

STRUCTURE

CONSTRUCTION

MANUAL

Reviewed /Approved by:

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1	<u>GENERAL INSTRUCTIONS</u>	3
2	<u>CONSTRUCTION TOOLS</u>	3
3	<u>LAYING OUT AND ADJUSTING THE BASE PLATES</u>	5
4	<u>MARKING OUT THE STRUCTURE</u>	6
5	<u>LAYING OUT OF THE FOOT PLATES</u>	6
6	<u>ERECTION OF COLUMNS AND GABLES</u>	8
7	<u>CONSTRUCTION</u>	10
	7.1 FRAME PREPARATION	10
	7.2 FRAME CONSTRUCTION	11
	7.3 CONNECTING EAVE PURLINS	12
	7.4 CONNECTING RIDGE PURLINS AND INTER PURLINS	12
8	<u>WIRE BAYS (ROOF AND SIDE)</u>	13
	8.1 POSITIONING OF THE WIRE BAYS.	13
9	<u>PRE-ATTACH BAY WIRES FOR ROOF AND SIDES</u>	14
10	<u>TENSIONING OF BAY WIRES</u>	15
11	<u>GABLE UPRIGHTS AND GABLE RAILS</u>	16
	11.1 CONSTRUCTION METHOD	17
12	<u>ROOF COVERS</u>	18
	12.1 BAR TENSIONING	20
	12.2 SHOCK CORD TENSIONING	20
	12.3 FITTING OF GABLE TRIANGLE	21
	12.4 FITTING OF SIDE AND GABLE WALLS	22
13	<u>DISMANTLING</u>	23
14	<u>MAINTENANCE INSTRUCTION</u>	24
	14.1 TENT - CONSTRUCTION	24
	14.2 FOR STORAGE AND TRANSPORT	24
	14.3 EXAMINATION	24
15	<u>TECHINICAL DETAILS OF THE STRUCTURE</u>	25

1 GENERAL INSTRUCTIONS

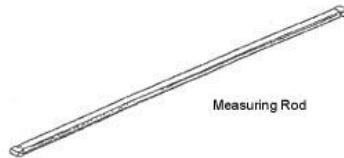
For the erection of a Clearspan Structure, a workforce minimum of 5 people is required.

- All on site personnel must wear issued uniforms and safety footwear.
- The order of construction must be followed precisely as set out in this manual.
- All wires must be pulled tight before completion of erection.
- The removal of wires is not permitted.
- Danger signs must clearly mark danger spots.
- For erection, use the tools that have been delivered and recommended to facilitate the erection.
- Ensure that all pins and bolts are secure. Also ensure that all purlins and inter purlins are correctly hooked in.

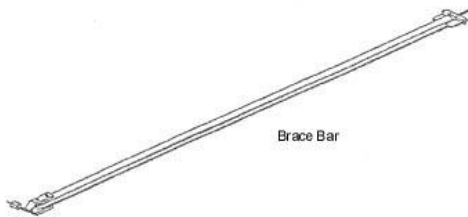
2 CONSTRUCTION TOOLS

With every site delivery the following tools must be included:

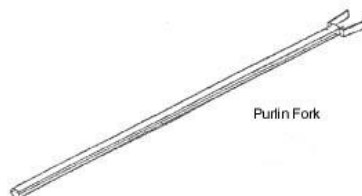
- Measuring Rod
- Brace Bar
- Purlin Fork



Measuring Rod



Brace Bar

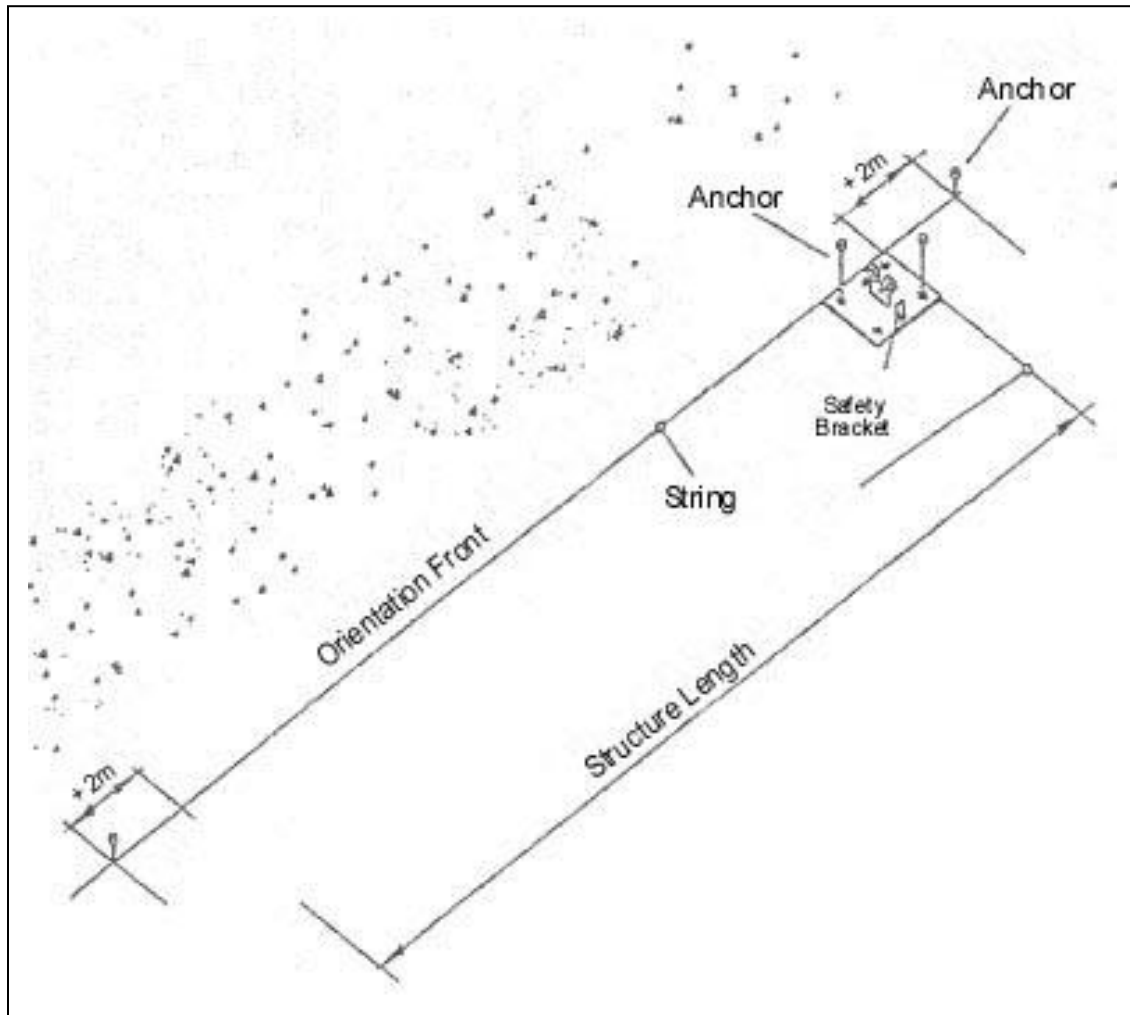


Purlin Fork

To facilitate the erection, it is recommended that the following tools be kept at hand:

- 3** Pull over ropes with snap hooks
- 2** Step ladders, height must be equivalent to the height of side wall
- 1** Adjustable spanner (minimum)
- 1** Crowbar
- 2** Sledgehammer
- 10** Wooden blocks 80 x 80 x 400mm (approx.)
- 1** Pliers
- 1** Tape measure (50m)
- 1** String for marking out. A minimum of twice the length of the structure is required.

