

"EXPRESSION OF INTEREST"

CRPF is adopting the following QRs/TDs of Temporary Accommodation options:-

i) Multi Storey Modern Portable Temporary Accommodation.

a) 40x20x19 / 36x18x19 (G+1) In feet

b) 40x40x19 / 72x18x19 (G+1) In feet

ii) Collapsible Container Accommodation.

Size 20X10X9 feet

iii) Rapid Deployable Container.

Size 5.80*2.50*2.60 mtr

3. The interested firms/parties dealing in subject matter are invited to submit their views/opinions on the proposed amendment of QRs/TDs of the above item by 22/06/2024.

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TECHNICAL SPECIFICATIONS FOR SHELTER

Living accommodation G+1: 12M (40 feet) X 6M (20 feet) X 6M (19'.8" feet).

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.

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 0 to 50 degrees 'C'.

3. BUILDING SIZES

Barrack (for 40 person) 12M (40 feet) X 6M (20 feet) X 6M (19'.8" 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 7.5 Mtr for 12M X 12M building and 6.75M for Size 12MX 6M building.

4. SHELTER WALLING

The Wall Panel Shall be made up of 0.5mm thick(TMT) PPGI ribbed sheet on both side with a layer of rigid CFC free polyurethane foam of density 40 Kg \pm 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 (Make- IFPL/KJPL/Metecno) 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.

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 PPGI 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.

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.

The joints all around the wall panels shall be joined & covered by means of PPGI 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.

The PPGI Sheets shall be of minimum 240MPA Steel Grade & Shall have a Zinc coating of minimum 120 GSM as per IS 277/1992, 5-7 microns of epoxy primer on both sides of the sheet & polyester top coat of 18-20 microns on one side/ outer side. The PPGI Sheets/ PUF Panels shall have a protective guard film of minimum 20-25 microns to avoid scratches to finished panel during transportation.

5. FALSE CEILING

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.

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 40x40x5mm & the size of T will be 65x65x6mm. The Joints all around the wall panels & false ceiling shall be joined & covered by means of PPGI flashing of size 50x50x0.60mm 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

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.

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

The material shall be fire-resistant and shall have excellent self-extinguishing characteristics.

Panels manufactured shall conform to IS Standards.

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-celled EPDM tape shall be provided during the production process for enhancing airtightness.

7. ROOFING

The Roof shall be provided in a two way slope of 1:4 ratio with PPGI Trapezoidal colour coated conforming IS 14246 Sheet of 0.5mm thick. 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 PPGI Ridge cover of Size 300x300mm 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 PPGI sheet shall be of minimum 240 MPA Steel grade & shall have a Zinc Coating of minimum 120 GSM as per IS 277/1992, 5-7 Microns of epoxy primer on both side of the Sheet & Polyester top Coat of 18-20 microns one side/outer side. The PPGI Sheets/PUF Panels shall have a protective guard film of minimum 20.52 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.

8. FLASHING

It will be responsibility of the contractor to fix & cover all joints using proper & suitable Size PPGI Flashing In 0.50mm Thickness. The PPGI Sheets Shall be of Minimum 240 Mpa Steel grade & shall have a Zinc coating of minimum 120 gsm as per IS 277/1992, 5-7 Microns of Epoxy Primer on both sides of the Sheet & Polyester top coat of 18-20 microns on one side/ outer side. The PPGI Sheets / PUF Panels shall have a protective guard film of minimum 20-25 microns to avoid scratches to finished panel during transportation.

9. DOORS (AS PER DRAWINGS)

Pressed Steel profile frame with PUF Panel Doors Shutters shall be provided in prefab structure as per the sizes give in the Drawing. Frame shall be made from PUF Insulated door 50 mm with 1.20 PPGI frame of size 2100x1000mm 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 Internal Shutter will be made up of Panel covered with Aluminum 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 150m. 1 Nos Tower Bolt of Size 200mm. 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 1000mm will be manufactured using suitable standard Aluminum hollow section/ profile. The window shall be provided with 3 mm thick clear Polycarbonate sheet fixed using EPDM 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 and 4 nos. window for 20x40 is to be provided as per drawing.

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 mild steel powder colour coated fancy type drapery rod with fixing arrangements will be provided for all openings (Door and Windows). The drapery rod should be a minimum 450 mm longer than the width of the opening.

13. PEG SET

20 No's Aluminium 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)

The structural steel framework shall consist of RHS sections conforming to IS 4923/1997. The framework shall consist of Trusses, Purlins, columns, etc. All the steelwork shall be given 2 coats of Zinc chromate primer. The steelwork shall be painted with 2 coats of synthetic Enamel paint of approved shade & make. The main shelter column of NPB 250 (30.11kg/m) 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 no's foundation bolts of 24 mm Dia & 600mm 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.

