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# Precast Advantage to Pradhan Mantri Awas Yojana (Housing for all by 2022)

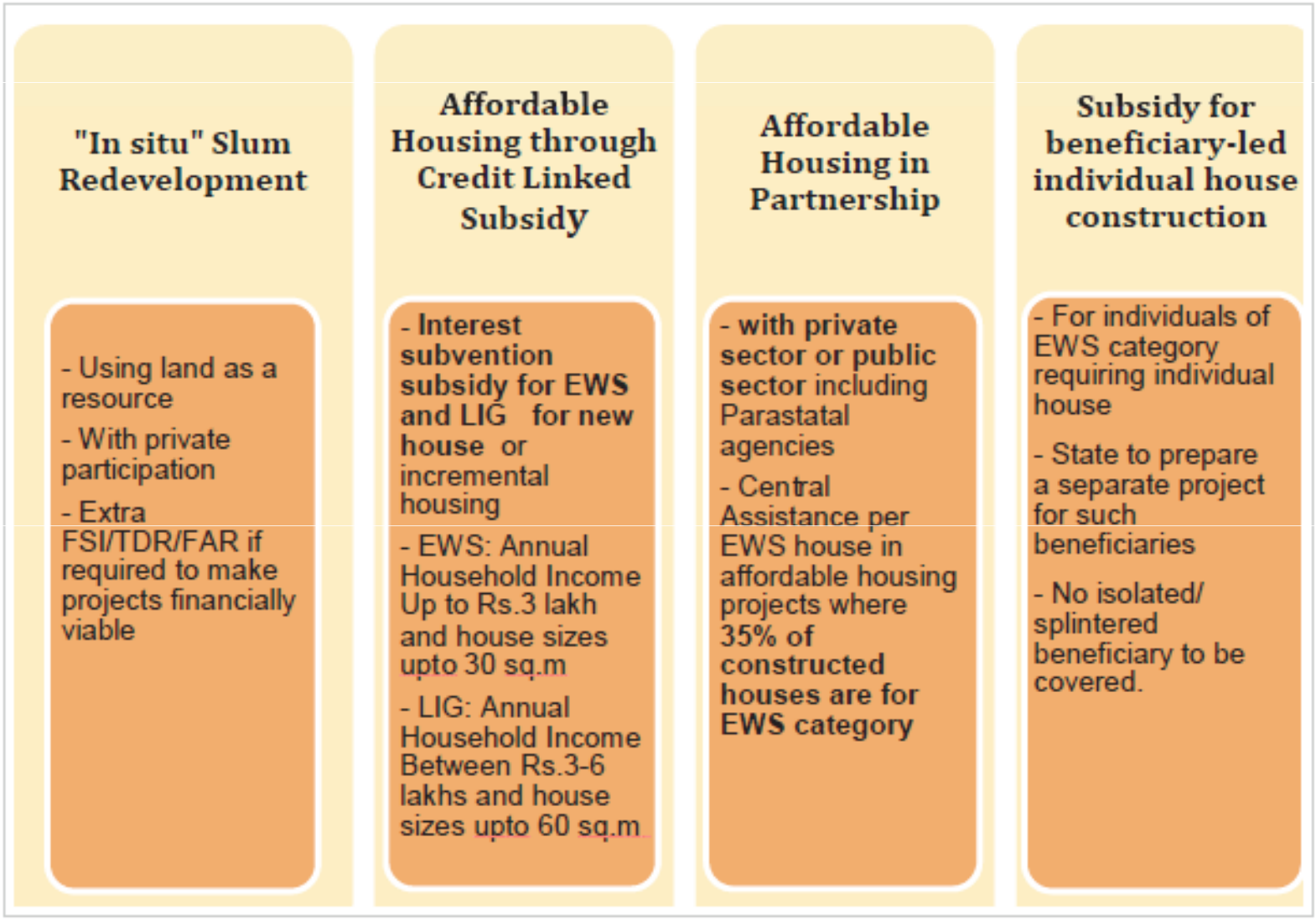
By: Saurabh Purandare

# Housing Deficit – Current Scenario

- The current housing deficit in urban India is approximately 18.78 Million houses. 95% of this deficit is in EWS & LIG sector. (As per GOI Reports)
- It is estimated that actual figure might be in the range of 40 Million houses based on studies conducted by various private agencies.
- In order to provide "HOUSING FOR ALL" or HFA, we need to construct 9400 Million sqft in 6 years (2016-2022) as per GOI reports. That means 1600 Million sqft every year on average basis.
- This deficit is approximately in 200 urban centers which means 8 million sqft of construction every year in each urban centre on an average basis.

