

# SMART BUILT PREFAB

## Innovative Precast Solutions for Small Buildings and Boundary Walls

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# SMART BUILT- BUILDING APPLICATIONS



**OFFICE**



**SCHOOL**



**GUEST HOUSE**



**LABOUR QUARTER**

## SMART BUILT- BUILDING APPLICATIONS



Anganwadi Prefab Structure

# SMART BUILT- BUILDING APPLICATIONS



Anganwadi in operation

## SMART BUILT- BUILDING APPLICATIONS



Prefab Health Center with PPGI sandwich panels

# SMART BUILT- OFFICE BUILDING PROSPECTIVE VIEW-01



Project:  
**PROPOSED PREFAB BUILDING FOR M/S. FYSOLATE AT VIZAG.**

Architects:  
**SMARTBUILT PREFAB PVT. LTD.**

## SMART BUILT- OFFICE BUILDING PROSPECTIVE VIEW -02



Project:  
**PROPOSED PREFAB BUILDING FOR M/S. FYSOLATE AT VIZAG.**

Architects:  
**SMARTBUILT PREFAB PVT. LTD.**

# SMART BUILT- OFFICE BUILDING REAL VIEW AT VISAKHAPATNAM



**SMART BUILT- SECURITY OFFICE BUILDING**



# SMART BUILT- INTERIOROS OF OFFICE BUILDING



# SMART BUILT- INTERIORS OF OFFICE BUILDING



**SMART BUILT- INTERIORS OF OFFICE BUILDING**



**SMART BUILT- APPLICATION FOR FISHERMAN HOUSE- KERALA**



# SMART BUILT- FRP CABINS



Prospective view of similar Smart Built Prefab House proposed for USIDCL



# SMART BUILT

## Prefab Mock up House with sloped roof at Hyderabad



# SMART BUILT

## Prefab Counters at Ahobilam, Karnool



# SMART BUILT PREFAB SOLAR PLANT PREFAB INVERTOR ROOM



# SMART BUILT PREFAB SOLAR PLANT PREFAB INVERTOR ROOM



## SMART BUILT PREFAB SOLAR PLANT PREFAB INVERTOR ROOM



# SMART BUILT

Prefab Shops at Ahobilam, Karnool



# SMART BUILT

## Prefab Toilet at Agricultural University, Hyderabad



# SMART BUILT

Prefab Community Toilet at Agricultural University, Garikapadu



# SMART BUILT

## Prefab Visitors Lounge at Agricultural University, Hyderabad



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## Prefab Visitors Lounge at Agricultural University, Hyderabad



# SMART BUILT

## 500 Sqft Low cost Prefab House at Hyderabad



# SMART BUILT PREFAB GVPR STAFF QUARTER AT HYDERABAD



# SMART BUILT PREFAB LABOR CAMPS



## SMART BUILT PREFAB WARE HOUSES



# SMART BUILT PREFAB MODULAR INTERIOR PARTITIONS



## SMART BUILT PREFAB MODULAR INTERIOR PARTITIONS



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## Precast Boundary Wall with concrete post & plain panel for industrial land



SMART BUILT

## Precast Boundary Wall with concrete post & plain panel with barbed wire fencing



## SMART BUILT

Precast Boundary Wall with concrete post & plain panel erected over stone masonry.



# SMART BUILT

Precast Boundary Wall with steel post & precast concrete panel at  
GMR Angul Power Plant, Orissa



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## Precast Boundary Wall with steel post & panel at Agricultural University, Hyderabad



SMART BUILT

## Precast Boundary Wall with steel post & panel at Agricultural University,



## SMART BUILT

Precast Boundary Wall with precast concrete post & brick textured wall panel at Kakinada



SMART BUILT

# Precast Boundary Wall with precast concrete post & brick textured wall panel at Rajahmundry



SMART BUILT

# Precast Boundary Wall for 6 MW solar power plant at Pargi, Hyderabad



# SMART BUILT

## Precast Boundary Wall on Hilly Terrain



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# Precast Boundary Wall for 50 Acres Industrial land



# CAMPARISON BETWEEN SMART BUILT PREFAB BUILDINGS WITH MODULAR PREFAB



# CAMPARISON BETWEEN SMART BUILT PREFAB BUILDINGS WITH OTHER LOW COST PRECAST BUILDING



# CAMPARISON BETWEEN SMART BUILT PRECAST TOILET WITH OTHER PRECAST TOILET



- **Technology:** Prefab Post & Panel Composite Structure
- **Columns:** Steel hallow concrete filled posts anchored with cast in situ concrete footing. Wall columns are anchored in cast in situ plinth beams
- **Walls:** 60mm thick both side finish precast Concrete Panels with tongue & groove
- **Roof (Sloped):** PPGI sandwich roof puf insulated panel of 30mm thick with one side corrugation supported by Steel hallow tubular section frame.
- **Roof(Flat) :** Concrete roof with composite deck sheet fitted over steel hallow tubular section frame
- **Flooring:** Cement Floor / Ceramic tiles /Vitrified tiles(Optional)

