Lightweight Toilet Superstructures

Installation & Assembly Guide

WATER RESEARCH COMMISSION

TT 484/10

LIGHTWEIGHT TOILET SUPERSTRUCTURES – MANUFACTURING GUIDE

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Report to the
Water Research Commission

by

University of Pretoria

WRC Report No. TT 483/10

March 2011

Obtainable from

Water Research Commission
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The publication of this report emanates from a project entitled *Lightweight moveable superstructures for VIP toilets* (WRC Project No. K5/1781)

This report forms part of a series of three reports. The other reports in the series are:
Lightweight moveable superstructures for VIP toilets (WRC Report No. 1781/1/100, and
Lightweight Toilet Superstructures: installation & Assembly guide (WRC Report No TT 484/10)

ISBN 978-4312-1-0093-1
Set No. 978-1-4312-0095-5

Printed in the Republic of South Africa

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Manual explained

This manual has been compiled to make the installation process of the toilet system on the right as simple as possible. Please take the time to read the instructions as they will guide you step by step through the process. There are 4 main steps involved in the installation process.

1) Installation of the Base components
2) Installation of the Panel components
3) Finishing procedures
4) Basic quality control test

Warning!!! – Serious injury may occur during assembly if the right precautions aren't met. Make sure you wear a hard hat, gloves and steel-cap boots during assembly.

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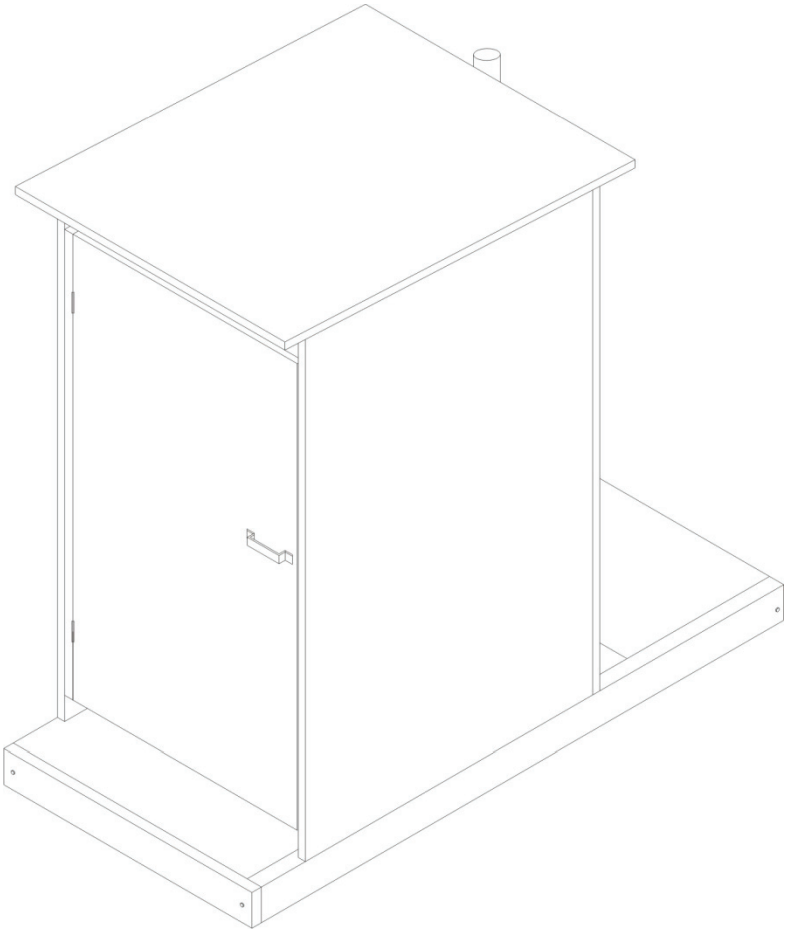
Lightweight Toilet Superstructure

Tools & Labour

You will require 1 x no 17 Spanner, a flat screw driver, a rubber mallet(hammer), & a team of 3 people to install the toilet structure as it is shown above. Please use correct safety equipment for installation.