# IMPLEMENTATION OF PMAY

- In PMAY, the four prong strategy is being adopted to provide HFA as below,



# IMPLEMENTATION OF PMAY - REALITY

- 95 % of the houses to be built are in EWS & LIG category and hence there is a great scope of standardizing the houses in both of these segments across India.
- But Majority of the projects under PMAY scheme are being built using **conventional** method of construction due to which, the inherent advantage that these projects offer in terms of **repetitions and huge volume turnover remain unexploited.**
- In addition, these large scale projects constructed using **conventional methods** complicates the Project Management in terms of **speed and quality** of the construction.
- The construction of **9400 Million sqft spread across 200 urban centers** can not be completed within **time and quality** unless we adopt **industrialized building construction** (Precast Concrete Technology).

# What is Precast?

- Precast Concrete is the concrete which has been prepared for Casting, Cast & Cured at a location which is not it's final destination.

- The Distance travelled of such products may be just a few meters in case of site based precasting methods or even thousands of kilometers in case of high value added precast products.

# Why Precast?

- Industrialized Production leading to better quality of construction.
- Enhanced speed of construction (the completion time gets reduced up to 50%)
- Reduced labor requirement (Up to 75% reduction in labor force)
- Reduction in overall cost of the project (up to 10%) as well as maintenance cost.
- Hygienic & clean work sites leading to better health & safety.
- Eco friendly & Green method of construction. (less wastages – 5% against 25%)

# Implementation of Precast Technology

- The Advantages that Precast Concrete Technology has to offer can be exploited to the fullest for Mass Housing Projects comprising of small, compact size apartments in large volumes.

