PREFAB TECHNOLOGIES IN JSPL HOUSING & TOWNSHIP

About JSPL

Jindal Steel and Power Limited (JSPL) is one of India's primary & integrated steel producers with a significant presence in sector like Mining, Power Generation and Infrastructure. With an annual turnover of over US$ 3.5 billion, JSPL is a part of the US$ 18 billion diversified O. P. Jindal Group and is consistently tapping new opportunities by increasing production capacity, diversifying investments, and leveraging its core capabilities to venture into new businesses. The company has committed investments exceeding US$ 30 billion in the future and has several business initiatives running simultaneously across continents.

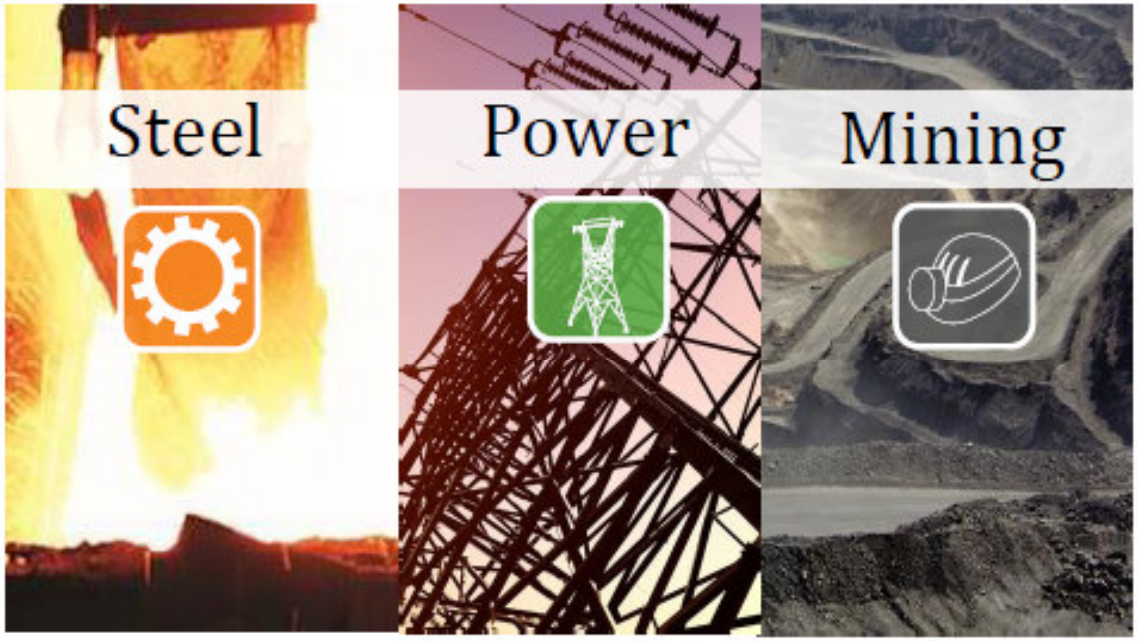
As JSPL contributes to India's growth, it has also set in place a global expansion plan in order to become one of the most prestigious and dynamic business groups of the country. The future is studded with challenges and JSPL is taking them on with vigor and courage.

JSPL is poised to foray into the infrastructure sector with its very own EPS Concrete Wall Panels, LGS, Speedfloor, Brick & Pavers, JGRS, LWA, Precast Walls etc.

JSPL at a glance

- Jindal Steel & Power Limited (JSPL) is a major player in steel, power and mining
- Captive coal mines -Dongamahua and Tamnar (Chhattisgarh)
- Iron ore mine - Tensa, Odisha and iron ore pelletisation plant at Barbil, Odisha
- Also present in Asia, Africa, Australia and Europe
- Revenues of US$3.64bn and cash profits of US$ 0.84 bn (FYE Mar'13)
- Market capitalization of US$5.2bn as on May, 13

Business segments



Steel	Power	Mining
▪ Steel: 3MMTPA ▪ Hot Briquetted Iron: 1.5 MTPA ▪ Pellet Plant: 4.5 MTPA	▪ Operational: 2,437MW	▪ Iron ore: 2 MTPA ▪ Coal: 16 MTPA

JSPL world wide presence

- ✓ Presence across 11 countries
- ✓ 15000 strong , committed & motivated workforce
- ✓ 35% of revenue from International Business and exports

CONSTRUCTION MATERIAL

Product Range

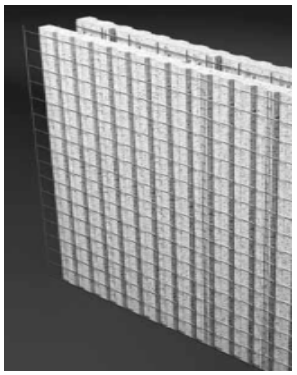
Cement

Cut & Bend

Welded Mesh

Speed Floor

LGS



EPS Panels

Global Road Stabiliser

Bricks & Pavers

LWA

Precast Panels

CEMENT (PSC & PPC)

After its successful stint in the steel and power sectors, JSPL has diversified towards cement production with JINDAL PANTHER Cement. From 0.7 MTPA existing Cement Plant located in proximity to its Steel Plant at Raigarh. JSPL intends to reach a production capacity of 2 MTPA cement by following a backward integration plan of utilizing slag from the blast furnace and fly ash from the power plant to produce 1 MTPA PSC and 1 MTPA PPC respectively.

PORTLAND SLAG CEMENT (PSC)

JSPL produces 100% blended cement i.e. Jindal Panther Portland Slag Cement. The motivation for producing blended cement primarily stems from the intent to conserve limestone reserves along with the environment.