3 LAYING OUT AND ADJUSTING THE BASE PLATES



The laying out and adjustment of the base plate must be done precisely.

Tools:

Measuring rod
Tape measure
String
Sledgehammer

Building Parts:

Base plate with
Base plate pin 155mm
2 No base plate pin 200mm
Earth anchor

4 MARKING OUT THE STRUCTURE

The side of the structure should be orientated along a road, hedge or house front.

5 LAYING OUT OF THE FOOT PLATES

Lay out footplates parallel to the chosen orientated front.

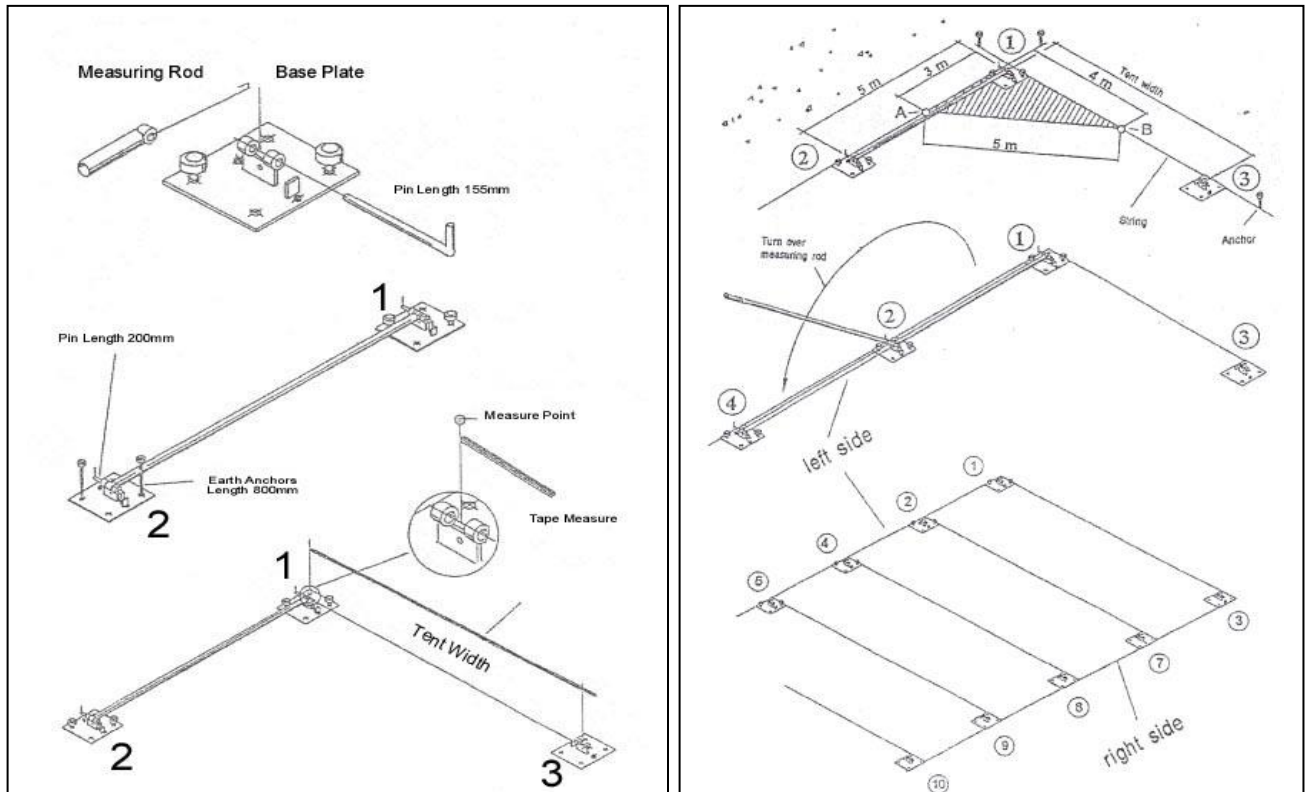
Risk Assessment:

First of all check for underground pipes by checking with the engineer and accessing maps as to where the pipes lie.

- Pull string tight and as level as possible (*about 2m longer than the length of the structure*) at each end.
- The edge of the first base plate should be parallel to the marker string and secured with 2 Earth Anchors (safety bracket to inside of structure).

Note: **Do not** hammer in the anchors completely, as they may require adjustment.

- Measuring rod with base plate pin 155mm long into base plate 1
- Secure pin
- Measuring rod with base plate pin 200mm long into base plate 2
- Secure pin
- Use base plate pins of 200mm length on base plates 2 and 7 (second base plate left and right).
- Mark out base plate 2 and secure with 2 No earth anchors (do not hammer these in all the way, only to about 2-3cm before head).
- All base plates – safety bracket to inside of structure.
- Mark out right base plate 3.
- Measure from the centre of base plate 1 to the centre of base plate 3, and measure the outer width of structure with a tape measure.



Note: Base plates 1 and 3 have to be in an exact right angle.

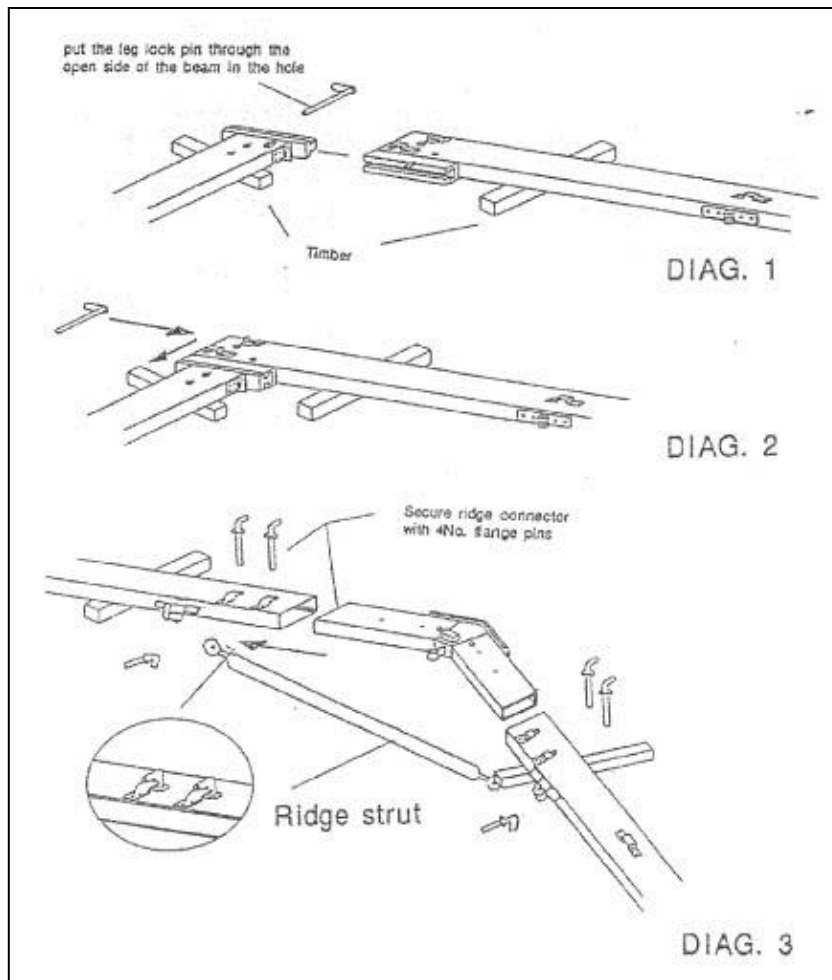
If you have difficulty inserting base plate pins on the opposite side; the base plates have been incorrectly measured.

