Mobile Clinic for Treatment of Infectious Diseases

6m x 10m Modular Shelter System

Reference Handbook for Setup, Operation and Maintenance

Table of Contents

Safety Information

The following general safety precautions are not related to any specific procedure and do not appear elsewhere in this manual. These are recommended precautions that personnel should understand and apply during various phases of set up, operation and maintenance.

KEEP AWAY FROM LIVE CIRCUITS
Operation and maintenance personnel must, at all times, observe all safety regulations. Do not replace components or make adjustments inside electrical equipment with the voltage applied. Under certain conditions, dangerous potentials may exist when the power control is in the OFF position. To prevent casualties, always remove power, discharge and ground a circuit before touching it. Adhere to all lock out tag out requirements.

RESUSCITATION
Personnel working with or near high voltage and / or hazardous chemicals should be familiar with modern methods of resuscitation.

DO NOT SERVICE OR ADJUST ALONE
Under no circumstances should any person service or adjust equipment except in the presence of someone who is capable or rendering aid.

CLEANERS, CHEMICALS, PAINTS, VINYL ADHESIVES AND PRIMERS
Cleaners, chemicals, paints, vinyl adhesives, and primers are toxic and can cause irritation to eyes, skin, lungs, nose , throat, or death. Avoid eye and skin contact or breathing of vapors.

USE SAFETY APPROVED EQUIPMENT
Cleaners, chemicals, and primers are flammable. Exercise care when applying cleaners, chemicals and primers to protect against fire. Use only approved blowers, explosion proof lights, and other equipment to prevent possible ignition of flammable materials. Ensure that fire extinguishers are readily available and in good working order.

DO NOT WEAR JEWELRY
Remove rings, watches, and other jewelry or metallic objects which may snag on equipment and cause serious injury.

PERSONAL PROTECTIVE EQUIPMENT
Protective equipment consisting of industrial goggles, rubber gloves, and a respirator is required when toxic materials are present. However, unique local conditions may make wearing personal protective equipment unnecessary or impractical. Consult local codes for an evaluation or personal protective equipment requirements. Leather gloves should be used when assembling the aluminum base and frame sections to prevent injury to personnel.

LIFT WARNING
Two people are required to remove or replace assemblies weighing 35 kilograms or more. Injury or damage to equipment may result if personnel fail to observe WARNING.

Section 1

General Information

1.1 Introduction

This section provides general information, characteristics, descriptions and capabilities of the **Mobile Clinic for Treatment of Infectious Diseases**, with emphasis on the shelter, extension and vestibule components.

1.2 Purpose and Function

This Mobile Clinic is designed for use as a medical facility for the treatment of infectious diseases and can be utilized for a number of functions including operating rooms, wards, pre-op, triage, supply, isolation and pharmaceutical distribution centers.

1.3 Performance Characteristics

This Mobile Clinic is designed for an extended set up life of 10 years with a shelf life of 20 years. The shelters are engineered for use in all types of weather such as snow, rain, hail, wind and on most types of even terrain. It is designed to be set up by a minimum of four trained installers.

1.4 System Description

This Mobile clinic includes two 6m wide x 10m deep x 3m high freespan medical shelter (Figure 1.1), two 1.2m x 1.5m x 2m Vestibule, complete electrical system, and respective Containers for shipping / storage. Containers are easily moved by forklift. Each structure is made with a lightweight structural aluminum frame system with a multi-layered insulating liner and covered with heavy duty vinyl fabric.

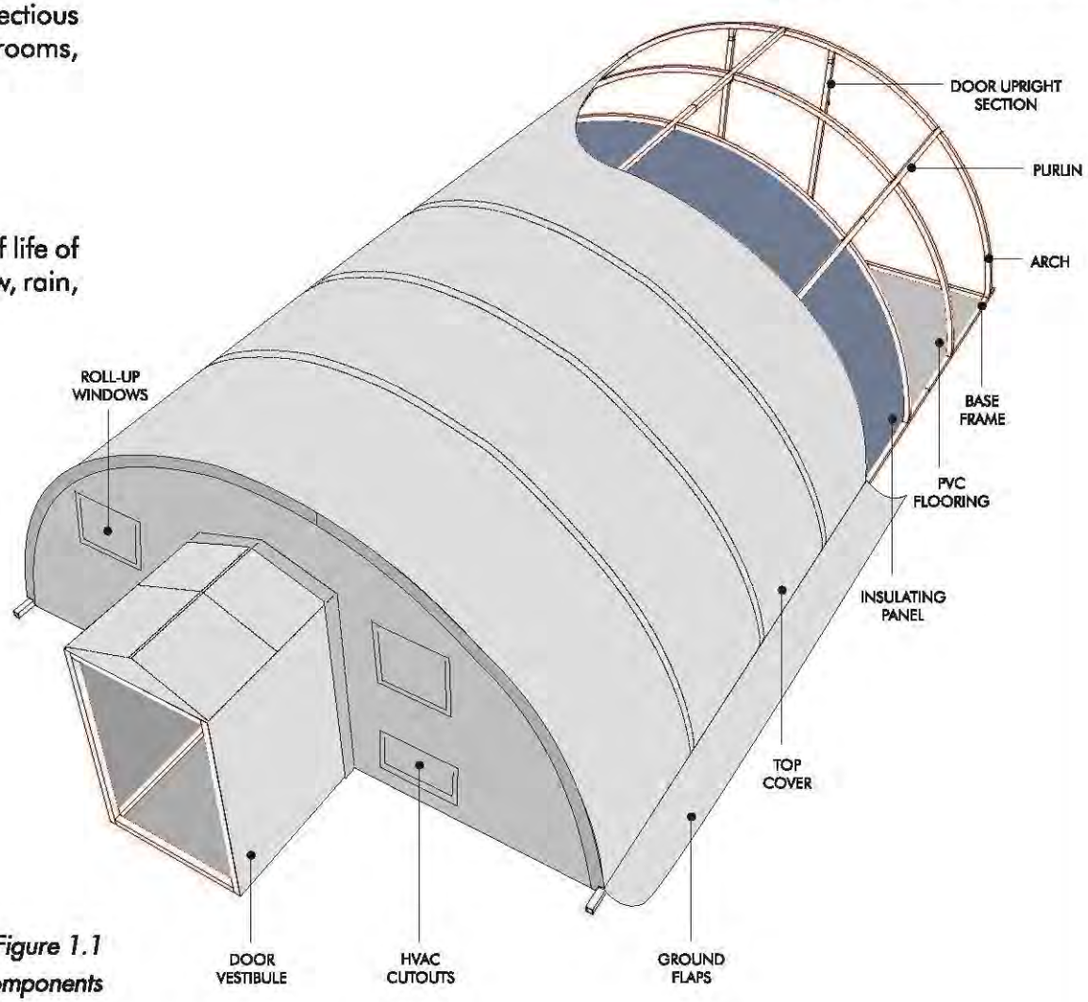


Figure 1.1
Basic Components

1.5 Power and Utility Information

The power distribution for the shelter consists of an outdoor main power system, outdoor HVAC & HEPA systems and an interior lighting / electrical system. Refer to Figure 1.2 below for illustration details. The following information assumes the components used for a set of two shelters.

