

Panval Rocket Stove -

(A Tin Can Rocket Stove for clean and efficient cooking with firewood.)

The Need :-

As per recent census figures almost half of India's population uses firewood for cooking ! If we consider only the rural population this proportion is as high as 70% !

And yet, 65 years after independence, a villager cannot get to see or buy a good efficient and affordable firewood cookstove at his local grocery or hardware shop.

In the absence of such a ready cookstove the villagers tend to use the ordinary 3-stone choolah which is a very inefficient and hazardous method of cooking.

It results in gross wastage of precious firewood and causes enormous indoor smoke pollution which very adversely affects the health of the women and small children of the household.

Global Statistics say that around 4 million people mostly women and children are killed every year due to ailments caused by indoor air pollution attributed to cookstove smoke. Out of these over 6 lakhs are from India !

This is a national emergency which has remained almost unnoticed, unrecognised and unaddressed. This is evident from the fact that not a single affordable firewood cookstove model is ubiquitously available all over the country under a government program or private entrepreneurship.

The "Panval Rocket Stove" has been conceived as a self-help solution for the masses of India to help themselves out of this dire situation.

The Panval Rocket Stove is the most simplistic clean-cookstove solution which breaks the price-barriers inherent in industry made stove products and brings efficient, almost smokeless cooking to the underprivileged millions at a price which even the poorest of the poor can afford.

The Panval Rocket Stove design is such that it can be made at home using just hand tools. The stove design is ideal for fabrication at the village cottage industry level and has the potential to not only make cooking cleaner and safer for the masses, but also serve as a means of constructive self-employment on a mass scale to the able youngsters of the lakhs of villages in India.

The guiding principles behind the stove design have been :

- 1) **Ubiquitous availability of raw material**
(oil tin cans that are available anywhere and everywhere in India)
- 2) **Simplicity of manufacture**
(simplest hand tools needed to make the stove)
- 3) **Simplicity of use**
(almost no training needed to start usage)
- 4) **Affordability**
(Made out of discarded tin cans available in scrap !)
- 5) **Efficiency**
(Design is based on the rocket stove principle giving estimated thermal efficiency three to four times that of the 3-stone fire. Enormous savings of firewood achieved.)

Product Info :~



Production and Sale :

- Material used for one stove: 3 scrap oil tin cans + 1 dozen sheet metal screws + 6" x 6" GI wire mesh
- Labour: 2-3 hrs of sheet metal cutting and folding
- Recommended MRP : Rs. 250/- to Rs. 300/-

Performance :

- Can make 20 cups of tea in 10-15 mins using just 8 twigs (150 gms of wood)
- Can give a bucketful of hot bathing water in just 20 mins using 12-15 twigs (300 gms of wood)
- Can boil 4 big potatoes in just 15-20 minutes using 10-12 twigs only (200 gms of wood)
- Can cook daal (lentils curry) for 4 people in 40 mins using just 12-15 twigs (250 gms of wood)

Salient Features :

- No need of Kerosene to fire it up. Paper or dry-leaf tinder works well enough.
 - No need of blowing air to ignite or re-ignite the flames. Works on a sustained, self-generated natural air draught.
 - The stove, used within its power range, is almost smokeless and so usable indoors even in flats and apartments.
 - Portable and can be carried around even when lit.
 - Thermally very efficient and uses just 25-40% of wood used in a 3-stone stone choolah for the same cooking job.
 - Cooks much faster than the 3-stone choolah
 - Production does not require any power tools and so is cottage industry work.
 - Design is simple and the stove can be manufactured by anyone with a little practice.
 - Can burn any type of biomass but is ideally suited for fuel in the form of small dried twigs available easily all around our village lands.
 - Ideally sized for cooking in quantities sufficient for a family of 5-6 members.
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Panval Rocket Stove-v1 (Oil Tin Can Version)