- Pull string along the width of the structure from base plate 1 to base plate 3, mark out.
- Measure out 3m along string line base plate 1 and 2, then measure out 4m along the string line between base plate 1 and 3.
- Between point A and B, the diagonal has to measure exactly 5m (the given measurements of 3, 4 & 5 can also be altered to 6, 8 & 10).
- Secure base plate 3 with 2 earth anchors to a distance of 20 metres.
- Undo measuring rod at base plate 1, turn over rod as per diagram, and secure to base plate 4. Secure base plate with 2 earth anchors.
- Continue in this way until all left hand side base plates are in place.
- Secure measuring rod to base plate 3 and set the 2nd right base plate 7.
- With measuring rod in place, measure 20 metres from the opposite base plate.

Repeat process for the remaining base plates.

6 ERECTION OF COLUMNS AND GABLES

Building Parts	Qty	Description
End Beam	4	Recognizable by the fixed gable upright brackets
Middle Beam		According to length of structure (without gable upright bracket)
Corner Legs	4	Fitted with saddle for corner gable rail and the Quadra is routed on the in and outside
Middle Legs		According to length of structure , routed on outside Quadra track only
Ridge Connector		According to length of structure
Flange Pins		According to length of structure
Leg Locking Pins		According to length of structure
Lock Off Rod	2	
Ridge Strut		According to length of structure
Strut Locking Pins		According to length of structure



- Connect legs and beams. Laying the pieces on blocks of wood will facilitate assembly.

Risk Assessment: Back injury can occur at this point. Ensure that correct manual handling techniques are in place. Toolbox talk at this point to ensure that correct procedures are reinforced.

- Lay corner legs and middle legs between base plates.
- Lay out end and middle beams, ridge connectors, flange pins, ridge struts and strut pins.
- Place a lock off rod to each corner leg.
- Push beam together until they are fully connected
- Secure beams and legs with leg lock pins. Ensure that pins are inserted from open end.
- Ensure that the legs and beams on the opposite side have been connected and secured, Insert ridge connector and secure with 4 flange pins.
- Connect ridge strut with flange pins to the beam.
- Insert legs.
- Insert 155mm base plate pin. To secure twist by 180°.

7 CONSTRUCTION

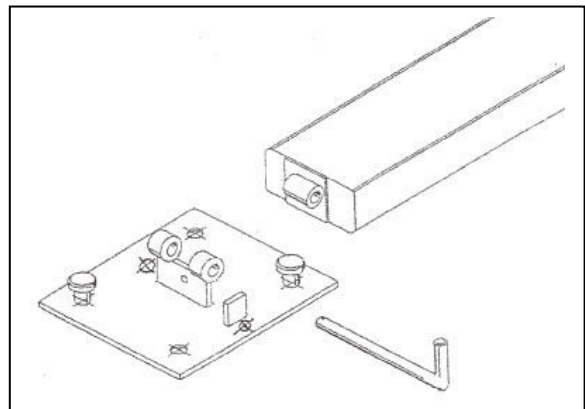
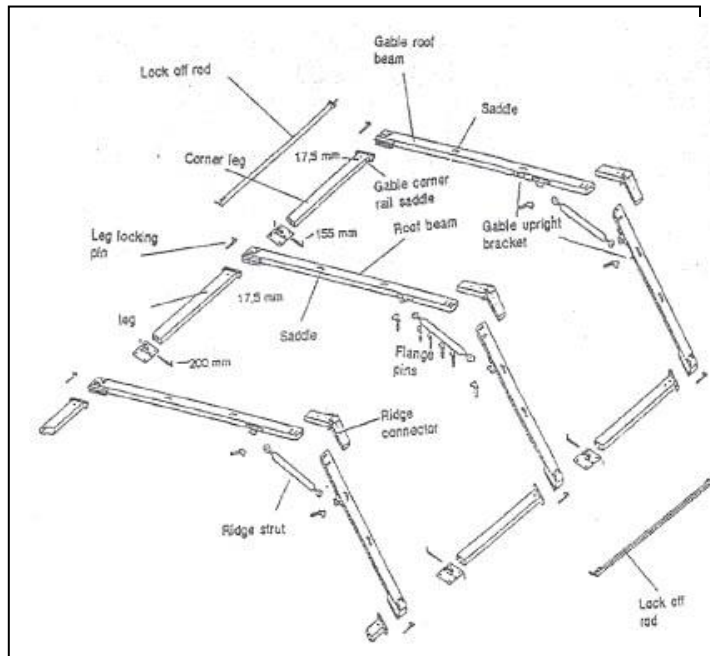
7.1 Frame Preparation

- Before construction, the lock off rod must be connected to the left and right of the corner legs.
- Insert lock off rod through bottom hole of corner leg and secure with R-clip.
- Connect a piece of string to R-clip so that it can be pulled out after connection of leg wires.
- Connect push up bar.

Risk Assessment: Back injury can occur. Reinforce correct lifting techniques with workers. Ensure hard hats are worn to ensure there are no head injuries. A tool box talk must be conducted prior to lifting the gable.

- Lift gable.
- Push pins of push up bar through the bottom and secure with R-clip.

To rectify, move the base plate with a crowbar so that the base plate pins can be inserted.