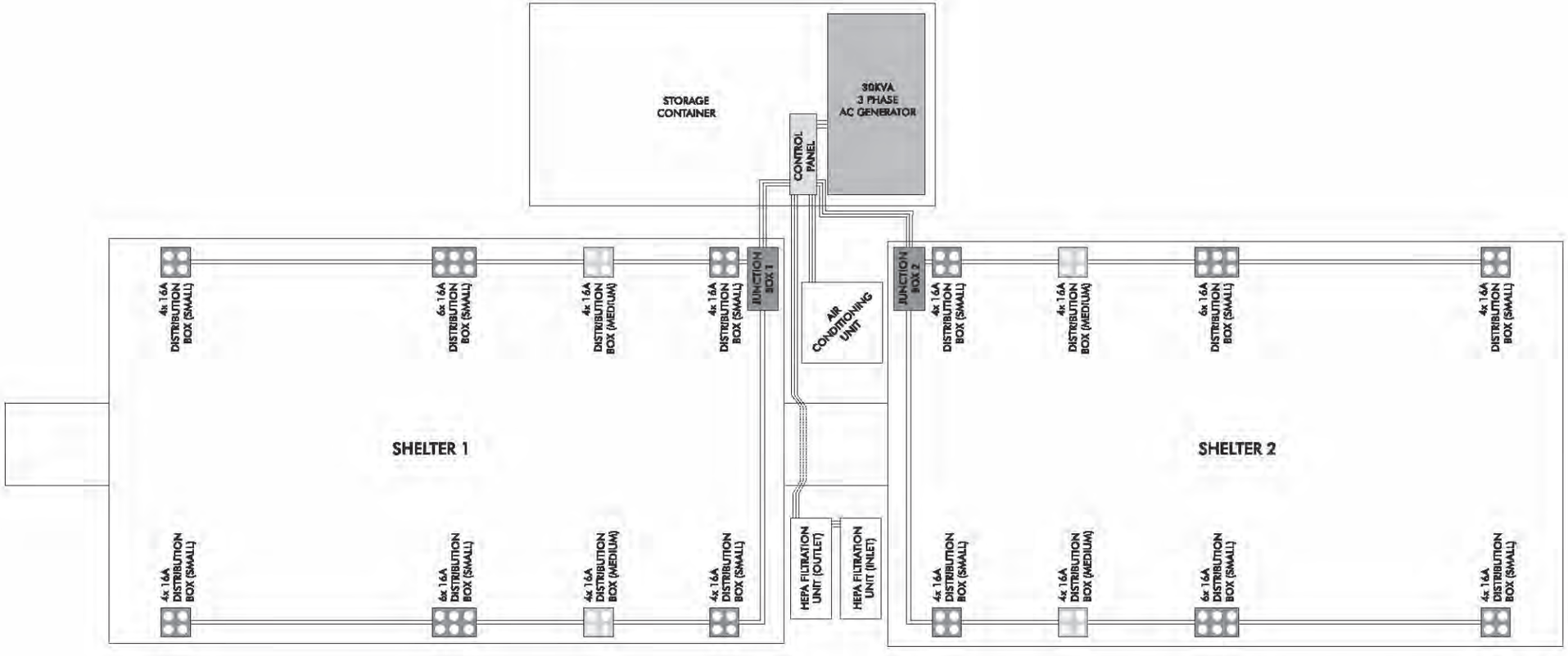


Figure 1.2
Schematic Illustration of Electrical System

Section 2

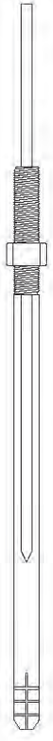
Supplied Equipment and Items

2.1 Introduction

This section defines the packing list of all items and equipment being supplied with the Mobile Clinic, including medical as well as non-medical equipment and furniture.
This section also lists out the basic tools that will be required for the installation of the shelter.

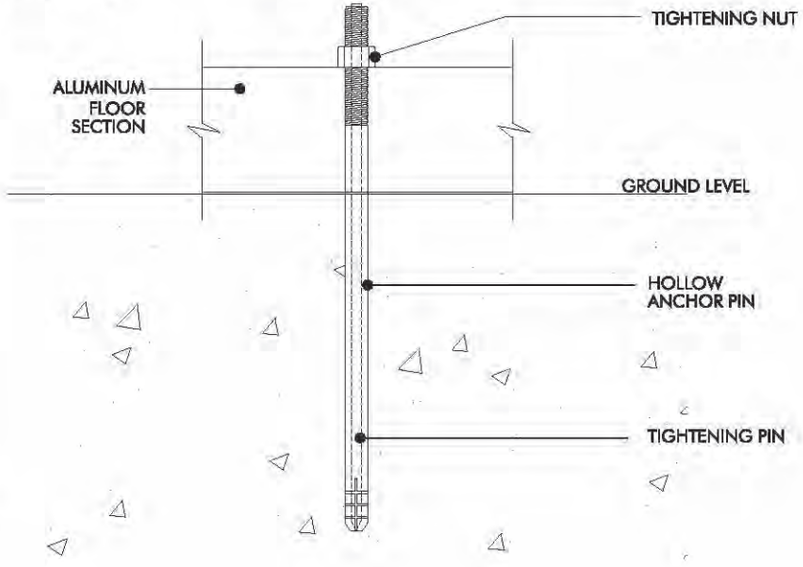
2.2 Basic Hardware Supplied and Tools Required

This section defines the packing list of all items and equipment being supplied with the Mobile Clinic, including medical as well as non-medical equipment and furniture.
This section also lists out the basic tools that will be required for the installation of the shelter.



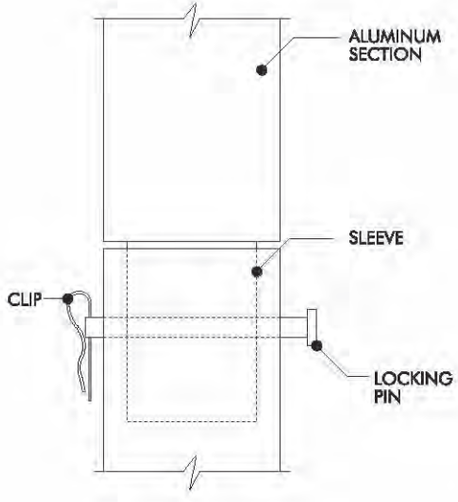
Anchoring Pins

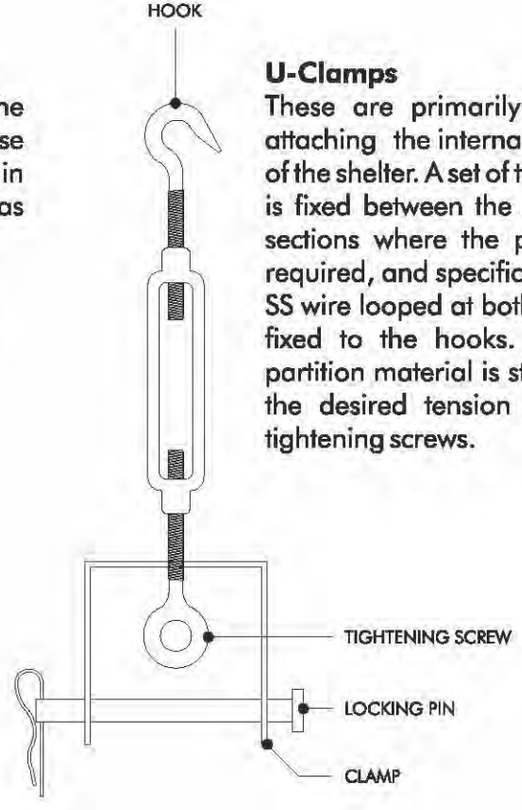
These pins are used to anchor the Aluminum floor sections firmly to the ground. The pins are to be inserted in the holes provided in the floor sections and then the tightening pin is to be hammered to its full extent. Then the tightening nut is to be rotated clockwise to complete the assembly.



Locking Pins

These pins are used to secure the Aluminum sections in place. These are to be inserted and clipped in the provided holes at each joint as indicated.





U-Clamps

These are primarily used for attaching the internal partitions of the shelter. A set of two clamps is fixed between the Aluminum sections where the partition is required, and specific lengths of SS wire looped at both ends are fixed to the hooks. Then the partition material is stretched to the desired tension using the tightening screws.

