

Machine Shop Practical

Session 1

10th October 2016

11 am - 1:30pm

MTB04

Instructors

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Aims for Session

- Introduction into Machine Shop including Machinery, Safety Rules and Health and Safety.
- Start practical work on Stepped profile.

Health and Safety

Health and Safety is paramount in the Workplace and must be adhered to at all times. Any issues that arise are to be reported to the instructors. No issues were found this Session.

PPE

In a workshop environment each individual is required to have personal protective equipment.

Steel toe Cap boots are Compulsory

Overalls or an overcoat (supplied by uni)

Safety Glasses (to be used near any machinery)

any long hair must be tied back.

any pull strings on hooded tops must be tucked inside to avoid entanglement.

Stepped profile task.

- Material needed:- mild steel $115\text{mm} \times 76 \times 6$
- Equipment needed :-

Marking out gauge - digital height gauge.

Square

Centre punch

Files

Drills - Centre drill, 5mm and 6mm

Taps - M6 $\times$ 1mm

Pillar drill

Step 1

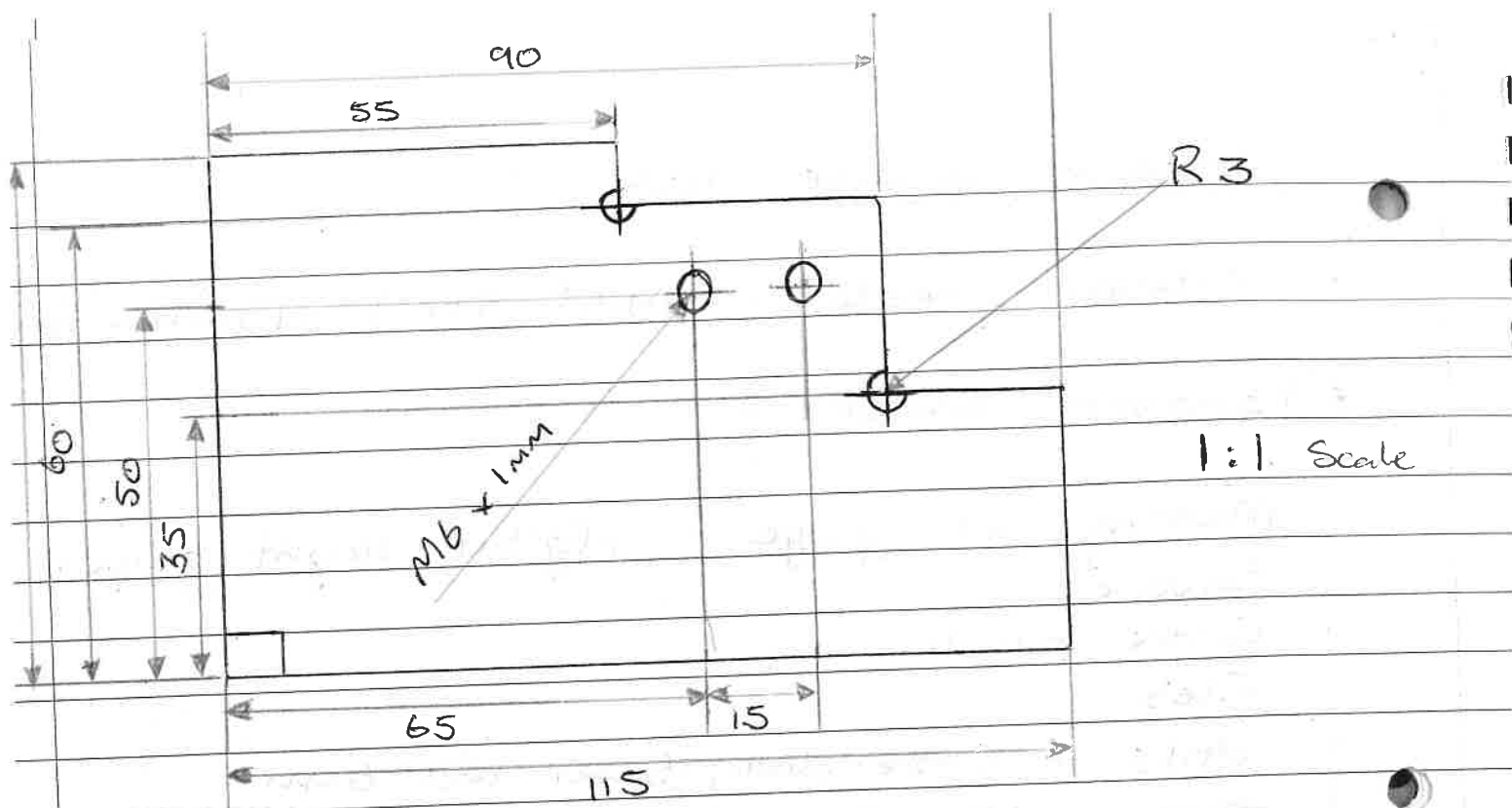
Material used was $76\text{mm} \times 6\text{mm}$ cut to an approx length of 115mm.