Riser



Riser and Firebox mating



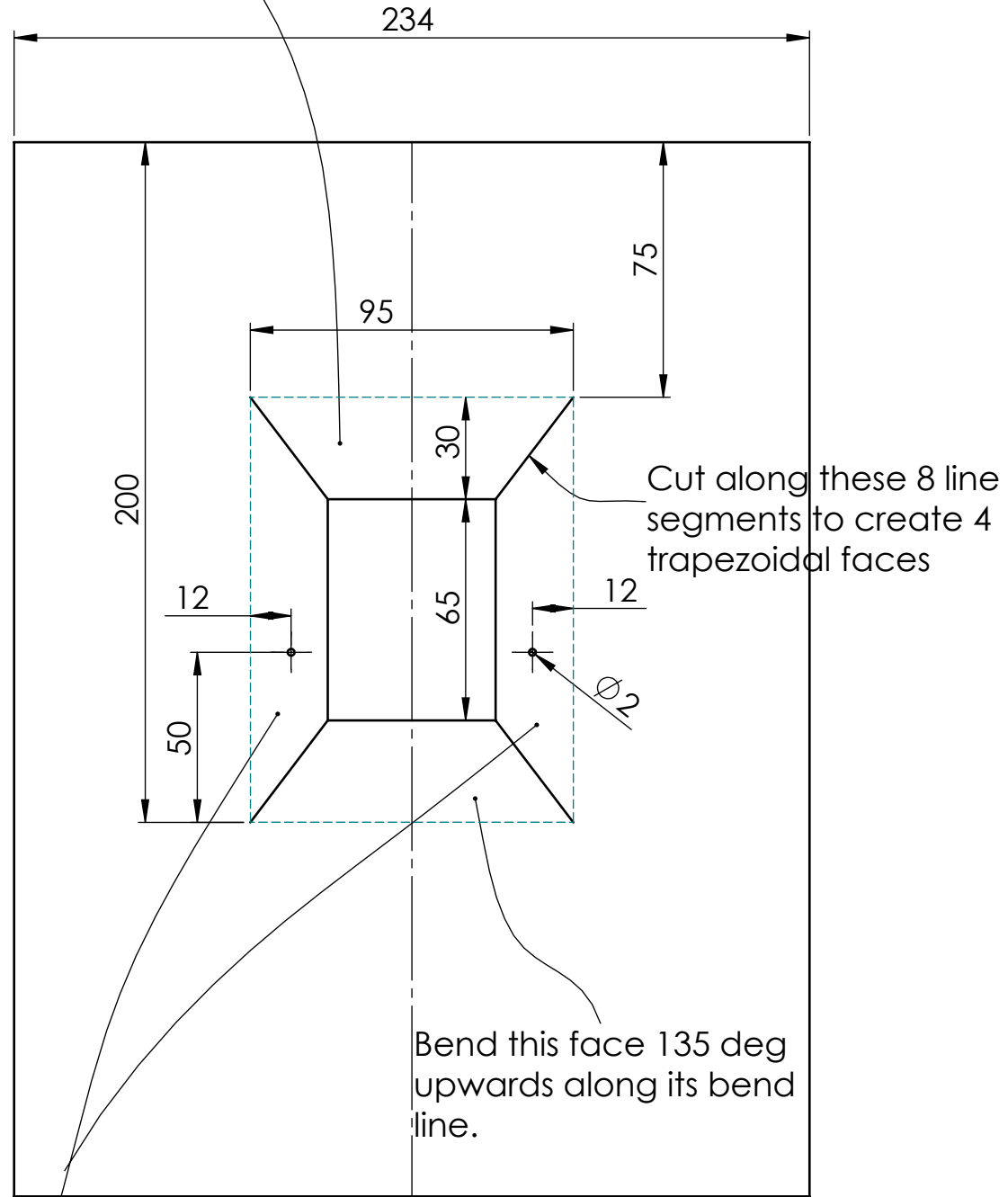
Sheet Metal development drawings and fabrication notes on following pages

