



“Construction Chemicals Conclave-2012”

(3rd National Conference on Construction Chemicals)

February 9-10, 2012 Chennai

SUCCESS STORY-

Use of Construction Chemical



M. Umasankar,

**DGM & Head Quality
CB & A SBG IC**



Presentation Plan

Initial Days

Poly Demands

“SOLUTION” the Solution

The “SUCCESS STORY”

Journey Ahead

Goals of IYC 2011

- increase public appreciation of chemistry in meeting world needs
- encourage an interest in chemistry among young people
- generate enthusiasm for the creative future of chemistry
- celebrate the achievements of Marie Curie and the contributions of women to chemistry



INITIAL DAYS

The early days construction additives that we know:

1. Romans -Milk, lard, blood
2. Europe – middle ages -Eggs
3. Chinese -Rice paste, oil, molasses, boiled bananas
4. Mesoamerica and Peru -Cactus juice, latex
5. Mayans -Bark extracts
6. Indus – Eggs, Milk, Jaggery

ACI Education Bulletin E4-03

INITIAL DAYS

The great Roman breakthrough was the development of hydraulic lime mortar and adding volcanic ash resulting in the making a mortar that would harden under water.

✦ “ Surprisingly, the ingredients of a good concrete are exactly the same that makes a bad concrete also, and it is only the “ know-how”, backed up by the understanding, that is responsible for the difference.”

✦ Adam. M. Neville



POLY DEMANDS

Construction is the 2nd largest industry , next only to agriculture and is growing at 25 % presently.

Construction accounts for 40 % of the national outlay and contributes nearly 7 % of the GDP annually.

Cement injects a large amount of carbon dioxide into the atmosphere and has a lifespan of about 150 years.

