



# AC!&

## BUILD REHAB



ADHAR CONSULTANCY AND INFRASTRUCTURE

[www.aci-india.co.in](http://www.aci-india.co.in)





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EARTHQUAKE DAMAGE, 2015, KATHMANDU, NEPAL



# ADHAR CONSULTANCY AND INFRASTRUCTURE

## ABOUT US

AC&I is a cutting edge engineering company that works towards solution based strengthening of buildings and concrete structures to improve their service existence span, make them earthquake resistant and improve their energy efficiency by means of repair & retrofits.

AC&I comprises of experienced professionals that execute niche range of engineering services for concrete structures through scientific assessments and economical design based solutions. Based on an accurate assessment, a suitable & cost-effective rehabilitation scheme is worked out before we restore requisite structural strength of the buildings, through best technologies.

AC&I works for retrofitting of structures deteriorated by ageing, water seepage, ground subsidence, earthquakes and fire or for envisioned alteration in usage of the building.



**Vision**  
Supporting Sustainable  
Construction.

**Mission**  
To provide advanced, cost effective  
and timely execution of repair &  
retrofitting solutions with highest  
level of professionalism



## ➤ SEISMIC RETROFITTING



Retrofitting of Embassy of Sweden, New Delhi

Extent of damage to a building caused during an earthquake depends not only on the magnitude & duration of the tremors, but also on the building configuration, foundation conditions, accuracy of the design, type of construction & quality control during execution.

### OUR METHODOLOGY FOR SEISMIC RETROFITTING INCLUDES:

ANALYSIS	DESIGNING	EXECUTION
Seismic analysis of building	Stadd pro and Etab design	Restoration of existing structure
Identifying gaps for structural integrity	Design of building constraints	Expansion joints
Earthquake lateral load analysis	P-Delta analysis	Anchoring and Rebaring

### AWARENESS PARTNERS

National Institute of Disaster Management	National Disaster Management Authority	Earthquake Engineering Research Institute
		

# WHAT WE CAN DO FOR YOU II

## Seismic Retrofitting

Buildings are vulnerable to damage during earthquakes under the following situations:

- The structure of the building may not have been designed and constructed to resist seismic forces.
- The condition of the building has visibly deteriorated due to ageing or poor quality of construction.
- Additions of floors or modifications to the building without proper structural analysis and consideration of additional loads.
- The soil condition was not investigated / properly treated during the design and construction of the building.
- The recent updating of building codes has rendered structure of existing buildings not in conformity with the provisions of latest codes.

Seismic retrofitting obviates damage during future earthquake and is meant:

- To increase the lateral strength and stiffness of the building.
- To increase the ductility of the building. This aims to avoid the brittle failure.
- To increase the integral action of the members and provide uninterrupted load path in a building.
- To enhance redundancy in lateral load resisting system. This helps eliminate possibility of progressive collapse.
- To ensure adequate stability against overturning and sliding.

### Seismic Retrofitting in Anticipation (Pre-Emptying Damage) :

A Seismic Retrofit provides existing buildings with more resistance to seismic forces/loads. This is accomplished after identifying/anticipating deficiencies in performance. In buildings, this process typically includes though not limited to strengthening weak connections found in roof to wall connections, continuity ties, shear walls and the roof diaphragm. In the past, building codes were less stringent about these aspects compared to today's standards.

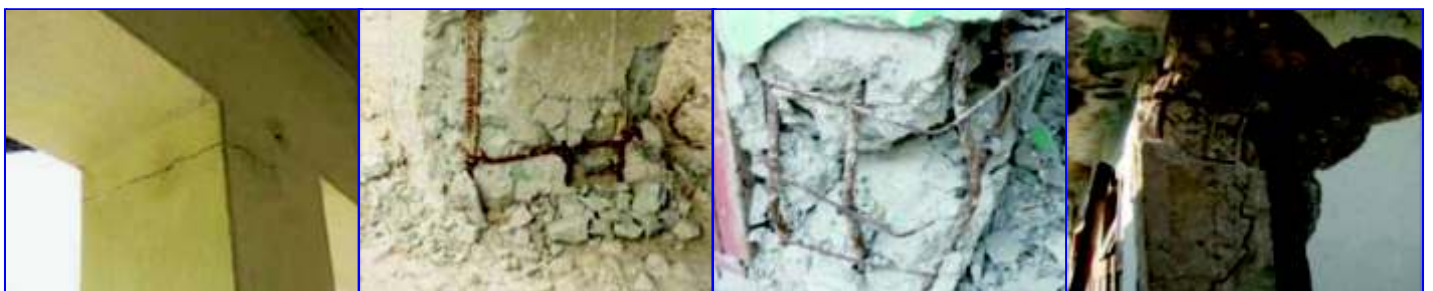
The existing buildings need to be retrofitted as per modern "Seismic Code Regulations" or/and due to the change in the target seismic performance level of the building under consideration. The other reasons for retrofit may include change in usage and functions of the building.

### Seismic Retrofitting after Damage (Post Disaster) :

After a building is damaged by earthquake, it is quite common to carry out surface repairs to the damaged structure. This ends up in only patch up of the damaged house in the process whereas by doing 'Seismic Retrofits', inner strength and safety of the building are assured.

Seismic Retrofitting is thus a process that goes beyond cement and chemical filling. It aims at enhancing the structural capacities (strength, stiffness, ductility, stability & integrity) of a structure to mitigate the effects of future earthquakes.

### Some noted damages after earthquakes



Shear Failure

Bottom Joint Failure

Buckling Failure

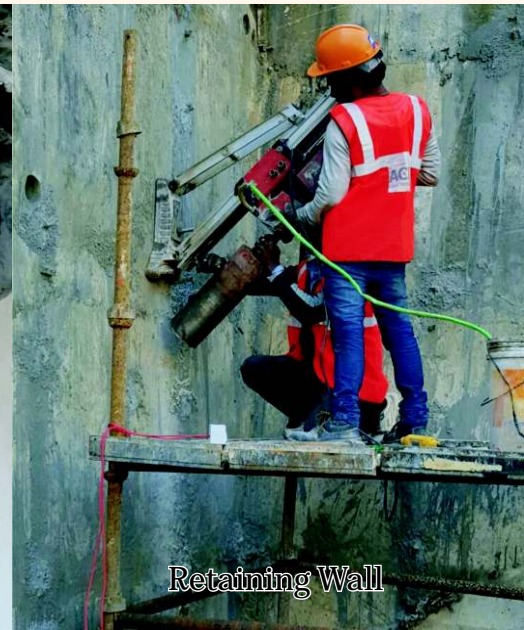
Ductile Failure



## ➤ REPAIRS & REHABILITATION



Beam



Retaining Wall



Column



Staircase



Slab

### Repair & Rehabilitation of Different Structures

Deteriorating structural strength of buildings due to ageing or distress needs to be restored and rehabilitated by suitable/appropriate means of timely intervention. Our team, experienced in repairs & rehabilitation timely interventions, has been carrying out the following:

- Strengthening of RCC structures.
- Repair of RCC structures.
- Repair of fire affected & earthquake damaged buildings.
- Repair of buildings affected due to uneven foundation settlement.
- Modifications to structure for superimposed changes in usage thereof.
- Repair for unforeseen damage to the buildings.

