

Plans for 110L Half Drum Brick Rocket Stove



Designed by Peter Scott/
GTZ ProBEC August 2005

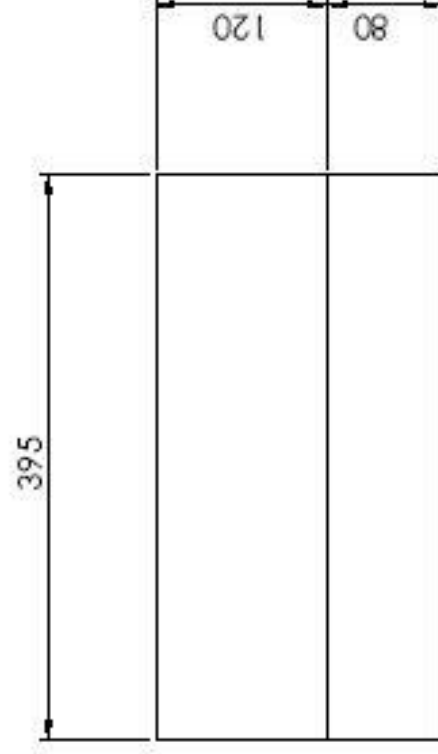
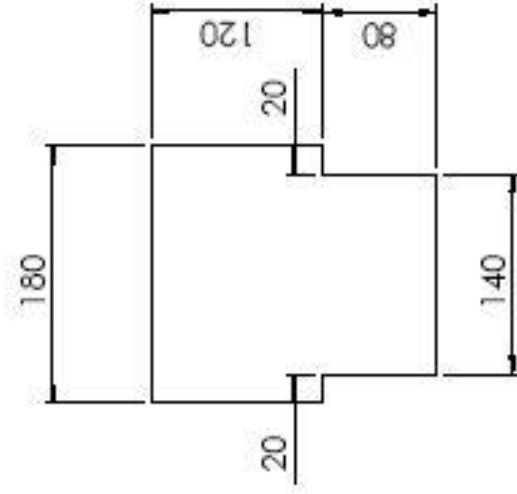
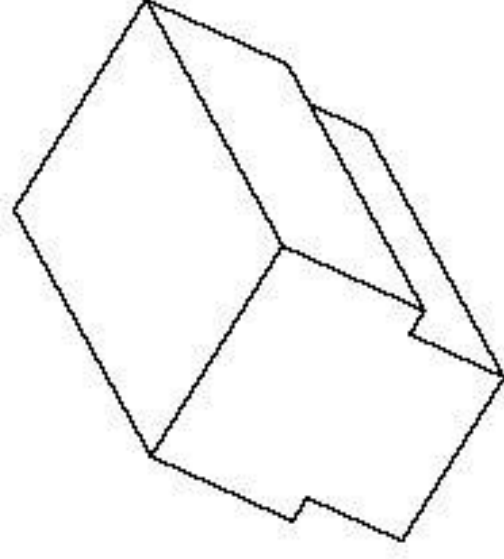
Materials for constructing the 110L Drum Brick Stove

This stove is designed for use with half a 220L drum (or equivalent)

- 500 common Bricks for stove body + 100 for foundation if needed
- 2-3 bags cement
- 10-15 sacs of sand
- 25 kg of HTM High temp mortar from Dedza pottery
- Three 100L Bag of fine Sawdust
- 8 Refractory Insulative Dedza Bricks. Ref # EKIB/3 made to fit the 18 by 18 cm combustion chamber
 - 3 large bricks @ 278 by 274 by 46 mm
 - 4 medium bricks @ 278 by 171 by 46 mm
 - 1 small brick @ 170 by 170 by 46 mm
- Pot stabilizer: 3 m of 10 mm round bar
5 m of 3-5 mm by 50 mm flat bar
- Shelf 170 by 455 piece of mild or stainless steel flat plate . Cast Iron is actually more durable and should be used if available.
- 1 wooden combustion chamber mould (see following page for dimensions)

For more information about the Rocket Stove please contact Peter Scott at apropeter@hotmail.com or in Malawi contact Andi Michel at 08 515922

Wooden mold for a brick stove
combustion chamber 180 x 180
for usage with a flat shelf



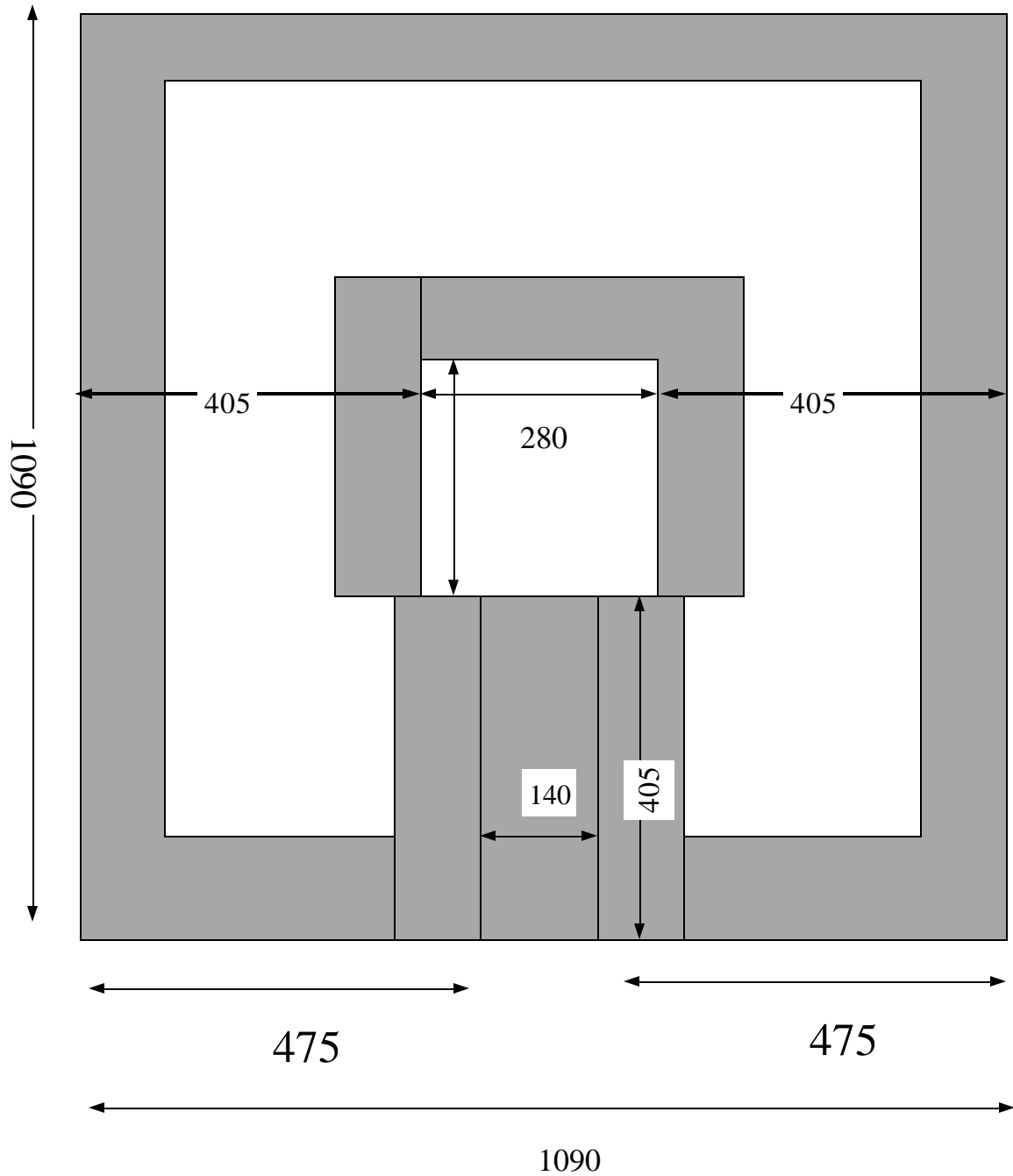
Detail of combustion chamber construction made with wooden form .