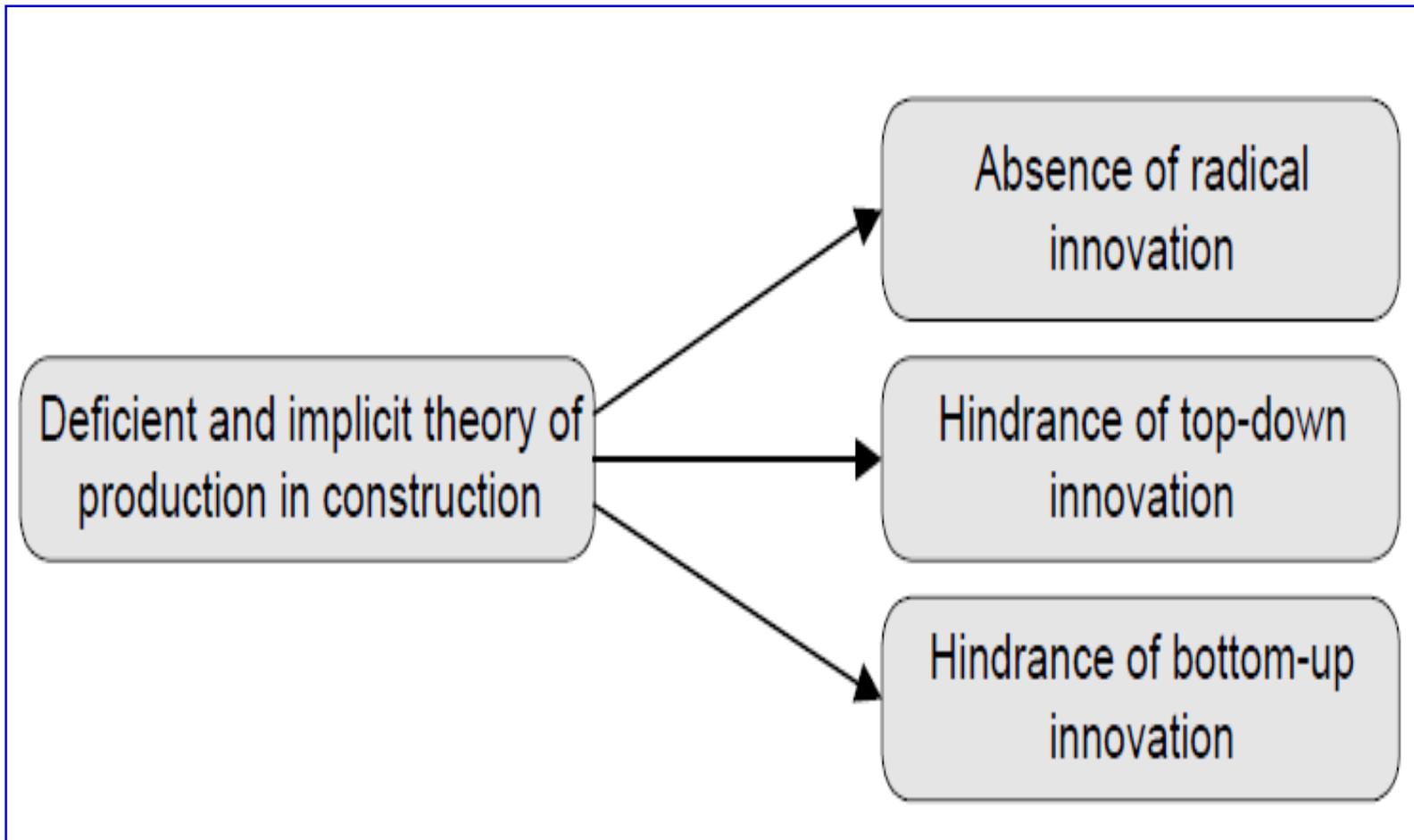
POLY DEMANDS

It is a challenging task to convince a customer to change their traditional methods and use new material / new technology.

When convinced the demand for Quality, efficiency and cost effectiveness of products multiplies.

Systems followed are well defined And focus is clear but all stakeholders must support each other.