2.3 Supplied Medical Equipment

TABLE 2-1 : LABORATORY EQUIPMENT

(Quantity of listed items pertains to a set of **two** tents)

SNO.	EQUIPMENT NAME	QTY. (PER 02 TENTS)	MAKE	MODEL	STANDARDS	GUARANTEE
01.	URINE ANALYZER	01	SD STANDARD DIAGNOSTICS	UROMETER 120	CE, FDA	12 MONTHS
02.	CENTRIFUGAL MACHINE	01	REMI	R-BC.BL	CE	
03.	MEDICAL NEEDLE CUTTER	02	MRK HEALTHCARE	NULIFE DOTS	CE	12 MONTHS
04.	PACKING & CARRY CASE	01	-	-	-	-
05.	GLUCOMETER	01	ROCHE	ACCUCHECK	CE	12 MONTHS
06.	HEMOGLOBIN METER	01	HEMOCUE	Hb 201+	CE, FDA	12 MONTHS
07.	BINOCULAR MICROSCOPE	01	LABOMED	VISION 2000	CE	12 MONTHS
08.	STARTER REAGENT KIT	01	-	-	-	-
09.	SPECTROPHOTOMETER	01	RIELE	5010 V5+	CE, FDA, ISO	12 MONTHS
10.	PREGNANCY TEST KIT	01	SARA HEALTHCARE	-	-	-
11.	HIV TESTING KIT	01	IND DIAGNOSTIC	-	-	-

TABLE 2-2 : OPD (OUTPATIENT DEPARTMENT) EQUIPMENT

(Quantity of listed items pertains to a set of **two** tents)

SNO.	EQUIPMENT NAME	QTY. (PER 02 TENTS)	MAKE	MODEL	STANDARDS	GUARANTEE
01.	MACINTOSH SHEETS	10	-	-	-	-
02.	DISINFECTION UNIT	01	-	-	-	12 MONTHS
03.	ELECTRICAL SUCTION MACHINE	02	HYGEIA	7A-23	CE	12 MONTHS

TABLE 2-2 *(contd.)*: OPD EQUIPMENT

(Quantity of listed items pertains to a set of **two** tents)

SNO.	EQUIPMENT NAME	QTY. (PER 02 TENTS)	MAKE	MODEL	STANDARDS	GUARANTEE
04.	AUTOCLAVE	01	MELAG	AUTOKLAV 23S	-	12 MONTHS
05.	BEDPAN	10	CAREVEL	C-6001	-	12 MONTHS
06.	DRESSING BOX	02	-	-	-	12 MONTHS
07.	SMALL OXYGEN CYLINDER WITH MASK	04	-	-	-	-
08.	SOILED LINEN TROLLEY (Canvas Bag)	01	CAREVEL	C-4401	-	12 MONTHS
09.	SOILED LINEN TROLLEY (Plastic Bucket)	01	CAREVEL	C-4403	-	12 MONTHS
10.	DRESSING TROLLEY	01	CAREVEL	C-4201	-	12 MONTHS
11.	CYLINDER TROLLEY	04	-	-	-	12 MONTHS
12.	STRETCHER	02	-	-	-	-
13.	MEDICAL NEEDLE CUTTER	02	MRK HEALTHCARE	NULIFE DOTS	CE	12 MONTHS
14.	EXAMINATION COUCH WITH CABINET	01	CAREVEL	C-3102	-	12 MONTHS
15.	PORTABLE ECG UNIT 12 CHANNEL	01	EDAN	SE-12 EXPRESS	CE, FDA	12 MONTHS
16.	VACCINE CARRIER	02	-	-	-	12 MONTHS
17.	MOBILE EXAMINATION LIGHT	02	SPARX	005 LED	CE	12 MONTHS
18.	SEMI-FOWLER BED WITH MATTRESS	10	CAREVEL	C-1602	-	12 MONTHS
19.	FOOT STEP DOUBLE	02	CAREVEL	C-6304	-	12 MONTHS
20.	VITAL SIGNS MONITOR	02	EDAN	IM 60	CE, FDA	12 MONTHS
21.	NEBULISER	02	PHILIPS	INNOSPIRE	CE	12 MONTHS

TABLE 2-2 *(contd.)*: OPD EQUIPMENT

(Quantity of listed items pertains to a set of **two** tents)

SNO.	EQUIPMENT NAME	QTY. (PER 02 TENTS)	MAKE	MODEL	STANDARDS	GUARANTEE
22.	NEGATOSCOPE (TWO FILMS)	01	CAREVEL	C-6802	-	12 MONTHS
23.	PULSE OXYMETER FINGER TYPE	02	-	-	-	-
24.	BEDSIDE SCREEN	02	CAREVEL	C-6202	-	12 MONTHS
25.	WEIGHT & HEIGHT SCALE (Adult / Infant)	01	DR .MOREPEN	DS-03	CE	12 MONTHS
26.	I.V. ROD WITH FOUR HOOKS	04	CAREVEL	C-6604	-	12 MONTHS
27.	DUSTBIN	02	CAREVEL	C-6503	-	12 MONTHS
28.	STETHOSCOPE	01	LITTMANN	3M	CE	12 MONTHS
29.	EXAMINATION TABLE WITH MATTRESS	01	CAREVEL	C-3201	-	12 MONTHS
30.	BEDSIDE LOCKER	10	CAREVEL	C-6001	-	12 MONTHS
31.	OVERBED TABLE	04	CAREVEL	C-6102	-	12 MONTHS
32.	DRESSING DRUMS (9" X 11")	02	CAREVEL	C-5101	-	12 MONTHS
33.	ELECTRONIC BP INSTRUMENT	02	EQUINOX	EQBP101	CE, FDA	12 MONTHS
34.	THERMOMETER	01	HICKS	-	-	12 MONTHS
35.	URINAL (FEMALE)	02	CAREVEL	C-5134	-	12 MONTHS
36.	URINAL (MALE)	02	CAREVEL	C-5133	-	12 MONTHS

2.4 Supplied Non-Medical Equipment

SNO.	EQUIPMENT NAME	QTY.
01.	MEDICALIZED TENT	01
02.	RECEPTION & REGISTRATION AREA	01
03.	TRIAGE AREA	01
04.	OPD	01
05.	SPECIALIST CLINIC	01
06.	LABORATORY	01
07.	STORAGE AREA	01
08.	PACKING BOX FOR MEDICAL TENT	-
09.	RECOVERY & QUARANTINE AREA	01
10.	PACKING BOX FOR TENT 2 & MEDICAL EQUIPMENT	-
11.	20 FT. CONTAINER FOR GENSET & WATER TANK	01
12.	AIR CONDITIONER	01
13.	SHATTER PROOF FLUORESCENT LAMP	10
14.	REFRIGERATOR	01
15.	WATER DISTRIBUTION	01
16.	GENSET	01
17.	ELECTRICAL FIRE EXTINGUISHER	02
18.	FIRE EXTINGUISHER FOR OTHER TYPES	02

SNO.	EQUIPMENT NAME	QTY.
19.	SMOKE DETECTOR	04
20.	FIRE ALARM	02
21.	SPRAYING DEVICE	01
22.	EXTERNAL ELECTRIFICATION	01
23.	PANELS FOR THE BASE	
24.	NEGATIVE PRESSURE ISOLATION SYSTEM	01

Section 3

Unpacking & Preparation

3.1 Introduction
This section provides the procedures to prepare the MHDDIPL Mobile Clinic for Treatment of Infectious Diseases for unpacking and setup.

3.2 Site Selection
Choose a site location with appropriate space (Refer to Figure 3.1 for recommended site dimensions). Ensure the area is free of any debris or sharp objects and make as smooth and level as possible.

3.3 Unpacking the Container
Refer to the packing list attached with this manual for parts nomenclature.
NOTE: Check with local site personnel for locations of underground electrical and / or water lines to determine the best location of base pieces requiring 18" spikes.

1. Locate the MHDDIPL container. Unlatch and remove the lid.
2. Unpack directly from the container by carefully removing the items between the packing liners and group according to type near the site.Inspect for any damaged or missing parts.
3. The fabric components will be on top and will be removed first. Keep them folded up as packed and set them aside.
4. Lay out the aluminum frame pieces in groups closest to the first shelter site for installation first.

3.4 Storing the Container
When the containers have been emptied, relatch for storage. The container should be stored in this manner until needed again. It can be moved by forklift to a desired location.

WARNING

- Wear safety glasses whenever using a hammer on spikes and anchors.
- When using a ladder, one installer should hold it steady while the other climbs.
- Always wear gloves while handling structural and fabric components
- Beware of spring tension on frame members.
- Do not use combustible heating devices inside the shelter unless properly vented.
- Ensure that the structure is properly anchored to fully resist all wind loads in the area.
- Use adequate number of personnel while handling heavy components.
- Injury or death to personnel may occur if WARNINGS are not observed.

CAUTION

- Do not allow snow or ice to accumulate on top of the shelter.
- Do not drag fabric components on the ground or over sharp objects.
- When driving spikes through base frame, do not bound on base frame or drive spike
- Damage to equipment may occur if CAUTIONS are not observed.

Section 4

Setup & Installation Guide

4.1 Introduction

This section provides procedures to prepare the 6m x 10m Mobile Clinic for Treatment of Infectious Diseases. Each paragraph should be carefully reviewed prior to starting actual set up procedures. Parts nomenclature can be found in APPENDIX A.