## **Advantages**

- No Need of crane to handle precast components
- Suitable for Plain area's, Remote & Hilly terrain
- Suitable for building structures in spreaded location like Govt. Anganwadis, Sub Health Centers , Grampanchayat bavans & School Buildings
- Needs less man power for on site erection
- Durable & strong compare to other modular prefabs
- Suits for Indian conditions

## **Advantages**

- No Plaster & Painting required
- Less maintenance
- Fast track technology
- Simple connection details
- Scope for customization
- Scope for mass production to meet the demand
- Scope for on site production by using mobile battery steel molds

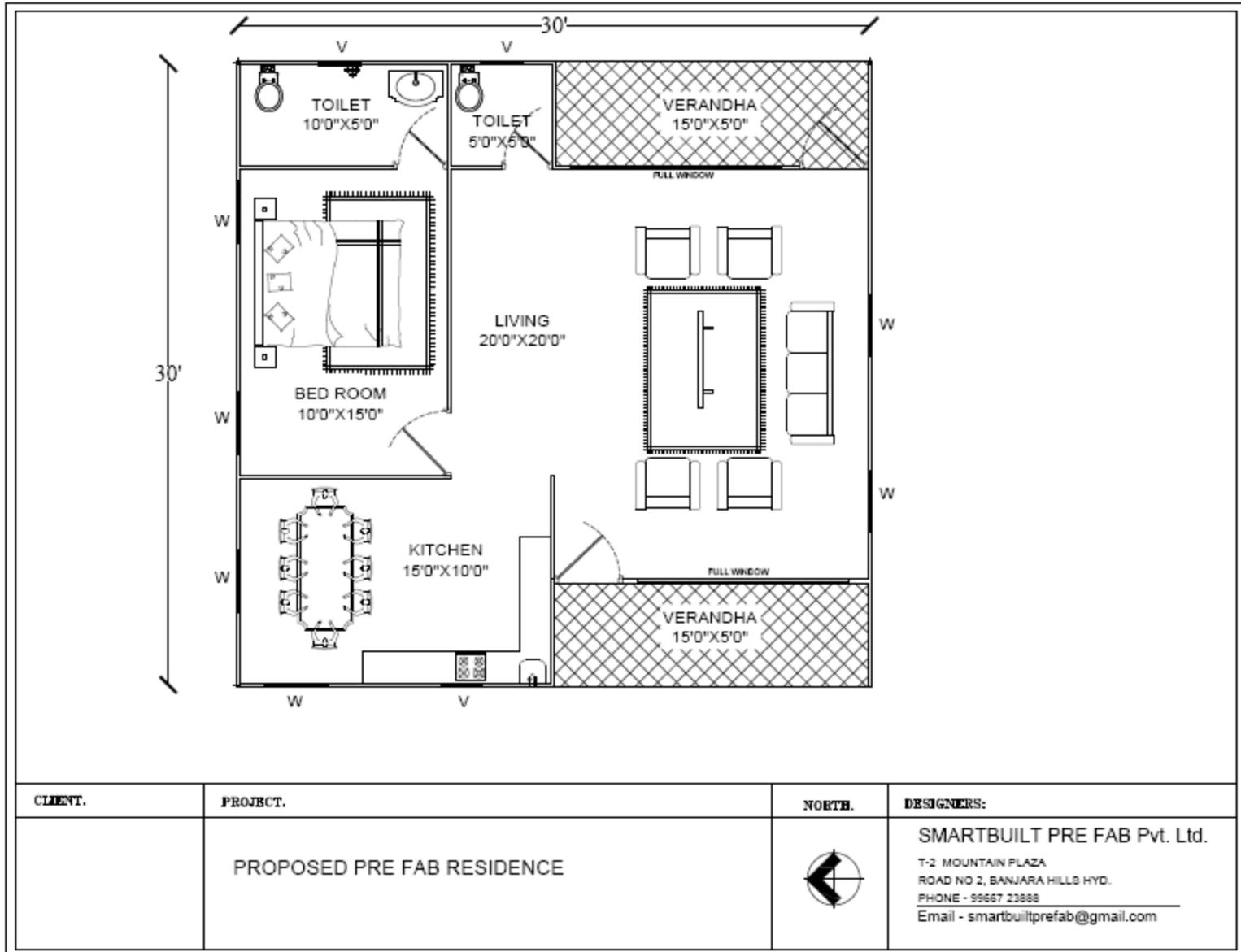
## Time Cycle For Each Building

Foundation	:	2 Days
Column Erection	:	2 Days
Wall Panel Erection	:	2 Days
Roof Beam	:	2 Days
Roof Panel	:	1 Day
Flooring	:	2 Days
Services Integration	:	3 Days
<b>Total Time Cycle</b>	:	<b>14 Days</b>

