



प्रधान मंत्री
आवास योजना-शहरी
Pradhan Mantri Awas Yojana-Urban



सत्यमेव जयते



एक कदम स्वच्छता की ओर

Ministry of Housing & Urban Affairs
Government of India



**GLOBAL
HOUSING
TECHNOLOGY
CHALLENGE INDIA**

Compendium of Innovative Emerging Technologies

shortlisted under Global Housing Technology Challenge - India





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DURGA SHANKER MISHRA
Secretary
Ministry of Housing & Urban Affairs
Government of India



Preface

Ministry of Housing and Urban Affairs (MoHUA), Government of India, is currently implementing Pradhan Mantri Awas Yojana- Urban (PMAY-U) with an objective to provide all weather pucca houses to all eligible beneficiaries in urban areas. Launched in June 2015, PMAY-U is one of the largest public housing programs in the world, with a goal of providing homes to over 11.2 million urban families by 2022 when the nation completes 75 years of its Independence. Further, due to rapid urbanization, massive construction activities are undergoing and planned in all the States/UTs for creating affordable housing with allied infrastructures.

Traditionally, dwelling units in the country are constructed using conventional technology. With the massive construction requirement & taking into consideration the important factors such as fast depleting natural resources, achievement of Sustainable Development Goals (SDGs) & international commitments to reduce carbon footprints, there is urgent need to find substitute for energy intensive building materials such as burnt clay bricks, and minimize the use of scarce natural materials such as river sand, water, timber etc. Globally, there has been technological advancement in the area of building materials and fast track prefabricated/pre-engineered construction practices. The use of alternate technologies in our country is in a limited extent so far.

In the PRAGATI¹ meeting held on 12th July 2017, Hon'ble Prime Minister emphasized and exhorted the States/UTs to accelerate adoption of innovative and alternative construction technologies to improve the pace and quality of work under PMAY-U and address the challenges of rapid urban growth and its attendant requirements. Construction of houses at the scale of PMAY (U) offers an opportunity for inviting alternative technologies from both within the country and across the globe, which may trigger a major transition through introduction of cutting-edge building materials, technologies and processes.

In the light of above, MoHUA initiated Global Housing Technology Challenge India (GHTC-India) in January, 2019 which aimed to identify and mainstream globally best available proven construction technologies that are sustainable, green and disaster resilient through a challenge process which will bring a paradigm shift in construction practices for affordable housing.

Construction Technology India (CTI), 2019, the 1st Biennial Expo-cum-Conference was organized on 02-03 March 2019 for providing a platform for exhibition, assessment and promotion of Innovative Construction Technologies from across the globe. Both Indian and International Technology Providers/ Companies participated in this challenge process.

¹ PRAGATI (Pro-Active Governance And Timely Implementation) is a multi-purpose and multi-modal platform chaired by Hon'ble Prime Minister, aimed at addressing common man's grievances, and simultaneously monitoring and reviewing important programmes and projects of the Government of India as well as projects flagged by State Governments.

During CTI, 54 technologies were shortlisted by a Technical Evaluation Committee (TEC) set up by MoHUA. These technologies have been grouped into six broad categories namely (i) Precast Concrete Construction System - 3D Precast volumetric, (ii) Precast Concrete Construction System - Precast components assembled at site, (iii) Light Gauge Steel Structural System & Pre-engineered Steel Structural System, (iv) Prefabricated Sandwich Panel System, (v) Monolithic Concrete Construction, and (vi) Stay in Place Formwork System.

In order to showcase these technologies, six Light House Projects (LHP) consisting of about 1,000 houses each, with allied infrastructure facilities are being implemented with six different technologies from above six groups at Indore (Madhya Pradesh); Rajkot (Gujarat); Chennai (Tamil Nadu); Ranchi (Jharkhand); Agartala (Tripura) and; Lucknow (Uttar Pradesh). The LHPs will demonstrate and deliver ready to live mass housing which are fast, of high quality and durability, sustainable and economical

With large scale uses, as compared to conventional brick and mortar construction. These projects shall serve as live laboratories for all stakeholders including Research & Development leading to the successful transfer & replication of technologies.

All the 54 shortlisted technologies and the associated Technology Providers are important for bringing paradigm shift in construction practices in the country. This Compendium provides concise information of the 54 technologies, its application in real projects in India and abroad and also provides contact details of technology providers.

The details of 54 innovative technologies included in the Compendium will provide synoptic view of these technologies which will be helpful to policy makers, public & private construction agencies and other concerned stakeholders for its adoption in their future housing projects. I urge prospective users to send their feedback to ghec-mhua@gov.in for improving this compendium so that it may serve useful document to transform technology in the construction sector of our country.

New Delhi
December 23, 2020



(Durga Shanker Mishra)

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Urban Transformation through Housing for All



A

Precast Concrete Construction System – Three Dimensional (3D) Volumetric

1	Pre-cast concrete system with columns, beams, walls, slabs, hollow core slabs & also 3D Volumetric components	Katerra
2	Vertical structural modules cast in Plant/Casting yard are assembled together through casting of floor panel. The unit is transported & installed at site	Moducast Pvt. Ltd
3	3D Modular casting using steel mould and high performance concrete of building modules in factory. These modules are transported to the construction site & assembled	Magicrete Building Solutions
4	Modules with 3D Volumetric Precast concrete unit, various units make a house	Ultratech Cement Ltd



Brief about Technology

3D Volumetric concrete construction is the modern method of building by which solid precast concrete structural modules (room, toilet, kitchen, bathroom, stairs etc. & any combination of these) are manufactured in Plant/Casting yard in a controlled factory condition. The Modules are transported through trailer to the site. It is then erected & installed using cranes/ push-pull jacks and integrated together in the form of complete building unit through jointing, grouting etc.

The Grade of concrete, thickness of wall/ floor & detailing of reinforcement is based on structural & functional requirements of the building in accordance with relevant Indian Standards/ National Building Code. The foundation shall be designed as per loading condition & bearing capacity of the soil.

Special Features of the Technology/System

- About 90% of the building work including finishing is complete in plant/casting yard leading to significant reduction in construction & occupancy time
- The controlled factory environment brings resource optimization, and improved quality, precision & finish
- The concrete can use industrial by-products such as Fly Ash, Ground granulated blast furnace slag (GGBFS), Micro silica etc. resulting in improved workability & durability, while also conserving natural resources
- Eliminates use of plaster
- The monolithic casting of walls & floor of a building module reduces the chances of leakage
- The system has minimal material wastage (saving in material cost), helps in keeping neat & clean construction site and dust free environment
- Optimum use of water through recycling
- Use of shuttering & scaffolding materials is minimal
- All weather construction & better site organization

Essential Requirements of the Technology/System

- Space for casting yard is required in addition to site for actual construction. The project is not viable if the factory is located far away. Setting up of casting yard requires time in month/(s) depending on project size & delivery schedule
- Approach road to site for movement of high capacity trailers, Cranes etc.
- Site should have space for proper leveraging & functioning of cranes
- Requires skilled labor & strict supervision
- Plumbing & electrical services need to be pre-planned



KATERRA



Infosys II, Bangalore, Commercial Development + Multi Level Car Parking (MLCP), Built up Area: 5,30,000 sqft



Embassy 7 B, Bangalore, Commercial Development +MLCP Built up Area: 17,00,000 sqft



GLOBAL
HOUSING
TECHNOLOGY
CHALLENGE INDIA



Precast Concrete Construction System – 3D Volumetric



(I) Technology: Pre-cast concrete system with columns, beams, walls, slabs, hollow core slabs & also 3D Volumetric components

ORGANISATION:

Katerra

Velankani Tech Park, No.43, Hosur Road, E-City Phase-1,
Bangalore – 560100, India

Website: www.katerra.com, www.kefinfra.com

CONTACT PERSON:

Shri M. Bopiah

Mob: 07868939444

Email: kavya.annem@katerra.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Embassy 7B Bangalore, 48, (Commercial), 1,58,000 Sqm, 2018
- Vaishnavi Serene Bangalore, 20m (Residential), 1,40,000 Sqm, 2020 (Ongoing)
- Yenepoya University, Mangalore, 26m, (Residential), 10,000 Sqm, 2016

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable upto Seismic Zone IV





**Bangalore Development Authority, Alur Village, Bangalore
(1,520 Units of G+3)**



**Aanganwari Centre, Jaipur (CSR support from Vedanta)
(Built up Area: 80 Sqm)**

Ministry of Women and
Child Development
Government of India

 **vedanta**

आंगनवाड़ी केंद्र कोड नं. 08110090308
गांव - रामनगरिया अजयपुरा
जिला - जयपुर

Precast Concrete Construction System – 3D Volumetric



(2) Technology: Vertical structural modules cast in plant/casting yard are assembled together through casting of floor panel. The unit is transported & installed at site. It is a precast system where the building is split into transportable modules/units.

ORGANISATION:

Moducast Private Ltd.

1st Floor, Rocklines Centre, 54 Richmond Road
Bengaluru- 560025, India

Website: www.moducast.org

CONTACT PERSON:

Shri Biswas Kumar Kollerri

Mob: 6366622268

Email: info@moducast.in

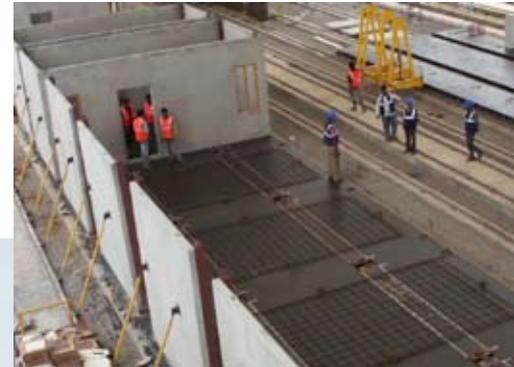
biswas@moducast.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Bangalore Development Authority, Alur, Village Bangalore (1520 units of G+3, 42.35 Sqm each with total built up area as 64,372 Sqm, 2012-2013)

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to seismic zone IV. Requires proper access to site & special transport logistics. Suitable up to G+3 due to limited hoisting capacity





Alpha, Daman



Dingankar's home, Kalhe Village, Panvel

Precast Concrete Construction System – 3D Volumetric



(3) Technology: 3D Modular Precast/ Magic Pods using steel mould and high performance concrete of building modules in factory/ casting yard. These pods are transported to the construction site & assembled

ORGANISATION:

Magicrete Building Solutions

702 B, 22 Business Point, S V Road, Andheri West
Mumbai, 400050, India

Website: www.magicrete.in

CONTACT PERSON:

Shri Siddharth Sharma

Mob: 9967870753

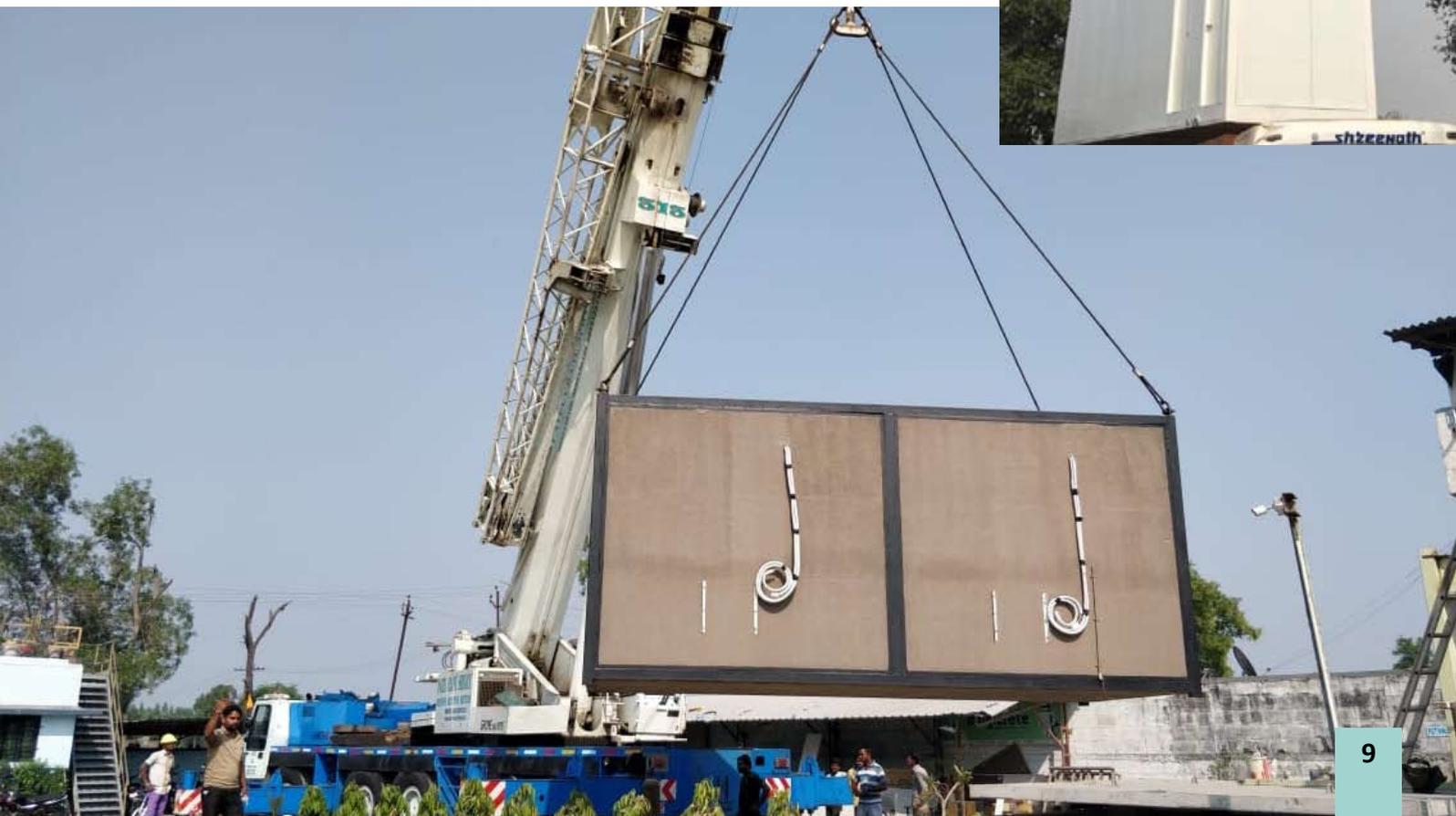
Email: Siddharth.sharma@magicrete.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Rabweh Heights Apartments Lebanon 8 buildings G+4/5, 32,000 m² approx. (USD 30mn) 2014
- Al Ain Offices AL AIN UAE, Supply and erection of modules for 3 and 2 storey workers accommodation building 16,000 m² approx. (USD 15mn) 2012