JINDAL PANTHER PSC is specially developed composite cement produced by intergrading high quality clinker yield, high quality slag and gypsum in suitable proportions, to give high finesse and better strength. This unique, value added product has hydraulic binding properties which are not found in ordinary Portland cement.

PORTLAND POZZOLANA CEMENT (PPC)

Jindal Panther Portland Pozzolana Cement imparts unmatched strength and durability to all concrete structures. It is manufactured by grinding Clinker, Gypsum and high quality Fly ash in close circuit mill. Gypsum is outsourced and Fly ash is from Jindal Thermal Power Plant.

CUT & BEND

Jindal Panther ™ has come up with InstaBuild Solutions, which provides ready to use TMT rebars to reduce wastage, labor, time and costs.

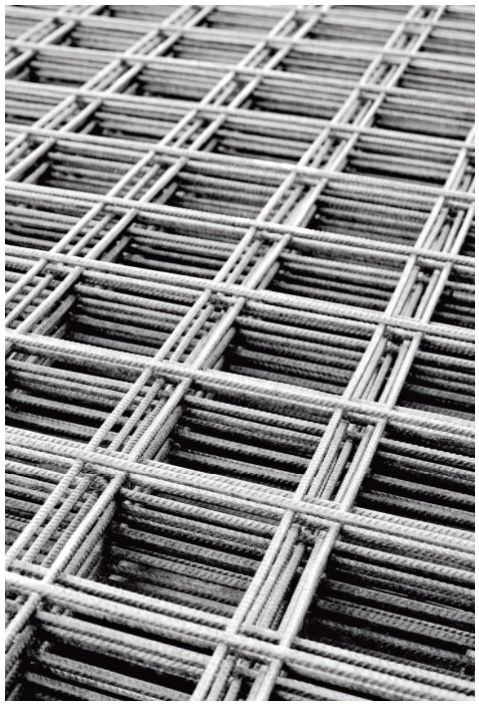
Almost every structure comes with its own unique requirement of design shapes. The practice of cutting and bending them at construction sites to meet individual requirements can be labour intensive, time consuming, resulting in enormous material wastage.

Recognizing the need for a customised solution, Jindal Steel and Power Limited has introduced ready-to-use Cut & Bend rebars.

At its Rebar Service Centre that employs the latest Italian technology, rebars are customised to required lengths and bent at required angles, in order to meet the project requirements. This fast and efficient service is capable of managing inventories better by reducing material wastage and production costs, apart from ensuring aesthetically superior cleaned and strong bars, which are made available right at the site.

WELDED MESH

Jindal Steel and Power Limited Weld Mesh is a new and efficient product which is aimed to expedite the construction of roads, metros, power projects, highway tunnel, concrete pavement, bridge deck pavement, airport runway, tunnel lining, housing floor, roof, wall, floor & concrete pipes. It is a processed steel product that consists of rebars welded together to form a grid pattern.



Use of Weld Mesh reduces construction time considerably as it eliminates activities like cutting, marking and spacing of bars and binding of wires to the bars.

ADVANTAGE

- Lower Production Cost
- Zero Waste
- Lower Financial Cost
- Elimination of storage
- Simple, safe and operational
- Greater response capacity and delivery flexibility

SPEEDFLOOR

Jindal Steel and Power Ltd. have come up with Revolutionary and innovative techniques to eliminate the outdated conventional flooring system with suspended concrete flooring system known as “Jindal Speedfloor” Manufactured at O.P. Jindal Industrial Park, Punjipatra (30 kms from Raigarh C.G.) SPEEDFLOOR, the unique suspended concrete flooring system, is an innovation in the building industry. So quick and easy to install. SPEEDFLLOR is a lightweight, cost effective system that’s perfect for multi-storey buildings and car parks.

ADVANTAGE

- Speedy Erection
- Cost Effective
- Less labour intensive
- Safe for seismic sensitive zone
- No need of propping and require less crane handling.
- Easily accommodates services through pre punched holes.

Click to know more about Speedfloor

LGS (LIGHT GAUGE STEEL)

Light gauge structure are galvanized cold formed steel sections for speedy low rise building construction, they are manufactured at O.P. Jindal Industrial Park, Punjipatra(30 km from Raigarh, CG) from state of the art automated roll forming lines.

LGS structure are environment friendly and enable faster construction of buildings with high precision. Being light weight there are substantial savings in transportation and labor costs. These structures also meet the design parameters as laid out in the building code and are resistant to disasters that can be caused by fire, earthquake and strong winds.

We provide the complete solution to your building construction needs which includes architectural design, structural design, detailing, production, dispatch and erection with each step executed by a highly trained and skilled team.

Click to know more about LGS

JGRS (JINDAL GLOBAL ROAD STABILISER)

Jindal Global Road Stabiliser (JGRS) is a highly effective soil stabiliser from JSPL in powder form developed using cutting edge technology by JSPL. Manufactured at Raigarh (Chattisgarh) JGRS is a unique hydration activated soil stabiliser which re-engineers a wide range of soils from clay, silt to gravely soils and makes it suitable for construction of embankments and pavements. Incorporation of a JGRS stabilized layer into the road and pavement construction will reduce the need for expensive aggregate or fill material from quarries. JGRS has been tested and certified by reputed institutes such as CRRI, IIT-Kharagpur and IIT-Roorkee.

ADVANTAGE

- Increase in the bearing capacity of stabilized soils.
- Introduces cohesion, especially later stage of development.
- Reduction in Plasticity index and swell potential of expanding soil.
- Stabilized layer is less susceptible to moisture ingress, hence water –resistant and impermeable.
- Lesser erosion of surface and hence more durability.