### INDUSTRY PARTNERS

REPAIR & REHABILITATION CHEMICALS PARTNER	REPAINT & WATER PROOFING SOLUTIONS PARTNER	REPAIR MACHINERY & ANCHOR BOLTS PARTNER
<p>BUILDING TRUST</p>  <p>Brand of the World</p>	 <p>asianpaints</p>	 <p>Hilti Outperform, Outlast</p>

# WHAT WE CAN DO FOR YOU II

Our experience includes the following technological interventions for “Repair & Rehabilitation”:

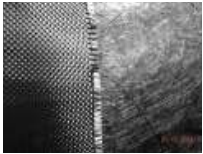


## Concrete Jacketing / Micro Concrete Jacketing

Used & designed for repairing of damaged reinforced concrete elements like columns, beams etc. Concrete Jacketing is useful where the areas are easily accessible for proper placement of concrete using shuttering, scaffolding and vibrator.

## Glass & Carbon Fibre Wrapping

Use of glass & carbon fibre wraps for strengthening of RCC structural members is gaining popularity due to its ease and speed of application without disturbing the functionality of building. These composites are useful for strengthening for normal and seismic loads.



## Carbon Laminates

This system utilizes high modulus carbon laminates that are bonded to concrete slabs/beams for increasing flexural strength. This method of repair has simple field installation procedure and assures high level of factory ensured quality control.

## Polymer Mortars

When compared with ordinary mortar, polymer modified mortars have higher tensile strength, flexural strength and offer more impact and abrasion resistance, water resistance and chemical resistance. Also, the polymer in mortar helps restrain micro-crack propagation, which improves the overall toughness of the mortar.



## Injection Grouting Systems / Low viscosity epoxy

Injection Grouting Systems as practiced are a unique combination of latest technologies that are used for filling cavities and cracks etc. in columns, beams and other concrete structures for repairs of aging concrete or for water proofing.

## Steel Plate Bonding

Steel plate bonding is used to increase flexural strength or stiffness by bonding plates to the soffits or top surfaces of beams and slabs. Shear strength can be increased by bonding plates to the side faces of structural elements. Plates are generally mild steel and are at least 4 mm thick to prevent distortion during the preparation process.



## Polyurea Application

Polyurea is a newer and more advanced technique than traditional coating systems and offers many advantages. It can be applied over a variety of concrete, metals, wood and more in a wide range of temperature and humidity environments. Polyurea has great application in controlling water seepage.

## Sprayed Concreting

Shotcrete (or Guniting) is a concrete conveyed through a hose & pneumatically projected at high velocity onto a surface. A construction technique wherein concrete undergoes placement and compaction at the same time due to force with which it is projected from nozzle. It can be impacted onto any type of surface including vertical or overhead areas.





## ➤ WATER PROOFING

We are specialized consultants and applicators in waterproofing and are quite experienced in tackling seepage problems. We understand what sort of damage can be caused to the structure due to seepage and thoroughly investigation before providing complete and economical waterproofing solutions.

At AC&I, we provide an extensive range of solutions to meet the precise waterproofing needs of our clients. We not only use high tech products manufactured all across globe, but also provide the excellent workmanship of our experienced team of applicators. We have the technological products, expert advisory personnel and a highly skilled work force.

The areas that we can waterproof include :

- Basements
- Wet Cores
- Swimming Pools
- Roof and Terrace Gardens
- Exterior Walls
- Underground Tunnels
- Metro Structures
- Marine Structures
- Dams
- Tunnels
- Rafts & Foundations

AC&I has applied waterproofing compounds of almost all leading brands in their projects :

### CHEMICAL PRODUCT SUPPLIERS

you can *RELY* on

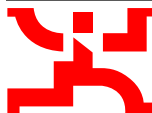
**CEMENTAID**

The way to Better Concrete  
[www.cementaid.com](http://www.cementaid.com)



**STP Limited**  
[www.stpltd.com](http://www.stpltd.com)

**FOSROC**



Constructive Solutions  
[www.fosroc.com](http://www.fosroc.com)



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BUILDING TRUST



Brand of the World  
[www.sika.com](http://www.sika.com)



**asianpaints**  
[www.asianpaints.com](http://www.asianpaints.com)

**BASF**

The Chemical Company

[www.basf.com](http://www.basf.com)



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# WHAT WE CAN DO FOR YOU II

Different kinds of waterproofing techniques include:



Cementaid Products

## Integral Waterproofing Systems

Hydrophobic admixtures absorb less than 1% of water, and give superior performance compared with permeability reducing admixtures. They considerably reduce the amount of water absorbed by dry concrete, and also protect against further water ingress when concrete is wet.

These include:      A) Hydrophobic  
                             B) Hydrophilic / Crystalline water proofing systems.



Membrane Waterproofing

## Membrane Waterproofing

In construction, a building or a structure is waterproofed with the use of membranes and coatings to protect contents underneath or within as well as maintaining structural integrity. The new membrane materials being employed seek to overcome shortcomings in older methods like PVC and HDPE. Generally, new technology using waterproof membranes relies on polymer based materials that are extremely adhesive to create a seamless barrier around the outside of a structure.

These include :-      (A) EPDM      (B) APP      (C) PU



Crystallisation

## Barrier Brush Bond

Barrier waterproofing compounds are intelligent, self-sealing waterproofing systems that transform porous concrete into a permanent, water-resistant barrier. The system provides a structural defence against water damage and steel reinforcement corrosion. Over a period, these crystals grow, filling the naturally occurring pores and voids in concrete, and permanently block the pathways for water and waterborne contaminants.



Injection Grouting

## Injection Grouting

Cracks as narrow as 1 mm can be bonded by the injection of epoxy. The technique generally consists of establishing entry and venting ports at close intervals along the cracks, sealing the cracks on exposed surfaces and injecting the epoxy under pressure.

These include :-      (A) Non Shrink Component added cement grouting  
                             (B) PU groutings



Pressure Guniting

## Pressure Guniting

Guniting or Shotcrete refers to concrete produced by the projection of wet sand and cement mixture onto an area, by means of pressure applied through a continuously feeding pressure vessel. Using guniting, concrete can be applied on irregular, vertical and overhead surfaces. This application is commonly used to protect slopes from erosion, as well as structures of large areas or uneven surfaces.