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to seismic zone IV. Site must have accessibility & technology needs special transport logistics





Five storey building, 20 Apartments
Total Built up Area: 10,000 sqft for Tata Housing At Boisar



Precast Concrete Construction System – 3D Volumetric



(4) Technology: Modules with 3D Volumetric Precast concrete unit, various units make on house. The moulds are customizable during the modules' design process. All openings - doors and windows, access points - pipes & conduits and insulation are designed into the mould

ORGANISATION:

Ultratech Cement Ltd.

Ahura Centre , 2nd Floor, Mahakali Caves Road, Andheri (W), Mumbai-400093, India

Website: www.ultratechcement.com

CONTACT PERSON:

Shri Ramesh Joshi

Mob: 9702065854

Landline:022 66917360

Email: ramesh.kjoshi@adityabirla.com

MAJOR PROJECT UNDERTAKEN USING THIS TECHNOLOGY:

5 Storied building with 20 apartments, cast & assembled in 33 days, Tata Housing at Boisar, Mumbai

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

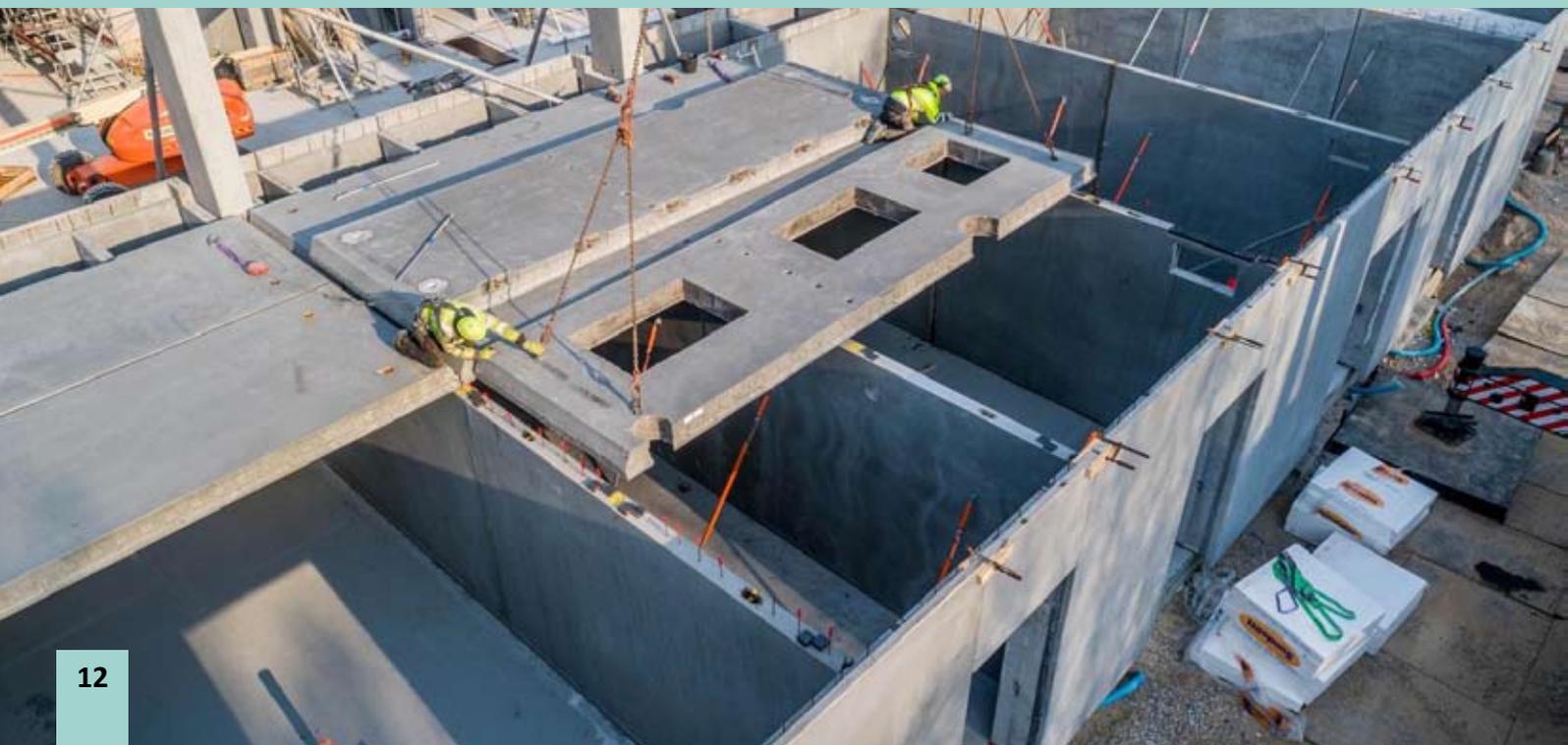
Suitable up to seismic zone IV. Site must have accessibility & technology needs special transport logistics



B

Precast Concrete Construction System – Precast components assembled at site

5	Precast Large Concrete Panel (PLCP) System with structural members (wall, slab etc.) cast in a factory/ casting yard and brought to the building site for erection & assembling	Larsen & Toubro Ltd.
6	Pre-cast Concrete Structural system comprising of pre-cast column, beam, precast concrete / light weight slab, AAC blocks/ infill concrete walls	B.G. Shirke Construction Technology Pvt. Ltd.
7	Optimal Pre-cast concrete components System through structural Analysis, design & equipment support.	Elematic India Pvt. Ltd.
8	Precast concrete construction system using precast walls with precast plank floor.	PG Setty Construction Technology Pvt Ltd.
9	Pre cast components comprising of beams, coloumns, staircase, slab, hollow core slab etc. manufactured in plant & erected on site	Teemage Builders Pvt. Ltd.
10	Pre-cast sandwich panel system & light weight precast concrete slab	NordicflexHouse
11	Prefabricated Interlocking Technology (without mortar) with Roofing as Mechnized Precast R.C. Plank & Joist system	Aap Ka Awas LLP
12	Large Hollow wall prefab concrete Panel (lightweight, interlocking, concrete panel) using factory produced large standard hollow interlocking concrete block.	G8Ark Factories Pvt. Ltd.



Brief about Technology

In Precast concrete construction the individual components such as walls, slabs, stairs, column, beam etc, of various thickness, shape and sizes of building, are manufactured in plant/ casting yard in controlled factory conditions. The components are transported to site, erected & installed through crane and assembled together through in-situ jointing/ grouting etc.

The Grade of concrete, the dimension & sizes of walling/ flooring components and detailing of reinforcement are based on structural & functional requirements of the building in accordance with relevant Indian Standards/ National Building Code. The foundation shall be designed as per loading condition & bearing capacity of the soil.

Special Features of the Technology/System:

- Nearly all components of building work are manufactured in plant/casting yard & the jointing of components is done In-situ leading to reduction in construction time
- The controlled factory environment brings resource optimization, and improved quality, precision & finish
- The concrete can use industrial by-products such as Fly Ash, Ground granulated blast furnace slag (GGBFS), Micro silica etc. resulting in improved workability & durability, while also conserving natural resources
- Eliminates use of plaster
- Helps in keeping neat & clean construction site and dust free environment
- Optimum use of water through recycling
- Use of shuttering & scaffolding materials is minimal
- All weather construction & better site organization

Essential Requirements of the Technology/System:

- Space for casting yard is required in addition to site for actual construction. The project is not viable if the factory is located far away. Setting up of casting yard requires time in month/(s) depending on project size & delivery schedule
- Site should have space for proper leveraging & functioning of cranes
- Requires skilled labor & strict supervision
- Plumbing & electrical services need to be pre-planned



Provident Sunworth Project, Bengaluru
Built up Area: 31.8 lakhs sqft, Units-2734, Building Blocks- 29



Hostel Building for Tirumala Tirupati Devasthanams Educational Institution of Sri Govindaraja Swamy Arts College at Tirupati,
Total Rooms - 107, Total Built up Area: 75, 733 sqft

Precast Concrete Construction System – Precast components assembled at site



(5) Technology: Precast Large Concrete Panel (PLCP) System with structural members (wall, slab etc.) cast in a factory/ casting yard and brought to the building site for erection & assembling

ORGANISATION:

Larsen & Toubro Limited

L&T House, Ballard Estate, Mumbai- 400001, India

Website: www.larsentoubro.com

CONTACT PERSON:

Shri K Senou

Mob: 9820874203

Landline: 022 67059093

Email: ksu@lntec.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Provident Housing Ltd Bengaluru (15 Building Blocks 1,440 Units B+S+12 - 1,54,868 Sqm) 2016
- Provident Housing Ltd Bengaluru (14 Building Blocks 1,344 Units B+S+12 - 1,40,747 Sqm) 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable upto Seismic Zone IV





**Housing Project for Maharashtra Housing and Area Development Authority
at Morwadi, Pune (BUA- 10,73,665 sqft, 937 Dwelling units)**



**Housing Project for CIDCO at Kharghar, Navi Mumbai
(BUA 20,72,382 sqft, 1,224 Dwelling units)**

Precast Concrete Construction System – Precast components assembled at site



(6) Technology: '3-S' Prefab Technology. Pre-cast Concrete Structural system comprising of pre-cast column, beam, precast concrete / light weight slab, AAC blocks/ infill concrete walls

ORGANISATION:

B.G. Shirke Construction Technology Pvt.Ltd.
72-76, Industrial Estate, Mundhwa, Pune- 411036, India
Website: www.shirkegroup.com

CONTACT PERSON:

Shri P.V. Shelke
Mob: 9049004034
Landline: 020 6708106
Email: pvshelke@shirke.co.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Planning, Designing and obtaining necessary approvals for Construction of 1832 LIG T/s and 635 MIG T/s at Vihar Bolinj, Thane Under Phase-1, Mumbai, Maharashtra, Built up Area: 1.74 Lakh Sqm (S+22/23/24), 2467 Houses, 21 buildings blocks, Nov, 2016
- Construction of 1500 residential flats in sr. No. 294 to 297 at Sholinganallur, Chennai, Built up area 1.46 lakh Sqm (S+10, 26 buildings blocks)

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to Seismic Zone IV





ELEMATIC INDIA PRIVATE LIMITED



Aurobindo Galaxy Office Tower, Hyderabad, 1.9 million sqft commercial building (25 storeys)

Elematic Scope: supply & setup of precast plant, building concept design, training for production of precast elements



Bismayah New City, Iraq, 1,00,000 housing units

Precast Concrete Construction System – Precast components assembled at site



(7) Technology: Optimal Pre-cast concrete components System through structural Analysis, design & equipment support. The Agency is primarily into supply of pre-cast Plant along with moulds & other accessories, structural design support & project monitoring consultancy.

ORGANISATION:

Elematic India Private Limited

H-38, 1st Floor, Bali Nagar, New Delhi- 110015, India

Website: www.elematic.com

CONTACT PERSON:

Shri Chander Dutta

Mob: 9810014696

Landline: 011 45769837

Email: chander.dutta@elematic.com

shrikant.luktuke@elematic.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Lakefront, Sainikpuri, Hyderabad, Construction Area: 51,000 Sqm Basement + G + 10 Storey, Precast Structural walls with Cast-in-situ Slab, 2012
- EWS / LIG Housing Contractor: BSBK Group (6200 apartments, Construction time 3 years G+3, G+8 buildings)

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to Seismic Zone IV. The firm needs to tie up with a Construction Agency





P.G. SETTY CONSTRUCTION TECHNOLOGY PVT. LTD.



