

**TECHNICAL SPECIFICATIONS LIVING ACCOMMODATION : 21.97M (72 FEET)
X 5.486M (18 FEET) X 3.2M(10.5 FEET) WITH BUNK BED.**

1. DESCRIPTION OF WORK

Construction of Prefabricated shelter using PUF Panels, Steel Structure, false ceiling, door & aluminum windows at various locations in all respects as per the concept drawings attached including design, supply, installation, and electrical wiring works, as per the general specifications as detailed below. The entire structure should be fully transportable in knocked down form.

2. DESIGN PARAMETER

The prefabricated structures shall be designed for a minimum life span of 20 years in plain areas in 1:4 slope covering wind velocity of up to 50m/s, Seismic Zone V, and ambient temperature ranging from -10 to 55 degrees 'C'. The manufacturer/supplier shall get the structural drawing/layout vetted by IIT/NIT/GEC at their own cost before the supply.

3. BUILDING SIZES

Barrack 21.97M (72 FEET) X 5.486M (18 FEET) X 3.2M(10.5 FEET)

Prefabricated shelter clear height below false ceiling shall be 2.90 Mtr. The shelter at the eaves shall be 3.00 Mtr & center height shall be 3.79 Mtr.

4. SHELTER WALLING (Make – JSW/TATA BHUSHAN)

4.1 The Wall Panel Shall be made up of 0.5mm thick(TMT) PPGL ribbed sheet on both side with a layer of rigid CFC free polyurethane foam of density 40 Kg ± 2Kg/cum as insulation in between. The Polyurethane foam shall be of latest IS. The thickness of PU foam layer shall be 49mm for having 50mm thick PUF panel . Outside colour of wall panel may be Olive Green/Off White or as per buyer requirement. The panels will be provided with tongue and groove joint and will be interlocked using cam lock systems. Gable ends will also be covered with same panels as in the main walls.

4.2 The wall panels exposed edges at bottom & top side shall be covered using bottom & top U track of size 53mm X 35mm X 0.5mm made out of PPGL Sheet & shall be secured to the wall panels using pop rivets. The U track at bottom shall be fixed onto the concrete plinth using anchor fasteners of 8mm diameter & 80mm in length provided at a spacing of 450mm c/c.

4.3 The PUF Panels shall be vertically joined together by tongue & groove arrangement all along the length. The wall panels shall be fixed to the steel frame structure on top & bottom using Nuts/Bolts/Screw tightened through the steel frame cleats for wall strength & sturdiness. Wall Panels at Gable ends will also be covered.

4.4 The joints all around the wall panels shall be joined & covered by means of PPGL flashing of size 50 x 50 x 0.50mm fixed using pop rivets at a minimum distance of 200mm on all exposed faces. All the wall joints shall be sealed with transparent/white color silicon sealant.

4.5 The PPGL Sheets shall be of minimum 350MPA Steel Grade & Shall has Aluminum and Zinc coating of minimum 150 GSM as per IS 277/1992. The PPGL Sheets/ PUF Panels shall have a protective guard film of minimum 25 microns to avoid scratches to finished panel during transportation.

5. FALSE CEILING (Make – JSW/TATA BHUSHAN)

5.1 False ceiling shall be provided in the living area only (Excluding Verandah) using 40mm thick PUF panels made up of 0.5mm thick PPGL sheet with guard film having ribbing pattern for aesthetic appearance on both sides with a uniform layer of 39 mm thick rigid CFC free PUF .

5.2 The False Ceiling Panels shall be fixed & supported onto the steel framework consisting of MS Painted L / T Sections. The False Ceiling shall be fixed to the structural steel framework of shelters using cleats & Nuts/ Bolts. The size of L angle will be 40 x 40 x 5mm & the size of T will be 65 x 65 x 6mm. The Joints all around the wall panels & false ceiling shall be joined & covered by means of PPGL flashing of size 50 x 50 x 0.50mm fixed using pop rivets at a minimum distance of 200mm. All the false ceiling joints shall be sealed with transparent/white color silicon sealant. The false ceiling panels will have a tongue and groove arrangement.

