

Sales & Marketing Department Structural Steel Division (SSD)

Development of a scientific model for Demand and Supply of Structural Steel in India.

08.03.13



Overview



- Focus – XII five year plan for India 2012-2017 (Under Execution)
- Scientific Model layout
- Fabricated structures market segmentation
- Demand estimation segment wise
 - Power and energy sector – Coal/Lignite based
 - Manufacturing plants – Steel & Aluminium (90%)
 - Cement plants
 - Transport services – road/railway ROBs
 - Shipping ports and airports construction
 - Refineries
- Supply estimation - Competition classification
 - Organised sector - in workshop model
 - Unorganised sector – in situ model
 - Organised sector – imports (china)

Overview Contd...



- Maturity of Indian market on a Global Standard
- Fabricated structures life cycle – maturity projection
- Pre-Engineered Buildings
- Speed Flooring System
- Integration of Pre-engineered + Speed floor

Focus – XII five year plan for India 2012-2017 (Under Execution)



- India's Twelfth Five Year Plan (2012-2017) calls for 'faster, sustainable and more inclusive growth'
- The Planning Commission -two alternative target scenarios for economic growth for the country.
 - 9% per cent growth is a repetition of the previous FYP
 - A higher one at 9.5 % average growth
- to have industry and manufacturing-related activities grow by 11 percent over the next five years, contrasted to 8 percent over the previous 11th five-year plan
- GDP growth for 2011-2012 was 6.5% and in Q4 2011-2012 was 5.3%

Scientific Model layout

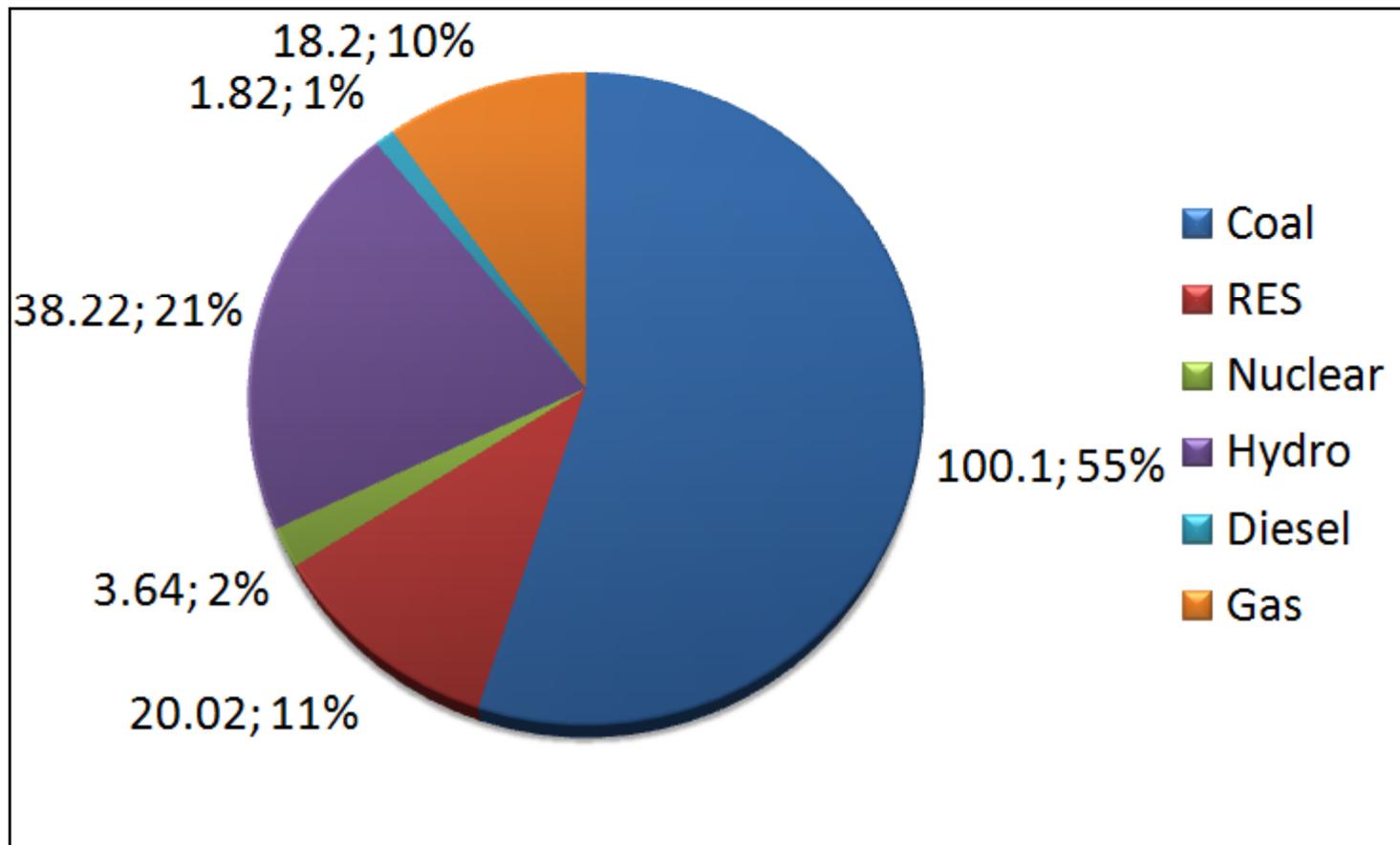
- As an end-use method, this model is based on the premise that to determine the demand for steel one must determine the demand of various commodities and activities that consume steel construction infrastructure market.
- A combination of primary and secondary data was used to estimate steel consumption patterns within each sector. Primary data collection involved holding direct talks with industry experts. Secondary information was compiled from a number of sources such as the annual survey of industry, Ministry of Statistics and programme implementation (MOSPI), Reserve Bank of India publications, Society of Automobile Manufacturers (SIAM), Construction Industry Development Council (CIDC), Planning Commission, Cement Manufacturers Association (CMA), Indian Electrical and Electronics Manufacturers Association (IEEEMA), World Steel Association and Steel Scenario yearbooks among others.

Demand Estimation – segment wise

Power Sector – Synopsis

Growth of electricity generation in India

Market Share in electricity generation sector wise sources



Demand Estimation – segment wise



Metals Manufacturing (MM)– Synopsis

- To achieve GDP of 9% MM sector should grow by 10.3% with GDP contribution from 15% at present to 25% by 2017
- Previous growth in MM sector between 1990-91 to 2010-11 Y-o-y basis grew by 8.2%
- A striking feature to be noted from the sectoral performance trends is the relatively higher growth in domestic demand for steel vis-a-vis that of availability. With demand overtaking supply, the country has become a net importer of steel, since 2007-08, i.e. from the 1st year of the 11th plan onwards.
- 11th plan target growth in production was 10-11% actual achieved was 7.7%. 12th plan target is 12-14%
- India still lags far behind the world average of 214.7 kg and China's average of 459.8 kg. The average is worse when compared with other Asian peers like Japan and South Korea at 506.7 kg and 1,156.6 kg, respectively.
- Private sector now accounts for 75% of total crude steel output compared to 37% in 1992-93 and 80% of total finished steel output compared to 67% in 1992-93.

Demand Estimation – segment wise



Cement Industry Synopsis

- To achieve GDP of 9% MM sector should grow by 10.3% with GDP contribution from 15% at present to 25% by 2017
- India is the second largest cement producer in world after China. Except India and China, other major producers are in the range of 45 - 65 million tonnes production (as against 52 - 86 million tonnes in 2008).
- The installed capacity has increased at (CAGR) of 13.6% during 11th plan while production witnessed an increase of 9.1 per cent during this period
- Need to increase cement demand – policy formulation

Demand Estimation – segment wise



Cement Industry Synopsis

Stimulus to sectors which are major users of cement

- Further push to housing development programmes;
- Promotion of concrete highways and roads;
- Use of ready-mix concrete in large infrastructure projects; and
- Construction of concrete roads in rural areas under Prime Minister's Gram Sadak Yojana.

This shall ensure an increased demand in cement and hence need of capacity expansion.

Demand Estimation – segment wise

Transport Services Ports/Airports - Synopsis

PORTS

- From the above it could be seen that there is a consistent and definite trend in incremental traffic from year 2000-01 onwards with the exception of year 2008-09. There is a high degree of correlation (0.996) between GDP and cargo throughput of ports in India. Therefore, cargo traffic projections by regression analysis technique were reckoned using time series data of cargo traffic at ports and GDP at constant prices from 2001-02 to 2010-11. The cargo throughput for the XII plan has been estimated based on the projected GDP growth at 8.5%, 9%, at 9.5% and at 10%.

Projected Traffic during XII Plan				(in million tonnes)
YEAR	at 8.5% growth in GDP	at 9% growth in GDP	at 9.5% growth in GDP	at 10% growth in GDP
2012-13		1096	1102	1107
2013-14	1193	1205	1217	1229
2014-15	1303	1323	1342	1363
2015-16	1423	1452	1480	1509
2016-17	1553	1592	1631	1671

Demand Estimation – segment wise



Transport Services Ports/Airports - Synopsis

Airports

- Global comparison of air travel penetration² shows that India (at 0.04 air-trips per capita per annum) stands far behind the developed countries like US and Australia (2 air-trips per capita per annum). China's domestic traffic is five times the size of India's despite having a population just 10% larger

- Some of the key achievements during last five years include the following:
 - India has become the 9th largest civil aviation market in the world
 - Passenger handling capacity has risen three-folds from 72 million (FY 06) to over 220 million (FY 11)
 - Cargo handling capacity has risen from 0.5 million MT (FY 06) to 3.3 million MT (FY 11)
 - Connectivity to North Eastern region has risen from 87 flights per week to 286 flights per week