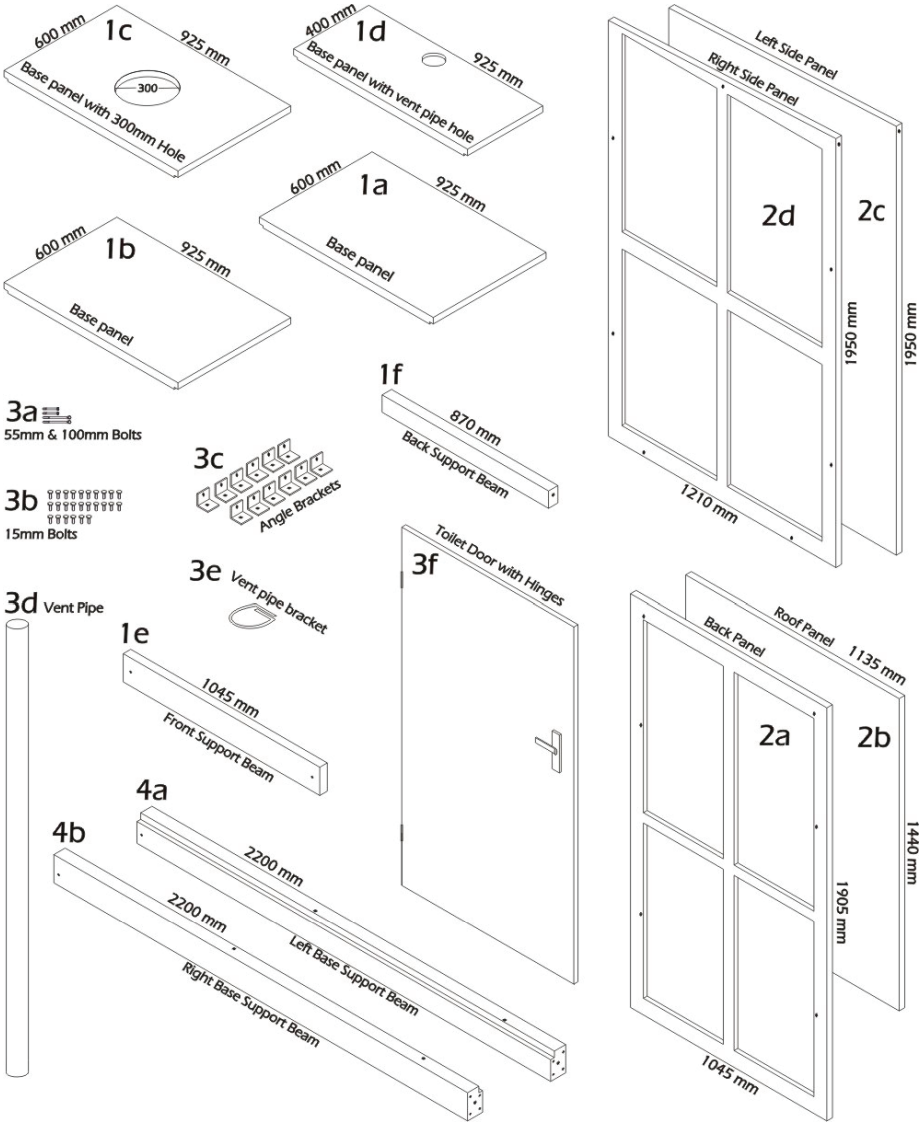


Components - Check List

To assemble the system as shown on the previous page you will need the following components.

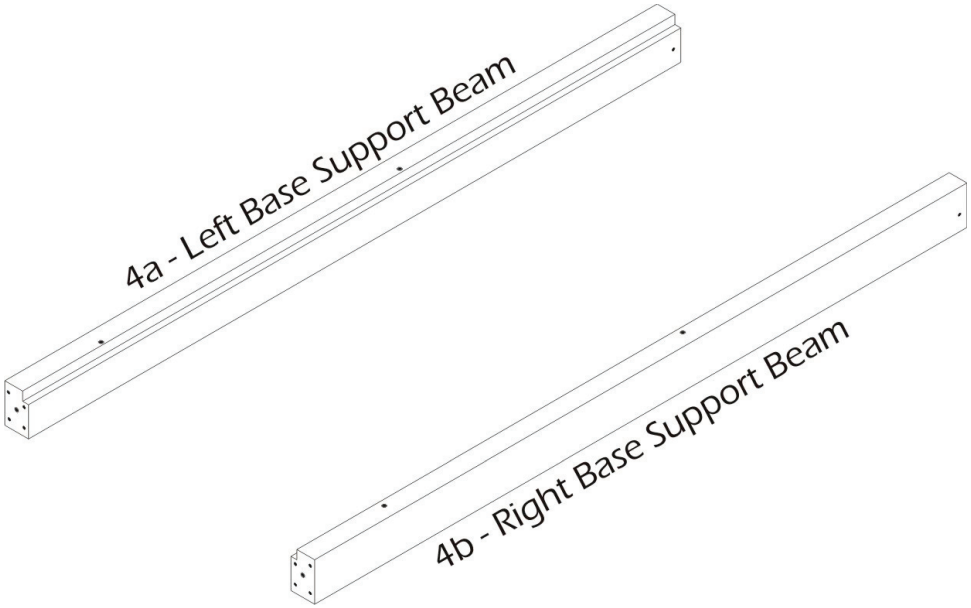
1a – 1 x Base Panels(no holes or pipe inserts)
1b – 1 x Base Panels(no holes or pipe inserts)
1c – 1 x Base Panel with 300mm hole
1d – 1 x Base Panel with Vent Pipe hole
1e – 1 x Front Cross Beam
1f – 1 x Back Cross Beam
2a – 1 x Back Panel
2b – 1 x Roof Panel
2c – 1 x Left Side Panel
2d – 1 x Right Side Panel(Inverse of Left Panel)
3a – 2 x M10 55mm & 2 x M10 100mm Galvanized Bolts
3b – 26 x M10 15mm Galvanized Bolts
3c – 12 x Aluminium Angle Brackets
3d – 1 x Vent Pipe
3e – 1 x Vent Pipe Bracket
3f – 1 x Toilet door & hinges
4a – 1 x Left Base Support Beam
4b – 1 x Right Base Support Beam

All Components

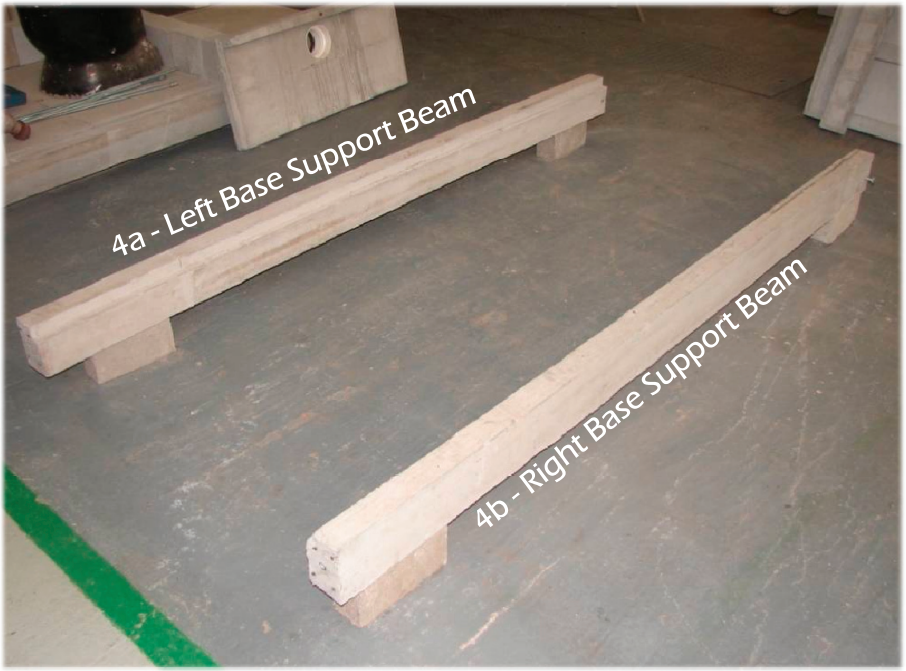


Step 1

- Place the left & right base support beams into position.
- Make sure they are level and the recesses are pointing towards the inside of the system, as shown below.