The wooden form will create two ledges that will support the 4.5 mm shelf.

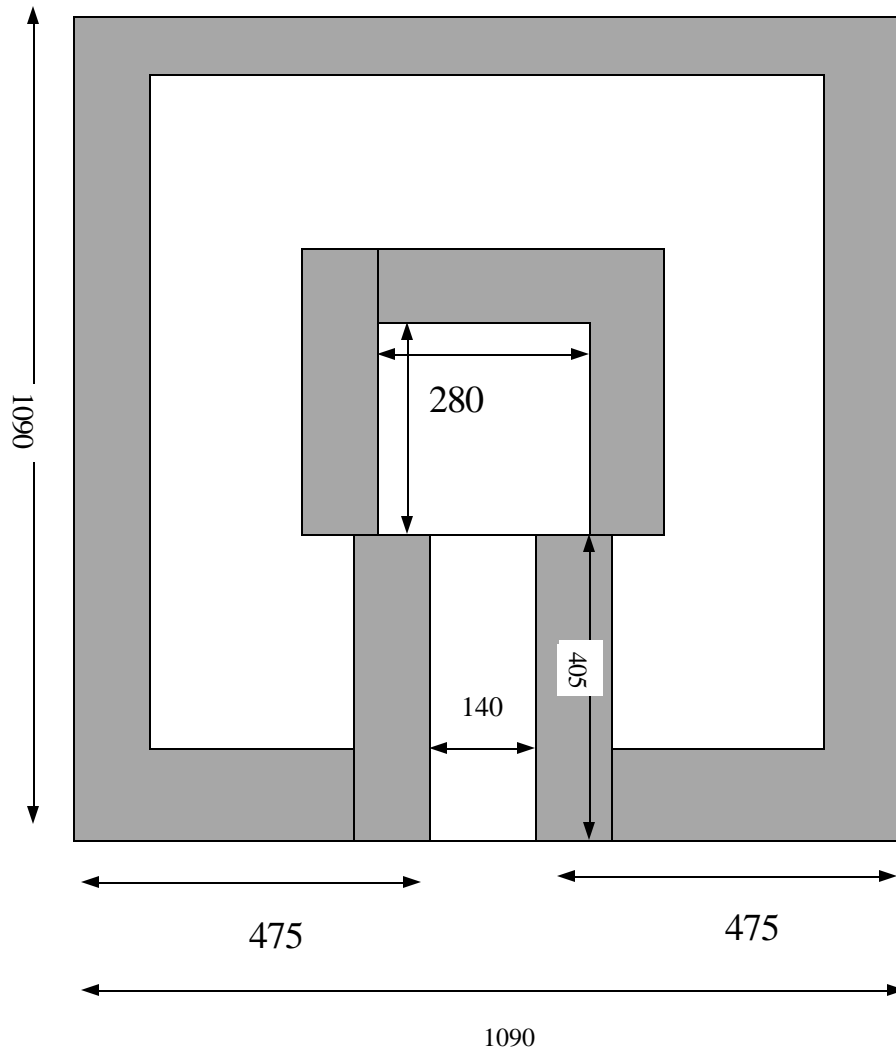
No legs are needed for the shelf



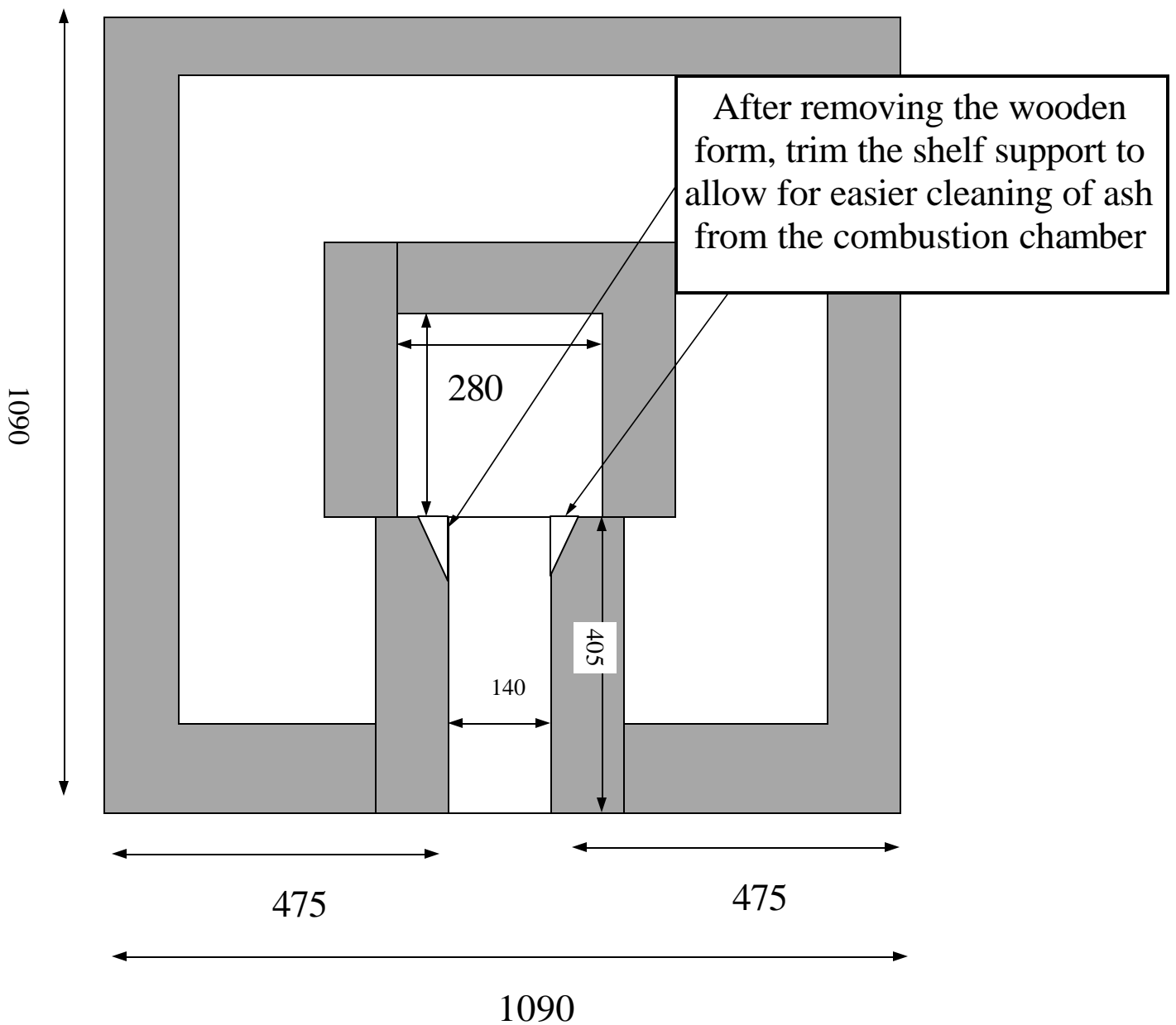
110L Drum Stove
1st course / Top view
Use wooden form for correct dimensions of
combustion chamber



