SIMPLE PLANS FOR THE SUNKEN POT APROSTOVE

This stove was designed through the coordinated efforts of Aprovecho Research Center, GTZ, ProBEC and the people of Southern Africa. If you have questions about these plans please contact your local ProBEC representative at_____ or contact Aprovecho at apro@efn.org.

This stove is designed for a #2 and #3 round-bottom cast iron pots. This stove can also be modified to accommodate a number of different pot sizes. The stove body can be built with 1 mm galvanized sheet steel (above left), cement, brick or 3CR12 (above right).
Material price for the galvanized model in South Africa is approx 300 Rand (Summer 2002).

Photos and Text by Peter Scott
Drawings by Ethan Hughes

Aprovecho Research Center
80574 Hazelton Road, Cottage Grove, OR 97424-9747, USA
phone: (541) 942-8198 fax: (541) 942-8198
e-mail: apro@efn.org webpage: http://www.efn.org/~apro

The Aprostove's chimney, combined with its high combustion efficiency, make it an ideal stove for people who are aware of the health and environmental hazards of open fires. However, the Aprostove is not the ideal stove for every cooking situation.

Here are some things to consider before introducing this stove in your community:

Are people cooking outside?	**Is Liquid Petroleum Gas (LPG) readily available?**	**Are they building conservative open fires?**	**Are they using flat bottom pots ?**
If yes, then consider building an unvented stove outside the house. Unvented stoves can often be more efficient, easier to build, and longer lasting. If the chimney is not replaced when it eventually degrades, the indoor stove could expose the family to more smoke than if they had continued to cook outside with an open fire.	**If yes**, than consider encouraging a switch to LPG. In many southern countries, wood is not sustainably harvested so even an improved wood stove can lead to long term forest degradation. There is some evidence that LPG stoves produces less green house gases than wood fires.	**If yes**, consider introducing a haybox or an unvented stove outside the house. A small, carefully tended open fire can be very efficient. Unfortunately, this type of fire is uncommon in most parts of the world.	**If yes,** consider introducing the Ecostove or a regular Rocket outside. Flat bottom pots will not work with the Aprostove due to poor contact with the cooking surface. I f they have only one pot, consider introducing a Rocket stove.

If you answer <u>YES</u> to any of these questions, you should RECONSIDER introducing the Aprostove into your community. See the next page for other designs that might be more appropriate or contact Aprovecho Research Center for more information.

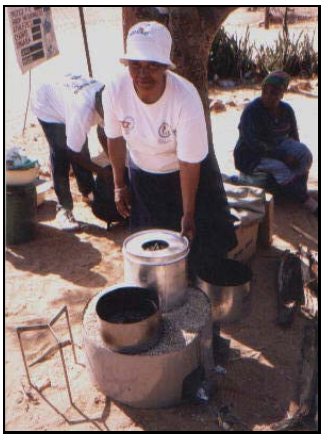
DIFFERENT STOVES FOR DIFFERENT NEEDS

Aprovecho stoves are built using principles that can be adapted to suit any cooking need. Because one stove design will not work in each community, we offer a number of stove models to choose from:

THE ECO STOVE

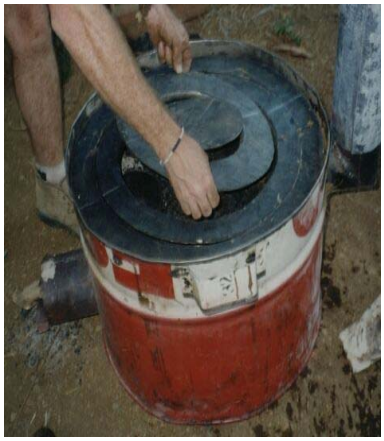
This stove - designed by Aprovecho—features an insulated ceramic rocket combustion chamber. It can cook 3 pots of food, make tortillas and bake bread. Price in Central America is approx US$ 80.

THE ROCKET STOVE



The Double Burner Rocket stove is less expensive and more efficient (25 - 30%) than the Aprostove. It is ideal for cooking outside or in areas where a chimney is not needed or available.

THE ROCKET RING STOVE



With the rings in place, multiple pots can be cooked at the same time. The rings can also be removed for use with individual round bottom pots.

THE HAYBOX COOKER

The haybox works by retaining heat inside a layer of insulation such as straw, wool or foam. The haybox can reduce fuel consumption by 70% and is simple and inexpensive to build .

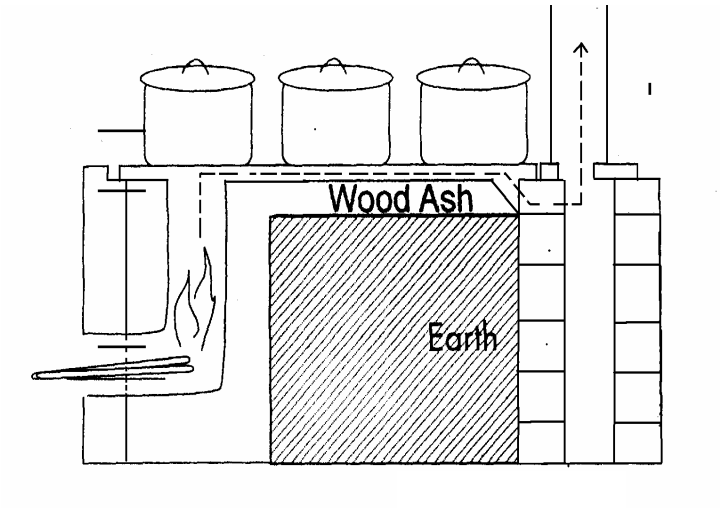
For more information about these stoves please contact Aprovecho Research Center.

BUILDING WITH BRICK OR CEMENT

The body of the Aprostove can be built with a variety of different materials such as cement, clay & sand, brick, adobe, or metal. This guide explains how to construct the stove with metal but other plans are available to build the Justa with cement and brick.

This cement Aprostove is being built by Helps International in the Guatemalan Highlands. Three individual cement pieces are cast in fiberglass molds and then assembled on site. The molds are easy to transport and help prevent design inconsistencies.

This brick stove –designed by Aprovecho - has an insulated rocket combustion chamber. Thousands of these stoves have been built in Central America. The metal lid is removable so a single pot can be cooked with direct flame.



The type of material (cement ,brick , adobe or metal)) that is used for the exterior stove body will not have a great impact on the performance of the stove. Special materials are not needed for the stove *body*. The stove will function effectively as long as the body of the stove can support 5 pots and can withstand tempera-

e

BEFORE GETTING STARTED

Tools

- Tin snips (offset if possible)
- Electric steel grinder and cutter
- Arc welder
- Vice grips and/or pliers
- Steel friction cutter for cutting 45° angles
- Square
- Metal chisel
- Scribe
- Metal jigsaw

Optional

- Hydraulic box and brake (for bending)
- MIG welder
- Plasma cutter

Materials

- 1 sheet of 1 mm galvanized steel)
- Combustion chamber: ceramic, 3CR12 ,or mild steel
- One sheet of 1225 mm by 2500 mm 1.2 mm 3CR12
- One sheet of 1225 mm by 2500 mm 2 mm steel
- 10 kg of medium grade vermiculite
- 6 m by 25 mm by 2 mm square tube
- 6 m by 10 mm by 2 mm square tube
- Stainless steel welding rods
- 100 mm galvanized chimney pipe and elbow section

BEFORE SELLING THE STOVE, YOU SHOULD ASK THE POTENTIAL BUYER A NUMBER OF QUESTIONS:

What type of fuel are they using for the majority of their cooking?

Wood?
The Aprostove is suitable.

Fossil fuel (paraffin or LPG)?
Be cautious about introducing a wood stove to women who are using other types of fuels as it can lead to an increase in overall wood consumption. Consider promoting a Haybox/Wonderbox instead.

Does the buyer want to cook inside or outside of their house?

Outside or in a well ventilated area?
The Rocket stove is suitable.

Inside?
The Aprostove is suitable.

What size pots are they using?

Are they round bottomed or flat bottomed or a combination of both?
Make the stove based on the cooks needs.

What is the thickness of the pieces of the wood that they are using?

Twigs and pieces less than 50 mm?
The 100 mm square tube diameter rocket stove be used.

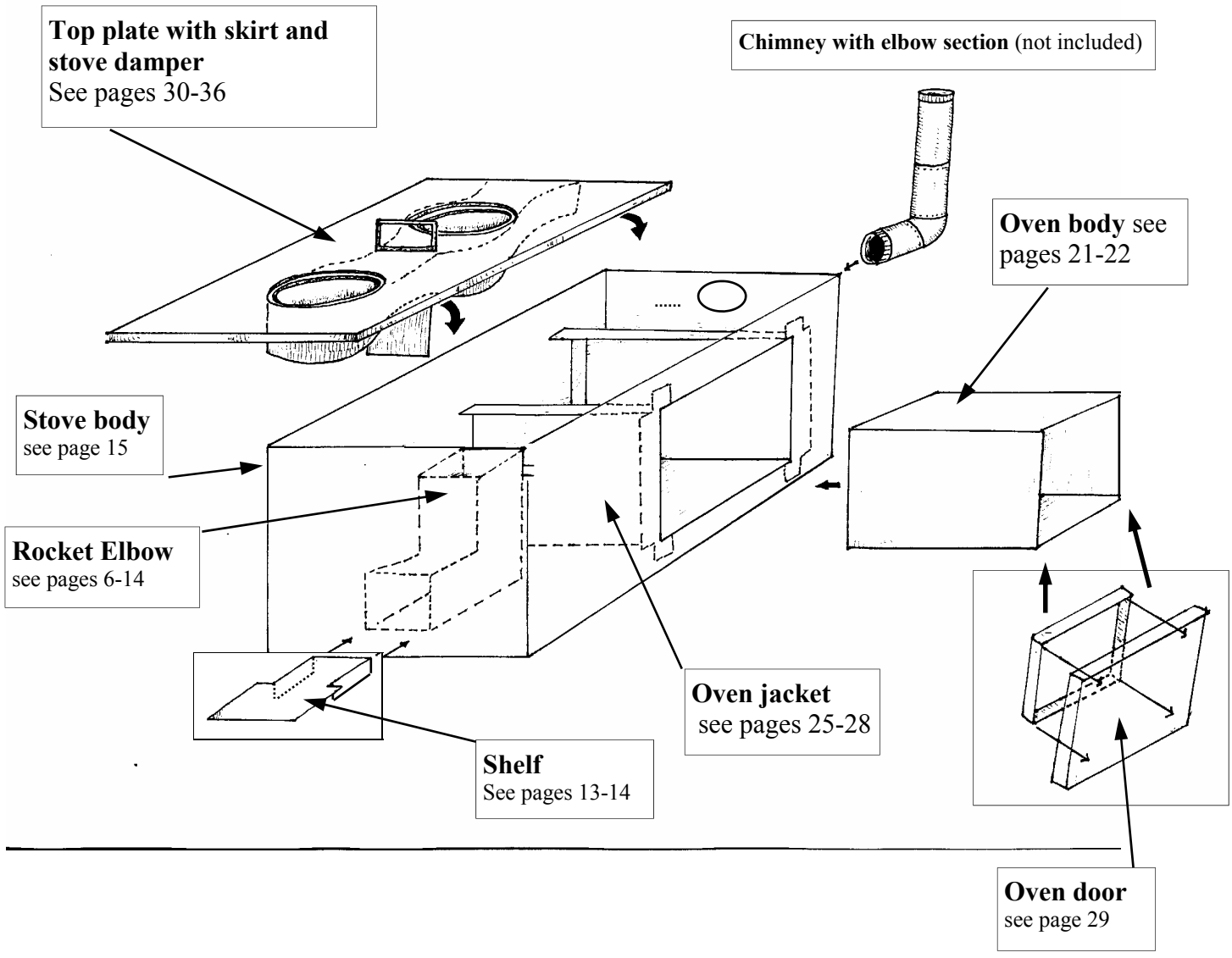
Pieces larger than 50 mm?
The 125 mm round tube diameter round rocket elbow should be used.

Note: This is only a partial list of the questions that should be asked. Try to find out as much about the cooking habits of each customer before selling a stove.

Note: In this guide 'O' bends refer to outward bends or bends up from the plane of the page , whereas 'X' Bends refer to inward bends or bends down away from the plane of the page. Unless otherwise noted, all bends are 90 degrees

SCHEMATIC OF THE APROSTOVE

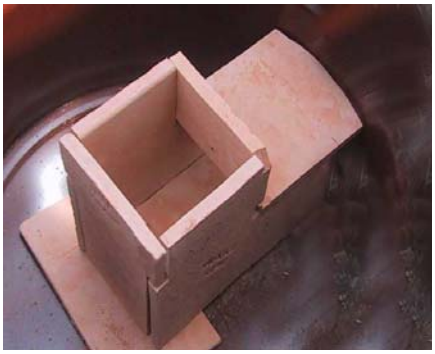
For detailed instruction on how to build the individual pieces of the Aprostove, please see the following pages:



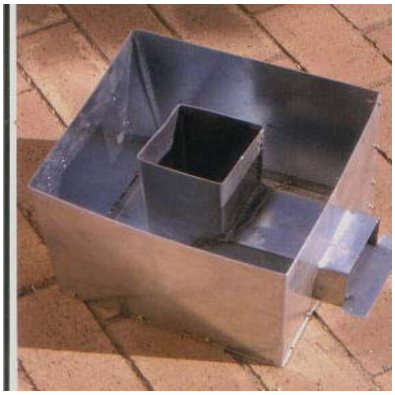
ROCKET ELBOW OPTIONS

The Aprostove can be made with different types of materials. The type of elbow/combustion chamber should be chosen before building the stove body as each elbow requires a different stove body configuration. Options are listed in order of preference.

Option 1: Ceramic Tiles
Price (in Central America): is approx 10 Rand per elbow



Option 2: 3CR12
1.2 mm flat sheet 3CR12 can be bent into a 100 mm rectangular box which can then be cut to form an elbow.
Price (in South Africa): is approx. 30 Rand per combustion chamber. (The 3CR12 elbow shown here is the Single Pot Rocket version*).



Option 3: 100 mm by 3 mm mild steel square tube
Price in South Africa: is approx 20 Rand per combustion chamber.

125 mm by 3 mm mild steel round tube can also be used .
Price: in South Africa is 22 Rand per elbow.

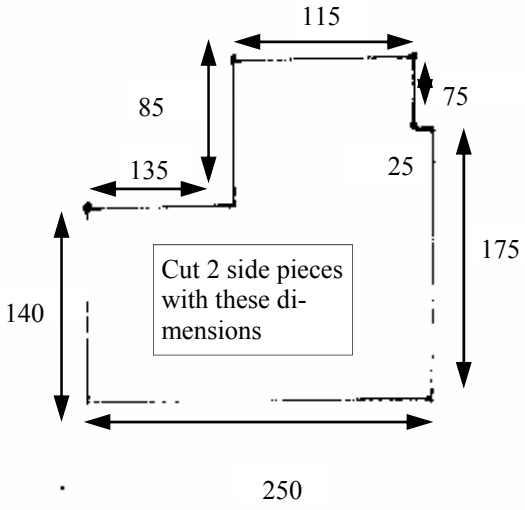
Cast iron, refractory cement and various types of insulative ceramic (such as pumice/ vermiculite and clay blends can be also be used. See Rocket Design Guide for more information about the benefits and challenges of some materials. Aprovecho is presently developing a new insulative ceramic elbow. Contact us for more details.
*Plans are also available for the Single Pot and Double Burner model.

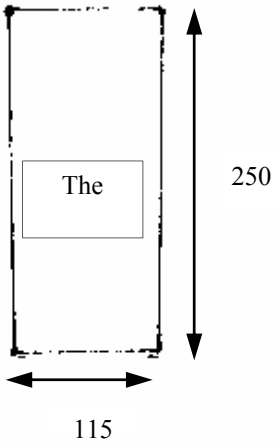
From the following 5 pages, choose one of the 3 elbow options: ceramic tiles, 3CR12 or 3 mm mild steel.