6. PUF SPECIFICATIONS

6.1 All material required for the manufacturer of shelter shall be new and shall comply with relevant bureau of Indian Standard Specification.

- All panels should have tongue and groove profile on all joining edges.
- All panels will be manufactured in single batch as per approved panel layout drawings using the above materials.
- Original Purchase voucher and test certificate will be submitted and the purchase can carry out inspection of any one panel from the lot at manufacturer premises to ensure the chemical and physical properties.
- The color inside and external wall panel will be as per buyer requirement of approved shade.

6.2 PUF panels shall be manufactured by Continuous/Discontinuous Line process using high-quality chemicals using blowing agents which have properties conforming to global & environmental guidelines, approved by UNDP

- a) ZERO Ozone Depleting Potential
- b) ZERO Global Warming Potential
- c) EXEMPT from Volatility Organic Compounds (VOC) Category
- d) Kyoto & Montreal Protocol Compliant

- 6.3 The material shall be fire-resistant and shall have excellent self-extinguishing characteristics.
- 6.4 Panels manufactured shall conform to latest IS Standards.
- 6.5 All panels should have tongue and groove profile on all joining edges with a projection of 10mm and 25mm wide for airtight sealing of the joints/ (optional item)-5mm open-sealed EPDM (Ethylene Propylene Diene Monomer) tape shall be provided during the production process for enhancing air tightness.

7. ROOFING (Make – JSW/TATA BHUSHAN/AMNS)

The Roof shall be provided in a two way slope of 1:4 ratio with PPGL Trapezoidal colour coated conforming IS-14246 Sheet of 0.5mm thickness. The Roof shall have minimum projection of 300 mm from the eaves wall & will be flushed at Gable Wall. The Roof Sheets shall be fixed on to the structural steel framework using 5x95mm self-tapping self-drilling screws with suitable EPDM seal Fasteners with bitumen & GI Limpet Washers complete up to the pitch of the Sheet. The Roof Sheeting Junction at center will be covered with 0.50 mm thick PPGL Ridge cover of Size 300 x 300 mm fixed over the Roof Sheeting & on to the Structural Steel Frame Work using 95mm self-Tapping self-drilling Screws with suitable Rubber Fasteners. The Roof will have a minimum projection of 300mm all around the Eaves & Gable Walls. The PPGL sheet shall be of minimum 350 MPA Steel grade & shall have Aluminum and Zinc Coating of minimum 150 GSM as per IS 277/1992. The PPGL Sheets/PUF Panels shall have a protective guard film of minimum 25 microns to avoid scratches to finished panel during transportation. Provision for outlets of Pipes of Bukhari in wall area with suitable installation in cold region as per requirement of the buyer (on site).

8. FLASHING

It will be the responsibility of the contractor to fix & cover all joints using proper & suitable Size PPGL Flashing of 0.50mm Thickness. The PPGL Sheets shall be of minimum 350 Mpa Steel grade & shall have Aluminum and Zinc coating of minimum 150 GSM as per IS 277/1992. The PPGL Sheets / PUF Panels shall have a protective guard film of minimum 25 microns to avoid scratches to finished panel during transportation.

9. DOORS (AS PER DRAWINGS)

Door shutter shall be made from 50 MM PUF Insulated having 0.5mm PPGL sheet with 1.20 mm PCGI frame of size 2100 x 1000 mm outer dimension. The Door Frame will be made up of suitable designed pressed Steel Profile section in approved Colour in 1.20 mm thickness GI. The door Shutter will be made up of Panel covered with Aluminum/PCGI Lipping all around. Each Door shall be provided with ISI marked Aluminum fitting such as 1 no. 300mm L drop Bolt, 2 Nos D Shaped Handles of 150mm, 1 Nos Tower Bolt of Size 200mm and 1 Nos Tower Bolt of Size 100mm. The Door shutter shall be fixed to the frame using 4 Nos MS BUTT Hinges (100 mm each).

