

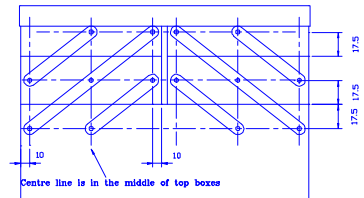
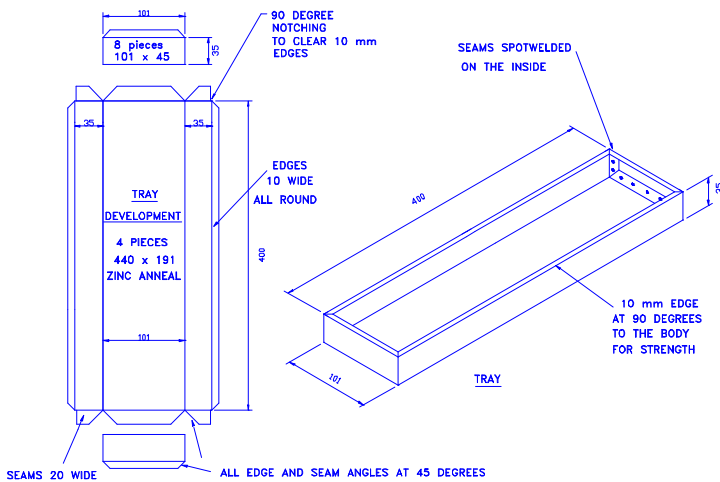
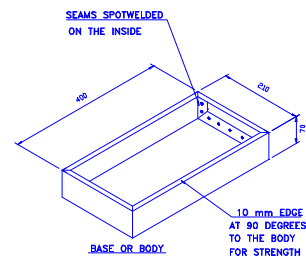
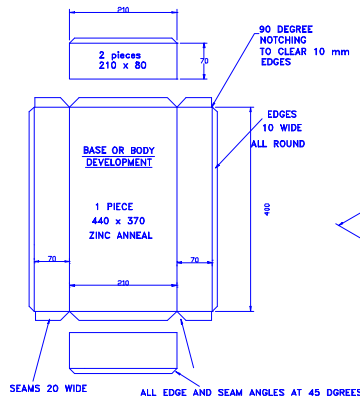
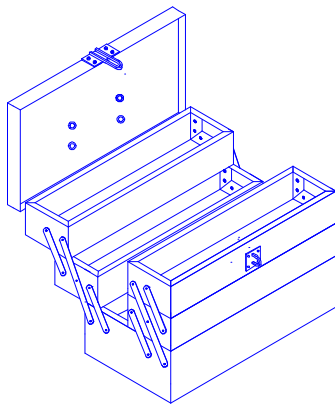