Click to know more about JGRS

FLY ASH BRICK AND PAVERS

Our state of art brick and pavers plants at Raigarh, Chattisgarh and Angul, Odisha with a combined capacity of approximately 4.5 lakh bricks per day are situated in proximity to our existing steel, power and cement plants.

Jindal Fly Ash bricks are made of fly ash, gypsum, lime and sand with fly ash content being about 30-50% thus making them a boon for the environment.

ADVANTAGE

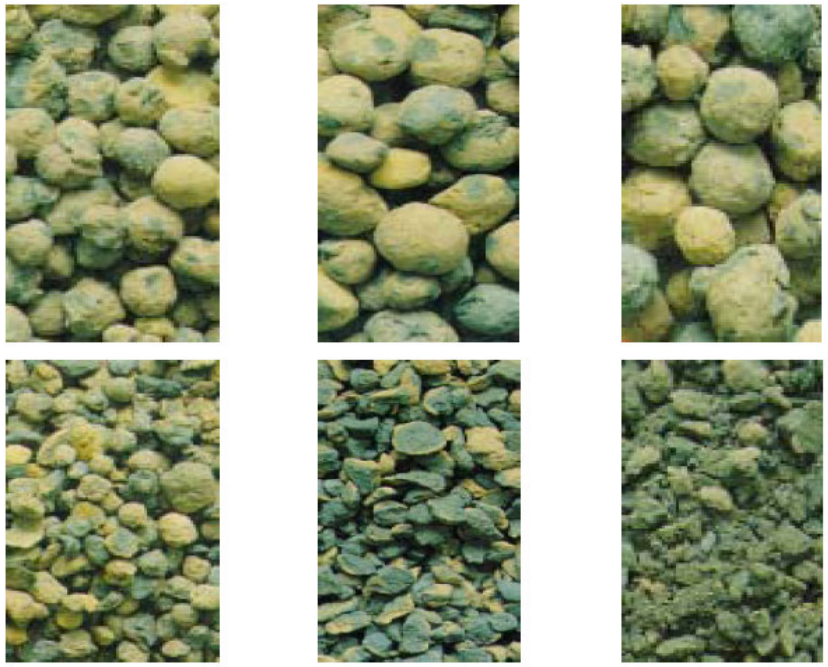
- High compressive strength
- Dimensional Accuracy
- Low Water Absorption
- No Coating Required for Gypsum Plaster
- No soaking time
- Environment Friendly
- Excellent Thermal Insulation
- Excellent Sound Insulation
- Fire Resistance
- No Efflorescence
- Cost Effectiveness

Click to know more about Bricks & Pavers

LWA (LIGHT WEIGHT AGGREGATE)

Light weight aggregate is low in density 1.e.710 kg. Where as normal aggregate is 1550 kg /cum. Density of LWA concrete is 1400-1800 Kg /cum. Where as normal concrete is 2300 -2500 Kg/cum.

LWA can be utilized as Blocks and slabs, structural concrete, Floor roof screeds, Bridges, High ways, sound obsorbtion material etc. Plant capacity at JSPL Angul is 300000 cum per annum



ADVANTAGE

- Reduction in weight - reducing loading
- Improve thermal properties
- Improve fire resistance
- Improve Acoustic Properties
- Improve durability
- Environmental benefits

PRECAST PANELS

Precast Panels allows for speedy erection which saves lot of time, as well as superb control of quality.

Our Production Facility

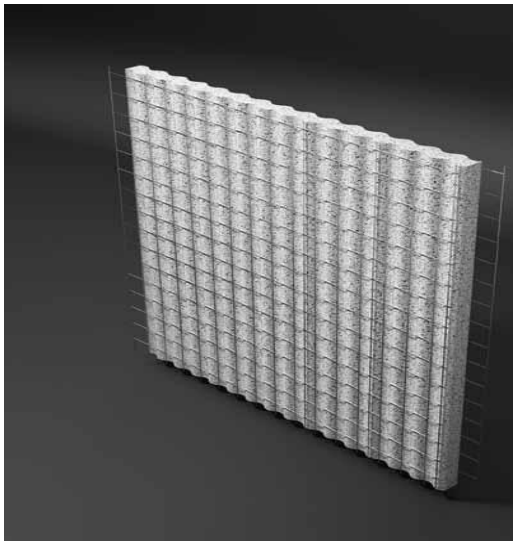
- o Column production
- o Wall production
- o Beam production
- o Slab production
- o Stair case production

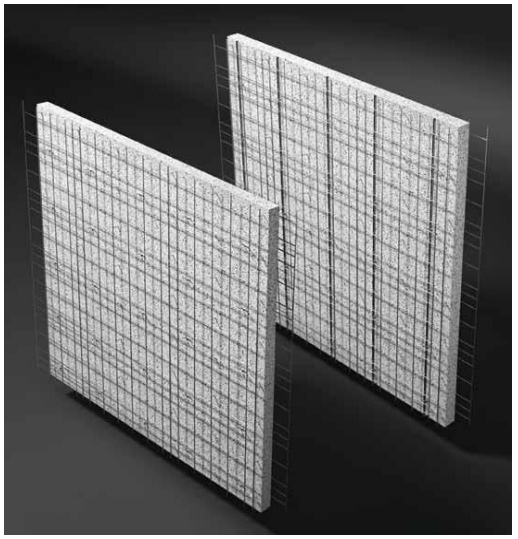
ADVANTAGE

- Speedy Construction
- Larger spans (buildings with large column-free spaces)
- Improved quality of structure
- Reduction in self weight resulting in raw material saving
- All weather construction
- Safe and Healthy working environment
- No wastage of material including water
- Low maintenance, longer life cycle
- No site pollution
- Ideal technology for High Acreage Projects

EXPANDED POLYSTYRENE CONCRETE WALL PANEL

EPS Concrete Wall Panel Home is a modern, efficient, solid, safe and economic construction system for the construction of buildings up to 4 storey. It consists of load bearing floor and roof panels made of polystyrene sheet assembled together with welded mesh and coated with concrete. EPS Concrete Wall Panel buildings are environment friendly and aesthetically appealing; a system that meets the needs of designers and resolves the difficulties of construction companies. They can be constructed quickly resulting in tremendous savings in time and money. EPS Concrete Wall Panels are manufactured at our plant at JSPL, Angul (Odisha).