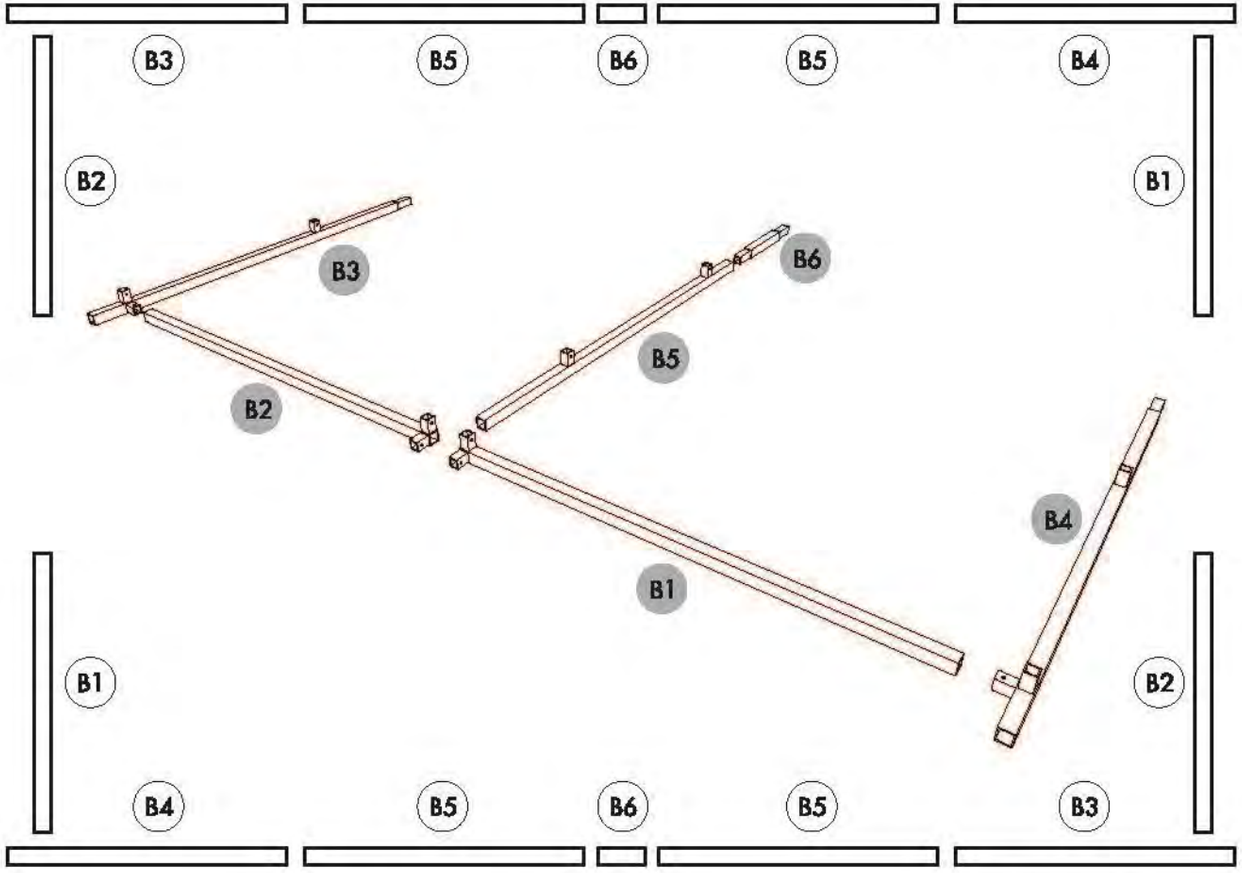


Figure 4.1
Base Layout Schematic

4.2 Base Assembly

1. Assemble the sections in sequence as indicated in Figure 4.1.
2. First position all the base sections on the platform and then slip them together completely.
3. Secure the sections in place with anchoring bolts after ensuring proper alignment with the platform.

4.3 Arch Assembly & Installation

This section provides procedures to fix the arches to the base frame. A step ladder or raised platform will be required along with a minimum of 4 personnel for installation of the arches.

Each arch consists of 4 arch sections and there are a total of 8 arches in one 6m x 10m shelter. The arches are to be installed one at a time simultaneously with the purlin sections which will hold them in place.

Steps for Installation of Arches

1. Starting on one end of the base, first install the two bottom arch sections on either side and secure them in place.

2. Move to the next arch location and similarly install another two bottom arch sections on either side.

3. Now install the first purlin sections in between the arches on either side and secure them in place.

4. Using a step ladder or raised platform fix the top sections of the arch and the central purlin section and secure them in place. One installer will need to hold the purlin section while another secures the arch sections in place. This will complete installation of 2 arches. The remaining arches are to be similarly installed following the above procedures.