110L Drum Stove
2nd course / Top view
Use wooden form for correct dimensions of
combustion chamber

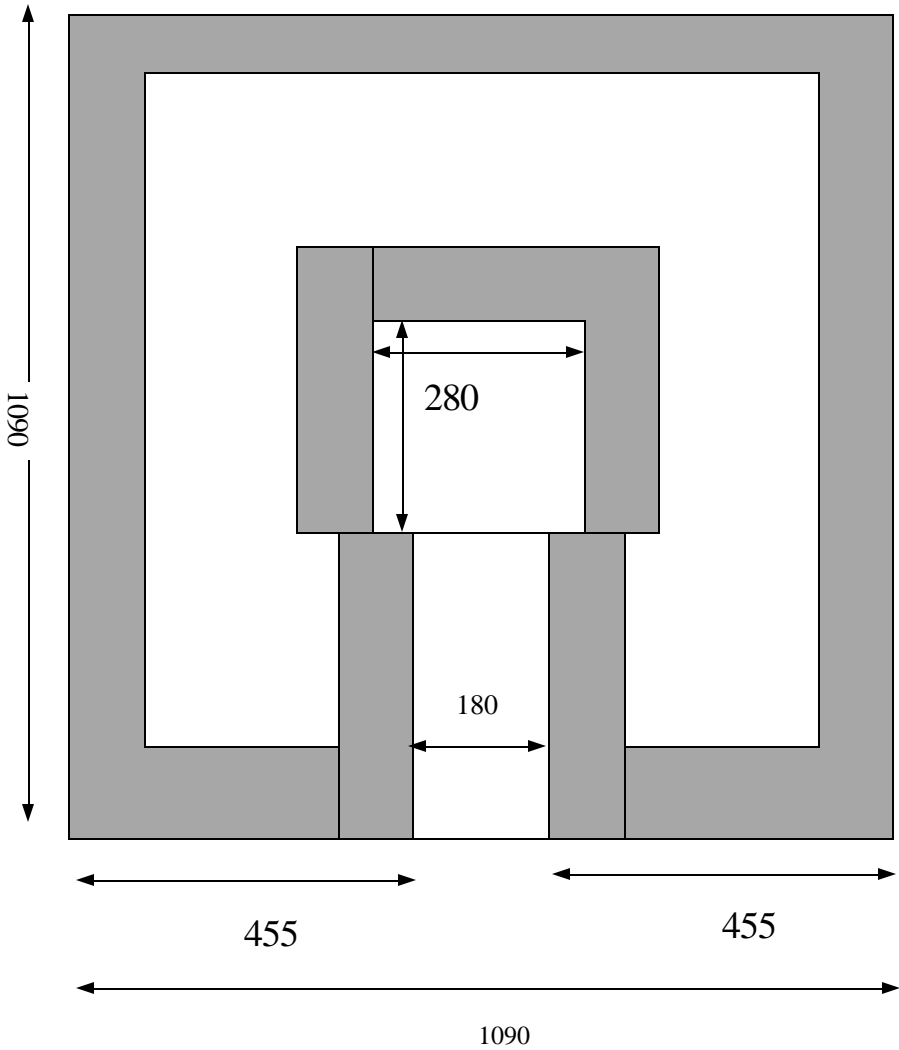


110L Drum Stove
2nd course / Top view
Trim the ledge to allow for easier cleaning of
the combustion chamber



110L Drum Stove

3rd course / Top view



Brick Assembly

The combustion chamber requires **8 Bricks**

3 large bricks @ 278 by 274 by 46 mm
4 medium bricks @ 278 by 171 by 46 mm
1 small brick @ 170 by 170 by 46 mm

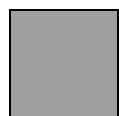
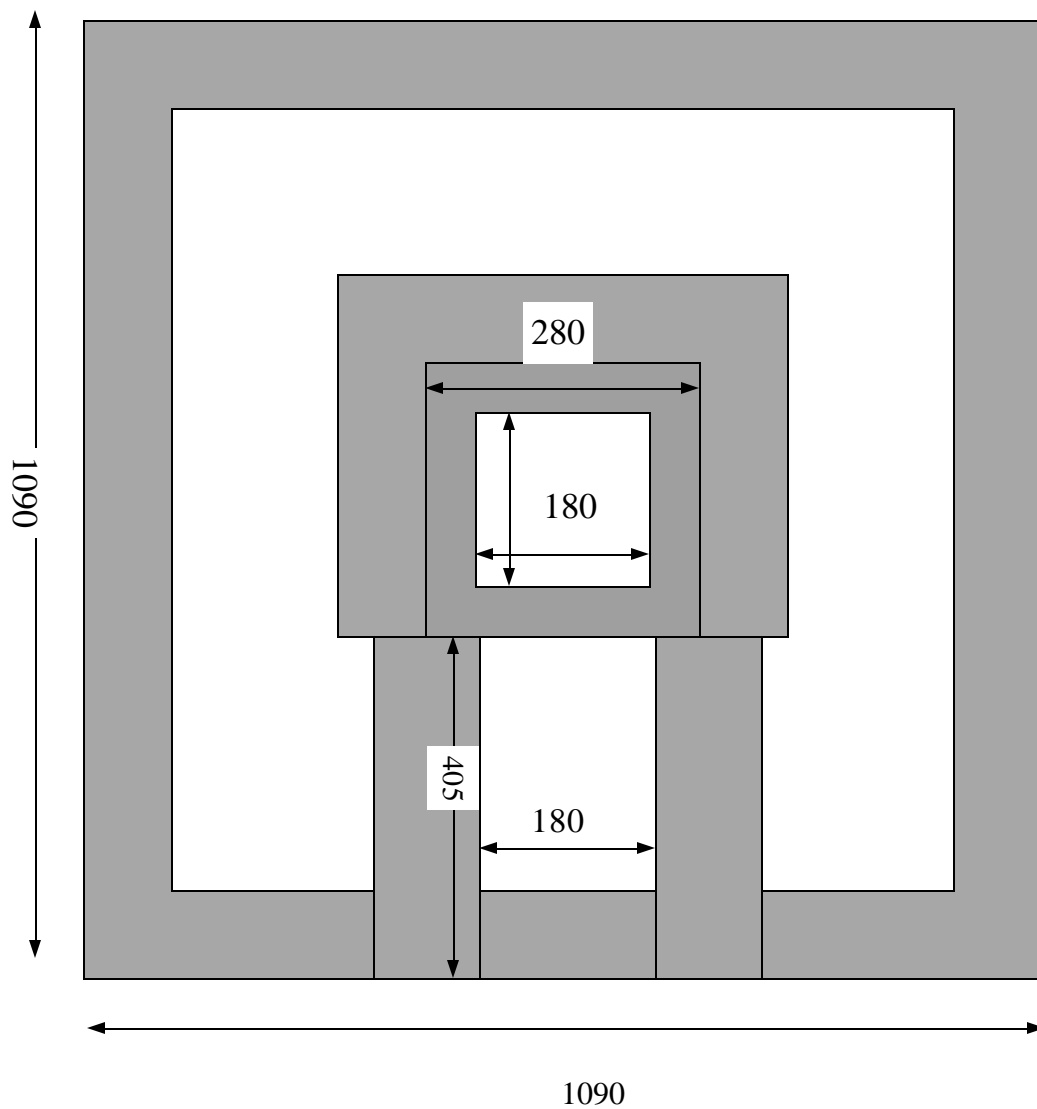
See photos below for correct placement of bricks.