Demand Estimation – segment wise

Transport Services Ports/Airports - Synopsis

Airports

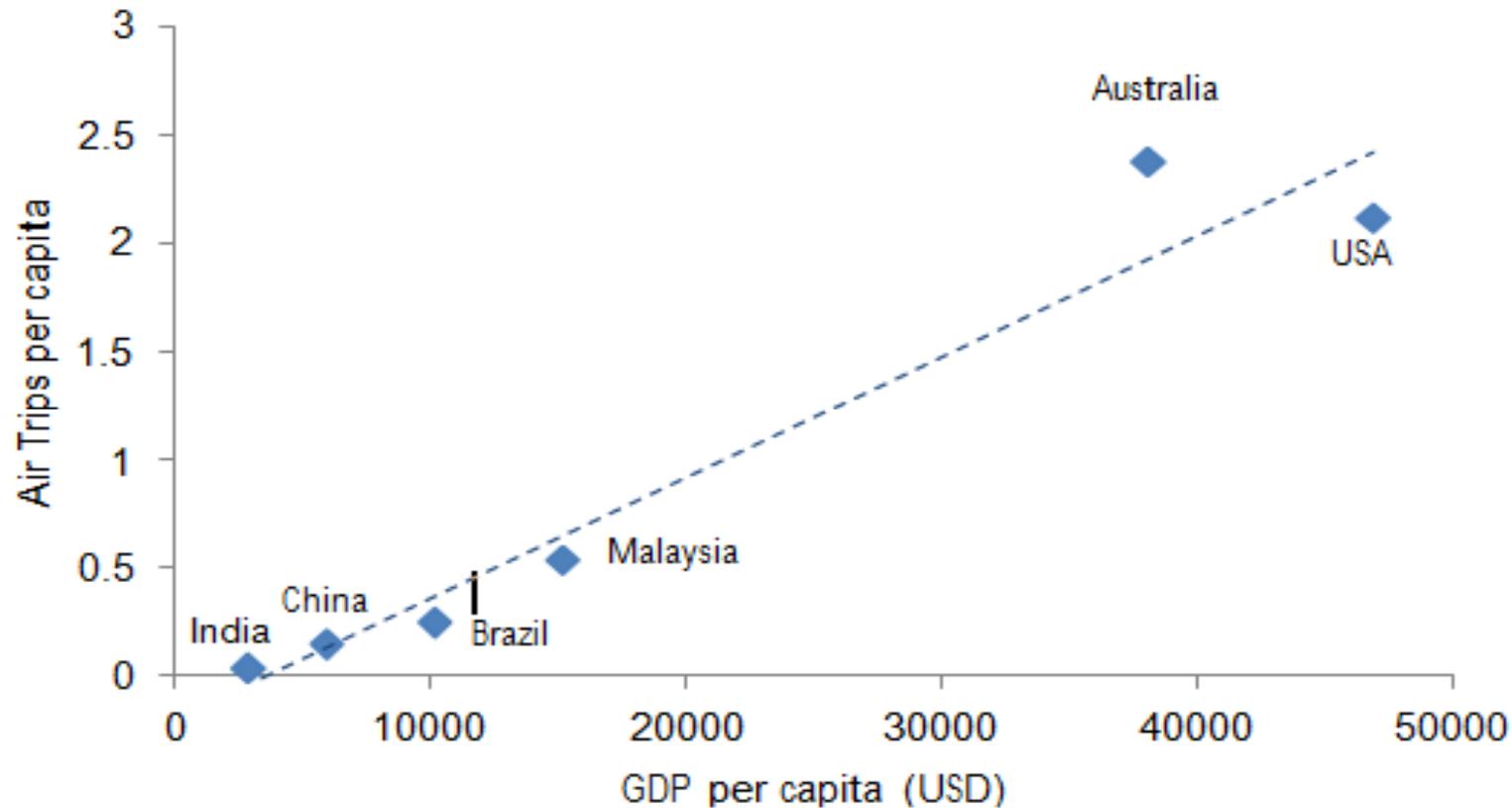


Figure 1: International comparison of air traffic penetration

Source: World Bank, FAA, DGCA India, CAAC, Malaysia Ministry of Transport, BTRE Australia, ANAC Brazil

Demand Estimation – segment wise



Transport Services Ports/Airports - Synopsis

Airports

- Total freight traffic handled by Indian airports increased at a CAGR 8% of over 11% in last five years to reach 2.33 MMTPA by 2011
- Forecast of air traffic carried out for 12'h plan period suggests that domestic passenger throughput' would grow at an average annual rate of around 12%. The domestic passenger throughput is expected to touch around 209 million by FY-17 from 106 million in FY-11.

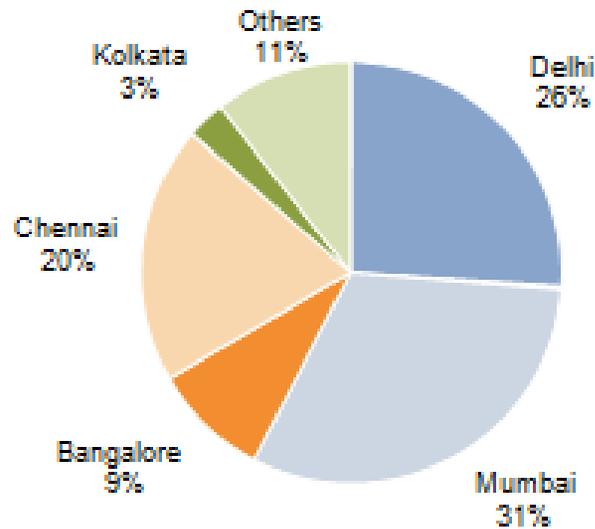
	FY 02	FY 07	FY 11	FY 17 (E)	Growth Rate
Domestic Passenger (Mn)	26	71	106	209	12%
International Passenger (Mn)	14	26	38	60	8%
Domestic Cargo Traffic (KMT)	294	530	852	1680	12%
International Cargo Traffic (KMT)	560	1021	1496	2650	10%

Demand Estimation – segment wise

Transport Services Ports/Airports - Synopsis

Airports.

International Freight Handled by Airports (FY 11)
100% = 1.5 mn tons



Domestic Freight Handled by Airports (FY 11)
100% = 0.83 mn tons

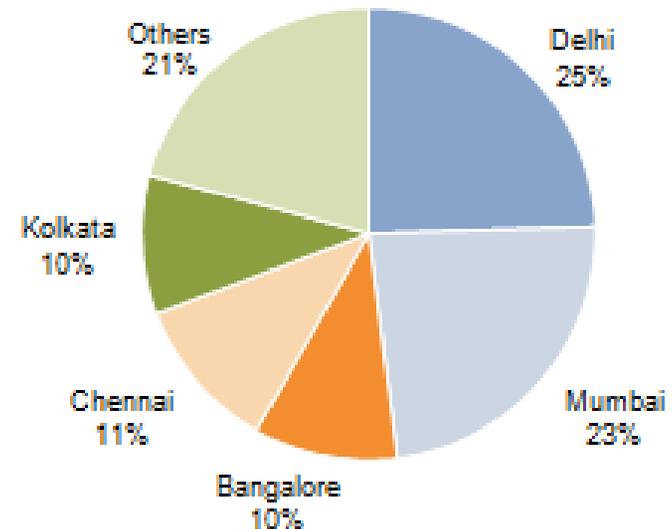


Figure 3: Airport wise break up of international and domestic freight handled in FY 11

Source: AAI

Demand Estimation – segment wise



Oil & Natural Gas Refinery Industry- Synopsis

- Refining capacity to expand to 310.86 MMTPA by 2017
- As per the report of Working Group on Refinery for 12th plan, the present refining capacity of the country which stands at 213.006 MMTPA is projected to jump by more than 30% by the end of 12th Five Year Plan by 2017

Total Fabricated Structures Projected Demand

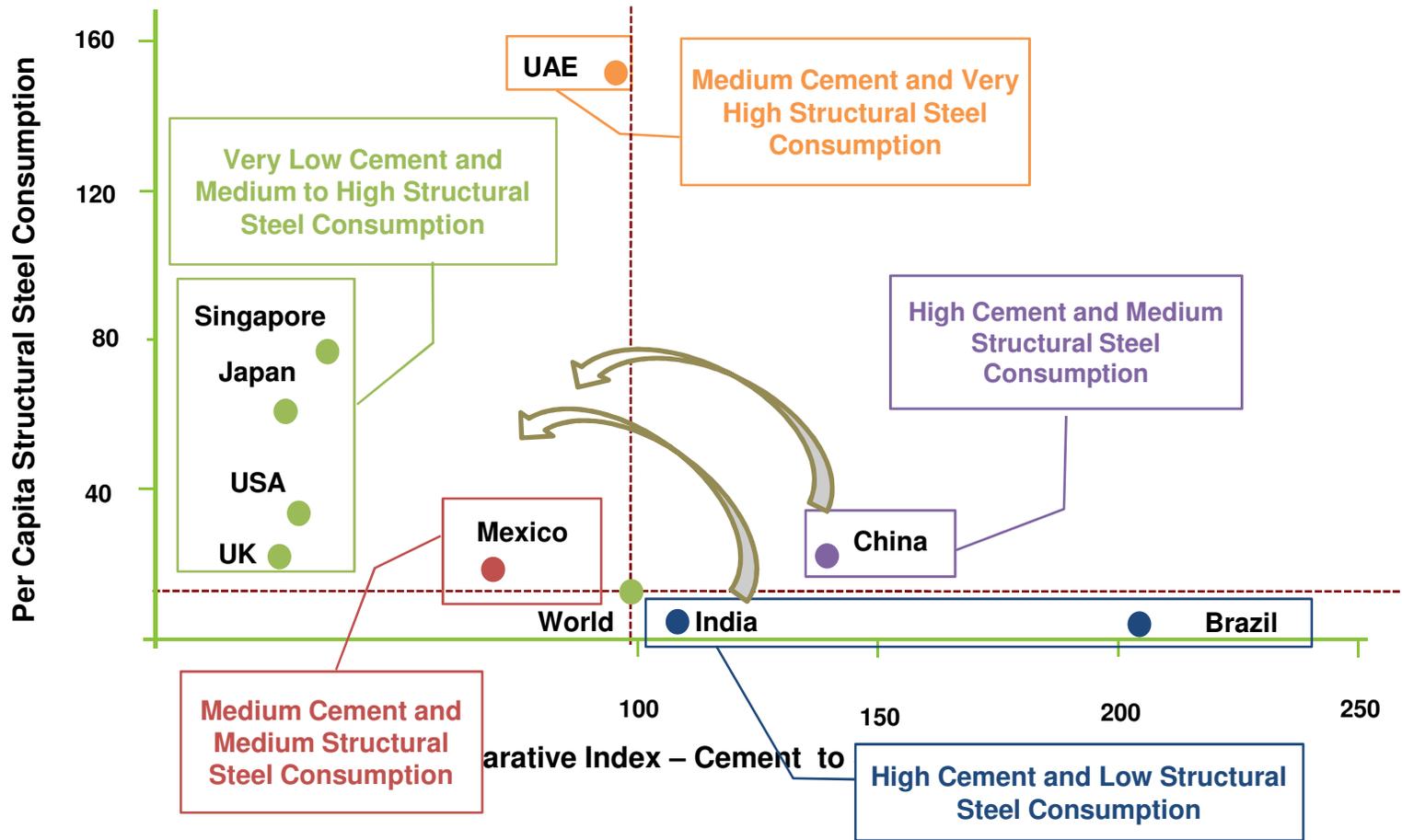


Based on the scientific model the estimated demand of fabricated structures is a sum of all sectors where it is utilized and hence adding them up we arrive at approx 50 lakh Tonnes in 5 year from 2012-2017 as follows: -

Industry Segmentation	Total investment (Crore INR)	Tonnage of Structures	Tonnes/crore	% market share
Metals manufacturing	2,88,330	4,83,935	1.678	10.27%
Cement plants	25,481	1,82,007	7.143	3.86%
Ship/airports	46,768	1,33,621	2.857	2.84%
Refineries	78,608	1,96,520	2.500	4.17%
Transport services	2,54,939	2,99,051	1.173	6.35%
Power	5,94,216	34,16,789	5.750	72.51%
	Grand Total in 5 year 2012-2017	47,11,923		
	Total per year	9,42,385		
	J SPL capacity	1,00,000		
	Market share on full load	11%		

Maturity of Indian market on a Global Standard

Cement vis-à-vis Structural Steel



As the developing countries mature, they may move towards medium cement and medium structural steel consumption, indicating increasing preference for Structural Steel

Supply estimation - Competition classification



The product lifecycle is divided into following three stages namely: -

- Development and introduction stage
- Rapid growth stage
- The phase of steady growth

Clearly from the previous slide fabricated structures domain falls in the development and introduction stage since this is yet to gain recognition against in situ fabrication works which has been the major contributor in the supply of such structures

Also, with the evolving market its expected that a lot of projects requiring cement and precast concrete materials will start getting replaced by Structural Steel.