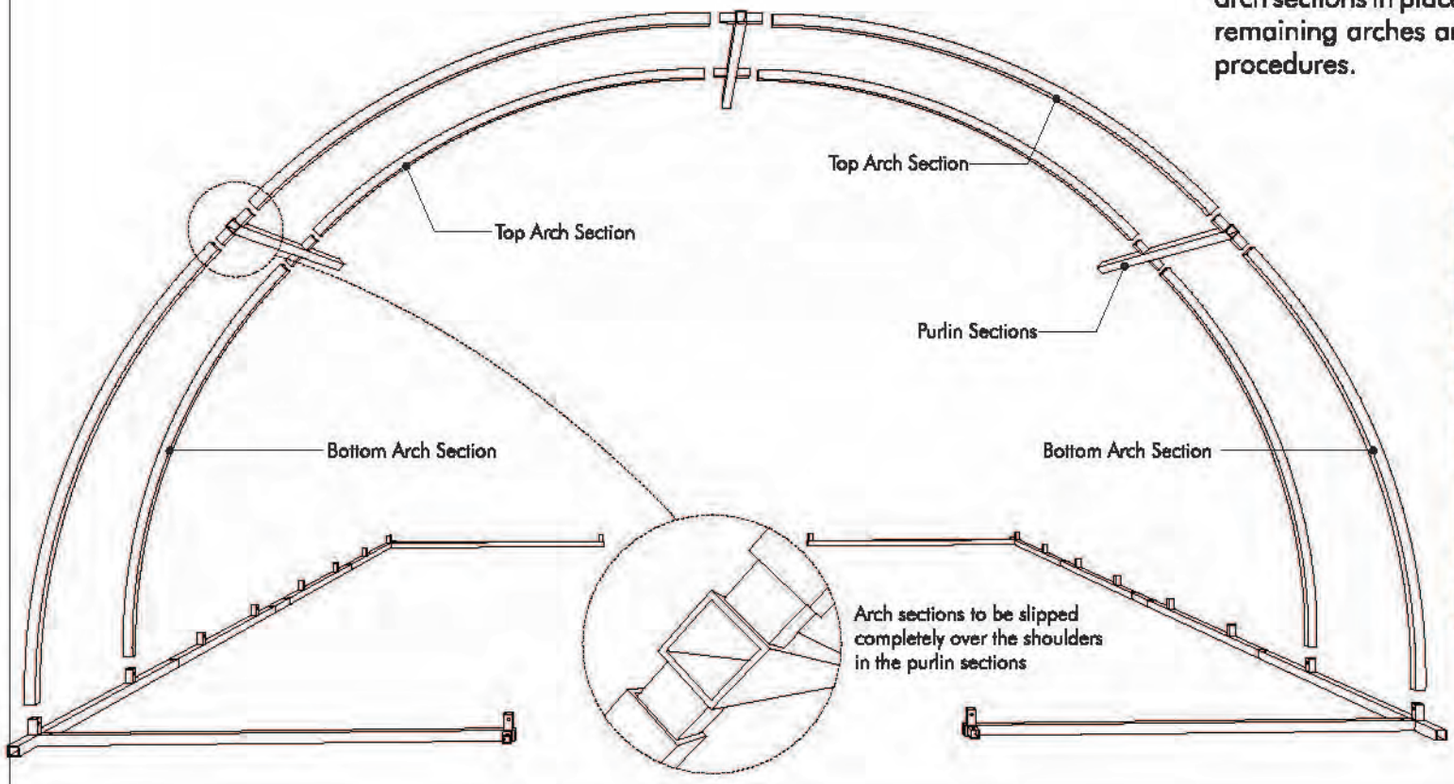


Figure 4.2
Arch Assembly

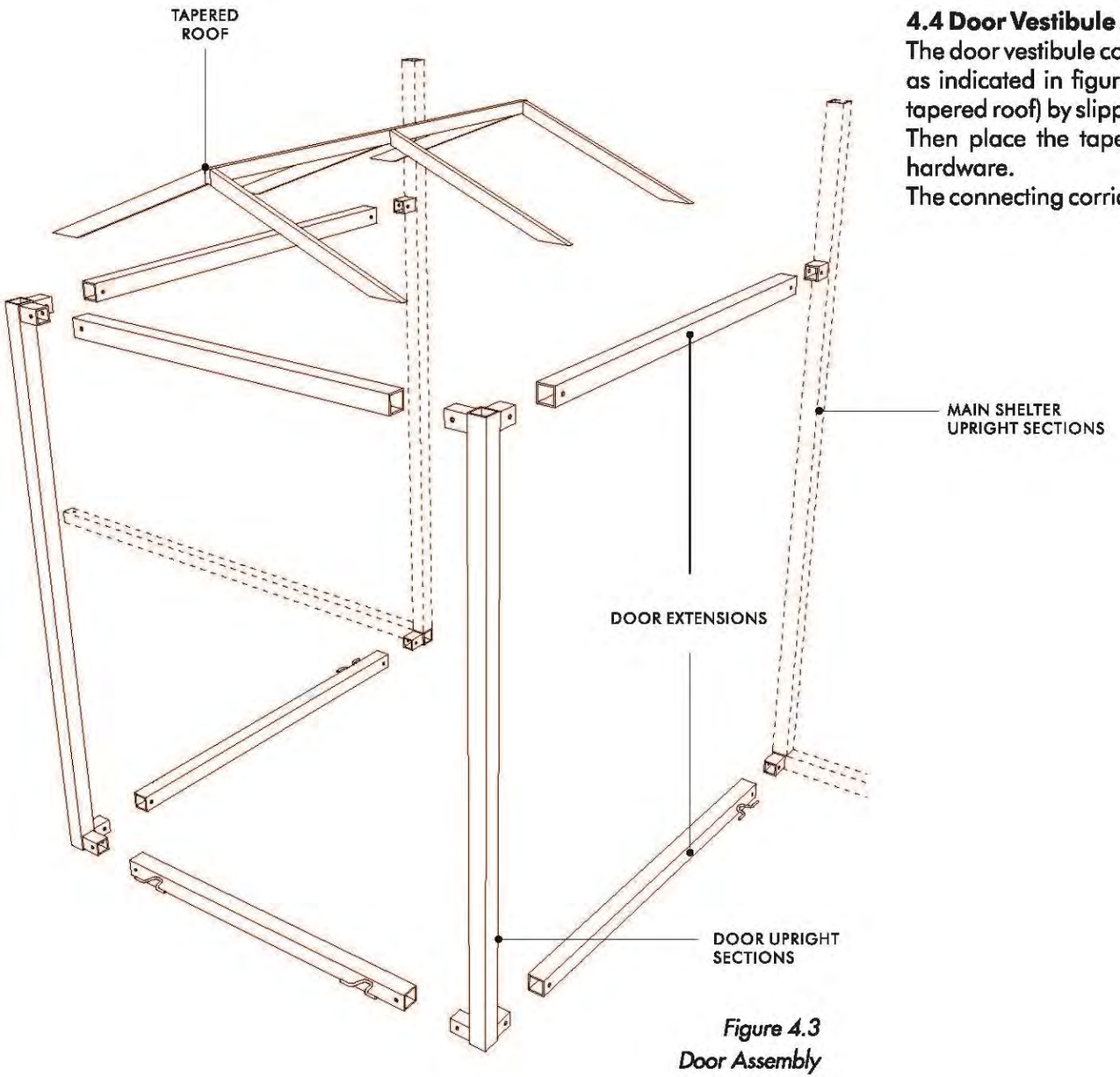


Figure 4.3
Door Assembly

4.4 Door Vestibule Assembly

The door vestibule components are to be fixed to the upright sections of the main shelter as indicated in figure 4.3. First assemble all the sections of the vestibule (except the tapered roof) by slipping them completely together, and secure them in place.

Then place the tapered roof and tighten it on top the vestibule with the provided hardware.

The connecting corridor between the two shelters has to be installed similarly.