3-5 mm Mortar is required between the joints but no mortar is needed **in between** the bricks and the stove body . Use 6 parts HTM and 1 part Portland cement for mortar



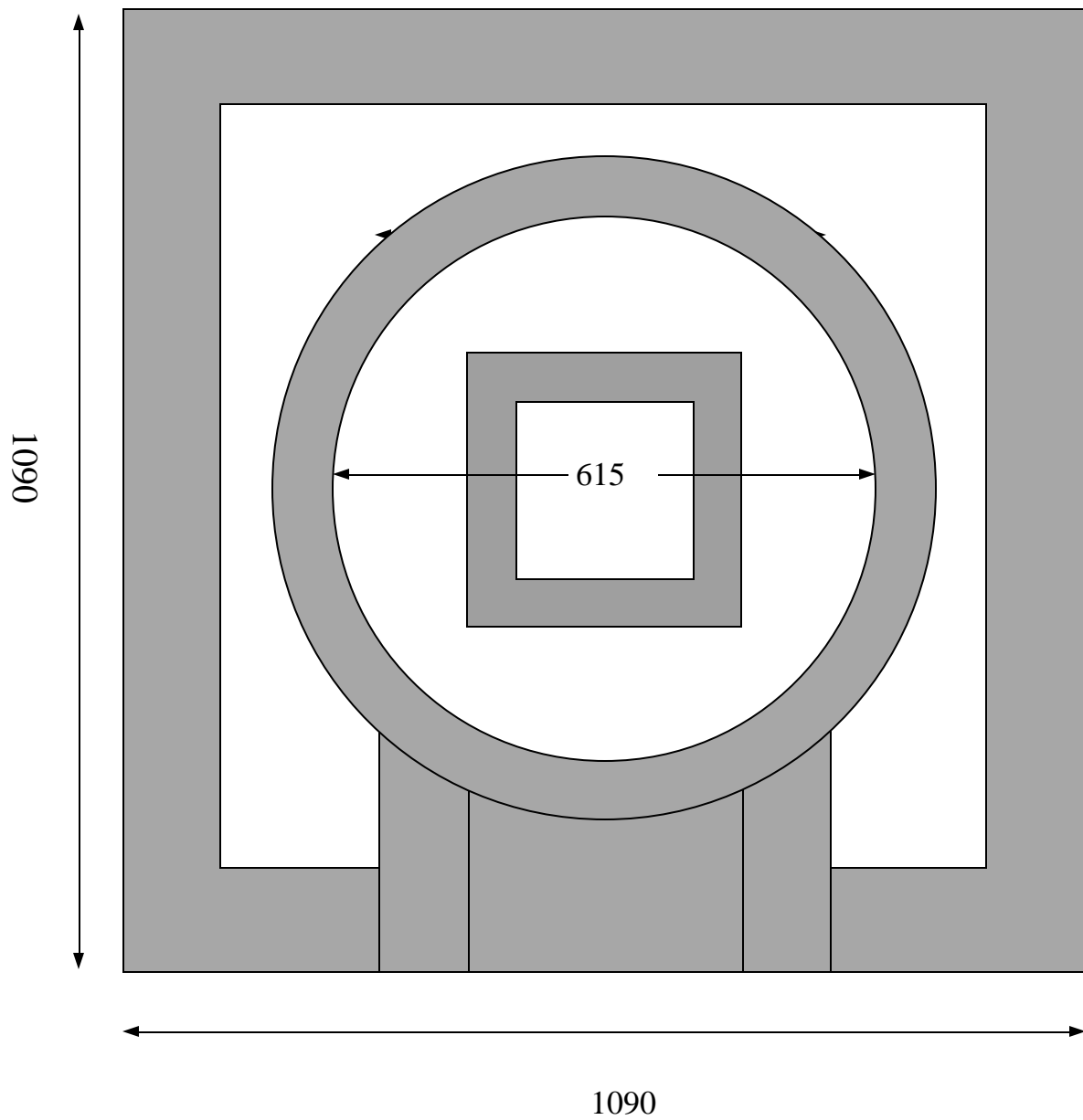
110L Drum Stove

Top View /Bottom section



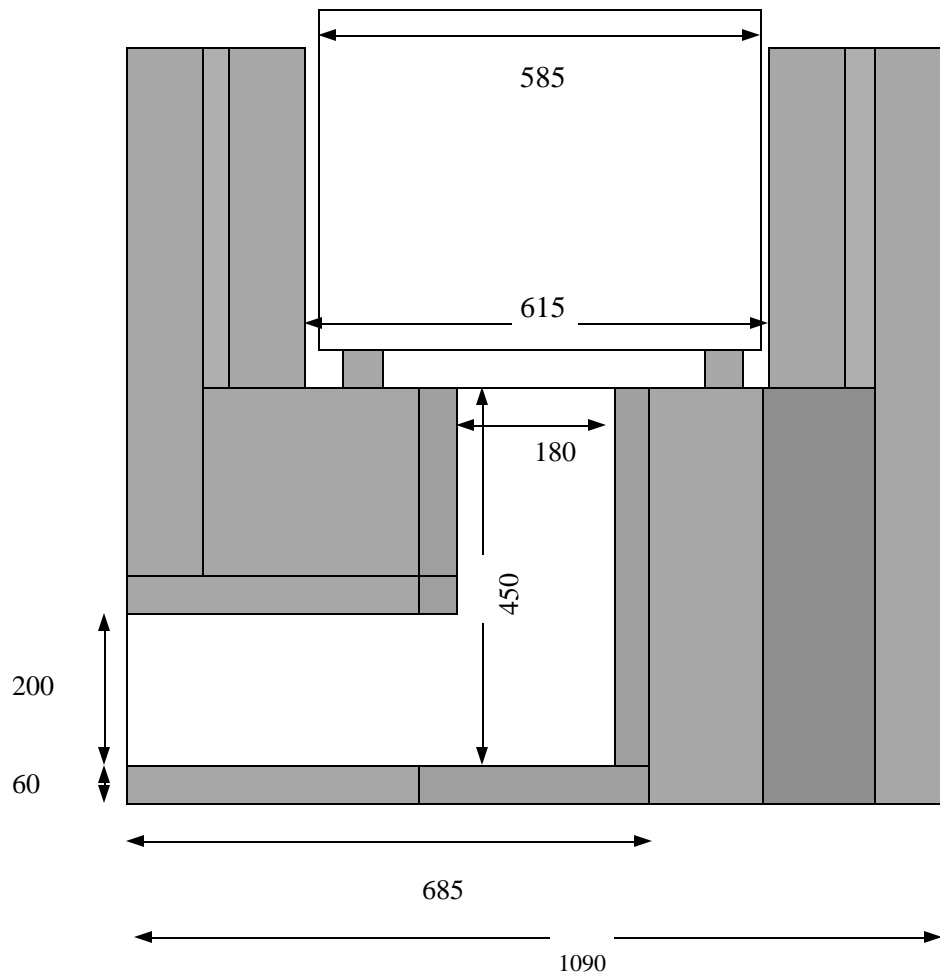
Insulated Dedza bricks





110L Drum Stove Top View/ Upper section



110L Drum Stove

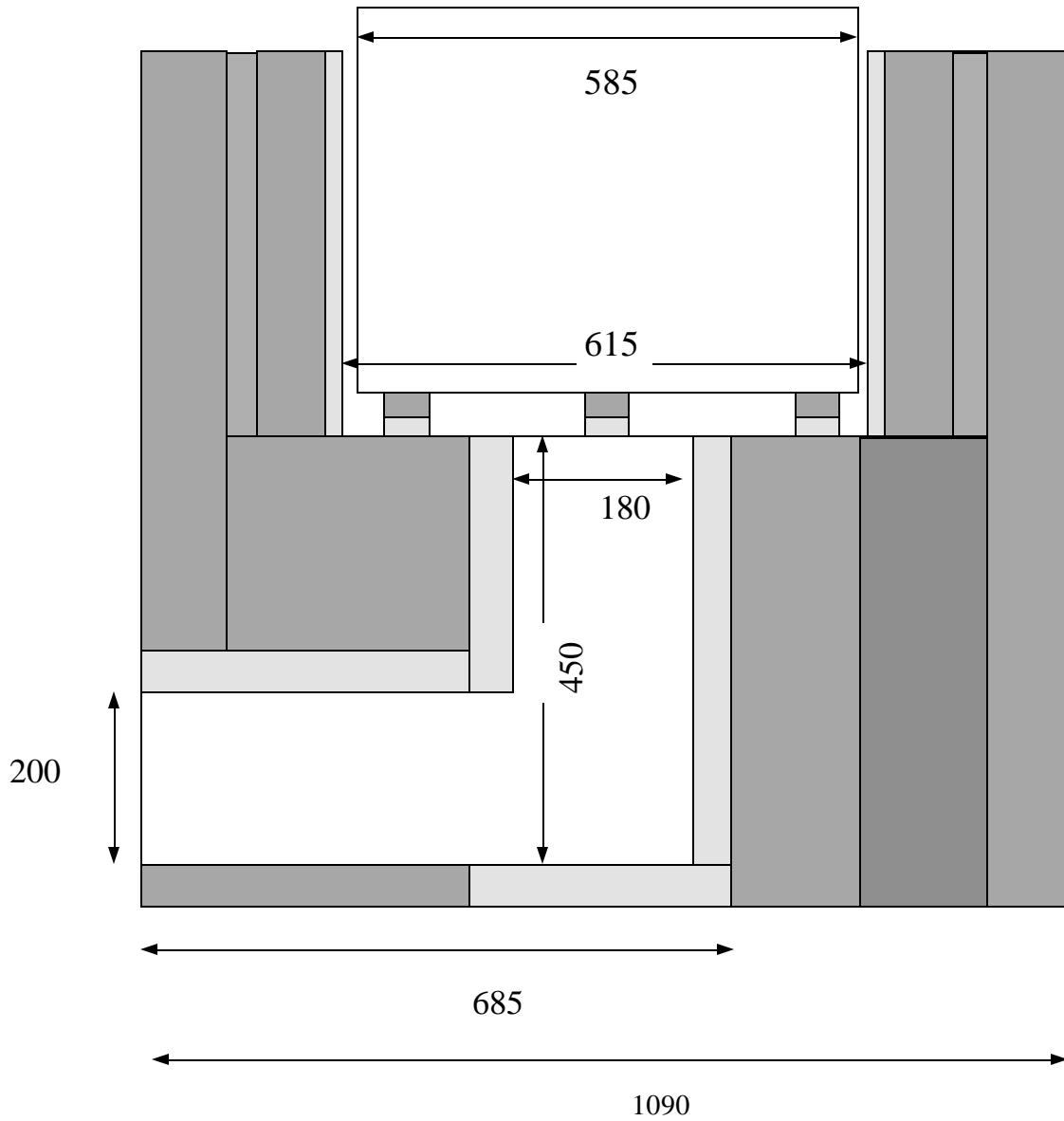
Side view/ cross sectional



-  Insulated Dedza bricks
-  Earth / soil
-  Common bricks
-  4 parts sawdust and 1 part cement