10. WINDOWS & SUNSHADES (AS PER DRAWINGS)

Aluminum 2-way sliding windows with fixed mesh from the outside & Aluminum Grills with all fittings shall be provided as per the drawings. The window frame of size 1000 x 1000 mm will be manufactured using suitable standard Aluminum hollow section/ profile. The window shall be provided with 3 mm thick clear Transparent Polycarbonate/FRP sheet fixed using EPDM (Ethylene Propylene Diene Monomer) rubber beading. The window shall also be provided with stainless steel mesh of 1.5 mm aperture & Aluminium grills fixed from outside of the window using suitable size Aluminium flats & rivets. 08 nos windows for 40x40 are to be provided as per drawing. (1.20 mm thickness PCGI)

11. SUNSHADE

Suitable Sunshades made out of 0.50mm PPGL sheets will be provided to all external windows and doors. The minimum projection for the sunshades will be 450 mm and 300 mm wider than the width of the opening. It should be suitably fastened with the main structure.

12. CURTAIN ROD ARRANGEMENT

25 mm diameter SS 304/MS powder coated fancy type drapery rod with fixing arrangements will be provided for all openings (Door and Windows). The drapery rod should be minimum 450 mm longer than the width of the opening.

13. PEG SET

40 Nos Aluminum twin peg Set / Coat Hook of 100 mm in size to be provided inside the shelter at a height of 1.8M fitted with Galvanized Screw.

14. STRUCTURAL STEEL FRAMEWORK (AS PER DRAWING)

14.1 The structural steel framework shall consist of RHS sections conforming to IS 4923/1997. The framework shall consist of Trusses, Purlins, columns, etc. The steel frame should be cleaned with wire brush with 2 coats of Zinc chromate/zinc rich primer. The steelwork shall be painted with 2 coats of synthetic Enamel paint of approved shade (smoke grey) & make. The main shelter column of NPB 250 (30.11kg/m)/ IS 808 provided at a distance as per drawing. The column bottom end plate size (as per drawing) shall be fixed to the concrete floor using 6 nos foundation bolts of 24 mm Dia & 600 mm long with suitable washers & nuts & bolts. The column shall also have a top plate of size (as per drawing) for connection with the truss plate.

14.2 The Roof trusses shall be made up using RHS section of 96 x 48 x 4 mm at the top & bottom cord of the truss and minimum 48 x 48 x 2.9mm thick internal members. The trusses shall be fixed on to the columns with connection plates 12 mm thick & tightened with the help of nuts & bolts. Trusses are to be provided at a distance of 3000mm c/c and shall be supported on truss columns.

14.3 Purlins are made up of RHS of size 96 X 48 X 4mm & shall be fixed between the trusses with suitable Cleats & Nuts & Bolts as per the drawing attached.

14.4 For Mezzanine Floor, Main beam NPB 250 (30.11kg/m)/IS 808 and Cold Formed Joist will be provided as mentioned in drawing.

14.5 The Steel Structure sections mentioned above are of minimum Sizes to be used & indicative. Higher section sizes & thickness can be adopted. The Shelters will be designed for the Design Parameters & Drawings as indicated in the Specifications mentioned above. Make for steel (APL/JSPL/SURYA/TATA/AMNS/SAIL)

15. WORKMANSHIP

(a) **Connection:** Nut-Bolt connection will be provided unless otherwise specified in the drawings. The welded connections will be conformed to IS 806-1968.

(b) **Fabrication:** The General Provisions in section 11 of IS 800 of 1984 will apply to all types of steel being used for fabrication.

(c) **Various Fasteners and Fittings:** Fasteners and fittings of 8.8 Grade(HT) shall be supplied unless otherwise specified in and shall be fixed where required. Fastening means will be provided for the items to be fitted at the time of erection. The Fasteners supplied shall conform to the relevant latest BIS Specification.

(d) **Finishes:** All Steel work will be cleaned with wire brush and given two coats of Zinc chromate/zinc rich Primer by the manufacturer in the factory. All the Steel items shall be painted using 2 coats of synthetic Enamel Paint of approved shade. All Paint Materials will be of Jenson & Nicholson/Berger/ Asian/JSW make, color -Smoke Grey or as per buyer. Over all DFT should be minimum 120 Micron

16. CIVIL WORKS

Foundation, Flooring & finishing Works - to be provided by Indenter/ Consignee as per the drawings. Vendor will provide anchor bolts of 8.8 grade.