### Man Power Requirement/Unit

- 1 Senior Technician
- 2 Mason
- 3 Unskilled Labor
- 1 Plumber
- 1 Electrician

# Sample prefab house floor plan



# **INSTALLATION STEPS**



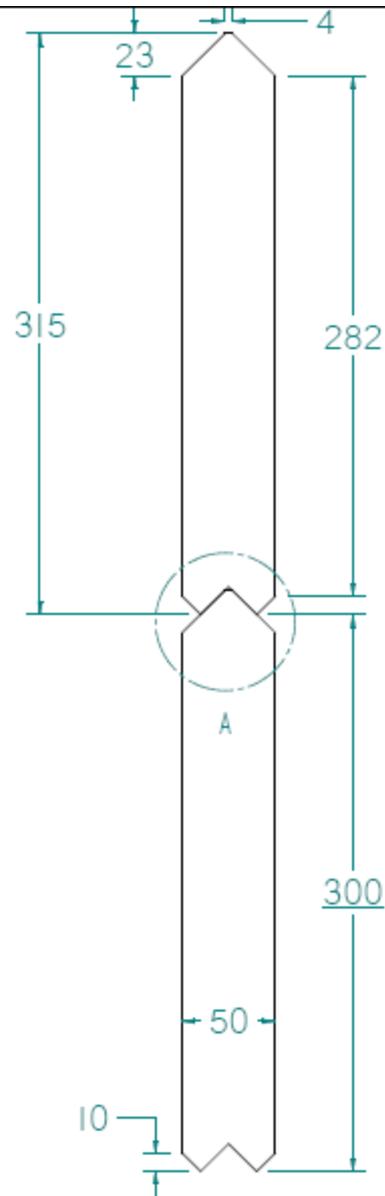




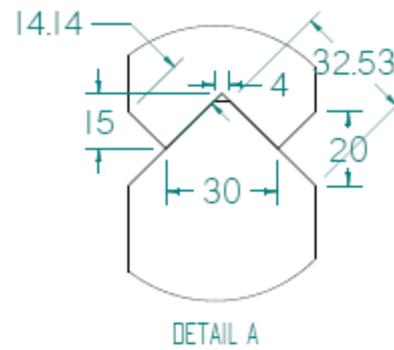
**SMART BUILT PREFAB PVT.LTD.**



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REVISION HISTORY		
REV	DESCRIPTION	DATE



DRAWN	NAME	DATE	Solid Edge
CHECKED	Markham	01/04/15	
ENG APPR			
MR APPR			
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS			SHEET NO 02









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**SLOPPED ROOF WITH COLORED CORRUGATED GALVALUME SHEET (OR) 30mm thick insulated puf panels**



## **FLAT ROOF WITH COMPOSITE DECK CONCRETE ROOFING**

## COMPOSITE COLUMN

Column of composite structure with H/L/T shape are made from GI/Galvalume steel sheet and produced through roll forming and profiles are get connected by rivets.

5mm thick MS plate connected with bolts are being used to connect column to beam to guarantee quick and easy installation at construction site.

After installation of column, concrete is filled into the hallow column finally the “Composite Column” is formed.



## ADVANTAGES OF USING COMPOSITE COLUMNS

- H/L/T shape of column provide formwork for inexpensive concrete core, causing higher compressive strength and stiffness of column.
- Steel-concrete interaction is taken for granted in concrete-filled steel columns.
- Using steel tube columns as formwork alongside its structural role is the economical method providing quick and easy construction
- Concrete filled steel columns, has more fire resistance than steel columns



## PRECAST WALL PANELS

Both side finish colored precast concrete panels made with M-30 grade concrete. Size of panel shall be 1830 mm x 300mm x 60 mm thick, reinforced with 4mm dia weld mesh. Each panel will have tongue and groove arrangement.

Precast concrete panels will be fixed between the two steel columns by sliding through the 60mm wide H column slots. Four persons can easily handle the panels, since the weight of each panel is 78 kilos.

For insulation Inner face of wall surface will be covered with 25 mm thick rock wool sheet and 6 mm thick cement fiber board.