The Roof trusses shall be made up using RHS section of 96x48x3.6 mm at the top & bottom cord of the truss and 48x48x2.9mm 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 3000 c/c and shall be supported on truss columns.

Purlins are made up of RHS of size 96 X 48 X 4.5 & shall be fixed between the trusses with suitable Cleats & Nuts & Bolts as per the drawing attached.

For Mezzanine Floor Main beam NPB 250 (30.11kg/m) and Cold Formed Joist Will be provided As per mentioned in drawing.

The Steel Structure sections mentioned above are 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.

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 mild Steel 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 BIS Specification.

- (d) **Finishes:** All Steel work will be given two coats of Red Oxide Zine Chromate 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 make color Smoke Grey.

16. CIVIL WORKS

Foundation, Flooring & finishing Works - to be provided by Indenter/ Consignee as per the drawings.

17. ELECTRICAL WIRING AND POINTS (EXCLUDING FITTINGS)

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 good brands (V Guard/ Havells/ Finolex/ Poly cab)

All wiring used shall be conforming to IS 694. All conduits shall be round PVC 25mm diameter medium grade conforming to IS 9537 Part 3. All sockets/switchboards shall be a modular design. MCB, Distribution boxes shall be ISI marked of reputed make. Earthing shall conform to IS 3043. 2 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 medium grade conduits with PVC Modular Design Switch Boxes, Modular Switches, Sockets, PVC lamp holders/Ceiling rose Etc. complete.
- 2) PowerPoint Copper Wiring using 4.0 Sq. mm PVC insulated Cables over the surface using PVC 25 mm diameter medium grade conduits with PVC Modular Design Switch Boxes, Modular Switches, Sockets, etc. complete.
- 3) 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.

S. No.	Description	Quantity
		20x40
1	Fan Points With Hook & Fan Regulators	8
2	Light Points With 1.5 Sq Mm Wire	12
3	Power Points with 4.0 Sq Mm Wire	4
4	5 Amp Socket	12
5	5 Amp On/Off Switch	22
6	15 Amp Socket	4
7	15 Amp On/Off Switch	4
8	25 Mm PVC Round Conduits Complete with Bends	40
9	32 Mm PVC Flat Conduits Complete with Cover	20
10	1.5 Sq Mm Copper Wire, 90 Mtr Bundles In 3 Colors	5
11	4.0 Sq Mm Copper Wire, 90 Mtr Bundles In 3 Colors	2
12	Main Modular Board-4 Way	4
13	Main Modular Board-6 Way	2
14	Main Modular Board-8 Way	2
15	Single Pole MCB-16 Amp	6
16	Single Pole MCB-32 Amp	4
17	Single Pole + Neutral MCB-32 Amp	2
18	Three Pole + Neutral MCB-32 Amp	1
19	Three Pole + Neutral MCB-40 Amp	0
20	Suitable Size Distribution Box	1

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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 0 to 50 degrees 'C'.

3. BUILDING SIZES

Barrack (for 80 personnel) 12M (40 feet) X 12M (40 feet) X 6M (19'.8" 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 7.5 Mtr for 12M X 12M building and 6.75M for Size 12M X 6M building.

4. SHELTER WALLING

The Wall Panel Shall be made up of 0.5mm thick(TMT) PPGI 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 (Make- IFPL/KJPL/Metecno) 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.

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 PPGI 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.

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.

The joints all around the wall panels shall be joined & covered by means of PPGI 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.

The PPGI Sheets shall be of minimum 240MPA Steel Grade & Shall have a Zinc coating of minimum 120 GSM as per IS 277/1992, 5-7 microns of epoxy primer on both sides of the sheet & polyester top coat of 18-20 microns on one side/ outer side. The PPGI Sheets/ PUF Panels shall have a protective guard film of minimum 20-25 microns to avoid scratches to finished panel during transportation.

5. FALSE CEILING

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.

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 PPGI flashing of size 50 x 50 x 0.60mm 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.

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The material shall be fire-resistant and shall have excellent self-extinguishing characteristics.

Panels manufactured shall conform to IS Standards.

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-celled EPDM tape shall be provided during the production process for enhancing airtightness.

7. ROOFING

The Roof shall be provided in a two way slope of 1:4 ratio with PPGI Trapezoidal colour coated conforming IS 14246 Sheet of 0.5mm thick. 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 PPGI 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 PPGI sheet shall be of minimum 240 MPA Steel grade & shall have a Zinc Coating of minimum 120 GSM as per IS 277/1992, 5-7 Microns of epoxy primer on both side of the Sheet & Polyester top Coat of 18-20 microns one side/outer side. The PPGI Sheets/PUF Panels shall have a protective guard film of minimum 20.52 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.