for any queries and clarifications please write to info@applinnova.com

Part Name:- Tin-Can

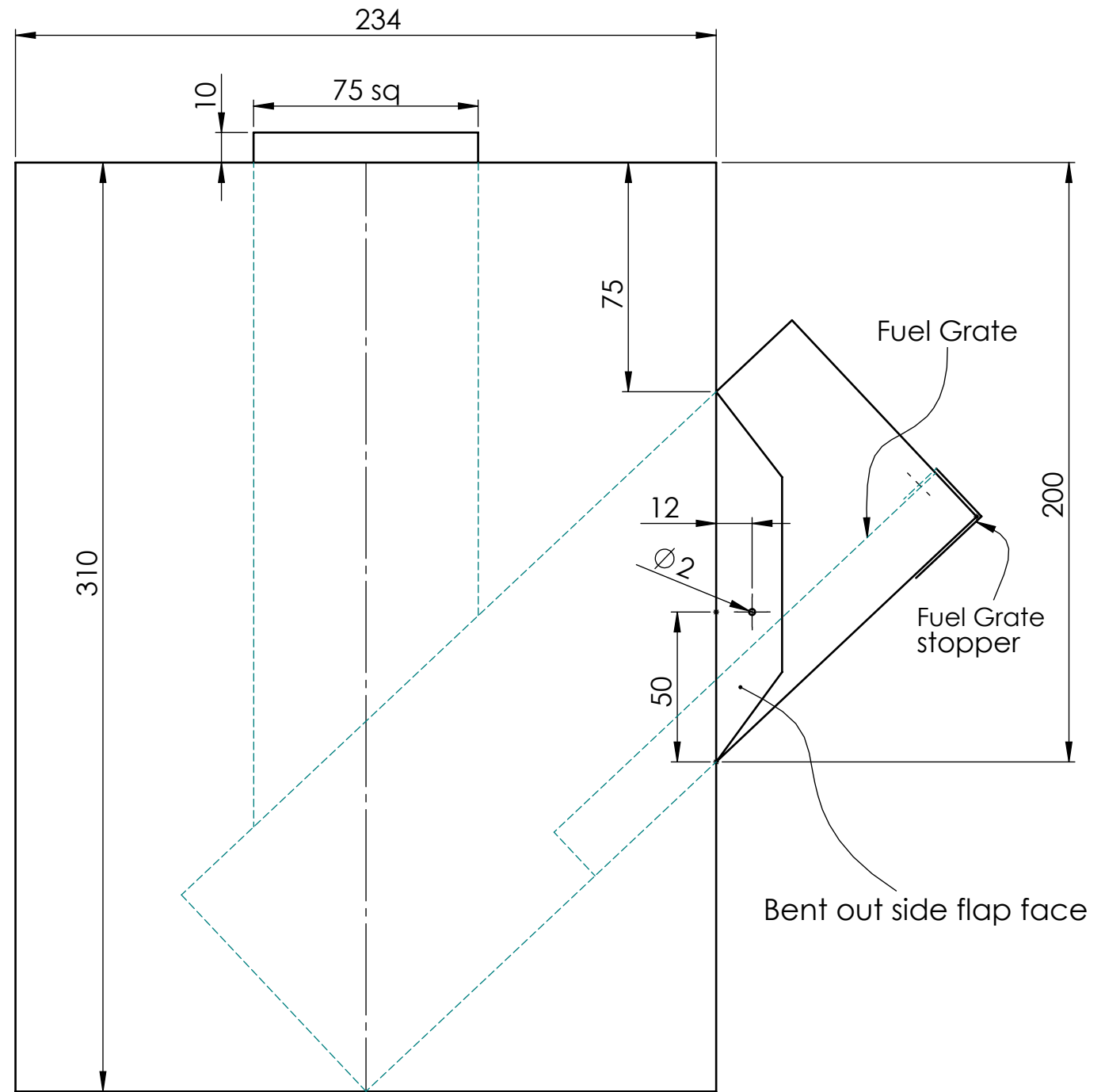
Front and Side views of the Stove assembly for dimensions and location details

Bend this face outwards and upwards by 43 deg to mate with upper the inclined face of the FireBox