**Karnataka State Police Housing Corporation Ltd., Bengaluru,
128 Pre Cast Quarters**



**Sample housing done for Mysuru Nirmiti Kendra in Bogadi,
Mysore. Total 8 houses per block.**

Precast Concrete Construction System – Precast components assembled at site



(8) Technology: Precast concrete construction system using precast walls with precast plank floor. The majority of structural components are standardized and produced with movable moulds

ORGANISATION:

P.G. Setty Construction Technology Pvt. Ltd.
74, Sandesh Arcade, 3rd Floor, Sahukar Chenaiah Road,
Kuvempunagar North, Saraswathipuram, Mysuru- 570009, India
Website: www.pgsetty.com

CONTACT PERSON:

Shri M G Somashekar
Mob: 08214257201, 8970070101,
9448284720
Email: md@pgsetty.com /
bhavyashetty@pgsetty.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Bangalore Development Authority (as JV Partner) Alur, Bangalore (1510 Units G+2) 65,800 Sqm, 2014
- Karnataka State Police Housing Corporation Ltd., Bengaluru, 128 Precast Quarters, 2 Blocks, Stilt + 8 Storeys in each block, 11,124 Sqm, 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to Seismic Zone IV.





TEEMAGE BUILDERS PVT. LTD.



CPWD / CRPF 251 Nos. Residential Quarters (G+3) at Coimbatore (TN)



NPCIL / KKNPP 40 Nos of Executive Apartments (G+10) at Anuvijay Township, Kudankulam (TN)

Precast Concrete Construction System – Precast components assembled at site



(9) Technology: Precast components comprising of beams, columns, staircase, slab, hollow core slab etc. manufactured in plant & erected on site

ORGANISATION:

Teemage Builders Pvt. Ltd.

35, College Cross Rd 1, KNP Puram, Odakkadu, Tiruppur,
Tamil Nadu- 641687, India

Website: www.teemageprecast.in

CONTACT PERSON:

Shri Vishnu Kumar

Mob: 8220051777

Email: mvk@teemageprecast.in/
sales@teemageprecast.in

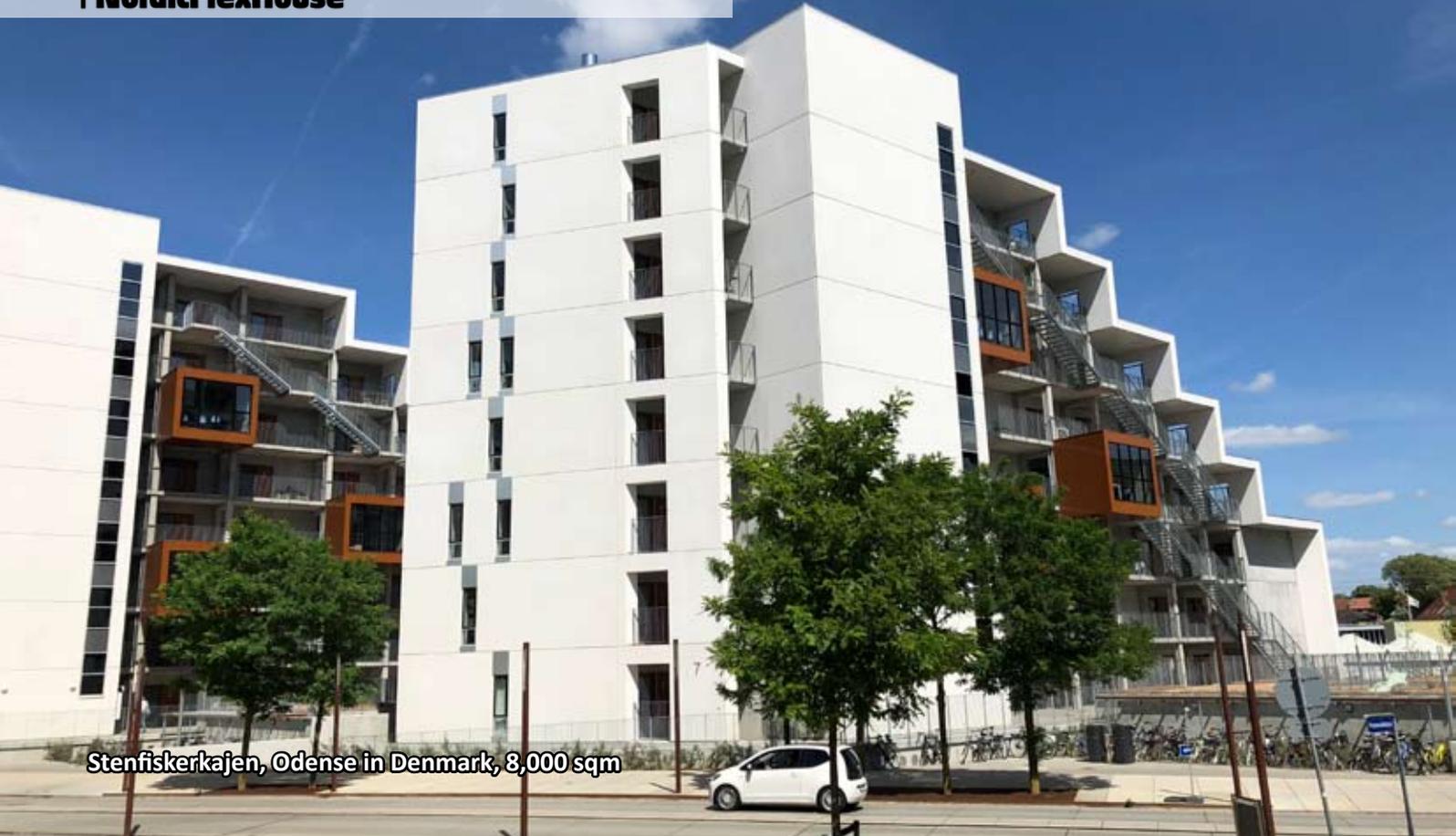
MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- CPWD / CRPF 251 Nos. Residential Quarters (G+3) at Coimbatore (TN) with area 16,000 Sqm
- NPCIL / KKNPP 40 Nos of Executive Apartments (G+10) at Anuvijay Township, Kudankulam (TN) with area 5,150 Sqm
- M/s.SCM Silks (P) Ltd Design and Construction of Commercial Building (2B+G+3) at Madurai with area 21,020 Sqm in 2015

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to Seismic Zone IV





Stenfiskerkajen, Odense in Denmark, 8,000 sqm



Krygerhus, Vejle in Denmark, 4,000 sqm

Precast Concrete Construction System – Precast components assembled at site



(10) Technology : Precast & light weight concrete slab (SL deck). SL-Decks are developed for flexible way of obtaining low weight, up to 3.6 mtr width, however, width can be increased by 50%

ORGANISATION:

NORDICFLEXHOUSE

LAUTRUPHOEJ 1-3, Ballerup- 2750 , Denmark

Website: www.nordicflexhouse.dk

CONTACT PERSON:

Shri Anders Thomsen

Mob: 52250493

Email: ant@nordicflexhouse.dk

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- 5E Byg A/S Robert Jacobsens Vej 73, København S (100 buildings) - 7,000 Sqm, 2018
- KPC BYG A/S Stenfiskerkajen, Odense (200 buildings) - 12,000 Sqm, 2017
- NRE A/S Amager Fælledvej 76, København S (140 buildings) - 10,000 Sqm, 2016
- Arkitektgruppen A/S Else Alfelts Vej 95, København (150 buildings) - 12,000 Sqm, 2015

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to Seismic Zone IV





**InnoGeocity Township, (phase 1), Oragadam, Chennai
500 Units (Total Built up area: 52,500 sqm)**



**Ministry of Animal Husbandry, Ballabgarh
(Total Built up Area: 20,000 sqm)**

Precast Concrete Construction System – Precast components assembled at site



(II) Technology: Prefabricated Interlocking Block Technology (without mortar). The technology is sourced from South Africa and indigenized in Local conditions, with Roofing as Mechanized Precast R.C. Plank & Joist system

ORGANISATION:

Aap Ka Awas LLP

C-204, LGF, Greater Kailash, Part-I,
New Delhi- 110048, India

CONTACT PERSON:

Shri Pramod Adlakha

Mob: 9811118803, 9810037701

Email: adlakhaoffice@gmail.com/
aapkaawas@gmail.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- InnoGeocity township, (phase 1), Oragadam, Chennai (2.5 Storeys, 500 Units of 3 Types, Type 1: 105 Sqm, Type 2: 106, Sqm & Type 3: 88 Sqm) of total built up area of 52,500 sqm.
- Housing for Welspun Industries Limited, Vapi, Gujarat (4 Storeys) of total built up area of 12,128 Sqm
- DSIIDC Technical Centre Building, Wazirpur Industrial Area, Delhi (3164 Houses, 1,05,556 Sqm) 2003-2006

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to G+3 storeys & Seismic Zone - IV



G8ARK FACTORIES PVT. LTD.



Precast Concrete Construction System – Precast components assembled at site



(12) Technology: Large Hollow wall prefab concrete Panel (lightweight, interlocking, concrete panel) using factory produced large standard hollow interlocking concrete block

ORGANISATION:

G8ARK Factories Pvt. Ltd.

Plot no. (5 , Industrial Park , Kakatur (II), Venkatachalam (M), SPSR, Nellore, Andhra Pradesh- 524320, India

CONTACT PERSON:

Shri William Ling

Mob: 9121092508, 6596737788,
6596351719

Email: william@g8ark.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Omkar/L&T Bhoiwada, Mumbai Using precast (2000 units G+23), 5 towers - 1,00,000 Sqm, 2014
- Singapore developer MCL using modular construction, Jurong west, Singapore (700 units G+16) 4 towers, 58,000 Sqm, 2017
- Singapore Post (logistic warehouse) using ECC wall Seletar Logistic, Singapore (commercial) 60,000 Sqm, 2016

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to Seismic Zone IV



C

Light Gauge Steel Structural System & Pre-engineered Steel Structural System

13	LGS Framing with various walling & roofing options	Mitsumi Housing Pvt. Ltd.
14	LGS Framing with various walling & roofing options	Everest Industries Ltd.
15	LGS Framing with various walling & roofing options	JSW Steel Ltd.
16	Light Gauge Steel Frame Structure with infill Concrete Panel (LSSFS-ICF) – the light weight concrete using a special mixing & pumping machine is filled in between two prefabricated concrete panels.	Society for Development of Composites
17	LGS Framing with various walling & roofing options	Elemente Designer Homes
18	LGS Framing with various walling & roofing options	MGI Infra Pvt. Ltd.
19	LGS Framing with various walling & roofing options	RCM Prefab Pvt. Ltd.
20	LGS Framing with various walling & roofing options	Nipani Infra and Industries Pvt. Ltd.
21	LGS Framing with various walling & roofing options	Strawcture Eco
22	LGS Framing with various walling & roofing options	Visaka Industries Ltd.
23	Prefabricated steel structural system with Dry wall system as AAC panels, PUF panels etc.	RCC Infra Ventures Ltd.
24	Hot rolled steel frame with speed floor	Jindal Steel & Power Ltd.
25	Hot rolled steel section with AAC Panels as floor & slab	HIL Ltd.
26	AAC wall and roof panel system to provide integrated solution. AAC products are reinforced and used in both load and non-load bearing applications.	Biltech Building Elements Ltd.
27	AAC Panels are Wire mesh/ steel reinforced for use as wall & slab. Appears to be non-load bearing panels to be used with structural framing.	SCG International India Pvt. Ltd.
28	Precast Light Weight Hollow-core wall Panel is a non-structural construction material with framed structures.	Pioneer Precast Solutions Pvt. Ltd.

Brief about Technology

Light Gauge Steel Framed Structures (LGSF) is based on factory made galvanized light gauge steel components. The components/sections are produced by cold forming method and assembled as panels at site forming structural steel framework of a building of varying sizes of wall and floor. The assembly is done using special types of screws and bolts. LGSF is typically ideal for one to four storey high buildings, especially for residential and commercial buildings & for buildings higher than G+3, it can be used with hot rolled Steel sections.

The flooring / slab can be with deck sheet supported on floor joists with in-situ reinforced concrete on the top or in-situ conventional RCC slab. Wall cladding used (high density cement fibre board, concrete panels etc.) shall resist the wind load & conform to the functional requirements.

The sequence of construction comprises of foundation laying, fixing of tracks, fixing of wall panels with bracings as required, fixing of floor panels, fixing of roof panels, decking sheet, fixing of electrical & plumbing services and finally fixing of insulation material & walling panels.

The LGSF frame, hot rolled steel section & cladding for wall shall be as per design requirements in accordance with relevant Indian/ International standards. The foundation shall be designed as per loading condition & bearing capacity of the soil.