Recommendation – Expansion

Need for expansion? – Reverse Mapping

- Total Expected demand for steel structures year wise

Year	Structural Steel Demand
2012-13	7,87,327
2013-14	8,58,186
2014-15	9,35,423
2015-16	10,19,611
2016-17	11,11,376
Grand Total	47,11,923

- Total Expected Supply for steel structures sector wise

Year	Supply Organised	Supply Unorganized	Supply Imports
2012-13	4,24,700	2,53,839	1,08,788
2013-14	4,67,170	2,73,711	1,17,305
2014-15	6,24,700	2,17,506	93,217
2015-16	6,24,700	2,76,438	1,18,473
2016-17	6,24,700	3,40,673	1,46,003

Recommendation – Expansion

11th plan overview of fabricated structures

- Mapping of demand and supply for the period

Year	Structural Steel Demand	Supply Organised	Supply Unorganized	Supply Imports
2007-08	5,51,129	2,46,890	2,12,967	91,272
2008-09	6,00,730	2,46,890	2,47,688	1,06,152
2009-10	6,54,796	2,46,890	2,85,534	1,22,372
2010-11	7,13,728	2,46,890	3,26,786	1,40,051
2011-12	7,77,963	2,46,890	3,71,751	1,59,322

Approach Strategy – Edge over competition

- India's largest prefab works installed capacity till date
- State of art CNC machines (Messer, Corimpex, Ficep)
- State of art RMH equipments (EOT cranes, Gantry cranes, Hydras etc.)
- State of art planning, scheduling and control systems
- Complete in house quality setup, teams
- Highly skilled and qualified work force with more than 500 years of combined experience

More description with pictures is discussed in the coming slides

Plant Details:

Plant	Installed Capacity (MT/Anm.)	Plant area (Acr.)	Covered area (Sq. Mts)	Manpower (Nos.)	Capacity Expansion (MT/Anm.)*
Punjipatra (Raigarh)	120,000	90	36,000	1300	180,000
Angul (Odisha)	50,000	50	32,000	500	120,000
Total	170,000		68,000		300,000

* Capacity expansion will be completed by Dec'12



Plant Facilities – Punjipatra (Raigarh)



JB FAB Infra

JB FAB INFRA Pvt Ltd
Light Gauge Steel Technology
Building Structures
(EPC - Projects)



Contact details:

PRE-ENGINEERED BUILDINGS (LIGHT GAUGE STRUCTURES)



FEATURES

- ❑ Low Project cost due to the reduction material and labour cost. Case study reveals saving of 8.5% with conventional system and 27% with structural steel building.
Specimen: Four storied labour dormitory of 28,000 sqft built up area at Raigarh.
- ❑ Faster construction by prefabricated panels. All structural components are precisely pre-manufactured and simply assembled on site. Case study indicate savings of 60%.
Specimen: Four storied residential apartment of 13,500 sqft built up area at Raigarh.
- ❑ Easiness in erection due to light weight.
- ❑ Chances of Progressive collapse is marginal.

FEATURES

- ❑ Quality construction. Durable and dimensionally stable. Doesn't expand or contract with moisture content, nor shrink, creep.
- ❑ Enhanced Thermal & Acoustic insulation with Boarding/Expanded Polystyrene (EPS) /Rockwool/Vapour Barrier. Reducing HVAC load by up to 10%.
- ❑ Eco friendly structure. Friendly with Indian Climatic conditions .
- ❑ Superior and sustainable performance.
- ❑ Minimum Impact on natural resources i.e. Wood, water etc.
- ❑ Lesser carbon foot print for pre & post construction

FIRE

- The system can be fire rated and will meet fire rating requirements set out in the Building Code.

- Internal walls covered with gypsum and cementitious board.

- exterior wall Sprayed with cementitious material directly onto the studs for at ground floor.

- Fire rated EPS.

SEISMIC BEHAVIOUR

- ❑ The use of a 'pin-jointed' or 'simply-supported' connection allows the joists flex without shearing.
- ❑ As a ductile system, it will dissipate the dynamic shock involved in seismic loading.
- ❑ The LGS structural weight is less than conventional structure. Under seismic conditions less mass means less inertial forces which can limit the damage

SOUND TRANSMISSION

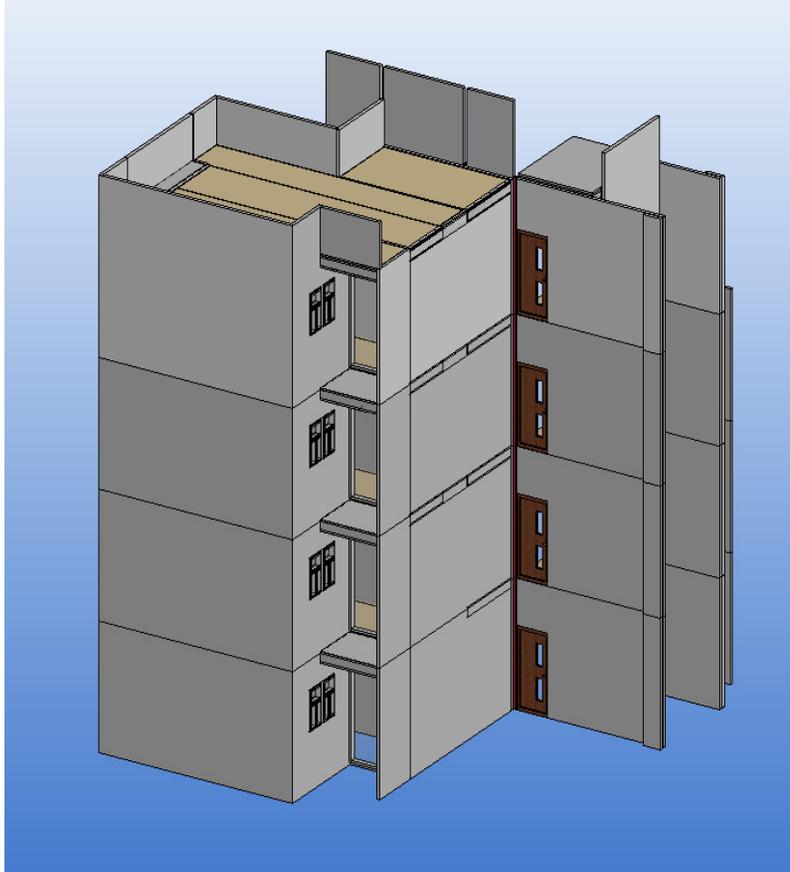
- ❑ The performance of the LGS system is better than that of a conventional construction. Gypsum board with Cement fiber board increases the STC of Rockwool /EPS insulation.
- ❑ The false ceiling under the joist provide STC 55.

THE PROCESS

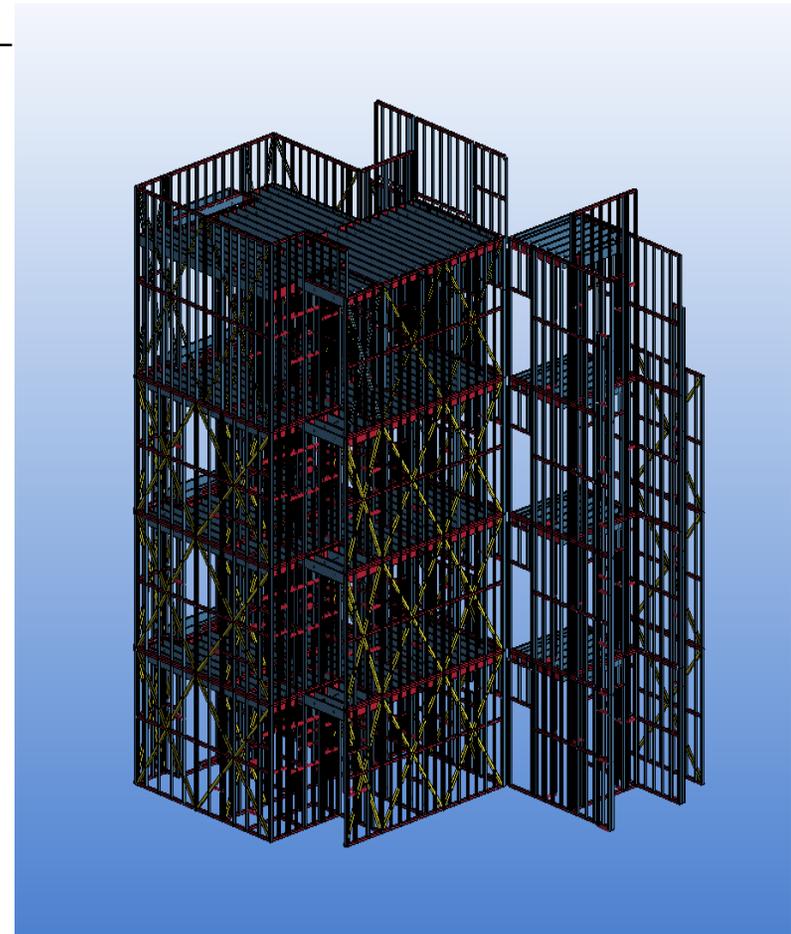
- ❖ Architectural Design
- ❖ Structural Design
- ❖ Manufacturing & Paneling
- ❖ Dispatch
- ❖ Structural erection
- ❖ MEP
- ❖ Finishes



G+3 – Residential Building



Perspective View



Framing View of the
model

Manufacturing & Paneling



Erection



Dispatch



Erection



- Tapcon Screw

Erection





ERECTION –DIFFERENT STAGES



Completed Building.