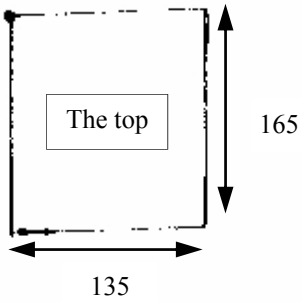
Follow the appropriate directions in the other parts of the guide which are specific to the elbow that you have chosen. For example if using the 100 mm elbow be sure to follow the directions for the corresponding 100 mm shelf.

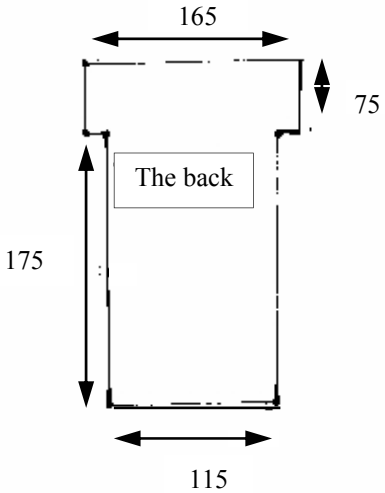
ROCKET ELBOW WITH CERAMIC TILES

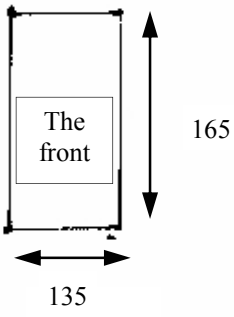
Use the following measurements to form a combustion chamber with ceramic bricks. Some experimentation will be necessary to create the ideal ceramic brick. The ideal bricks are not hard pressed or compacted like modern brick. They use a lot of water and are set up 'sloppy'. This will result in a porous brick that is friable. When placed in water, it should 'fizz' due to the large number of pores in the brick. The tiles should not feel dense or heavy but crumbly and soft. The ideal thickness is 25 mm. See Rocket Design Guide for more info.





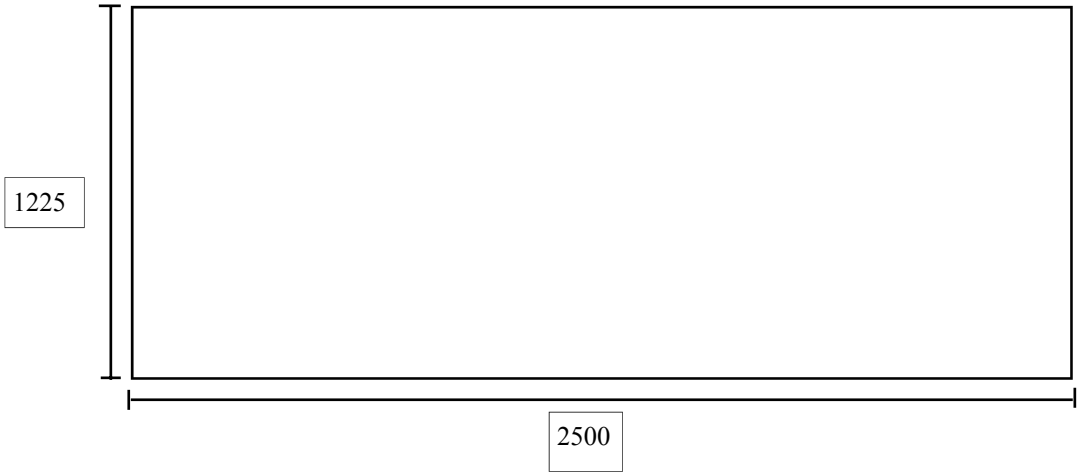




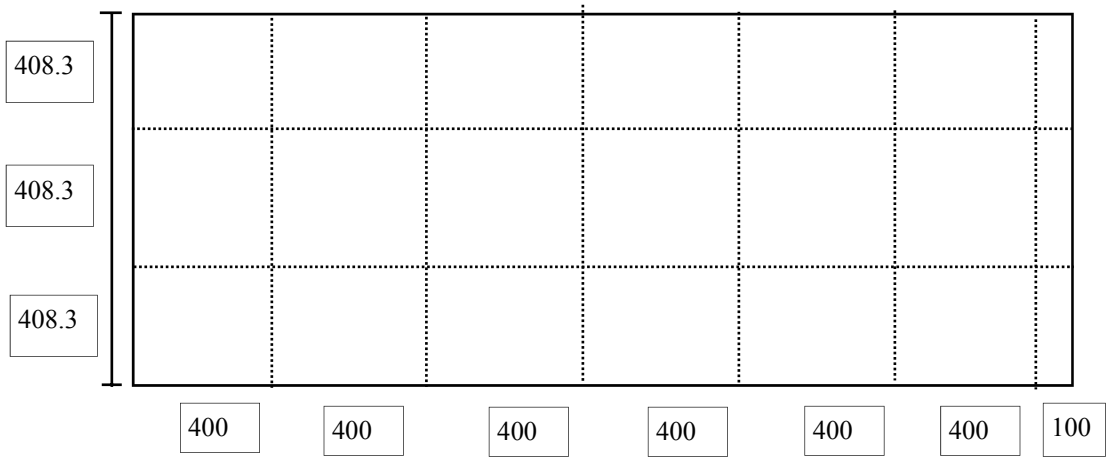


BUILDING THE COMBUSTION CHAMBER WITH 1.2 MM 3CR12

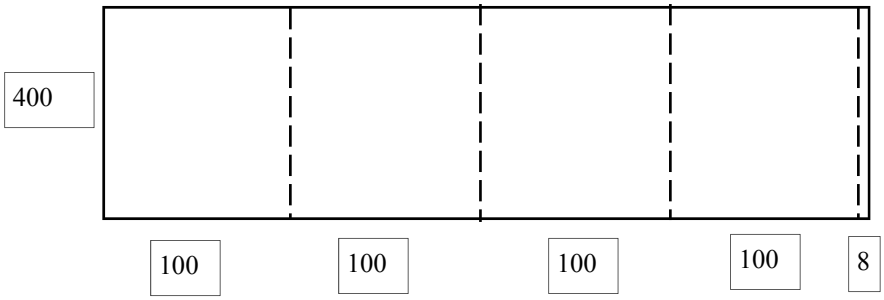
Take one piece of 1225 mm by 2500 mm by 1.2 mm 3CR12.



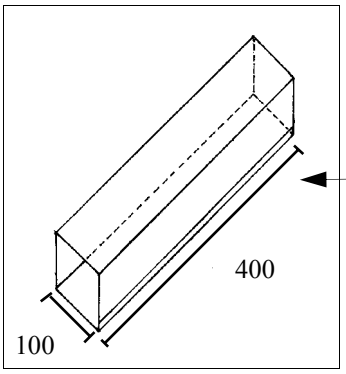
Scribe and cut the 1225 mm by 2500 mm piece as shown below to yield 15 elbows.



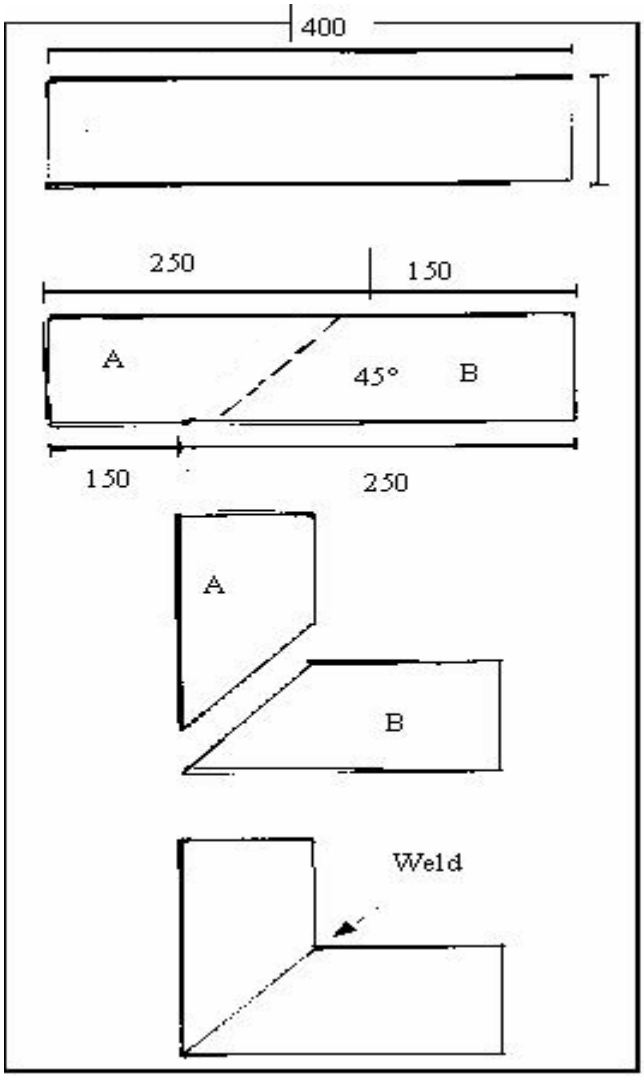
Take each piece and scribe the lines as shown but do **not** cut . Bend the 4 scribed lines to form a 4 -sided box with an 8 mm lip. See following page for a sketch of how the box should ap-



COMPLETING THE 100 MM 3CR12 COMBUSTION CHAMBER



The 3CR12 rectangular box from the previous page should look like this.



Take the 400 mm by 100 mm section.

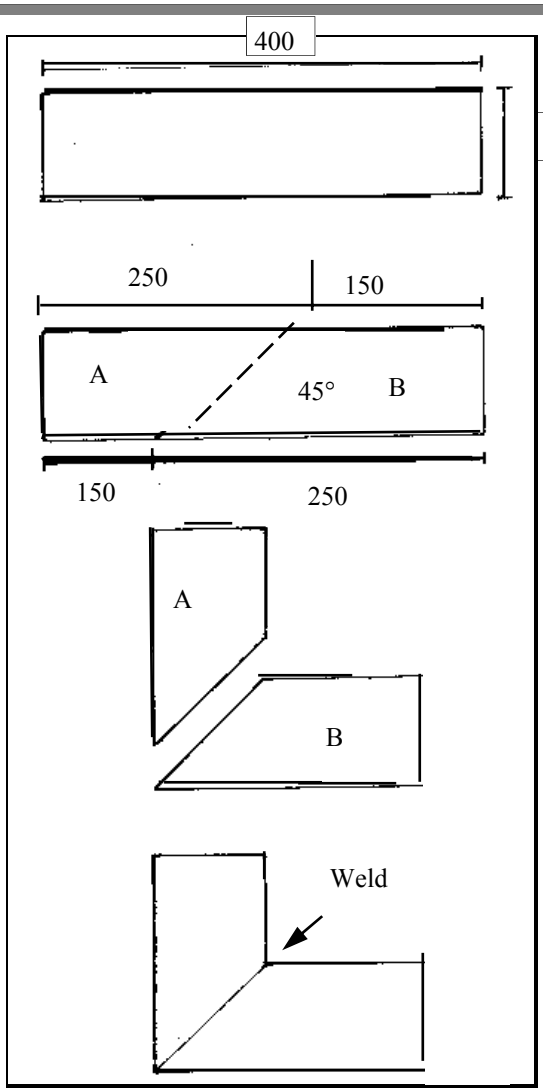
Cut a 45 degree angle as shown.

Lift section 'A' 90 degrees on the vertical and rotate 180 degrees.

Connect the two pieces and **tack** weld along the seam. Make sure there are **no** gaps along the seam that could allow insulation to fall through.

Before welding the two pieces together, grind the insides of the joints smooth. If sharp pieces are left exposed then the stove users could cut their hands when they reach in to the combustion chamber to clean out the wood ash .

CONSTRUCTING THE 100 MM SQUARE TUBE ROCKET ELBOW



Take one piece of 100 mm by 6 metre square tube and cut a 400 mm section.

Cut a 45 degree angle as shown.

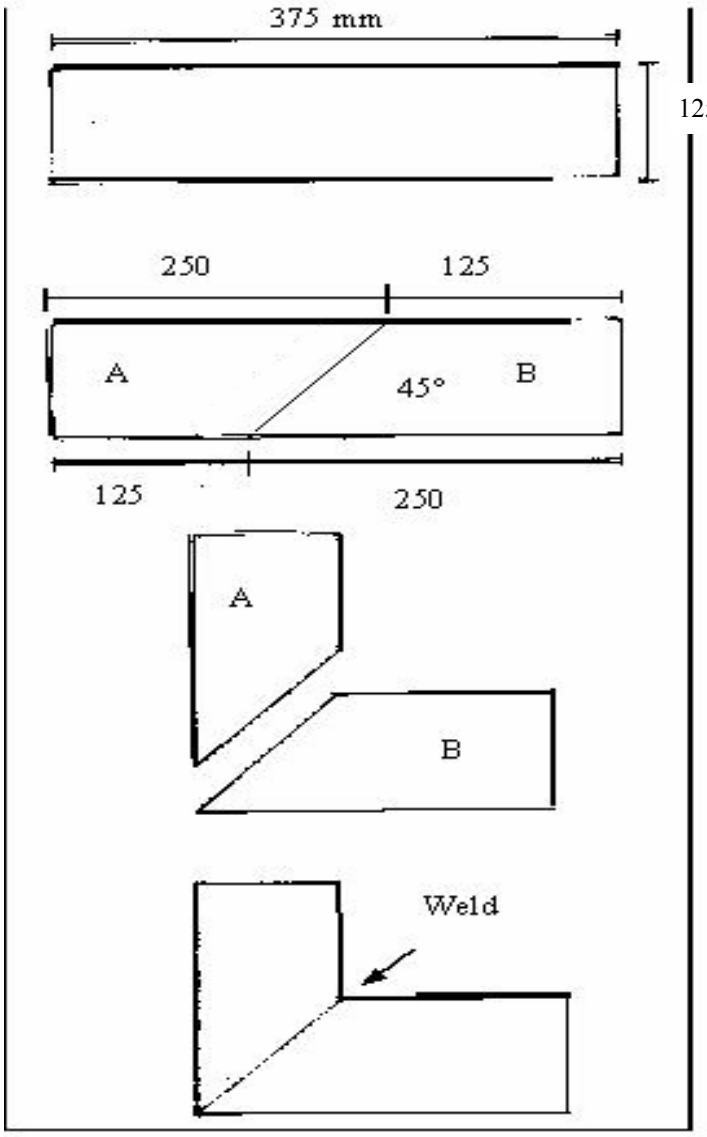
Lift 'A' section 90 degrees on the vertical and rotate 180 degrees.

Connect the two pieces and **tack** weld along the seam. Be sure to fill in any gaps between the pieces that might allow insulation to pass through.

Before welding the two pieces together, grind the insides of the joints until smooth. If sharp pieces are left exposed on the inside of the tube, the cook could cut their hands when they reach in to clean out the wood ash.

Build two complete combustion chambers as shown.

BUILDING THE 125 MM BY 3MM ROUND TUBE ROCKET ELBOW



Take one piece of 125 mm by 6m round tube and cut one 375 mm section.

Cut a 45 degree angle as shown.

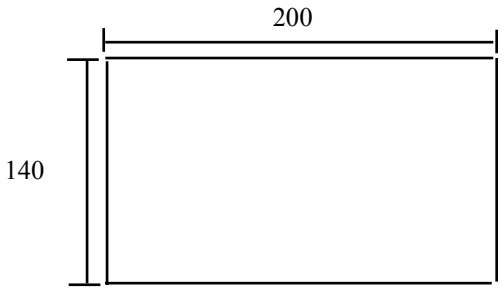
Lift section A 90 degrees on the vertical and rotate 180 degrees.

Connect the two pieces and **tack** weld along the seam. Be sure to fill in any gaps that might allow insulation to pass through.

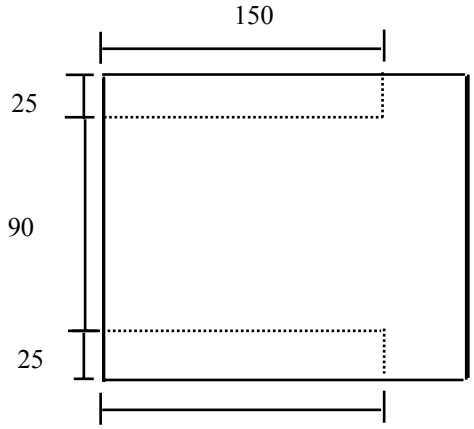
Before welding the two pieces together, grind the insides of the joints smooth. If sharp pieces are left exposed the cook could cut their hands when they reach in to clean out the wood ash.