Special features of the Technology/System:

- High strength to weight ratio. Due to light weight, significant reduction in design earthquake forces is achieved. Chance of progressive collapse is marginal due to highly ductile and load carrying nature of closely spaced studs/joists
- Fully integrated computerised system with Centrally Numerical Control (CNC) machine primarily employed for manufacturing of LGSF sections provide very high Precision & accuracy upto 1 mm
- The speed of construction is very high. A typical four storeyed building can be constructed within one month
- Structure being light, does not require heavy foundation
- Structural element can be transported any place including hilly areas to remote places easily and structure can be erected fast
- Structure can be shifted from one location to other without wastage of materials
- Steel used can be recycled multiple times

Essential Requirements of the Technology/System:

- Electrical cables need to be properly insulated with mini circuit breakers
- The labors are required to be trained for fabrication/assembly works
- Plumbing & electrical services need to be pre-planned



**MITSUMI
HOUSING**

MITSUMI HOUSING PVT. LTD.



Affordable Housing at Nairobi, Kenya



Beach House at Mombasa, Nairobi, Kenya



GLOBAL
HOUSING
TECHNOLOGY
CHALLENGE INDIA



Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(13) Technology: Cold Formed Light Gauge Steel Frame (LGSF) Construction Technology

ORGANISATION:

Mitsumi Housing Pvt. Ltd.

202, Radhe Kishan Arista Opp. Hirabhai tower Jawaharchowk - Isanpur Road, Maninagar, Ahmedabad- 380008, India

Website: www.mitsumihousing.com

CONTACT PERSON:

Shri Ajay Shah

Mob: 9898575799

Email: ceo@mitsumihousing.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Ministry of Transport, Infrastructure, Housing and Urban Development Mombasa, Nairobi, Kenya (1800 Units 81,000 Sqm) 2017
- AGI, West Africa (1250 Units, 44,594 Sqm) 2015
- CWG, WhiteHorse YK, Canada (282 Suits, 28,800 Sqm) 2007

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+3 storeys. Hybrid with steel frame for high rise. Labelling materials to be used should meet the site specific quality and durability requirements





EVEREST INDUSTRIES LTD.



Orissa Power Generation Corporation, Jharsuguda, Orissa
Total Built up Area: 1,07,134 sqft

Construction of 2 Nos. Hostel Block, NTPC - KUDGI, Karnataka
Total Built up Area: 28,334 sqft



Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(I4) Technology: Light Gauge Steel Construction - Light gauge steel frame is a cold formed process and is made with high tensile steel sheets and coating of zinc & aluminium for protection against corrosion

ORGANISATION:

Everest Industries Ltd.

Everest Technopolis, D-206, Sector 63, Noida- 201301, India

Website: www.everestind.com

CONTACT PERSON:

Shri Subrata Dutta

Mob: 9810809762, 9971698448

Email: sdutta@everestind.com

bagarwal@everestind.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- OPGC, Jharsuguda, Orissa (15 Building, G+1) - 1,07,134 sqft, 2017
- NTPC, Dallipali, Orissa (1 Building G+1) - 10,300 sqft, 2017
- IIT Mandi, (25,300 sq.ft., G+2 Structure)
- HCL Technologies Lucknow, Uttar Pradesh (2 Building, G+3) - 1,46,500 sqft, 2016
- NTPC, Kudgi, Karnataka (2 Building, G+1) - 28,334 sqft, 2015

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+3 storeys. Hybrid with steel frame for high rise. Labelling materials to be used should meet the site specific quality and durability requirements





JSW STEEL LTD.



Polytechnic College, Uttarakhand



Engineering College, Uttarakhand



Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(15) Technology: LGS Framing with various walling & roofing options

ORGANISATION:

JSW Steel Ltd.

JSW centre, BKC, Bandra east, Mumbai- 400051, India

Website: www.jswsteelbuildings.com

CONTACT PERSON:

Shri MV Krishna

Mob: 8007170888

Landline:022 42861000

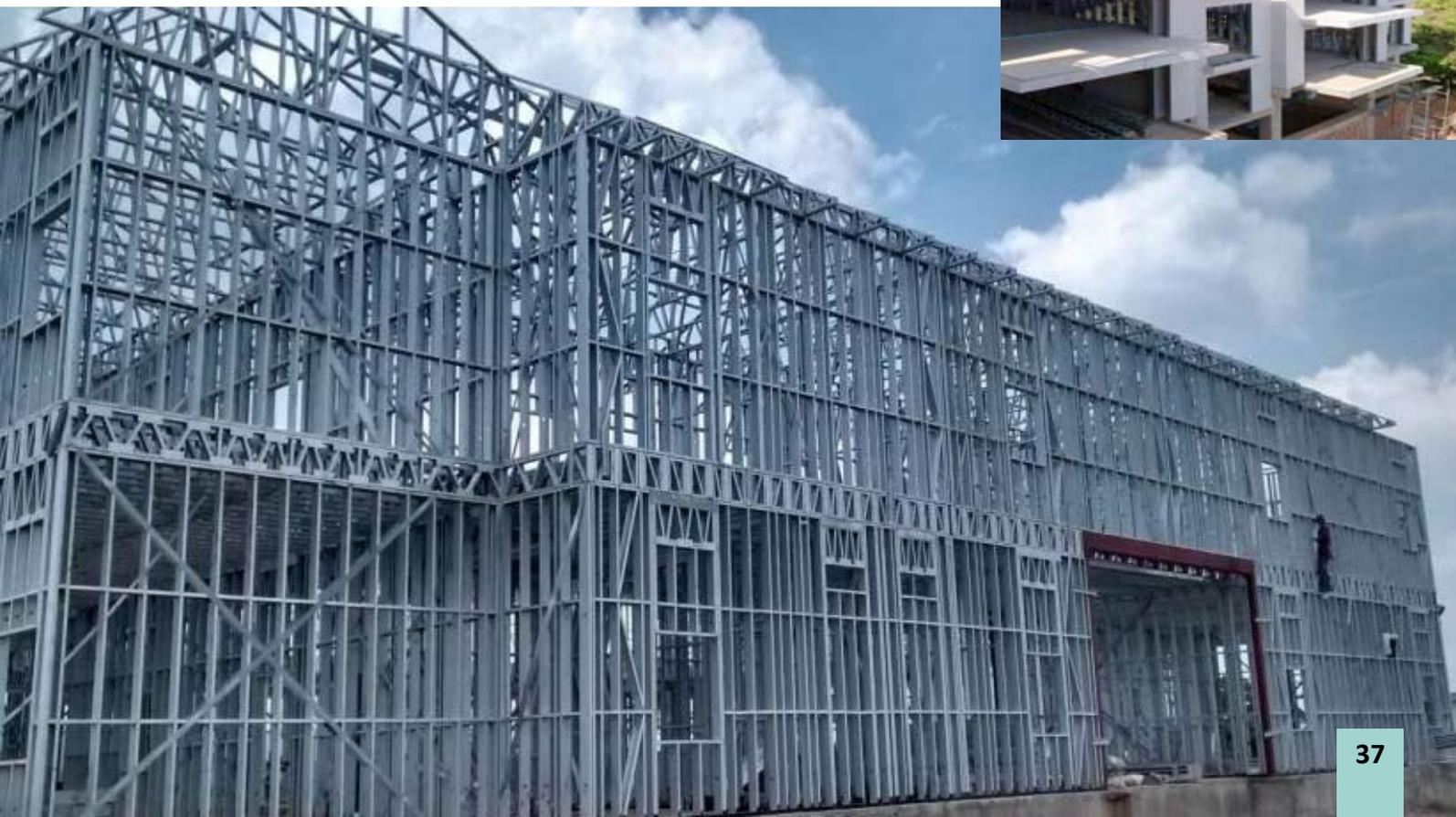
Email: krishna.melarcodes@jsw.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Paradise Avenue Jammu G+13 (12,546 Sqm) 2016
- G+5 Service Apartments, Palolem Hills, Goa (3,252 Sqm) 2014
- DTTDC Office, New Delhi built in 3 months

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys. Hybrid with steel frame for high rise. Panelling materials to be used should meet the site specific quality and durability requirements





Resort Building constructed using LGSFS – Dry wall Panel Technology, Ratnagiri, Maharashtra Built up Area: 415 sqm



G+1 Finished Building at Calicut using LGSFS – Dry wall Panel Technology, Calicut, Kerala, Built up Area: 133 sqm

Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(16) Technology: Light Gauge Steel Frame Structure with infill Concrete Panel (LSSFS-ICF) – the light weight concrete using a special mixing & pumping machine is filled in between two prefabricated concrete panels

ORGANISATION:

Society for Development of Composites

No. 205, Bandematt, K.S.Town, Bangalore- 560060, India

Website: www.compositestechologypark.com

CONTACT PERSON:

Dr. R. Gopalan

Mob: 7676299152

Landline: 080 28482771

Email: drgopalan2003@yahoo.com

drgopalan2011@yahoo.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Salarpuria Sattva, Bangalore (3 Single storied houses of 1370.60 Sqm) in 2015
- Goa Cottage, Goa (1 House of 1186 Sqm) in 2016
- Managers Quarters, Sakaleshpuram (5 storied building of 1456 Sqm) in 2016

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys. Hybrid with steel frame for high rise. Panelling materials to be used should meet the site specific quality and durability requirements





Celebration Lawn, Haldwani, Uttarakhand
Built up Area: 1800 sqft

Tribal Girls School cum Hostel, Chindwara, Madhya Pradesh



Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(17) Technology: LGS Framing with various walling & roofing options

ORGANISATION:

Elemente Designer Homes

Dewal Chaur, Rampur Road, Haldwani- 263139, India

Website: www.elemente.in

CONTACT PERSON:

Shri Anuj Sharma

Mob: 8744060631

Landline:0120 4775199

Email: anuj.sharma@elemente.in
info@elemente.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Residential building, G+3, under Demonstration Housing Project of BMTPC at Hyderabad
- Govt. Nursing College, Almora, Uttarakhand
- Step By Step International school, Mahapura, Jaipur (Floor addition) Area: 13,260 sqft Utility (School building)

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys. Hybrid with steel frame for high rise. Panelling materials to be used should meet the site specific quality and durability requirements





MGI INFRA PVT. LTD.



Kesar Farm House, Noida
Built up Area: 3,000 sqft



Paradise Avenue Project, Jammu
Built up Area: 1,35,000 sqft (234 DUs)

Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(18) Technology: Light Gauge Steel Framing (LGSF) Solutions.
LGS Framing with various walling & roofing options

ORGANISATION:

MGI Infra Pvt. Ltd.

D-66, 60 Feet Road, First Floor, Chattarpur, New Delhi- 110074, India

Website: www.mgiinfra.com

CONTACT PERSON:

Shri Hitesh Jaju

Mob: 9810164007

Email: hitesh.jaju@mgiinfra.com/
info@mgiinfra.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- UPRNNL Baans, Jaitee, Berinaag, Pankhu, Raigar at Uttarakhand (Single Work Order with Multiple Locations) (03 (G+2), 02 (G.F) 7,981 Sqm) 02-2016 to 03-2017
- Simula Infra Development, Paradise Avenue Jammu (1 block, Stilt+13, 13,234 Sqm) 2016
- Eclectic Developers Pvt. Ltd Goa (3 blocks, G+5 3,954 Sqm) 2013
- NTPC Khargone Madhya Pradesh (4 blocks, G+1 5,560) 2017

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys. Hybrid with steel frame for high rise. Panelling materials to be used should meet the site specific quality and durability requirements





Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(19) Technology: Light Gauge Steel (LGS) Construction.
LGS Framing with various walling & roofing options

ORGANISATION:

RCM Prefabs Pvt. Ltd.