## ➤ LOW COST CONSTRUCTION



Low Cost Demonstration Houses in Raebareilly, UP



Rehab House Design for Kalinpong, West Bengal



We offer a complete package for the design and construction of low/medium cost housing, while working with appropriate technology. We have an in-house technical team responsible for designing and development of efficient cost-effective building system that can be constructed at site in a short duration.

AC&I provides field level technical assistance, guidance, hands-on trainings, on-site monitoring and evaluation and adherence to standards of agencies involved with similar projects apart from direct execution. These goals are efficiently achieved by well documented project report and relevant records of the housing projects.

At AC&I, our team is experienced with multi hazard proof, locally based approach for design & construction of 'Shelter Units and Other Facilities including Schools. We focus on 'Energy Efficient' and 'Cost Effective' house construction with improvised local materials like Cement Stabilised Earth Blocks (CSEB), treated bamboo, ferro-cement products, micro concrete etc.

Over the years, our team has successfully demonstrated houses built with these technologies under numerous projects in different parts of the country.

### TECHNOLOGY LEADER

B M T P C	HUDCO
	



# WHAT WE CAN DO FOR YOU II

Some “Low Cost Techniques” practiced are:



## Brick Arches for RCC Lintels

RCC lintels which consist of materials like cement & rebars are costly; these can be replaced by brick arches for small spans. This methodology of making lintels with brick can save construction cost up to 30-40% over RCC Lintels.



## Filler RCC Slab for Roof

Filler Slab is a normal RCC slab where the bottom half depth of concrete representing tension zones in the slab is replaced by filler materials such as bricks, tiles, etc. These filler materials are placed so as not to compromise on the structural strength & also save upto 20-30% in cost compared to conventional RCC slab.



## Precast-doubly Curved Shells

Precast doubly curved shells have been in use for the past several years as roofing. These shell units can effectively replace solid RCC slabs. Use of shells fully eliminates the requirements of shuttering and partially eliminates the scaffolding, also these are lighter in weight.



## Compressed Earth Blocks (CEBs)/Fly Ash Blocks

CEBs or Fly ash blocks are blocks compressed with hand-operated or hydraulic press. Stabilizers such as cement, gypsum, lime etc. are used during production. Advantages of CEB/ Fly ash blocks include uniform building in which elements can be easily integrated.



## Brick Rat-Trap Bond Walls

A 'Rat-Trap' bond for brick masonry walls is used as an alternative to the conventional English or Flemish bonds. In this bricks are placed on edge in a 1:6 cement sand mortar and a cavity is created. It results in a cost reduction of up to 25% since the amount of bricks and mortar required per cubic meter is reduced.



## LWC

It may be defined as the concrete of substantially lower unit weight than that made from gravel or crushed stone. By using suitable aggregates the density of concrete can be reduced. This light weight concrete not only results in reducing dead weights on structure, but also has a better insulation against heat and sound.



## Plank & Joist Roofing

It is a building system in which precast reinforced cement concrete planks—rectangular slab elements—are placed on precast RCC joists. The roof gets completed with in-situ concrete poured over the haunches in planks and over the partially precast joists, thus ensuring monolithic action of individual precast elements.



## Precast Concrete

It is a construction product produced by casting concrete in a reusable mold or form which is then cured in a controlled environment, transported to the construction site and lifted into place. In contrast, standard concrete is poured into site-specific forms and cured on site.



## Ferrocement Panels

It is a construction material that has proved to yield superior properties in terms of crack control, impact resistance, and toughness, largely due to the close spacing and uniform dispersion of reinforcement within the material.

# ➤ NON-DESTRUCTIVE TESTING



Rebound Hammer Test



Test for Compressive Strength



Carbonation Test



Ferro Scanning



Ultra Sonic Pulse Velocity Test



Capo Test

Non destructive Testing (NDT) is used to examine condition or quality of a structure without damaging it. We offer the following services using state-of-the-art testing techniques:

## Reinforced Cement Concrete (RCC)

- Rebound Hammer test to assessing the concrete compressive strength.
- Ultrasonic pulse velocity test to establishing quality of concrete.
- Drilling out concrete cores for laboratory testing to determine compressive strength.
- Test to determining depth of carbonation in concrete.
- Remaining Life Assessment Test
- Test to determining the chloride & sulphate contents in concrete.
- Rebarlocator test to determining details of rebars in various RCC members and for assessing concrete cover.
- Permeability of Insitu concrete.
- Pull Out (LOK), Pull Off and Break Off Tests
- Ferro Scanning

## FELLOWSHIP PARTNER



An ISO 9001: 2008 Company

**AECS Engineering and Geotechnical Services Pvt. Ltd.**  
**ISO : 9001 - 2008**



# WHAT WE CAN DO FOR YOU II

## CONDITION SURVEY

Mapping defects in buildings, bridges and dams through rapid visual survey to plan NDT locations for effective testing.

## PILE INTEGRITY TESTING (PIT)

Pile integrity test is performed using a portable, battery powered unit, which requires no backup vehicle or vulnerable cables disrupting normal construction activity. This small strain impulse technique enables the integrity of piles to be established rapidly and economically to enhance confidence in the foundation. Upto 200 piles per day can be tested with this unit, depending on access and pile head condition.

## CROSS HOLE SONIC LOGGING (CHSL)

The Cross Hole Sonic Logger is used to detect defects in concrete structures and in other solid structures such as rock or concrete-rock interfaces. These include: honeycombing; segregation due to improper concrete placement methods; washout of cement due to groundwater flow; cracks in pile shafts due to shrinkage; inclusion of foreign material causing contamination of concrete; necking and arching of piles.

## FERRO SCANNING

Ferrosan and Ground Penetrating Radar (GPR) both offer an effective means of reinforcement detection and imaging within concrete.

The Ferrosan can provide estimates of rebar diameter, while GPR can provide slab thickness.



# ➤ INSTRUMENTATION SURVEY

## LEADING AGENCY FOR BUILDING AND CONSTRUCTION MONITORING

ADHAR CONSULTANCY AND INFRASTRUCTURE (AC&I) is a pioneer company in the field of instrumentation and monitoring through state-of-the-art vibrating wire instruments and other types too. AC&I provides excellent and quality services that will help the projects in realising efficient and economical design and construction of civil engineering structures. Our services include Geotechnical Investigations, Rock Mechanics, Slope Stabilization, Ground Improvement, Geophysical Investigation, Concrete Technology, Non-destructive Testing of Structures, Field Instrumentations and Project Management for the benefit of power, transport, building, and industry sectors.

We are motivated by the simple fact that our success is tied to your success. Our team comprises professionals who provide specialized skills and expertise to your assignment in a timely manner. We can help move a project along in a timely fashion.