ADVANTAGE

- Reduction in Construction Time
- Lightness, handling and transportability
- Seismic Resistance
- Cyclone Resistance
- Integration with other systems
- Fire Resistance
- Thermal Insulation and Sound Insulation

EPS CONCRETE WALL PANEL BUILDINGS

Under Construction

EPS Wall Panel Building, JSPL Angul

Under Construction

EPS Wall Panel Building, JSPL Angul

RCC + EPS Partition Wall Building, JSPL Angul (Under Construction)

EPS building during and after construction, JSPL Angul

During finishing

After finishing

Residential Total EPS Wall Panel Building, JSPL Angul

EPS building interiors, JSPL Angul

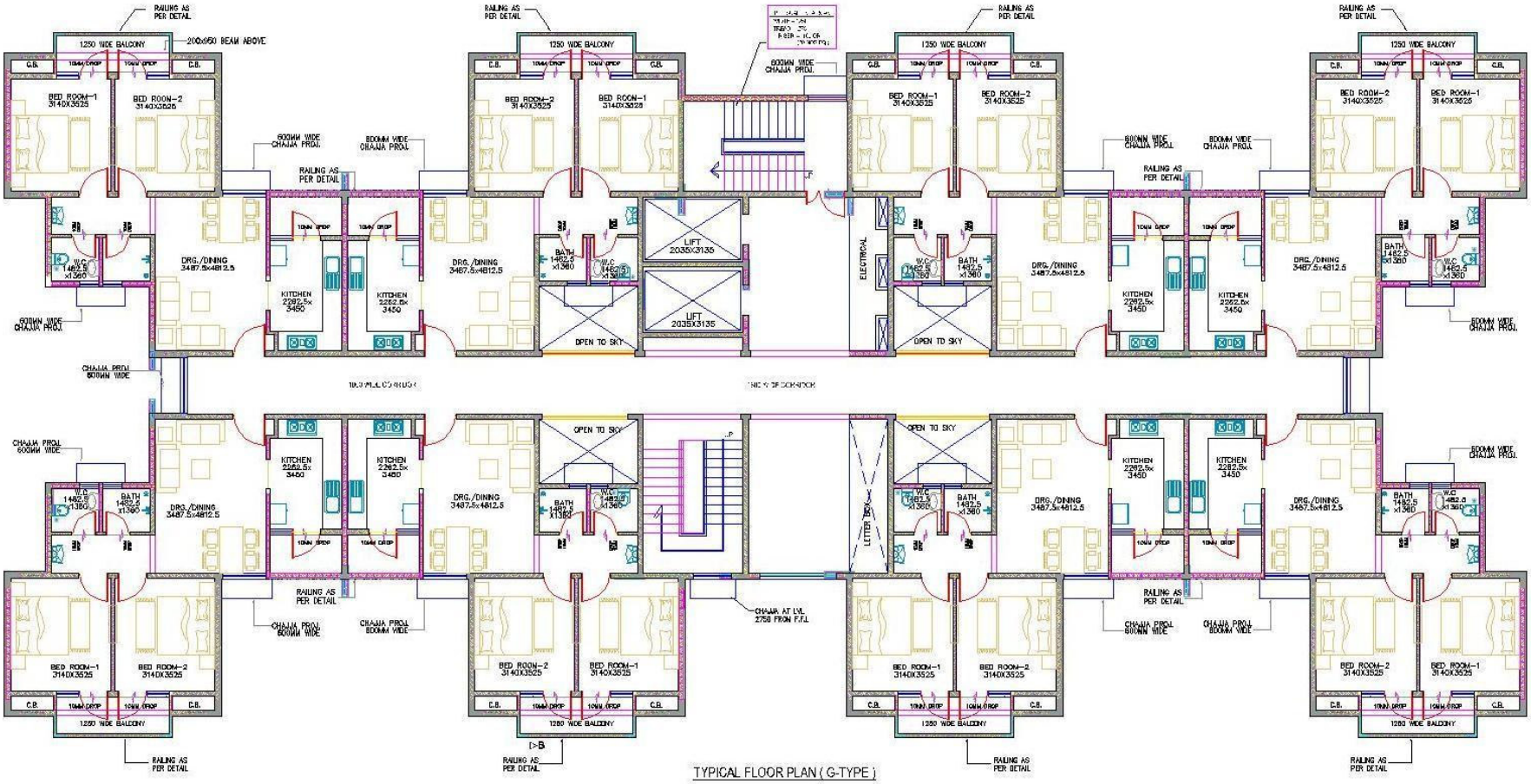
PRESENTATION ON G+11 STOREY COMPOSITE STRUCTURAL STEEL & INNOVATIVE BUILDING ELEMENTS