Placing of two BASE SUPPORT BEAMS

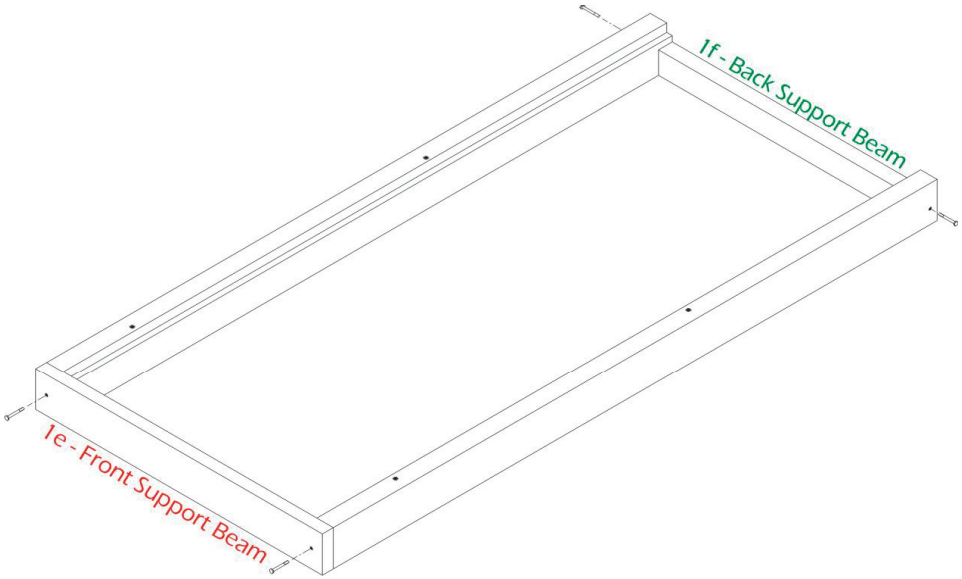


NB! It is important to make sure the surface is level onto which the beams are to be placed.

Step 2

-Wedge the Back support beam into place, and fasten the bolts as displayed below. Make sure not to over tighten the bolts as they might strip.

- Place the Front support beam into place and fasten the bolts as displayed below. Once again don't over tighten the bolts.



Fastening of BACK & FRONT SUPPORT BEAMS

1) Insert bolts into hole

1) Check if bolt screws in

2) Line up back beam

2) Line up front beam

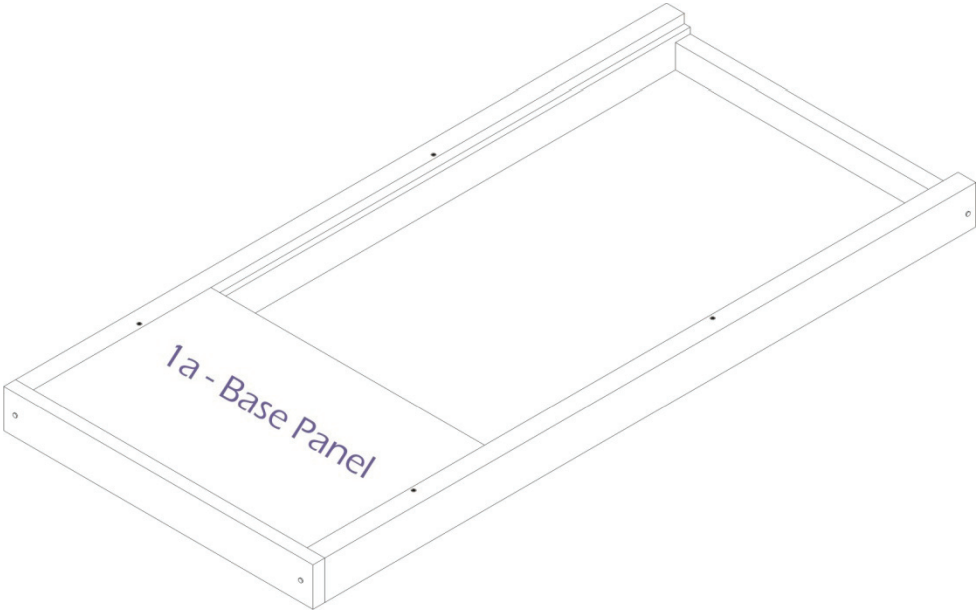
3) Fasten bolt with 17 spanner

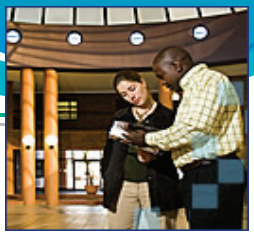
3) Fasten bolt with 17 spanner

NB! Make sure not to over tighten the bolts as this could cause them to strip.

Step 3

- Make sure the inside ridges of the beams are cleaned with a brush or cloth.
- Place the first Base Panel into place as displayed below, making sure it's flush with the front support beam.