Staircase Area





Internal Finishes(Quarters)





THE STRUCTURAL



Floor Dead & Live Load Values



Dead Load : IS 875- Part1
 Live Load : IS 875-Part2
 Wind Load : IS 875-Part3
 Seismic Load : IS 1893-2002
 BS9590 part 5; Euro code 3 part 1.3

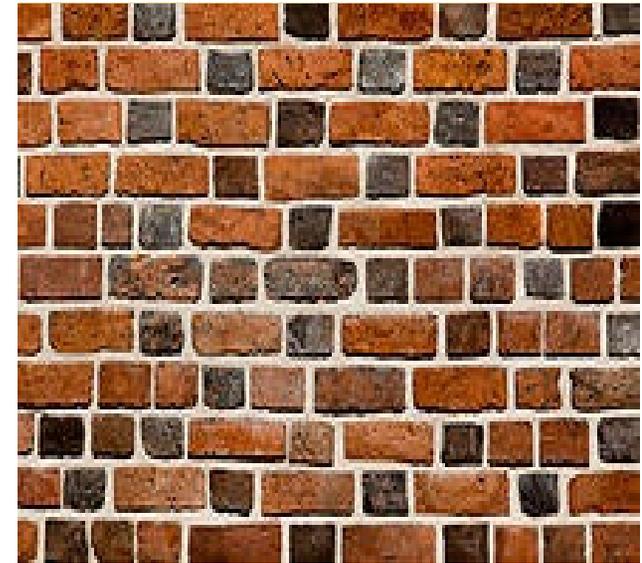


Floor Dead Load Values				
Floor Assembly	LGS Floor		Conventional Floor	
	KN/m ²	kg/m ²	KN/m ²	kg/m ²
10 mm Ceramic Tile + 30 mm Mortar	1.015	101.5	1.015	1.015
120 mm Thick Concrete Slab (2500 Kg/cu.m)	-	-	3	300
100mm mineral fibre insulation (10kg/m ³)	0.01	1		
Concrete, 60 mm thick	1.5	150		
Decking sheet, .7mm	0.067	6.7		
Light gage steel joist (2.0 mm Thick)	0.133	13.3		
6mm CP board cassette (density 1350 kg/m ³)	0.081	8.1		
Total Dead Load	2.806	280.6	4.015	401.5
Total Live Load	2		2	

Wall Load



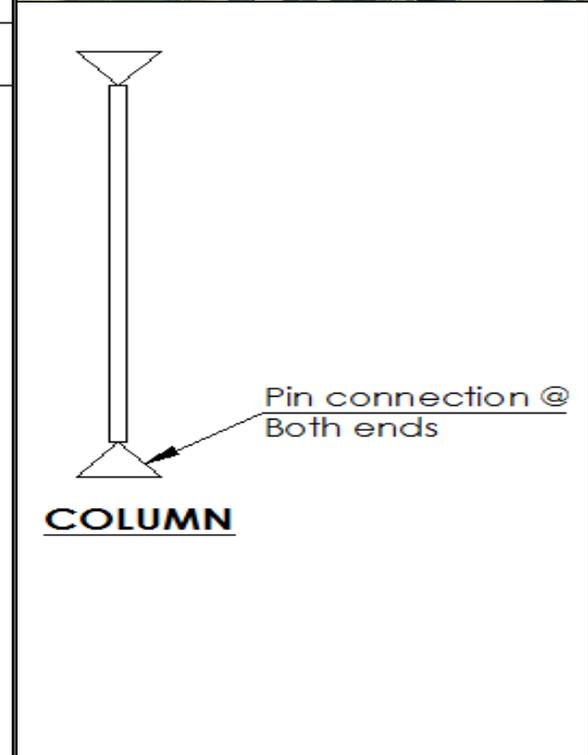
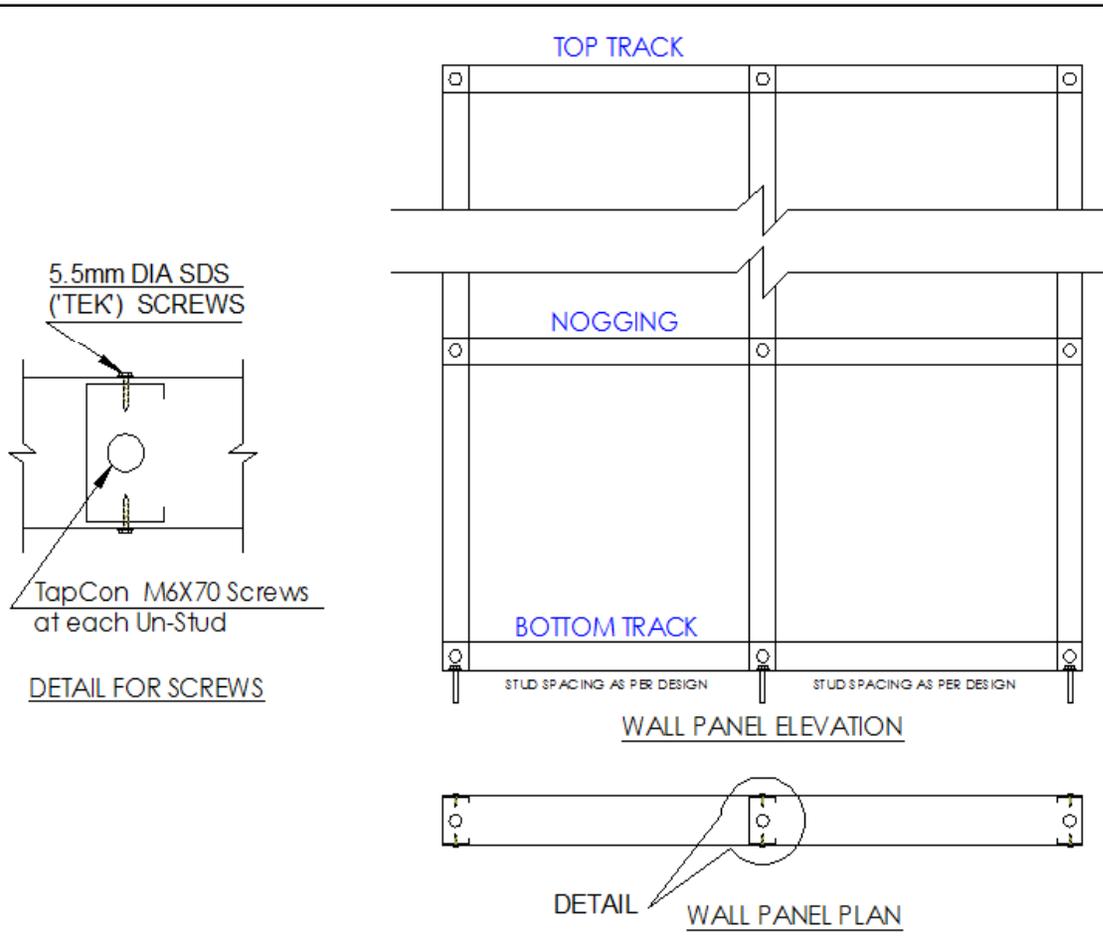
Exterior Load Bearing Wall Load		
External wall Load Bearing Wall Assembly	KN/m²	kg/m²
10 mm Cp Board both side	0.27	27
Light Gage Steel Studs and tracks	0.07	7
Cladding & Finishes	0.1	10
Total Dead Load	0.44	44



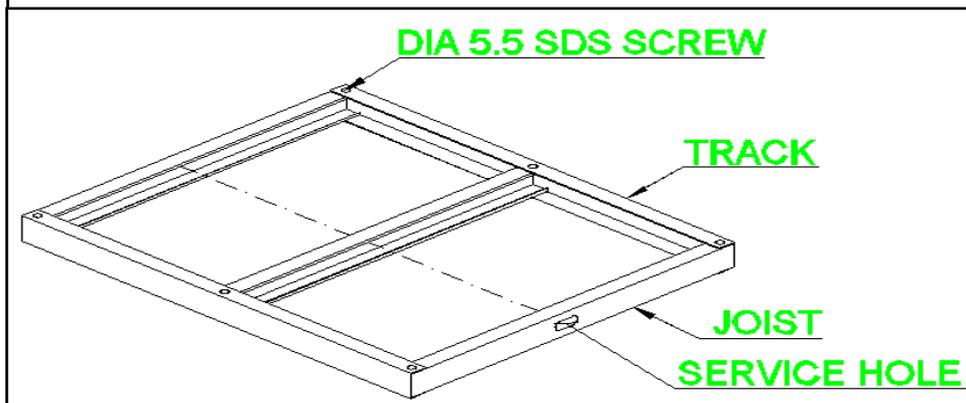
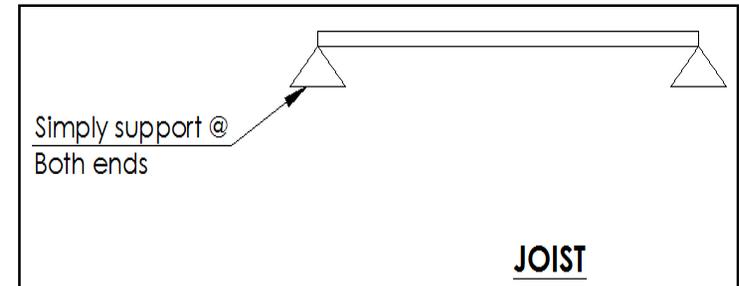
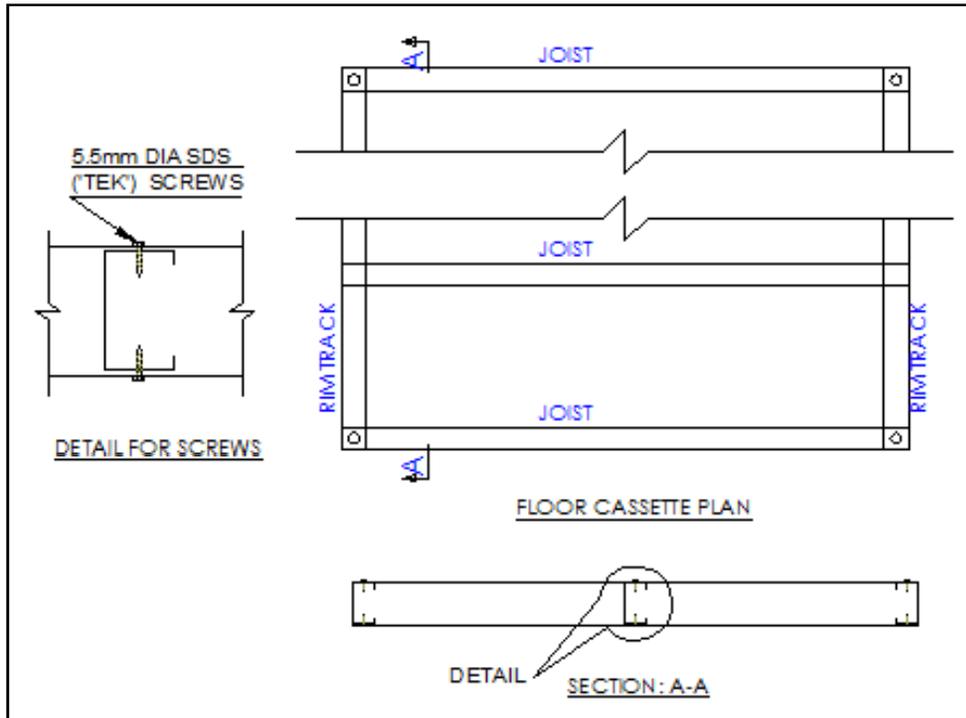
Brick Wall		
	KN/m ²	kg/m ²
230 mm thick wall (density 1900 Kg/cu. m)	4.37	437
20 mm plaster both side (density 1500 kg/cu. m)	0.6	60
miscellaneous	0.1	10
Total Dead Load	5.07	507