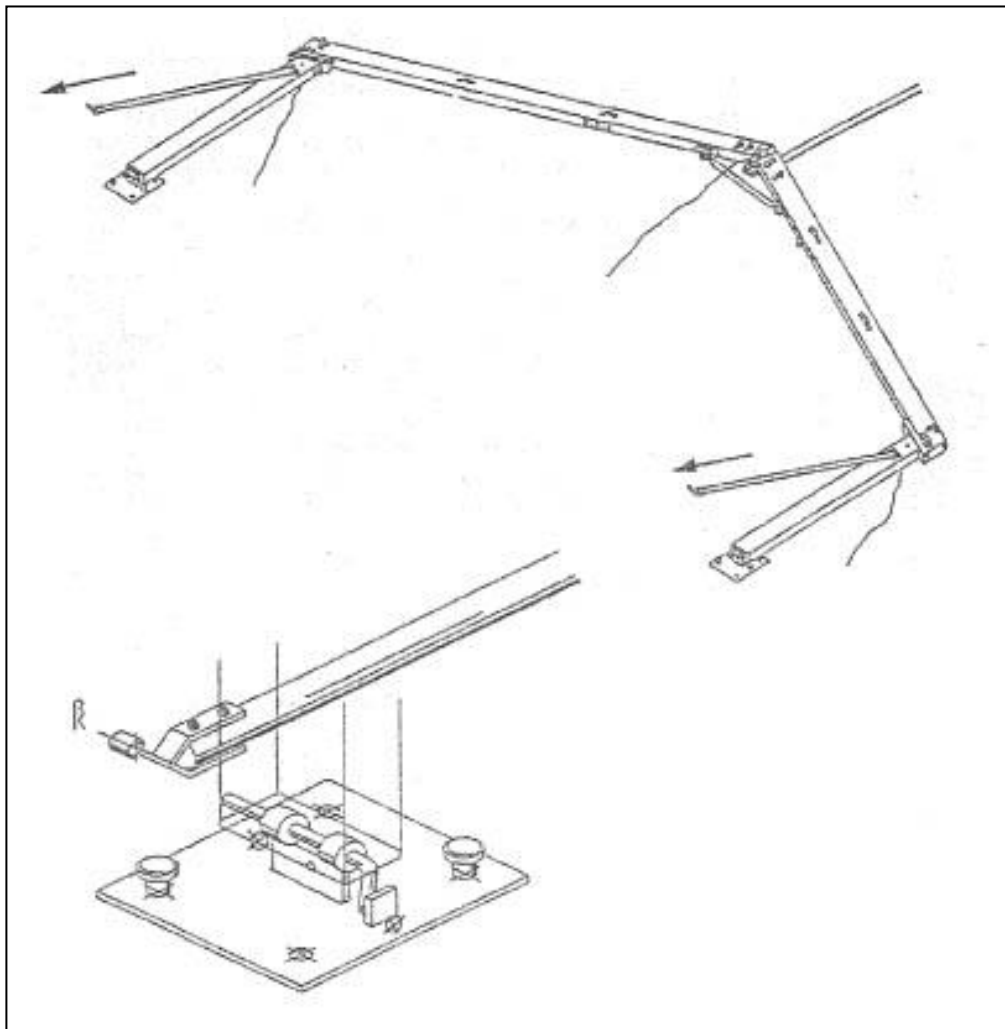


7.2 Frame Construction

- One person must pull on each lock off rod.

Risk Assessment: Back injury can occur. Reinforce correct lifting techniques with workers once again. Ensure all hard hats are worn to ensure there are no head injuries. Ensure that the information contained within the toolbox talk is being maintained prior to lifting the gable.

- With 2 people standing at each corner of the leg, lift the gable in the middle and push up into position with the help of the push up bar.
- Connect lock off rod to base plate.
- Push lock off rod from the outside onto the 200mm long base plate pin and secure with R-clip.
- Disconnect push up bar (with string, pull out R-clip and pin).

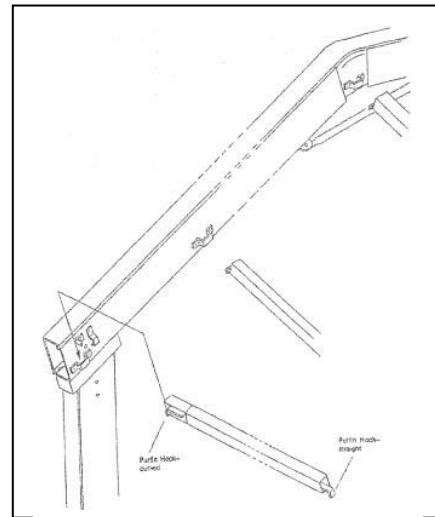
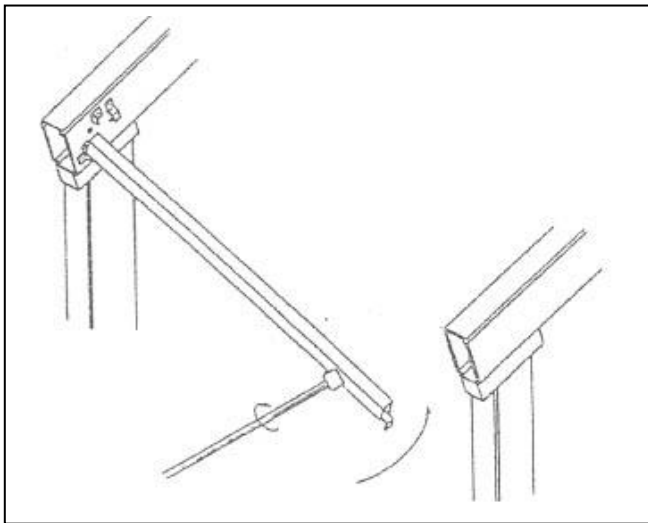


7.3 Connecting Eave Purlins

- Hook on eave purlins with curved hook onto beam ensuring that purlin is sitting against the side angle,

Risk Assessment: Back injury can occur. Reinforce correct lifting techniques with workers. Ensure hard hats are worn to ensure there are no head injuries. Reinforce tool box talk.

- Push up the second frame.
- Connect push up bar (R-clip with string).
- Raise frame and using the purlin fork, inset eave purlins on the left and right. To prevent slipping, twist the purlin fork to catch the eave purlin.



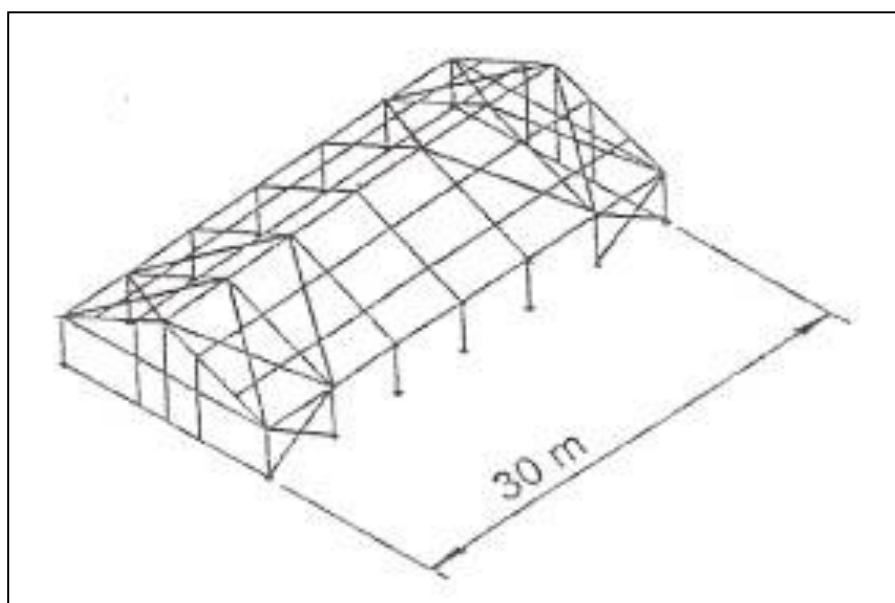
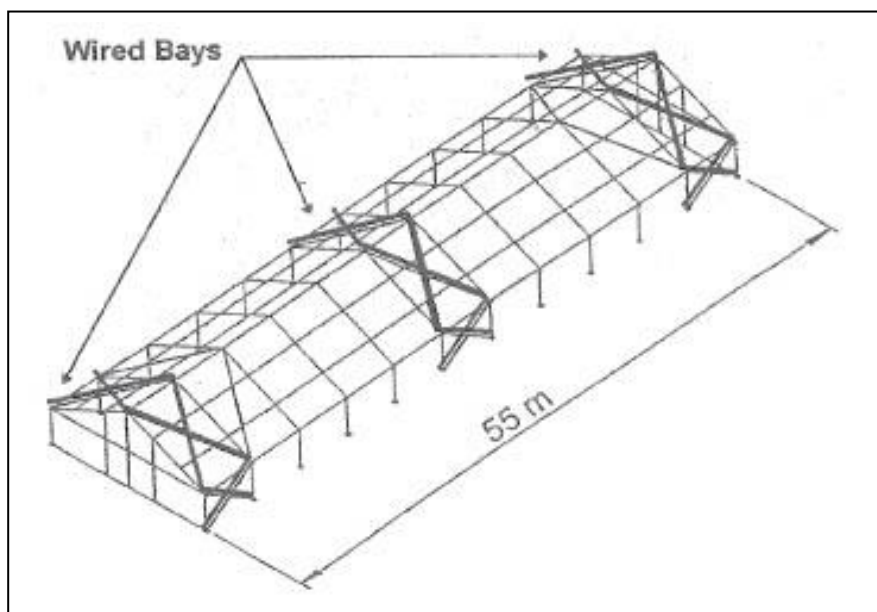
7.4 Connecting Ridge Purlins and Inter Purlins