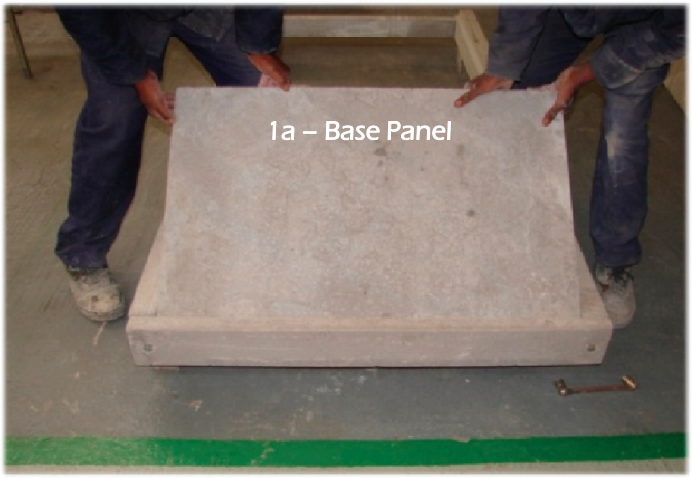




Preparing and placing of BASE PANELS

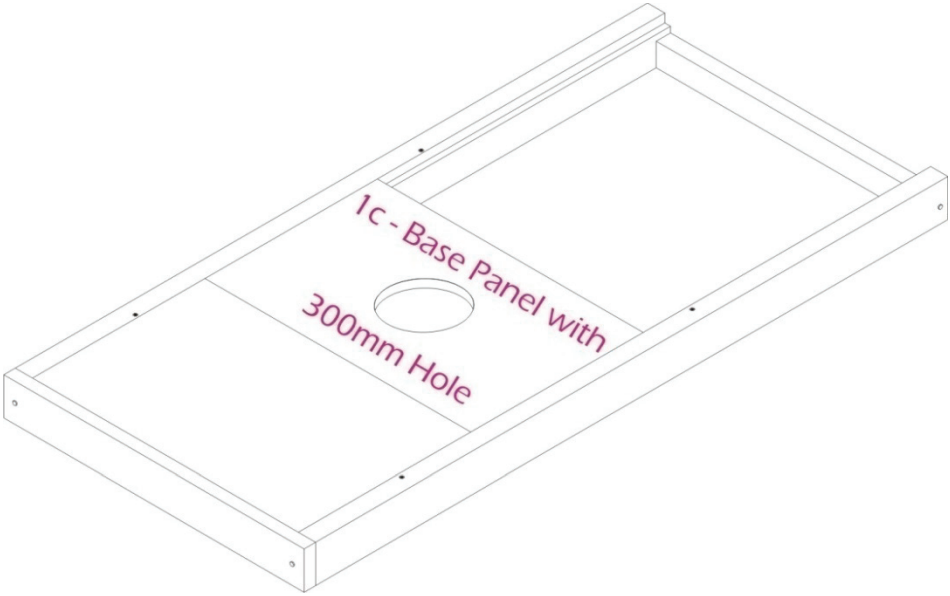
1) Clean the inside ridges thoroughly

2) Place the first Base Panel into position



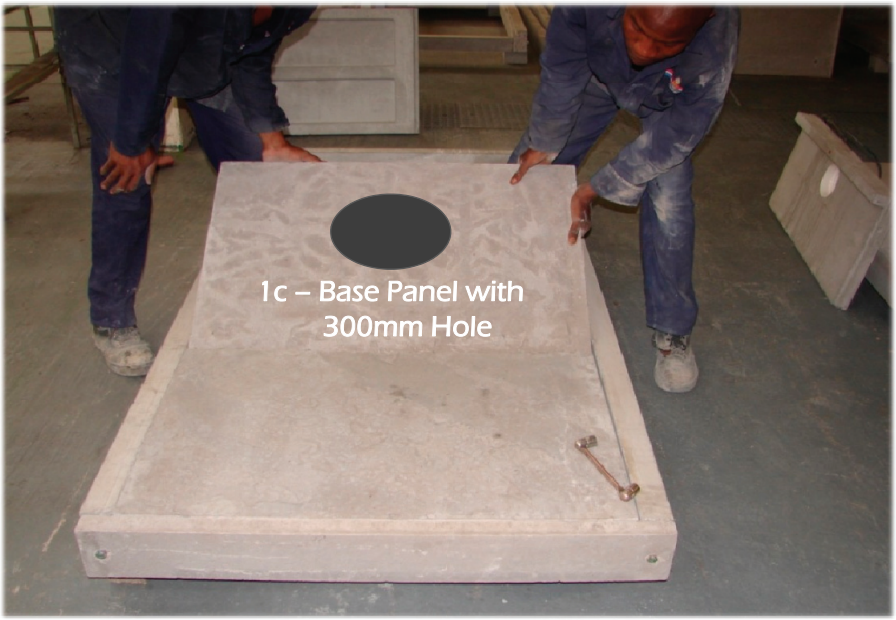
Step 4

- Place the Base Panel with 300mm Hole into place as displayed below, making sure it's flush with the first base plate.



Placing of BASE PANEL WITH 300mm HOLE

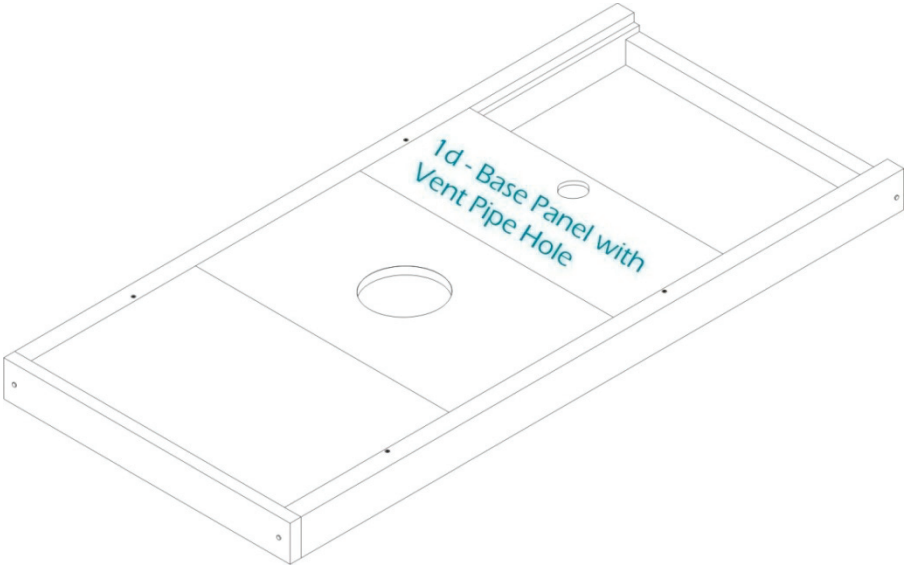
1) Place the panel with 300mm Hole into position as shown below.



NB! Watch your fingers when releasing the panel.