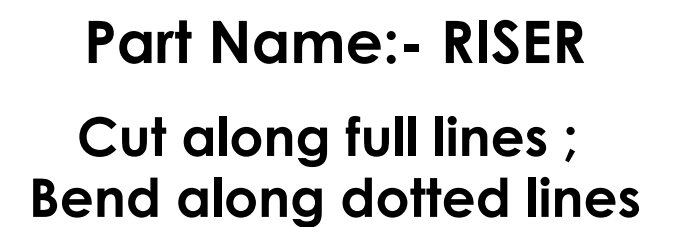


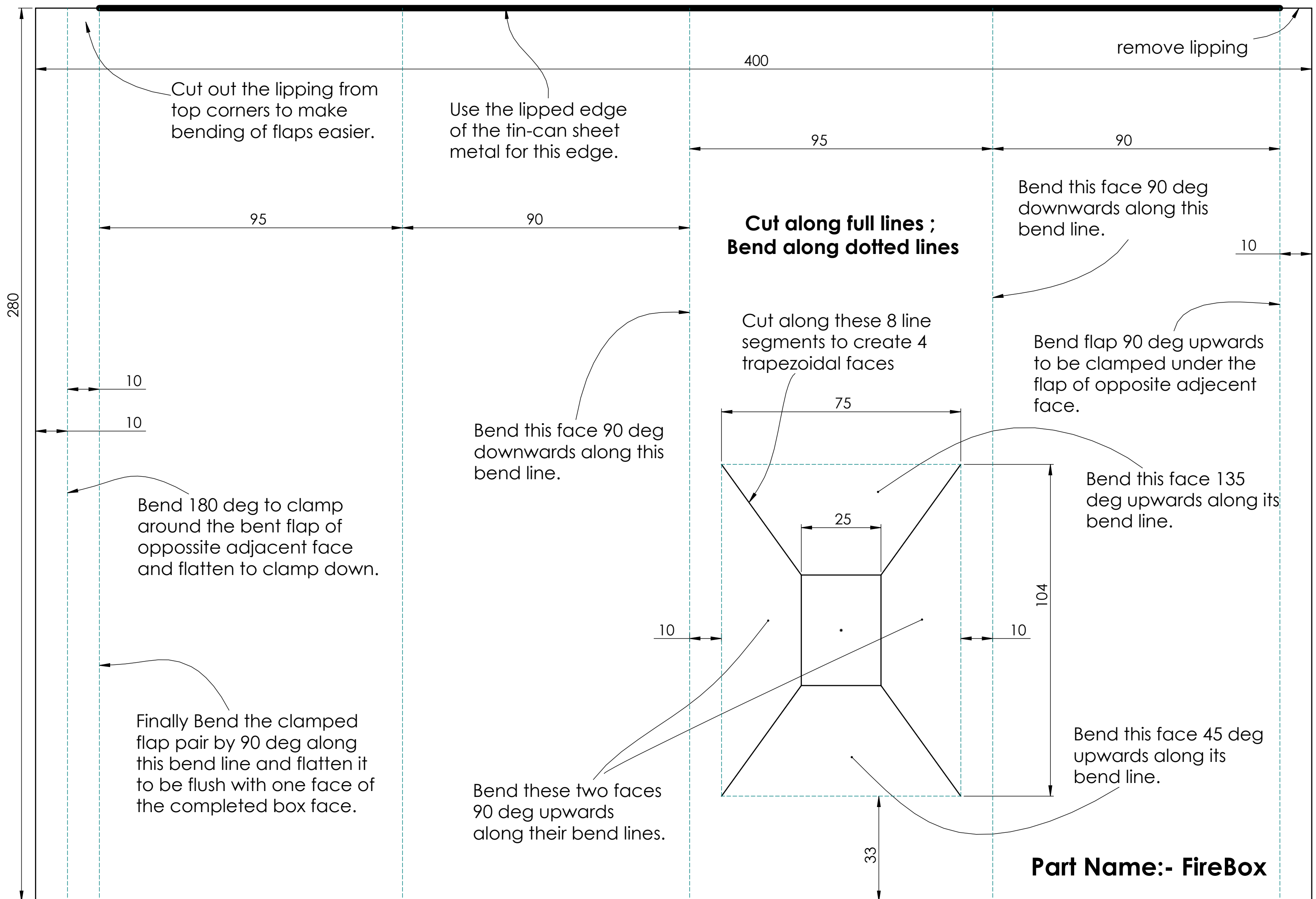
Bend these two side flap faces 90 deg outwards along their bend lines.