POLY DEMANDS





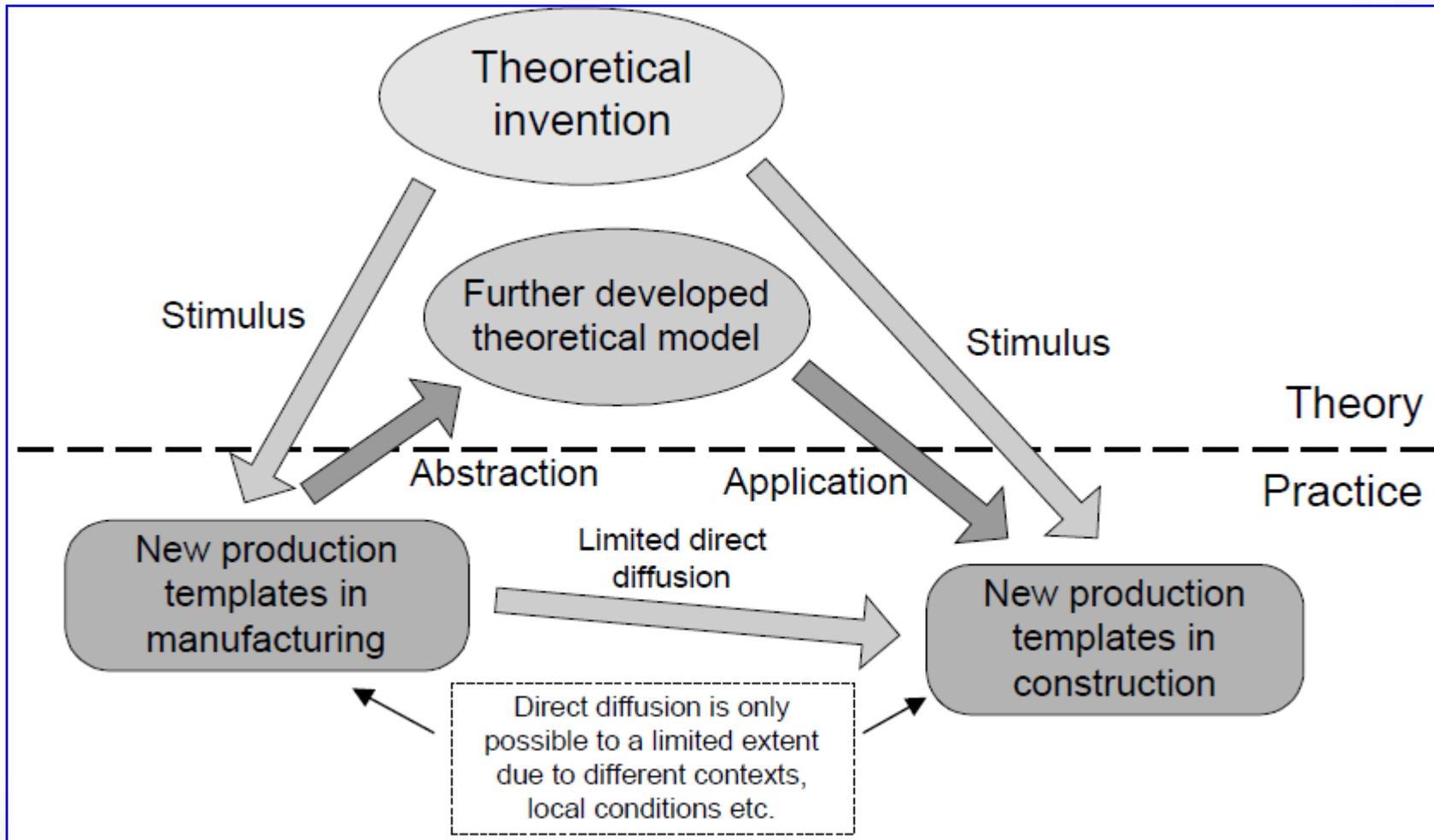
POLY DEMANDS

Efficiencies in actual construction practices need to be augmented to match increased efficiencies in products adopted for true delivery

It is interesting to note that globally as well as in our country, repair works account for almost 50 per cent of the total value of construction works.

The aging and lack of maintenance of buildings are further adding to the need for repair and restoration works.