BUILDING THE SHELF FOR THE 100 MM COMBUSTION CHAMBER

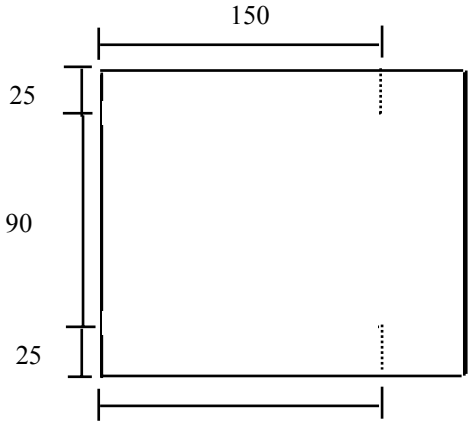
(Use 2 or 3 mm mild steel or 1.2 mm 3CR12)



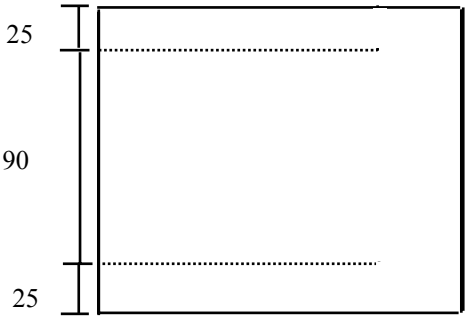
Cut one piece of mild steel or 3CR12 into a 200 mm by 140 mm section.



Scribe but do **not** cut the dotted lines as shown.



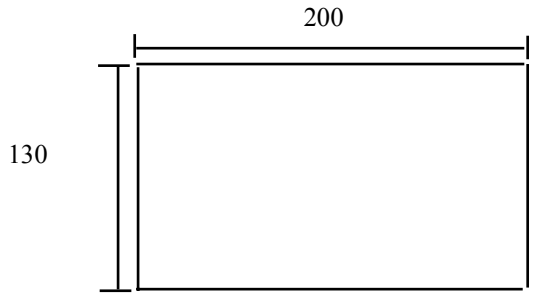
Cut the two 25 mm dotted lines.



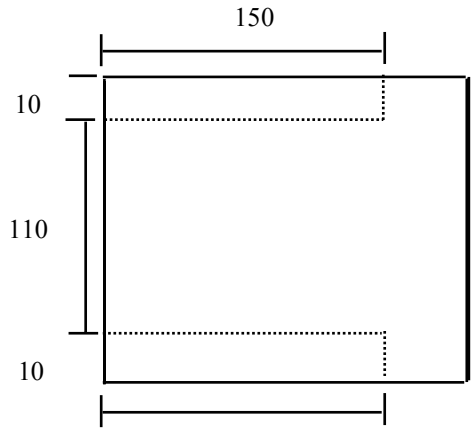
Fold along the two dotted lines to form the 25 mm shelf supports.

BUILDING THE SHELF FOR THE 125 MM ROUND TUBE ROCKET ELBOW

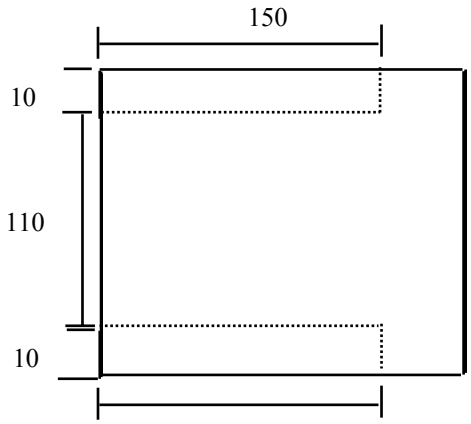
Use 2 or 3 mm mild steel or 1.2 mm 3CR12)



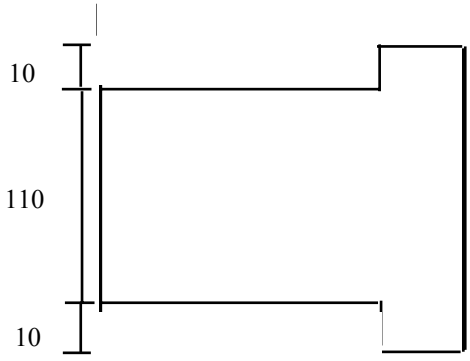
Cut one piece of 200 mm by 130 mm 3 mm mild steel or 1.2 mm 3CR12.



Scribe the dotted lines as shown.



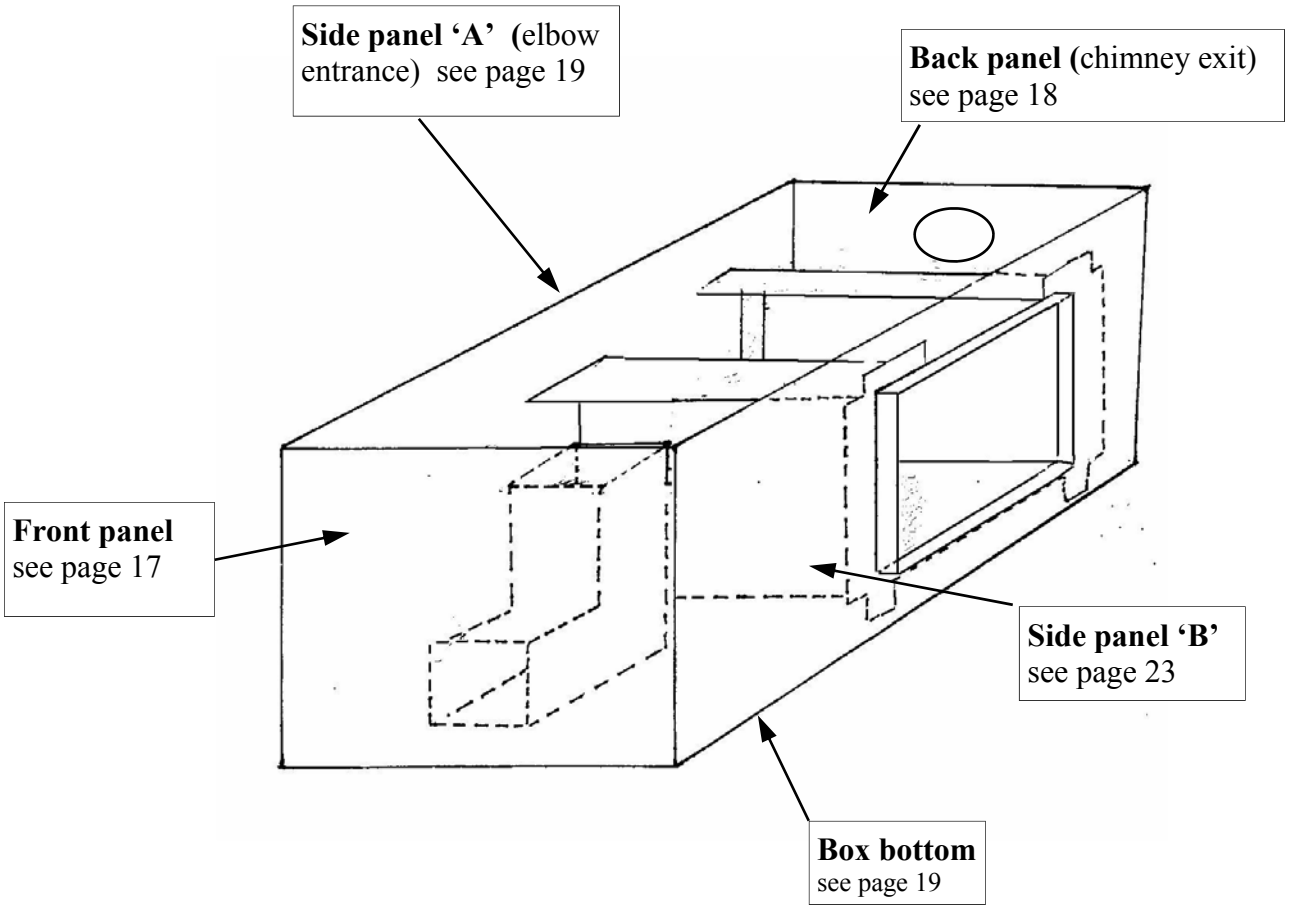
Cut along the dotted lines and remove the two 10 mm by 250 mm sections.



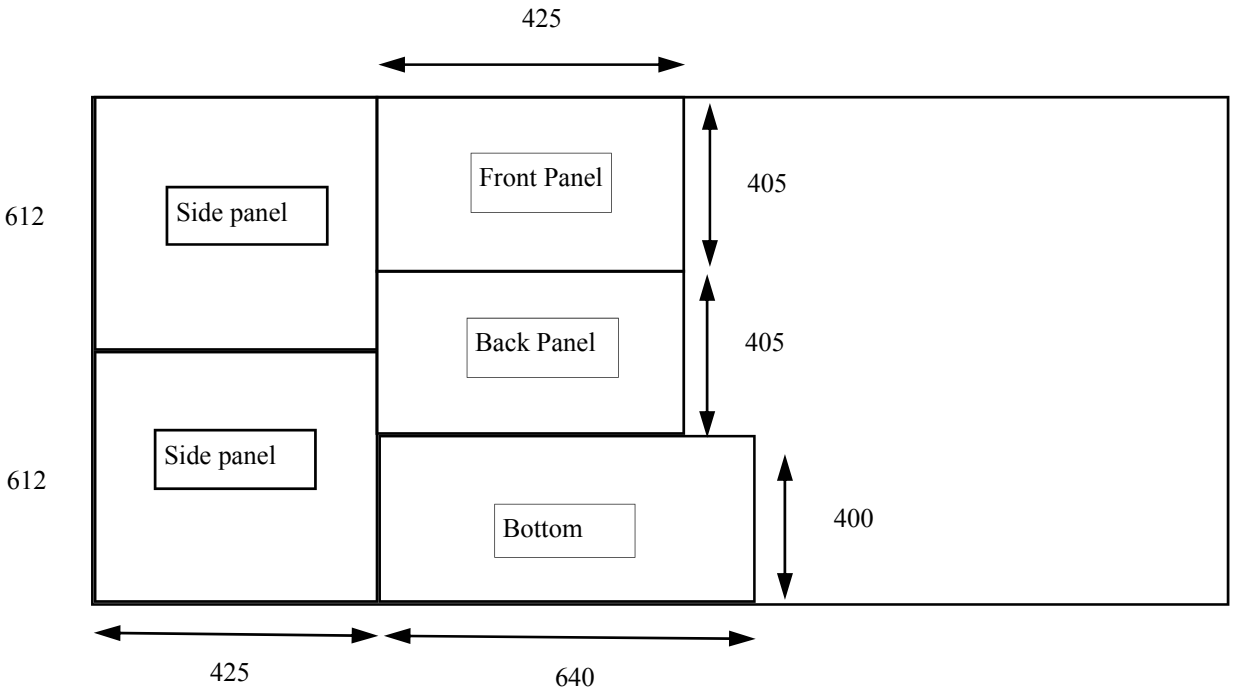
The shelf should be T-shape upon completion.

CONSTRUCTING THE APROSTOVE BODY

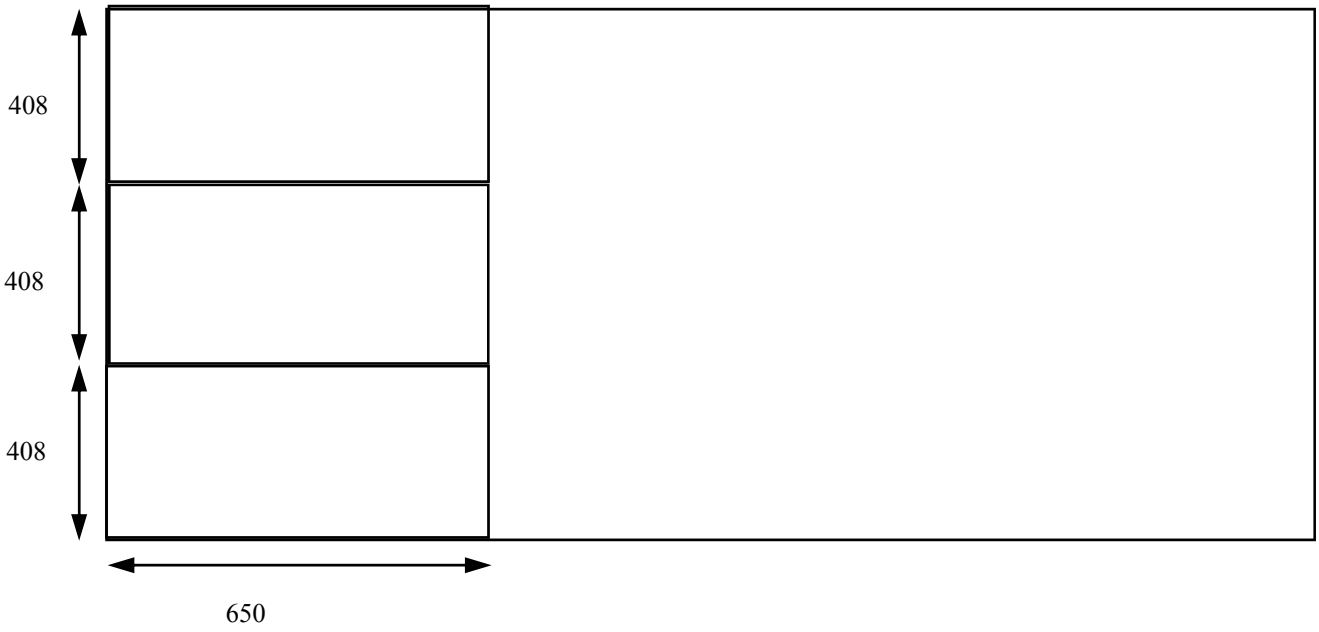
For detailed instruction on how to build the individual pieces of the stove body, please see the following pages:



SCRIBING THE INDIVIDUAL STOVE BODY PANELS



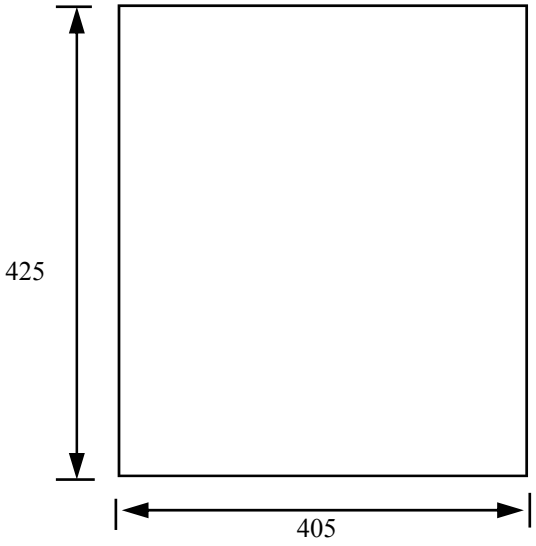
For the top plate use 2 mm ungalvanized plate steel.



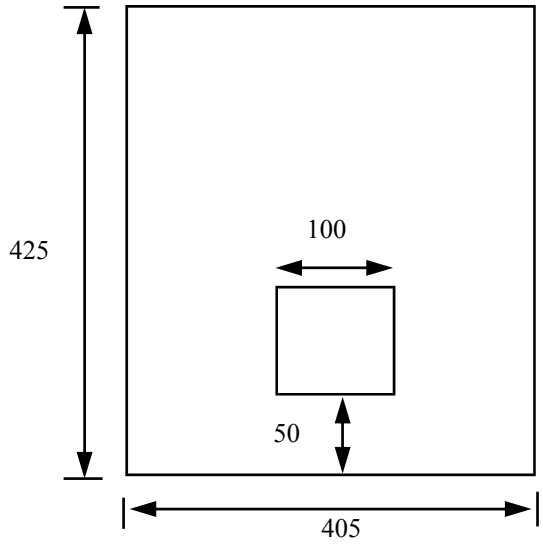
BUILDING THE BODY OF THE ECOSTOVE (For 100 mm Rocket Elbow)

The Front Panel for Rocket Elbow entrance.