- This Technology can be implemented on such Projects in two ways,

    1. Site based precast Plant
    2. Dedicated precast Plant

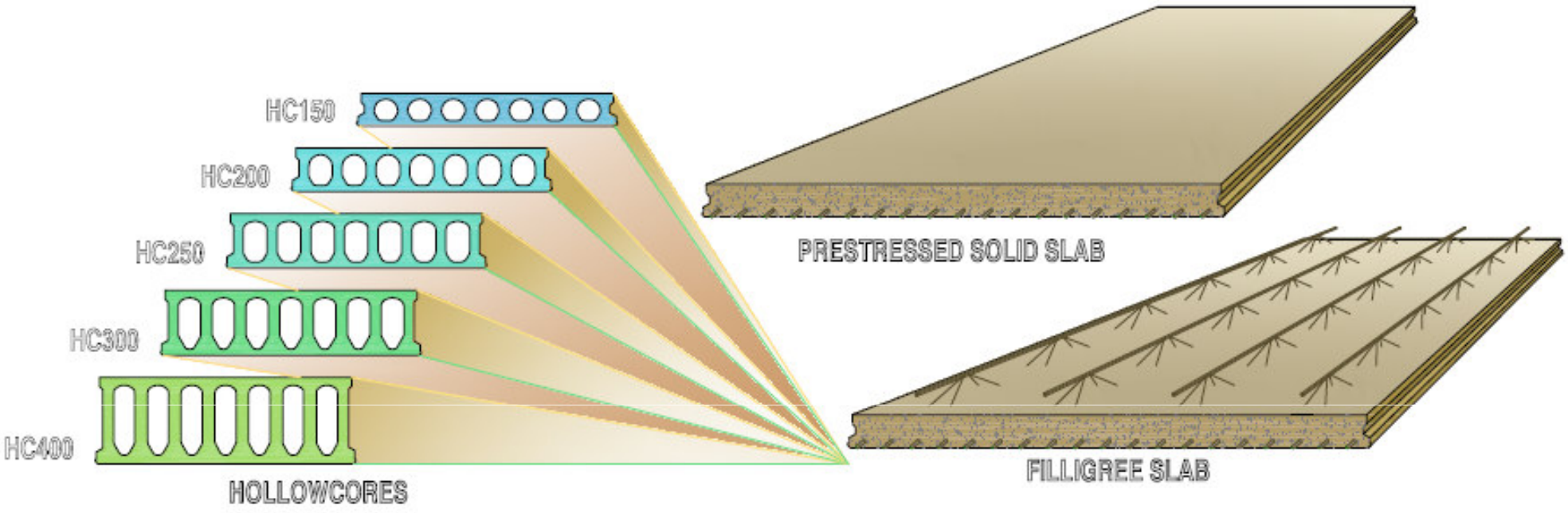
# Site Based Vs Dedicated Precast Plant

- The Site based precast plants form a lucrative option for Indian Market as the **excise duty** which otherwise gets attracted from Factory made precast components is saved.

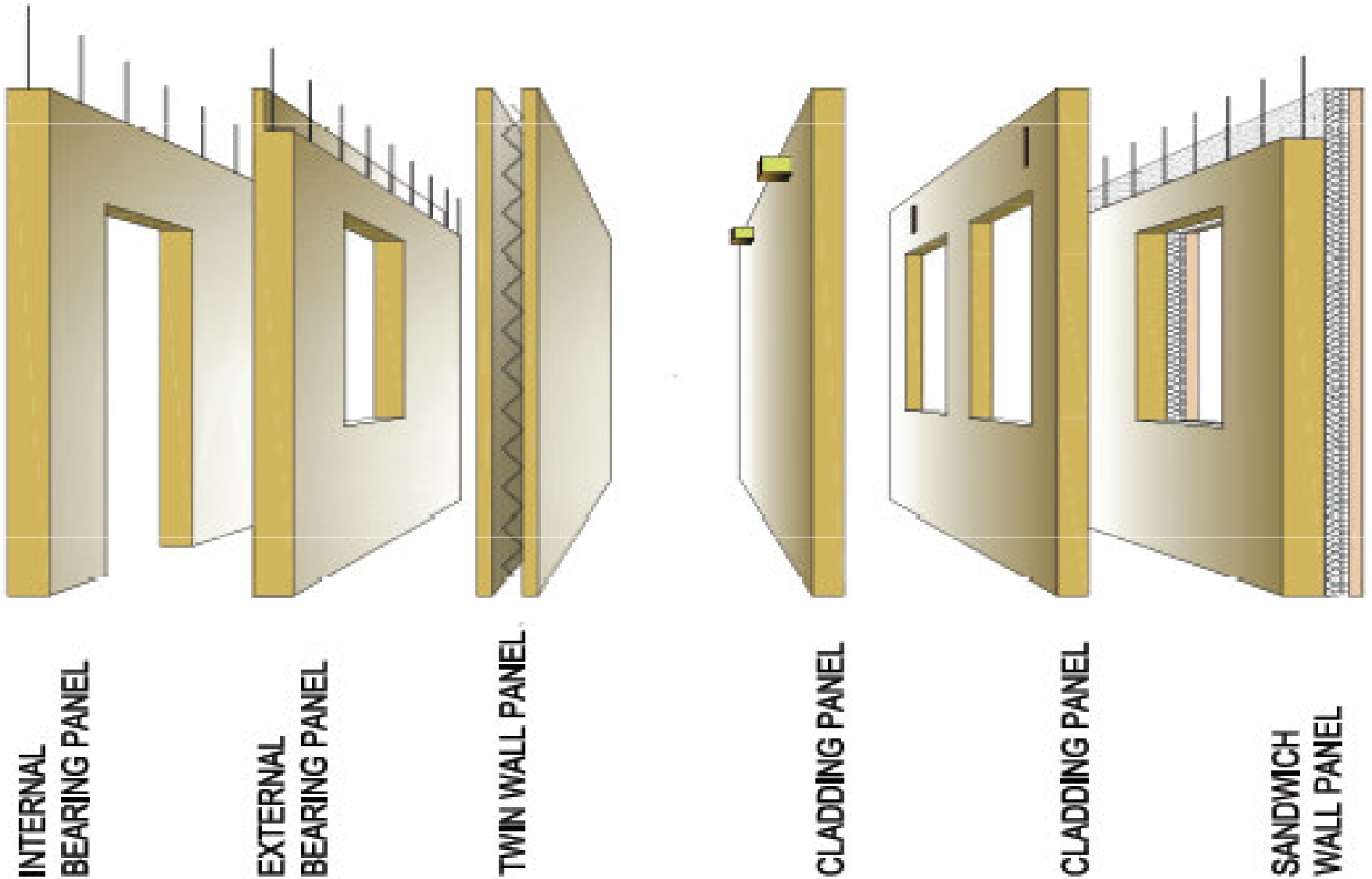
- Anyhow for adopting site based plant, there has to be sufficient volume of construction to justify the initial cost of setting up.