G+11 COMPOSITE STEEL & EPS CONCRETE WALL BUILDING AT ANGUL

SALIENT FEATURES

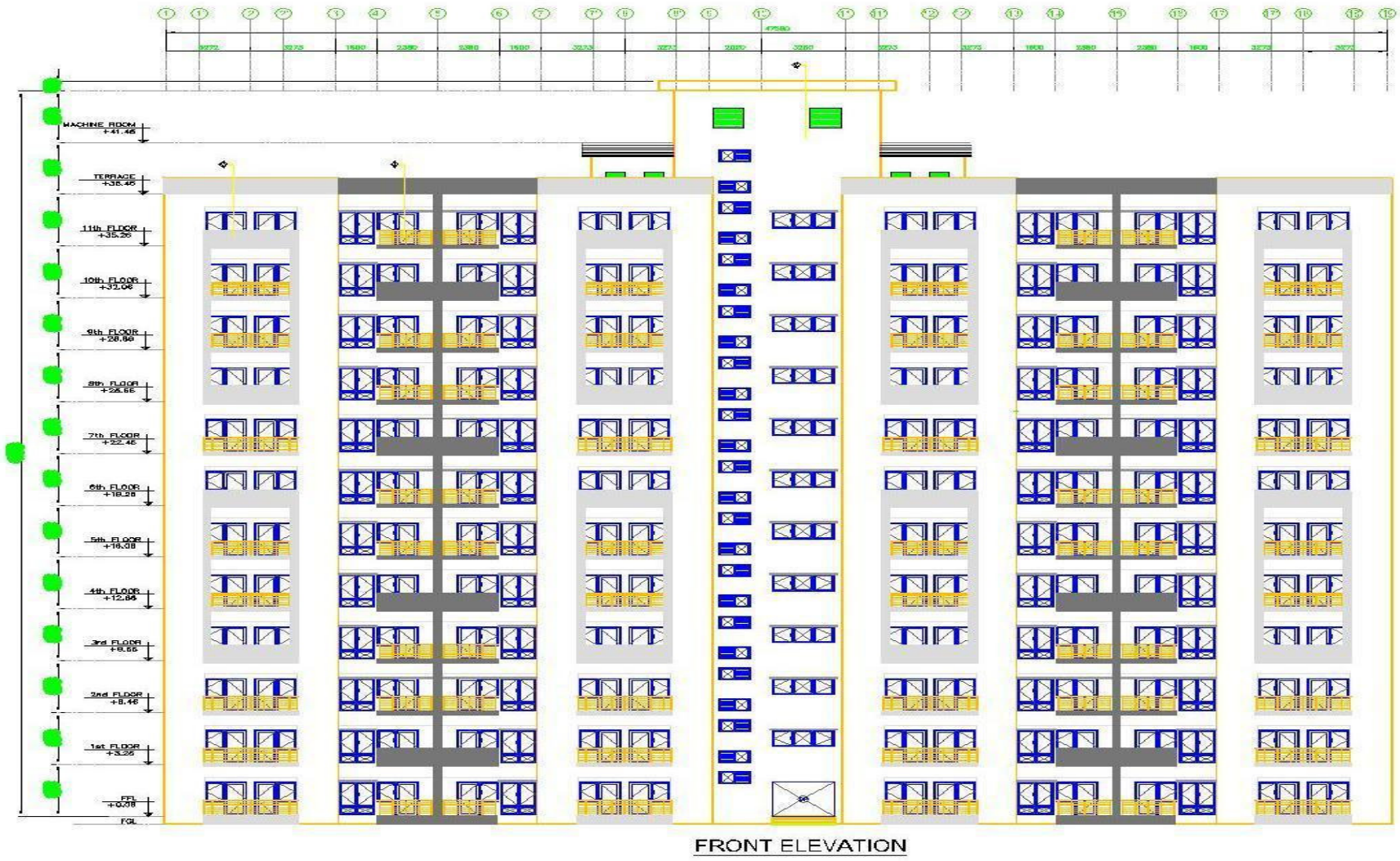
S. No	Description	Particulars (Area in sqft)	Remarks
1	No. of floors	G+11	
2.	Type of flats	2 Type (G & F Type)	
3.	No. of blocks	7 nos.	
4.	Builtup area of one block (G-Type)	97,371	
5.	Builtup area of one block (F-Type)	1,06,326	
6.	Total Built up area	7,08,214	
7.	Construction start date	01.12.2012	
8.	Completion of project	31.12.2014	

TYPICAL FLOOR PLAN, TYPE-G, G+11 AT ANGUL



Type G - Consist of 2 Bedrooms, 1 Drawing-dining, 1 Kitchen, 1 W.C., 1 Bath, 2 Balconies

FRONT ELEVATION, TYPE-G, G+11 AT ANGUL



FRONT ELEVATION

Type G - Consist of 2 Bedrooms, 1 Drawing-dining, 1 Kitchen, 1 W.C., 1 Bath, 2 Balconies

GROUND FLOOR PLAN, TYPE-F, G+11 AT ANGUL

Type F - Consist of 2 Bedrooms, 1 Drawing-dining, 1 Kitchen, 1 W.C., 1 Bath, Dress & attached Toilet , 2 Balconies

FRONT ELEVATION, TYPE-F, G+11 AT ANGUL

G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL

CONCEPT DESIGN

- Two types of Housing i.e. Type-G (720-750 sqft.) & Type-F (850-900 sqft.)
  - G – For entry level Workers
  - F – For next level Workers
- Opted for high rise structures to meet the ever increasing demand of housing and to optimise use of our land bank at Angul.
- Use of our own indigenous construction materials like LGS, EPS Concrete Wall Panel & HRS to show cases JSPL inherent potential.

DESIGN EFFICIENCY

- Design entails common walls, double loaded corridors and light & ventilation shafts.
- To achieve economy in Services (lift & shaft) and to achieve reduced corridor length (to break monotony) it was decided to have eight flats per floor.
- Eights flats per floor also lend itself to increased protection against wind load.
- Circulation areas have been optimised efficiently.
- Cantilevers and offsets were avoided to preserve Architectural aesthetics and structural design.