71, Mayfair Apartments, Mayfair Gardens, Haus Khas,
New Delhi- 110016, India

Website: www.rcmprefabs.com

CONTACT PERSON:

Shri Rakesh C Misra

Mob: 9930003494

Landline: 011 41656633

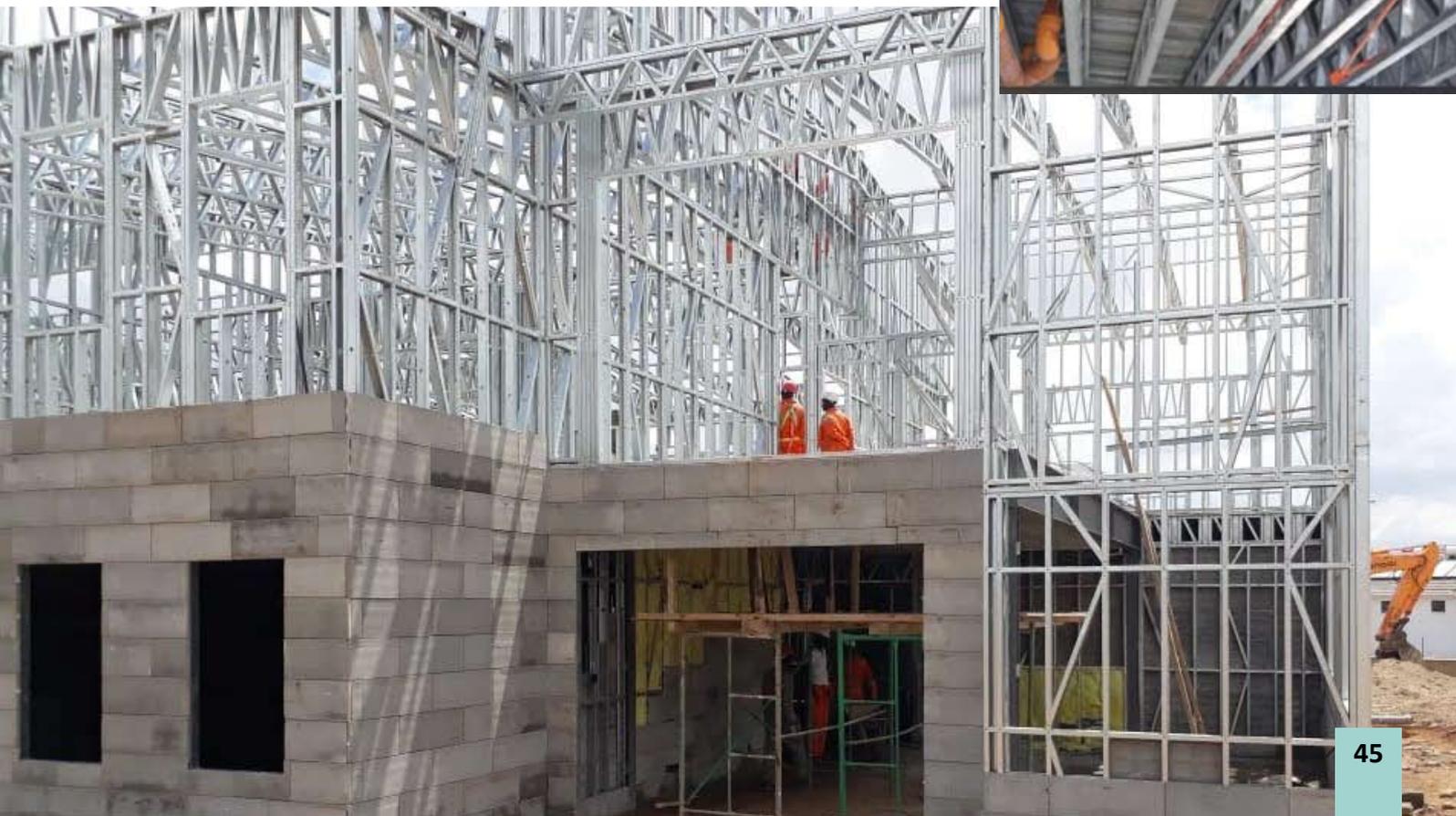
Email: rakesh@rcmprefabs.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Ayala Land Corp. Bellavita-Alaminos, Laguna, Philippines (506 Houses in 1 building of 15,180 Sqm) 2018
- Avida Land Corp. Avida Village Iloilo, Pavia, Iloilo, Philippines (195 Houses in 2 building of 11,700 Sqm) 2016
- 10 Ayala Land Corp., Bellavita-Tapia, Gen. Trias, Cavite, Philippines (292 Houses in 2 building of 8,760 Sqm) 2016

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys. Hybrid with steel frame for high rise. Panelling materials to be used should meet the site specific quality and durability requirements





**Community Hall for Bihar State Power Holding Company,
Patna, G+1- 25,000 sqft with External Insulation & Finishing
System**

**Rooftop Extension at Srisailam Andhra Pradesh,
Built-up Area: 30,000 sqft for Sri Bhramaramba Mallikarjuna
Temple or Srisailam Temple**



Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(20) Technology: Light Gauge Steel frame Construction. LGS Framing with various walling & roofing options

ORGANISATION:

Nipani Infra & Industries Pvt. Ltd.

Nipani Industries , 2nd Floor Bhasin Arcade, Main Road
Gorakhpur City, Jabalpur- 482001, India

Website: www.nipaniindustries.com

CONTACT PERSON:

Shri Somu Pandey

Mob: 9300626212, 9425412110

Landline:0761-4022215

Email: somujabalpur@gmail.com;
nipani.industries@gmail.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Simula Global Paradise Apartments, Jammu (S+13 - 13,234 Sqm) 2015
- Executive Engineer , CPWD Trichur Central Division, Trichur, Pallakkad, Kerala (G+1 & G+2 of 6,318 Sqm.) 2019
- Chief Engineer, The Orrisa Police Housing & Welfare Corp. Ltd (OPHWC), Janpath, P.O. Bhoinagar, Bhubaneswar, Malkangiri Orissa, (G+1 of 7,442 Sqm)

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys. Hybrid with steel frame for high rise. Panelling materials to be used should meet the site specific quality and durability requirements





Prague, Czech Republic
Built-up Area : 3,500 sqft



Pilot House, Gorakhpur
Built-up Area: 350 sqft (as per PMAY)

Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(21) Technology: Light Gauge Steel Framing with Ekopanely Board as in fill walling & various roofing options

ORGANISATION:

EKOPANELY & STRAWCTURE ECO EKOPANELY SERVIS

Jedousov 64, Prelouc- 53301, Czech Republic

Website: www.strawcture.com

CONTACT PERSON:

Ms. Shriti Pandey

Mob: 7607776756, 7364811164

Email: shriti_pandey@strawcture.com
bares@ekopanely.cz

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Ekopanely, Czech republic (700 Houses in 2 Buildings of 84,000 Sqm) 2000-2019
- White / Bristoll, United Kingdom (1 House in 3 buildings of 3,200 Sqm) 2015
- Slovakia Bratislava (30 Houses in 2 buildings of 4,500 Sqm) 2008-2019

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys. Hybrid with steel frame for high rise. Panelling materials to be used should meet the site specific quality and durability requirements





VISAKA INDUSTRIES LTD.



**Karnataka Neutraceuticals Pvt. Ltd, Hasan, Karnataka
(75 mm VPanel, Total wall area: 30,600 sqft)**

Kerala Rehabilition Houses (55 Nos, 1 Unit with 500 sqft area)



Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(22) Technology: Light Gauge Steel Framing with V-infill walling option & various roofing options

ORGANISATION:

Visaka Industries Ltd.

Visaka Towers, 1-8 303/69/3, S.P. Road,, Secunderabad- 500003, India

Website: www.constructionnext.in

CONTACT PERSON:

Shri Manish Kumar

Mob: 9811771317

Email: manish.kumar@visaka.in

vinfill@visaka.in/constructionnext.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- QITCO- Qatar International Trading Company, Saudi Arabia Dammam and Riyadh G; (1092 nos; 40'x10', 40,580 Sqm) 2016-17 Accommodations for project sites for all categories QITCO, Saudi Arabia
- NTPC, Camp, Kudgi- Field Hostel Buildings
- Paradise Avenue, Jammu (G+13 6,273 Sqm.) 2016 Affordable Housing, MGI infra partnership

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys. Hybrid with steel frame for high rise. Panelling materials to be used should meet the site specific quality and durability requirements





AFMEC Agra Trade Center, Agra, UP
Built up Area: 8,500 sqm



DG MAP, Delhi
Built up Area: 480 sqm

Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(23) Technology: PEB - Pre-Engineered Buildings using a combination of built-up sections, hot rolled sections and cold formed elements with various options for walling & flooring

ORGANISATION:

RCC Infra Ventures Ltd.

14 GF, Vipul Agora, Mg Road, Gurugram- 122002, India

Website: www.rccinfra.com

CONTACT PERSON:

Col. M Anand

Mob: 9999632889

Landline: 0124 4009411

Email: anandm@rccinfra.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- JSWMI Palwal (G, 10,553 Sqm) 2018
- AFMEC Agra Trade Center, Agra, UP (G+1, 9,800 Sqm) 2018
- Delhi Public School, Jhansi, Built up Area: 3,000 Sqm

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology





Embassy Tech Village, Bangalore, 12 Buildings
Built up Area: 15 lac sqft



Lounge & Stud Farm of Hyderabad Race Club

Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(24) Technology: Speedfloor system - Speed floor system is a suspended concrete flooring system using a roll formed steel joist as an integral part of the final concrete and steel composite floor

ORGANISATION:

Jindal Steel and Power Ltd.

Plot no.2, Sector 32, Gurgaon- 122001, India

Website: www.jindalsteelpower.com

CONTACT PERSON:

Shri Naman Agarwal

Mob: 8826113837, 9958945309

Email: naman.agarwal@jindalsteel.com
rohan.vasishtha@jindalsteel.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- OP Jindal University, Hostel, admin, academic block & Staff housing, Punjipathra, Chattisgarh (G+6 & G+3 85,000 Sqm) 2015
- G+29 Alphathum Tower (5 Towers), Noida
- Mist Tower, Festival city, Noida (8 lac sqft)
- Embassy Tech Village , Bangalore (12 Buildings, 15 lac sqft)

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology with accepted walling components





DLF EWS Bldg., DLF Phase 5, Gurgaon
Total Built up Area: 3.9 lac sqft, 2010 units of 194 sqft (1BHK)



Omkar Pawai, Transit Camp, Mumbai
Total Built up Area : 3.5 lac sqft G+7,
5 bldgs/ 205 sqft (1 BHK) 1,700 units

Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(25) Technology: Prefabricated Steel Structure with Prefab Cement Sandwich Panels

ORGANISATION:

HIL Limited

7th Floor, SLN Terminus, Survey No. 133, Gachibowli,
Hyderabad- 500032, India

Website: www.hil.in

CONTACT PERSON:

Shri Mr. Rajib Ghosh

Mob: 04030999000

Landline:01204914900

Email: rajib.ghosh@hil.in; info@hil.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Govt. of Karnataka, Car Nicobar, A&N Islands (4,000 Dwelling Units (2,000 Twin Units) 90,340 Sqm) 2008
- Military Engineering Services, Near Sangam camp, Leh (J&K) (G+1, 11 buildings, 5,984 Sqm) 2016
- Project – Omkar Pawai, Transit Camp, Location – Mumbai (MH) (G+7 Storeys 20,000 Sqm) 2015

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology with accepted walling components





IITC Corporate Office, Gurgaon

**Imperial Tower, Mumbai, 65 storied building
(13,000 cubic mt of AAC Blocks used)**



Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(26) Technology: Autoclaved Aerated Concrete (AAC) wall and roof panel system to provide integrated solution for upto G+1 housing. AAC Panels are reinforced and used in both load and non-load bearing applications

ORGANISATION:

Biltech Building Elements Ltd.

71 & 83 Okhla Industrial Estate Phase III, Delhi- 110020, India

Website: www.biltechindia.com

CONTACT PERSON:

Shri Rajdeep Chowdhury

Mob: 9811076657

Landline: 01149696629

Email: rajdeep.chowdhury@bilt.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Air Force Sargent's Quarter in Jalvayu Vihar , Gurgaon (168 nos., G+2) Construction Cost : 5.27 Crores, Period of Completion : 12 months (May 1997- June 1998)
- MES, Gurgaon (G+3) Residential
- MHADA Mumbai (S+14 & 24) Residential
- MHADA Konkan Board (at Virar) (S+24) Residential

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to G+1 (Load bearing). Suitable with steel frame for high rise





SCG

SCG INTERNATIONAL INDIA PVT. LTD.



Miami Bang-pu, Samut prakan, Thailand



The Kith Tiwanon, Nonthaburi, Thailand



GLOBAL
HOUSING
TECHNOLOGY
CHALLENGE INDIA



Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(27) Technology: Q-Con AAC Wall Panels. Q-Con Panels are light weight, steel reinforced groove and tongue panels that can be installed by normal on-site installer. These are suitable for external and internal walling

ORGANISATION:

SCG International India Pvt. Ltd.

Unit No. 609, 6th Floor, Emaar Palm Spring, Plaza, Golf Course Road,
Gurugram- 122001, India

Website: www.scg.com

CONTACT PERSON:

Shri Suppakit Varnapura

Mob: 9840808998, 9971035222

Email: suppakwa@scg.com/
scgindia@scg.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- The Park 2 Village, Samuthsakorn, Thailand
- Palm Springs Nimman, Bangkok, Thailand
- Zensation Sathorn, Bangkok, Thailand

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to G+1 (Load bearing). Suitable with steel frame for high rise





PIONEER PRECAST SOLUTIONS PVT. LTD.



Anir Tech Park, OMR / Rajive Gandhi Salai, perangudi, Chennai
Built up Area: 65,000sqft



Residential Sarojine Gardens, Karai village, Ranipet Town, near Vellore, Buil up Area: 1,98,000 sqft

Light Gauge Steel Structural System & Pre-engineered Steel Structural System



(28) Technology: K-Wall - Precast Light Weight Hollow-core Wall Panels. Precast Light Weight Hollow-core wall Panel is a non-structural construction material to be used with structural frames

ORGANISATION:

Pioneer Precast Solutions Pvt. Ltd.