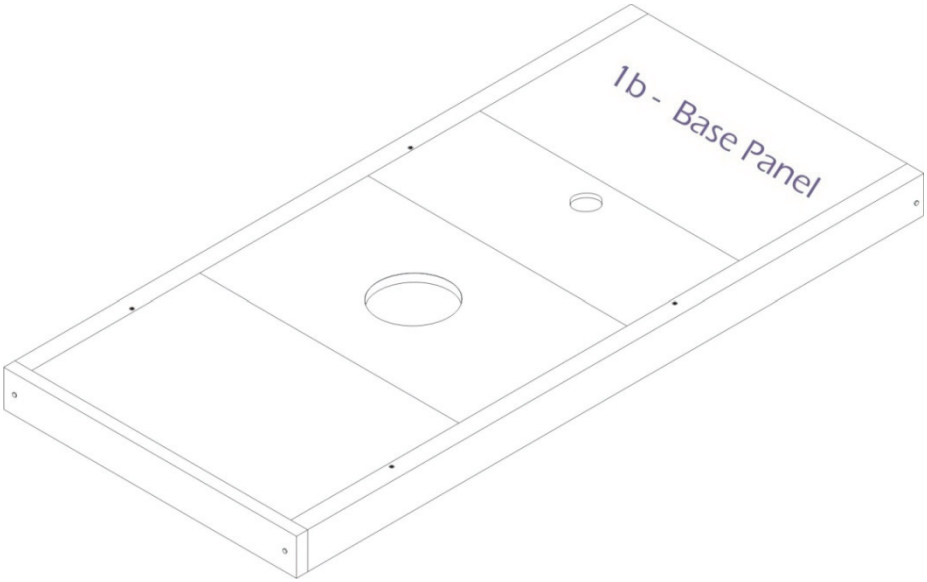
Step 5

- Place the Base Panel with Vent Pipe hole into place as displayed below, making sure it's flush with the "Base Panel with 300mm Hole".



Step 6

- Place the second Base Panel into place as displayed below, making sure it's flush with the "Base Panel with PVC Waste".
- The base installation is now complete.



2 - Panel Installation

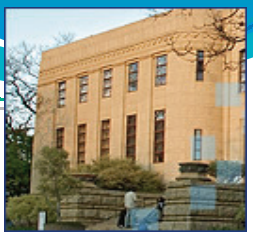
Step 1

- Place the left side panel into position, as displayed below, making sure the holes of the base and side panel align in such a way that the angle brackets can be bolted on, to keep the panel in place.
- NB! Don't let go of the panel. Hold it in place until the back panel has been fastened.

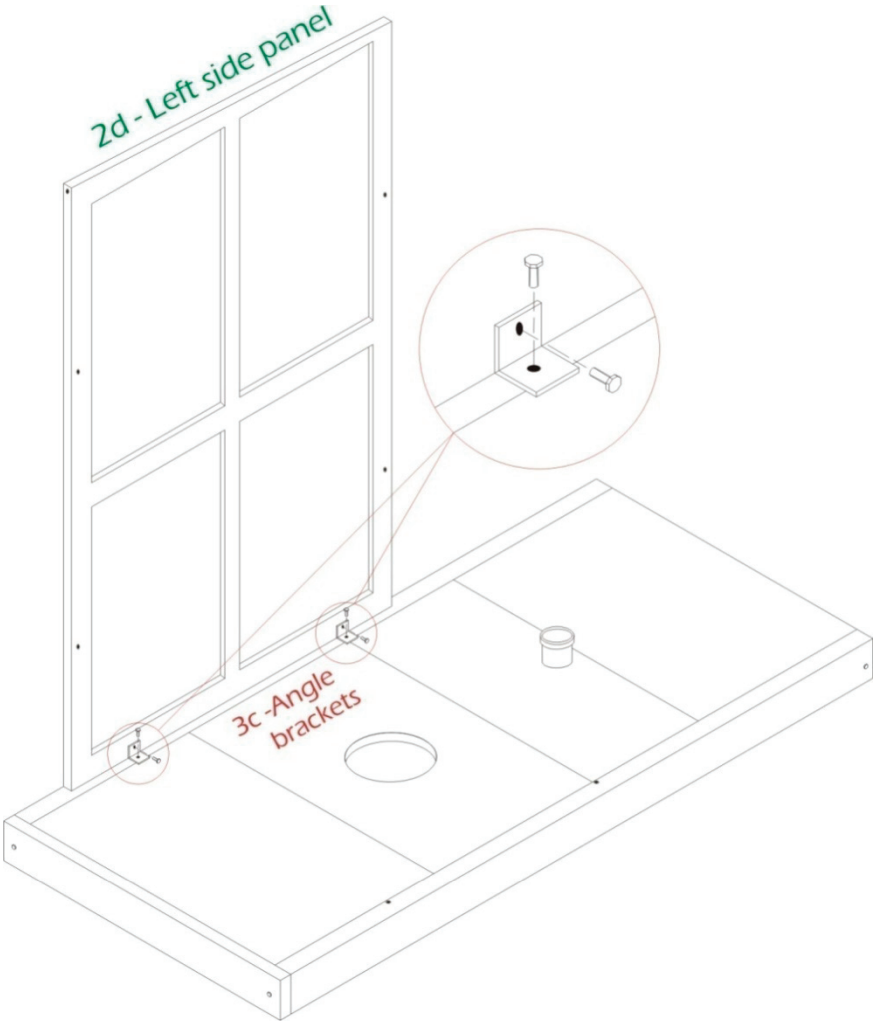
Placing of LEFT SIDE PANEL

The picture above clearly shows that two people can carry the panels without much effort.

2d – Left Side Panel



Placing of LEFT SIDE PANEL & fastening brackets

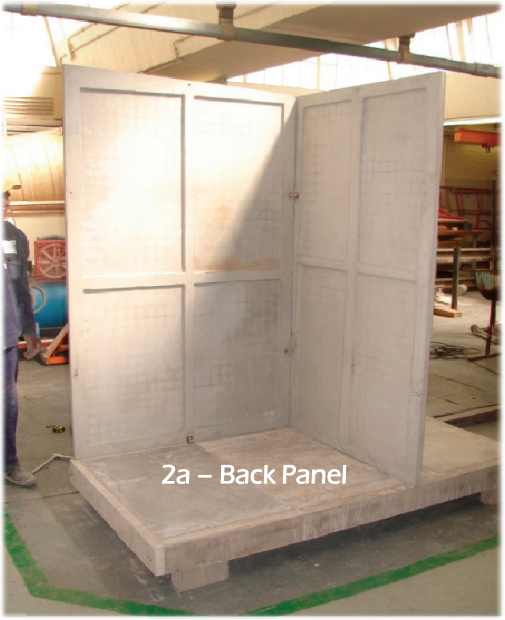


NB! Don't let go of the panel until the second panel has been fastened.

Step 2
- Place the back panel into position, as displayed on the right, making sure the holes of the back and side panel align in such a way that the angle brackets can be bolted on, to keep the panels in place. It is now safe to let go of the left side panel.