17. ELECTRICAL WIRING AND POINTS (EXCLUDING FITTINGS)

17.1 The electrical wiring points shall be provided within the structure only. Provision for connecting to the main line shall be done by the client. All the wiring and fittings used shall conform to ISI Mark and shall be of good brands (V Guard/ Havells/ Finolex/ Poly cab)

17.2 All wiring used shall be conforming to IS 694. All conduits shall be round PVC minimum 25mm diameter medium grade conforming to IS 9537 Part 3. All sockets/switchboards shall be of modular design. MCB, Distribution boxes shall be ISI marked of reputed make. Earthing shall conform to IS 3043. 2 Nos. Lightning arresters per building shall be provided as per Standard Specification (Anchor/ Havells/ L&T).

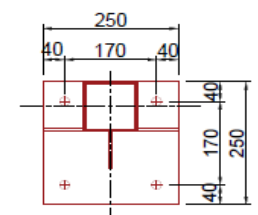
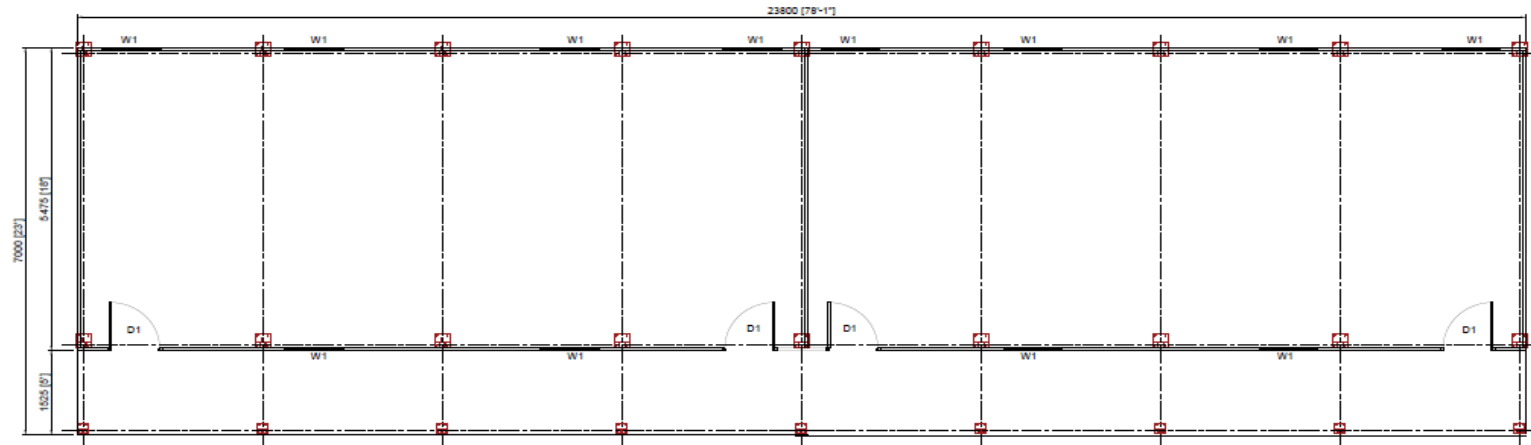
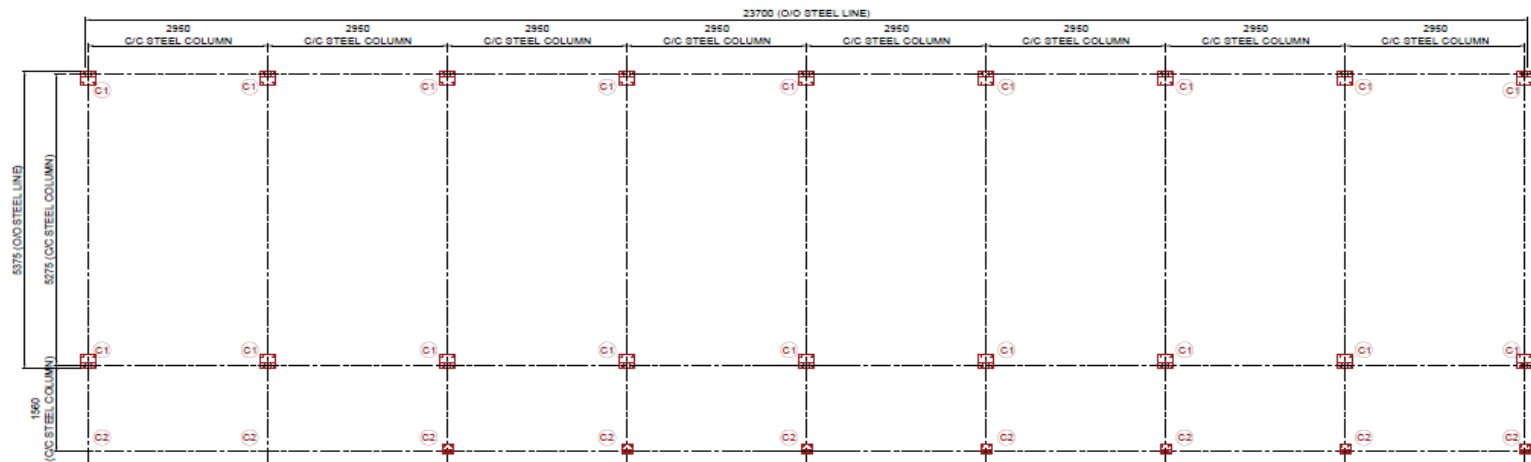
1) Light Point Copper Wiring using 1.5 Sq. mm PVC insulated Cables over the surface using PVC 25 mm Diameter minimum medium grade conduits with PVC Modular Design Switch Boxes, Modular Switches, Sockets, PVC lamp holders/Ceiling rose etc. complete.