No.132, Nelson Manickam Road, Chennai- 600029, India

Website: www.pioneerprecast.in

CONTACT PERSON:

Shri Syed S Mohammed

Mob: 7550031609, 9840770707

Email: marketing@pioneergroups.co.in
sharath@pioneergroups.co.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Anir tech park Chennai, (5,000 Sqm) 2017
- 2 House Holding, Chennai, 8 premium villas (6,500 Sqm) 2018
- Valley Vistas Pvt Ltd, Chennai, 750 dwelling units with parts completion of total requirement of 60,000 Sqm wall panel (Ongoing project)

RECOMMENDATIONS BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable with steel frame



D

Prefabricated Sandwich Panel System

29	Reinforced Expanded Polystyrene sheet core with sprayed concrete as wall & slab	Worldhaus Construction Pvt. Ltd.
30	EPS Cement sandwich Panel: wall & slab with EPS Cement sandwich Panel to be used with RCC or Steel structural frame. Load bearing upto G+1 storey	Bhargav Infrastructure Pvt.Ltd.
31	EPS Cement sandwich Panel: wall & slab with EPS Cement sandwich Panel to be used with RCC or Steel structural frame. Load bearing upto G+1 storey	Rising Japan Infra Pvt. Ltd.
32	Reinforced Expanded Polystyrene sheet core with sprayed concrete as wall & slab	Bau Panel Systems India Pvt. Ltd.
33	Reinforced Expanded Polystyrene sheet core with sprayed concrete as wall & slab	BK Chemtech Engineering
34	Reinforced Expanded Polystyrene sheet core with sprayed concrete as wall & slab	MSN Construction
35	Reinforced Expanded Polystyrene sheet core with sprayed concrete as wall & slab	Beardsell Ltd.
36	Pre-fab PIR (Poly-isocyanurate) based Dry Wall Panel System” as non-load bearing wall.	Covestro India Pvt. Ltd.
37	Sandwich panels as wall & slab	Project Etopia Group



Brief about Technology

Sandwich panel systems are factory made wall panels replacing conventional brick & mortar walling construction and can be used as non-load bearing as well as load-bearing applications. The two broad sub categories of sandwich panels have been considered;

a) The panels made of inner & outer boards (cement/fibre/MGO) with infill core of lightweight concrete / patented / proprietary materials etc.

The panels made of inner & outer boards (cement/fibre/MGO) with infill core of lightweight concrete / patented / proprietary materials are both load bearing & non load bearing categories. When used as infill (non load bearing walls), Steel / RCC frames may be used.

The design of RCC/Steel frame, walling component & slab shall be based on structural & functional requirements of the building in accordance with relevant Indian Standards/ National Building Code. The foundation shall be designed as per loading condition & bearing capacity of the soil.

Special features of the Technology/System

- The system is dry walling system, brings speed in construction, water conservation (no use of water for curing of walling components at site). The sandwich panels generally have light weight material as core material, which brings resource efficiency, better thermal insulation, acoustics & energy efficiency
- Being light in weight results in lower dead load of building & foundation size
- Higher stories can be constructed using structural frames

Essential Requirements of the Technology/System

- The joints of panels with each other need to be perfectly locked by materials (cement, glue, dowel bars, polymer modified mortar etc.)& mechanism (leveling of panels etc.) prescribed by Panel manufacturer
- Cutting/chiseling of panels for openings such as doors, windows, service conduits etc. requires little training & through tools/machines prescribed by Panel manufacturer
- The panels if used as floors/ roofs, shall require screeding concrete of minimum 35 mm thickness with nominal reinforcement/ GI wire mesh for monolithic action to avoid leakage through panel joints

b) The other category is based on reinforced Expanded Polystyrene Core Panel System (EPS). These reinforced EPS panels as walling, slab, staircase components are finished on site by spraying shotcrete on both sides.

Expanded Polystyrene (EPS) Core Panel System is based on factory made panels, consisting of self extinguishing expanded polystyrene sheet with minimum density of 15 Kg/m³, thickness not less than 60 mm, sandwiched between two engineered sheet of welded wire fabric mesh, made of high strength galvanized wire of 2.5 mm to 3 mm dia. The panels are finished at site using shotcrete.

The design of EPS wall & slab panels shall be based on structural & functional requirements of the building in accordance with relevant Indian Standards/ National Building Code. The foundation shall be designed as per loading condition & bearing capacity of the soil.

Special features of the Technology/System

- The panels have high load carrying capacity. The residential buildings upto G+3 configuration can be designed as load bearing structure
- The panels being light weight, helps in easy installation, transportation & reduction in construction time
- The EPS core has high thermal & acoustics efficiency, which can further be customized to deliver specific thermal insulation requirements
- Buildings made using panels are lightweight, but are at the same time rigid due to two sheets of reinforced plaster that interact to create an enveloping 'shell' of the whole structure. This aspect makes the building seismic & wind resistant
- Building with any geometric shape/complex architectural drawings can be constructed

Essential Requirements of the Technology/System

- As the wires used are thin, it must conform to the specification i.e. minimum tensile strength of 600 N/mm² & minimum galvanizing/ zinc coating of 60 gsm
- The Shotcrete should be done preferably in two layers, first layer must be done pneumatically by trained persons
- EPS must be of fire resistant grade



Balu Garden (for Tata Employees), Coimbatore
Built up Area: 21,000 sqft

Egle Ridge, Begur, Bangalore
Built up Area: 1,400 sqft



Prefabricated Sandwich Panel System



(29) Technology: Worldhaus Rapid Panel - Reinforced Expanded Polystyrene sheet core Panel with sprayed concrete as wall, slab & staircase

ORGANISATION:

Worldhaus Construction Pvt. Ltd.

102/5, 1st Floor, 7th A Main, 3rd, Phase , Jayanagar,
Bangalore- 560011, India

Website: www.worldhaus.com

CONTACT PERSON:

Shri Girija Prasad Swain

Mob: 9740916023

Email: swaingirija@yahoo.com

girija@worldhaus.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Hurricane Rebuild, Individual homes Project Name : Rebuilding Unión Hidalgo Oaxaca, Mexico and Neighboring States (G, G+1, G+2, G+3, 68,160 Sqm) 2018
- G+3 @ Hennur Road, Bangalore
- Villa of 1400 sqft @ Begur, Bangalore
- Apartment at Vellore TN B+G+5, 4,000 Sqm, 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys





BHARGAV INFRASTRUCTURE PVT. LTD.



**Sunrise School Building Surat,
Built up Area: 1,500 Sqm**



**Residential House Kerela
Built up Area: 300 Sqm**

Prefabricated Sandwich Panel System



(30) Technology: Fly Ash, Expanded Polystyrene Sheet (EPS) Cement Sandwich Panels (EPS Cement sandwich Panel). Wall & slab with EPS Cement sandwich Panel to be used with RCC or Steel structural frame. Load bearing upto G+ I storey

ORGANISATION:

Bhargav Infrastructure Pvt. Ltd.

B-2/20, Hojiwala Ind Est Sachin Palsana Raod, Surat- 394230, India

Website: www.bhargavinfrastucture.com

CONTACT PERSON:

Shri Siddharth Singh

Mob: 9824193000

Landline: 912612390300

Email: info@bhargavinfrastucture.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- H.B.K Contracting Qatar, U.A.E. (G+4 13,936 Sqm) 2015
- Hubtown/GSRTC Surat, Mehsana Ahmedabad, Gujarat (G+3, 5,110 Sqm - 2014/2015-2016/2017)
- Navrachana University/ International School, Vadodara (G+3 4,683 Sqm) 2013
- Labour Shelter, Pal, Surat (G, 5,110 Sqm) 2013

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to G+1 (Load bearing). Hybrid with Steel/RCC frame for multi storey





RISING JAPAN INFRA PVT. LTD.



Nanning Lvgang Int. Center, Zhuangjin Ave. Nanning, Guangxi, China (1.5 Millions Sqm panels)



**4 Floor Apartment Building, Nagpur (G+3)
Total Built up Area: 8,000 sqft**



Prefabricated Sandwich Panel System



(31) Technology: Fly Ash, Expanded Polystyrene Sheet (EPS) Cement Sandwich Panels - Wall & Slab with EPS Cement sandwich Panel to be used with RCC or Steel structural frame. Load bearing upto G+ I storey

ORGANISATION:

Rising Japan Infra Pvt. Ltd.

I-203, Som Vihar, R. K.Puram, New Delhi- 110022, India

Website: www.rijapaninfra.com

CONTACT PERSON:

Shri R P Gupta

Mob: 9560695701

Email: info@rijapaninfra.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Haitian Construction Group Co., Ltd., China (9 Towers with total 195 floors, 3,55,000 Sqm) 2018
- TOWER – 15 NBCC Apartment, New Kidwai Nagar, New Delhi, 2018
- 4 Floor Apartment Building, Nagpur, 2017
- Nanning Lvgang Int. Center, Zhuangjin Ave. Nanning, Guangxi, China (1.5 Million Sqm Panels) 2017 – 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to G+1 (Load bearing). Hybrid with Steel/RCC frame for multi storey





Luxury Villas, Mijas , Spain



Atalaia Townhouses, Portugal

Prefabricated Sandwich Panel System



(32) Technology: BAUPANEL construction system - Reinforced Expanded Polystyrene sheet core Panel with sprayed concrete as wall, slab & staircase

ORGANISATION:

Baupanel Systems India Pvt. Ltd.

42, 4th floor, Vigyan Lok, Delhi- 110092, India

Website: www.baupanel.com; www.shsholdings.org

CONTACT PERSON:

Shri Amit Gupta

Mob: 9811156812

Email: ag@shsprojects.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Mixta Africa Developer Morocco (Martil) (1,500 units (G+5) 68,500 Sqm) 2011
- Gines Municipality, Spain (Seville) (500 detached units (G+1) 28,000 Sqm) 2010
- Baupanel Antigua, Antigua & Barbados (Caribbean) (250 detached units (Single floor) 15,000 Sqm) 2016

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys





Prefabricated Sandwich Panel System



(33) Technology: Emmedue Building System - Reinforced Expanded Polystyrene sheet core panel with sprayed concrete as wall, slab & staircase

ORGANISATION:

B K Chemtech Engineering Pvt. Ltd.
1 Jeremiah Road, Frazer town, Bangalore- 560005, India
Website: www.bkengineering.in

CONTACT PERSON:

Shri Angelo Battigelli
Mob: 9945178113, 08041657945
Email: angelo@bkengineering.in
admin@bkengineering.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- BENJA, Developer & Contractor, Dakar, Senegal Cité Tobago, Dakar, Senegal (103 Houses G+2 and mixed Apartment & commercial Buildings of 100 m² each in average, 1,45,000 m²) 2011
- RED 4 as Developer and DLB as Contractor, Mauritius (G+2 apartment complex 12,500 m²) 2015
- French Army Housing complex, Djibouti (10 apartment houses of G+1, 3,750 m²) 2016

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys





MSN CONSTRUCTION



Residential, Pammal, Chennai (6 dwellings)
Total Built up Area: 7,200 sqft



Residential Unit, T. Nagar, Chennai (4 units)
Total Built up Area: 7,200 sqft

Prefabricated Sandwich Panel System



(34) Technology: MSN EPS 3D Panel system - Reinforced Expanded Polystyrene sheet core Panel with sprayed concrete as wall, slab & staircase

ORGANISATION:

MSN Construction

No 666, 47th Street, 9th Sector, K K Nagar, Chennai- 600078, India

Website: www.msnconstruction.in

CONTACT PERSON:

Shri M Madhu Sudhan

Mob: 8778577499, 9445990109,
9444733310

Email: msneps@icloud.com
msnconst@icloud.com

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys





Residence, First Floor, J P Nagar, Bangalore
Built up Area: 1,125 sqft

Jeevaodaya Hospital, First Floor, Sathyavedu, Chennai
Built up Area: 4,000 sqft



Prefabricated Sandwich Panel System



(35) Technology: QuikBuild Construction System – Reinforced Expanded Polystyrene sheet core Panel with sprayed concrete as wall, slab & staircase

ORGANISATION:

Beardsell Limited

47, Greams Road, Chennai- 600006, India

Website: www.quikbuild.com

CONTACT PERSON:

Shri Mukesh Kejriwal

Mob: 9350109685, 9382609405

Landline : 044 28293296

Email: mukesh@beardsell.co.in
lawrence@beardsell.co.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Himalaya Drug Bangalore (G+1 2,000 Sqm) 2016
- Vaga Auto Ltd Rudrapur, Uttarakhand (G+2 5,000 Sqm) 2017
- Bihar Police Building Construction Corporation, Patna (Ground Floor 1,500 Sqm) 2017
- East Coast Railway Khurda Road, Odisha (G+3 3,000 Sqm) 2018
- IIT-Jammu/ CPWD Jagti, Jammu (G+2 30,000 Sqm) 2019
- Tamil Nadu Police Housing Corporation Ltd.

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys





COVESTRO INDIA PVT. LTD.



PIR house, Malaysia
Built up Area: 550 sqft

LIC Housing, Jaipur
Total Built up Area: 4,320 sqft (G+3, 2 BHK, 8 flats)



Prefabricated Sandwich Panel System



(36) Technology: Pre-fab PIR (Poly-isocyanurate) based Dry Wall Panel System as non-load bearing wall

ORGANISATION:

Covestro India Pvt. Ltd.