- Also, such plants have lesser efficiency than state of the art plants for obvious reasons.

# Standard Precast Components - Flooring

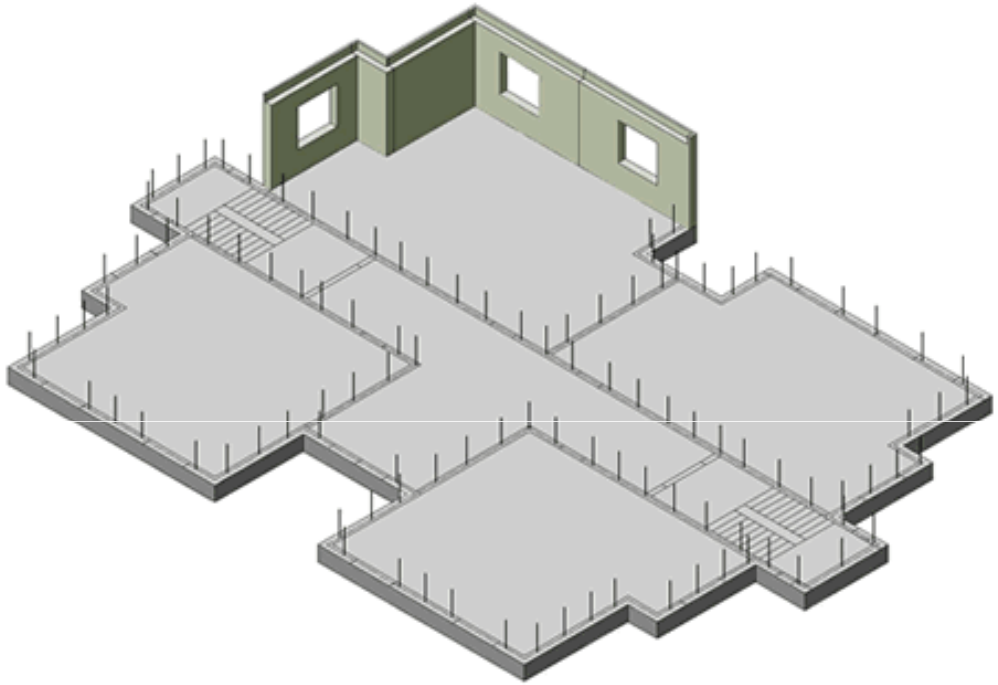


# Standard Precast Components - Walls



# Standard Precast Components – 3-D Modules

# Erection Sequence of Precast Structure



Erection of External Panels

# Structural Framing

- The Structural Frame for such buildings using precast concrete technology is essentially a **Load-Bearing** type of construction (cross-wall frame) eliminating the ugly column & beam offsets inside the compact rooms.
- The flooring slab can be in the form of solid reinforced precast units of room size (for site based plant) resting on the load bearing walls on all fours thus eliminating the requirement of structural topping.
- In case of dedicated precast plants, the flooring units have to be in the form of precast planks of not more than 2.4m width from transportation constraint. For monolithic action, these planks need to be topped with cast in place structural screed.