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It will be responsibility of the contractor to fix & cover all joints using proper & suitable Size PPGI Flashing In 0.50mm Thickness. The PPGI Sheets Shall be of Minimum 240 Mpa Steel grade & shall have a Zinc coating of minimum 120 gsm as per IS 277/1992, 5-7 Microns of Epoxy Primer on both sides of the Sheet & Polyester top coat of 18-20 microns on one side/ outer side. The PPGI Sheets / PUF Panels shall have a protective guard film of minimum 20-25 microns to avoid scratches to finished panel during transportation.

9. DOORS (AS PER DRAWINGS)

Pressed Steel profile frame with PUF Panel Doors Shutters shall be provided in prefab structure as per the sizes give in the Drawing. Frame shall be made from PUF Insulated door 50 mm with 1.20 PPGI 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 Internal Shutter will be made up of Panel covered with Aluminum 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. 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 Polycarbonate sheet fixed using EPDM 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 and 4 nos. window for 20x40 is to be provided as per drawing. 1.20 mm thickness GI

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 mild steel powder colour coated fancy type drapery rod with fixing arrangements will be provided for all openings (Door and Windows). The drapery rod should be a minimum 450 mm longer than the width of the opening.

13. PEG SET

20 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)

The structural steel framework shall consist of RHS sections conforming to IS 4923/1997. The framework shall consist of Trusses, Purlins, columns, etc. All the steelwork shall be given 2 coats of Zinc chromate primer. The steelwork shall be painted with 2 coats of synthetic Enamel paint of approved shade & make (smoke grey). The main shelter column of NPB 250 (30.11kg/m) 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.

The Roof trusses shall be made up using RHS section of 96 x 48 x 3.6 mm at the top & bottom cord of the truss and 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 3000 c/c and shall be supported on truss columns.

Purlins are made up of RHS of size 96 X 48 X 4.5 & shall be fixed between the trusses with suitable Cleats & Nuts & Bolts as per the drawing attached.

For Mezzanine Floor Main beam NPB 250 (30.11kg/m) and Cold Formed Joist Will be provided As per mentioned in drawing.

The Steel Structure sections mentioned above are 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.

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 mild Steel 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

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- (d) **Finishes:** All Steel work will be given two coats of Red Oxide Zine Chromate 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 make color Smoke Grey.

16. CIVIL WORKS

Foundation, Flooring & finishing Works - to be provided by Indenter/ Consignee as per the drawings.

17. ELECTRICAL WIRING AND POINTS (EXCLUDING FITTINGS)

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 good brands (V Guard/ Havells/ Finolex/ Poly cab)

All wiring used shall be conforming to IS 694. All conduits shall be round PVC 25mm diameter medium grade conforming to IS 9537 Part 3. All sockets/switchboards shall be a modular design. MCB, Distribution boxes shall be ISI marked of reputed make. Earthing shall conform to IS 3043. 2 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 medium grade conduits with PVC Modular Design Switch Boxes, Modular Switches, Sockets, PVC lamp holders/Ceiling rose Etc. complete.
- 2) PowerPoint Copper Wiring using 4.0 Sq. mm PVC insulated Cables over the surface using PVC 25 mm diameter medium grade conduits with PVC Modular Design Switch Boxes, Modular Switches, Sockets, etc. complete.
- 3) 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 151 Marked as per approved make.

Sl. No.	Description	Quantity
		40x40
1	Fan Points With Hook & Fan Regulators	16
2	Light Points With 1.5 Sq Mm Wire	24
3	Power Points with 4.0 Sq Mm Wire	8
4	5 Amp Socket	24
5	5 Amp On/Off Switch	40
6	15 Amp Socket	8
7	15 Amp On/Off Switch	8
8	25 Mm PVC Round Conduits Complete with Bends	80
9	32 Mm PVC Flat Conduits Complete with Cover	40
10	1.5 Sq Mm Copper Wire, 90 Mtr Bundles In 3 Colors	9
11	4.0 Sq Mm Copper Wire, 90 Mtr Bundles In 3 Colors	4
12	Main Modular Board-4 Way	8
13	Main Modular Board-6 Way	4
14	Main Modular Board-8 Way	4
15	Single Pole MCB-16 Amp	12
16	Single Pole MCB-32 Amp	8
17	Single Pole + Neutral MCB-32 Amp	4
18	Three Pole + Neutral MCB-32 Amp	0
19	Three Pole + Neutral MCB-40 Amp	1
20	Suitable Size Distribution Box	2

Drafts QRs/Tds of collapsible liftable container

20 x 10 x 9 Feet

1. The work shall consist of design, supply, transportation and commissioning of the collapsible liftable containers of dimensions (20 x 10 x 9 feet) with all electrical items and fittings.