- Lay out ridge and inter purlins with curved hook and hook into purlin saddles.
- Using purlin fork, hook in ridge and inter purlins on opposite side.
- When all ridge and inter purlins are connected, the bay wires can be tensioned.
- The securing of the 2nd frame, is done by connection and securing the ridge and eave purlins.

8 WIRE BAYS (ROOF AND SIDE)

8.1 Positioning Of The Wire Bays.

- With structures up to 40 metres long, the wires are positioned on the roof and side of the first and last bay.
- You must install wires in the second bay from both ends of the structure.
- For structures 45 metres or larger, every sixth (6th) bay should be wired.



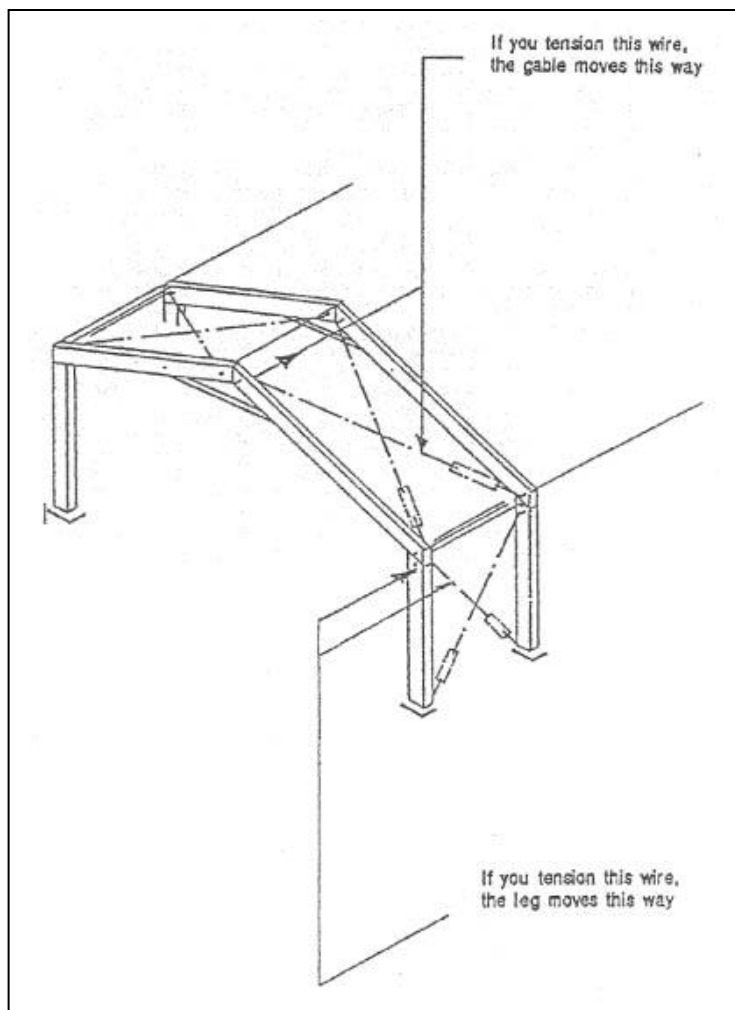
9 PRE-ATTACH BAY WIRES FOR ROOF AND SIDES

- Lay wires to the frame.
- Unscrew turnbuckle (but do not take apart completely). Position the turnbuckles at the bottom when tightening the wires.
- Attach wires to roof and secure with ring bolts and nuts.
- On 1st frame attach wire from above.
- On 2nd frame, from underneath.
- The ropes can also be used for pulling up the frame.

Note: The wires are connected at the top. After connecting the inter purlins, the wires will be connected to the eaves.

10 TENSIONING OF BAY WIRES

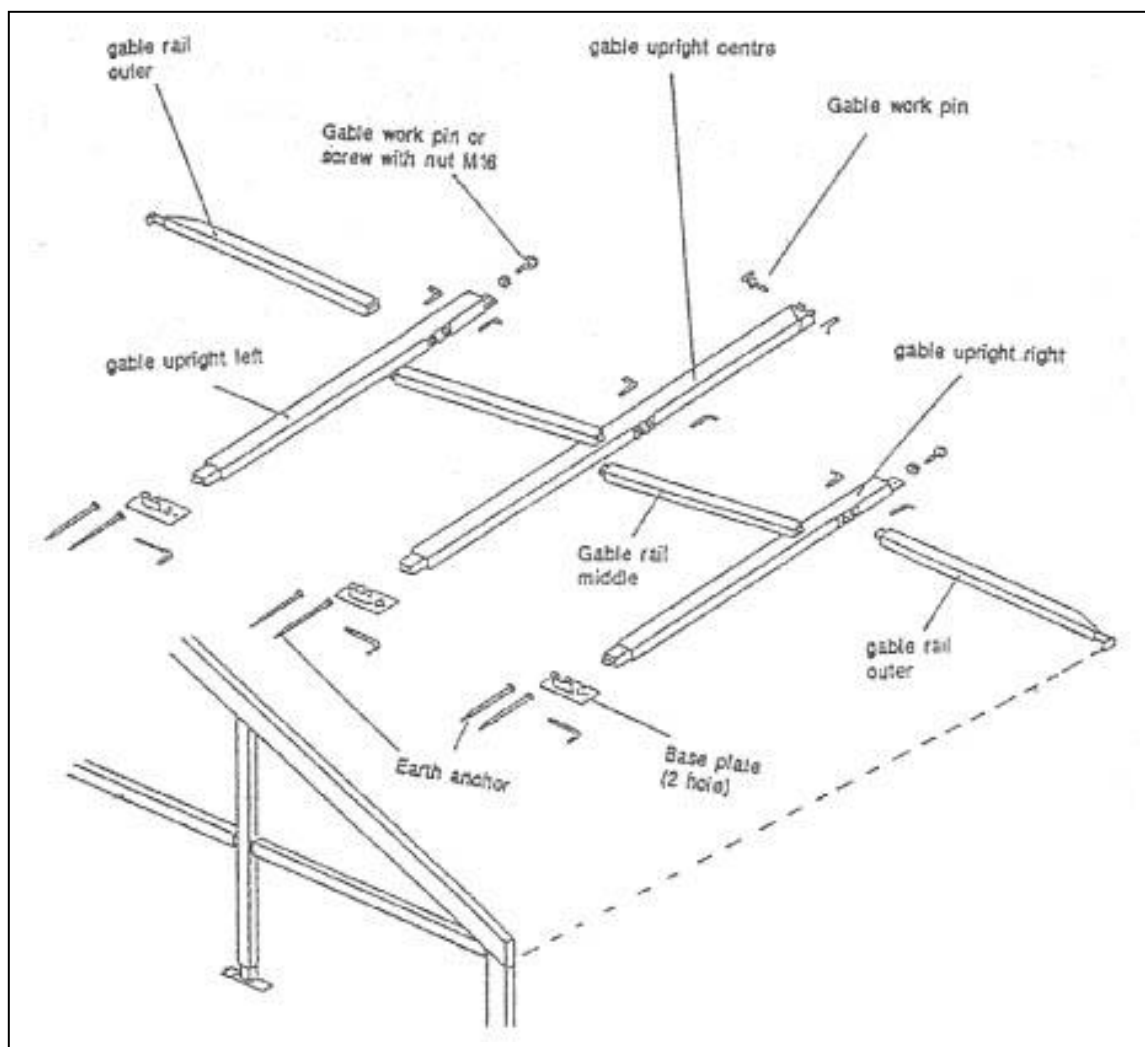
- All bay wires must be tensioned before proceeding with the construction of the structure.
- On the side, the wires are already secured on the upper holes.
- Attach ring bolt to the base plate, then tighten turnbuckle slightly.
- A ladder has to be used for the fastening of the roof wires.
- Attach roof wires into hole of beam above sliding connection.
- Slightly tighten the turnbuckles.
- The frame should be in a straight line when seen from the side.
- Disconnect lock off rod.
- The following two eave purlins and the following bay can be assembled.