Before marking out it was required to find the best 2 sides for a square edge to obtain a reference point for all measurements.

Once a reference point was found, with the digital marking gauge used to mark out all required dimensions. dimension needed are sketched out on next page.

Once all marking out is completed centre punch required holes to be drilled. Using a bench mounted pillar drill.

A Drawing of Step profile and dimensions on next page.



Step 2 - See next page for pillar drill Setup.

Drill holes. 4 holes are required on this piece,
 2 relief holes of 6mm
 2 threaded holes of $M6 \times 1mm$

Once Satsfired with Centre punch marks the holes needed to be drilled.

the work piece needed to be clamped prior to drilling, this is to ensure the work piece remains stable and is unlikely to spin when drilling.

Also helps with accuracy of holes, if un-clamped work piece is likely to deviate from centre punch mark.

2 relief holes - First, a Centre drill is required to countersink a hole in the workpiece at 60° , this is to aid the drilling of the main hole. Keep work piece clamped until both centre and 6mm hole is drilled.
 Next for Second 6mm hole.

Pillar drill Setup.

A Pillar drill, mounted on a work bench is used to drill the 4 holes on the workpiece.

For safety the drill has 2 Emergency cut off switches; 1) at the front of drill 2) on the work bench which can be operated by ~~your~~ knee or hand.

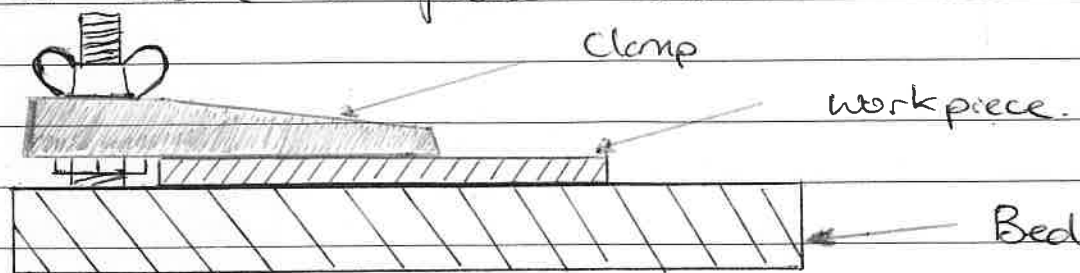
Also the drill has a safety guard with a cut off switch, this must be in place to operate machine.

~~When~~

The pillar drill has an adjustable bed to allow for various sizes of materials to be drilled. Adjust bed to a reasonable distance from drill bit.

Once happy with height the workpiece is clamped in place so unable to move and is centred to drill bit.

It is important to clamp workpiece correctly so the clamp and workpiece are flat to ensure a greater contact area.



End of Session.

Today's session was a success.

The introduction was thorough with regard to the machinery and Health and Safety. No issues were raised.