Wall Panel

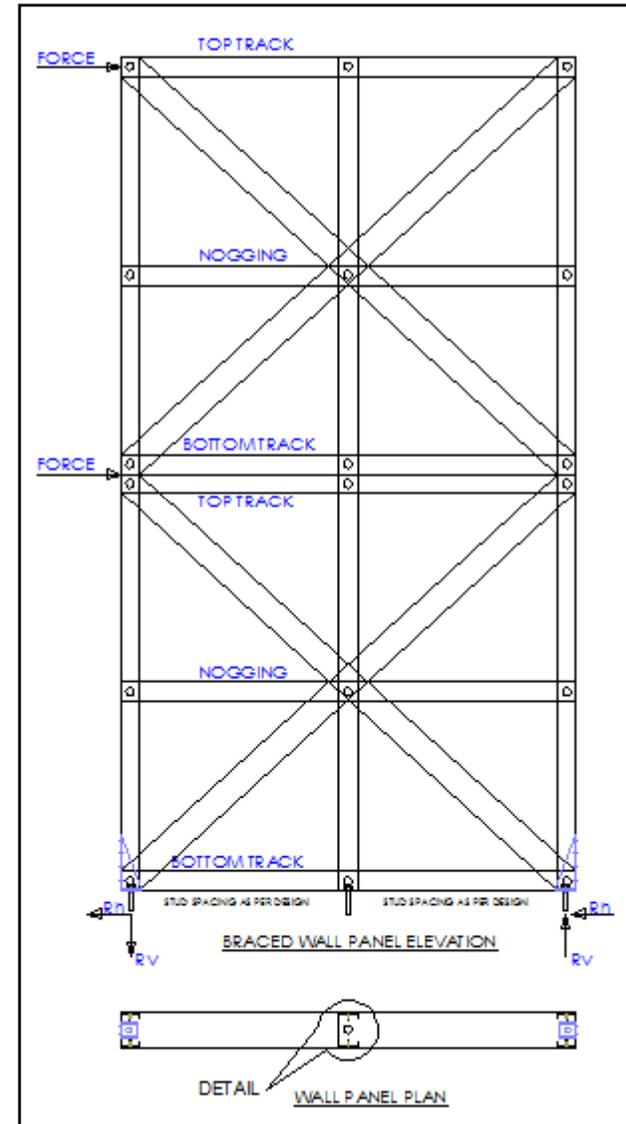
Wall Panel Details



Floor Cassette Details



Braced Wall Panel- Load Transfer Details





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Dr. S.Arul Jayachandran
Associate Professor

02/05/ 2012

To
Mr.S V Rao, Executive Director,
Structural Steel Division, Jindal Steel & Power Limited
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Certificate of structural adequacy of the Standardized (G Type) G+3 residential flats using LGS at Punjipatra, Raigarh, CG by M/s JB Infra Pvt Ltd

The task of proof checking the design of Standardized (G Type) G+3 residential flats using LGS at Punjipatra, Raigarh was referred to IITM.

The following documents were submitted to IITM- (i) the soil investigation report (ii) architectural drawings of the G+3 flats (iii) connection drawings (UBJ-SD-026 to UBJ-SD-026) and (iv) the detailed load and design calculation by Dr. Chunxu Jiang.

IIT Madras carried independent evaluation of loads and design of the LGS G+3 systems as per Indian Code IS:801(1975) and the British code BS:5950 – P5 for design and the IS:875 and IS:1893 codes for loads. All the connection details were checked. Later a visit was made by IITM to the site at Punjipatra for an onsite evaluation of the construction. Based on the independent analysis and design carried out by IITM on the (G Type) G+3 residential flats using LGS at Punjipatra, Raigarh, and also based on the site visit, it is certified that the designs submitted by M/s Jindal Steel & Power Limited is structurally adequate and the G+3 LGS flat system is safe as far as the strength of stiffness requirements.

With warm regards

(S.Arul Jayachandran

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Associate Professor
Department of Civil Engineering
Indian Institute of Technology Madras
Chennai - 600 036, INDIA

**Designs
Vetted
by IIT
Chennai**

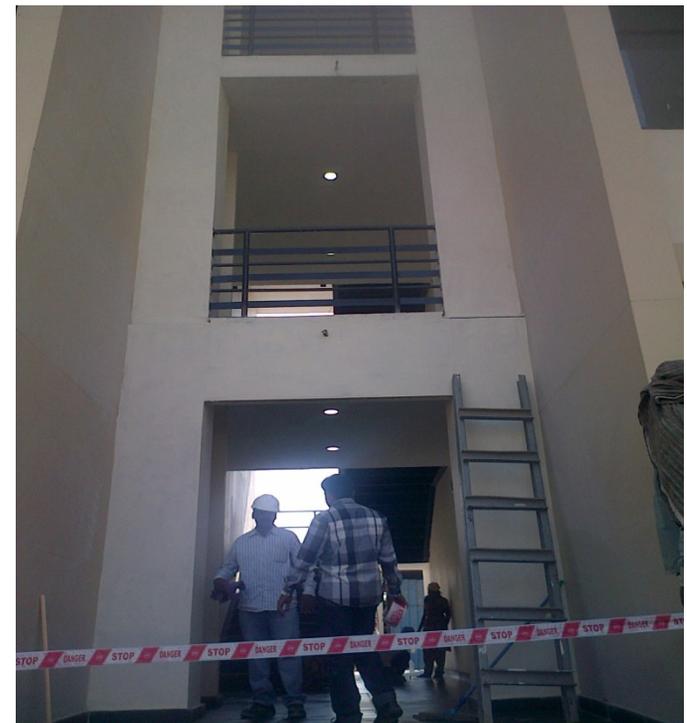


PROJECTS



SL NO	PROJECT NAME	LOCATION	SCOPE	AREA (SQF)	STATUS OF WORK
1	G –TYPE , G+3 .20 BLOCKS	JSPL HOUSING PARSADHA ,CG	EPC CONTRACT FOR LGS BULIDING ,INCLUDING FINISHING	351000	ONGOING .04 BLOCKS COMPLETED
2	2 ND FLOOR EXTENSION	JSPL ,GUEST HOUSE AT RAIPUR.,CG .	EPC CONTRACT FOR LGS BULIDING ,INCLUDING FINISHING	4000	COMPLETED
3	TECHNICAL BLOCK	JSPL, RAIPUR,CG .	EPC CONTRACT FOR LGS BULIDING ,INCLUDING FINISHING	4200	COMPLETED
4	SITE OFFICE	BRICK PLANT ,JSPL,RAIGARH	EPC CONTRACT FOR LGS BULIDING ,INCLUDING FINISHING	1500	COMPLETED
5	STAFF HOUSE BUILDING	SITE OFFICE FOR SONIPAT ,JINDAL REALITY LTD .	EPC CONTRACT FOR LGS BULIDING ,INCLUDING FINISHING	3000	COMPLETED
6	A-TYPE ,G+3 HOSTEL BUILDING	JSPL HOUSING PARSADHA ,CG & BARBIL ,ODISSA .	EPC CONTRACT FOR LGS BULIDING ,INCLUDING FINISHING	60000	UNDER PROGRESS
7	HOSPITAL BUILDING	HORSE HOSPITAL ,NOIDA FARM HOUSE .	DESIGN ,LGS SUPPLY ,ERECTION AND INTERIOR FINISH .	4000	UNDER PROGRESS
8	2 ND FLOOR EXTENSION	GIRLS HOSTEL , OP JINDAL INSTITUTE OF TECHNOLOGY ,RAIGARH ,CG	EPC CONTRACT FOR LGS BULIDING ,INCLUDING FINISHING	15000	STRUCTURE COMPLETED,INTERIOR
9	PLANT OFFICE	JB FAB PLANT OFFICE ,PUNJIPATRA ,RAIGARH ,CG .	EPC CONTRACT FOR LGS BULIDING ,INCLUDING FINISHING	1200	COMPLETED

COMPLETED BUILDING AT PARSADA ,G -TYPE ,G+3



Quarters at Raigarh

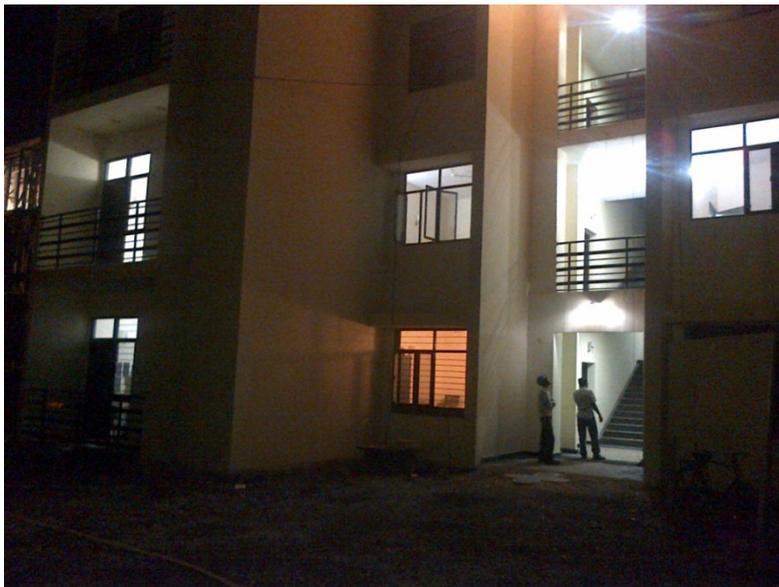


UNDER
CONSTRUCTION



COMPLETED
BUILDING

Night View of G+3 building.



