ratio (Unsoaked)
- California Bearing Ratio (Soaked)
- Permeability
- Lab Vane Shear
- Direct Shear (Undrained)
- Direct Shear (Drained)
- Swelling Pressure
- Free Swell Index

Chemical Tests

- pH
- Chloride
- Sulphate
- Silica (SiO₂)
- Alumina (Al₂O₃)
- Loss on Ignition (LOI)
- Calcium Oxide (CaO)
- Magnesium Oxide (MgO)

Field Tests

- Field Density excluding labour, transport etc. by (a) Core Cutter Method. (b) Sand pouring jar.
- Standard Penetration Test in Pit
- Plate Load Test
- Exploratory Boring with undisturbed samples, Standard Penetration Tests, Water samples & Geotechnical report.

ROCK : All Physical & Chemical Tests

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CONTACT DETAILS



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R & D Unit & Laboratory

**ISO/IEC 17025
Accreditation**

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