AC&I has many building instruments, the details of which are as below:

### ➤ Tilt Plate/Meter

The tilt plate is a disc about 120MM in diameter. It is fixed to the structure with grout or screws. The four pegs on the tilt plate are used to orient the tilt meter. Horizontally-mounted tilt plates allow tilt readings in two planes that are 90 degrees apart. Vertically-mounted tilt plates allow tilt readings in one plane.



### ➤ Building Settlement Point

The building settlement point is to be embedded /fixed to a vertical member to monitor the vertical settlement/movement of any structure. It consists of a male anchor fitted into the anchor socket which in place is usually embedded/fixed in a column/wall of thickness greater than 80mm. These points are best monitored using digital level equipment for the most precise readings.



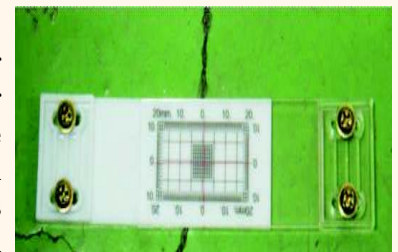
### ➤ Bi-Reflex Target

The bi-reflex target is made of a rigid plastic material which is robust. The reflector is mounted on a circular frame and the frame is mounted on an adjustable semicircular rigid frame with the help of two screws. This allows rotating and fixing the direction of target. The target has a cross mark on it to allow precise targeting by a total station.



### ➤ Crack Meter

The crack meter is suitable for measuring the width of a crack in two directions i.e. on sides and in Up & Down. This is a very simple and accurate instrument to monitor hair cracks. The mechanical crack meter is made of poly-carbonate transparent sheet with graduated marks. Both the sheets will be assembled on a crack with the help of fasteners.





# WHAT WE CAN DO FOR YOU

# I

## ➤ PRE-CONSTRUCTION SURVEY

A pre-construction condition survey provides independent photographic and documentary evidence of site specific structures and features prior to commencement of construction. All prominent defects in the form of cracks, spalling concrete, settlement, movement, or other structural or cosmetic defects will be recorded with digital photographs and compiled into a comprehensible report.

The purpose of a pre-construction condition survey is to provide a snap-shot in time record of the condition of adjacent structures prior to construction activities. While it is not expected that construction will cause damage to neighboring structures, a survey is undertaken as a precautionary measure and will assist building owners, contractors and developers in the event of a claim for damage.

Videographic evidence, although available, is not widely used due to a lack of ability to focus on specific areas. Video footage is typically utilized only to give wide angle generalized views of large areas but cannot document with the same detail as high resolution digital photographic evidence.

### Tell Tale Crack Gauging

Once a pre-construction condition survey has been completed, monitoring of any relevant existing cracks observed in adjacent foundations can be conducted utilizing one of the two methods. Placement of a monitoring paste to track movement at pre-existing cracks can aid in the determination of subsequent movement, or installation of standard Tell Tale Crack Gauges spanning pre-existing cracks can facilitate a quantitative measurement on two axes (horizontal and vertical) where any subsequent movement occurs.

In conjunction with a photographic survey, a pointwise survey can also be conducted of the adjacent roadways, sidewalks, curbs and other fixed features deemed relevant to the proposed construction at the site to establish their pre-construction location and elevation for future comparison.

The vertical and horizontal datum is recorded, with a photograph taken of the pointwise feature surveyed. The collected data is then presented in a drawing referencing the general locations recorded with a thumbnail photo of each point taken. If required, a subsequent survey and comparison to the initial survey can be conducted. Baseline data is retained on file for all future comparisons

## ➤ BRIDGE REPAIR



SPS Bridge Repair work in Bihar



Injection Grouting over Bridge at Bihar

## ➤ CORROSION CURE

The choice of a means of controlling corrosion depends on economic, safety requirements, number of technical considerations. AC&I process for which some design methods are listed below :

**Design :** Engineering design is a complicated process that includes design for purpose, manufacturability, inspection, and maintenance.

**Material Selection :** Selection of material quality like durability of corroded elements & there proportions are primarily points to design a structure.

**Protecting Coatings :** Protective coatings can be metallic, such as the galvanized steel or they can be applied as a liquid "paint".

**Inhibitors and Other Means of Environmental Alteration :** They are chemicals that are added to controlled environments to reduce the corrosivity of these environments. Corrosion inhibitors include the chemicals marinate on steel elements to make them less corrosive.

**Corrosion Allowances :** Engineering designers must consider how much Steel is necessary to withstand the anticipated load for a given application. Once the necessary mechanical load safety factor has been considered, it becomes necessary to consider whether or not a corrosion allowance is necessary to keep the structure safe if it does corrode.

**Cathodic Protection :** It is an electrical means of corrosion control which can be applied using sacrificial (galvanic) anodes or by means of more complicated impressed current systems.

## ➤ CARBONATION CONTROL

**Carbonation of Concrete :** A major factor in concrete decay is carbonation, caused by Carbon Dioxide (CO<sub>2</sub>) in the atmosphere reducing the alkalinity of concrete. . Sulphates from vehicle exhausts and chlorides from de-icing salts also contribute to concrete degradation.

The alkalinity of concrete is typically between pH12 and pH13. A drop in the level of alkalinity to a pH of below 9.5 eliminates the passivation and protection, making the concrete susceptible to attack by water and oxygen, leading to corrosion of reinforcing steel and eventually spalling of the concrete.

**Methodology :**     Barrier Coating  
                          Increasing alkalinity of Concrete

AC&I process for concrete repair system is based on cementitious and mineral constituents and is suitable for all forms of concrete substrate. The system consists of a range of materials that provide protection to both the concrete and steel reinforcing bars.