SB-801, 8th Floor, Cloud Campus, Empire Tower, Thane-Belapur Road, Airoli, Navi Mumbai- 400708, India

Website: www.covestro.in

CONTACT PERSON:

Shri Saumya Anand

Mob: 9149102443

Email: saumya.anand@covestro.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Al Jaber Transport & General Contracting LLC. / End user: Zones Corporation Abu Dhabi / UAE (42 Building Units of 3 storey, 2,32,140 m²) December 2008
- Flood Rehabilitation, Kelantan, Malaysia (G+0 House 812.48 sqft)
- Employee Quarters, Langkawi, Malaysia (G+4 House Top 2 floors are installed with PIR Technology for speedy construction)

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable with steel frame





BRE Innovation Park, United Kingdom (108 Sqm)

Corby Development, United Kingdom (47 units- 31 Homes and 16 Apartments)



Prefabricated Sandwich Panel System



(37) Technology: Sandwich panels as wall & slab. It is a wall panelised construction system comprising of light weight load bearing insulated panels

ORGANISATION:

Project Etopia Group

Website: www.projectetopia.com

CONTACT PERSON:

Shri Joseph Daniel

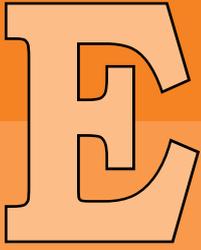
Mob: +44 7947211709

Email: josephdaniels@projectetopia.com

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+ 3 storeys





Monolithic Concrete Construction

38	Aluminium form work system for Monolithic Concrete construction	Maini Scaffold Systems
39	Aluminium form work system for Monolithic Concrete construction	KumkangKind India Pvt. Ltd.
40	Aluminium form work system for Monolithic Concrete construction	S-form India Pvt. Ltd.
41	Aluminium form work system for Monolithic Concrete construction	ATS Infrastructure Ltd.
42	Aluminium form work system for Monolithic Concrete construction	Innovative housing & Infrastructure Pvt. Ltd.
43	Aluminium form work system for Monolithic Concrete construction	MFS formwork Systems Pvt. Ltd.
44	Aluminium form work system for Monolithic Concrete construction	Knest Manufacturers LLP
45	'Tunnel form' construction technology, an cast in situ RCC system, based on the use of high-precision, re-usable, room-sized, steel forms or moulds for monolithic concrete construction	Outinord Formworks Pvt. Ltd.
46	Aluminium form work system for Monolithic Concrete construction	Brilliant Etoile Pvt. Ltd.

Brief about Technology

Monolithic Concrete Construction technology intends to replace the conventional steel/plywood shuttering (formwork) system with customised engineered formwork which is manufactured in the factory set up under controlled conditions. In this system, in place of traditional RCC framed construction of columns and beams and infill walls; all walls, floors, slabs, stairs, including columns & beams (as per design requirement) together with door and window openings are cast-in-place monolithically using appropriate grade of concrete in one operation. The especially custom designed modular formwork is used for the purpose which facilitates easy handling with minimum labour & without use of any equipment. Being modular formwork system, it enables fast construction of multiple/mass modular units.

The formwork system can be one of the following two types;

- i) **The modular aluminium formwork systems*** are made of light weight Aluminium using robotics welding system. The fixing of the formwork is done using tie, pin & wedges system. It does not require very skilled labour to do the job.
- ii) **Customized engineered tunnel form system*** consists of two half shells made of steel which are placed together to form a room or cell. Several such cells make an apartment.

The wall is designed as shear wall. The grade of concrete, wall & slab thickness, detailing of reinforcement are based on structural & functional requirements of the building in accordance with relevant Indian Standards/ National Building Code. The foundation shall be designed as per loading condition & bearing capacity of the soil.

Special features of the Technology/ System:

- Facilitates rapid construction of multiple/ mass modular units (similar units)
- Results in durable structure with low maintenance requirement
- The precise finishing can be ensured with no plastering requirement
- The concrete can use industrial by-products such as Fly Ash, Ground granulated blast furnace slag (GGBFS), Micro silica etc. resulting in improved workability & durability, while also conserving natural resource
- Being Box type structure, highly suitable against horizontal forces (earthquake, cyclone etc.)
- The large number of modular units bring economy in construction

Essential Requirements of the Technology:

- A lead time of about 3 months is required for initiation of work, as the formwork are custom designed, manufactured and prototype approved before manufacturing required number of sets of formwork
- Post construction alterations are difficult
- All the service lines are to be pre-planned in advance
- Not much saving in construction in one storey structure
- It is recommended that implementing agency shall ensure proper planning for heat insulation and air ventilation in the housing units through proper orientation, shedding etc. (refer IS 3792:1978 for guidance)



Monolithic Concrete Construction



(38) Technology: Maini Aluminium Formwork (MAFS) - Aluminium Formwork System used is specially designed modular formwork, for monolithic Cast-in-situ shear walls construction

ORGANISATION:

Maini Scaffold Systems

Plot No.-1,1 A & 2, Sector - 6, I.I.E. SIDCUL, Pant Nagar, Distt. Udham Singh Nagar (Uttarakhand), Rudrapur- 263153, India

CONTACT PERSON:

Shri Anuj Vachher
Mob: 9810584614
Landline: 05944-49686868
Email: anuj@mcepl.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- M/s My Home Projects (Vihanga) Residential, Hyderabad (Built up Area: 3,20,000 Sqm) 2015
- M/s My Home Projects (Avatar) Residential, Hyderabad (Built up Area: 3,60,000 Sqm) 2017
- M/s KPC Projects (APTIDCO - PMAY) Andhra Pradesh 430 sqft Unit Area, Total Built up Area: 32,616 Sqm

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology





kumkang
Kind

KUMKANGKIND INDIA PVT. LTD.



**Ahuja Tower, Mumbai (Units - 72 nos.)
Total Built up Area: 7,49,460 sqft**



**Vaibhava, Bangalore (40 building blocks, 7 floors)
Total Built up Area: 3,20,316 sqft**

Monolithic Concrete Construction



(39) Technology: Kumkang Kind formwork system - Aluminium Formwork System used is specially designed modular formwork, for monolithic Cast-in-situ shear walls construction

ORGANISATION:

KumkangKind India Pvt. Ltd.

104, Sky Vista Bldg., Viman Nagar, Pune- 411014, India

Website: www.kumkangkind.com

CONTACT PERSON:

Shri DONGHYUN EOM

Mob: 8446433117

Email: kkindiasales@gmail.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Shapoorji Pallonji Co. Pvt. Ltd., Andhra Pradesh (114 Houses G+3, 1,65,260 Sqm) 2019
- Vijay Nirman Co., Andhra Pradesh (80 Buildings G+3, 99,149 Sqm) 2019
- KMV projects. Ltd., Andhra Pradesh (101 Buildings G+3, 1,07,794 Sqm) 2019

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology





Lodha Palava Phase II, Mumbai (G+25, 41 towers)
(Aluminium Formwork Quantity: 1,10,000 sqm, 41 sets)

Hiland Greens, Kolkata (G+15, 23 towers)
(Aluminium Formwork Quantity: 44,900 sqm, 23 sets)



Monolithic Concrete Construction



(40) Technology: S-Form Aluminum formwork system - Aluminium Formwork System used is specially designed modular formwork, for monolithic Cast-in-situ shear walls construction

ORGANISATION:

S-FORM India Pvt. Ltd.

Unit No 323, 3rd Floor, Tower B4, Spazet Park, Sohna Road,
Sector 49, Gurugram- 122001, India

Website: www.s-form.co.kr

CONTACT PERSON:

Shri Jason Ha

Mob: 9810397725, 9891491281

Landline: 0124 4762403

Email: jasonha@s-form.co.kr/
manojmehta@s-form.co.in

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Gaursons Project Delhi/NCR (Ghaziabad) 14 Projects (1,00,000 m² of Formwork Quantity) 2014 to 2019
- Siddha Group Project, Kolkata, West Bengal, 6 Projects (60,000 m² of Formwork Quantity) 2017 to 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology





ATS INFRASTRUCTURE LTD.



**Gulf Meadows, Dera Bassi, Punjab
13 Towers**



**Paradiso, Sector Chi-04, Greater Noida
24 Towers, 1031 Apartments**

Monolithic Concrete Construction



(41) Technology: Aluminium Formwork System used is specially designed modular formwork, for monolithic Cast-in-situ shear walls construction

ORGANISATION:

ATS Infrastructure Ltd.

711/92, Deepali, Nehru Place, New Delhi- 110019, India

Website: www.atsgreens.com

CONTACT PERSON:

Ms. Aarti Nagarajan

Mob: 9643202170

Landline: 01207111500

Email: aarti.nagarajan@atsgreens.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- ATS GREENS, Sector 50, Noida
- Pragma, Gif City, SEZ Gujarat
- Kinghood Drive, Sector 152, Noida Expressway

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology





Monolithic Concrete Construction



(42) Technology: Aluminium Formwork System used is specially designed modular formwork, for monolithic Cast-in-situ shear walls construction

ORGANISATION:

Innovative Housing & Infrastructure Pvt. Ltd.
PCL House - SCO 198, Sector 7C, Chandigarh- 160019, India
Website: www.pclnewchandigarh.com

CONTACT PERSON:

Shri Sukhjinder Singh
Mob: 9876021417
Landline: 0172 5078661
Email: pclnewchandigarh@gmail.com

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology





Kumar Prospera, Pune (G+22, 5 Towers, 417 units)
Total Land Area: 4.71 acre



MVN Athens, Sohna, Haryana (G-14, 9 Towers, 1079 units)
Total Land Area: 5 Acre

Monolithic Concrete Construction



(43) Technology: MFS Aluminium form work system. Aluminium Formwork System used is specially designed modular formwork, for monolithic Cast-in-situ shear walls construction

ORGANISATION:

MFS Formwork Systems Pvt. Ltd.

A1/268, 1st Floor, Indusand Bank Neelam Bata Road, NIT
Faridabad- 1210019, India

Website: www.mfsformwork.com

CONTACT PERSON:

Shri Rohit Sharma

Mob: 9810439840

Landline:01294169800

Email: rohit@mfsformwork.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- M/s Indu Projects Ltd., Project of Lucknow Development Authority, Lucknow (Towers -5 , Floors-22, Each Tower of 86,460 Sqm) 2015
- M/s Bindal Construction, Raipur Development Authority (Towers -14, G+3, 11,480 Sqm) 2018
- M/s Inderjeet Mehta Construction, Greater Hyderabad (2BHK Housing at Dungigal, Hyderabad, Towers – 8, Floors – 9, each Tower of 43,344 Sqm) 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology





KNEST MANUFACTURERS LLP



Monolithic Concrete Construction



(44) Technology: Knest Aluform System Aluminium Formwork System used is specially designed modular formwork for monolithic Cast-in-situ shear walls construction

ORGANISATION:

Knest Manufacturers LLP

Plot No.45, Navalkh Umbare, Tal.Maval, Talegaon MIDC,
Pune- 410507, India

Website:www.knestaluform.in

CONTACT PERSON:

Shri Rekha Ramdas Ugalmugale

Mob: 9604558424

Email: hr@knestaluform.in

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology





**Commercial & Residential Building, Al Bandarya, Saudi Arabia
(192 Apartments)**



Les Benanier, Alger, Algeria, 20 Towers & 6 Levels (1,280 Apartments)

Monolithic Concrete Construction



(45) Technology: Outinord 'Tunnelform' construction technology, Is an cast in situ RCC system, based on the use of high-precision, re-usable, room-sized, steel forms or moulds for monolithic concrete construction

ORGANISATION:

Outinord Formworks Pvt. Ltd.

Gat No. 628, 629, Tal Khed, Kuruli Chakan, Pune- 410501, India

Website: www.outinord.com

CONTACT PERSON:

Shri Jignasu Mehta

Mob: 9730899000, 8237848583

Email: j.mehta@outinordtech.net

sales-india@outinordtech.net

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Moulay Idriss - City Fes Morocco (3,600 Units) 2013
- Manazil Ismailia – City Meknes Morocco (1,000 Units) 2013
- Ville Nouvelle Project Dambri – City Constantine Algeria (1,000 Units) 2014
- Sampada Navi, Mumbai, India (2,064 Units, Apartment Complex of 60 Buildings)

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology





Monolithic Concrete Construction



(46) Technology: Aluminium Formwork System used is specially designed modular formwork, for monolithic Cast-in-situ shear walls construction

ORGANISATION:

Brilliant Etoile Private Limited (Indian Subsidiary)

B 71, Flatted factory complex, Okhla 3, Delhi-110020, India

Website: www.rislandindia.com

CONTACT PERSON:

Shri Karan Narang

Mob: 9999106682

Landline: 0124452888

Email: karannarang@risland.com

MAJOR PROJECT UNDERTAKEN USING THIS TECHNOLOGY:

Penthouse Type A LVL 1: Carpet Area: 400.01 Sqm/ 4,305.71 sqft

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable technology



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Stay In Place Formwork System

47	Expanded-Steel Panel reinforced with all-galvanised Steel Wire-Struts serving both as the load-bearing steel structure and as the stay-in-place steel formwork filled with EPS-alleviated concrete	JK Structure Ltd.
48	Factory made prefab Glass fibre reinforced Gypsum cage panels suitable for wall & slab with reinforcement & concrete in cavities as per the requirement	FACT RCF Building Products Limited
49	Structural Stay In Place Galvanized Steel formwork system for walling with the same bottom single layer formwork for slabs/ in-situ slab	Coffor Construction Technology Pvt.Ltd
50	Factory produced PVC Stay in place formwork with in-situ concrete & reinforcement in walling units and cast in-situ RCC Slab	Novel Assembler Private Limited
51	Fully load bearing walls with 150 mm monolithic concrete core sandwiched inside two layers of EPS as walling. The forms are open ended hollow polystyrene interlocking blocks which fits together to form shuttering system	Reliable Insupack Pvt. Ltd.
52	Stay in place light weight polymer formwork with cast in situ reinforced concrete & in-situ flooring slab	Kalzen Realty Pvt. Ltd.
53	Fast Bloc, Insulated Concrete Form (ICF), acting as formwork for concrete and rebar, Coloumn/post and beam construction, creating an strong skeleton in the walls	Fastbloc Building Systems
54	Formwork system "Plaswall" with Two fibre cement boards (FCB) & HIMI (High Impact Molded Inserts) bonded between two sheets of FCB and erected to produce a straight-to-finish wall with in-situ concrete	FTS Buildtech Pvt.Ltd.