11 GABLE UPRIGHTS AND GABLE RAILS

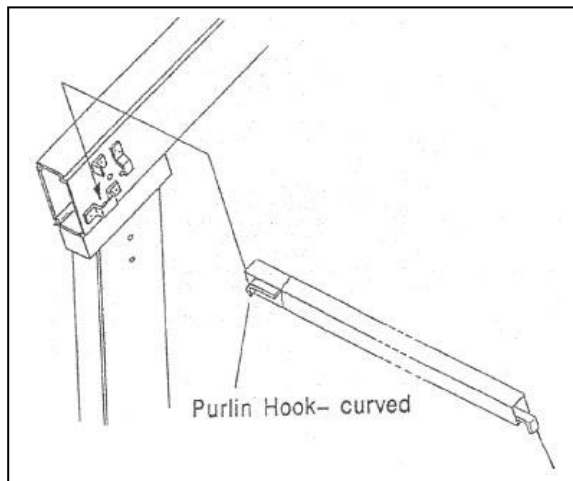
Materials Required

- 2 Gable Upright Centre
- 4 Gable Upright Side
- 4 Gable Rail Middle
- 4 Gable Rail Outer
- 6 Base Plates
- 12 800mm Earth Anchors
- 4 M16 Nuts And Bolts
- 12 Gable Work Pins
- 2 Flange Pins
- 6 Base Plate Pins



11.1 Construction Method

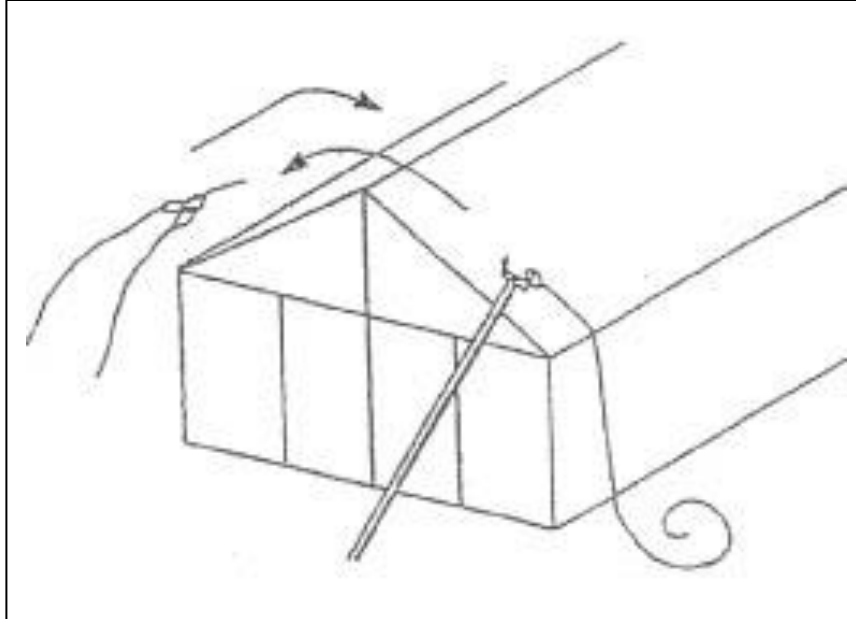
- Lay out gable uprights and gable rails on the inside of the structure.
- Attach gable uprights.
- Attach sliding inserts to base plates using pins and tighten bolt, which holds the sliding insert in place.
- Insert gable rails.
- Secure base plates with earth anchors.
- Insert remaining anchors to gable uprights base plates and hammer securely into the ground.