110L Drum Stove

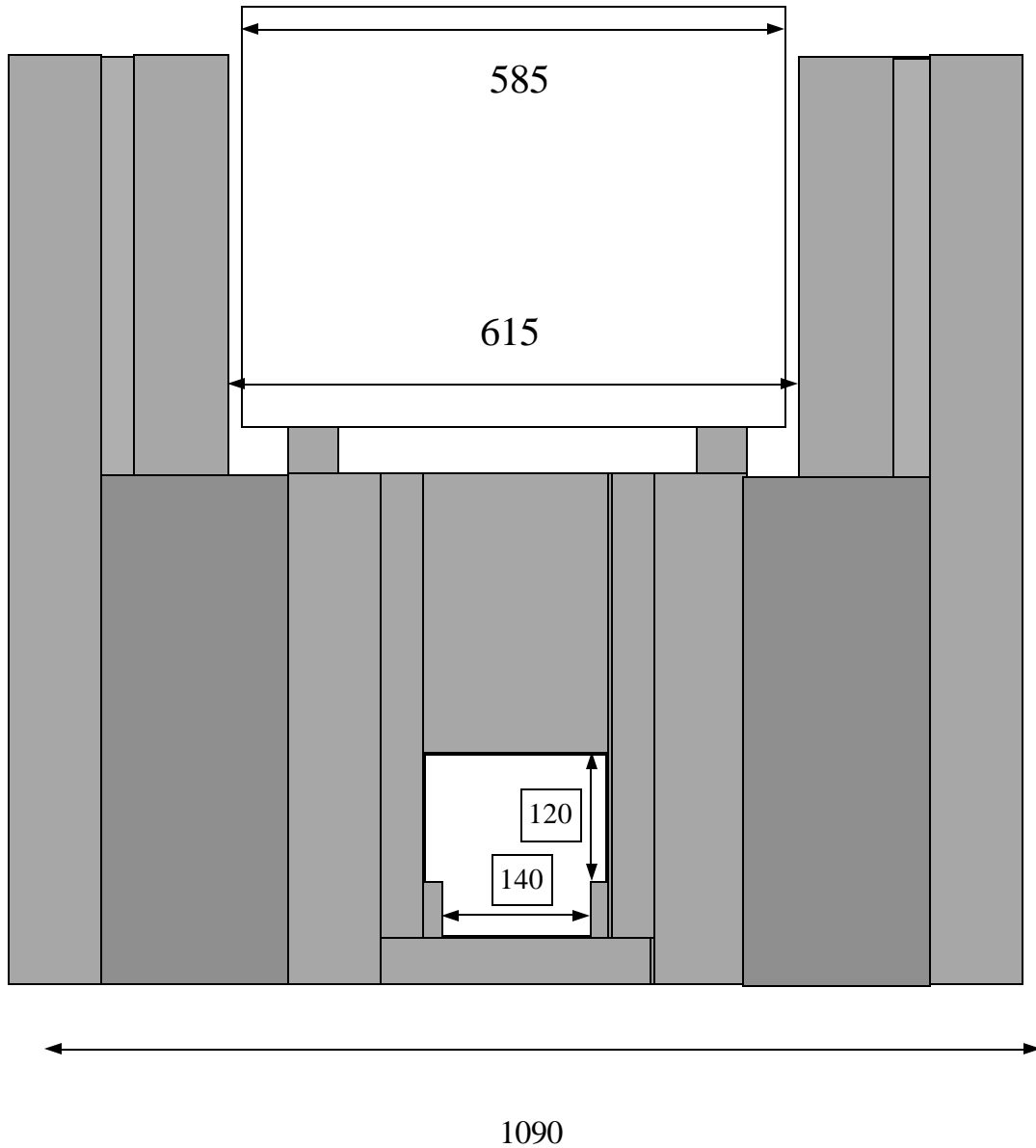
Side view/ cross sectional



Dedza Pottery High Temp Mortar

110L Drum Stove

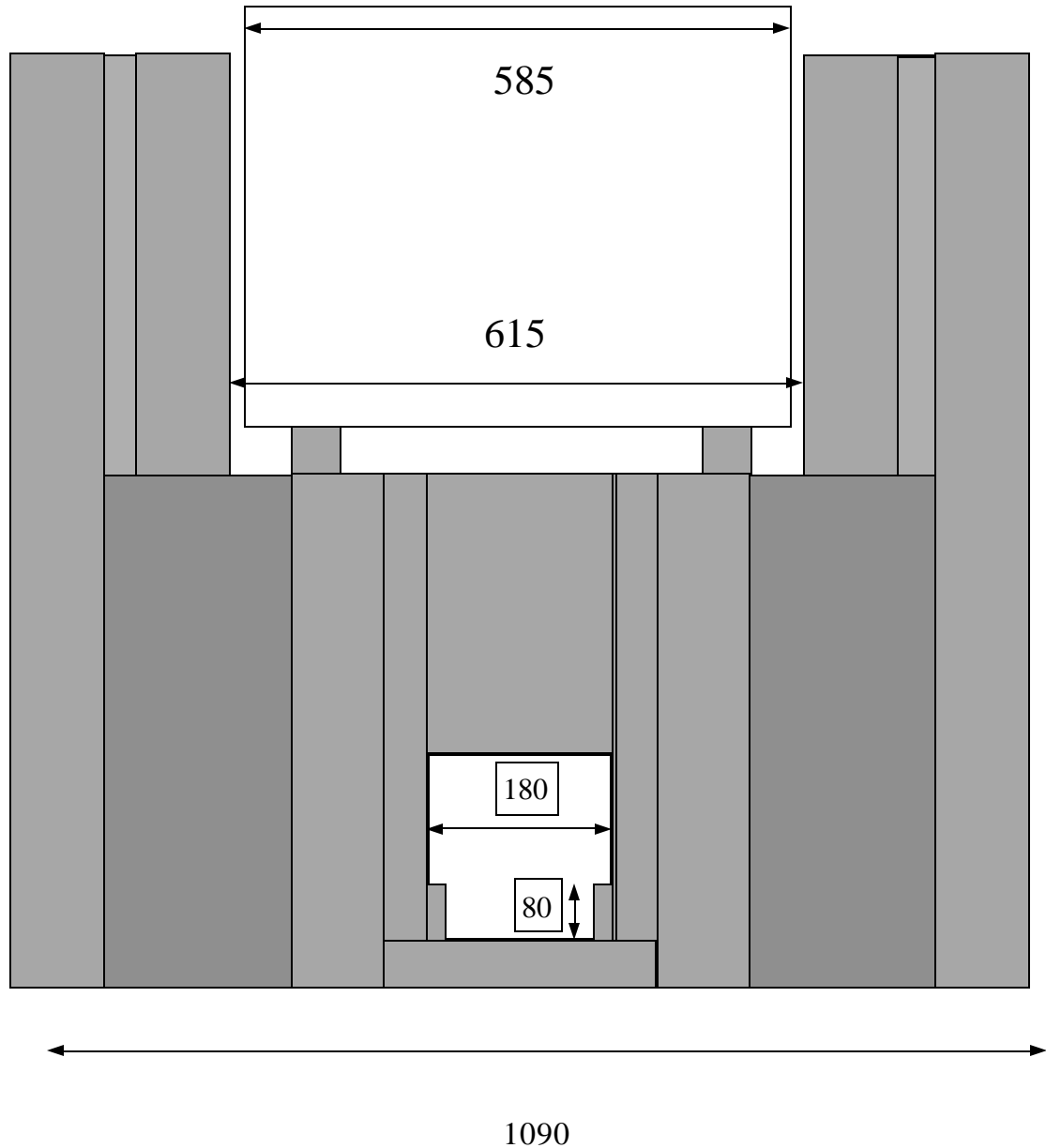
Front view/ cross sectional



Use the wooden mould to produce the lip on the sides of