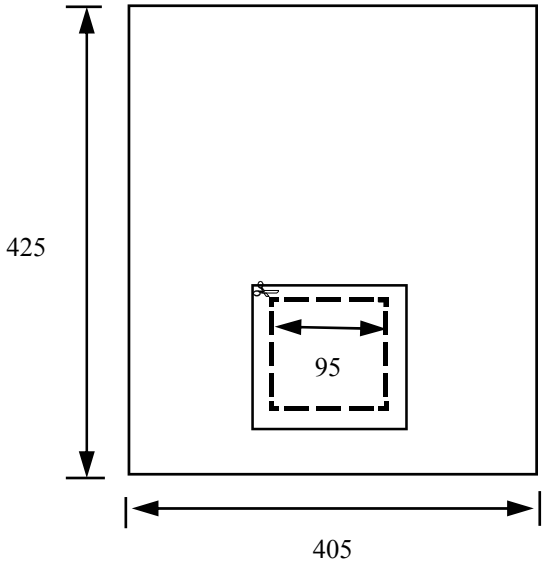
1 Take a piece of 1 mm galvanized sheet steel and cut one piece 425 mm by 405 mm.



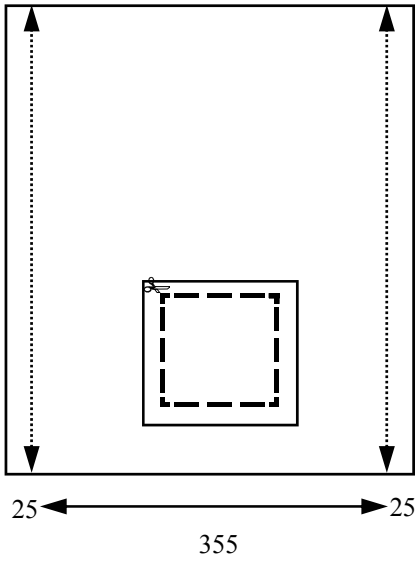
2 Take the rocket elbow and center it 50 mm from the bottom of the sheet and scribe a line around its 100 mm perimeter.



3 Scribe and cut a line 5 mm inset from the previous 100 mm scribe line**.** 'O' Bend the 5 mm flange to fit the perimeter of the combustion chamber.



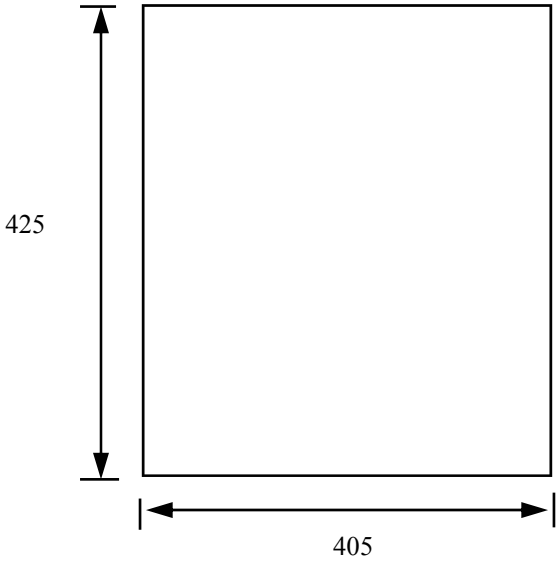
4 Scribe two 25 mm lines along the 425 mm sides and then 'O' Bend.



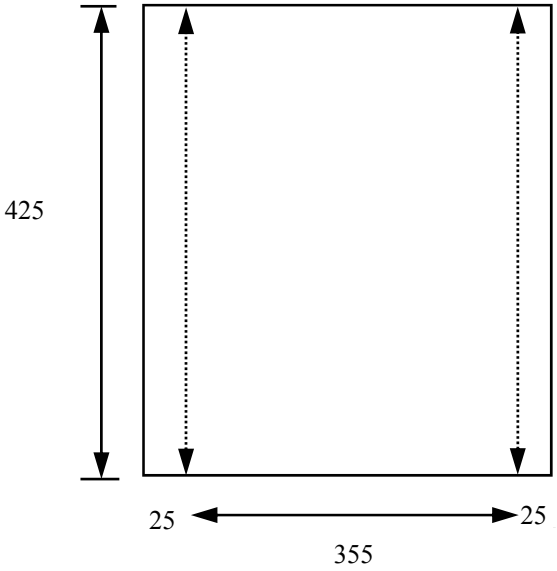
BUILDING THE BODY OF THE ECOSTOVE

Back panel (chimney exit)

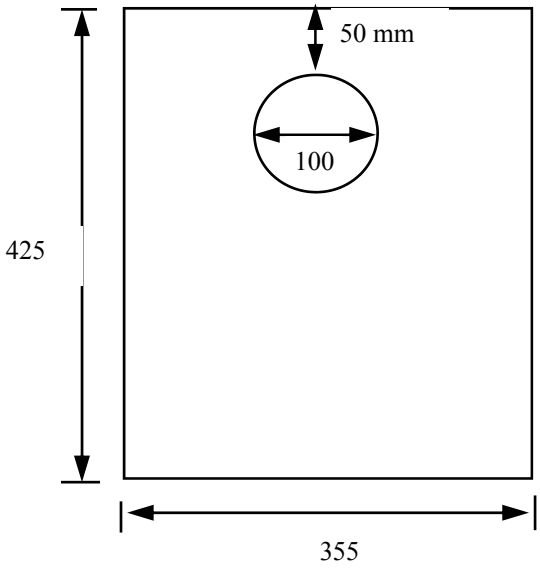
1 Take a piece of 1 mm galvanized sheet steel and cut one 405 by 425 section.



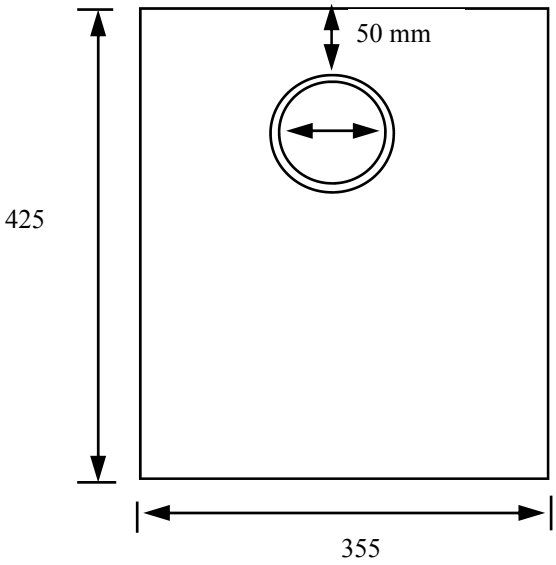
2 Scribe and 'O' Bend two 25 mm flanges. **Be sure to bend on the 425 mm side.**



3 Then center a section of chimney pipe - 50 mm from the top - and scribe a 100 mm circle.



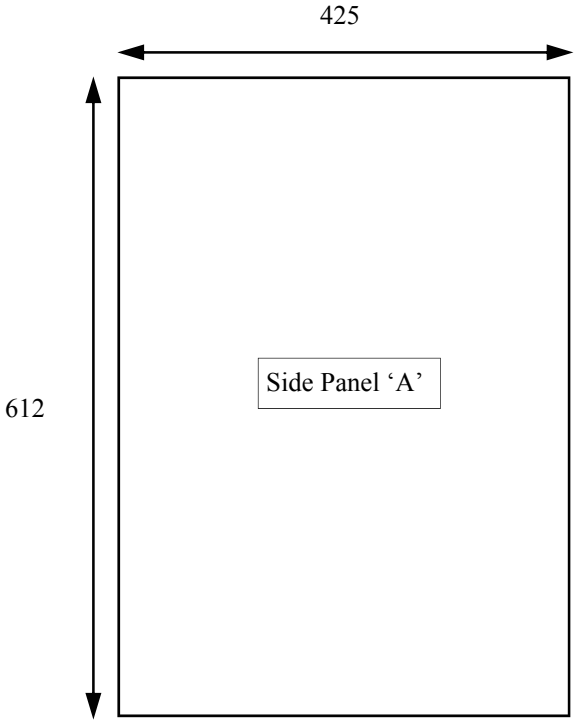
4 Scribe a 95 mm circle inside the 100 mm circle. Cut the 95 mm circle and 'O ' Bend the 5 mm flange to fit the chimney.



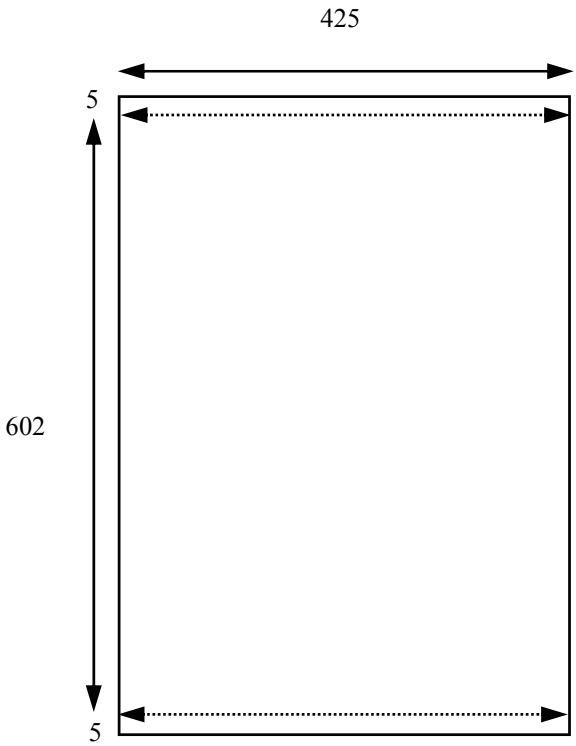
BUILDING THE BODY OF THE ECOSTOVE

Side panel 'A' and **Bottom panel**

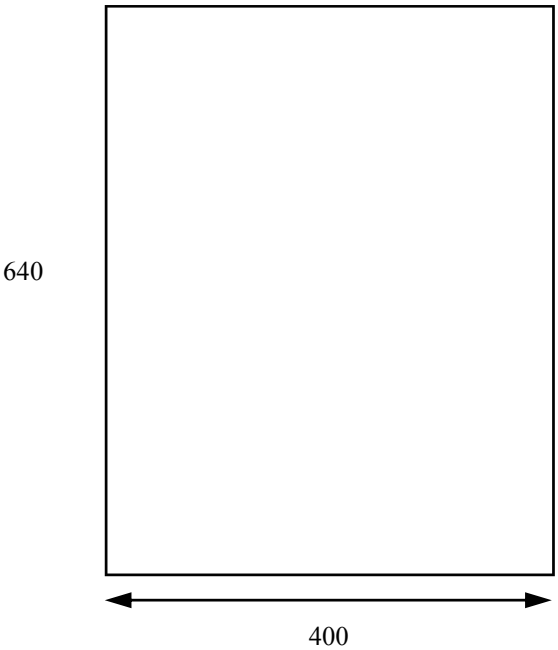
1 Take a piece of 1 mm galvanized sheet metal and cut one section 612 mm by 425 mm



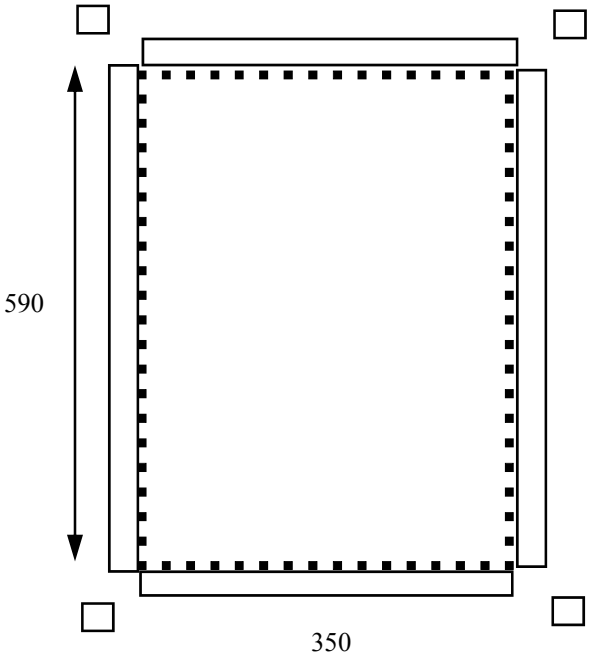
2 'O' Bend two 5 mm flanges.



Box bottom Take one piece of 1 mm galvanized sheet steel and cut one section 640 mm by 400 mm



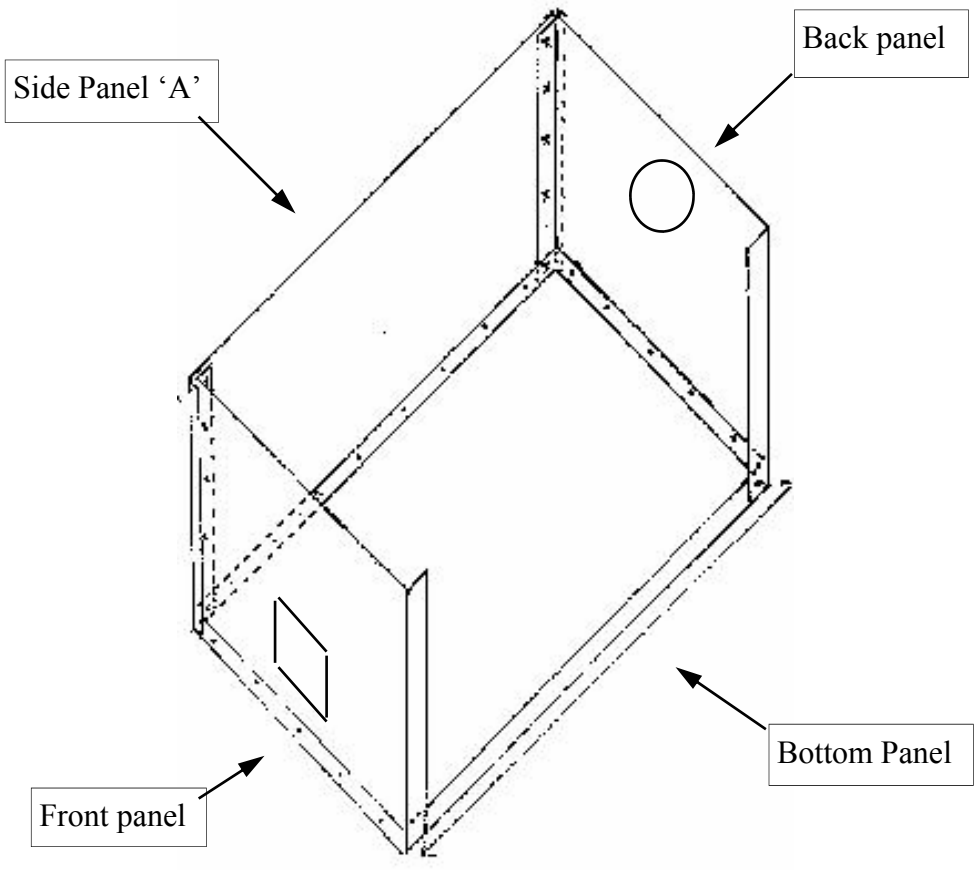
Remove a 25 mm tab from each corner and then fold to form four lips.