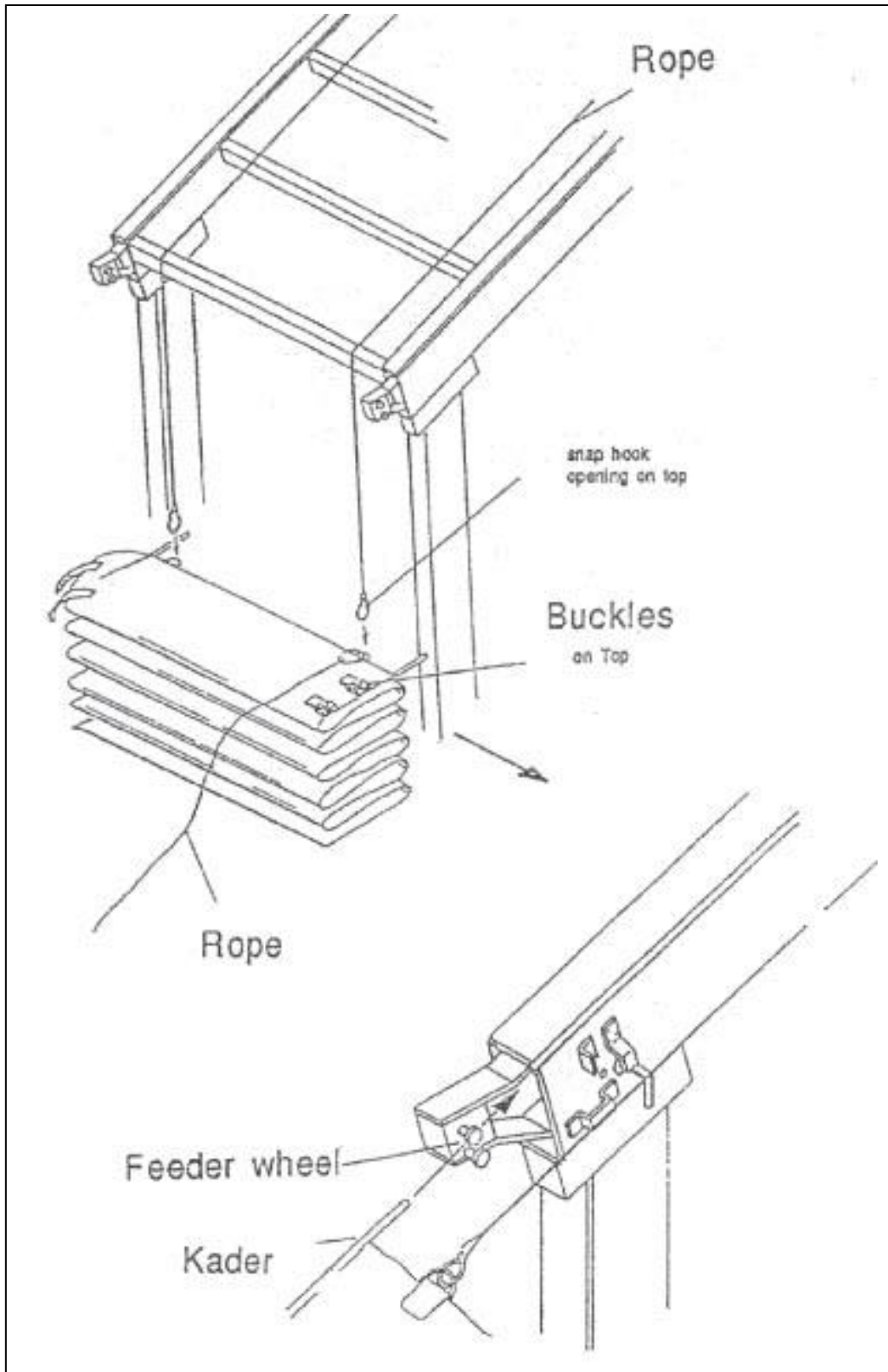


12 ROOF COVERS

Note: Three ropes will be required for pulling over the roof cover.

- Securely bolt the feeder wheels to the side on which the covers are to be fitted.
- Using a purlin fork, pull the first rope over the ridge.
- Hook 2 ropes onto the first one and now pull the first rope back.
- When the cover gets pulled over the frame, the rope, which is not being used, has to be hooked onto the cover, not that you can bring back the other 2 ropes for pulling on the next cover.
- Lay out cover (buckle to the outside). Hook in hooks of pullover ropes.
- The opening of the hook has to point upwards so that it doesn't open when pulling.
- Insert kader into kader track.
- Once the cover has been fed into kader track as per diagram, a minimum of 2 people must pull from the opposite side of frame.
- One person gives the command and the cover has to be pulled across evenly.
- About 30cm from the ridge, the cover has to be pulled all the way over the ridge.





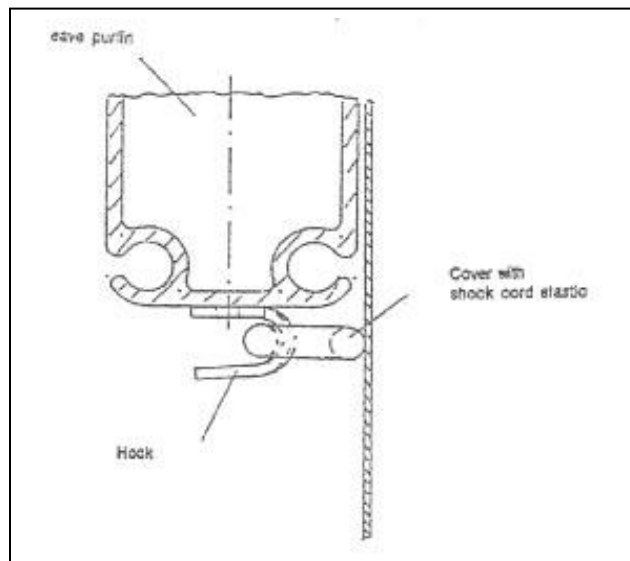
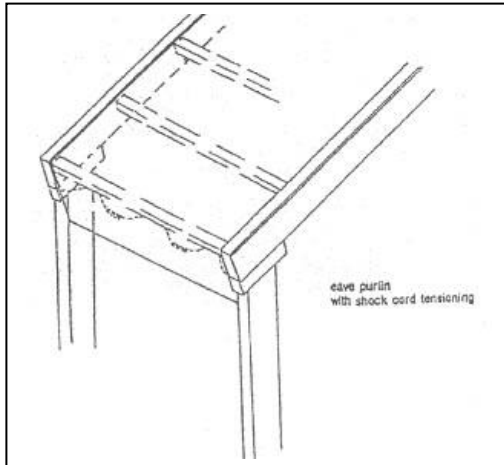
12.1 Bar Tensioning

- When all roof covers are attached to the frame, insert tension bar into roof cover pockets.
- Insert tension connector and hook on tension strap.
- Hook tension strap hook into hole in leg. Take ratchet and tighten it evenly on both ends of the tension bar.