# EXAMPLES: AFFORDABLE HOUSING

**"Santushti Homes" at Bhiwadi**

250 affordable homes
G+3 Storied 3 Blocks
Load bearing Precast walls
Precast Solid Slabs (room size)
Site Based Precast Plant
Design Approved by IIT Delhi
Project completed

## "EWS Central Park" at Gurgaon

Apartment scheme

G+12 Story

Load bearing Precast walls

Precast Solid slabs

Site based Precast Plant

Project Completed

## "SRA scheme at Bhoiwada" at Mumbai

2500 apartment scheme
Slum Rehab Project
G+23 Storied 6 Blocks
Load bearing Precast walls
Precast Solid Slabs (room size)
Precast WC & Bath Pods
Dedicated Precast Plant
Design Approved by VJTI, Mumbai
Project Completed

## “Tata Peenya” at Bangalore

1892 Apartments scheme
Basement +G+14
Load bearing Precast walls
Precast Solid slabs
Site based Precast Plant
Project – 50% complete


14

## “Commune-1” at Bangalore

550 apartment scheme
Basement +G+13
Load bearing Precast walls
Precast Solid slabs
Site based Precast Plant
Project 50% complete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## "Golf Village" at Noida

Apartments scheme
3.0 Million Sq.ft
1B + 2P + 20 floors
Load bearing Precast walls
Hollow core precast prestressed slab
Dedicated Precast Plant
Project 35% complete

# SWOT Analysis – Precast Technology

## Strengths

- Speed, Quality, Economy
- Low Maintenance
- Seismic Resistant
- Quick Turnover of Money
- Universal Application

## Weakness

- Lack of awareness & availability
- Resistance to Change
- Fear of Unknown
- Unfamiliarity of Architects and Engineers
- Lack of Exposure to the technology in Technical Institutes

## Opportunities

- Huge Requirement of Affordable Houses
- Shortage of Skilled Labor
- Large Size Projects
- Exposure to Global Market
- Demand for Quality Construction

## Threats

- Govt. Tax Policy, Lack of Govt. Support & Encouragement
- Bad Past Experience with Substandard Technology & execution
- Vested Interests
- Lack of Standardization
- Imaginary Problems

# CONCLUSION

**The Precast Concrete technology has already arrived in India due to large size projects, need for quality construction with speed & reduced labour force. All these advantages can be exploited to the maximum by careful planning & designing.**

# RECOMMENDATIONS

- **Freeze the Construction system & technology to be adopted.**
- **Standardize LIG & EWS units in terms of Architectural plans to suit chosen technology.**
- **Allot approximate 100 acres of land at 200 strategic locations to set-up manufacturing units for producing precast concrete components to be run by entrepreneurs.**
- **Remove the excise duty on factory made products for precast components manufactured under PMAY.**
- **Adopt PPP model for construction of houses under PMAY for assured speed & quality.**

# How Innovela can help achieve HFA by 2022

- By Freezing the Construction system & technology to be adopted along with GOI.
- Standardizing LIG & EWS units & building layouts in terms of Architectural plans to suit chosen technology.
- Preparing the by-laws for construction of houses under PMAY scheme & development control rules for preparation of layouts.
- Identifying 100 acre land parcels at strategic locations across India in a phase wise manner.
- Help entrepreneurs in setting up of the industrial unit for production of building components.
- Creating the guidelines for erection of building components at site.
- Project Management & QA/QC at manufacturing unit as well as site.

# About InNovela Building Solutions Pvt. Ltd.

- We have been working for a leading precast manufacturing company in UK & Ireland since 2003 as a Design & Project Management Team based in Dublin, Ireland. We have started our operations in India since Jan'10 under a flagship name of Innovela Building Solutions Pvt. Ltd.
- Over the past 7 years our team has been involved in Design, Production & Erection of Various types of Precast Concrete Structures like Residential Developments, Commercial Developments & Utility & Functional Structures like Car parks, Warehouses, Box Culverts etc.
- Innovela Building Solutions is a young and dynamic consulting engineering group operating in the niche segment of Precast Concrete Technology. The Innovela Team posses a widespread experience in the field of Precast Concrete Technology and has been involved in Design, Manufacture and Erection of some of the finest structures in Europe, USA & India.
- **The Innovela Team stands out in providing the best possible, innovative and practical solutions to the various challenges arising due to Clients' aspirations.**

# Core Values, Core Purpose, Mission & Vision

- Core Values

  Ethics First

  Optimum Utilization of available Resources.

  Viable & Sustainable Solutions to Client's Aspirations.

  Recognition & Encouragement of Innovative Talent in an Open & Transparent Work Culture.

- Core Purpose

  Contribute to the infrastructure development for betterment in Quality of Indian Life.