POLY DEMANDS



POLY DEMANDS

The field of Construction Innovation relates to:

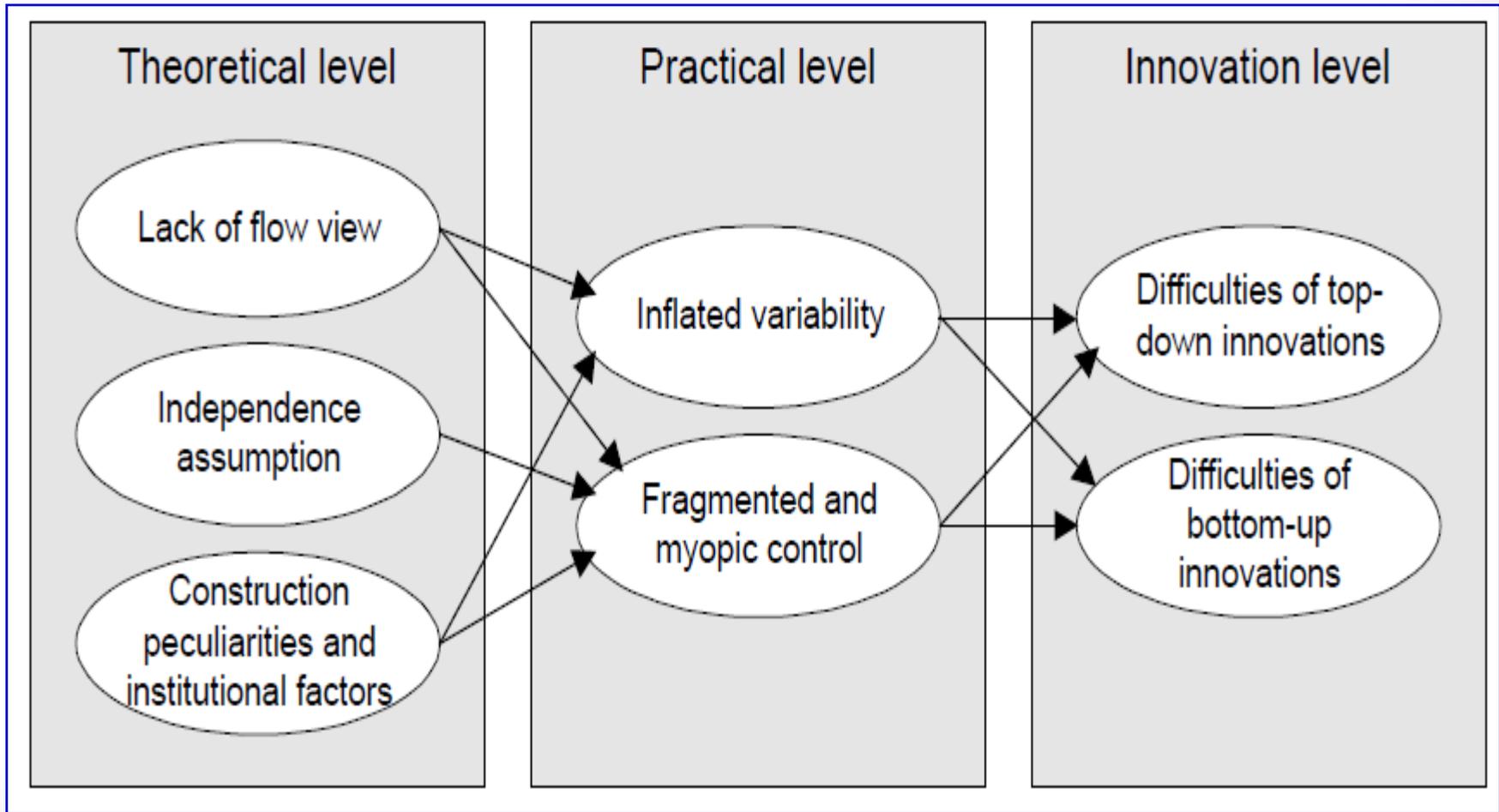
- Improving the sustainability of the pre-cast concrete, and construction and demolition waste supply chains.
- Developing a greater awareness in the construction industry of the value of construction chemicals.
- Benchmarking the utilisation level of a specifically developed integrated product on a construction project over a field trial period of 12 weeks.