APPENDIX A : PARTS NOMENCLATURE

Nomenclature of Structure & Fabric Components

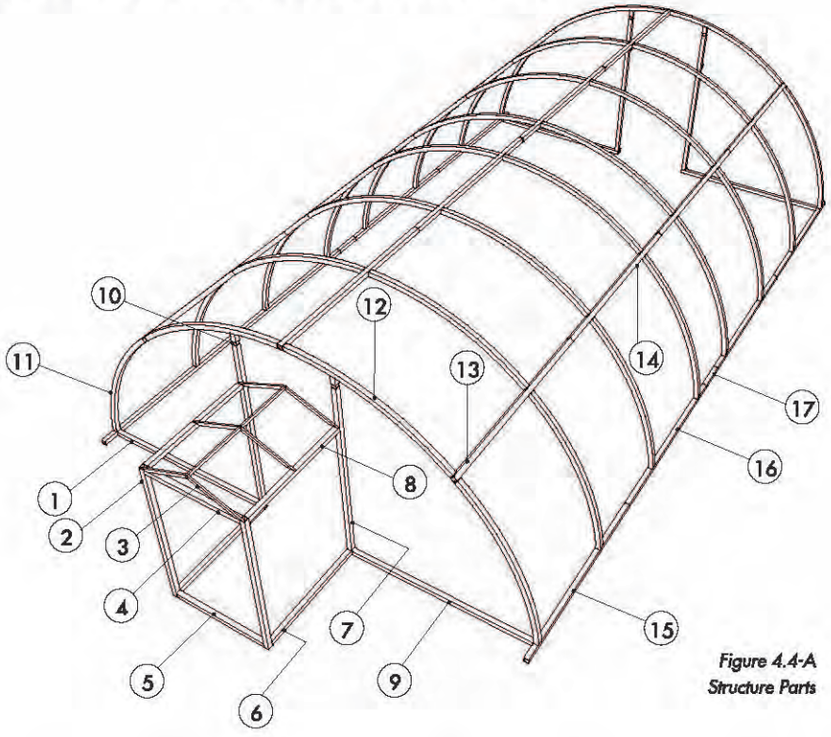


Figure 4.4-A
Structure Parts

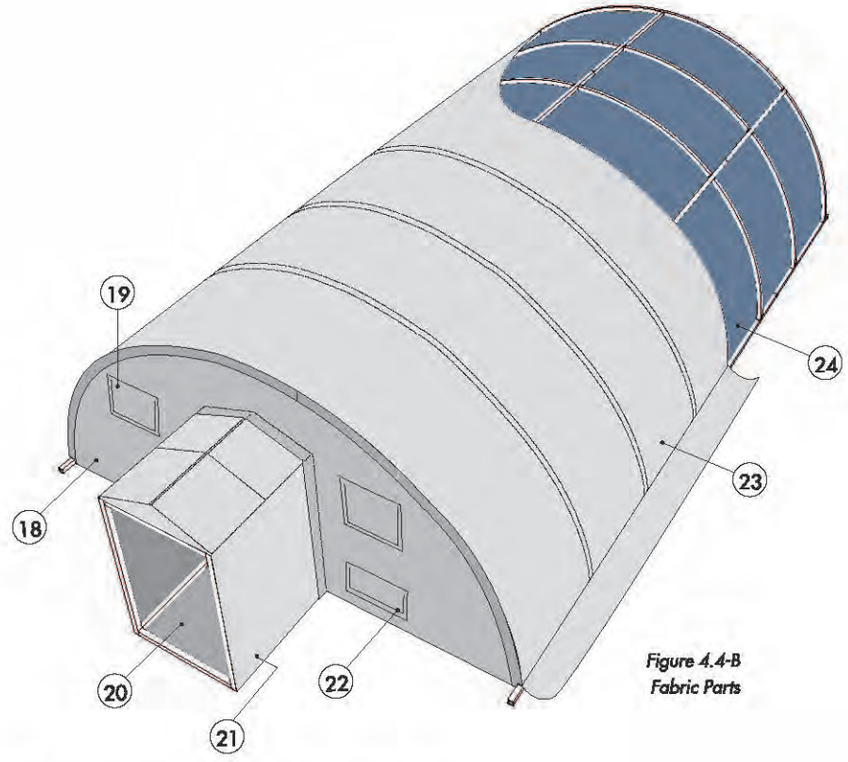
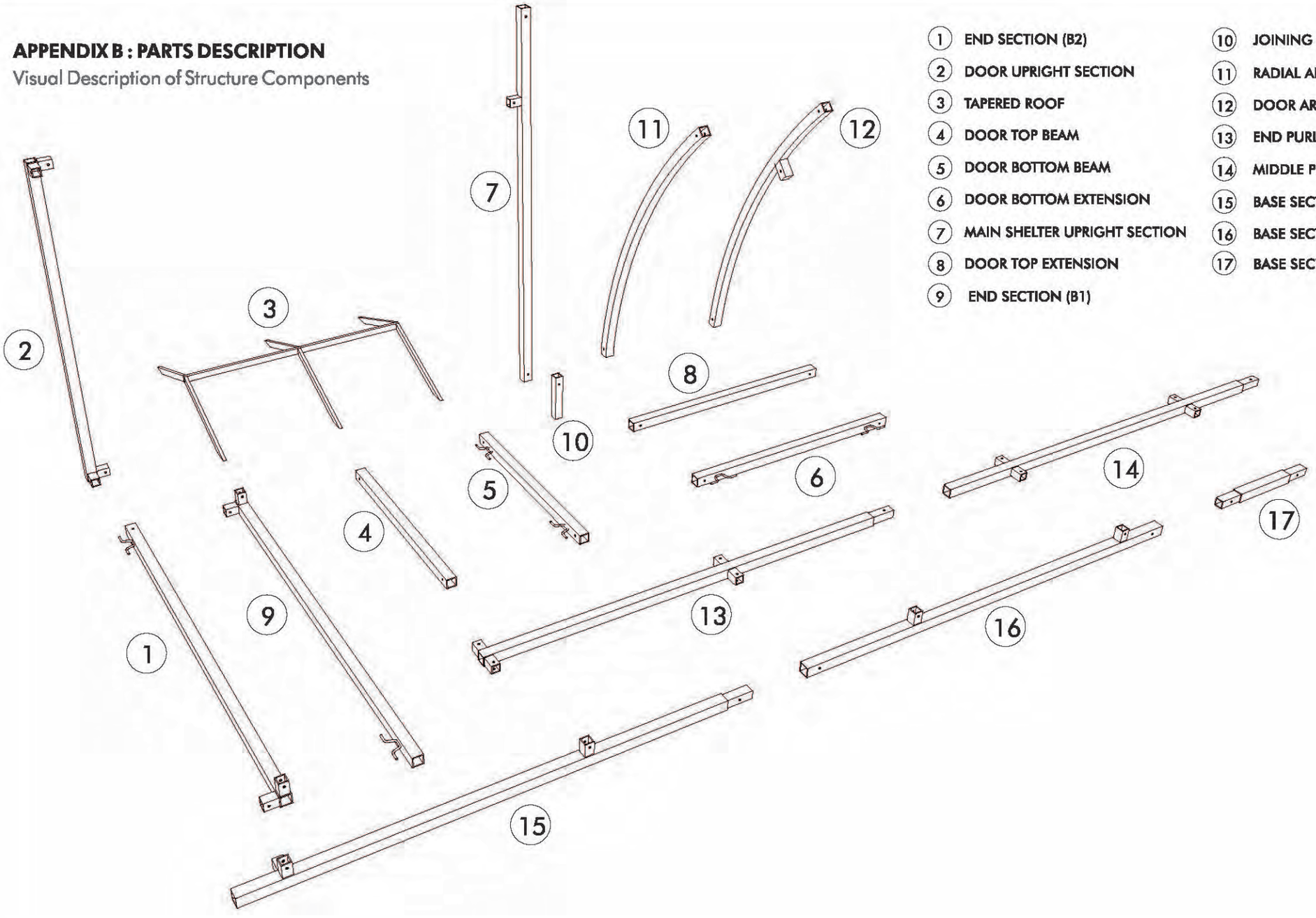


Figure 4.4-B
Fabric Parts

1. END SECTION (B2)
2. DOOR UPRIGHT SECTION
3. TAPERED ROOF
4. DOOR TOP BEAM
5. DOOR BOTTOM BEAM
6. DOOR BOTTOM EXTENSION
7. MAIN SHELTER UPRIGHT SECTION
8. DOOR TOP EXTENSION
9. END SECTION (B1)
10. JOINING SLEEVE
11. RADIAL ARCH SECTION
12. DOOR ARCH SECTION
13. END PURLIN
14. MIDDLE PURLIN
15. BASE SECTION (B4)
16. BASE SECTION (B5)
17. BASE SECTION (B6)
18. END PANEL
19. ROLL-UP WINDOWS
20. NON-SLIP FLOOR
21. DOOR VESTIBULE COVER
22. ELECTRICAL / HVAC PORT
23. TOP COVER
24. INSULATING PANELS

APPENDIX B : PARTS DESCRIPTION

Visual Description of Structure Components



1. END SECTION (B2)
2. DOOR UPRIGHT SECTION
3. TAPERED ROOF
4. DOOR TOP BEAM
5. DOOR BOTTOM BEAM
6. DOOR BOTTOM EXTENSION
7. MAIN SHELTER UPRIGHT SECTION
8. DOOR TOP EXTENSION
9. END SECTION (B1)
10. JOINING SLEEVE
11. RADIAL ARCH SECTION
12. DOOR ARCH SECTION
13. END PURLIN
14. MIDDLE PURLIN
15. BASE SECTION (B4)
16. BASE SECTION (B5)
17. BASE SECTION (B6)

Section 5

Fabric Components Installation Guide

5.1 Introduction

This section provides procedures to install the fabric components of the MHDDIPL Mobile Clinic for Treatment of Infectious Diseases. The following procedures have to be followed to fix the end panels, insulating panels, top cover and door vestibule covers to the already erected aluminum structure of the shelters.

CAUTION: Do not drag Fabric components over rough ground surface or sharp objects. This may permanently damage the component and render it unfit for insulation.

5.2 Composition of Insulation Panels

Each single-piece insulating panel is comprised of four layers of different materials as indicated in Figure 5.1. These layers are joined together by double stitching.

These panels are fixed to the base frame using hook and loop fastener (Velcro ®) strips. These strips are stitched on the edges of the insulating panels as well as on the top side of the aluminum arch sections.
Finally there is a layer of PVC coated fabric which serves as an additional cover for the insulation panels.

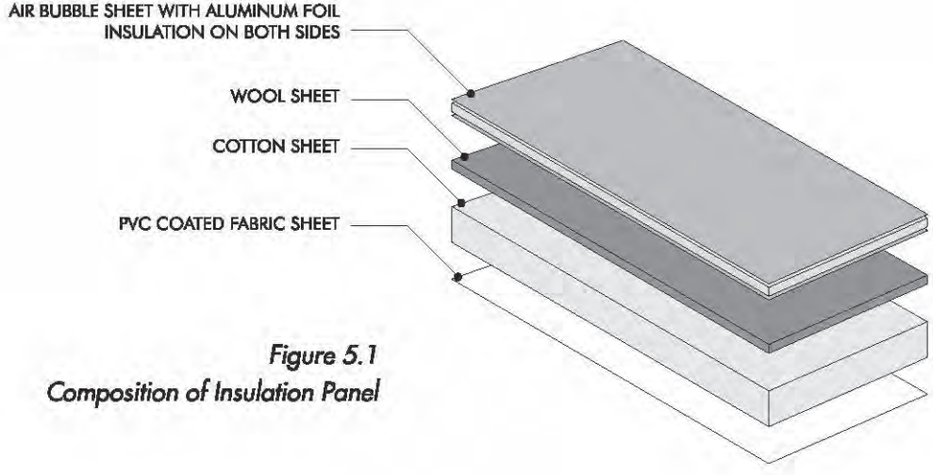


Figure 5.1
Composition of Insulation Panel

5.3 Door-end Panel Installation

The first step towards installing the fabric components is to fix the end panels on either side. Each end panel consists of a single piece insulating panel with the PVC coated fabric cover stitched to it. The fabric cover is looped along the edges with a nylon fastening rope running from end to end. The end panel has to be placed over the arch and tightened by tethering the nylon ropes to the cleats provided on either side.