the combustion chamber that will support the metal shelf

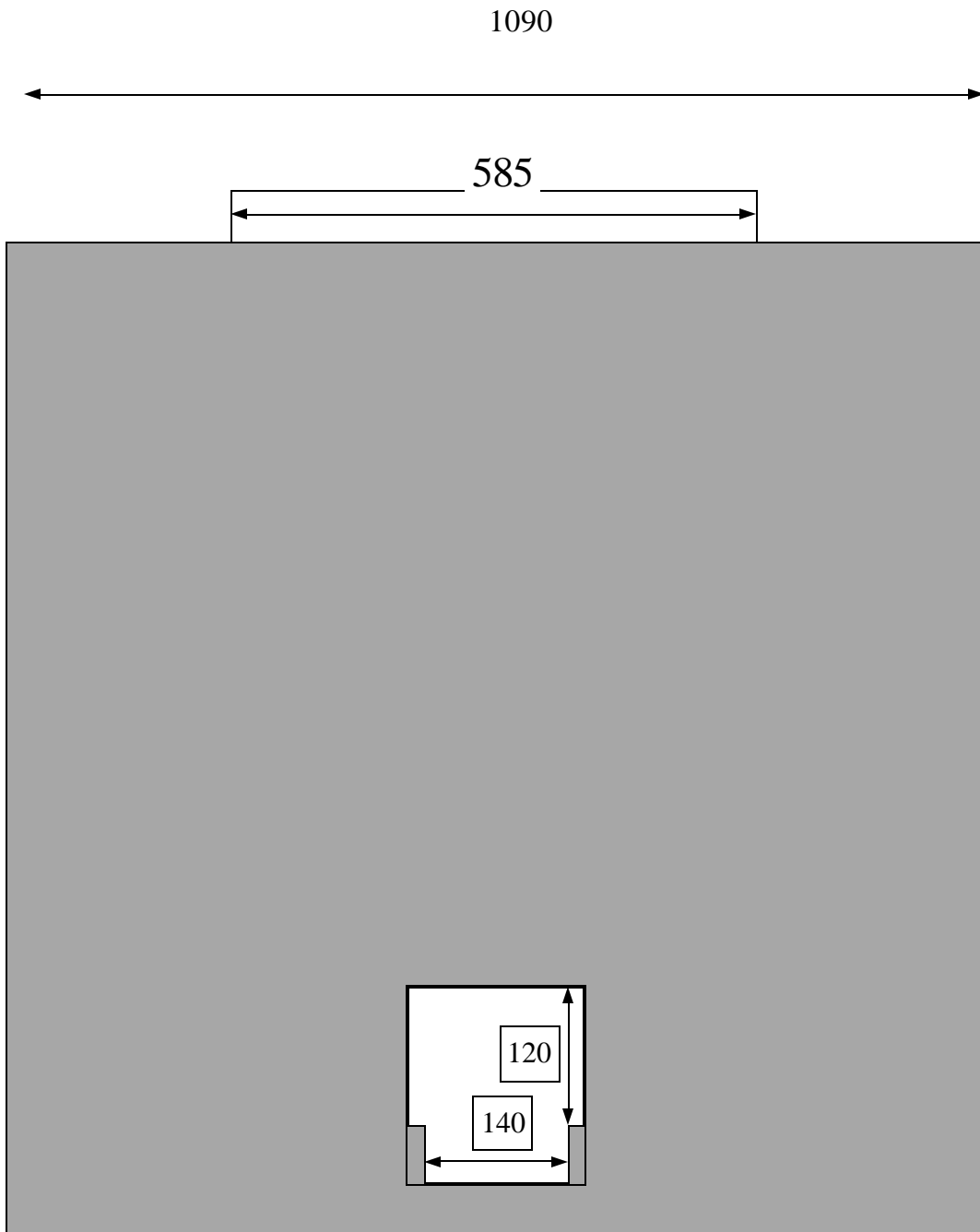
110L Drum Stove

Front view/ cross sectional cont'd



Use the wooden mould to produce the lip on the sides of the combustion chamber that will support the metal shelf