POLY DEMANDS

The field of Construction Innovation relates to:

- Improving implementation of relationship management on construction projects and to facilitate a change in culture leading to effective performance in terms of established business better than usual.
- Analyse the implications of Construction Innovation research on the regulatory and policy framework.

POLY DEMANDS





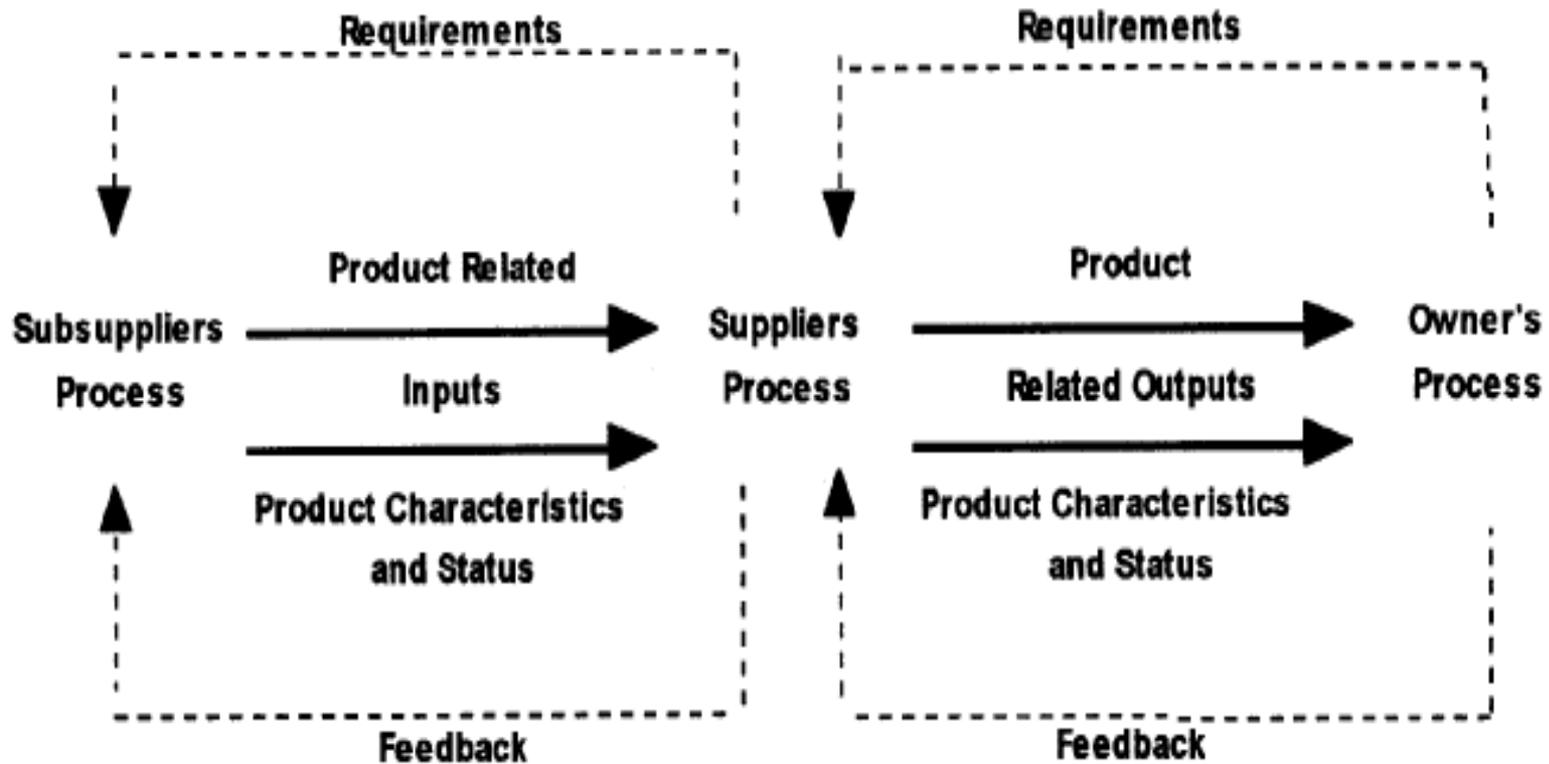
POLY DEMANDS

At times the same customer expects the same price and same services for small orders too in which case it becomes very difficult to meet ends.

The opportunities are plenty, but there is a big need of discipline in the industry.

'SOLUTION' THE SOLUTION

QUALITY MANAGEMENT





'SOLUTION' THE SOLUTION

Construction chemical is one of the niche segments from the chemical industry.

Construction Chemicals are specialty products used in structures to increase their life, and also to impart additional protection from environmental hazards.

Construction chemicals are essential for high quality concrete and for promoting the improvement of concrete performance.



'SOLUTION' THE SOLUTION

In the overall growth of the construction industry, construction chemicals play a vital role.

There is an increased emphasis on high quality construction requiring selection of appropriate building materials.

Therefore the demand for construction chemicals for building new and for renovation of existing buildings has been on the rise.

'SOLUTION' THE SOLUTION

The present Indian construction chemical industry is estimated at Rs 2000 crore of which Rs 1200 crore comprise organized sector while Rs 800 crore is unorganized.

It is expected to touch Rs 4000 crore by 2013.

There are total 352 companies including many key and niche worldwide players.



'SOLUTION' THE SOLUTION

It is estimated that 50% of concrete produced in India these days contains one or more types of admixtures.

According to a survey, 79% of all ready-mixed concrete producers use fly ash,

at least 70% of produced concrete contains a water-reducer admixture.



'SOLUTION' THE SOLUTION

Chemical Admixtures

ASTM C 494, —Standard classifies 7 types as:

Type A Water-reducing admixtures;

Type B Retarding admixtures;

Type C Accelerating admixtures;

Type D Water-reducing and retarding admixture;

Type E Water-reducing and accelerating admixtures;

Type F Water-reducing, high-range, admixtures; and

Type G Water-reducing, high-range, & retarding admixtures.

'SOLUTION' THE SOLUTION

Mineral admixtures

Mineral admixtures reduce cost, reduce permeability, increase strength and change other concrete properties.

There are three main *mineral admixtures*.

1. Fly ash ;Supplementary Cementitious Materials (SCM),
2. Silica fume, and
3. Ground granulated blast furnace slag; also SCM.



'SOLUTION' THE SOLUTION

Coloring admixtures

They should meet the requirements of ASTM C 979.

Materials used to change the color of the concrete:

- Modified carbon black,

- Iron oxide,

- Phthalocyanine,

- Umber,

- Chromium oxide,

- Titanium oxide, and

- Cobalt blue.