- 2) Power Point Copper Wiring using 4.0 Sq. mm PVC insulated Cables over the surface using PVC 25 mm diameter minimum medium grade conduits with PVC Modular Design Switch Boxes, Modular Switches, Sockets, etc. complete.
- 3) Sub main wiring Three phase cable (4 core) 4 sq mm wire (distance from main line to be confirm)
- 4) Supply and fixing of approved make powder coated Steel Sheet Distribution Box including Bus Bar, Neutral Bar and Earth Bar complete in all respects as per IS 13032. The DB shall also have required MCB and isolator of ISI Marked as per approved make.

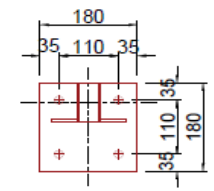
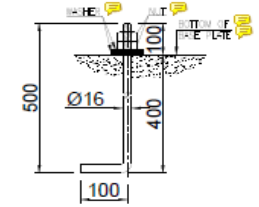
Requirement of electrical fittings

Sl. No.	Description	Quantity
1	Fan Points With Hook & Fan Regulators with switch	24
2	Light Points With 1.5 Sq Mm Wire with switch	32
3	Power Points with 4.0 Sq Mm Wire with switch	8
4	5 Amp Socket with switch	40
5	15 Amp Socket with switch	8
6	25 Mm PVC Round Conduits Complete with Bends	80
7	32 Mm PVC Flat Conduits Complete with Cover	40
8	1.5 Sq Mm Copper Wire, 90 Mtr Bundles In 3 Colors	9
9	4.0 Sq Mm Copper Wire, 90 Mtr Bundles In 3 Colors	4
10	Main Modular Board-4 Way	8
11	Main Modular Board-6 Way	4
12	Main Modular Board-8 Way	4
13	Single Pole MCB-16 Amp	12
14	Single Pole MCB-32 Amp	8
15	Single Pole + Neutral MCB-32 Amp	4
16	Three Pole + Neutral MCB-40 Amp	1
17	Suitable Size Distribution Box	2
18	Bulk LED head lamp of 25W.	10

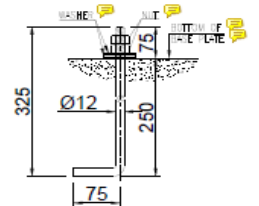
Note – to be reviewed considering the bunk bed provision.