CONSTRUCTING THE BOX

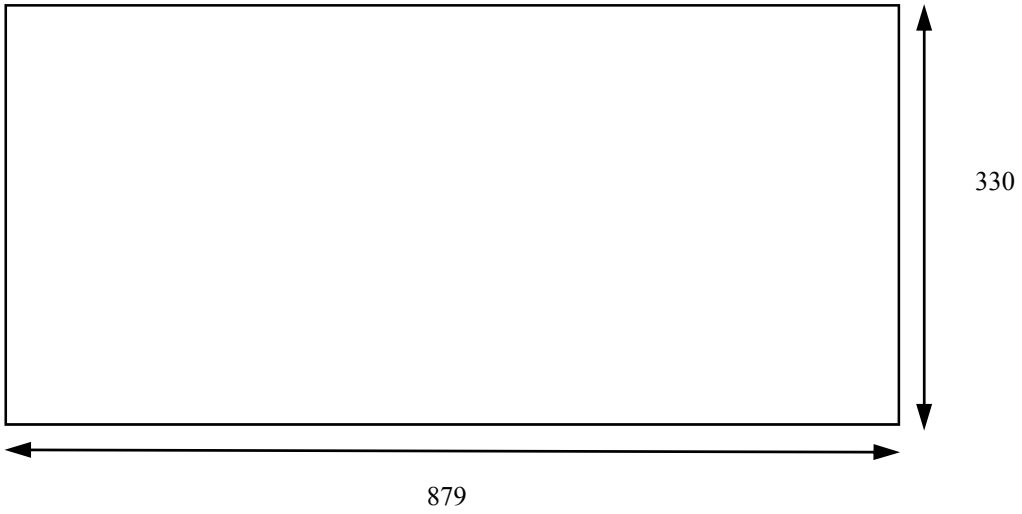
Join the front panel and the Back panel to the **outside** of the box bottom. Drill 5 holes where each panel meet but attach only 2 screws per side.

Then attach side panel ‘A’ to the **outside** of the Back and the Front panels. Drill 5 holes where each panel meet but attach only 2 screws per side.

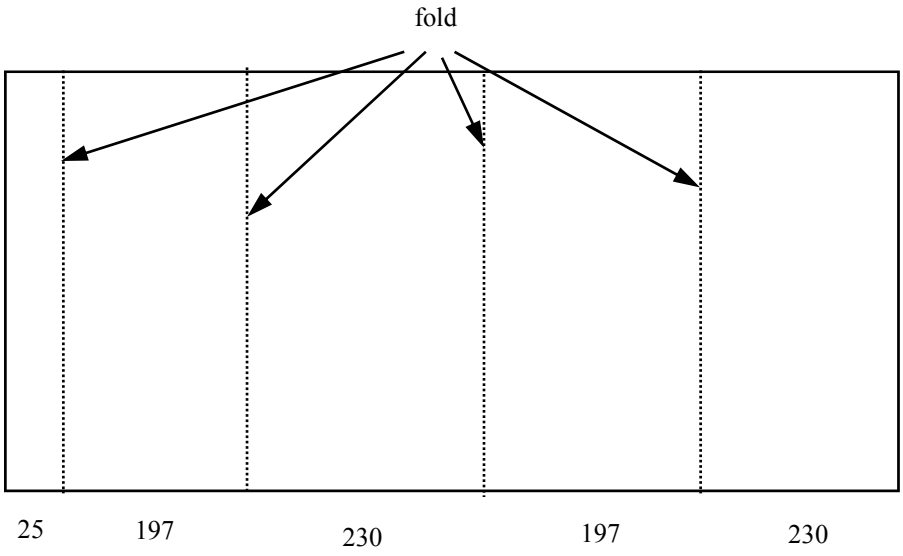


CONSTRUCTING THE OVEN

Take a piece of 1.2 mm 3CR12 and cut one section 879 by 330 mm.

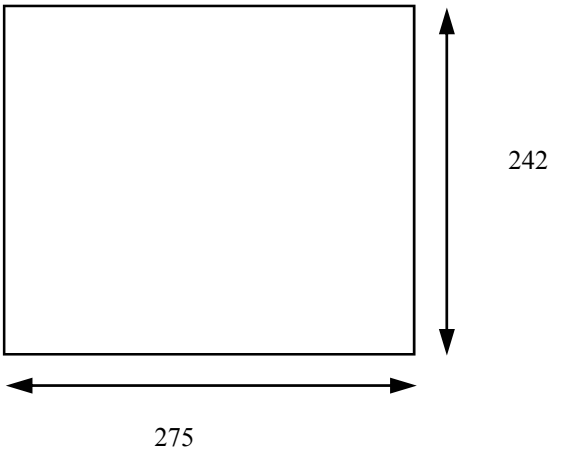


Scribe the lines as shown and then fold into a 4 sided box with a 25 mm lip. Weld with stainless steel welding rods. Before welding , double check that the 4 sides are exactly 25, 197, 230, 197, and 230.

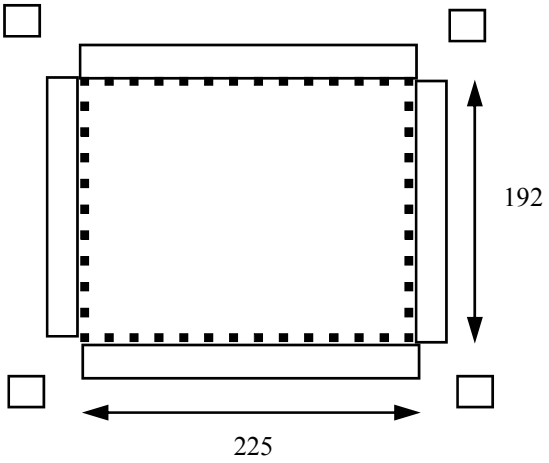


CUTTING THE OVEN BOTTOM

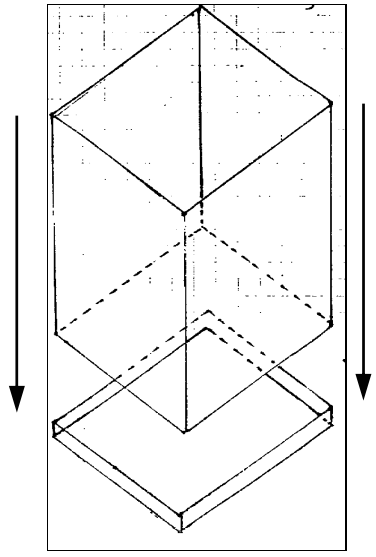
1 Cut one piece of 1.2 mm 3CR12 242 mm by 275 mm.



2 Remove a 25 mm tab from each corner and fold the sides to form the four lips of the oven bottom.

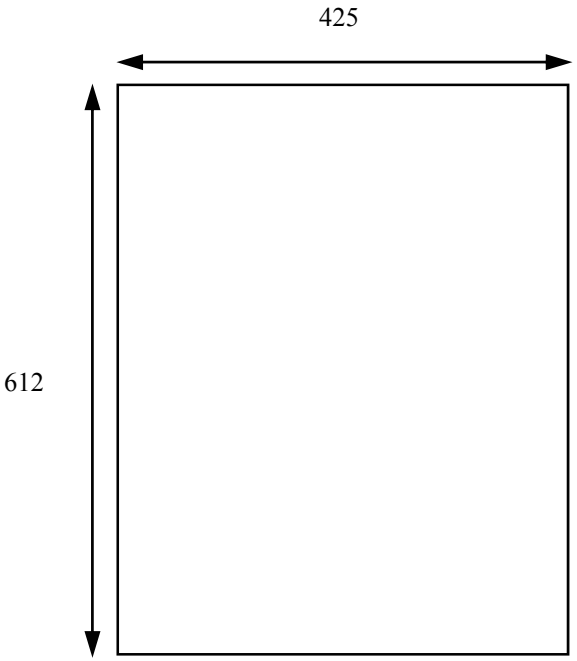


3 Insert the oven bottom into the **inside** of the oven box and tack weld with stainless steel welding rods.

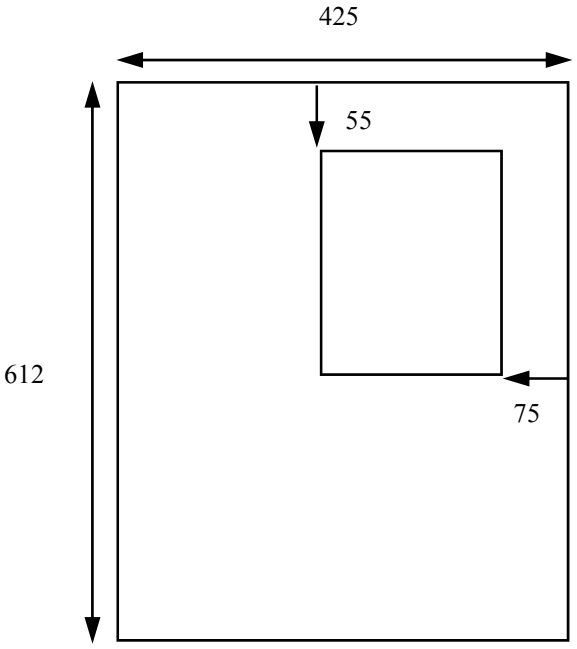


CUTTING SIDE PANEL 'B' (OVEN ENTRANCE)

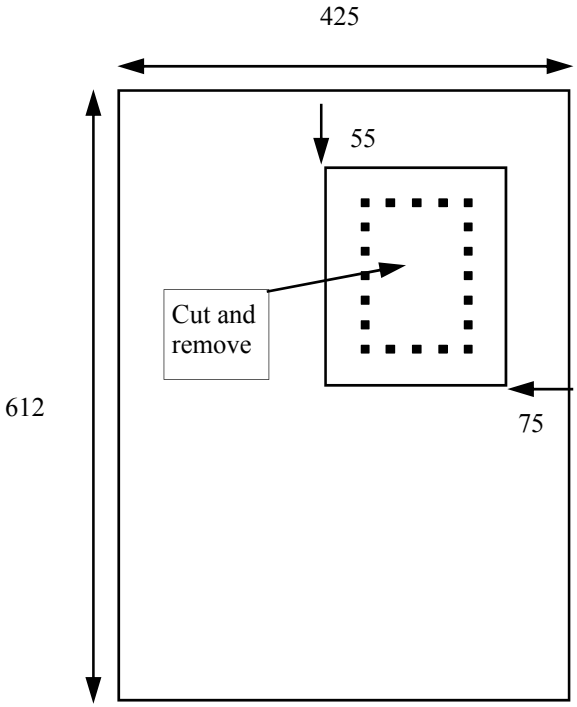
1 Take one piece of 1 mm galvanized sheet steel and cut a 612 by 425 mm section.



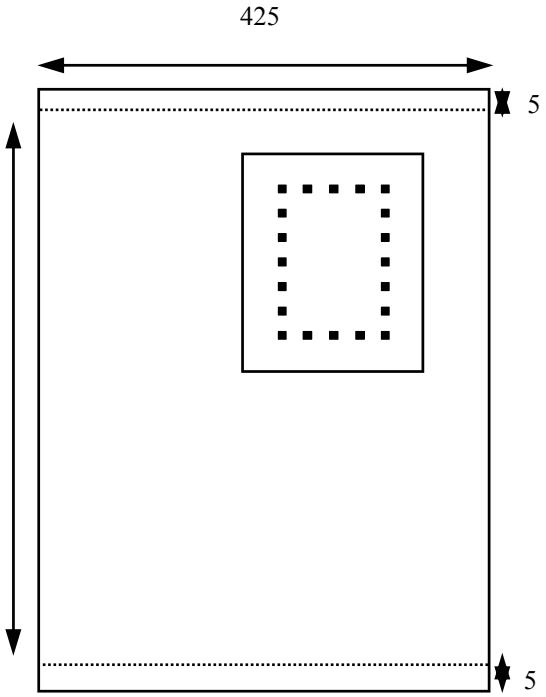
2 Place the completed oven unit on the top right corner of the sheet—75 mm from the bottom and 55 mm from the side. Scribe but do not cut a line around the oven body.



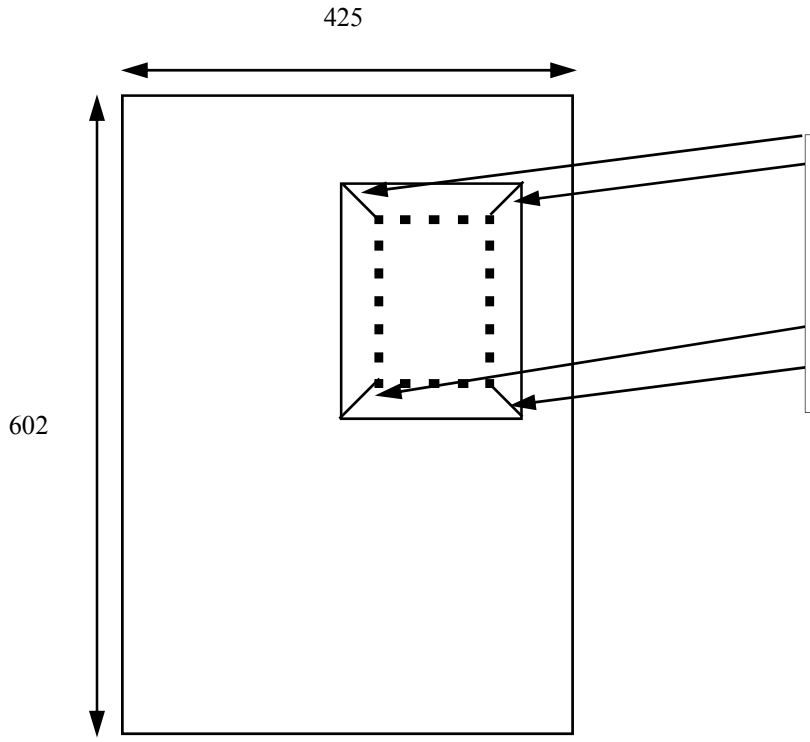
3 Scribe another box , inset 25 mm in from the previous box. Cut out the inset box.



4 X' Bend two 5 m flanges (bending down **away** from the planes of page).

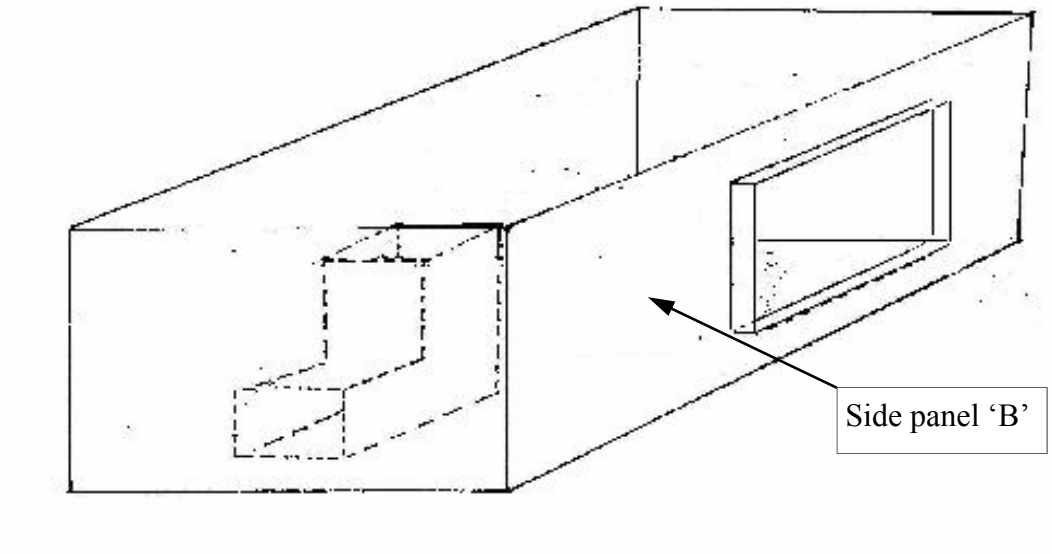


COMPLETING THE OVEN ENTRANCE



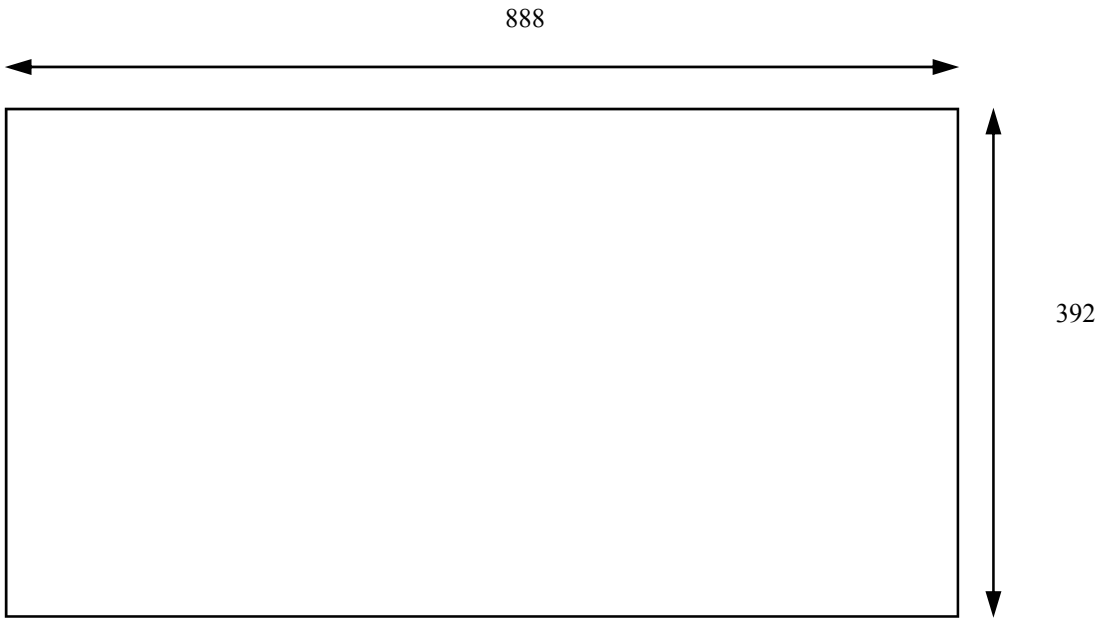
Cut four 25 mm lines on a 45 degree angle to form the four flanges . 'O' bend these flanges (bending up and out ward from the plane of the page).