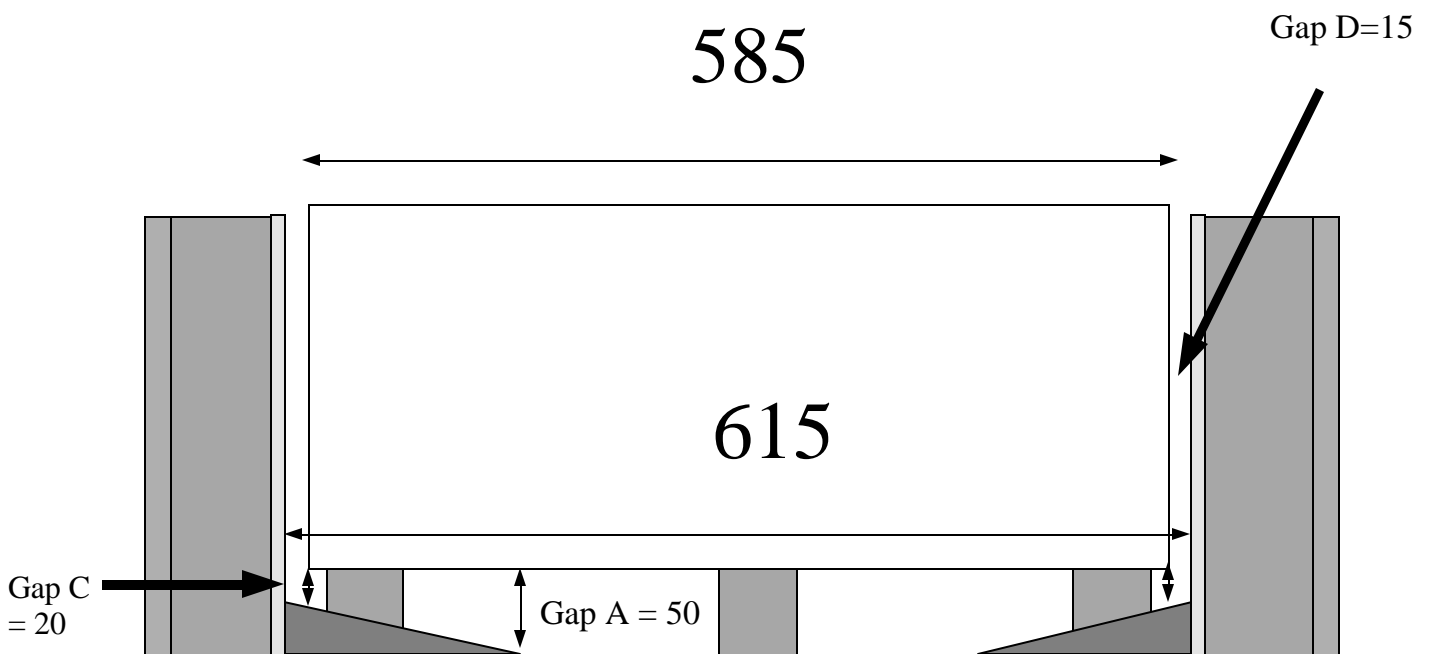
Front exterior view 110L Drum Stove



Detail of slope underneath pot

Gap A = 50 Gap C = 20 Gap D = 15

Note: these gaps are slightly larger than theory requires but this will help to accommodate irregularly shaped cooking drums



Mix 6 part high temp mortar with 1 part cement and 7 parts fine sawdust



High Temp Mortar

Pot Stabilizer and skeleton

Step 1 Take a 3 mm flat bar and roll it into a **flange**.

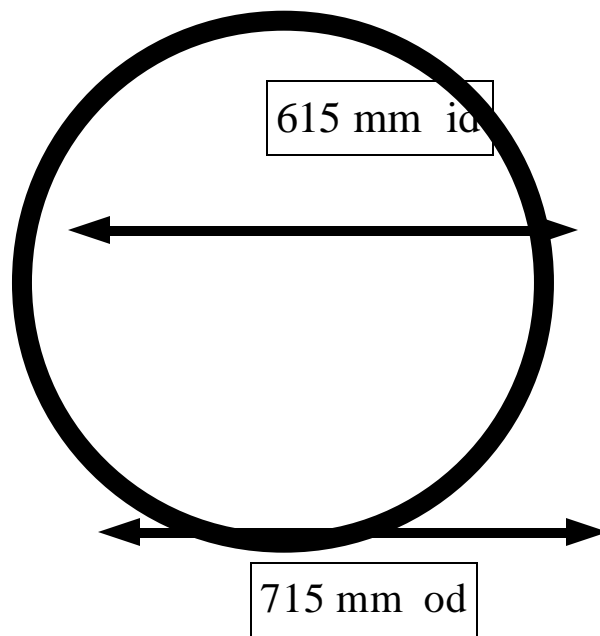
Step 3 Cut 8 pieces of 10 mm round bar and weld to the **inside** of each ring



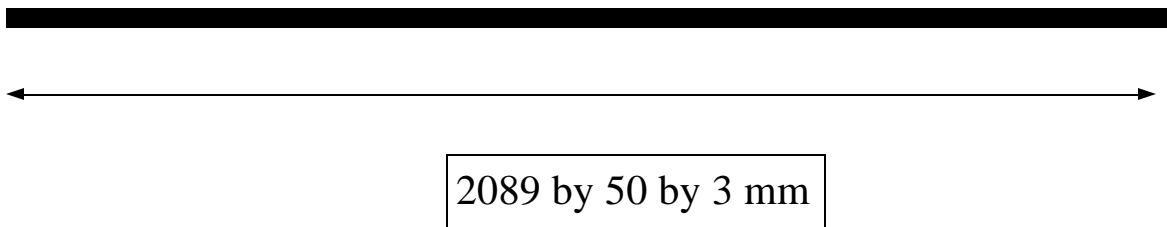
Step 2 Take a 10 mm round bar and roll it into a **ring**

Step 4 Take a 3 mm mild steel flat bar and roll it into a **ring**

Step 1 Make a **flange** from a 3 mm by 50 mm mild steel **flat bar** with an internal diameter of 615 and an external diameter of 715 mm. This flange will give an accurate dimension to the top of the pot support stabilizer

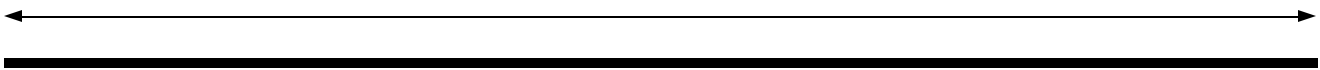


To make the **flange** take a piece of 3 mm by 50 mm mild steel flat bar and cut a **2089** mm length. A special flange rolling machine will be required for rolling the flange into a perfect circle