G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL

CONSTRUCTION METHDOLOGY

- **“Foundation” :** In order to improve the soil bearing capacity “Soil Stabilization” process was carried out. Soil bearing capacity was enhanced to 24T per sqm. (The earlier proposed pile foundations were thus avoided) . It helped in easing out the construction with substantial saving in foundation cost.

- **“Foundation Base” :-** Raft with plinth walls. Tilting load because of wind load was a major structural design challenge. It was achieved by providing 30 cms raft slab with 1.5M high plinth walls. It helped in saving of foundation costs. It was also easy to construct. The plinth walls contains bare minimum reinforcement.

- **EPS walls made as load bearing and shear walls and as such this resulted in a reduced depth of HRS section thus saving costs.**

G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL

- Erection work was re started when four speed floor slabs were completed.

- Placement of Polystyrene Panels and composite beams then followed. Polystyrene panels are designed for a dual role i.e. they are “Load Bearing” and also act as shear walls.

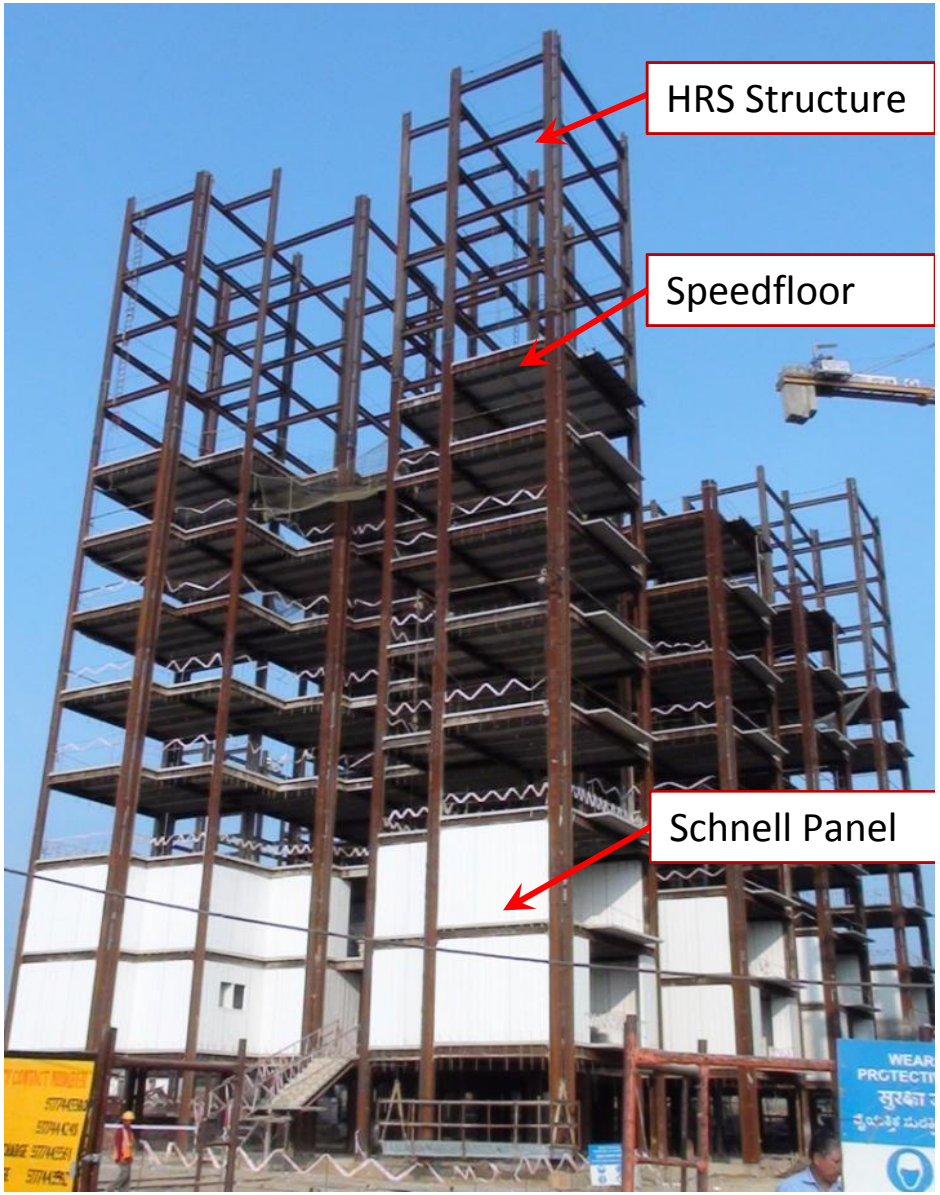
- **These buildings are the first of its kind.** Therefore, all the steps, detailing made after well thought of.