2. Design Consideration: -
 - Roof Slope : - As per the geography of the site locations
 - Snow/Design Load : - As per the geography of the site locations or as per IS:875
 - Wind Speed : - Maximum 55 m/s as per IS:875
 - Seismic Zone : - Zone V
 - Temperature withstand : - (+) 55 degree C to (-) 10 degree C
 - Fire Rating : - Fire Retardant self extinguishing
 - The product shall be fully transportable in knocked down form

Sl. No.	Components	Components Technical Description	Unit	Qty
01	Steel Structure & connections	Structure shall be fabricated of Rectangular Hollow Sections or built up section or specially designed for Columns and Trusses, Cold Form Folded Sections for purlins and runners. The steel structure shall be designed as per IS- 800:2007 and as per wind load conditions applicable for the area mentioned in IS-875:1987 . The RHS/SHS shall be used as per IS-4923 and the Cold formed sections shall be used as per IS-801:1975. All steel member surfaces will be prepared through wire brush with two coat primer and two coat enamel paint. The Structural framework shall be designed to withstand wind condition of 55m/s - in Seismic zone V and ambient temperature range (-) 10 degree C to (+) 55 degree C	Kgs	
02	Wall & Ceiling Cladding	The wall panels shall be made up of 50mm thick composite PUF sandwich between 0.5mm Pre-Painted Galvalume (PPGL) Sheet . The panels shall be made of micro ribbing Pre-Painted Galvalume Sheet on both sides with 50mm thick layer of CFC/HCFC Free PU foam of density of 40±2 kg/m ³ as insulation. The insulated panels will have tongue groove arrangements for panel to panel joining. The Pre-Painted Galvalume Sheet shall have minimum 120 gsm of Alu and Zinc coating and minimum coating of 4-5micron epoxy primer and 20 micron polyester top coat on the finish surface and 7-8micron primer alkyl base on reverse. The effective cover width of the panel shall be of minimum 1000 mm and length of the panels shall be to suit as per site or as per transportable length. Metal sheet make- TATA/JSW/Equivalent (As per directions of EIC.)	Sqm	
03	Roofing	The secondary roofing sheets shall be constructed of 0.5 mm Pre-Painted Galvalume Steel (PPGL) Sheet in trapezoidal shape. The color of the top side sheet will preferably be color as per buyer of minimum 20 microns Regular Modified Polyester (RMP) coating over 4-7 microns Primer on the top side and 5 microns of backer coat over the primer on the bottom side of the sheet. Metal sheet make- TATA/JSW/Equivalent (As per directions of EIC.)	Sqm	
04	Flooring	The flooring shall be done using 18 mm HD cement fibre board over the bottom MS framework. And further 2mm Anti-static PVC vinyl sheet shall be provided over the cement board. Everest \vishakha\equivalent (As per directions of EIC.)	Sqm	
05	Insulated Door	Double/Single leaf door PUF insulated door will be provided with specially designed 1.2mm of PCGI frame with swing/overlap leaf of 50mm thickness . The insulated door shall be provided with all necessary fittings like Canopy, Al-drop, hinges, door	1 No's	

		handle etc. whichever is applicable as per layout. Door assesories will be SS 304 (As per directions of EIC.)		
06	Windows	The Sliding Window 2 nos shall be provided with of aluminium framed glass sliding window size (1175x900) mm will be provided with fittings aluminium grill . The Canopy (Sunshade) will be provided outer side of wall.thickness of glass shall be 5mm toughend (As per directions of EIC.)	2 No's	
07	Hardware	The lift-able container shall be provided with Base U channel, Inner and outer L flashing, Ridge flashing, cover flashings etc. and silicon sealant, pop rivets, screw, nut and bolts etc. for proper connections.flashing in 0.8 mm thickness (As per directions of EIC.)	LOT	
08	Legs	The legs (6mm thickness) shall be properly designed in order to the relevant geographical sites and as per the relevant IS codes. Same as structural materials (As per directions of EIC.)		
09	Electrical Items	Electrical item	Qty.	Make & Modal
		Tube Light 22 W (Single)	04	Bajaj/BCLSB
		16 Amp. Switch Socket	01	Anchor Roma/ Equivalent
		5 Amp. Switch Socket	04	Anchor Roma/ Equivalent
		20 Amp(only Ac Point)	01	Havells/Equivalent
		Wall Mounted Fan	04	Havells/Equivalent
		MCB	01	Bajaj/Equivalent
<u>Wiring & cables used shall be of Finolex /Polycab /Kalinga /Equivalent as per direction of EIC.</u>				