## ADVANTAGES OF USING PRECAST CONCRETE WALLS

- More Stronger and Durable and suitable to Indian climatic conditions than other prefab wall panels like PPGI PUF panels, LGFS wall panels etc.
- Less maintenance
- No plastering & painting required
- Suits for both Hilly & Plain Terrains
- Environmental protection
- Most area-saving
- Most waterproof and damp proof
- Most fire-proof
- Most sound-insulation
- Most anti-seismic and impact resistance
- Cost effective and suits for low cost housing



## **FLAT ROOF WITH COMPOSITE DECK CONCRETE ROOFING FOR PLAIN AREA'S**

Composite metal deck floor consists of corrugated ribbed cold rolled galvanized metal sheet connected to the hollow steel beam section, composite metal deck floor finally is formed by concrete placement on floor.

Galvanized metal deck sheets are produced in the factory with high quality by full automated roll forming machine.

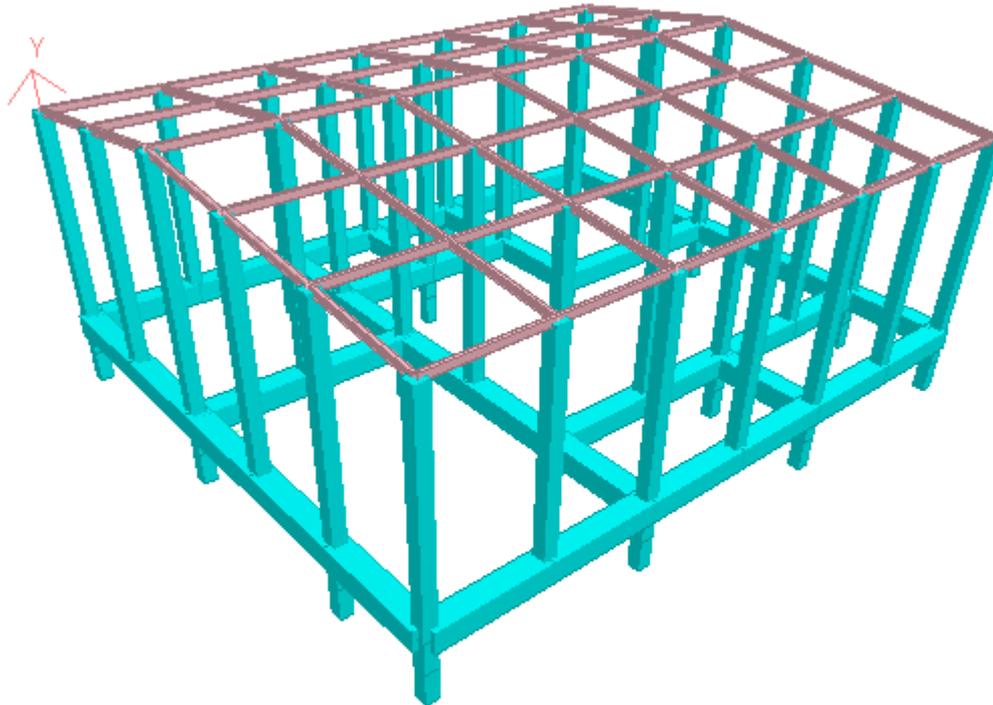
According to the last researches of steel deck institute of USA(SDI) to avoid from cracking due to shrinkage and thermal changes, steel bar mesh or macro synthetic finer shall be used.



# ADVANTAGES OF BUILT UP CEILING

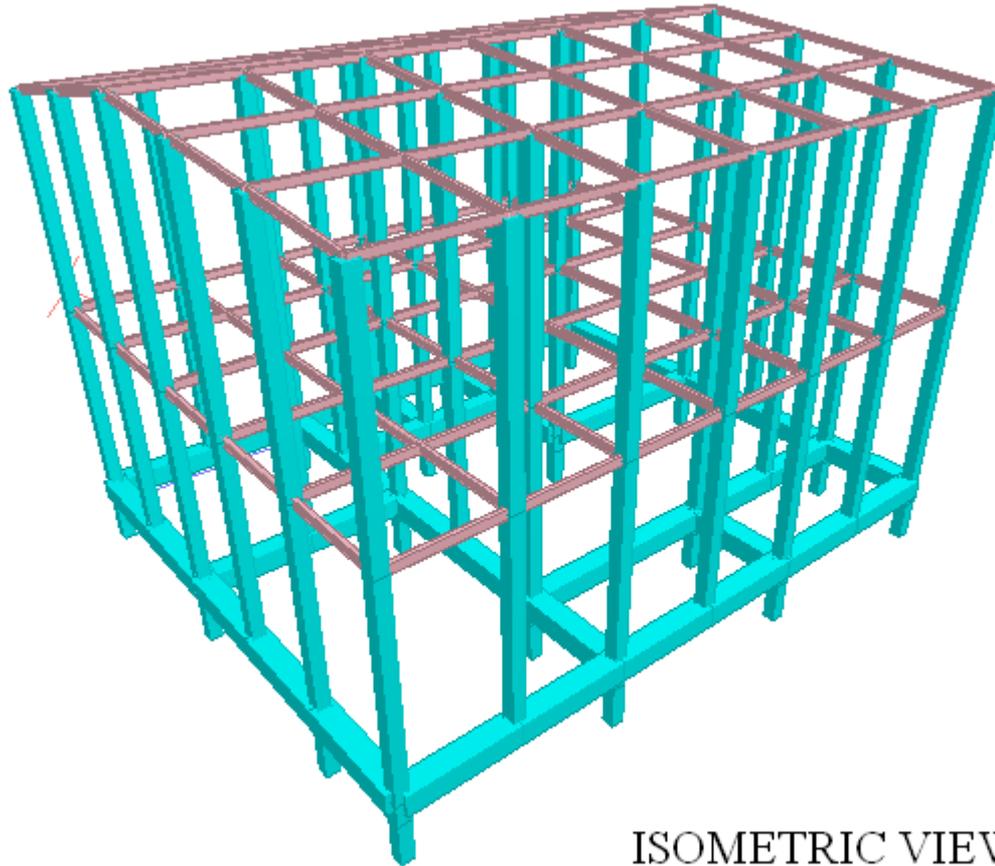
- No form work required
- Labor cost saving
- Easy transportation of steel floor deck
- High speed during execution
- Steel floor deck acting as formwork in concrete placement stage
- Steel deck is used as a safe platform during concrete floor placement