Internal Finishes(Quarters)



Wash Basin



Kitchen Cooking Platform



Bathroom



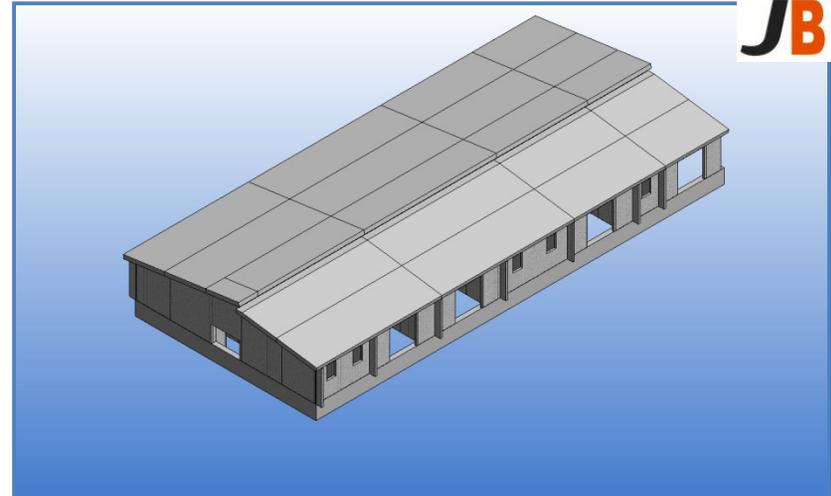
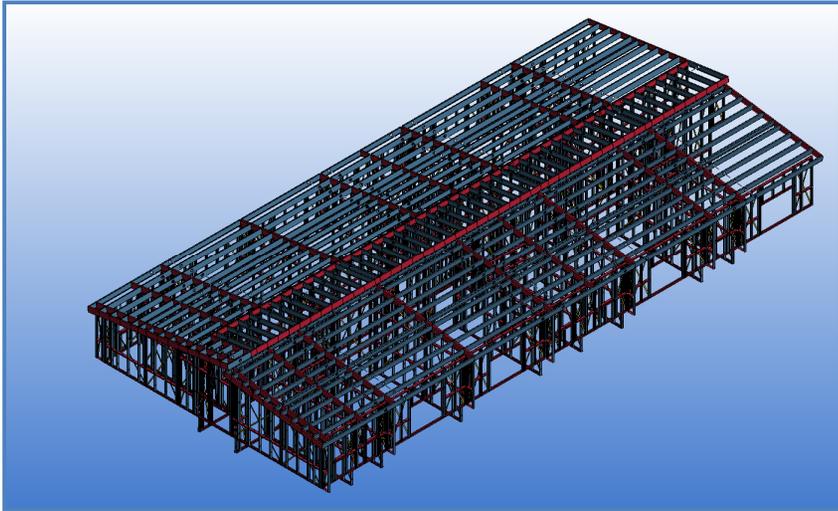
Finishing Work (G-TYPE ,G+3)



Kitchen



Bed
Room
&
Balcony
Door



PROJECT OFFICE



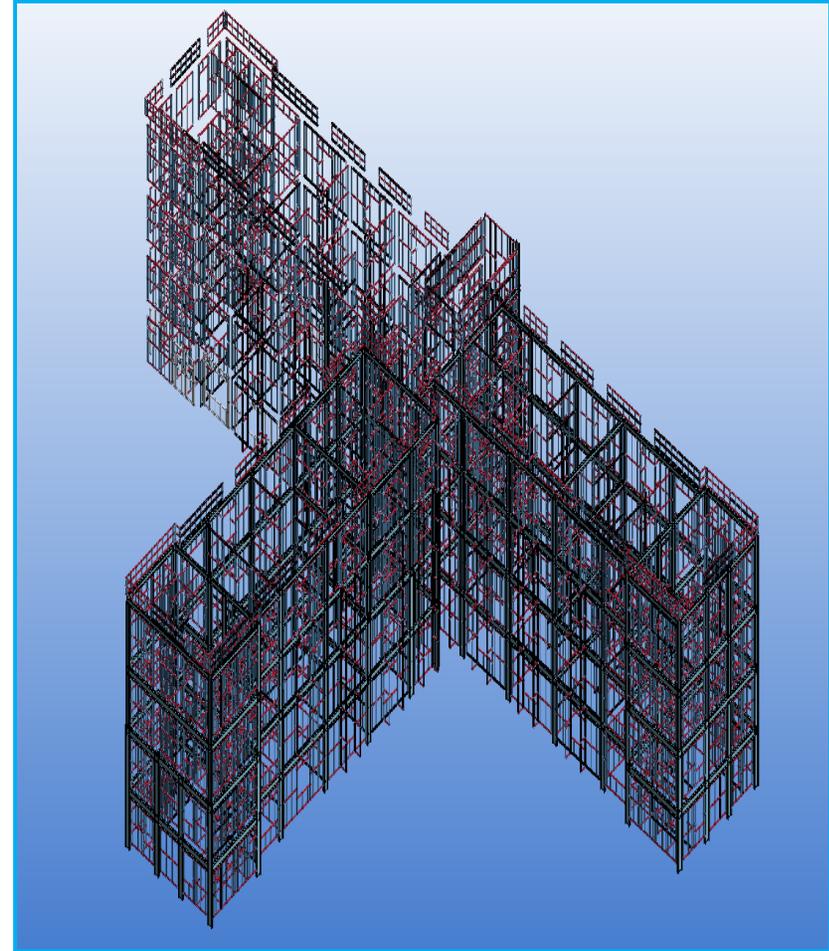
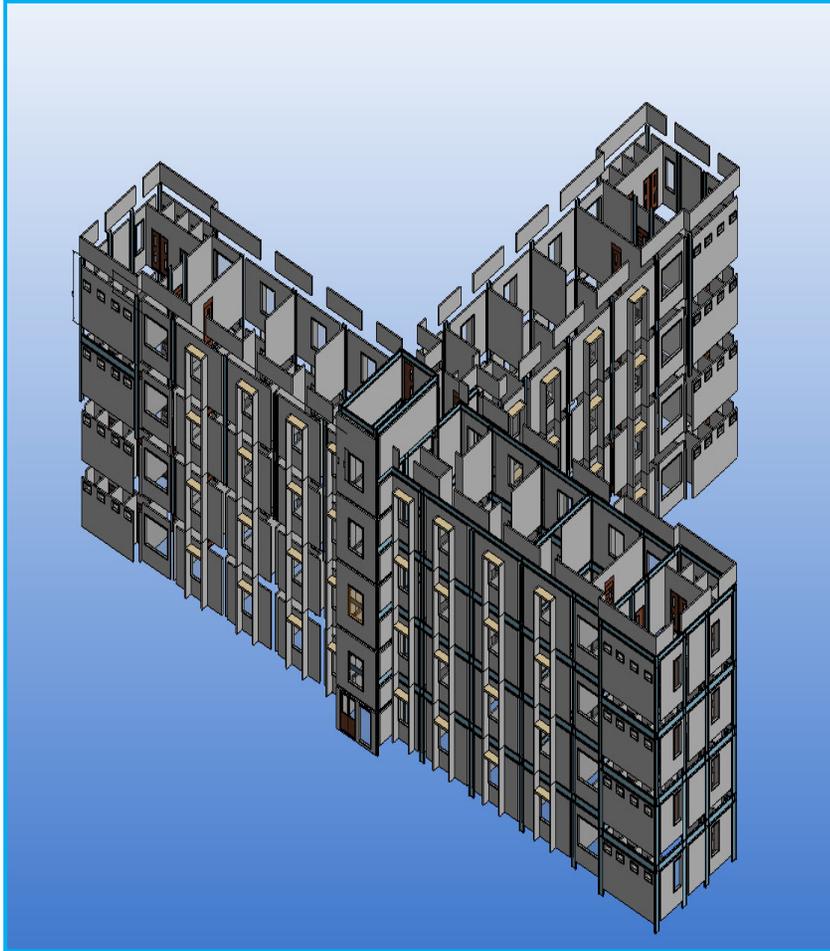
PROJECT OFFICE



PROJECT OFFICE

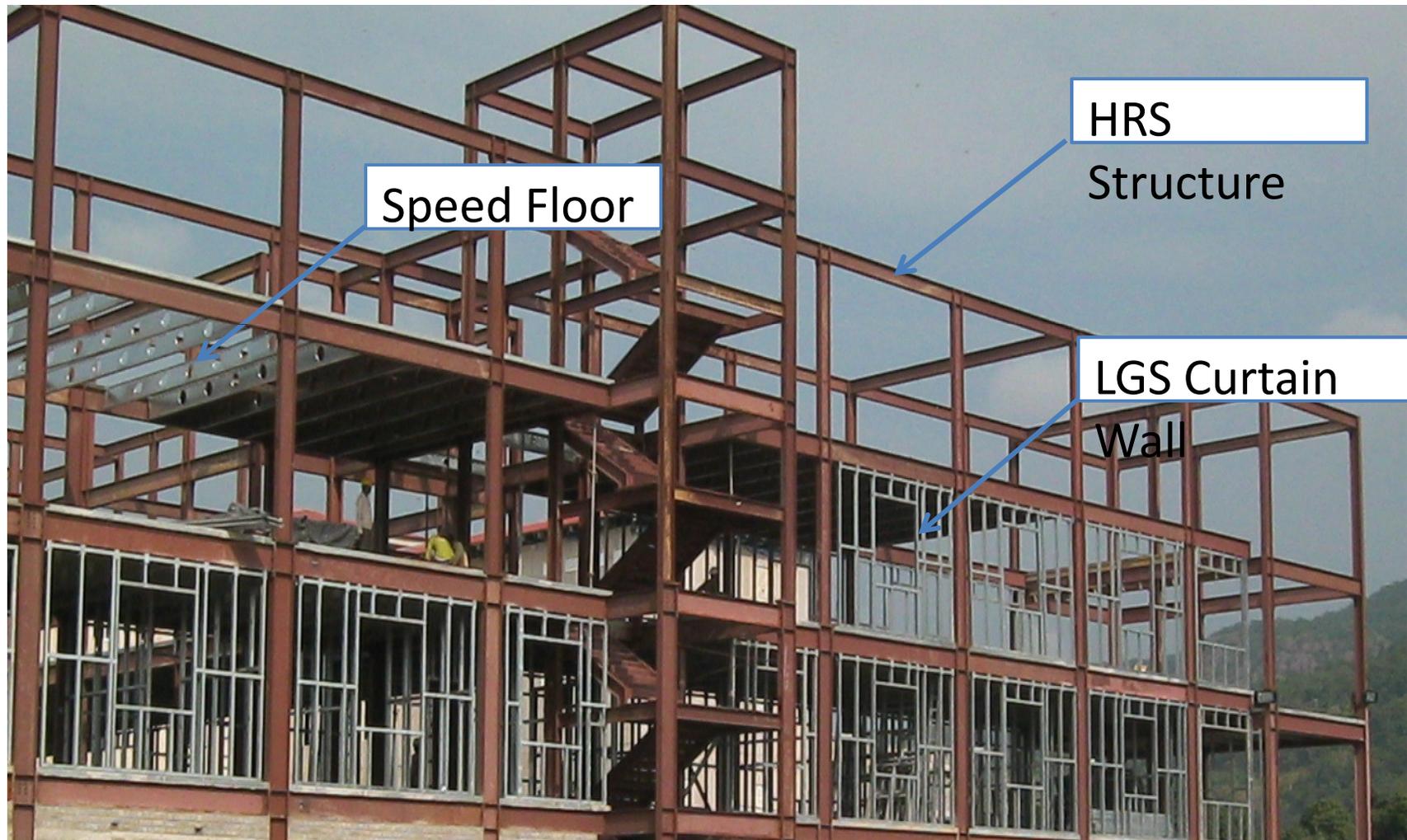


Dormitory Curtain Walls: Four Storied



PERSPECTIVE & FRAMING VIEW

COMBINATION OF HRS ,LGS AND SPEED FLOOR ,FOR DORMITORY BUILDING .