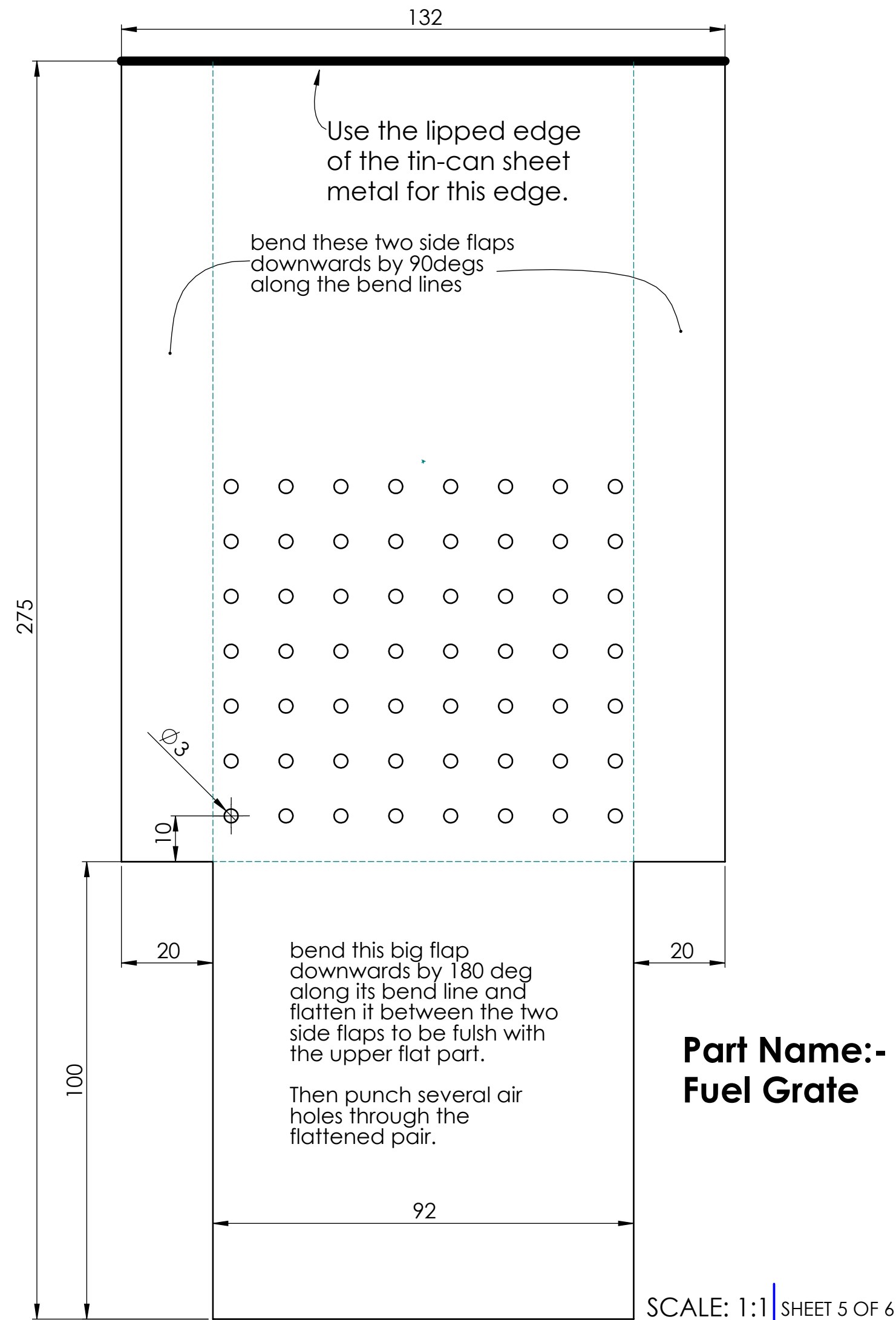
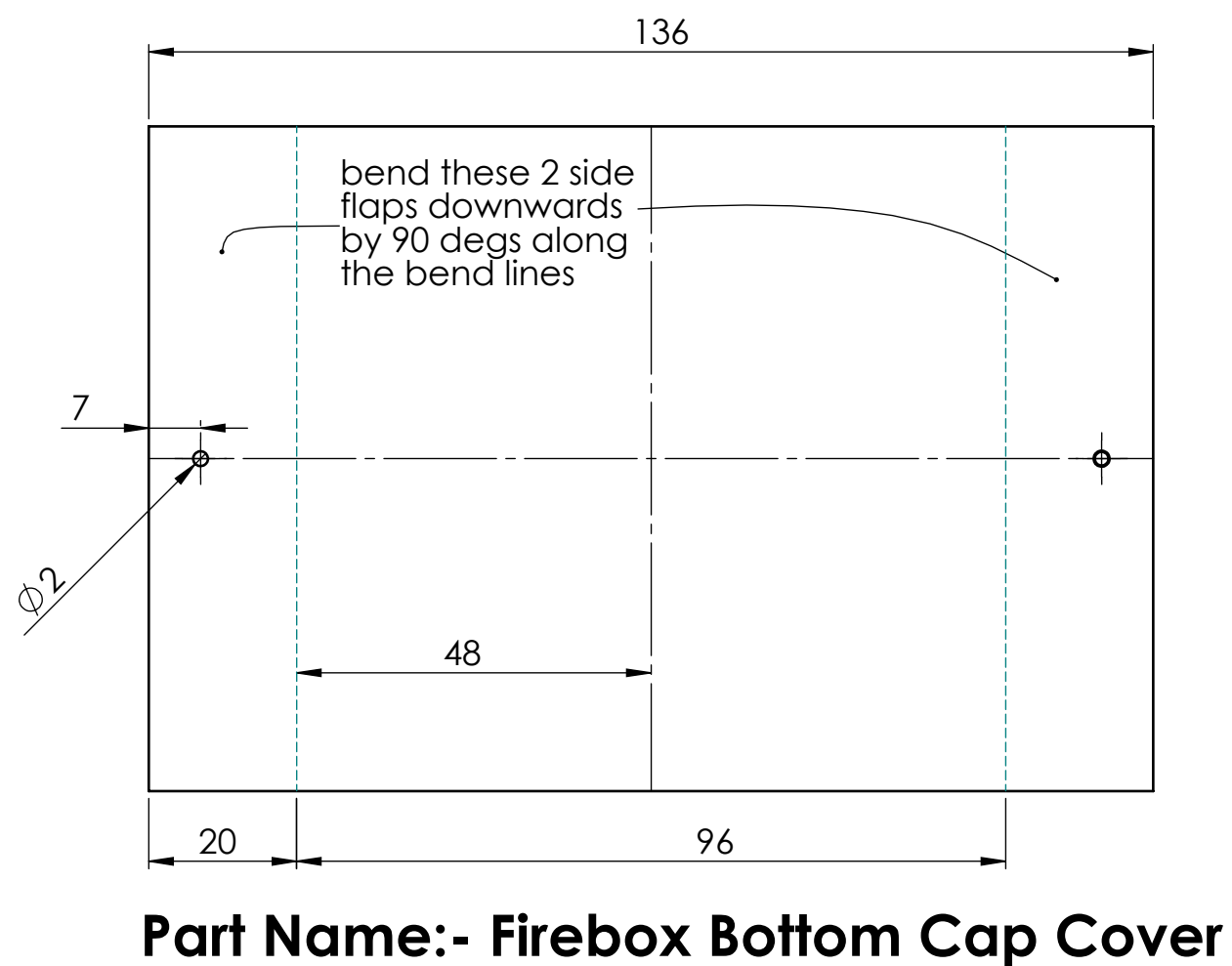
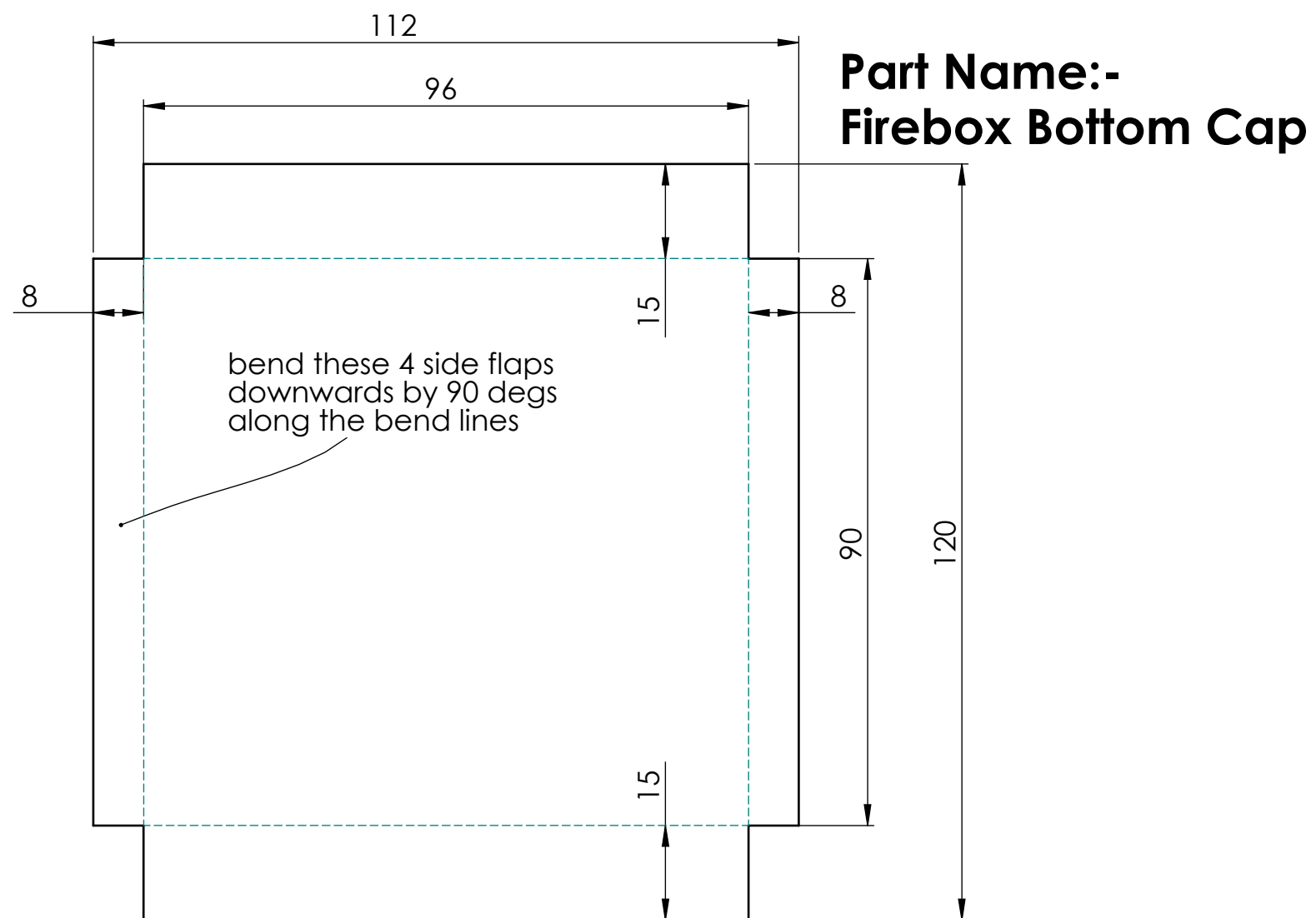
Front View
showing only cut lines for the
Firebox opening in the Tin-Can
Firebox and Riser are not
shown in this view