Once the oven entrance is cut, attach side panel 'B' to the outside of the Front panel, Back panel and the Bottom panel Drill and attach with metal screws.

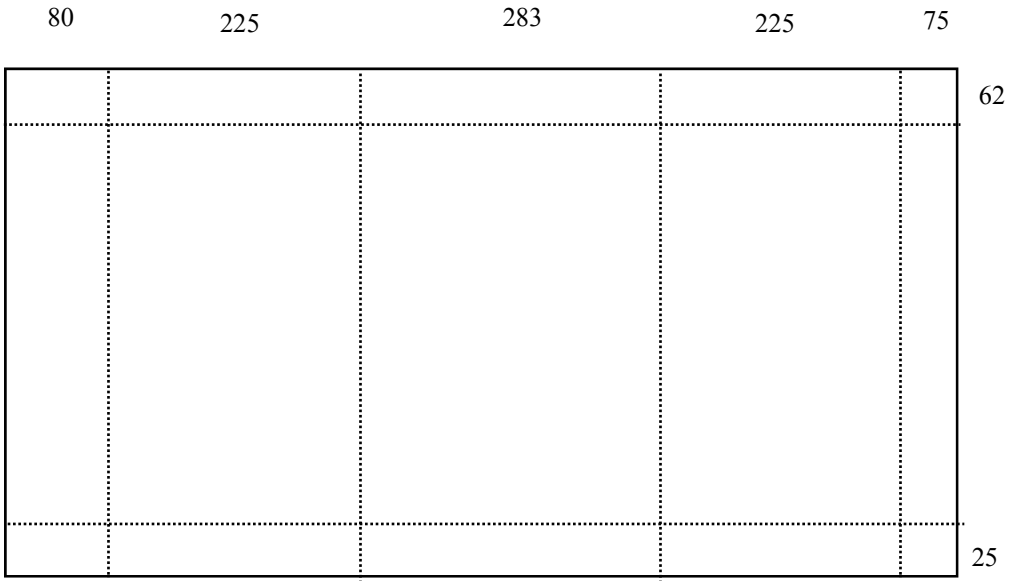


BUILDING THE OVEN JACKET

Take one piece of 1 mm galvanized sheet steel or 1.2 mm 3CR12 and cut an 888 by 392 mm section.

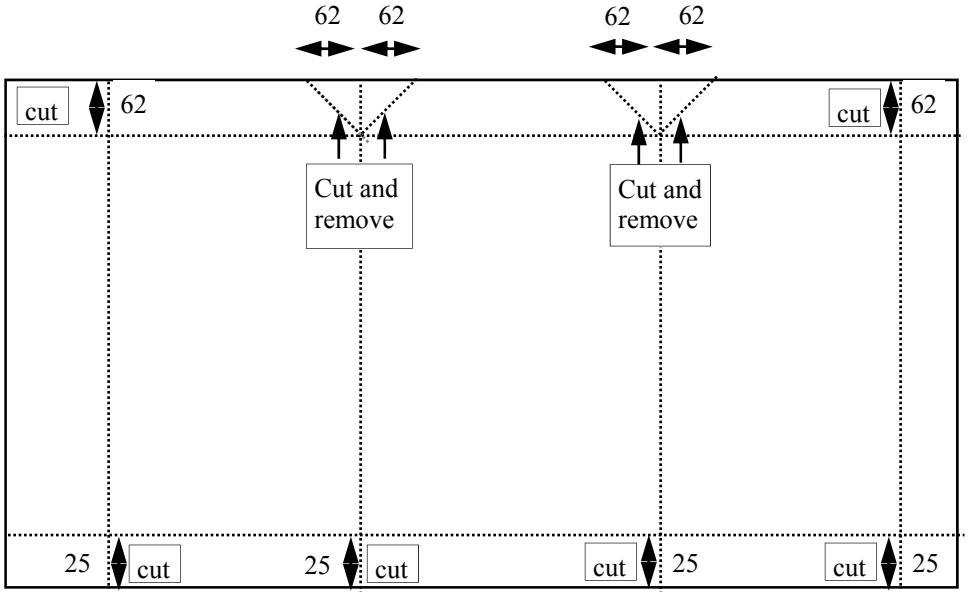


Scribe the lines shown below.

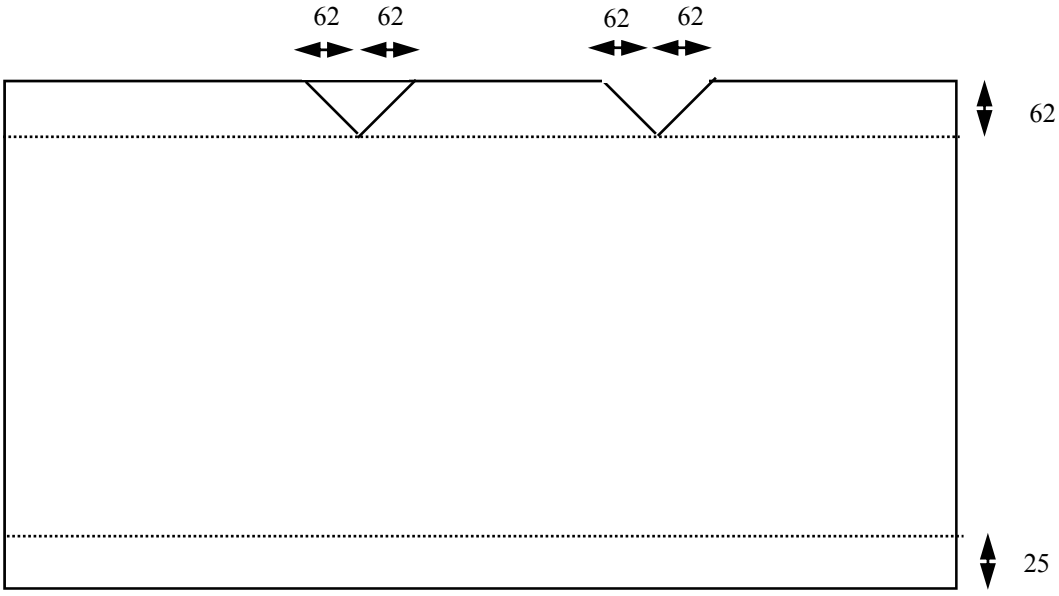


BUILDING THE OVEN JACKET (CONTINUED)

Cut 2 miter joints and 6 straight cuts along the dotted lines. Make the straight cuts from the edge of the sheet only to the **first** horizontal line. Do not cut beyond the horizontal line.



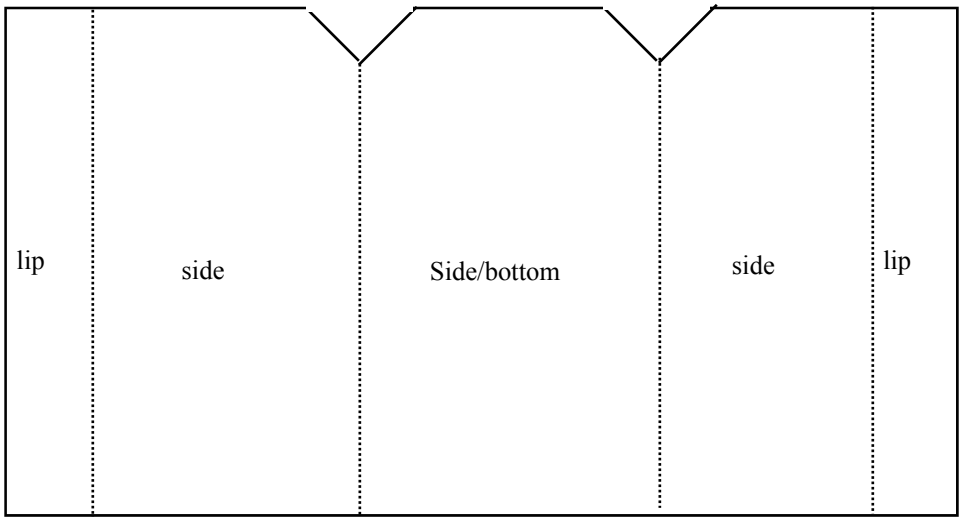
Make an '0' crease* along the 62 mm dotted horizontal line and then make an 'X' crease* along the 25 mm dotted horizontal line. DO NOT FOLD.



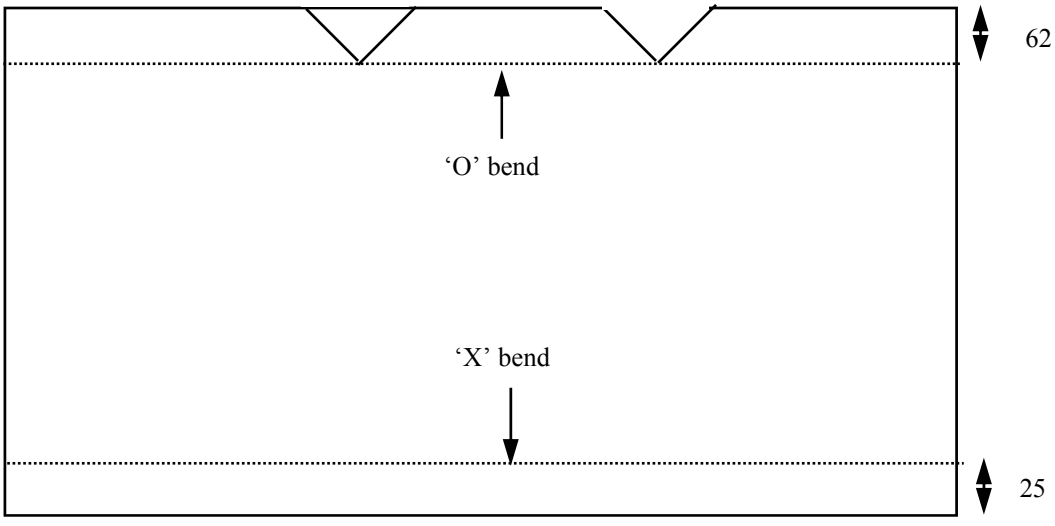
*To make a crease , bend to 20 degrees and then flatten to remove the fold . When finished, the piece will lay flat with a small indentation

BUILDING THE OVEN JACKET (CONTINUED)

'O' Bend and fold 90 ° along the previously scribed vertical dotted lines.

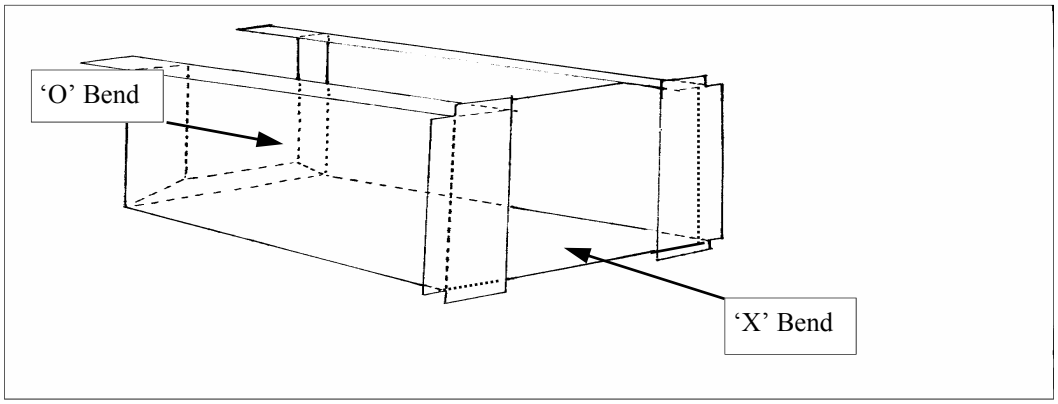


The jacket should now be a 3 sided box with two lips . Using the previous **crease** marks, fold an 62 mm 'O' bend and a 25 mm 'X ' bend. Use pliers or vice grips to fold.

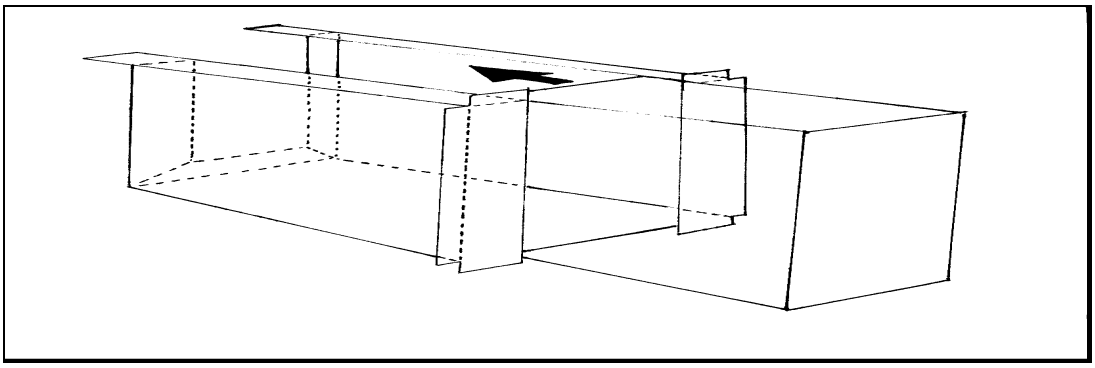


BUILDING THE OVEN JACKET (CONTINUED)

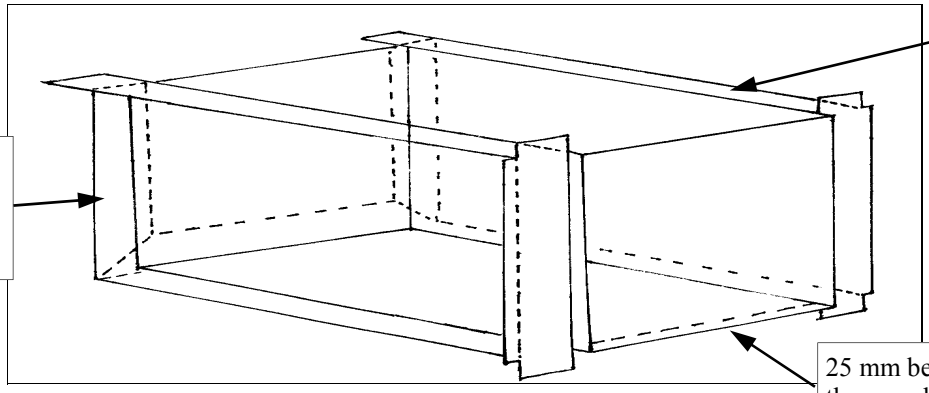
Once folded, the oven jacket should look like the drawing below. Note that the folds at the back of the skirt are opposite to folds at the front of the jacket ('X' Bends vs. 'O' Bends)



Place the oven jacket into the stove body and then slide the oven into Side panel 'B'/oven entrance.