After the end panel is tied in place, the door flaps provided in the panel have to be turned around the door upright sections and fastened using the provided Velcro® strips.

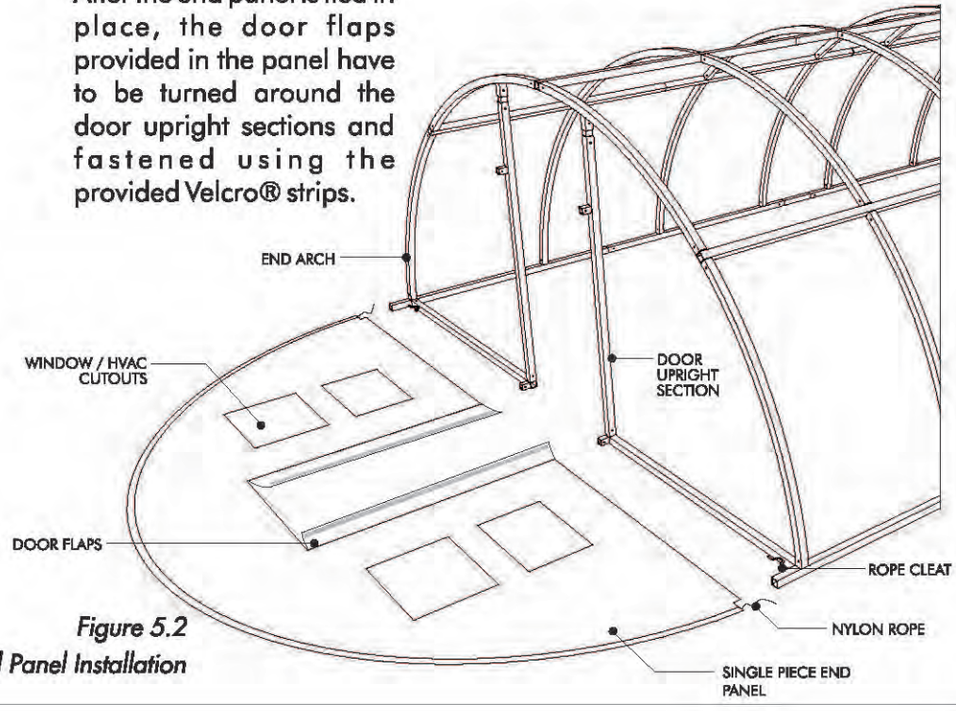


Figure 5.2
End Panel Installation

5.4 Insulating Panels Installation

Each 6m x 10m shelter has seven 4-layer single piece insulating panels. These are fixed with a combination of hook and loop Velcro® fasteners on either side as indicated in Figure 5.3. Each insulating panel has to be installed sequentially, starting from one end of the shelter and installing each consecutive panel till the other end is reached.

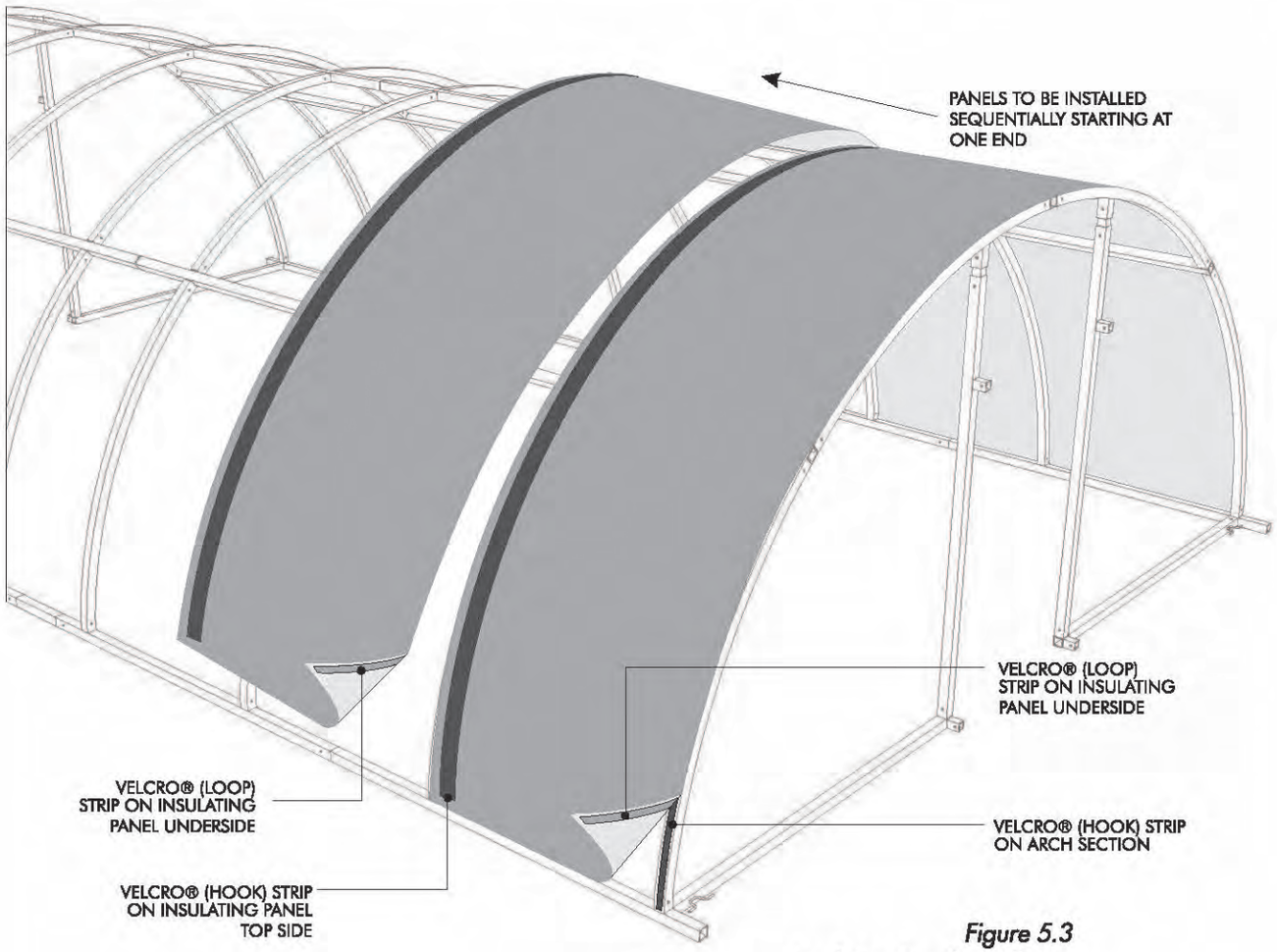


Figure 5.3
Insulating Panel Installation

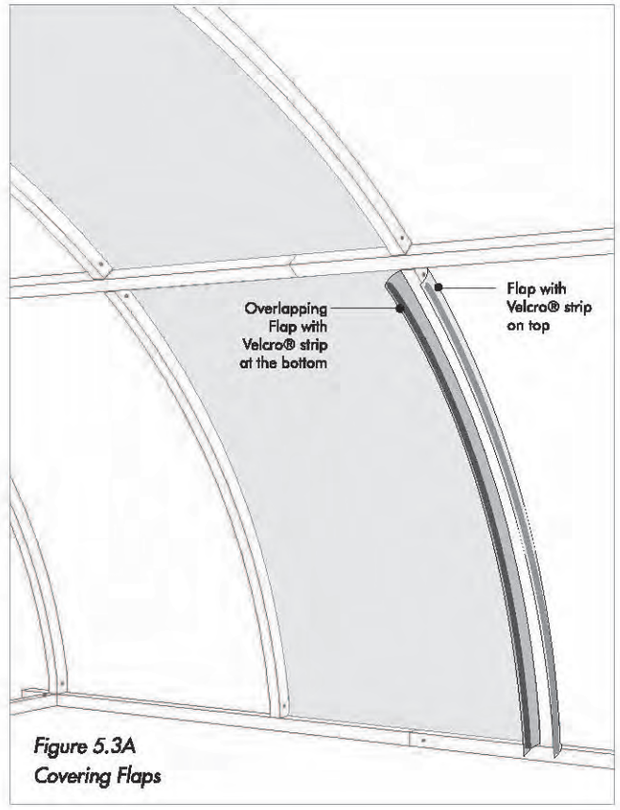


Figure 5.3A
Covering Flaps

5.5 Arch Section Covering Flaps

The insulating panels are also fitted with covering flaps on either side that will conceal the aluminum arch sections from the inside of the shelter. The flaps are overlapped and fastened together using the provided Velcro® strips.