Brief about Technology

These are **lost formwork systems** which are left in the structure and can either act as insulation or part of structural system. These formworks are in the form of Expanded Polystyrene (EPS) blocks/panels which are known as insulated concrete forms, steel cage filled with concrete/lightweight concrete known as structural forms, Cement fibre boards, Glass fibre reinforced gypsum cage Panels, PVC formworks etc.

Once the Stay in place formwork is put & aligned along the wall, the normal concrete or light weight concrete along with reinforcement as applicable is placed in cavities. Some stay in place formwork system offer solutions for floor/roof, using concrete along with reinforcement.

The design of wall, slab & structural framing / members if any shall be based on structural & functional requirements of the building in accordance with relevant Indian Standards/ National Building Code. The foundation shall be designed as per loading condition & bearing capacity of the soil.

Special Features of the Technology/ System

- Having formwork already as part of system, the construction of building is faster as compared to conventional buildings. The formwork needs only some support for alignment purpose
- In case of concrete as filling material, the curing requirement of concrete is significantly reduced, thus saving in precious water
- Many of such formwork systems do not have plastering requirement
- In case of EPS blocks/ panels as formwork system, the thermal efficiency of building is significantly improved

Essential Requirements of the Technology/System

- In case of GFRG Panels, all openings & cut section of full width of wall should be done at factory itself & cutting of panels at site need to be avoided. For curved wall & domes, these panels are not suitable
- The electrical/ plumbing system should be such that most of the pipes go through cavities in order to facilitate minimum cutting of panels
- The stay in place form work systems use factory produced components. The closeness of project site to the plant will have positive impact on project viability, while distance from plant will have implications in terms of cost & carbon footprint during transportation



JK STRUCTURE



50,000 Apartments of 85 Sqm in the “pre-embargo”, Iran

2,500 units housing program in the outskirts of the industrial city of Kaluga, South of Moscow, Russia



Stay In Place Formwork System



(47) Technology: JK Structure Expanded-Steel Panel reinforced with all galvanised Steel Wire-Struts serving both as the load-bearing steel structure and as the stay-in-place steel formwork filled with EPS alleviated concrete.

ORGANISATION:

JK Structure

42 Swan Street, Petersfield, UK-GU323A

Website: www.jk-structures.com

CONTACT PERSON:

Shri Maxime Sadowsky

Mob: 0033617866

Landline: 004477853615

Email: maximeais@aol.com;
structurejk@gmail.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- BENJA, Developer & Contractor Dakar, Senegal Cité Tobago, Dakar (Senegal) (103 Houses G+2 1,45,000 m²) 2011
- Sabok Sasan Sarie Developer & Contractor Tehran, Iran New City of Parand, near Khomeini Airport (Iran) (1,650 Apartment Buildings from G+2 to G+5 with 75 m² apartments 18,50,000 m²) 2013
- RED 4 as Developer and DLB as Contractor, Cap Malheureux (Mauritius) (G+2 apartment complex 12,500 m²) 2015

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+3 storeys





FACT RCF BUILDING PRODUCTS LTD.



Hostel Building IIT Tirupati Campus

BMTPC Demonstration Housing Project, Nellore



Stay In Place Formwork System



(48) Technology: FRBL PREFAB GYPWALL Factory made prefab Glass fibre reinforced Gypsum cage panels suitable for wall & slab with reinforcement & concrete as infill as per the requirement

ORGANISATION:

FACT RCF Building Products Ltd.

Fact CD Campus, Ambalamedu Post, Kochi, Kerala- 682303, India

Website: www.frbl.co.in

CONTACT PERSON:

Shri C.P. Dinesh

Mob: 9895226339

Landline:04842721972

Emailj. mdfrbl@gmail.com

pmcfrbl@gmail.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Sultanate of Oman, Muscat region (Mass Housing 2,51,000 Sqm) 2018
- Sultanate of Oman, Sohar region (Mass Housing 83,643 Sqm) 2017
- IIT Tirupati, Andhra Pradesh (Hostel Buildings 14,000 Sqm) 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to 10 storeys in seismic zone-III, & up to 6 storeys in seismic zone-V if conforming to design requirements





**Siddhi Vinayak Glory, Nasik , Parking + 4 structure,
Total Built up Area: 6,216.84 sqft**



**DHP at Bihar sharif, G + 2 structure (36 Nos houses)
Total Built up Area: 17,641 sqft**

Stay In Place Formwork System



(49) Technology: Coffor - Structural Stay in Place Formwork System- Structural Stay In Place Galvanized Steel formwork system for walling & with the same as bottom single layer for floor/roof slab

ORGANISATION:

Coffor Construction Technology Pvt. Ltd.
601-Omega Building, Hiranandani Gardens, Powai,
Mumbai- 400076, India
Website:www.cofforindia.com

CONTACT PERSON:

Shri Jignesh S Pawar
Mob: 9727432387, 9867004501
Landline:02225702317, 02652290718
Emailj. jignesh@cofforindia.com
info@cofforindia.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Cameroon, Olembe Yaounde, total allocation of 640 houses in first phase of Mass housing 320 Houses (G+4, 38,400 Sqm) 2015
- Raro Trading Corporation LLP, All Over Maharashtra (24 Villa Projects 2,037 Sqm) 2018
- BMTPC Demonstration Houses, Bihar Sharif (G+2 Structure of 1,715 Sqm) 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable for G+3 storeys





NOVEL ASSEMBLER PVT. LTD.



Housing Project, Brisbane, Australia
Built up Area: 750 Sqm



F3 Affordable Homes., Abidjan, Ivory Cost
Built up Area: 65 Sqm

Stay In Place Formwork System



(50) Technology: PVC Stay in place formwork is factory produced formwork with required grade of reinforcement & poured in-situ concrete in walling units & cast in-situ RCC Slab

ORGANISATION:

Novel Assembler Pvt. Ltd.

5863 Leslie Street, Unit 610, Toronto, M2H1J8

1418 B-Wing, Dalamal Tower, F.P. Journal Marg, Nariman Point,
Mumbai - 400 021

Website: www.coldroll.ca/www.novelbuildtech.com

CONTACT PERSON:

Shri Sudhir Kumar

Mob: 9821614821

Landline:16474791969

Email sudhir@novelbuildtech.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- GO Group Developers – Calle 54 Marbella, Edificio La Riviera Local #3, Panama City (2,500 Detached single storey homes 1,00,000 Sqm) Dec 2018
- Airport Control and Radar Tower-Brazil

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable Technology





Sainath Ford, Indore, M.P. - 10,000 sqft



Gupta Villa, Theog, Distt. Shimla, HP - 2,500 sqft

Stay In Place Formwork System



(51) Technology: ICF Technology-Fully load bearing walls with 150 mm monolithic concrete core sandwiched inside two layers of EPS as walling

ORGANISATION:

Reliable Building Solutions

Sector-82, Noida-201304, India

Website: www.reliableinsupacks.com

CONTACT PERSON:

Shri Madan Mohan Roy

Mob: 9810258899

9818058899

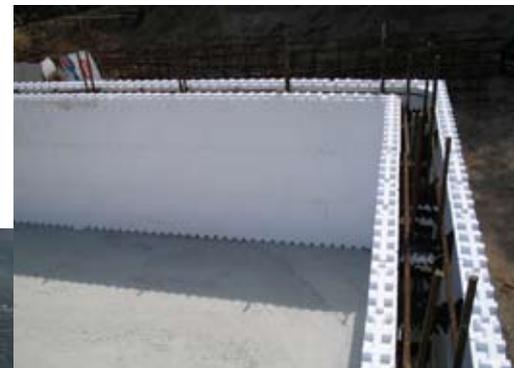
Email [mmroy@reliableinsupacks.com/](mailto:mmroy@reliableinsupacks.com)
admin@reliableinsupacks.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- West Village Hamilton, Ontario, Canada (106 Building with 9 storeys 19,050 Sqm) 2008
- 2355907 Ontario, Inc Richmond Street Apt. - London, Ontario (1 Building with 19 storeys 31,320 Sqm) 2014
- Reliable insupacks Surajpur (1 Building 2 storeys 1,675 Sqm) 2017

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to G+3 in Seismic Zone V and higher storeys in Seismic Zone IV as per design





KALZEN REALTY PVT. LTD.

**Andhra Pradesh Mahila Abhivruddhi Society, Hyderabad,
Andhra Pradesh**

Residential unit in Vijayawada, Andhra Pradesh



Stay In Place Formwork System



(52) Technology: Kalzen construction system - Stay in place light weight polymer formwork with cast in situ reinforced concrete & in-situ flooring slab

ORGANISATION:

Kalzen Realty Pvt. Ltd.

22-223/1/G1 Aruna Coop. Society Sai Krupra Residency Jayanagar
KPHB, Hyderabad- 500072, India

Website: www.kalzenrealty.com

CONTACT PERSON:

Shri Umesh Nayak

Mob: 930663665

Email: umesh.nayak@kalzenrealty.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- The Collins, Campbelltown NSW, Australia (11,400 Sqm) 2016
- The Sanotio, West Gosford, Australia (8,200 Sqm) 2018
- Cromer, Sydney, Australia (29,000 Sqm) 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable Technology as Stay in place pre-assembled PVC wall forms along with cast in-situ RCC slab





Puerto Penasco, Sonora, Mexico (555 Sqm)



Stay In Place Formwork System



(53) Technology: FastBloc Building Systems Fast Bloc, Insulated Concrete Form (ICF), acts as formwork for concrete and rebar, Column/post and beam construction, creating a strong skeleton in the walls

ORGANISATION:

Fastbloc Building Systems

239 Sun Valley Ct, Ripon- 95366, California, USA

Website: www.fastblocs.com

CONTACT PERSON:

Shri Grant Kakita

Mob: 8186017611, 1619865339

Email: j.grant@fastblocs.com
info@fastblocs.com

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Halieus Construction Mexico (30 units/ 1-2 storeys 8,000 Sqm) 2018
- Lazarian Homes Various Countries (10 units/ 1-2 storeys, 2,500 Sqm) 2018
- Costa Rica School/ Housing development Costa Rica (5 Units, 1 storey, 1,500 Sqm) 2018

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to G+3 in Seismic Zone V and higher storeys in Seismic Zone IV as per design





**Total 720 Units of Human Settlement by Siculo Shickeka at Meyerton, South Africa
Built up Area: 28,800 Sqm**

**Aanganwari Centre, Jaipur (CSR support from Vedanta),
Built up Area: 70 Sqm**



Stay In Place Formwork System



(54) Technology: Plaswall System- Formwork system “Plaswall with two fibre cement boards (FCB) & HIMI (High Impact Molded Inserts) bonded between two sheets of FCB and erected to produce a straight-to finish wall with in-situ concrete

ORGANISATION:

FTS Buildtech Pvt. Ltd.

302, Vishakha Arcade, Opp. Courtyard Hotel, Off Veera Desai Road,
Andheri West, Mumbai- 400053, India

Website: www.fabforms.ae

CONTACT PERSON:

Shri Feroz Khan

Mob: 9987593590

Landline: 022 26785900

Email: fm@fabforms.ae

mktg@fabforms.ae

MAJOR PROJECTS UNDERTAKEN USING THIS TECHNOLOGY:

- Century Communities Carmona, Philippines (1,400 units 1,12,000 Sqm) 2012-13
- Malate Construction & Devt. Laguna, Philippines (3,200 units 2,40,000 Sqm) 2016
- Global-link Properties Laguna, Philippines (6,000 units 3,00,000 Sqm) 2014

RECOMMENDATION BY GHTC TECHNICAL EVALUATION COMMITTEE (TEC):

Suitable up to G+3 in Seismic Zone V and higher storeys in Seismic Zone IV as per design





The Joint Secretary & Mission Director (Housing for All)
Ministry of Housing and Urban Affairs
Government of India
Room No. 116, G-Wing, Nirman Bhawan, New Delhi
Tel: 011-23061419, Fax: 011-23061420
E-mail: jshfa-mhua@gov.in