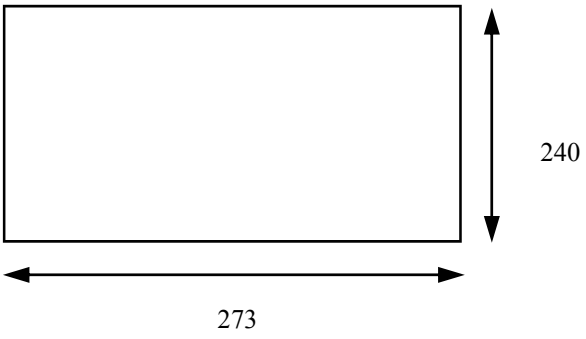
Use an arc welder to weld the **jacket** to the **oven** and the **jacket** to the **stove body**. The gap between the oven body and the jacket is important. See below for the proper gap on each side.



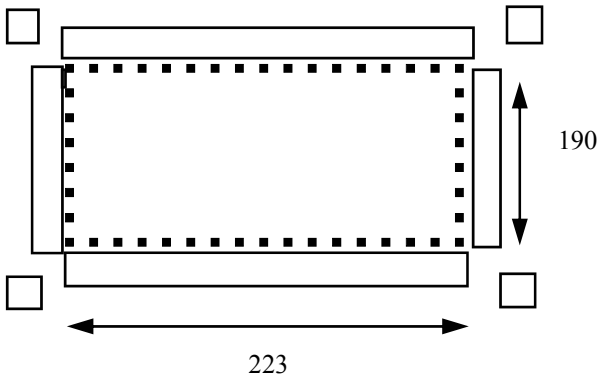
BUILDING THE OVEN DOOR

Internal door compartment .

This piece is designed to fit **inside** the oven.
1 Take 1 piece of 1.2 mm 3CR12 and cut a 273 mm by 225 mm section.

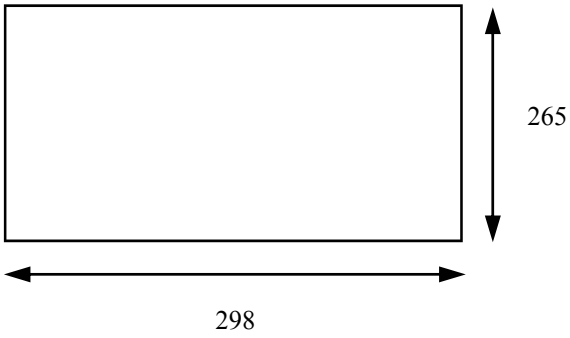


2 Remove a 25 mm tab from each corner and then fold to form four lips.

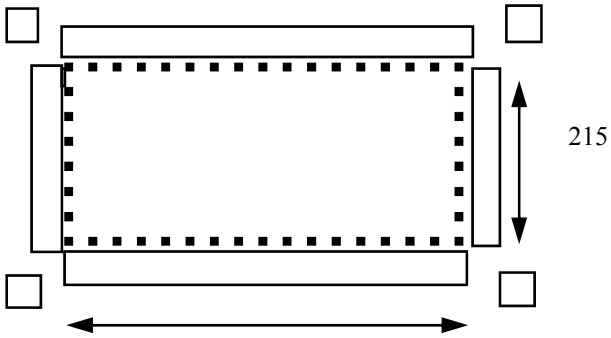


External door compartment

This piece should fit snugly on the **outside** of the oven.
1 Take one piece of 3CR12 and cut a 265 mm by 298 mm section.

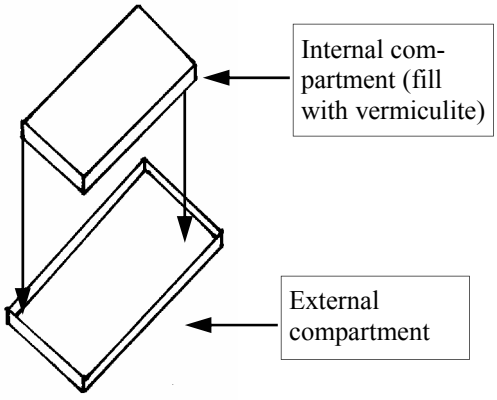


2 Remove a 25 mm tab from each corner and then fold to form four lips



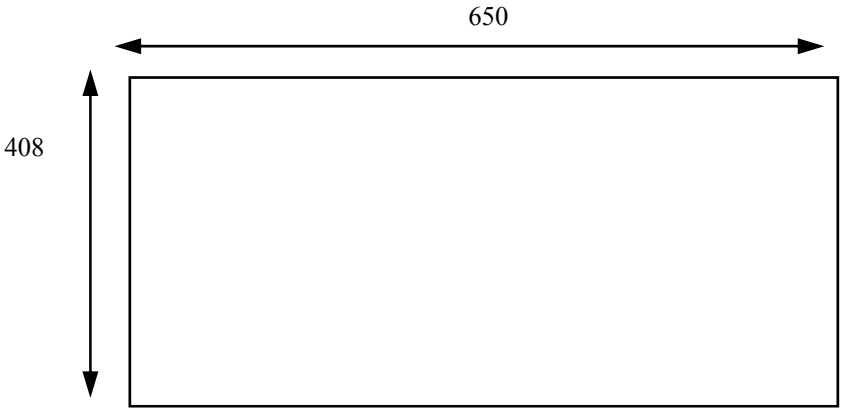
Fill the inside of the internal compartment with vermiculite or fiberglass insulation . Then weld the internal compartment to the inside of the external compartment.
(note: Be sure that the internal compartment fits into the oven before welding together).

Then make a handle to your own specifications and attach to the outside of the external compartment.

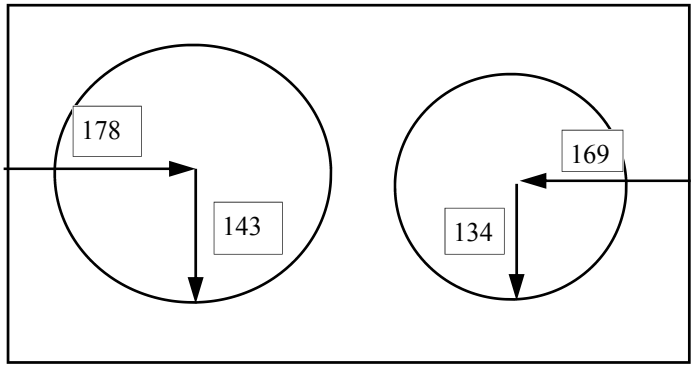


CONSTRUCTING THE TOP PLATE /COOKING SURFACE

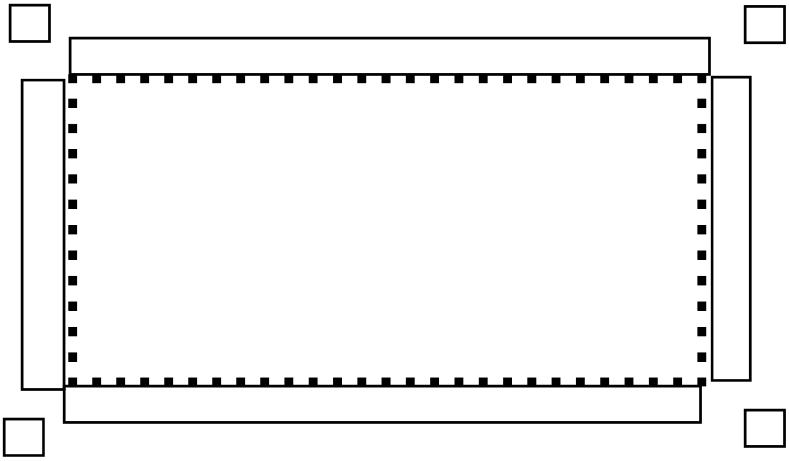
These measurement are for a #2 and a #3 round-bottom cast iron pots. The stove can be modified to accept larger and smaller size pots



Take a piece of 2 mm mild steel and cut one 408 mm by 650 mm section.



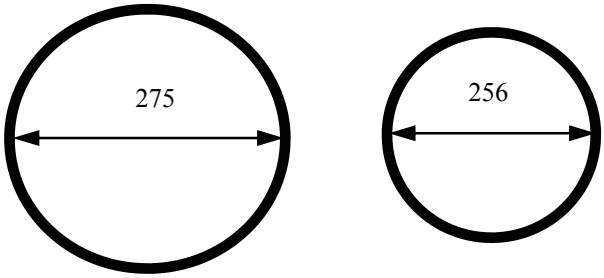
Scribe the large circle - 178 mm from the edge. Scribe the smaller circle -169 mm from the opposite edge. Use a jig saw or plasma cutter to cut the two circles. Try to cut the circles cleanly so that the remaining pieces can be reused as stove lids.



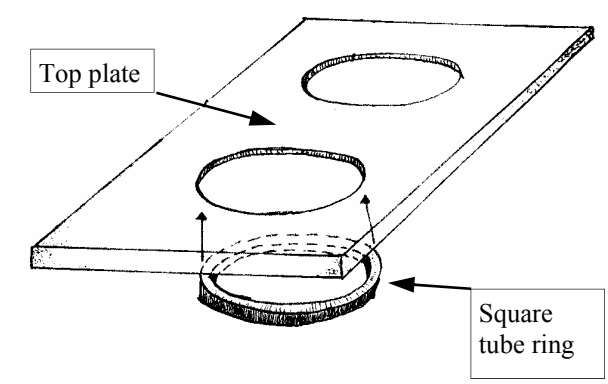
Remove four 20 mm square tabs from each corner and then fold.

CONSTRUCTING THE TOP PLATE /COOKING SURFACE Cont'd

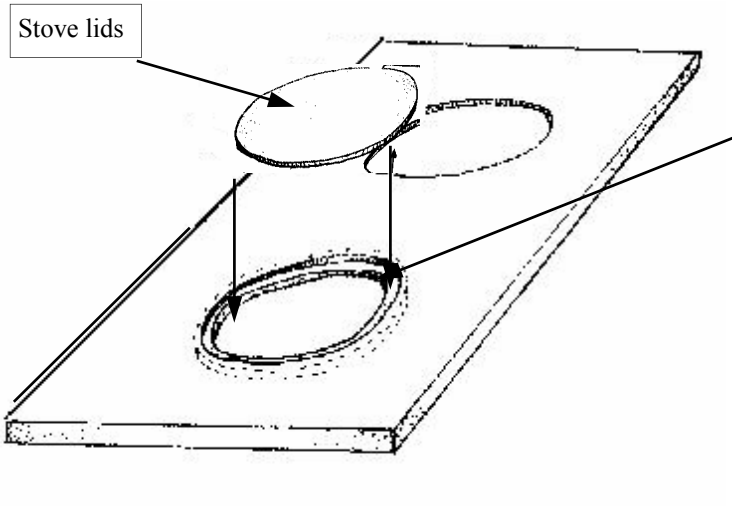
Take a piece of 2 mm by 10 mm square tubing and cut an 866 mm section and an 810 mm section.



Bend each section into a circular ring and weld.



Take the top plate that you cut on the previous page and clamp it to the welding table (to prevent warping). Then tack weld the square tube rings to the underside of the top plate. note: although the drawing adjacent only shows one ring, be sure to attach both the front and the back ring. Attach the 275 mm ring under the large hole and the 256 mm ring under the smaller hole.

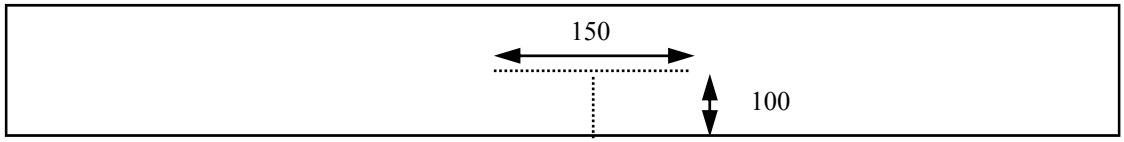


Once attached to the top plate, one half (or 5 mm) of the tubing should be visible from above.
The exposed part of the square tube will form a lip that will support the stove lids. The stove lids can be used to seal the stove when the pots are not in place. This will keep smoke from entering the house.

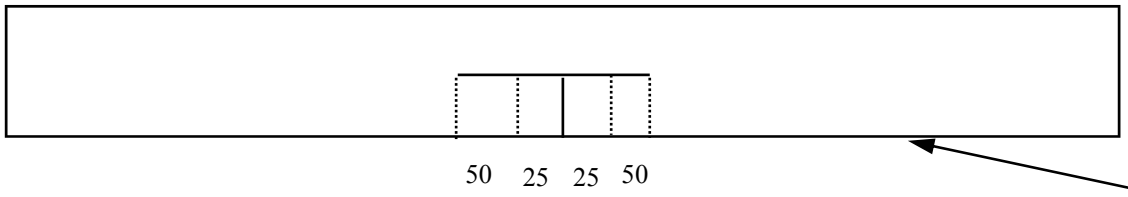
CUTTING AND INSTALLING THE POT SKIRT

Take one piece of 1.2 mm 3CR12 and cut a 150 mm by 1350 mm section .

Find the center of the sheet and cut along the 100 mm vertical line and the 150 mm horizontal line.

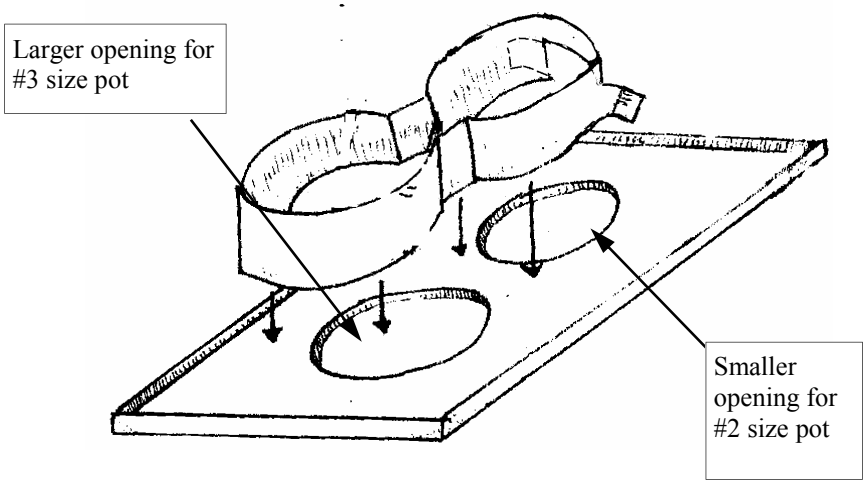


Make two 25 mm 'X' Bends and two 50 mm 'X' Bends to form the passage to the chimney exit.



Weld the **bottom** of the skirt to the underside of the top plate.

Bottom view of Top plate

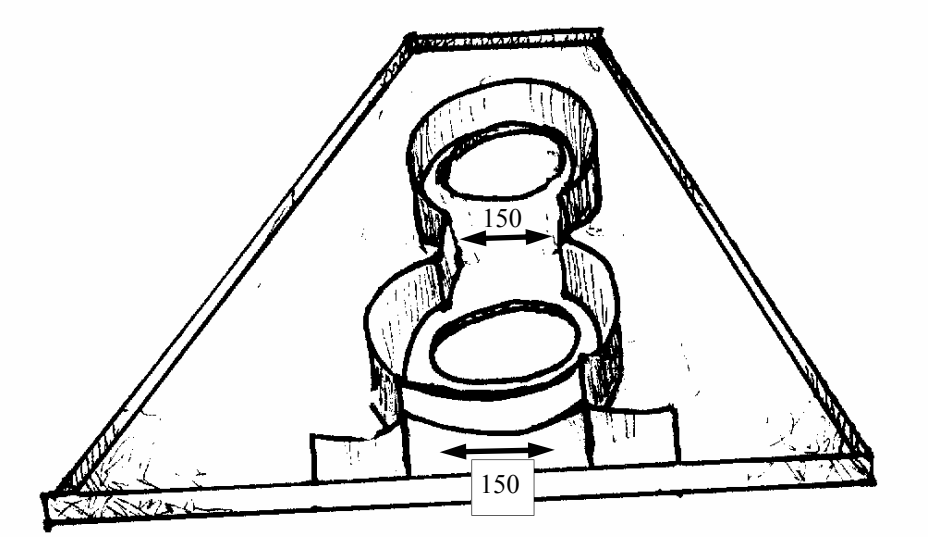


Use a clamp to attach the top plate to a welding table (to prevent warping). Place the skirt so that the 'X' Bends lay behind the smaller ring (the opening for the chimney exit). Tack weld the skirt around the outside of the 10 mm square tube rings as shown in the adjacent picture. See next page for more info about placing the skirt on the top plate.