Draft QRs/TDs Collapsible Rapid Deployable Shelter

1. **Scope of work.** The work consists of Design, manufacture and supply/transportation of prefabricated and living shelter(CRDS) of size after folding(5.80 x 2.50 x 0.63)M (Height) and size of after installation(5.80 x 2.50 x 2.60)M (Height):-

- (a) Shelter Size **(5.80 x 2.50 x 2.60) mt.**
- (b) Two Men Winch op for unloading and erection
- (c) Solar Controller system alongwith charge controller & lithium battery
- (i) **1xSolarpanels.** Size (1200x650 mm) with module for mounting the structure on roof with rating 100 W & 12 V.
- (ii) **Wire.** To connect solar panel to charge controller Length – 8Mtr Size 1.5 Sqmm, 2 Core (Copper Wire) **Make : Havells/Polycab/Finolex**
- (iii) **Charge Controller.** Rating 12 V, 10 Amp .
- (iv) **Battery** – Li Battery **10aH** 12 V
- (v) **Inverter:-** AC & DC compatible (automatic), Li Powder based pure sine wave Input voltage – 100 v to 300v Output Voltage – 180 v to 200 v

S.NO.	Item	Specification
1	SPV MODULE	
i)	Type of SPV Module	Poly Crystalline
ii)	Make	MNRE (Govt. of India) Approved
iii)	Open Circuit Voltage	22V
iv)	Short Circuit Current	6.06A
v)	Maximum Power Voltage	18V
vi)	Maximum Power Current	5.56A
vii)	Operating Voltage	12V
viii)	Maximum Power	100W
ix)	Module Efficiency	15%
x)	Maximum System Voltage	1000V
2	SOLAR CHARGE CONTROLLER	
i)	Rating	12V 10A
ii)	Type of Solar Charge Controller	PWM
iii)	Load Current	<10A
iv)	Low Battery Cut off	11.0V±0.2V
v)	Charging Cut off	14.4V±0.2V

vi)	Trickle Charging	13.2V±0.2V
vii)	Load Reconnect	12.5V±0.2V
vii)	Indications	
	Low Battery	RED LED
	Boost Charging	GREEN LED- Blink Fast
	Trickle Charging	GREEN LED - Blink Slow
3	INVERTER	
i)	Input Voltage (Standard range)	100 V ~ 300 V
ii)	Input Voltage (Narrow range)	180V ~ 260 V
iii)	Output Voltage (Mains Mode)	Same as Input
iv)	Output Voltage (UPS Mode)	200V~ 230V ± 10%
v)	Output Waveform (Mains Mode)	Same as Input
vi)	Output Waveform (UPS Mode)	Pure Sinewave
vii)	Switchover from Mains to UPS and UPS to Mains	Automatic
viii)	UPS Transfer Time	≤ 15 msec.
ix)	Design	Micro Controller Based Design with IPS Technology
x)	Battery Charging Current	Constant Charging approx. 10% of the rated Battery Current in AH
xi)	UPS Overload / UPS Short-circuit	110% / 300%

(d) **Gantry Structure. One set for 10 Shelters.** Sample set of Gantry structure will be produced to inspection team and approved during pre construction stage. Each set of Gantry structure will have items as per details given below ISI marked and conforming to IS code :2062.

- (i) Truss ISMB 200x100x5 mm of length 6 mtr – 01 Nos.
- (ii) Winch system 3 Ton capacity including 04 roller with sliding plate and lifting winch Worm type (both side) – 01 Set.
- (iii) Chain pulley block 3 Ton capacity – 01 Nos.
- (iv) Scaffolding 6mtr - 02 Set.
- (v) Vertical standard post size 48x3x3000mm (8 Nos per column) within built cup lock system in which 4 Nos post will be fixed with base plate of size 200x200x5mm – 02 Column for one set.
- (vi) Horizontal ledger pole of size 48x3x1500mm with inbuilt cup locks system (20 Nos Per column) – 02 Column for one set.
- (vii) Centre Jack with complete assembly (As per sample) 01 Nos

- (viii) D Spanner 04 Nos
- (ix) Hammer 1 kg 01 Nos
- (e) Moving Excel – 200X50X5 MM as per IS1079 : 2009(EXACT POSITION IN DESIGN)
Moving Excel – 36 Nos.
Right side 15 nos
Left side 15 nos
Front side 3 nos
Back side 3 nos