# 3 D IMAGES OF BUILDING FRAME



ISOMETRIC VIEW - G

# 3 D IMAGES OF BUILDING FRAME G+1



ISOMETRIC VIEW- G+1

# Smart Built Prefab Single & Two Storied Prefab Houses design approved letter from NIT, Warangal Approved Letter



DEPARTMENT OF CIVIL ENGINEERING  
**NATIONAL INSTITUTE OF TECHNOLOGY**  
**WARANGAL-506004**

Report on  
**The Proof checking of Structural Designs for the Single and Two Storied Prefabricated Houses**

Proposal No. 1423  
 Date: 11-12-2014

Ref: 1) Lr from M/s Smart-Built Prefab Pvt. Ltd, Hyderabad, dt.18<sup>th</sup> Oct 2014  
 2) NITW SRIC Proposal No. 1423

M/s Smart-Built Prefab Pvt. Ltd, Hyderabad has requested, vide letter cited above the proof checking of Structural designs for the Single and Two Storied Prefabricated building structures. The designs were carried out by M/s Q Engineering Prospects Pvt.Ltd, Hyderabad. Accordingly 'Proof checking of the structural designs and drawings of the foundations and Steel prefab superstructure of the above mentioned building' has been done by Prof.D.Rama Seshu, Dept of Civil Engineering, NIT. The following are the details of proof checking.

1. The proposed Single/Two story Prefabricated building has overall plan dimensions of 9 x 7.5m (30'x25'). The different rooms in the building are Hall (20'x10'), Kitchen cum dining (10'x15'), Two Bed rooms (each 10'x10'), Two toilets (each 5'x5') and Verandah (20'x5'). Any dimension in the proposed structure is multiple of 1.5m (5'). The stair case in case of two storied building is fabricated independently and connected rigidly to the columns of the prefab building.
2. The buildings consisted of 'Super structure made using prefab elements' supporting on 'Cast in-situ substructure. The Steel prefab columns are supported on RC pedestals (foundations).
3. The Substructure is proposed to consist of isolated cast in-situ RC footings, designed for the vertical loads and moments induced due to gravity and lateral loads.
4. The loads considered in the design are as per IS 875 and consisted of dead load, Live load and Wind load.
5. The typical load data consisted of:

<b>LOADS</b>	
Dead Load on Roof	= Self weight of the 85 mm thick slab
Live Load (for Building)	= 200 kg/sq.m (floor) ; 75 kg/sq.m (Roof)
Live Load (for Stair case)	= 300 kg/sq.m
Wind load	= 120 kg/sq.m (intensity including k1,k2 and k3=1)
	(Ext / Internal wind pressure coefficients as per IS 875-part-3)

**LOAD COMBINATIONS**

1. 1.0 (DL+SELF WT+L L)
2. 1.0 (DL+SELF WT+ W L 'X' DIRECTION)+VE / -VE)
3. 1.0 (DL+SELF WT+ W L 'Z' DIRECTION)+VE / -VE)
4. 0.75 (DL+SELF WT+L L+ W L 'X' DIRECTION)+VE / -VE)
5. 0.75 (DL+SELF WT+L L+ W L 'Z' DIRECTION)+VE / -VE)