STORY

Quality Awards

IMC-Ramkrishna Bajaj NQA Award 2005 for Business Excellence – Based on Malcolm Baldrige National Quality Award of USA



CII- EXIM Bank award for Business Excellence – Commendation for Significant Achievement – Based on European Foundation for Quality Management (EFQM)



THE SUCCESS STORY

LARSEN & TOUBRO



Impressive in Speed

- ✦ Pre Fabrication of members
- ✦ Tough strength to match shifts
- ✦ Elegance at the end

Friday, February 17, 2012



THE SUCCESS STORY

LARSEN & TOUBRO

Imaginative in Design

- **Broad spectrum of color options**
- **Infinite textures, shapes, and patterns**
- **Versatile range of architectural applications**



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STORY

Innovative in Appearance

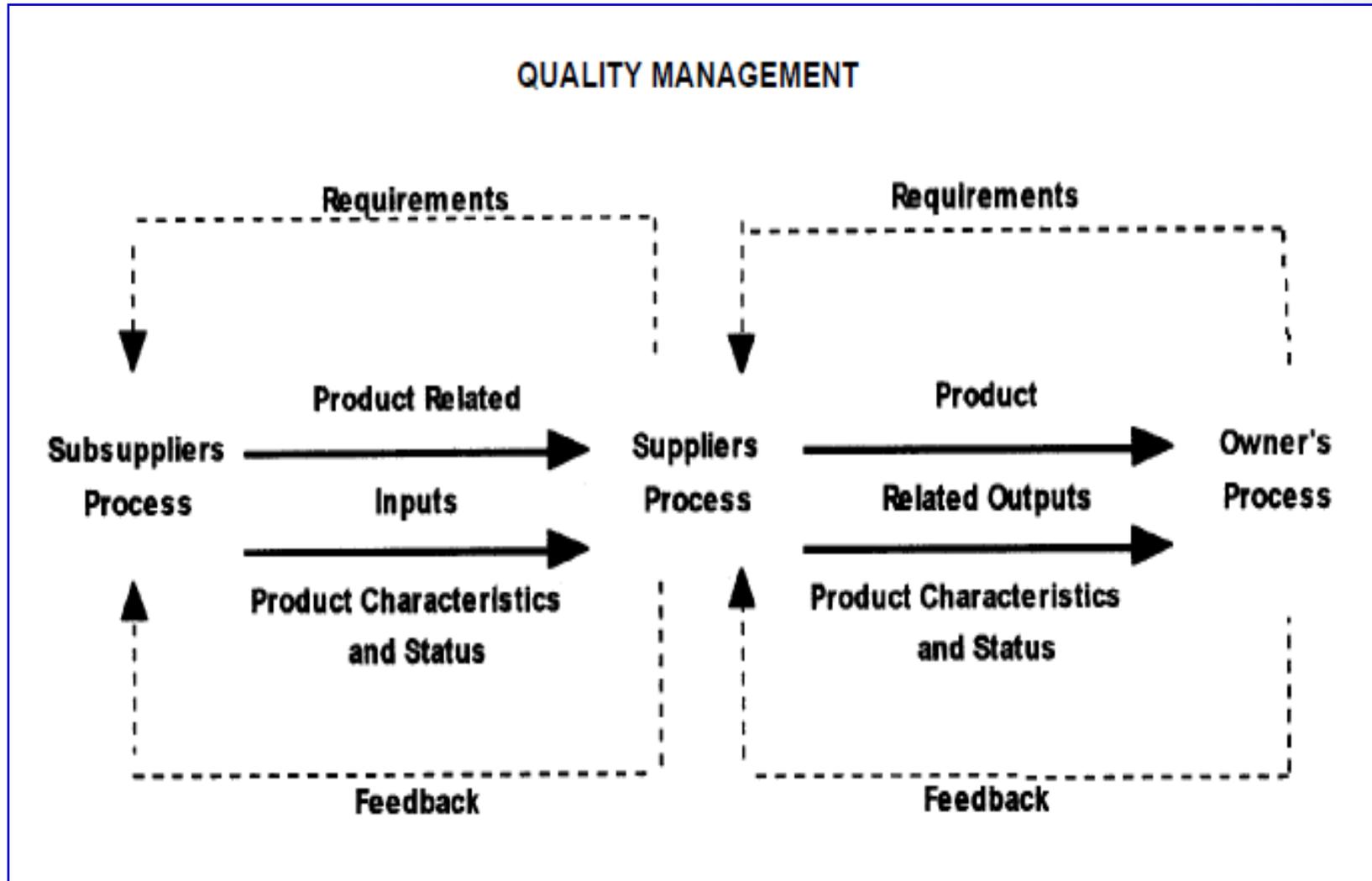
- **Decorative, cost-effective alternative to stone, steel, and glass**
- **Plasticity for fine surface detailing and versatile finishes**
- **Long-term beauty, durability, and economy**