VARIOUS TECHNOLOGIES USED

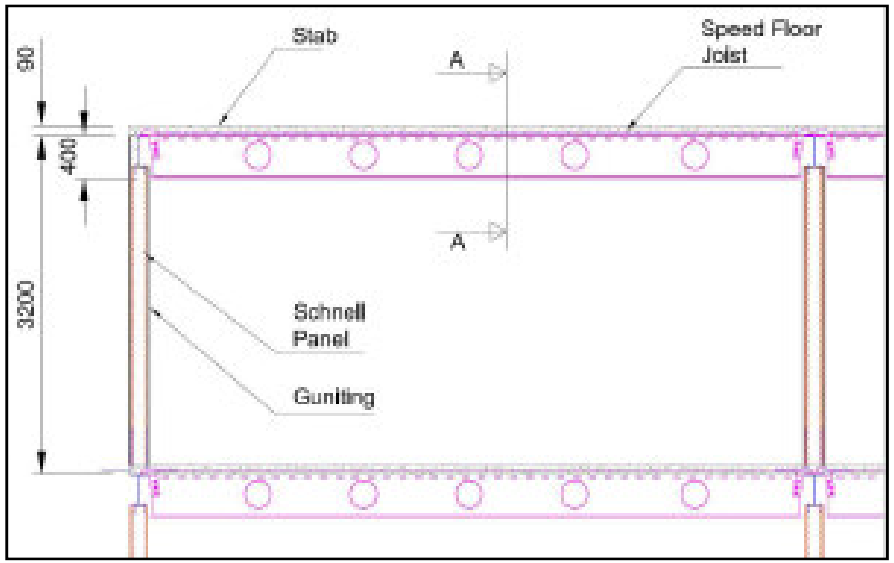
- Stabilization of Soil
- Using of plinth walls and omitting piles
- Providing holes in HRS beams and columns and reinforcement bars to convert HRS panels to load bearing and shear walls.
- Speedfloor slabs
- EPS Panels
- Use of Polystyrene to cover HRS columns & beams against fire protection.

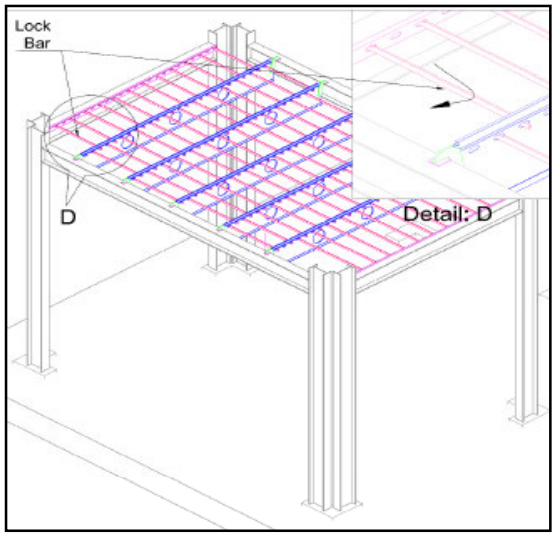
G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL

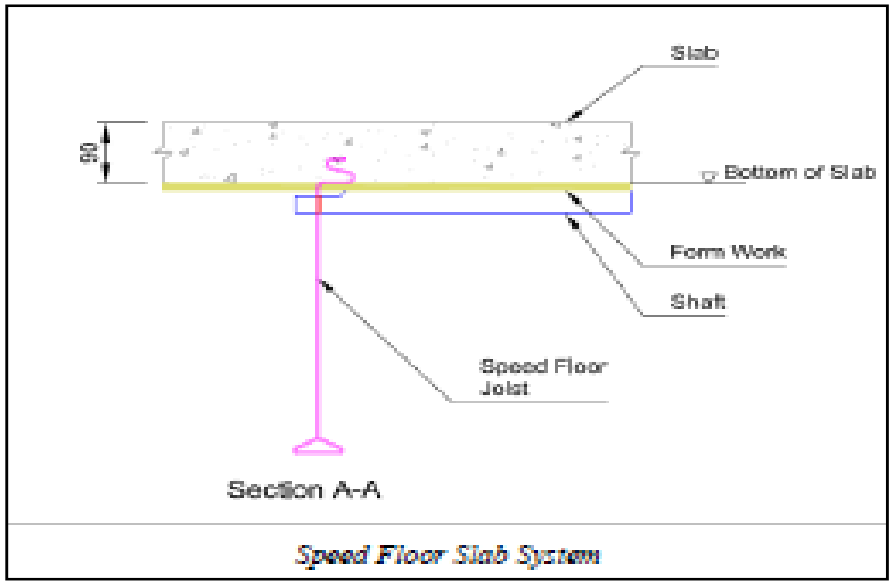
- Combination of Hot Rolled Sections, Speedfloor and Schnell Technology
- Hot Rolled Structure erected up to 11th floor
- Schnell panelling on 1st and 2nd floor
- Speed floor slab up to 8th floor