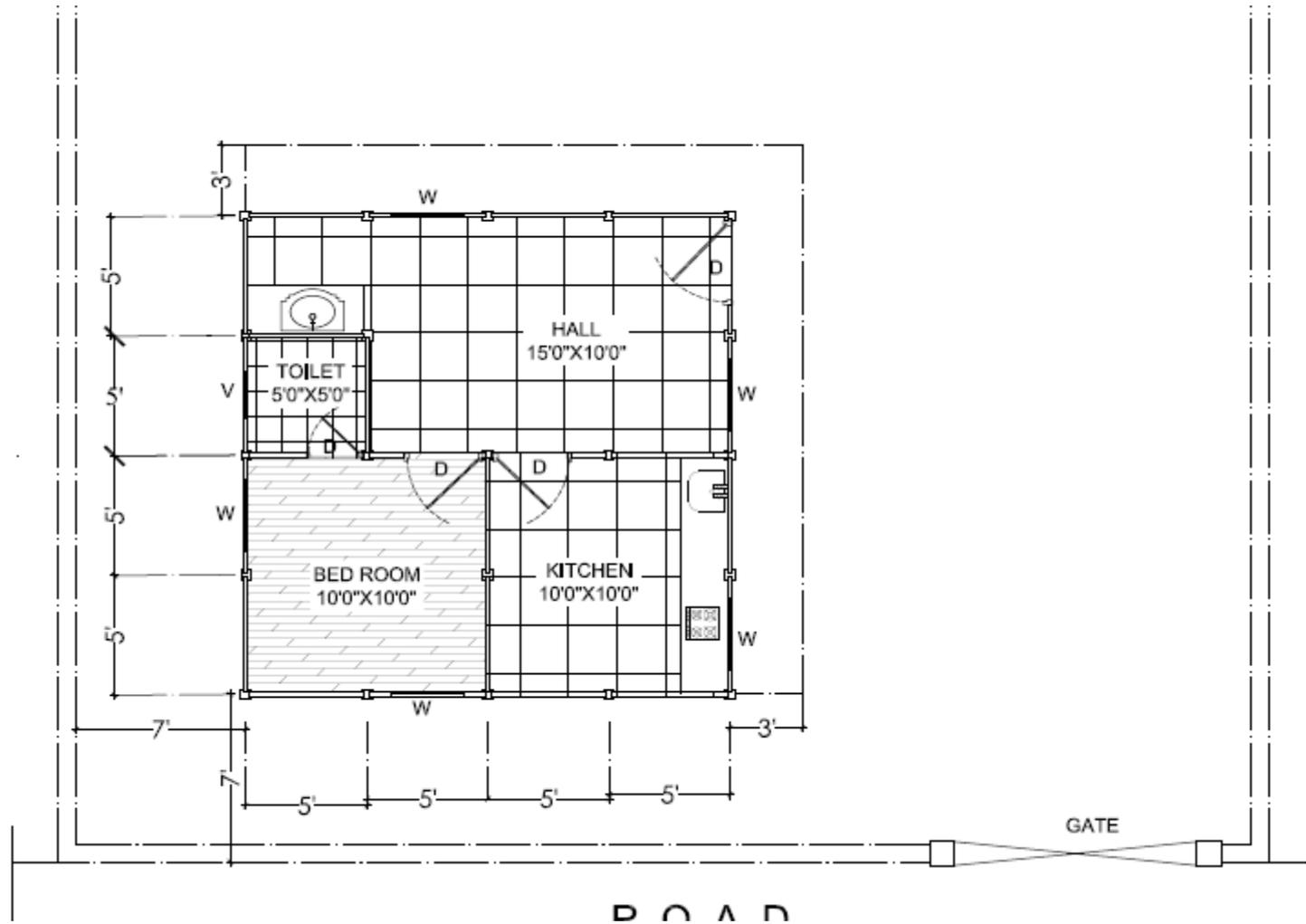
6. Support conditions considered in analysis as 'Fixed Supports'. Supports are as per STADD support reaction document. The Roof, Floor and slab offer diaphragm action. Wall offer lateral restraint to the columns.
7. The Soil is assumed as C-Phi soil with a bearing capacity of 200 kN/Sqm
8. The Roof slab consisted of corrugated sheet supporting streeed concrete with designed wale mesh reinforcement.
9. Steel Hollow sections (SHS) filled with concrete are used for columns.
10. Design was carried out following the analysis using STADD and the relevant IS codes viz. IS 456 etc. The proposed composite column SHS 125 x 125 x 0.8 filled with M20 concrete is found to be safe against all check as per ECCS requirements.
11. The system of SHS columns filled with concrete, together with the beams connected and the concrete floor slab supported by the corrugated decking profile (which acts as permanent shoring) will make the entire structure a rigid stable one. Hence the composite action of the floor slab is considered in the STADD analysis.
12. The details of the STADD and drawings are proof checked and same are found to be correct.