Corroded Section get treated at Fertilizer Plant, Visakhapatnam



# WHAT WE CAN DO FOR YOU

## ➤ PROJECT MANAGEMENT CONSULTANCY

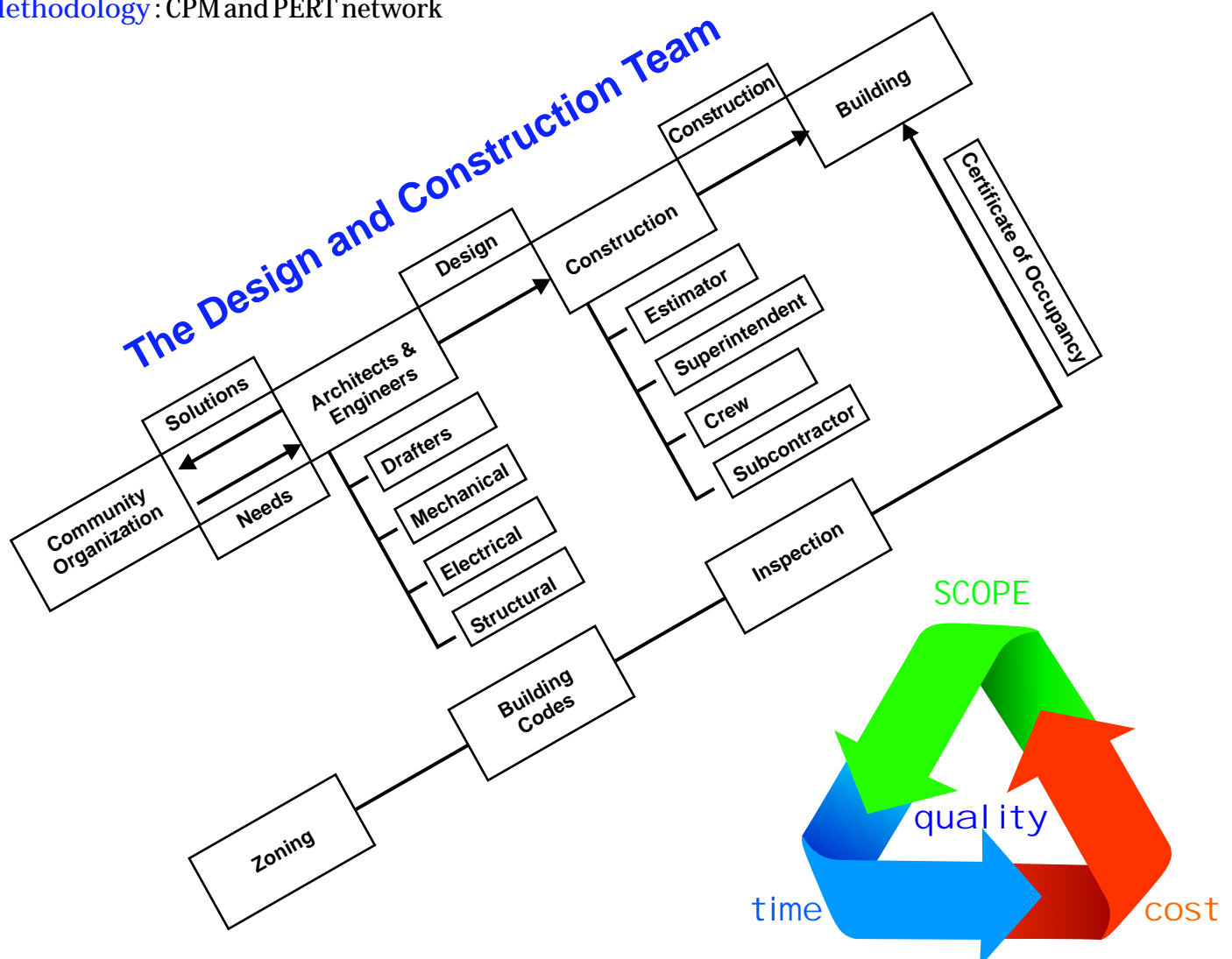
We provide professional project management services to a number of clients pan India. We deliver value for money by providing the highest standards of project management, utilizing our experienced project engineers to realize business benefits and deliver projects to time, cost and quality.

Our client's projects are diverse and our service covers strategic projects, for large/medium/ smaller organizations.

We pride ourselves on providing a tailored project management service that assists our clients in establishing their options, defining their project needs and managing project delivery – we become your trusted advisor.

Our Expertise project teams plan and control every aspect of the project life-cycle from concept to definition, implementation and handover. Our project management service includes the definition, leadership, planning, stakeholder management, control and successful delivery of projects on your behalf.

**Methodology** : CPM and PERT network



## ➤ CONTROLLED DISMANTLING

AC&I has recently stepped into the field of controlled dismantling. As an expert on dismantling RCC structures, we offer precise slitting, cutting, drilling, and sawing of reinforced concrete, masonry and natural stone structures. Using advance equipment ensures the integrity of the existing structure. Slitting tools can be used for installing electric cables and conduits in concrete, masonry and sand lined block.

**Methodology :** Measure of weak point + Calculation using Specific Technique + Safety + Mock Exercise +Execution in controlled Manner

### Process :

- Floor Saw (For Sawing R.C.C. up to 320mm deep)
- Wall Saw (For cutting walls/ Slabs/ Columns/ Beams up to 710mm depth)
- Wire Saw (For cutting almost anything and everything up to 7.5mtr circumference)
- Diamond Core Cutter (Up to 500mm dia. Core & length up to 2.5mtr)
- Underwater Wire Saw (For cutting under water)
- Buster (For demolition of heavy foundation/column/beam, with 265 tones pressing force)
- Crusher (For crushing of R.C.C. slab with force up to 30 tons & wall of thickness up to 300mm)

With a gamut of equipments and a trained team, we perform dismantling in least time and with maximum efficiency. We take special measures in a project where the structures are functional and require extra care. Our team of engineers and executives are always approachable to analyze the typical needs of controlled demolition at your premises.





# COMPLIANCES AND ASSURANCES

# III

## Health & Safety

Structural Specialities considers that there is no more important goal for the company than the achievement of consistently high standards of health and safety. Structural Specialities is committed to the prevention of work-related ill-health or injury and considers that it is a business necessity to ensure the occupational health and safety of anyone who may be affected by their activities.

## Quality

Structural Specialities is committed to achieving Quality and has adopted the philosophy that Quality is not an event, but a journey without a finish line. The aim is to become a leader in the field by providing clients with a high standard of work conforming to contract specifications, with a clear focus on achieving client and employee satisfaction. Quality Management System at Structural Specialities has been developed, implemented and maintained in accordance with the requirements of ISO 9001:2008. Structural Specialities is committed to continually improve the effectiveness of the Quality Management System.

**Structural Specialities has established the following measurable quality objectives:**

- Ensuring that the client's requirements are well-understood and satisfied to the best of our ability.
- Ensure effective and efficient delivery of services to meet the needs and expectations of clients.
- Ensure cost effective solutions to clients.
- Ensure that activities engaged by the company are conducted safely for employees, subcontractors and visitors to maximize performance.
- Ensure high quality work, conforming to the contract specifications, building regulations and industry's best practices.

Structural Specialities acknowledges that it is incumbent upon employees at all levels to ensure that the provisions of the Quality Management System are met. This is achieved by effective communication and employees' acceptance of their responsibilities with respect to fulfilling the company's quality objectives.