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THE SUCCESS STORY





THE SUCCESS STORY

Best Practices & Learning's at Delhi One Project

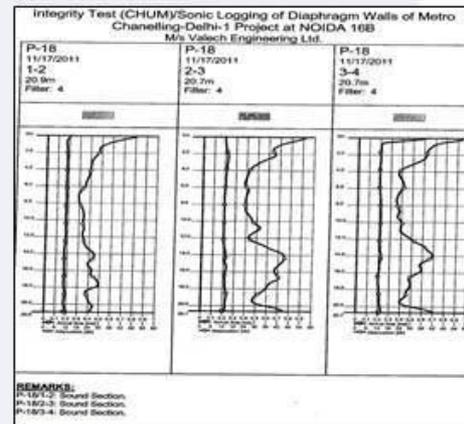


■ DIAPHRAGM WALL:

- Used Polymer instead of conventional Bentonite.
- Polymer use resulted in good surface finish of diaphragm wall.
- No contamination of concrete/ least over break.
- Sonic Logging test indicated uniform/ geometry & sound Concrete.



Sonic Logging Test Arrangement



Sonic Logging Test Record



Grabbing of D Wall Panel

STORY

Single Large pours reducing construction time through

- Columns of 6 m Height
- Large size Slabs



GIFT CITY PROJECT, Gandhi Nagar

STORY



Retaining wall 5.1 m

Shear wall

GIFT CITY PROJECT, Gandhi Nagar

Large pours with excellent finish



STORY



Mahatma Mandir Project, Gandhi Nagar

Reduction in construction time due to
Precast wall M-40 grade concrete

160C
/180D



THE SUCCESS STORY

LARSEN & TOUBRO



Inclined column and isolated footing with SCC

MAHATMA MANDIR PROJECT

THE SUCCESS STORY



Concrete of SCC type with M 30 Grade for Residential Towers at Hyderabad. The site was adjudged Outstanding Concrete Structure by ICI, Hyderabad



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STORY

Concrete of SCC type delivering HPC of M 80 Grade with slump retention as well as set retention for 4 ½ hours achieved in India Tower Project in Mumbai



THE SUCCESS STORY

Concrete of HPC type delivering HPC of M 60/75 Grade pumped to a length of 30/6 meter-once through achieved in Orchid Crown in Mumbai.



THE SUCCESS STORY

Concrete of HPC type delivering HPC of M 60/ M 80 Grade pumped to a length of 700 meter-once through- achieved in Orchid Crown in Mumbai.

Orchid crown site creates a record by pumping M-80 grade concrete through the longest concrete pipeline