2. Design criteria.

- (a) Seismic Co-efficient – As per Seismic Zone V.
- (b) Snow load - 100 kg\sqm standing on roof.
- (c) Wind load - Equivalent to wind speed of 55 M/Sec as per IS875.
- (d) Roof slope -1:4 (Collapsible type)
- (e) External temperature – (-) 35 degree Celsius to +55 degree Celsius .
- (f) Water absorption/Penetration –Nil
- (g) Complete termite proofing
- (h) Fire resistant – Insulation material used should be grade A Fire retardant & should not emit toxic fumes.(standards)
- (j) Ease of construction – Shelter should be foldable easy to erect by two men only, easy to transport and modular in design. Structure to be foldable as one entity with all beams, Columns, all wall, doors & windows included inside. No structural member of the shelter to be separate & entire shelter to be transported as one entity.
- (k) Design load – As per IS875.

3. **Design Data**

- (a) Length - 5.80M
- (b) Width - 2.50M
- (c) Height- 2.60M
- (d) The floor area will be 5.70M x2.40M
- (e) Structure to be foldable as one entity with all beams, columns, roof, all wall, door& windows included inside. No structural member of the shelter to be separate & entire shelter to be transported as one entity.

4. **Material:-** All material used for the manufacturing of shelters will be new and will comply with relevant IS as applicable as given in succeeding para. Steel used shall be conforming to IS: 2062 for general structural purposes. The material (Mineral/Rock Wool) should provide insulation against extreme cold weather condition. Mineral/rock wool to be of Grade A as per IS code : 8183:1993 & fire retardant & should not emit toxic fumes.

5. **Structural Members.** Structural Members shall be as per the schedule of structure:-

(a) **Collapsible Corner Columns (vertical).** Two Nos in each wall (total 4 in shelter) which are split into two parts of size 122mmx 61mmx2mm thick rectangular hollow section 1155mm long as per **IS code : 2062** & filling with rock wool for insulation. Fixing of 4 Nos clamp on top of shelter with holes for attachment with the **DESHACKEL** for lifting of shelter. Bottom of shelter provided with four Nos legs in each wall (total 8 in shelter) with holes on four corner legs for anchoring at time of transport of shelter. **Stilts (DESIGN)** of 12" to be provided. Base plate of 9" x 9" to be fixed below all stilt legs.

(b) **Middle Collapsible Columns (Front & Rear wall).** One Nos in each wall (total 2 in shelter) which split into 2 part of size 60mmx 60mmx2mm thick square hollow section 973mm long as per IS code : 2062 & filled with rock wool for insulation.

(c) **Beams Front and Rear wall.** Two Nos of beams in each wall (total 4 in shelter) of size 122mmX61mmx2mm rectangular hollow section 5556mm long as per IS code : 2062 & filled with rock wool for insulation and suitably welded with roof frame and floor frame. Two Nos in each wall (total 4 in shelter) **intermediate beams** of size 122mmX61mmx2mm thick rectangular hollow section lengthwise side 5556mm long with filled with rock wool for insulation and fitted with 5 Nos 200mm long **MOVING EXCEL** in each wall total 15 OFshelter on front and back wall welded both side.

(d) **Tie beam.** Two Nos of tie beam in four part 40mm x 40mm x 1.6mm, 2748mm long as per IS code : 2062 &SHS with proper locking arrangement to be locked with welded two side one end with corner columns and other end with middle columns on front and back wall of shelter.

(e) **Gable wall columns and beams.** Two columns in each wall (total 4 in shelter) of SHS 60mm x 60mm x 2mm, 2385mm long SHS as per IS code : 2062 and two Nos (total 4 in shelter) horizontal beams of size 60mmx60mmx2mm on top and bottom of gable wall SHS as frame with proper locking arrangement to be locked with welded both sides columns of gable walls of shelter. One additional same size vertical column on door side Gable for door frame and one section above door 977mm long same size. **Fitted with 200mm MOVING EXCEL 3 Nos on both gable walls welded both side.**

6. **Lower Roof.** The roof shall be straight. Roof shall be provided with 0.50mm pre coated steel PPGL Sheet COLOR AS PER BUYER SPECIFICATION. Roof Panel to be filled with mineral/rock wool 50mm thick. 80Kg/Cum +/- 5% to provide insulation against extreme cold weather condition in roof panels.