## COMPLETED WORKS

### STRUCTURAL STRENGTHENING / RETROFITTING

#### CORPORATE CLIENTS

- Re-strengthening of all type of structural elements including Beams, Columns & Slabs in the Basements of Tower A,D,E,F & J including non tower area.  
KINGSBURY APARTMENT BUILDING  
TDI INFRASTRUCTURE Ltd, TOWNSHIP,KUNDLI,HARYANA
- Retrofitting of RCC wall  
INSTITUTE OF MANAGEMENT NEW CANTT. ROAD, HATHIBARKALA,  
DEHRADUN, UTTARAKHAND (248001)
- Strengthening of Reception Building  
EMBASSY OF SWEDEN -5 NYAYA MARG,  
CHANAKYAPURI, NEW DELHI (110021)
- Strengthening of the CCD Building  
EMBASSY OF SWITZERLAND 4-5 NYAYA MARG, CHANAKYAPURI,  
NEW DELHI (110021)

#### OTHER

- Strengthening and section Enhancements of Columns work  
PARSVNATH DEVELOPERS LIMITED  
THE PARSVNATH, 27, K.G MARG, NEW DELHI
- Repair and Structural Strengthening of the two buildings in the society  
NEW COSMOPOLITAN APARTMENTS  
PLOT NO.33, SECTOR-10,DWARKA, NEW-DELHI
- Repair and Rehabilitation work on Tower-A & B  
SHIVANI CO.OPERATIVE GROUP HOUSING SOCIETY Ltd.  
PLOT NO.18, SECTOR-12, DWARKA, NEW-DELHI (110078)
- Retrofitting Works on North-South-East-West Block  
THE CHITRAKOOT DHAM CO-OPERATIVE GROUP HOUSING SOCIETY  
LTD PLOT NO.2, SECTOR-19, DWARKA, NEW-DELHI (110075)

### SEISMIC ANALYSIS / RETROFITTING

#### CORPORATE CLIENTS

- Seismic Analysis of Building  
THE WORLD BANK  
72, LODHI ESTATE, NEW DELHI
- Seismic design of non-tower basement B1/B2/B3, Omaxe forest spa  
JAGDAMBA CONTRACTORS & BUILDERS LTD  
FARIDABAD, HARYANA
- NDT for seismic retrofitting in coromandal fertilizer plant  
COROMANDAL INTERNATIONAL LTD  
PB NO.1116, SRIHARIPURAM MALKAPURAM POST VISAKAPTNAM

#### OTHER

- Structural survey and assesment of c.v. mess centre and mati ghar  
INDIRA GANDHI NATIONAL CENTER OF ARTS  
JANPATH, NEW DELHI (110001)
- Vulnerability assessment survey of cityscape apartments  
CG PROPERTIES (P) LTD  
CHAUDHARY TOWERS, JHAMSİKHE, LATILPUR, NEPAL
- Seismic assesments of the classic house building  
WORLD HEALTH ORGANIZATION  
MAHATMA GANDHI ROAD, INDRAPRASTHA ESTATE, NEW-DELHI (110002)

### REPAIR AND REHABILITATION

#### CORPORATE CLIENTS

- Epoxy injection grouting & crack filling in non-tower area  
JAGDAMBA CONTRACTORS & BUILDER LTD  
12,LOCAL SHOPPING CENTRE, KALKAJI,NEW DELHI (110019)
- Epoxy grouting of the building NEW  
AROHİ CGHS Ltd  
PLOT NO.13, SECTOR-12, DWARKA NEW-DELHI (110075)
- Repairs of exterior area in Block-A  
DELHI METRO RAIL CORPORATION  
METRO BHAWAN,FIRE BRIDGE LANE, BARAKHAMBА ROAD, NEW DELHI

#### OTHER

- Repair of all type of structural elements including beams, column and slab  
TDI INFRASTRUCTURE PVT LTD  
9, KASTURBA GANDI MARG, NEW DELHI (110001)
- Repair of damaged column at terrace of B-block  
SWATI APARTMENTS  
121.P EXTENTION, PATPARGANJ, DELHI (110092)
- Repair of columns  
IRCON GROUP HOUSING SOCIETY  
PLOT NO.14, SECTOR-18A, DWARKA, NEW-DELHI (110078)

### LOW COST HOUSING

#### CORPORATE CLIENTS

- Construction of 24 Earthquake safe, low cost housing  
BUILDING MATERIAL TECHNOLOGY PROMOTION COUNCIL  
RAIBARELLY, UTTAR PRADESH
- Construction of Demonstration House  
BUILDING MATERIAL TECHNOLOGY PROMOTION COUNCIL  
LOW COST HOUSING FAIR, PRAGATI MAIDAN, NEW-DELHI (2012)

#### OTHER

- Construction of Demonstration house  
BUILDING MATERIAL TECHNOLOGY PROMOTION COUNCIL  
HUDCO BUILD TECH (2013)
- Demonstrating Housing project  
SISMO BUILDING TECHNOLOGY  
BIHAR

### WATER-PROOFING

#### CORPORATE CLIENTS

- Repair shafts and water-proofing of janaki apartments  
JANAKI GROUP HOUSING SOCIETY  
SECTOR 21, DWARKA, NEW-DELHI
- Water proofing for basements of Tower-E (Phase-2)  
UNITY GROUP  
BASANT PROJECT,DCM SITE, KAROL BAGH, DELHI

#### OTHER

- Water proofing of raft and basement in India trade centre  
INDIA TRADE CENTRE  
KHASARA NO.433, SALARPUR,BHANGEL,GREATER NOIDA (U.P)
- Survey to ascertain water seepage in UNWEP office building  
DIGNITY BUILDCON  
1ST FLOOR APARTMENT, SULTANPUR,MG ROAD, NEW-DELHI

### NON-DESTRUCTIVE TESTING

#### CORPORATE CLIENTS

- NDT test at Ask automotive pvt ltd  
KLA CONSTRUCTION TECHNOLOGIES PVT LTD  
PLOT NO.28, SECTOR-4, IMT MANESAR, HARYANA

#### OTHER

- NDT test for horizon towers  
KLA CONSTRUCTION PVT LTD  
KATHMANDU, NEPAL

### BRIDGE REPAIR

#### CORPORATE CLIENTS

- Repairs of cracks at ara-chapra ganga river bridge  
S.P SINGLA  
ARA-CHAPRA GANGA RIVER BRIDGE BIHAR

#### OTHER

- Sealing of hair cracks, PSC beams of Chambal bridge  
PNC-TRG. JOINT VENTURE  
NH-3,DHOLPUR-MORENA,AGRA-GWALIOR ROAD