5.6 Top Cover Installation

The top cover is a large one-pice fabric component made of heavy duty PVC coated fabric sheets heat welded together. A minimum of 4 personnel are required to install the final top cover on the shelters.

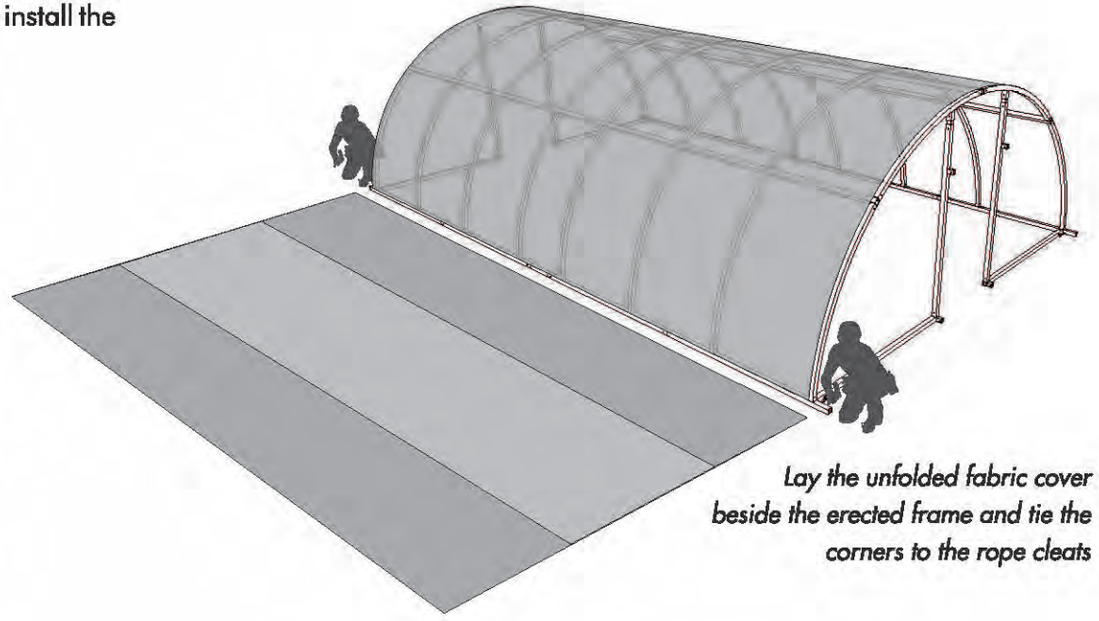
Steps for Installation of Top Cover

1. Unfold the one piece fabric cover completely and place it beside the erected shelter structure.

2. Secure the two adjacent corners of the cover to the rope cleats provided in the Aluminum base sections.

3. Now using step ladders on either end, pull the other loose corners of the fabric cover gradually over the shelter frame. Care has to be taken during this procedure so that the cover is not damaged in any way.

4. Finally when the entire fabric has covered the frame, secure the other end to the rope cleats after sufficient tightening.



Lay the unfolded fabric cover beside the erected frame and tie the corners to the rope cleats

Pull the remaining corners simultaneously over the arch sections and secure the other end similarly

Figure 5.4
Top Cover Installation

5.7 Fabric Partition Installation

Partition panels are used to create smaller segregated areas inside the shelter, such as Examination rooms, Laboratory, Quarantine Area etc.

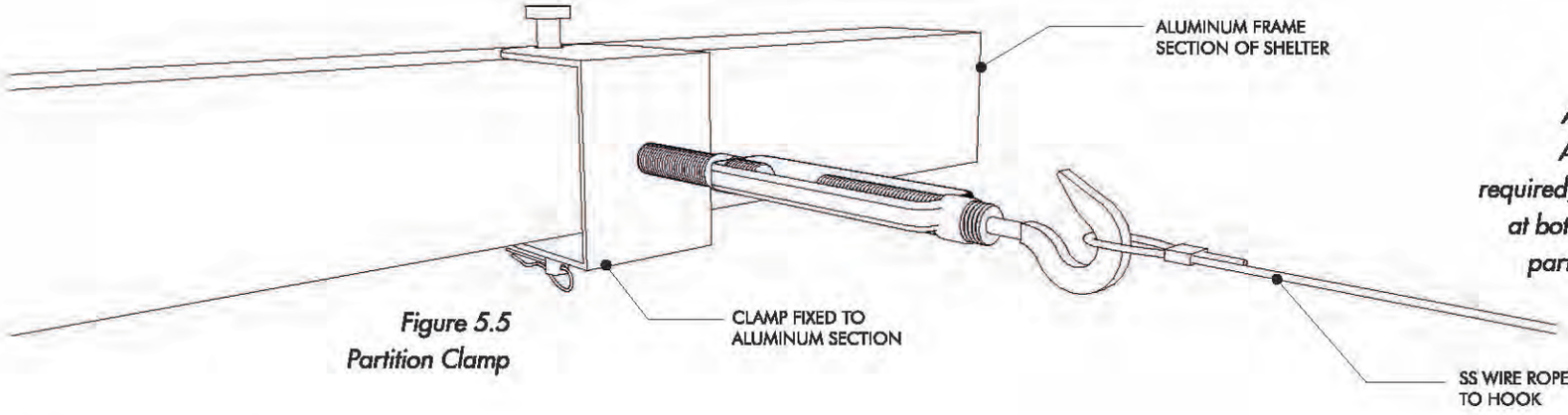


Figure 5.5
Partition Clamp

A set of two clamps is fixed between the Aluminum sections where the partition is required, and specific lengths of SS wire looped at both ends are fixed to the hooks. Then the partition material is stretched to the desired tension using the tightening screws.

5.8 Flooring Panels Installation

The flooring of the shelters makes use of insulated PUF (Polyurethane) panels arranged on the floor in grid form and covered with an anti-skid material. These PUF panels have a high load bearing capacity and excellent thermal and moisture insulation.

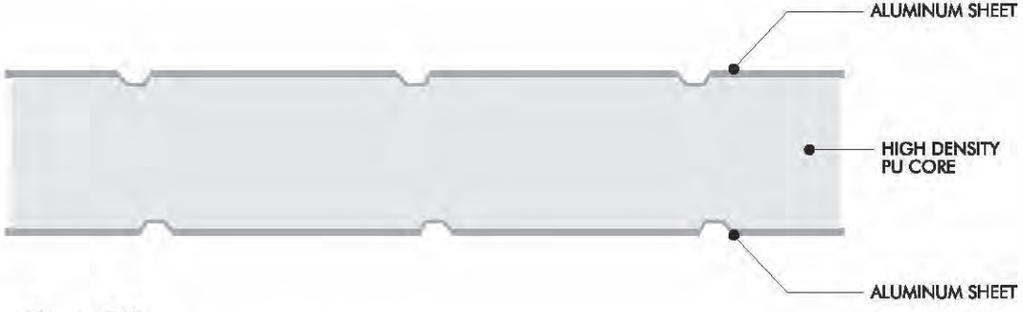


Figure 5.6
Composition of Insulated PUF Panel

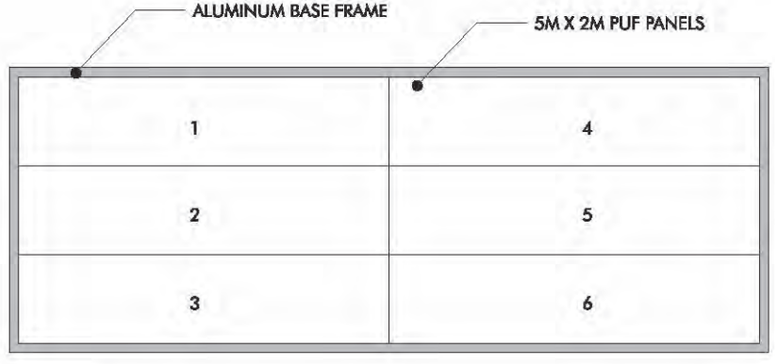


Figure 5.6A
Grid arrangement of PUF Panels