*The foundation and structural designs of the single and two storied prefabricated houses presented by M/s Smart-Built Prefab Pvt. Ltd, Hyderabad are adequate and safe for the loadings and load combinations considered. The proof checked drawings are herewith enclosed. The corrections if any are marked on the drawings enclosed.*

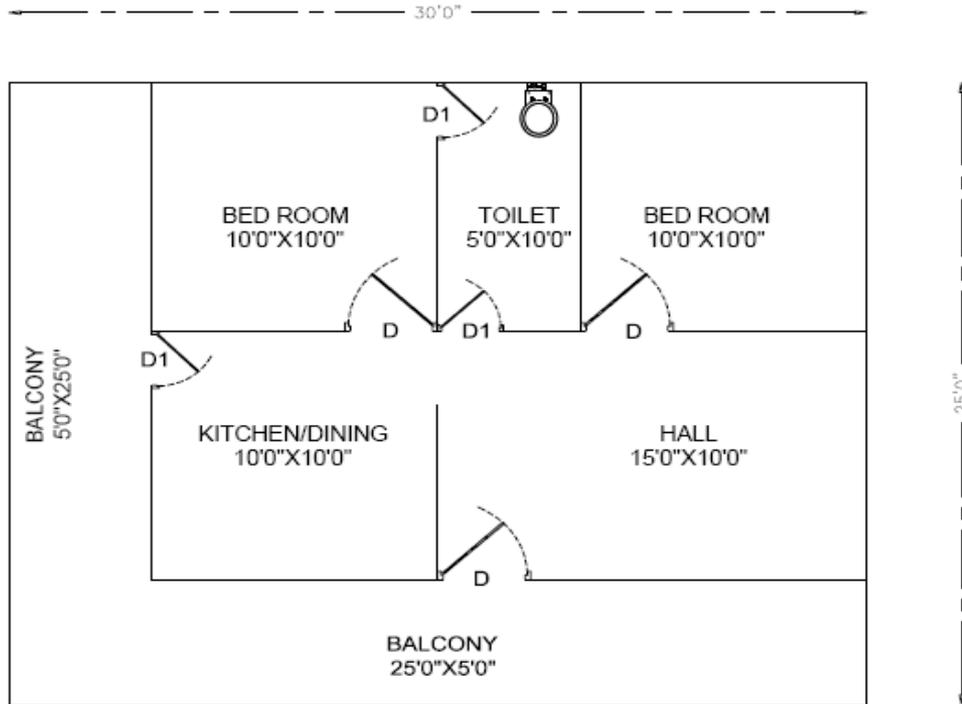
Date: 11/12/2014

  
 Dr D.Rama Seshu  
 Professor  
**PROFESSOR**  
 Structures Division  
 Department of Civil Engineering  
 National Institute of Technology  
 Warangal-506 004.