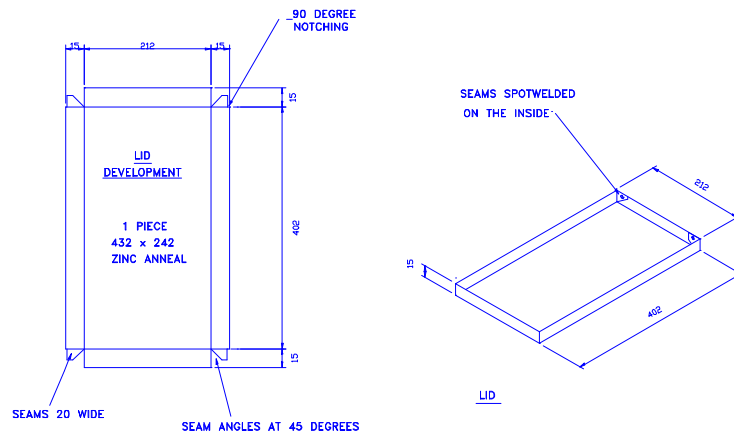
BEAUDESERT STATE HIGH SCHOOL

ENGINEERING WORK BOOK

CANTILEVER TOOLBOX

Time allowed – 12 weeks





Procedure for making the Cantilever Toolbox

Base and Trays

1. Mark out the size of the overall metal pieces from which the base and 4 trays are to be made, on the sheet of zinc anneal – using a metre rule and scribe.
 - ~~Base~~ Base 440 x 370 – 1 off
 - ~~Trays~~ Trays 440 x 191 – 4 off
2. Cut the sheet on the guillotine to the sizes marked.
3. Mark out the base and trays to the sizes shown on the drawings – using dividers, scratch gauge, rule and scribe, and 45 degree “boats” – be careful to get all the sizes exact in the marking out.
4. Use tinsnips to cut out all 45 degree and straight notchings – refer to drawings – see note on the drawing regarding relieving the 90 degree notching to clear the 10 mm edges (when folded up).
5. File off any sharp corners – using a smooth grade hand file.
6. Fold each piece in the following order on the pan brake –
 - ~~the~~ the 10 mm edges - to 90 degrees
 - ~~the~~ the 20 wide seams – to 90 degrees
 - ~~the~~ the 70 high sides – to 90 degrees
 (some changing of the pan brake fingers will be necessary)
7. Mark out the end pieces for both the base and the trays
 - ~~Base~~ Base – 210 x 80 – 2 off
 - ~~Trays~~ Trays – 101 x 45 – 8 off

8. Mark the 10 mm edges and 45 degree angles on each and cut using tinsnips.
9. Fold the 10 mm edges on each – panbrake
- 10 Use a smooth hand file to take the sharp corner off the bottom two corners of each end piece, to allow these to fit in place, level in height with the sides.
11. Spot weld the ends in place - before welding ensure that the 45 degree angles meet properly, and that the heights are correct.
12. Mark out the position of the 3.3 mm holes for the strap pivots for the tray mechanism. Refer to the drawing. Centre punch the positions and then drill all holes, using a hand drill (air or battery).
13. Assemble the trays in position above the base, as per the drawing, and measure the holes centres for each strap in turn, add on the width of the strap(13 mm) to each centre length for the length of the straps.
14. Mark out and cut (using a hacksaw), the 13 x 3 mm black mild steel straps.
15. Grind a semi circular end on the straps at each end (do not shorten the straps at all.
16. Mark out the centres for the 3.3 mm holes at the end of each strap, and drill on the pedestal drill.
17. Undercoat and top coat the straps.
18. Using an appropriate washer on either side of the strap for smooth pivoting, assemble the straps by pop riveting between the base and trays.
19. Mark and cut out the lid to suit the assembled tray top, leave a clearance of 2 mm all round the top. (refer to the drawing)
20. Cut out, fold and spot weld the top.
21. Using non mortice 50 mm hinges, fit the top to the trays, and a hasp and staple for locking, to the front.
22. If required, spray paint the tool box.
23. Fit the top handle to the tool box.

Competencies covered

Unit 1.1F.1 Undertake interactive workplace communication.

Element – 1.1F.1 Communicate information about tasks, processes, events, or skills.

Criteria		Met
1.1F 1.1	An appropriate choice of communication techniques are used.	
1.1F 1.2	Multiple operations involving several topics are communicated.	
1.1F 1.3	Listening is done without continuous interruptions of the speaker.	
1.1F 1.4	Questions are asked to gain extra information	
1.1F 1.5	Correct sources of information are identified	
1.1F 1.6	Information is selected and sequenced appropriately	
1.1F 1.7	Verbal reporting and written reporting done where required	
1.1F 1.8	Communication is demonstrated in unfamiliar situations	

Element - 1.1F.2 Take part in group discussion to achieve appropriate work outcomes.

1.1F 2.1	Responses sought and provided from others in the group	
1.1F 2.2	Constructive contributions are made towards the production processes involved.	
1.1F 2.3	Goals and aims are communicated.	

Element - 1.1F 3 Represent the views of the group to others.

1.1F 3.1	Views and opinions of others are understood and reflected accurately.	
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Unit 1.2F Apply principles of occupational health and safety (OH&S) in work.

Element – 1.2F.1 Follow safe work practices

1.2F 1.1	Work is carried out safely to school standards and legislative requirements.	
1.2F 1.2	Housekeeping is undertaken to school standards.	
1.2F 1.3	Responsibilities and duties of students are understood and demonstrated.	
1.2F 1.4	Personal protective equipment is worn and stored to school standards.	
1.2F 1.5	All equipment and safety devices are used to legislative requirements and school standards.	
1.2F 1.6	Safety signs are identified and followed as per instruction.	
1.2F 1.7	All manual handling is carried out to legal requirements and school standards.	
1.2F 1.8	Emergency equipment identified and used as appropriate.	