# WHAT WE HAVE BEEN DOING

# IV

## CLIENTELE

Those who demand Seismic Safety of their Structures:	Those who Respond to Structural Distress:	Those who Respond to Structural Ageing:
<ul style="list-style-type: none"> <li>&gt; Embassy of Sweden</li> <li>&gt; Embassy of Switzerland</li> <li>&gt; The World bank</li> <li>&gt; World Health Organization (WHO)</li> <li>&gt; National Institute of Disaster Management (NIDM)</li> <li>&gt; Indira Gandhi National Center of Arts (IGNCA)</li> <li>&gt; Coromandal International Ltd</li> <li>&gt; Institute of Management Studies (IMS)</li> <li>&gt; India Trade Center</li> <li>&gt; Spaze - Towers Pvt. Ltd.</li> <li>&gt; Building Materials &amp; Technology Promotion Council (BMTPC)</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Delhi Metro Rail Corporation</li> <li>&gt; TDI Infrastructure Ltd</li> <li>&gt; Parsavnath Developers Ltd</li> <li>&gt; Delhi Lease &amp; Finance (DLF)</li> <li>&gt; S P Singla</li> <li>&gt; KLA Construction (P) Ltd</li> <li>&gt; Unity Group</li> <li>&gt; IITL - Nimbus</li> <li>&gt; PNC - TRG (JV)</li> <li>&gt; Jagdamba Contractor &amp; Builders Pvt. Ltd.</li> <li>&gt; CG Properties (P) Ltd</li> </ul>	<ul style="list-style-type: none"> <li>&gt; Delhi Development Authority (DDA)</li> <li>&gt; Delhi Metro Rail Corporation (DMRC)</li> </ul> <p>COOPERATIVE GROUP HOUSING SOCIETIES</p> <ul style="list-style-type: none"> <li>&gt; Shivani Apartments</li> <li>&gt; Chitrakoot Dham</li> <li>&gt; Swati Apartment</li> <li>&gt; IRCON Apartments</li> <li>&gt; Arohi Apartments</li> <li>&gt; KM Apartments</li> <li>&gt; Vrindavan Apartments</li> <li>&gt; The New Cosmopolitan</li> <li>&gt; Janki Apartments</li> </ul>

## KIND OF STRUCTURES WE DEAL IN

- |                                     |                       |                       |
|-------------------------------------|-----------------------|-----------------------|
| > MUD BUILDINGS                     | > SCHOOL BUILDINGS    | > HOSPITAL BUILDINGS  |
| > INSTITUTIONAL BUILDINGS           | > HIGH RISE BUILDINGS | > REFINERIES          |
| > FERTILIZER PLANTS                 | > BRIDGES             | > SLOPE STABILIZATION |
| > COOPERATE GROUP HOUSING SOCIETIES | > EMBASSIES           | > DAM & TUNNELS       |

# STRUCTURAL LABORATORY



## AECS ENGINEERING & GEOTECHNICAL SERVICES PVT LTD

### LEADING AGENCY FOR LABORATORY TESTING & NON-DESTRUCTIVE TESTING

AECS Engineering and Geotechnical Services Pvt. Ltd. is a complete geotechnical solutions company that helps in realising efficient and economical design and construction of civil engineering structures.

We are leading service providers in 'Geological & Geotechnical Investigations', 'Rock Mechanics', 'Geophysical Investigations' and 'Concrete Technology' for power, transport, building and industry sectors.

#### Services:

Geotechnical Investigations	Slope Stabilisation	Concrete Technology
Rock Mechanics	Non-Destructive Testing	Construction Materials Survey
Geophysical Investigations	EarthWork	Laboratory Testing
Ground Improvement		

#### LABORATORY TESTING

Our inhouse laboratory is ISO 9001:2008 certified and its testing capabilities include the following:

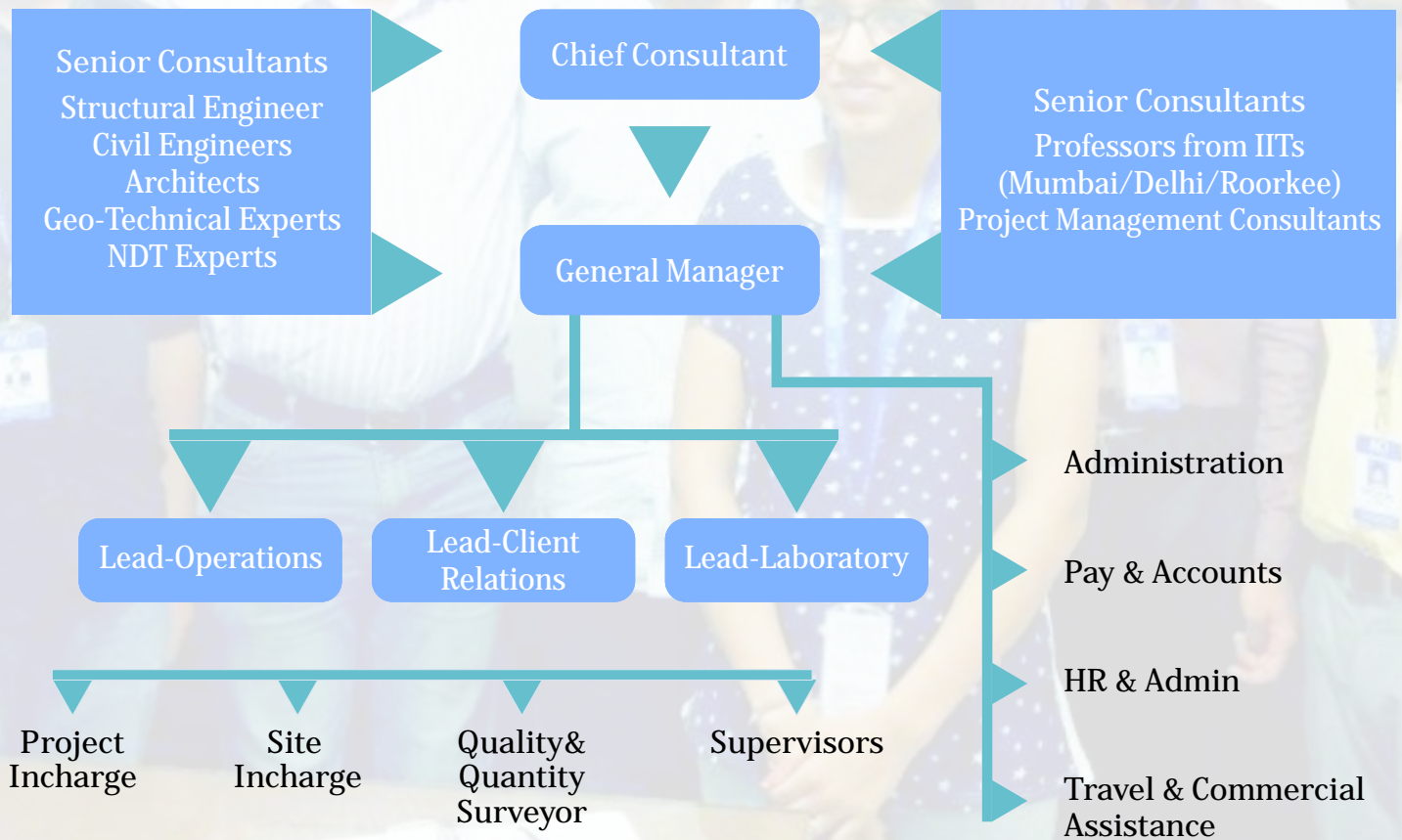
Rock	Soil	Coarse & Fine Aggregate	Concrete	Cement/mortar	Water for Mixing & Curing
Index Properties	Gradation Analysis	Specific Gravity	Mix Design	NORMAL CONSISTENCY	pH Value
Uniaxial Compressive Strength	Grain size Distribution	Water Absorption	Work ability	Setting Times (Initial & Final)	Volume of 0.02 normal NaOH to neutralize 100ml sample of water, using phenolphthalein indicator
Modulus of Elasticity and Poisson's Ratio	Atterberg's Limits	Gradation & Fineness Modulus	Water Absorption	Compressive Strength	Volume of 0.02 normal $H_2SO_4$ to neutralize 100 ml sample of water using mixed indicator
Triaxial Compression Test	Unconfined Compressive Strength	Material finer than 75 micron IS sieve	Density	Fineness	Total Solids
Tensile Strength - Direct & Indirect (Brazilian Method)	Direct Shear Test	Aggregate Impact Value	Compressive Strength	Compressive Strength (3, 7 & 28 days)	Organic Impurities
Flexural Strength	Triaxial Shear Test	Aggregate Abrasion Value	Split tensile strength	Soundness	Inorganic impurities
Point Load Strength Index	Consolidation	Aggregate Crushing Value	Shrinkage	Shrinkage	Sulphates ( $SO_2$ )
Hardness	Permeability	Soundness	Permeability	Heat of Hydration	Chloride content (CI)
Slake Durability Test	insitu Density, Moisture Content and Specific Gravity	Organic Impurities Mica content	Modulus of Elasticity and Poisson's Ratio	Chemical Composition	Suspended matter
Swelling Index Test	Relative Density	Alkali Aggregate Reactivity (Chemical Method, Mortar Bar Method, Accelerated Method)	pH Value	Sulphate content	
Permeability	CBR	Elongation & Flakiness Index	Sulphates content	Chloride content	
Direct Shear Test on Rock Joints	Determination of Total Soluble Solids, Organic Matter, Calcium Carbonate, Cation Exchange Capacity, pH value and Total soluble sulphates	Deleterious substances (coal & lignite, clay lumps, material finer than 75 micron IS sieve, soft fragments & shale)	Chloride content	Cement content	
Petrographic Examination	Proctor/Modified Proctor Compaction Characteristics	Mortar Making Properties of Fine Aggregate	Set Concrete Mix Proportions (Chemical Method)		
Rock Joint Studies	Characterization of Expansive, Soft, Sensitive & Dispersive Soils	Petrographic Examination	Grout mix design		