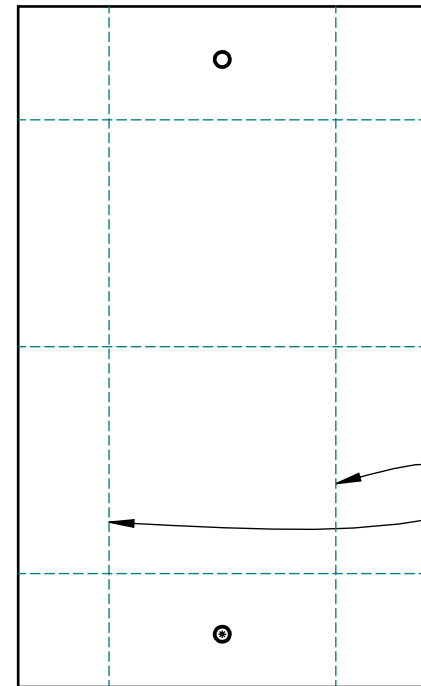
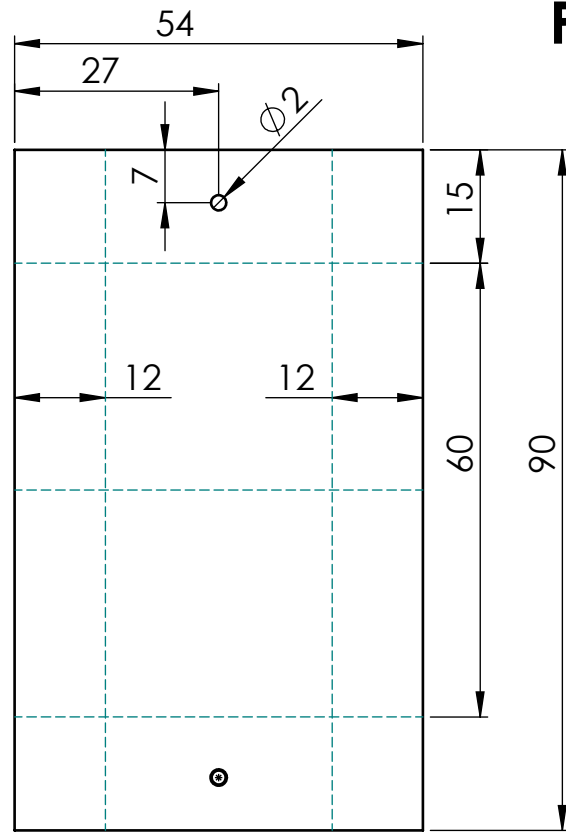
Left Side View
showing location of the Firebox, Riser and Fuel Grate.
Tin-Can opening side flaps shown
in bent position