Element – 1.2F.2 Report workplace hazards

1.2F 2.1	Workplace hazards identified and reported to teacher.	
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Element – 1.2F.3 Follow emergency procedures

1.2F	3.1	Identifies the means of contacting appropriate personnel in the event of an accident	
1.2F	3.2	Emergency and evacuation procedure understood and carried out.	
1.2F	3.3	School evacuation procedures followed	

Unit 1.3F Apply quality procedures**Element - 1.3F.1 Take responsibility for own quality**

1.3F	1.1	Concept of supplying product or service to meet customer needs or requirements understood and applied.	
1.3F	1.2	Accepts the “right first time” concept as a personal responsibility	

Element – 1.3F.2 Apply standard procedures of workplace quality to own job

1.3F	2.1	Quality system procedures followed.	
1.3F	2.2	Conformance to specifications ensured.	

Unit 1.4F Plan to undertake a routine task**Element – 1.4F.1 Identify task requirements**

1.4F	1.1	Instructions for procedures are obtained, understood and if necessary, clarified.	
1.4F	1.2	Relevant specifications for task outcomes are obtained, understood, and if necessary, clarified.	
1.4F	1.3	Task outcomes are identified	
1.4F	1.4	Task requirements, such as completion time and quality measures are identified.	

Element – 1.4F.2 Plan steps required to complete task

1.4F	2.1	Based on specifications and instructions provided, the individual steps or activities required to undertake the task are understood, and if necessary, clarified.	
1.4F	2.2	Sequence of activities required to be completed are identified in plan.	
1.4F	2.3	Planned steps and outcome are checked to ensure conformity with instructions and relevant specifications.	

Element – 1.4F.3 Review plan

1.4F	3.1	Outcomes are identified and compared with (planned) objectives, task instructions, specifications, and task requirements.	
1.4F	3.2	If necessary, plan is revised, to better meet objectives and task requirements.	

Unit 18.1A Use hand tools

Element – 18.1A.1 Use hand tools

18.1A	1.1	Appropriate hand tools selected according the task requirements.	
18.1A	1.2	Hand tools are used to produce required outcomes to job specifications which may include finish, tension, size or shape.	
18.1A	1.3	All safety requirements are adhered to before during and after use.	
18.1A	1.4	Unsafe or faulty tools are identified and marked for repair, according to designated procedures, before, during, and after use.	
18.1A	1.5	Routine maintenance of tools, including hand sharpening undertaken according to standard operational procedures, principles, and techniques.	
18.1A	1.6	Hand tools are stored safely in an appropriate location, according to standard operational procedures, and manufacturers' recommendations.	

Unit 18.2A Use power tools/hand held operations

Element – 18.2A Use power tools

18.2A	1.1	Appropriate power tools selected according to the task requirements.	
18.2A	1.2	Power tools used following a determined sequence of operation, which may include, clamping, alignment and adjustment to produce desired outcomes to job specifications which may include finish, size or shape.	
18.2A	1.3	All safety requirements are adhered to before during and after use.	
18.2A	1.4	Unsafe or faulty tools are identified and marked for repair, according to designated procedures, before, during, and after use.	
18.2A	1.5	Operational maintenance of tools , including hand sharpening undertaken according to standard operational procedures, principles, and techniques.	
18.2A	1.6	Power tools are stored safely in an appropriate location, according to standard workshop procedure, and manufacturers' recommendations	

Machinery and equipment used

Guillotine, Pan Brake, 1 metre and 300 mm rules, scribes, centre punches, hammers, 45 degree 'boats', tinsnips, mallets, dressers, air and /or portable battery drills, pedestal drill, pedestal grinder, pop rivet gun, spray gun, hacksaw, metal work vice.

Record keeping

All criteria which have been successfully met by each student, must be recorded on the students **Engineering Competencies Student Booklet** as soon as possible, but no less often than at the end of each semester.