- Mission

  To facilitate the transition from Conventional Construction Method to the Precast Concrete Technology; specifically to the large scale developments in Indian Realty Sector using the acquired knowhow on international projects combined with strong technical knowledge, innovative concepts and effective project management systems.

- Vision

  To be the **First Choice** for providing Precast Design Services. By 2013.

  To be the Leader in Providing **Total Precast Solution** for the large scale Indian realty projects by 2015.

# Services we Offer

- Feasibility Study & Technical Assistance in Preparation of Project Report for Funding Agency.
- Technical Guidance in setting up Precast Plant
- Structural Analysis, Design & Drawings for Construction projects using Precast Technology.

# Area of Application

- Residential Development
- Commercial Developments
- Retail Malls
- Warehouses
- Institutional Buildings
- Hospitality Buildings (Hotels, Hospitals)
- Stadia
- Multi level car parks

# Our Clients


Panchshil


Kumar Properties
Construction & Biotechnology


supertech
Yours for Life

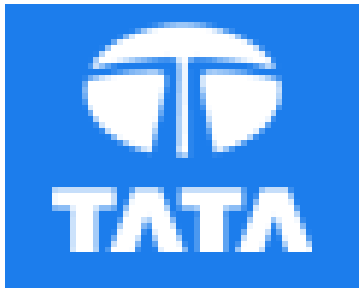

The Chennai Silks


MARVEL
REALTORS


VME
precast
Moulding the Future


LARSEN & TOUBRO LIMITED
Engineering Construction & Contracts Division


Central Park


TATA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# Projects -Feasibility & Plant Assistance

- Feasibility Studies
  - Panchshil Realty, Pune
  - Supertech Limited, Noida
  - Kumar Properties, Pune
  - Marvel Realtors, Pune
  - Teemage Builders, Coimbatore
  - L&T ECC, Chennai
  - Godrej & Boyce- Construction Division, Mumbai
  - Amrapali Group, Noida
  - Tata Housing, Mumbai
  - Pandhe Infracon, Mumbai
  - Godrej Properties
  - SJ Contracts Pvt. Ltd.
- Plant Assistance
  - Supertech Limited, Noida – Assistance in identifying the Machine Suppliers for the Proposed Precast Plant.
  - Teemage Builders, Coimbatore - Assistance in identifying the Machine Suppliers for the Proposed Precast Plant & guidance in master plan layout of the plant.
  - Marvel Realtors, Pune - Assistance in identifying the Machine Suppliers for the Proposed Precast Plant & guidance in master plan layout of the plant.

# PROJECTS – STRUCTURAL DESIGN & DRAWINGS

| No. | Project Discription | Name of Client | Area | Status |
|---|---|---|---|---|
| 1 | Structural Design of Residential Development "Lakeside" at Chennai | VME Precast, Chennai | 0.25M sqft | Construction |
| 2 | Structural Design of Engineering Hostel Building for SRM University at Trichy. | VME Precast, Chennai | 0.15M sqft | Construction |
| 3 | Structural Design of Affordable Housing at Bhiwadi, Rajasthan. | Shweta Estates, Gurgaon | 0.15M sqft | Shell Completed |
| 4 | St. Joseph College at Chennai | VME Precast, Chennai | 0.04M sqft | Completed |
| 5 | SRA scheme at Mumbai using Precast walls & slabs (G+22) | L&T ECC, Mumbai | 1.20M sqft | Shell completed |
| 6 | Sangria Commercial – A commercial Project of G+3 floors | Marvel Realtors, Pune | 0.15M sqft | Construction |
| 7 | Verano Commercial – A commercial Project of G+3 floors | Marvel Realtors, Pune | 0.15M sqft | Design Development |
| 8 | Tata Peenya, Bangalore | Tata Housing | 2.00M sqft | Design Development |
| 9 | Godrej Garden City, Ahemadabad | Godrej Properties | 2.00M sqft | Design Development |
| 10 | EWS at Central Park, Gurgaon | Shweta Estates, Gurgaon | 0.15M sqft | Design Development |
| 11 | Commune – I, Bangalore | Commune Properties (I) Pvt. Ltd. | 0.50M sqft | Design Development |
| 12 | Golf Country at Noida | Supertech Limited | 2.20M sqft | Design Development |

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# Thank You

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