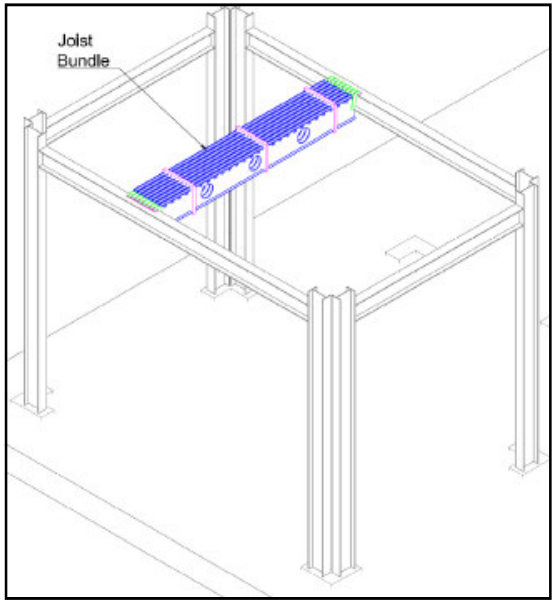


G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL









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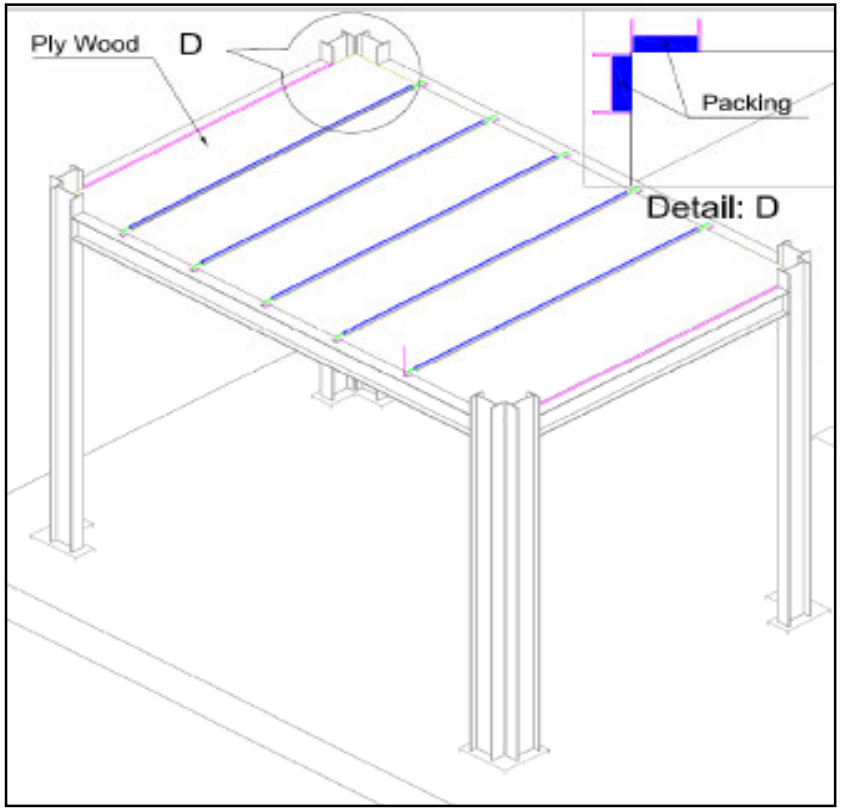
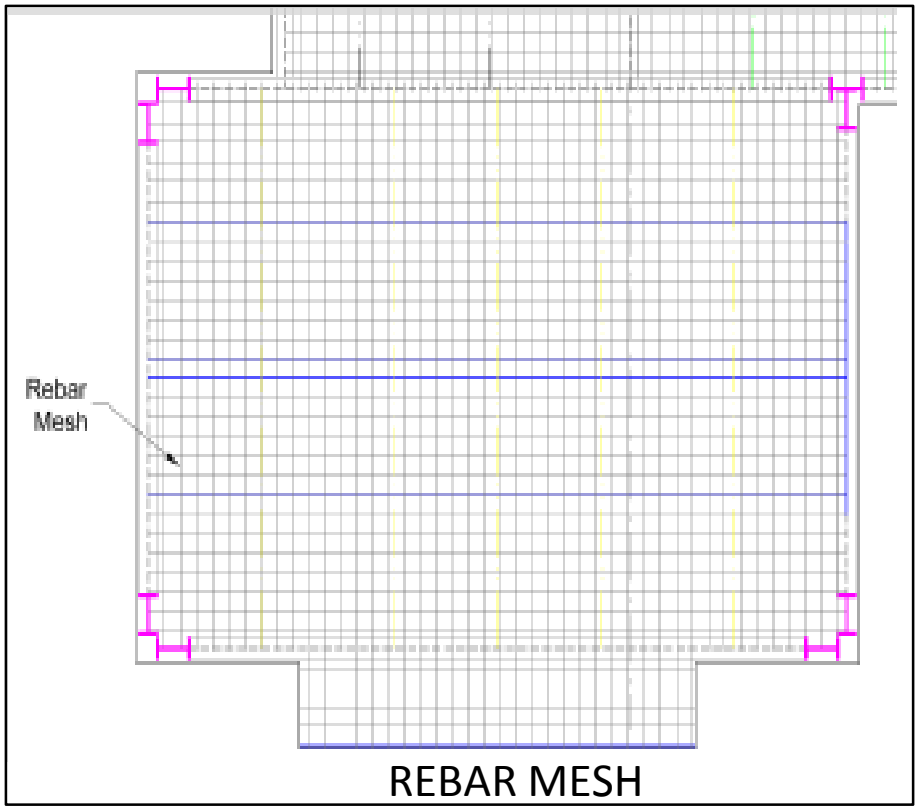
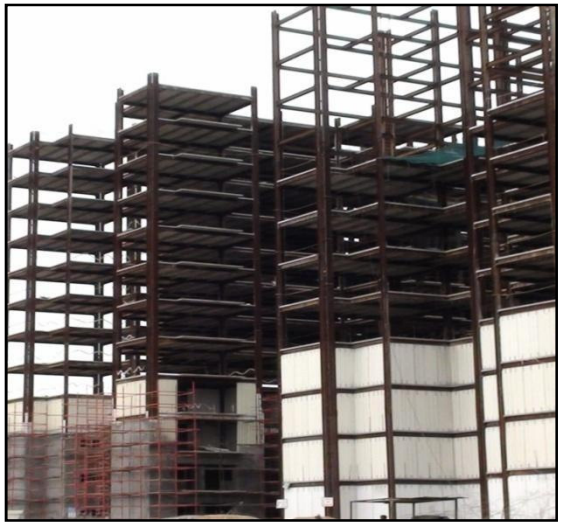




REBAR MESH

G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL

ACTUAL SITE PHOTO



G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL

ACTUAL SITE PHOTO

Click here to see EPS Video

G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL

Schnell panel erection at the corridor

Schnell panel erection & electrical conduit fixing

G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL

Speedfloor slab bottom corridor portion

Speedfloor slab bottom

G+11 COMPOSITE STEEL & EPS WALL BUILDING AT ANGUL

Shotcreting Schnell panel wall

Internal finishes

ERECTION OF EPS PANELS

Click here

THANK YOU