Placing of BACK PANEL

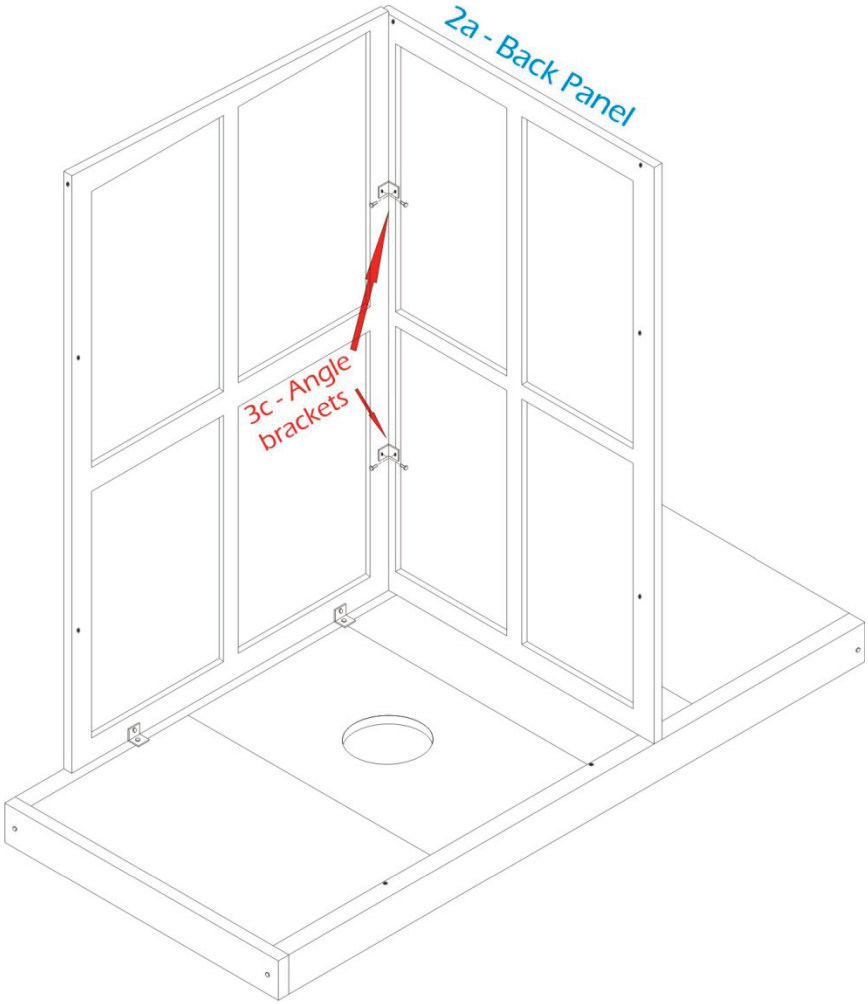
Fastened angle bracket below.



2a – Back Panel

The Left Side Panel can now stand on it's own.

Placing of Back Panel & fastening brackets



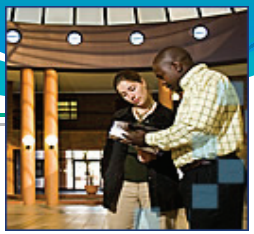
Step 3

- Place the right side panel into position, as displayed on the right, making sure the holes of the back and side panel align in such a way that the angle brackets can be bolted on, to keep the panel in place.

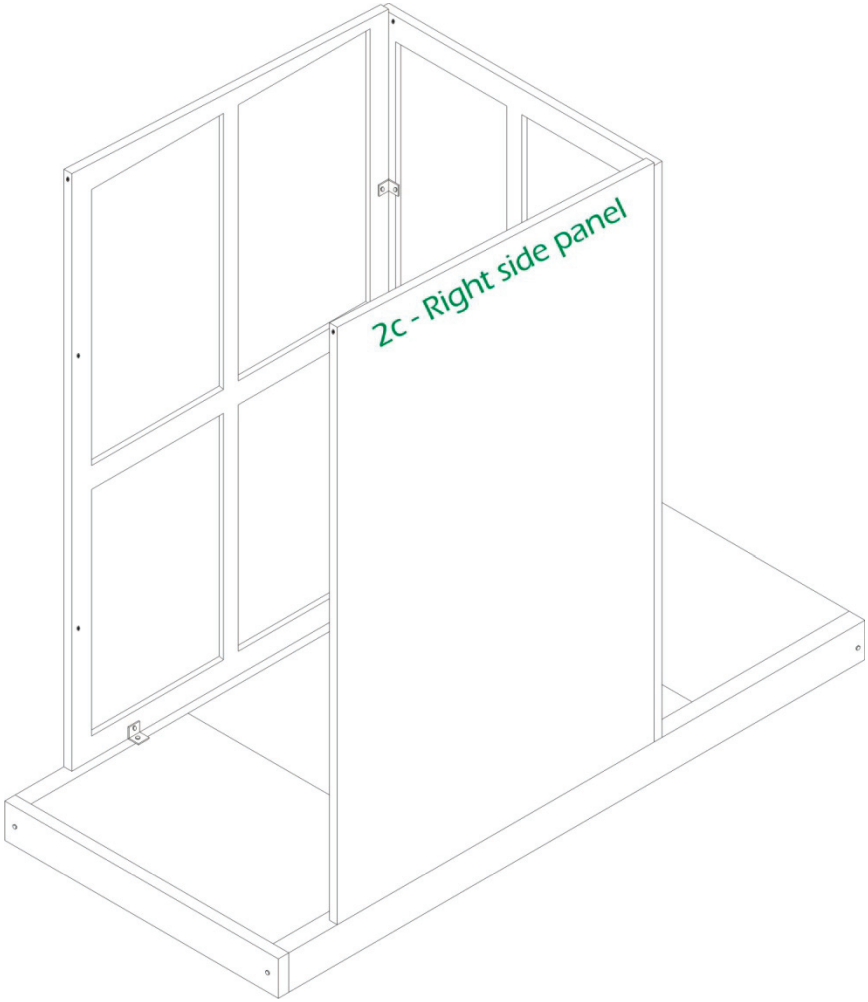
Placing of RIGHT SIDE PANEL

A positive attitude gives these workers the leading edge.