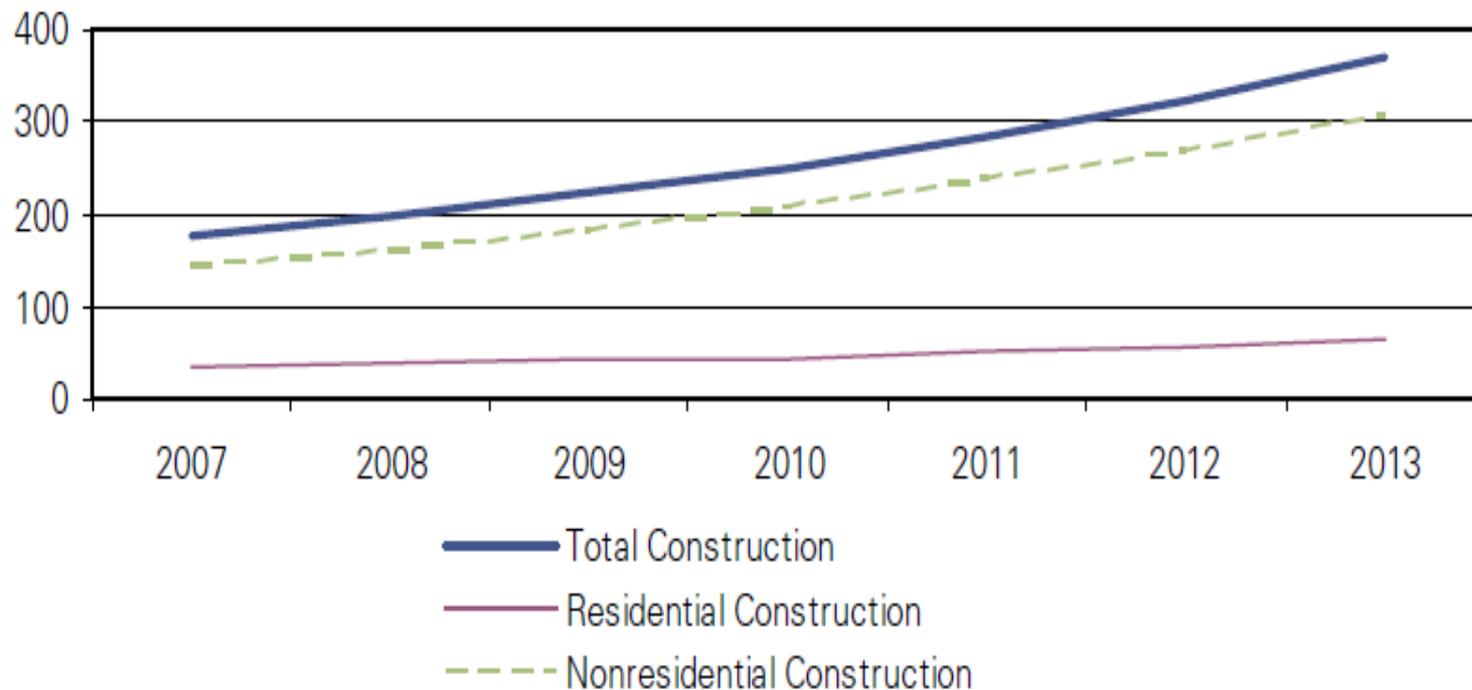
The Orchid Crown project site at Mumbai has achieved the pumping of M-80 grade concrete by pumping it with a BP 2800 concrete pump through 600m concrete pipeline. This is the longest length of pipeline and highest grade of concrete pumped so far among Buildings & Factories sites of L&T. The site has pumped 2500cu.m of M-80 grade concrete so far. Apart from this the site has completed 30,000cu.m of M-60 grade concreting in the last eight months.



JOURNEY AHEAD

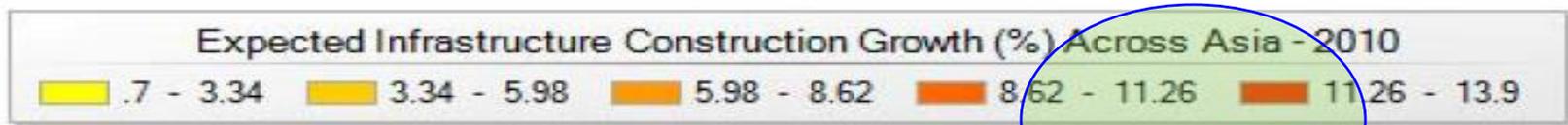
India's Construction Spending Outlook

(Billions US\$)



Source: IHS Global Insight

JOURNEY AHEAD



Source: IHS Global Insight



JOURNEY AHEAD

PREDICTIONS

Fifty years from now the material that will be called concrete will be very different from what we have today.

Designing materials at the molecular level using very powerful computational and visualization tools will lead to breakthroughs in concrete as well as other materials.

—*William F. Baker*

JOURNEY AHEAD

PREDICTIONS

I foresee greater emphasis on performance specifications. Where strength is specified, there will be no limitations on minimum cementitious materials or water-cementitious materials ratio.

Mixture designs will be recognized as different from mixture proportions following Abrams' 1918 position stated in Lewis Institute Bulletin 1.

James M. Shilstone, Sr.

JOURNEY AHEAD

PREDICTIONS

The next 50 years of change will be equivalent to the changes we have seen in the past 400 years.

Structural concrete members continue to increase in span with reduced thickness as material properties viz. compressive and tensile strength are increased.

-Peter H. Emmons



JOURNEY AHEAD

FUTURE OF CONCRETE CONSTRUCTION

in short

Improved material technology

Improved production technology

Improved system implementation



JOURNEY AHEAD

PREDICTIONS

LIQUID

THE FUTURE OF CONCRETE

STONE



M. Umasankar,

**DGM & Head Quality
Commercial Buildings & Airports SBG IC
L&T Construction**