C1-COLUMN BASE PLATE
12 mm Thick
(Hole Dia-18 mm)



C2-COLUMN BASE PLATE
10 mm Thick
(Hole Dia-14 mm)



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Approved by:

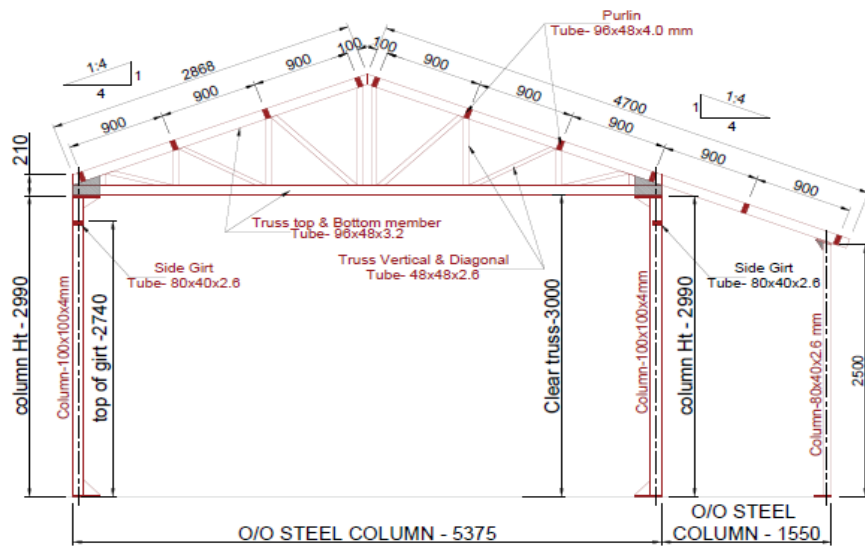
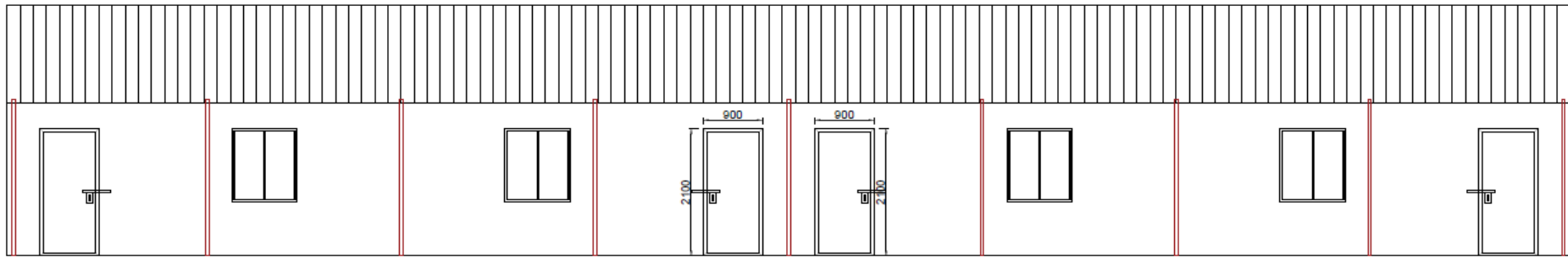
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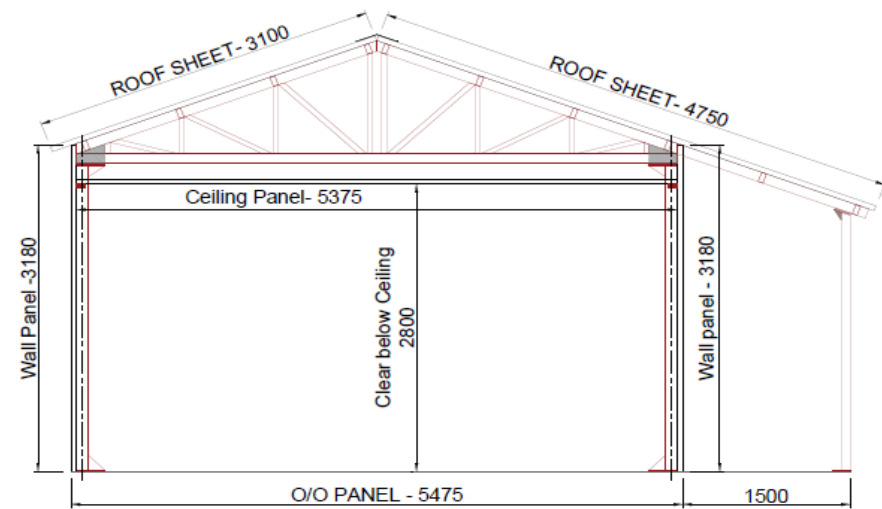
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TITLE: - STRUCTURAL & LAYOUT PLAN