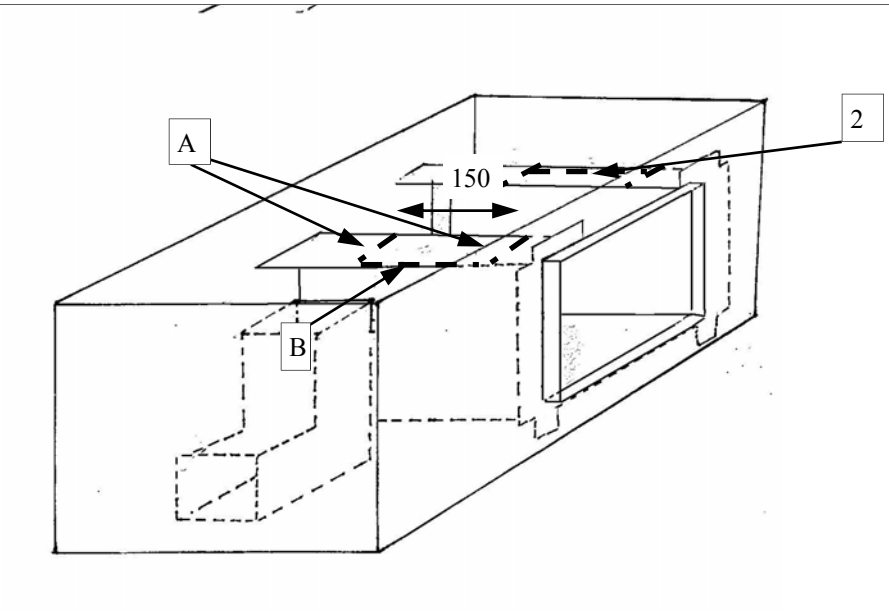
COMPLETING THE TOP PLATE

(Use 2 mm mild steel)

It is important to maintain a 150 mm gap between the two sides of the skirt to allow sufficient airflow between the first and the second pot. The 150 mm gap between the two sides of the skirt is the same dimension that will be scribed on the oven jacket to create the opening for the jacket entrance and exit.



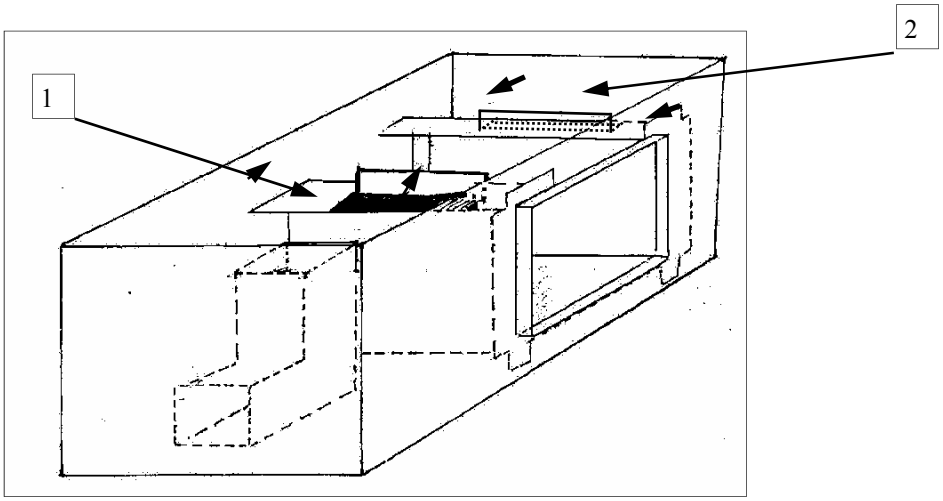
Cutting the openings into the oven jacket. 1 Oven Jacket entrance Place the top plate/skirt unit on top of the stove body and A) scribe two lines where the bottom of the skirt meets the oven jacket. Then B) draw a third line joining the first two lines at the **front** of the oven jacket . Using an electric grinder cut these three lines**. 2 Oven jacket exit** Repeat step A at the back of the oven exit. Then draw a third line joining the first two lines at the back of the oven jacket.



COMPLETING THE TOP PLATE

(Use 2-3 mm mild steel or 1.2 mm 3CR12)

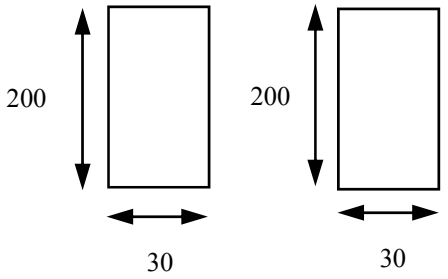
1 After cutting the three lines, bend the piece upwards to create a vertical flange. As shown in the drawing below. **2** Repeat at the back of the oven to form the jacket exit.

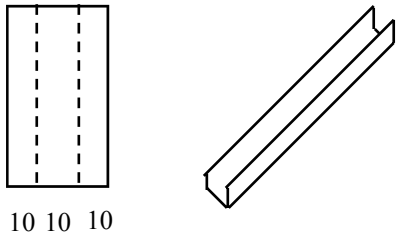


Constructing the damper.

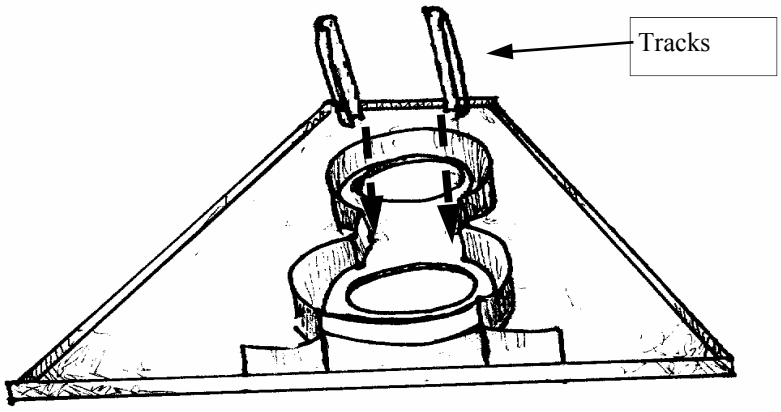
1 Take a piece of 1.2 mm 3CR12 and cut **two** 30 mm by 200 mm sections.

2 Scribe two 10 mm lines and then make two 'O' folds to form a three sided 'track' that will serve as the guide for the damper. Repeat for both pieces.





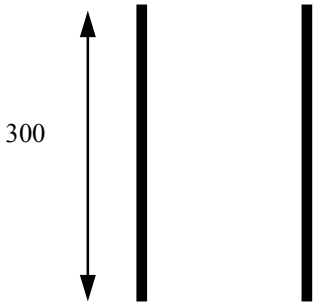
Place the top plate on the stove body so that the tracks enter into the oven jacket. Weld the 'tracks' to the inside of the skirt. The tracks should lay as close to the oven body as possible.



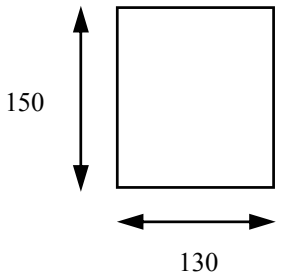
)CONSTRUCTING THE OVEN DAMPER

(Use 2-3 mm mild steel

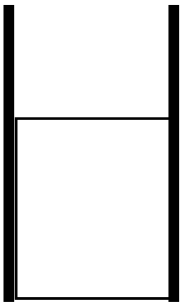
1 Take a 7 mm steel bar and cut two 300 mm sections. These bars are the rails of the damper.



2 Take a piece of 2 mm plate steel and cut a 130 mm by 150 mm section



3 Weld the rails to the **outside** of the 2 mm steel plate.



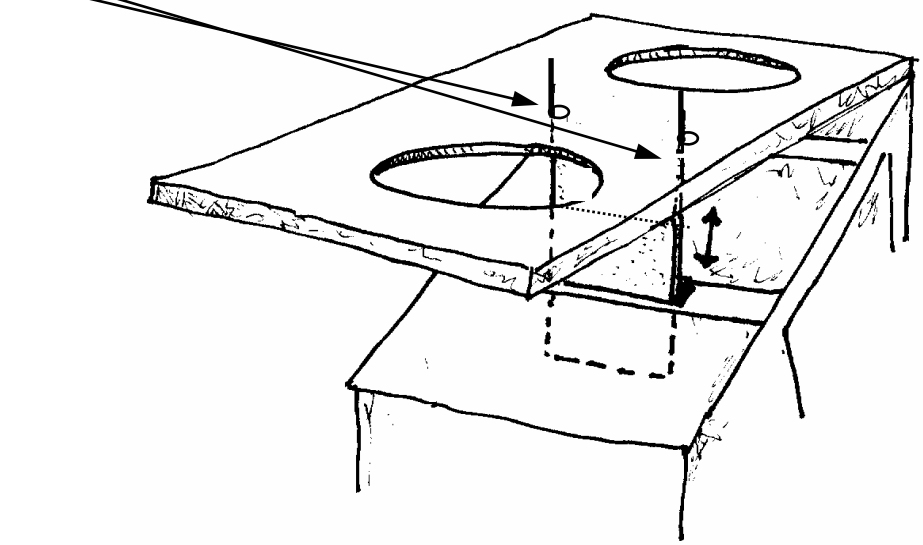
A Drill two 10 mm holes in the top plate and slide the rails of the damper through them.

The damper should:

- slide smoothly in the tracks
- sit inside the track guides
- lay as close to the oven body as possible

When the damper is in place, there should be a 50-65 mm gap between it and the f**ront** of the oven jacket. When the damper is in the lowered position it should create a 130 mm by 100 mm passage between the first and second pot.

A

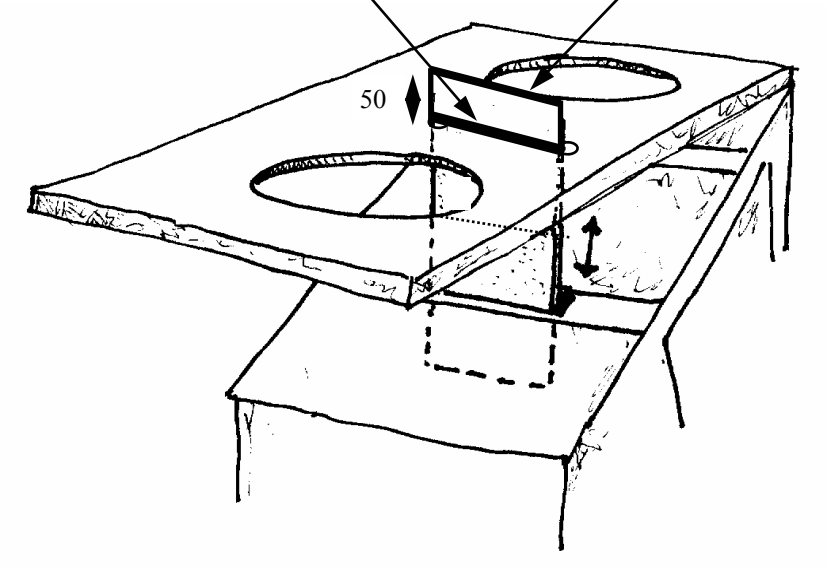


CONSTRUCTING THE OVEN DAMPER

Constructing the damper handle

1 Weld a piece of 7 mm steel bar between rails of the damper, 50 mm below the top of the rails. This will hold the damper in the correct open position .

2 Weld another piece of 7 mm steel bar between the top of the rails. This will be the handle for the damper.

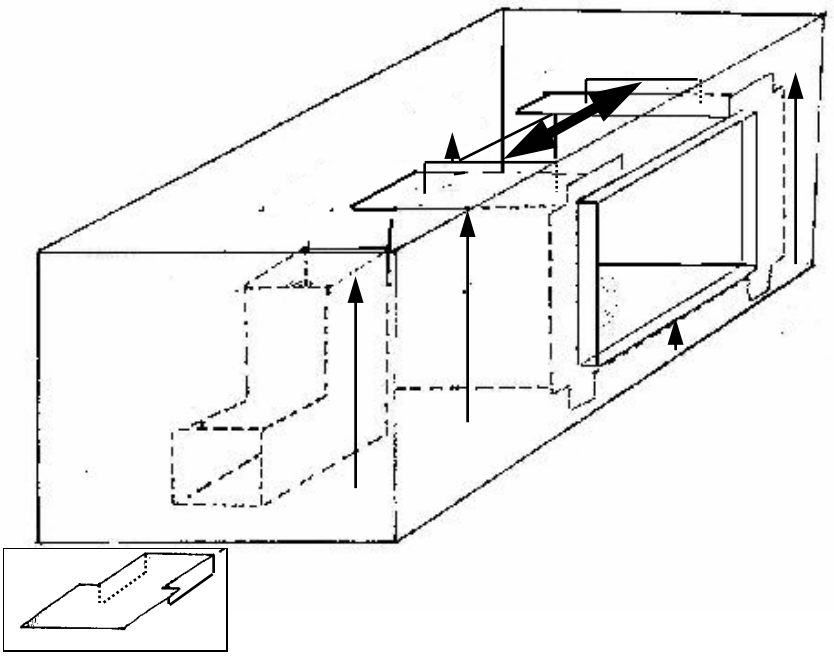


The damper unit should look like this when finished.

The top of the tracks - where the tracks meet the top plate - can be lightly pinched with vice grips to hold the damper in place when it is in the up (or closed) position . Be careful not to pinch the tracks too tightly or the damper will not slide at all.

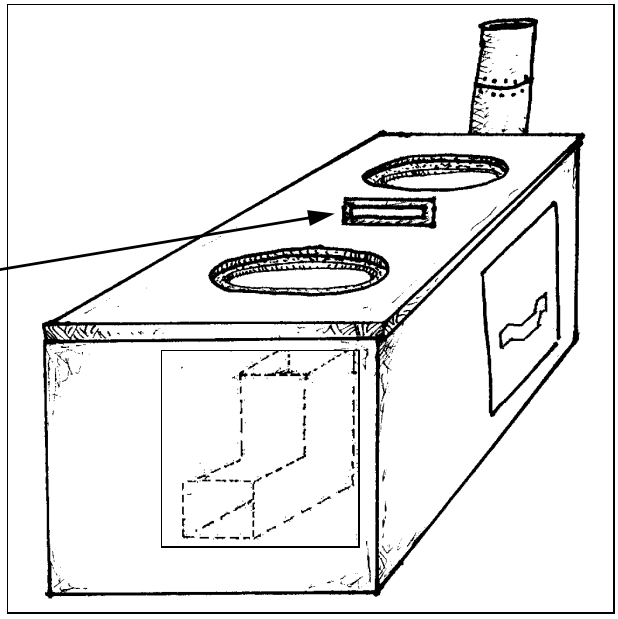
FINISHING THE STOVE

Fill the stove with medium grade vermiculite or wood ash (see arrows in diagram below). Fill under and around the Rocket Elbow. Fill under and around the oven jacket. Be sure to **not** put any vermiculite between the oven jacket and the oven body as it will block the passage of heat around the oven. Fiberglass insulation can also be added between the skirt and the stove body.



Insulation should also be added on top of the oven unit (between the ◆ . The two flanges that were cut and formed on page 34 should hold the insulation in place and stop it from falling down into the oven compartment.

Once the stove body is filled with insulation then the top plate can be permanently affixed to the body of the stove. Drill 4 holes per side and connect with metal screws.



The diagram on the right shows the damper in the lowered or open position This allows hot gases to pass to the first and second pot but not the oven . When the damper is in the raised or closed position it allows hot gases to travel past the first pot and enter the oven but not the second pot . For the oven to work either both pots or stove lids must be in place to maintain sufficient draft.