(a) **Lower Outer Frame.** Main frame 122mm x 61mm x 2 mm thick hollow rectangular section, OF LENGTH 5800 MM 2 NOS welded suitably with columns ON THE SIDES. Two SHS of size 60x60x2mm thick as per IS code:2062 FRONT AND BACK & inner side welded with main frame to rest the floor panel at 22mm depth from top of main frame RHS and four Nos of SHS of 1.6mm thick of size 40mmx40mm, 2184mm long parallel to gable wall at the centre to centre 1087mm to rest the of floor panels. Top side on main frame to be fixed with SHS of 2mm thick of size 60mmx60mm for hold of wall panels.

(b) **Lower Cross tie Beam.** Two Nos tie beam of size 40mm x 40mm x 1.6 mm thick, square hollow section 5434 mm long as per IS code :2062 & perpendicular to gable wall has to welded with lower outer frame with the help of moving excels, with SHS of 2mm thick of size 60mm x 60mm for hold of wall panels. 4 NOS CRPSS TIE BEAM OF 40X40X1.6 MM OF SHS TO BE WELDED WITH MAIN FRAME

7. **Upper Collapsible Roof.** Two-part corrugated collapsible Roof should be attached with shelter with the help of excel and locked with the shelter during transportation. LOWER SIDE OF HE ROF SHOULD BE FITTED WITH PPGL SHEET 0.5MM AS PER BUYER SEPCS TO BE FITTED ON THE INSIDE

8. **Wall Panels (Internal/External).** All wall panels shall be made of Anti corrosive powder coated PPGL SHEETS 0.6 mm thick PGL sheet on both sides. The thickness of Insulation shall be 51.2mm, 80 +/- 5% Kg/Cum. The insulation material (mineral/rock wool) in the panel shall have fire retarding and self-extinguishing properties as per international standard (Grade A) as per IS code : 8183:1993. There should not be any gap between wall panels and wall and roof by provision of suitable joining arrangement. Other details of wall panels are as follows:-

(a) All material required for the manufacture of shelter shall comply with relevant Bureau of Indian Standard Specification.

9. The bulk density of insulation should be 80 Kg/Cum \pm 5% Kg/ Cum made from mineral/rock wool. The total thickness of the finished composite panel should be 51.2mm. The tolerance in the panel can only be on the plus side conforming IS code :8183:1993.

(a) The manufacture shall have facilities for conducting bend test, impact resistance, cross hatch adhesion test, paint coat thickness test to IS-14246 and for galvalume test to IS-277 of pre-painted galvanized steel sheets.

(b) The outer PPGL(COLOR AS PER BUYER SPECIFICATION) skin made from hot dipped galvalume steel of the panels should be 0.6 mm thick TCT (Total coated thickness).

- (c) The insulated core of these composite panels should have the following properties:-
- (i) Density – 80 Kg/Cum \pm 5% Kg/ Cum.
 - (ii) **External colour of panel as per buyer specification**
 - (iii) Compressive Strength At 10% deformation – minimum 2.1Kg/cm².
 - (iv) Tensile Strength -minimum 3.7Kg/cm².
 - (v) Bending Strength - 4.0Kg/cm².
 - (vi) Adhesion Strength (Foam to Steel) - 2.9Kg/cm².
 - (vii) Close Cell Content - 90-95%.
- (d) **All panels** will be manufactured in single piece as per approved panel layout drawing using the above materials and manufacturing process
- (e) The purchaser can get quality testing of any panel from the lot supplied to ensure quality control as per given specifications. Cost of quality testing will be borne by the supplier.

10. **Fire Proof Door.** One door of size 977mm x 2000mm with 40mm thick thermal insulated pre painted polymer Coating color as per buyer specs) on Galvalume (PPGL) sheet with 3 Pcs of hinges and hatch bolt with suitable door frame and locking arrangement.conforming to IS 4020:

11. **Window.** 02 Nos Windows of size 800mm x 1200mm with pre- coated Polymer coating, color as per buyer aluminum sliding shutters with toughened glass 5 mm thick. All Aluminum framework material should confirm to **IS 5047 (Part I & II)**, All sections of aluminum frame/track shall be 2 mm thick and shall be of ISI mark

13 **Exhaust Fan.** Exhaust fan size min 225mm X 225mm made of sturdy Engineering plastic complete with louvers with hinged flaps shutter, voltage 230V,50 Hz, RPM 1200,Coppe winding of sweep 300m.

14 **Bunk Beds.** **As per IS 17636;2021 and buyer approved specs .**

15 Mattress. Tech specification are as under :-

- (a) Size of cushioned platform with plywood(confirming to IS..) of thickness 12 mm and size as per bunk bed.
- (b) Cushion provided to be thickness 100 mm with density 25 Kg+- 2kg per Cum of foam relevant IS Code.