# Sample prefab house floor plan



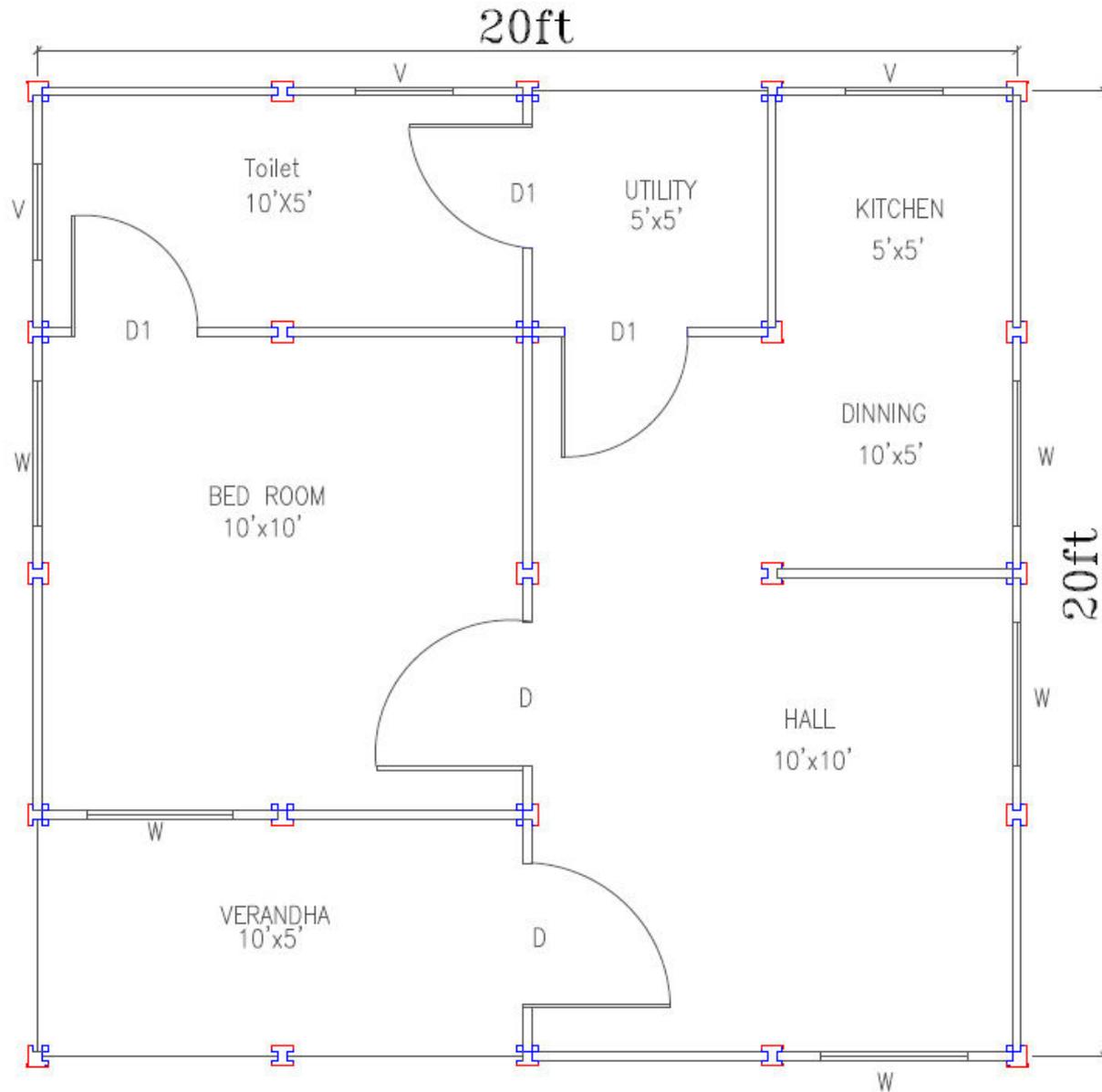
# Sample prefab house floor plan



PLAN

CLIENT.	PROJECT.	NORTH.	DESIGNERS:
	PROPOSED GUEST HOUSE AT SHNKAR PALLY		SMARTBUILT PRE FAB Pvt. Ltd. T-2 MOUNTAIN PLAZA ROAD NO 2, BANJARA HILLS HYD. Email - smartbuitprefab@gmail.com

# Sample prefab house floor plan



## **Advantages of Smart Built Prefab:**

In comparison to conventionally constructed houses, The models we propose are stronger and easier to build, still maintaining quality in terms of durability and maintenance.

### **Features**

- Built with prefabricated components.
- Less on site labor requirement
- Fitted with customized modular window and door frames designed to integrate with precast concrete panels.
- Roof frame fits over top of concrete filled GI steel posts.
- Stronger & Durable, No Maintenance, More Fire resistance
- Suits for both Hilly & Plain area's
- Cost effective and suits for farm house, Guest Houses & village homes

## **Material Specification:**

**Columns** : Hallow H Profile GI steel columns made with 0.8mm thick sheet. The size of column shall be 125mm x 125mm with slot of 50mm wide on both sides to accomodate the precast concrete wall panels. After erection of columns & wall panels, each column shall be filled with liquid concrete made with 10 to 12 mm aggregate. Since concrete will be filled insitu after erection, during erection handling of hallow steel columns is easier and faster.

**Precast Concrete Wall Panels** : Both side brick finish textured colored precast concrete panels made with M-25 garde concrete. Size of panel shall be 1440mm x 300mm x 46mm thick, reinforced with 3mm dia weld mesh of opening 50mm x 50mm. The panels will be joined by cement mortor and each panel will have tongue and groove arrangement.

**Roof** : All steel columns are get connected by hallow tubular section at roof level connected to embedded MS base plates over steel columns. 30mm thick oneside corrugated puf insulated panels shall be used as roof covering.

**Flooring** : 75mm PCC bed of 1: 4 : 8 over consolidated murum filling. Laying of tiles ( ceramic/vitrified etc) clinet scope.

## **Material Specification:**

**Doors** : Steel door frame made with 1.5mm profiled steel sheet and 30mm thick flush door shutter. For toilet FRP door shutters shall be used.

**Windows** : Steel frame made with 1.5mm profiled steel sheet and aluminium sliding shutters with 10mm dia MS safety grills.

**Plumbing & Electrical Works** : As per client requirement.

# CASTING AND FABRICATION FACILITIES

OF

## SMART BUILT PREFAB



**SMART BUILT PREFAB PVT.LTD.**

## CONTACT US

### CONTACT NUMBERS:

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# THANK YOU



**SMART BUILT**

**Prefab Pvt. Ltd.**