Section View(structural)



Section View(PANEL)

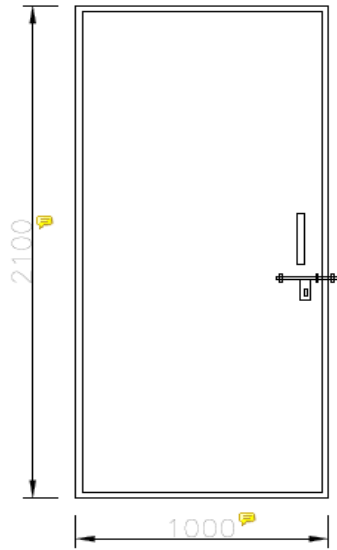
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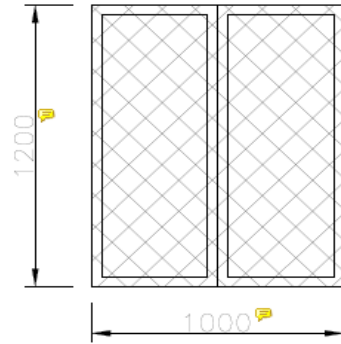
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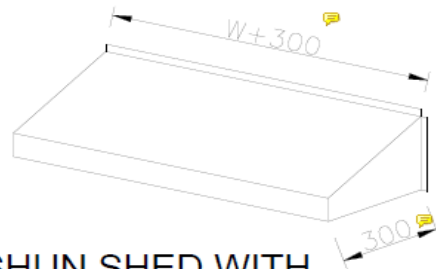
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 TITLE: - ELEVATION & SECTIONS



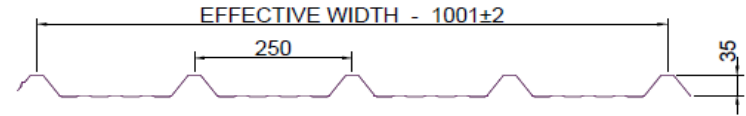
35mm PUF
PANEL DOOR
with ALU.
EXTRUDED
JAMB
PROFILE



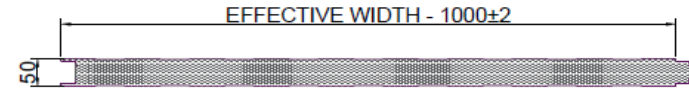
ALUMINUM
EXTRUDED SECTION
FRAME SLIDING
WINDOW with ALU.
GRILL



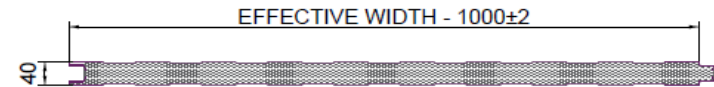
SHUN SHED WITH
SUPPORT FRAME



ROOF SHEET SECTION DETAIL



WALL PANEL SECTION DETAIL



CEILING PANEL SECTION DETAIL

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SHEET No.: - 03 of

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REV.No. - 00

PROJECT: - 23.7mx7.0m

TITLE: - DETAIL DRAWING OF ITEMS