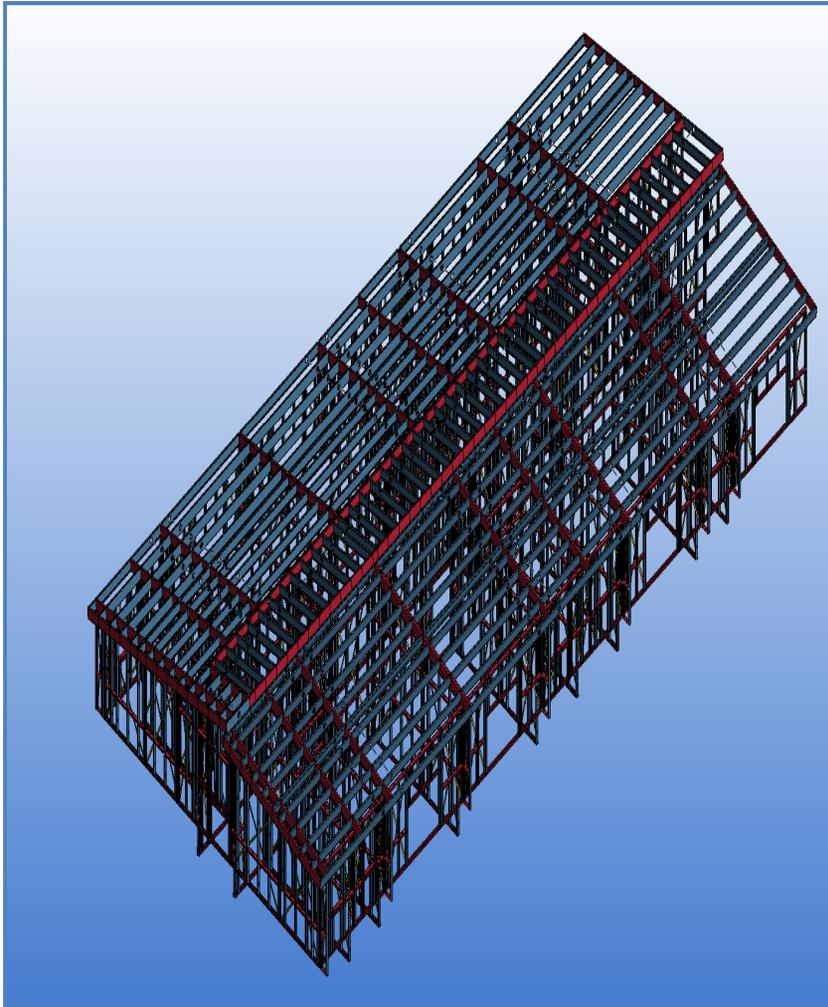
COMBINATION OF HRS ,LGS AND SPEED FLOOR ,FOR DORMITORY BUILDING .



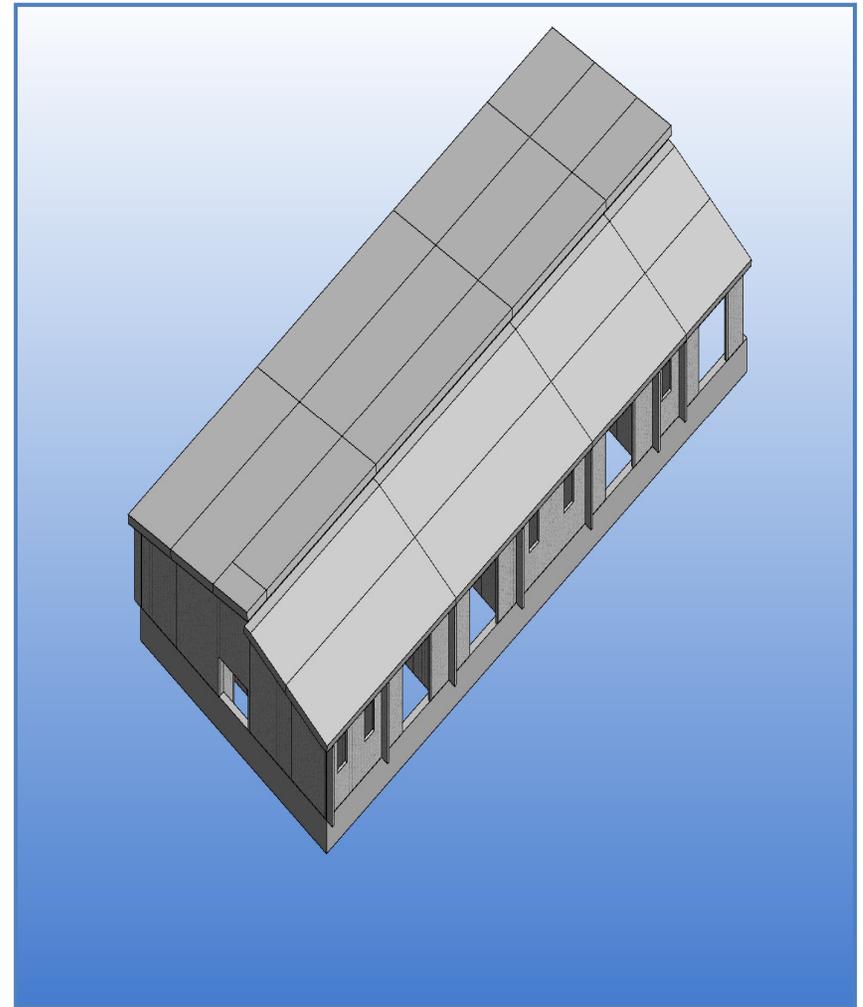
COMBINATION OF HRS ,LGS AND SPEED FLOOR FOR DORMITORY BUILDING



Guest House, Raipur: Single Floor Extension



Framing View of the model



PERSPECTIVE VIEW

Guest House, Raipur: Single Floor Extension ,Erection Work **JB**



Guest House, Raipur: Single Floor Extension Matching elevation



Guest House, Raipur: Single Floor Extension Matching Elevation **JB**



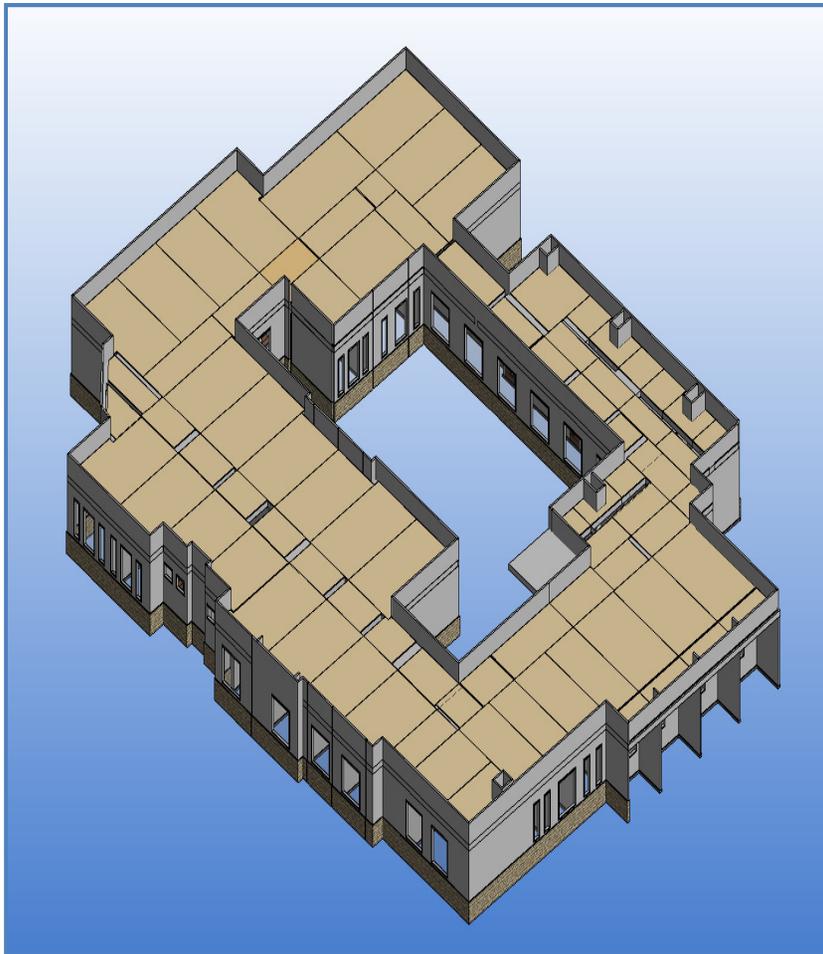
Guest House, Raipur: Single Floor Extension Toilet Finishes **JB** ✓



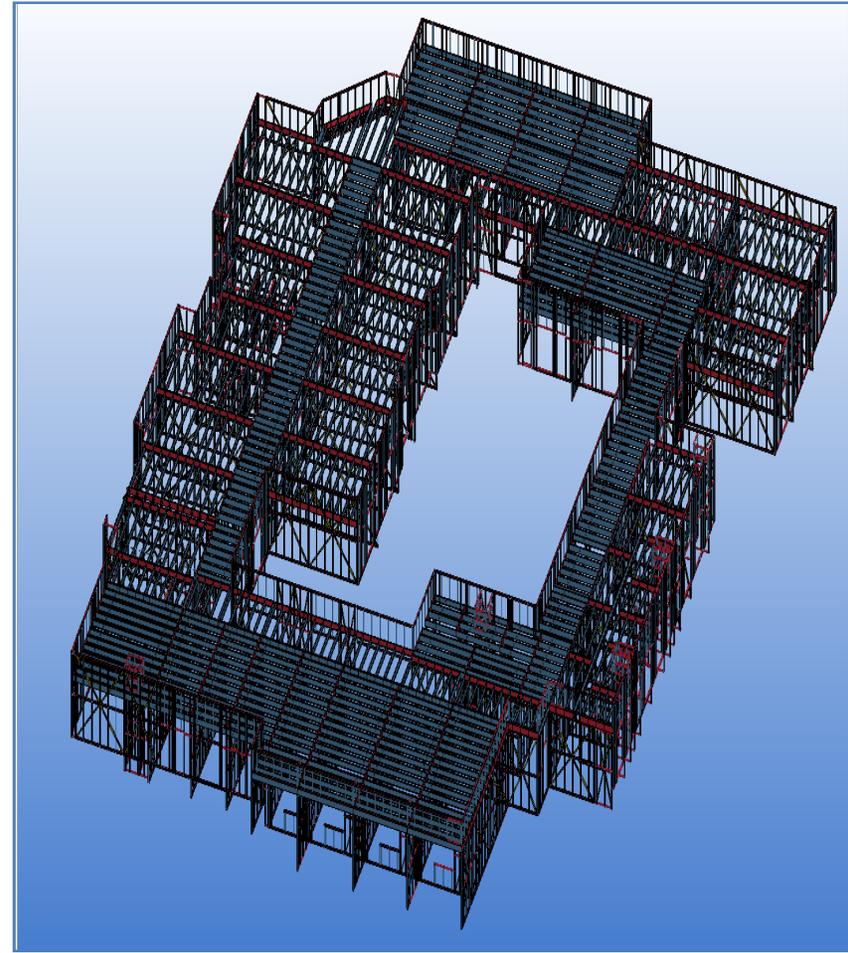
Guest House, Raipur: Single Floor Extension Corridor Area **JB** 