2c – Right Side Panel



Placing of RIGHT SIDE PANEL & fastening brackets



Step 4

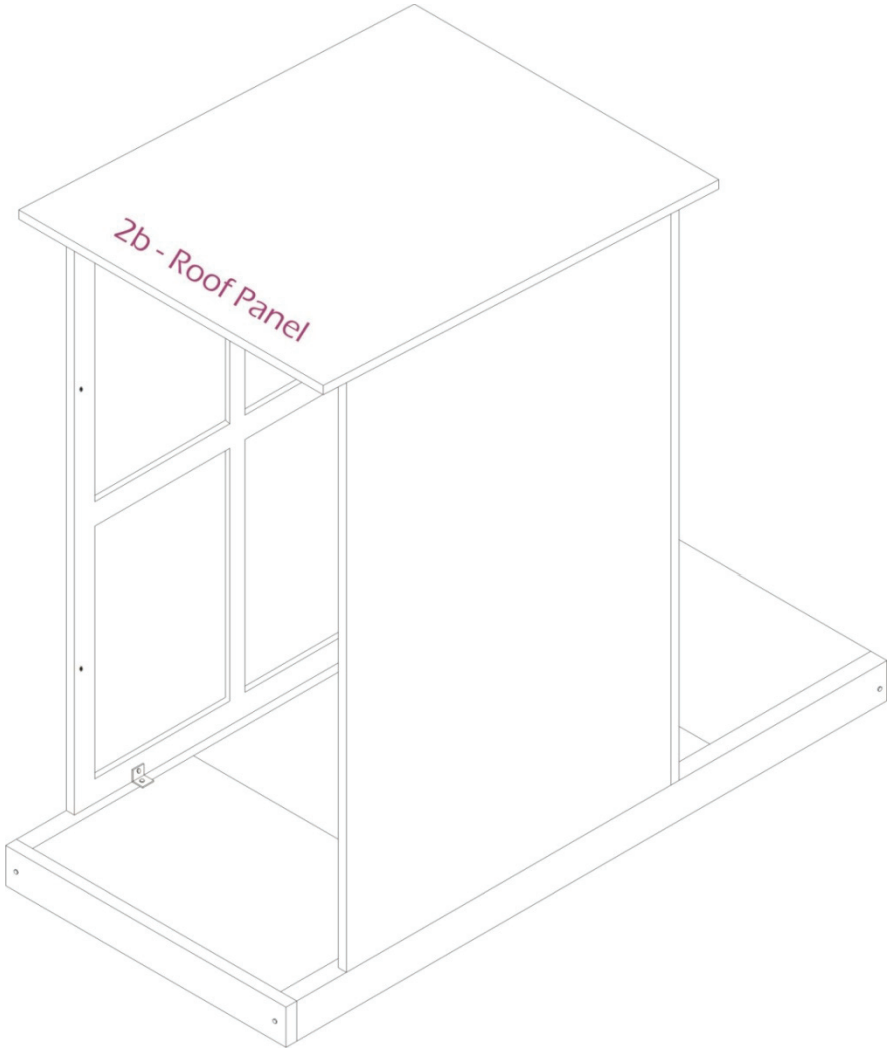
- Slide the roof panel into position from the back, as displayed below, making sure the holes of the roof and side panels, as well as the back panel align in such a way that the angle brackets can be bolted on, to keep the panel in place. Caution, the panel is heavy!

Placing of ROOF PANEL

2b – Roof Panel

Caution when sliding the panel into place. Make sure the person on the inside checks the edges so that the panel doesn't slide off the sides.

Placing of ROOF PANEL & fastening brackets

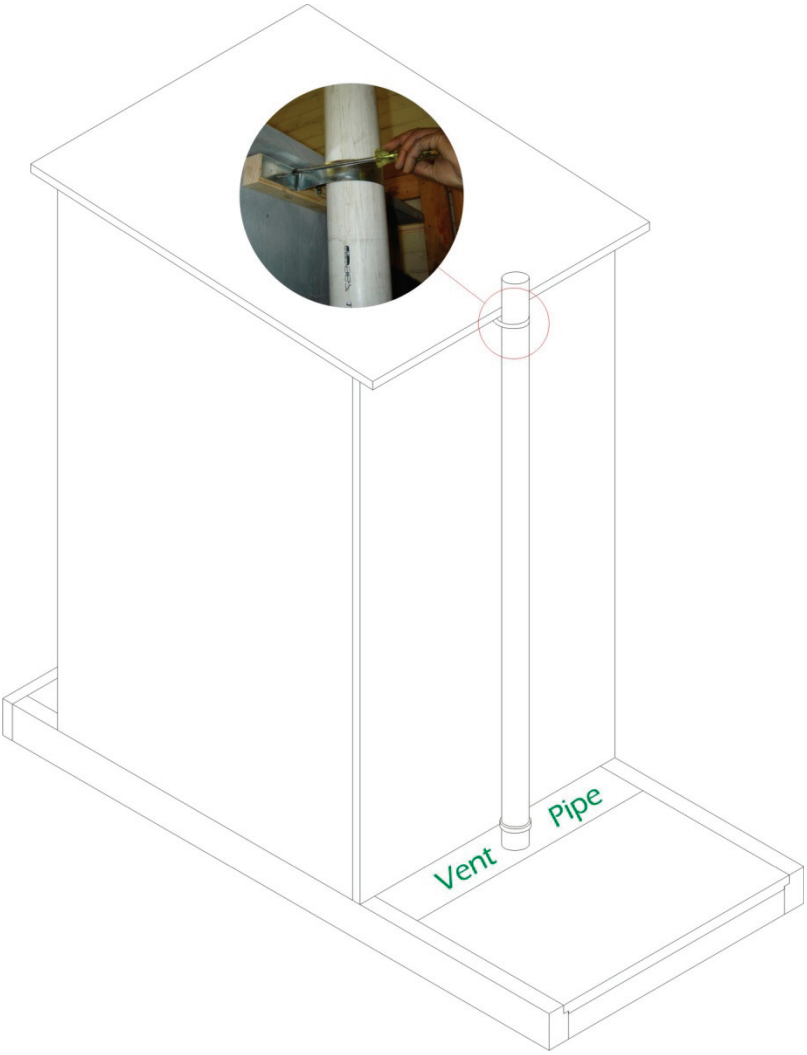


Step 5

- Fix the vent pipe into place, then bolt the supplied vent pipe bracket into position using a 25mm M10 Galvanized bolt.