12.2 Shock Cord Tensioning

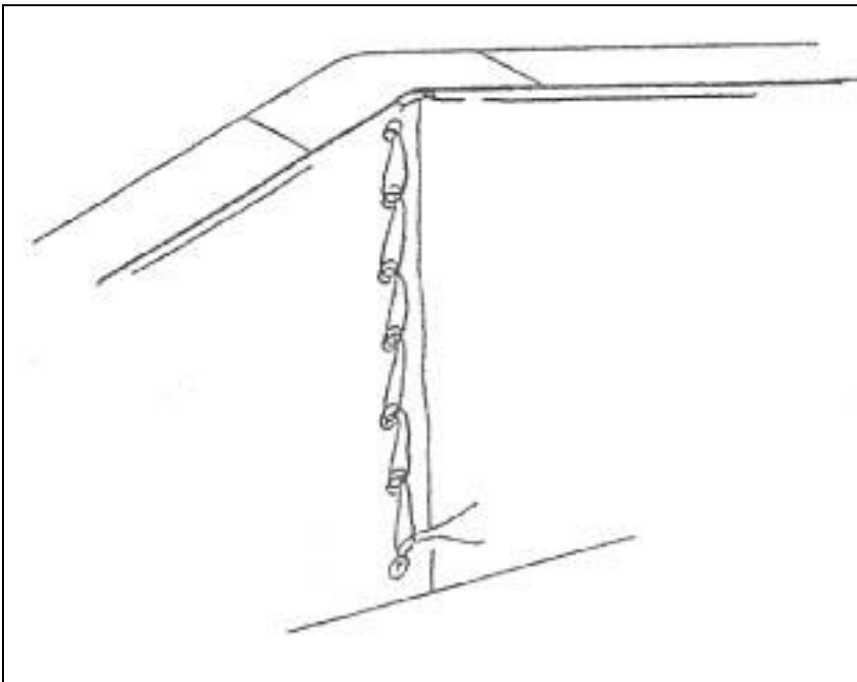
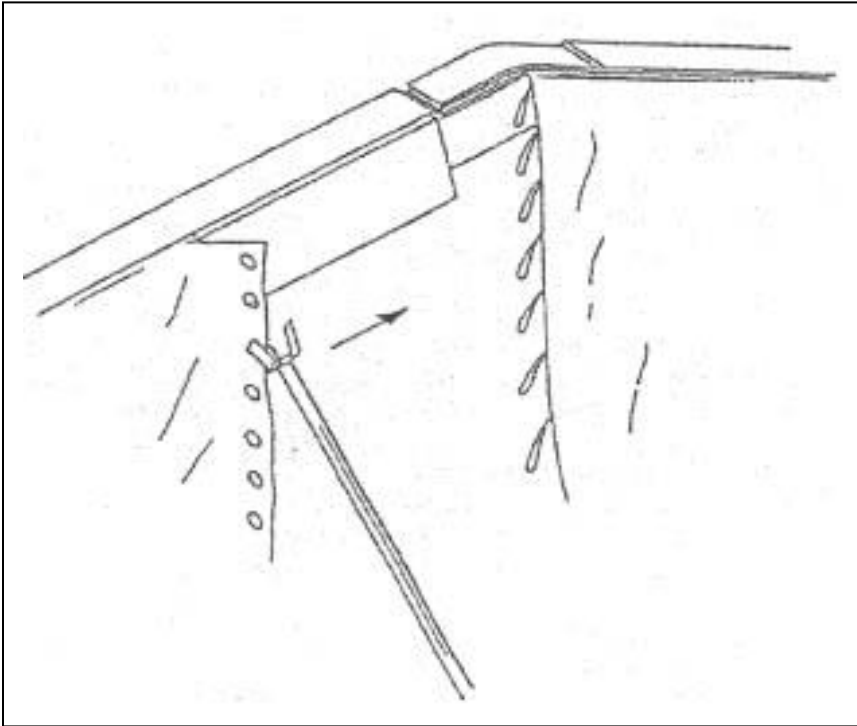
- When all roof covers are over the frame put the shock cord elastic around the eave purlin on one side and fix it to the hooks on the purlin.
- Put the shock cord elastic around the second eave purlin and fix it to the hooks on the purlin.

Note: Tensioning should be commenced at both ends of the structure and finished in the centre.



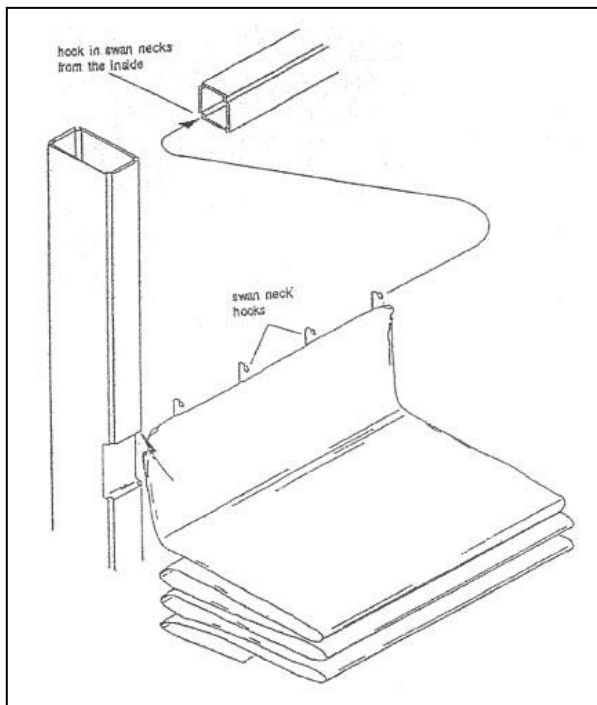
12.3 Fitting of gable triangle

- Pull cover with help of purlin fork to gable centre, making sure that laces are on the inside.
- Lace from top to bottom as per diagram
- Knot the bottom lace.



12.4 Fitting of side and gable walls

- Feed lower half of the covers into the kader and push downwards.
- Insert over into the kader and push upwards.
- Ensure that the kader hooks on the side walls point outwards and that the kader hooks on the gables point inwards.
- Hook in swan neck hooks into kader track of gable rails and eave purlins.
- Lace as per gable triangles.
- Insert ground rails into sidewall pockets.
- Attach ground rail to base plate pins.
- Secure with R-clips.
- Insert ground rails into gable wall pockets.
- Attach ground rail to the ringbolt of the leg wire.
- Secure with R-clip.
- Secure roof flaps with buckles.



13 DISMANTLING

- Remove ground rails.
 - Attach lock off rod to the first frame (last frame to be taken down).
 - Unhook side and gable walls - lay on protective sheet and fold.
 - Unhook gable triangles, also lay on protective sheet and fold.
 - Remove roof cover tensioning.
 - Remove roof covers and lay on protective sheet and fold.
 - Remove gable rails then gable uprights.
 - Loosen wires on first frame but do not remove.
 - Attach push up bar onto first frame.
 - Remove leg wires
 - Unscrew roof wires on bottom of beam (see page 8).
 - Remove purlins
- Note:** Purlins are the only thing still holding the frame up.
- Loosen lock off rod at bottom, each lock off rod and push up bar has to be secured by one person (see point 2 in brackets, if lock off rod is attached to the last frame, point 13 is not necessary).
 - Lay down first frame.
 - Dismantle beams, legs and ridge connectors.
 - For dismantling middle bays, follow points 8, 12, 13, 14 and 15.
 - When reaching wire bay, dismantle covers as described in points 8, 10, 12, 13, 14 and 15
 - With last frame, follow points 1 to 10.
 - Pull anchors using the peg puller.
 - Load base plates and anchors.

14 MAINTENANCE INSTRUCTION

14.1 Tent - Construction

You must tension the roof - side - wires and screws after:

- a period longer than 3 months (and every 3 months after that)
- a heat period
- a storm

You have to check that the earth anchors are still fixed. Damaged parts must be changed as quickly as possible

14.2 For Storage and Transport

You must store and transport the aluminum profiles on the small side. Please, check that no parts will be damaged by the transportation.

14.3 Examination

You have to make an examination before and after the erection.

For long term hire an inspection must be conducted every month to ensure that..

- All purlins must be in the right position.
- Examine bolt and screw connections to ensure that they are secure.

15 TECHNICAL DETAILS OF THE STRUCTURE

Min Length:	20m
Max. Length:	any
Width:	20m
Roof Height:	6.27m
Side Height:	3.00m
Roof Pitch:	18
Leg Profile:	220 X 100mm
Beam Profile:	220 X 100mm
Eave & Ridge Purlin Profile:	130 X 70mm
Gable Uprights Profile:	130 X 70mm
Gable Purlins Profile:	130 X 70mm
Purlin Profile:	60 X 60mm
Bay Distance (Centres):	5m
Gable Upright Distance:	4m / 5,0m
Main Construction:	Aluminium
Connecting Parts:	Galvanised Steel
Connection (Leg/Beam)	Sliding Eave Connection
Anchorage:	Earth Anchors
Load Assumptions:	Wind Load 0,5 Kn/m ² Snow Load, According To Din 4112
Max. Wind Speed	100 Km/H