Hostel: Single Floor Extension

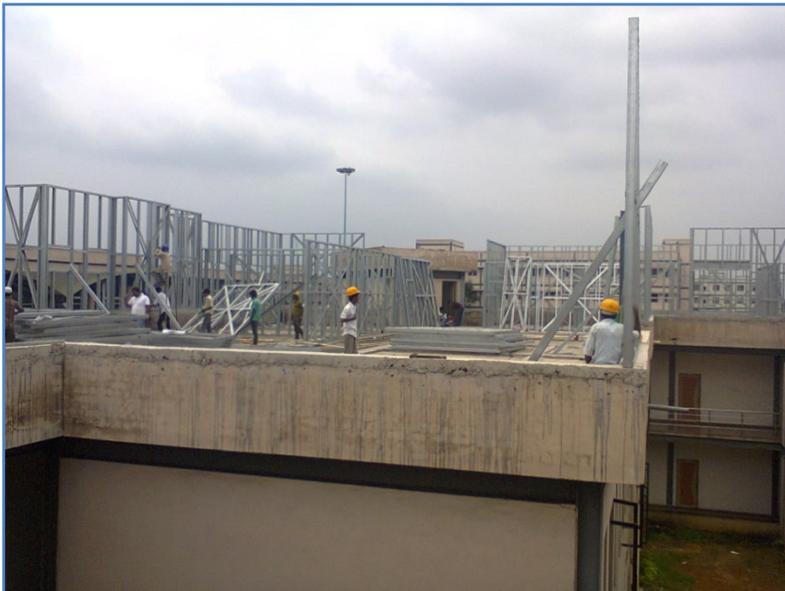


PERSPECTIVE VIEW



FRAMING VIEW

Hostel:-Erection of wall Panel



Hostel :-Roof Panels



Hostel :-Roof decking



Hostel : -Matching Elevation



Hostel :- Fixing CP Board



Matching elevation



Hostel : - Matching Elevation



SURFACE	
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- | | |
|-----------------------------------------|------------------------------------------------------------------|
| <input type="checkbox"/> External Wall: | <input type="checkbox"/> Guniting -1.5mmx50 mesh above 25mm EPS. |
| | <input type="checkbox"/> Cement Fiber board of 10mm thick |
| | <input type="checkbox"/> PPGL/PPGI sheets |
|
 | |
| <input type="checkbox"/> Internal Wall: | <input type="checkbox"/> 9mm Cement Fiber Board |
| | <input type="checkbox"/> 12.5 mm Gypsum Board |
| | <input type="checkbox"/> 12.5mm Gypsum board above 6mm CB |
| | <input type="checkbox"/> Guniting -1.5mmx50 mesh above 25mm EPS |
| | <input type="checkbox"/> Tiles Above Guniting |

SURFACE

- Flooring:
 - 70mm thick RCC above 0.7mm GI decking sheet.
 - Cement Fiber board of 18mm+10mm thick

- Roofing:
 - 70mm thick RCC above 0.7mm GI decking sheet.
 - 0.45mm thick PPGI/PPGL Roof sheeting

FINISHES

- Architectural:

All Architectural Features like coving, Boxes, Cantilever, Projections, Infill walls, Wall mounted cabinets, wash basins.

- Finishes:

- Sand Cement Plaster /Guniting
- Gypsum Based Plasters
- Gypsum Boards
- Cement Boards
- Dry Stone/Panels Cladding
- Texture Paints
- Laminations



THE COMPANY



JB FABINFRA



- ❖ Subsidiary of 15 billion USD Jindal Group.
- ❖ A pioneer of Light Gauge Structures (LGS) technology in the country.
- ❖ Constructed India's first four storied building with LGS.
- ❖ Manufacturing facility located at Raigarh (CG).
- ❖ Advanced procedure for quality assurance.

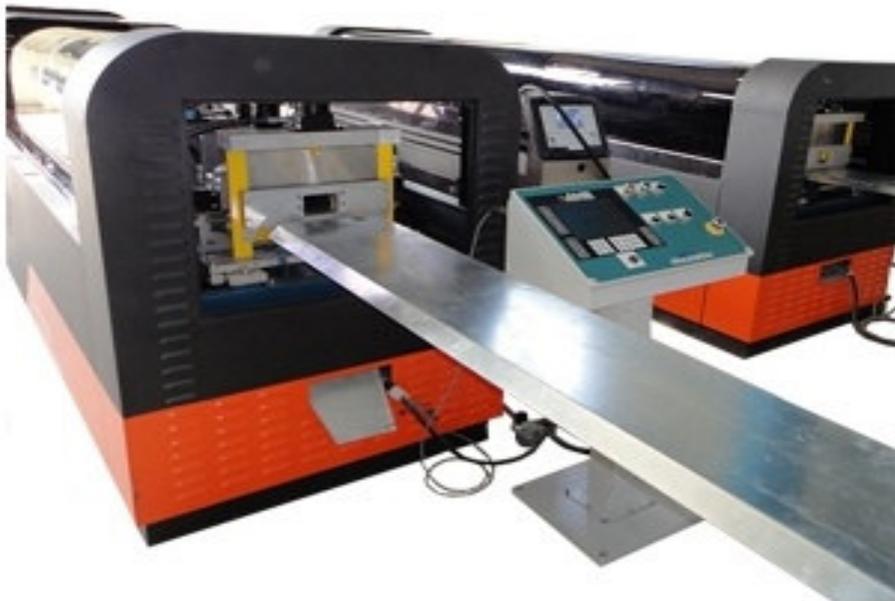


JB FABINFRA



❖ Covered Area:30,000 Sqft

❖ Capacity:16,000 MT/year
(15000sqft building/day)



JB FABINFRA



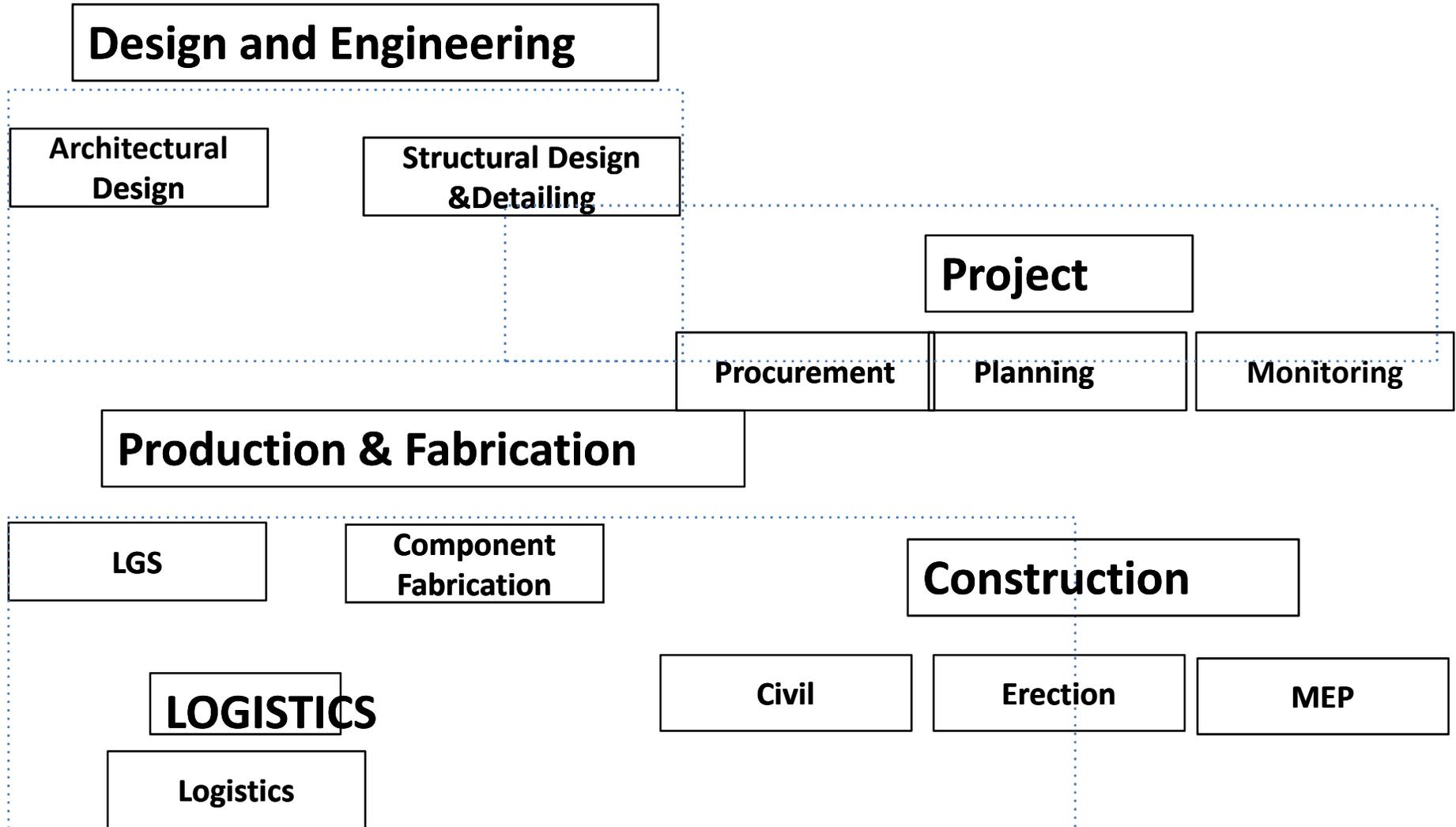
- ❖ Presently executing more than 50,000 sq.mtr LGS projects.
- ❖ State of the art manufacturing facilities for producing LGS.
- ❖ Planning and Engineering is facilitated with Integrated Design and Engineering Software.



forming lines production
tions.



JB FAB INFRA



JB FABINFRA OFFERS



Engineering Procurement and Construction of Low rise Buildings

Focused Segments

- Low Cost Houses
- Residential buildings
- Bus & Truck Terminals
- Project Office
- Restaurants
- Shopping Malls
- Commercial Buildings
- Staff Quarters/Hostel
- Cabin /Toilets



Provides solution to all segments of B & C Industry

Jindal Steel & Power Limited *(Structural Steel Division)*

Introduces
For the First Time in India

THE SPEED FLOOR SYSTEM



THANK YOU





Thank you