# WE THE COMPANY

# VI



## Operational Lines

**Thomas Joseph (General Manager)**, a Mechanical Engineer with 31 years experience in design, development and installation of Civil Engineering Instruments/ equipments is an expert in geotechnical field investigations, insitu rock mechanics testing, slope stabilization and ground improvement. Life Member, Indian Geotechnical Society.

**Dominic Joseph (Operation Head)**, is a MBA in HR & Marketing who has experience in handling operations including marketing to delivery of projects related to civil engineering, office administration, grievance handling, co-ordination with Government Authorities and public enterprises etc. He has been associated with GoI for over 26 years where he has mastered exceptional interpersonal communication skills.

**Nitin S. Verma (DGM Technical)**, an Architect with over 17 years of experience of working on design, planning and implementation of structures including housing, schools, sanitation units and water structures in vulnerable and disaster affected areas. He is an Accredited Green Professional (AP) licensed under the Indian Green Building Congress (IGBC) and specialises in lowcost and sustainable construction.

**Sanjeev Trehan (DGM Civil)**, a Civil Engineer with 17 years experience in non-destructive testing, condition survey and repair & rehabilitation of structures, pile integrity testing slope stabilization, ground improvement, Geotechnical & Insitu rock mechanics test. Also, experienced in carrying out investigative field-tests. Life Member, Indian Geotechnical Society

## Guiding Force

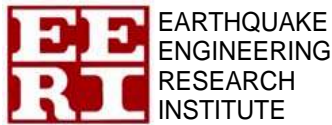


**S.B. Suri (Chief Consultant)**, a Civil Engineer with M.E. in Water Resources Development from I.I.T., Roorkee with long experience in non destructive testing (NDT), repair & rehabilitation of structures, concrete technology & geotechnical engineering. Former Director, CSMRS, New Delhi, Executive Member of Indian Society of Rock Mechanics and Tunneling Technology, Life Member of Indian Geotechnical Society.

**Dr. R. Kuberan (Advisor)**, a Civil Engineer with PhD in Geotechnical Engineering from I.I.T., New Delhi with specialization in Geotechnical Investigations, Rock Mechanics, Geophysical Investigations and Disaster Safety. Former Chief Research Officer, CSMRS, Former Honorary Secretary Indian Geotechnical Society, Donor Fellow IGS and Life Member, Indian Society for Rock Mechanics and Tunneling Technology



**Nakul Dev (Senior Consultant)**, a Civil Engineer with B.E. (Hons.) from BITS, Pilani and M. Tech. (Soil Mechanics and Foundation Engineering) from I.I.T., New Delhi with expertise in Geotechnical Engineering, Soil Dynamics, Concrete Technology & Construction Quality Control. Former Chief Research Officer, CSMRS, New Delhi. Life Member, Indian Geotechnical Society.



The Earthquake Engineering Research Institute (EERI) is a global, nonprofit, technical society of engineers, geoscientists, architects, planners, public officials and social scientists.

EERI members include researchers, practicing professionals, educators, government officials and building code regulators.

We are members of EERI.



The Indian Green Building Council (IGBC) was initiated by Confederation of Indian Industry (CII) in year 2001 with a vision to usher in a green building movement in India and facilitate India to become one of the global leaders in green buildings.

IGBC certifies professionals with Green Accreditations.

We are IGBC accredited professionals (AP).



National Disaster Management Authority  
Government of India

The Government of India in recognition of the importance of Disaster Management enacted the Disaster Management Act in 2005, which envisaged the creation of National Disaster Management Authority (NDMA), to spearhead and implement a holistic and integrated approach to disaster management in India.

We are awareness partners of NDMA.



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APPLICATOR**

BUILDING TRUST



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**ADHAR CONSULTANCY AND INFRASTRUCTURE**

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