16 **Flooring.** Flooring will consisting of following:-

- a. **Lower Outer Frame.** Main frame 122mm x 61mm x 2 mm thick hallow rectangular section, welded suitable with columns. One frame of size 60x60x2mm thick SHS as per IS code :2062 & inner side welded with main frame to rest the floor panel at 22mm depth from top of main frame RHS and four Nos of RHS of 1.6mm thick of size 80mmx40mm, 2184mm long parallel to gable wall at the centre to centre 1087mm to rest the of floor panels. Top side on main frame to be fixed with SHS of 2mm thick of size 60mmx60mm for hold of wall panels.
- b. **Lower Cross tie Beam.** Two Nos tie beam of size 40mm x 40mm x 1.6 mm thick, square hallow section 5434 mm long as per IS code :2062 & perpendicular to gable wall has to welded with lower outer frame at bottom of inner floor frame for support to floor and in the centre proper locking arrangement with suitable welded.
- c. **Floor Panel.** 16mm thick 1200mm x 2400mm cement fibre board ISI confirmimg to IS standard marked quality board lower side coated with rubberized paint of 60 micron thick. 2mm epoxy coated will be over the top surface of floor.

17 **Fasteners (ss 304 confirming)** Each shelter shall be supplied with 10% extra fasteners, nuts, bolts, screws, washers etc than actually required.

18 **Joints.** All the joints will be air tight and self insulation sealing tape of **50mm wide and 100Mtr long will be provided with living shelters (Relocatable).**

19 Details missing, if any, will be assumed as per good engineering practice and will be provided by the supplier after being approved by inspection team of consignee and the rates will be inclusive of this fact. Whenever there is variation between technical specifications and drawings, technical specifications are to be followed.

20 **Quality of steel.** Steel will be of YST- 240 grade. RHS members will conform to IS 4923 :1997 and for other steel members conform to IS 2062. Test certificate of steel from manufacturer will be submitted.

21 **Colour Panels.** Colour of panels will be **as per buyer spec**

22 **Quality Control.** Accepting officer is free to get all parts/any part checked for quality conformation as given in the technical specifications from testing agencies. Cost of testing will be borne by the supplier

23 Stencil marking must be done with Paint on all major components and following must be written:-

- a. Firm's name.
- b. Supply order No and year.
- c. Name of the component.
- d. Job No
- e. Month and year of manufacture

24 **Workmanship and Finishing.** Workmanship and Finishing will be of high standard. Joints will be air tight and leak proof. All the parts will be of good finish with good aesthetic value. All metallic and hardware items will be properly painted with paint and primer.

25 **Electric items.** Internal electrification of the shelter shall be carried out all as per the approved make for the respective items in **Appx 'A'** and shall be ISI mark

Note :-

- a. Details and pictures of the shelter proto type to be uploaded by all participating vendors in bid documents.
- b. Details missing, if any, will be assumed to be provided by the supplier as per good engineering practice, and will be approved by inspection team of consignee.
- c. All material required shall comply with relevant Bureau of Indian Standard Specification.

STORE LIST OF ELECTRIC ITEMS OF Collapsible Rapid Deployable Shelter

Ser No	Nomenclature	A/U	Qty	Remarks
01	LED Light 5 Watt suitable for concealed lamp holder Philips/Bajaj/Goldwyn/Havells/Syska/Surya	No	03	
02	PVC Copper cable 1 Sqmm 5 Core with multi stranded conductor for earth wire in green colour. Make : Havells/Polycab/Finolex	RM	10	
03	Concealed metal box suitable for module switches and socket with module surface plate of 6 module Make : Havells/Bajaj/Anchor	Nos	03	
04	Switch modular type 5 Amp one way Havells/ABB/Anchor/Legrand/Schneider	Nos	07	
05	Switch modular type 15 Amp one way Havells/ABB/Anchor/Legrand/Schneider	Nos	01	
06	Socket 3 pin 5 Amps modular type Havells/ABB/Anchor/Legrand/Schneider	Nos	04	
07	Socket 3 pin 15 Amps modular type Havells/ABB/Anchor/Legrand/Schneider	No	01	
08	Cable PVC insulated Aluminum conductor served with inner sheathing of PVC tape armoured with galvanized steel wire or tape and overall PVC sheathed cross sectional are 10 Sqmm 2 Core as per IS 694 Havells/Polycab/Finolex	RM	20	
09	Exhaust fan made of sturdy Engineering plastic complete with louvers with hinged flang shutter, Voltage 230V,50 Hz,RPM 1200,Copper winding of sweep 300m.	Nos	01	
10	Electric Cage Fan	Nos	02	