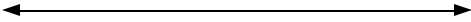


Step 2 Take a 1963 mm length of 10 mm round bar and roll it into a circle

10 mm round bar
1 piece @1963 mm



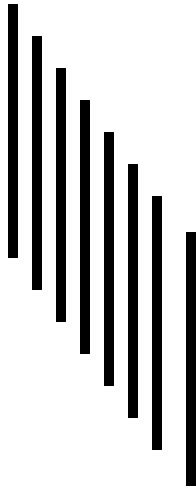
615 mm id



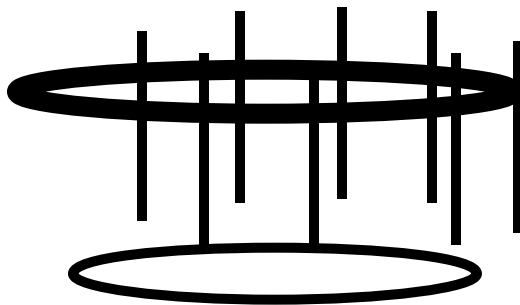
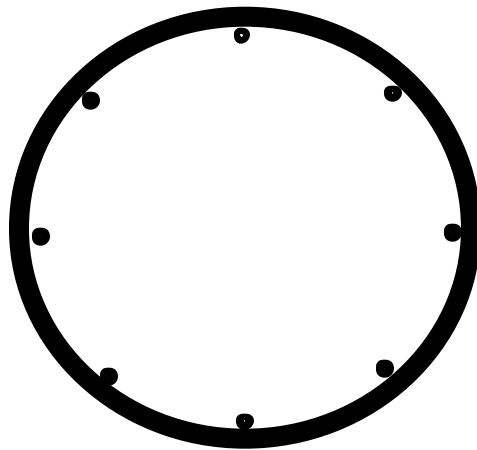
Step 3 Cut 8 pieces of
10 mm round bar
@ 415 mm



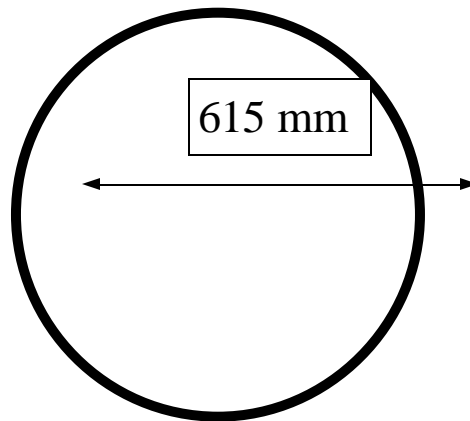
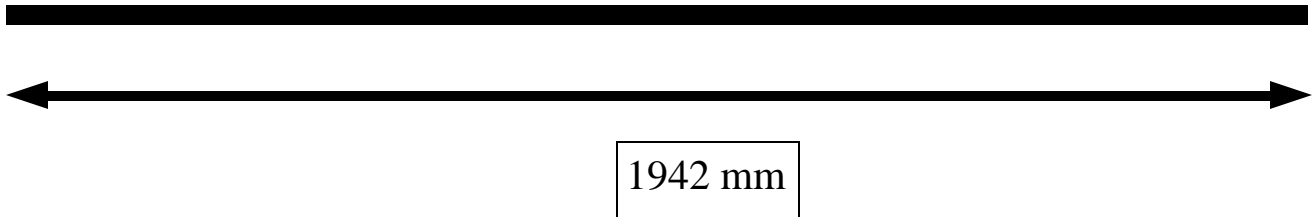
415 mm



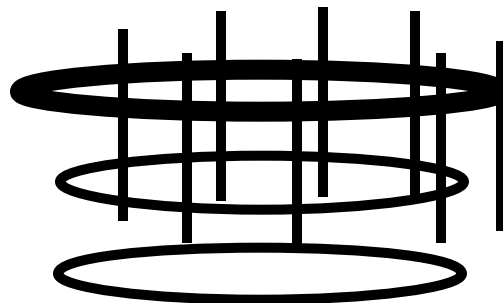
Step 3b Weld the 8 pieces of 415 mm round bar to the inside of the flat bar flange and to the inside of the 10 mm ring



Step 4 Take the 3 mm flat bar and cut 1 piece @ 1942 mm
Roll this into a 615 mm diameter circle



Weld the flat bar circle around the **outside** of the eight 10 mm round bar pot stabilizers. It must be a perfect circle to create the proper gap



Place the pot stabilizer skeleton level with the **top** of the combustion chamber .

A thin layer of cement under the skeleton will help to keep it in the ideal position .



Make sure that the 3 brick pot supports are **level** before you begin soldiering the bricks around the skeleton

Soldier the bricks, placing them on **top** of the bottom round bar ring, around the **outside** of the middle flat bar ring, and **flush** with the inside of the flat bar flange at the top of the skeleton. After soldiering the bricks, cover them with a thin (2-3 mm) coating made of 5 parts HTM and 1 part cement

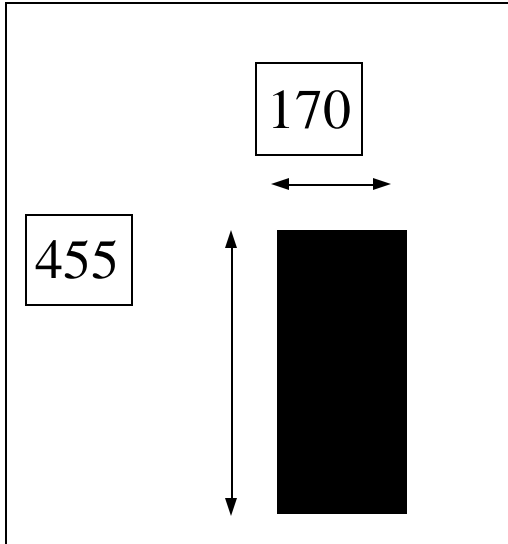


Give the stove a steel float finish.

Taper the **top** of the stove to give a gentle slope **away** from the pot. This will help to drain water away from the pot skirt and the combustion chamber

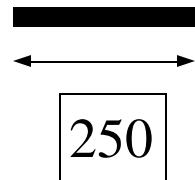


Legless wood shelf

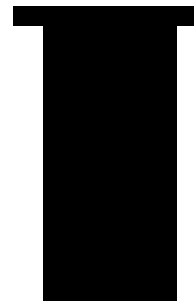


Take a piece of 4.5 mm stainless steel sheet, cast iron, or mild steel and cut a 170 by 455 mm length

Cut a 10 mm Round
250 mm

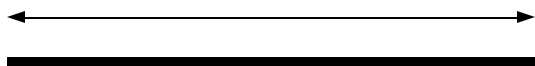


Weld the round bar to the back of the 4.5 mm plate. This will stop the shelf from going too deep into the stove



Ash rake

1000 mm



8 mm
round bar

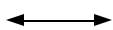


Bend here

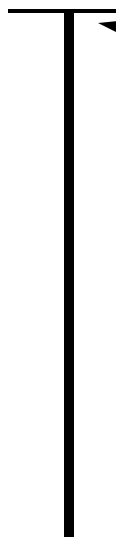
80 mm



1.6 mm mild steel



150 mm



Weld here