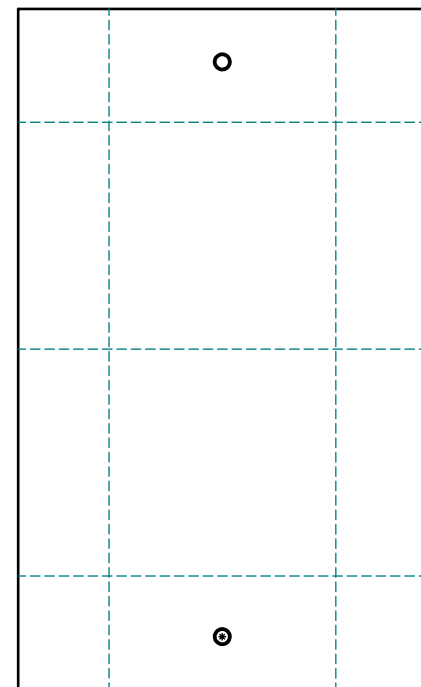
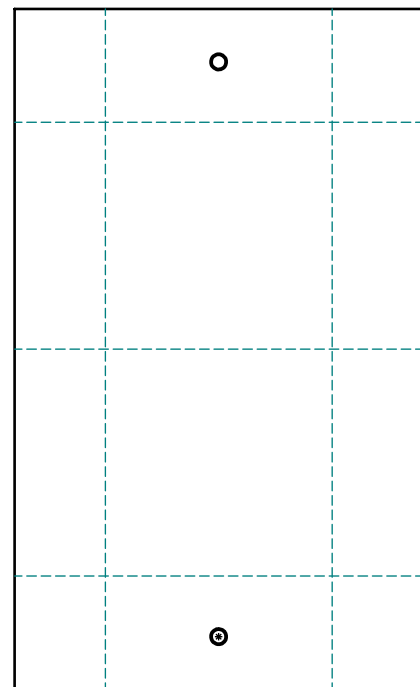
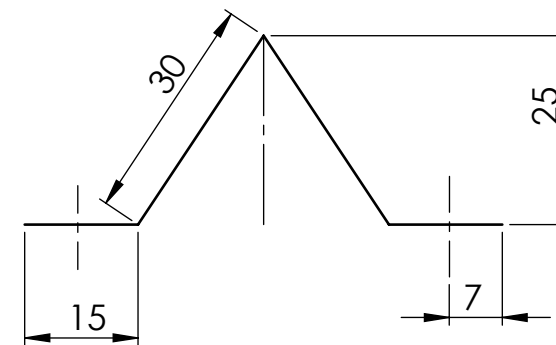