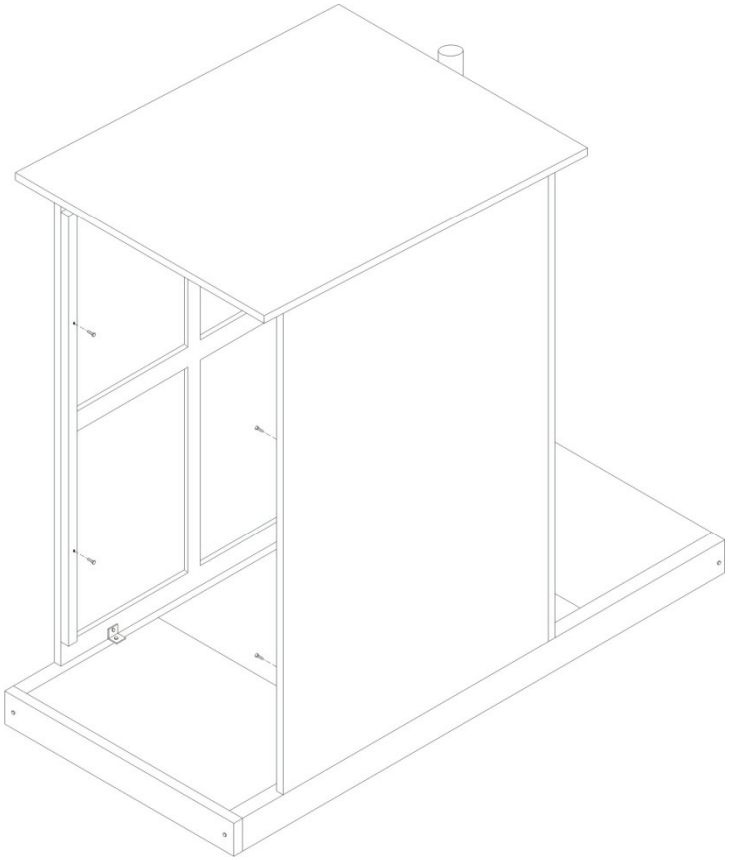
3d – Vent Pipe

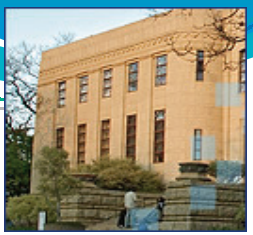
Fastening of vent pipe bracket



Step 6

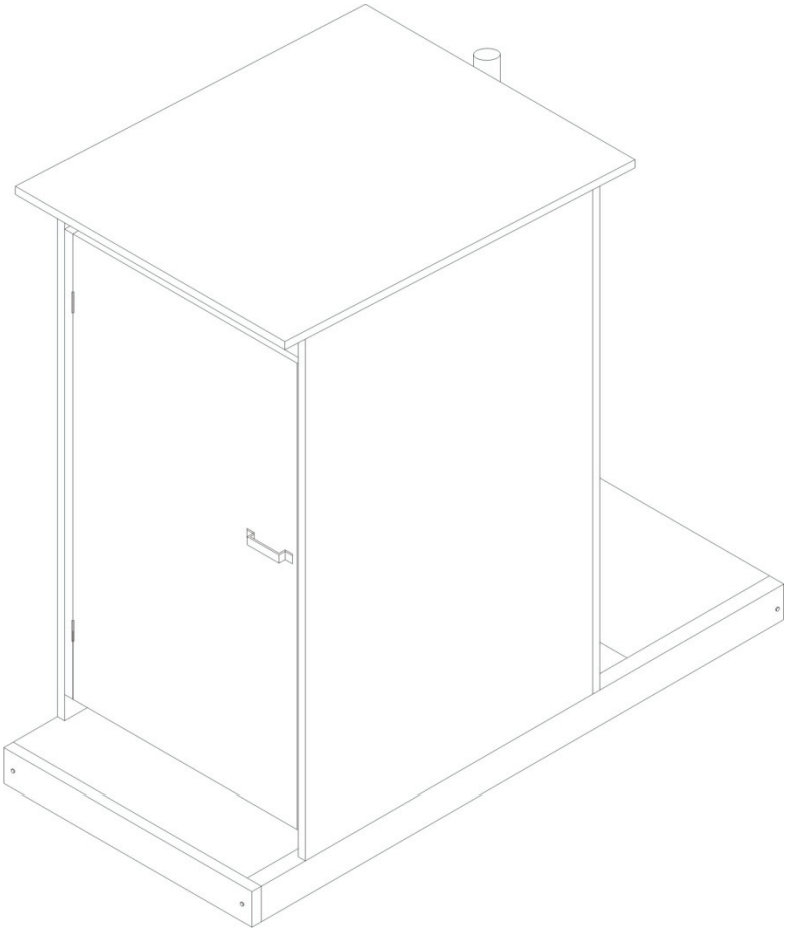
- Fasten a 1.9m length of 38x38x2mm Square tubing, using the supplied 25mm M10 bolts, and a 1.9m length of 40mm angle iron onto the opposite side.





Step 7

- Install the door with normal self latch galvanized hinges to complete the installation of the Toilet System.



3 – Recommendations

- Erect the structure close to your home for future water supply.

- Paint the entire structure to beautify.

- Paint the inside floor with a rubberise paint for easy cleaning purposes.

- Paint the underside of the structure with a acid resistant, rubberised paint before assembly. This will greatly increase the lifespan of the toilet.

- When the old pit is full, dig a new pit and fill the old one with the soil from the new hole. Then simply pull the structure with a bakkie onto the new pit.

4 – Quality Control

TEST 1 – Light a small peace of tissue or news paper and throw it into the toilet pit/hole then quickly check outside if smoke is coming from the Vent Pipe. This test is run to check for proper ventilation.

TEST 2 – Pour a bucket of water over the roof and throw one against the walls to check for any leaks on the inside.

TEST 3 – Check all bolts to make sure they have been tightened properly.

TEST 4 – Bump Test: If available test the walls for structural stability by using a pendulum tripod with a sand bag. If not then just ram the wall with the shoulder to see if it gives way. If the walls buckle/ crack or break then there is no re-enforcing steel present and the product is a reject.

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