Part Name:- Pot Support (4 nos.)



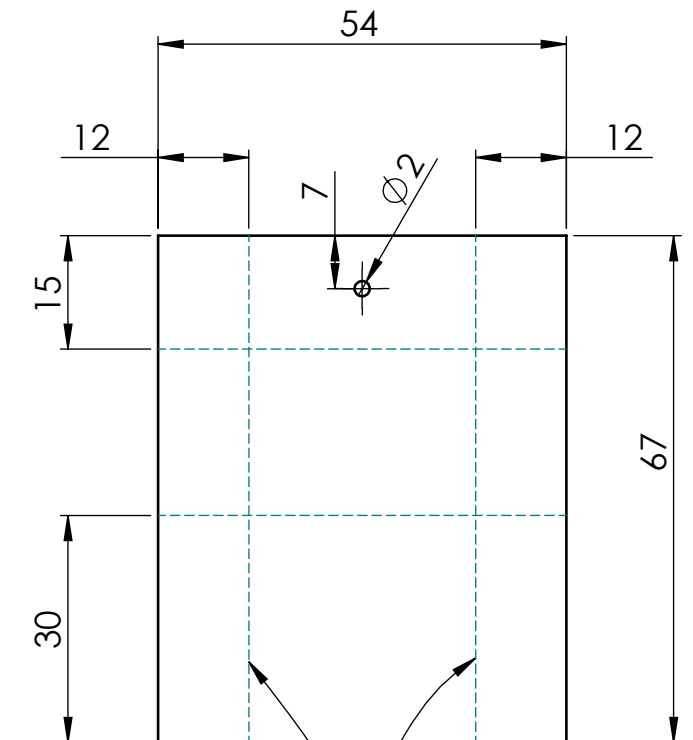
first bend by 180 deg and flatten along these two vertical lines to provide 12 mm hemming on either sides.

Then bend the hemmed piece into an A shape that is 25mm tall by bending appropriately along the three horizontal bend lines.



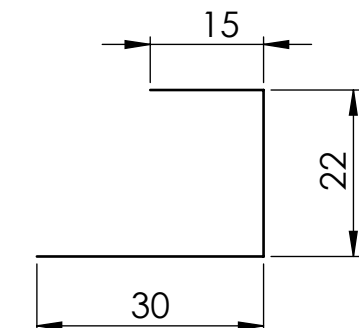
These 4 pot holders are to be screwed on the top surface of the Tin Can with 8 nos. of 10 mm long sheet metal screws. Locate them in the four corners of the square Riser mouth.

Part Name:- Fuel Grate Stopper



first bend by 180 deg and flatten along these two vertical lines to provide 12mm hemming on either sides.

Then bend the hemmed piece into a C shape (shown below) by 90 deg bends along the two horizontal bend lines.



This stopper should be fixed centrally against the lipped top edge of the Fuel Grate using a single 10mm sheet metal screw.

This stopper prevents the Fuel Grate from sliding down into the FireBox.