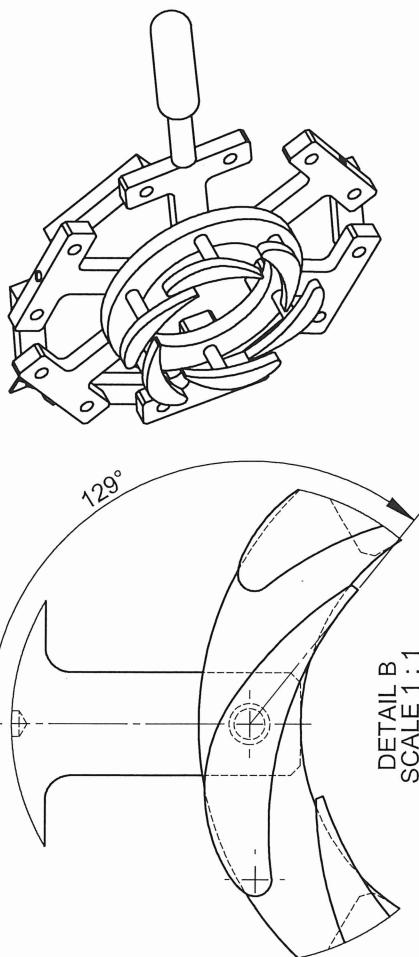


# Turbomachinery Computer Aided Design CWM

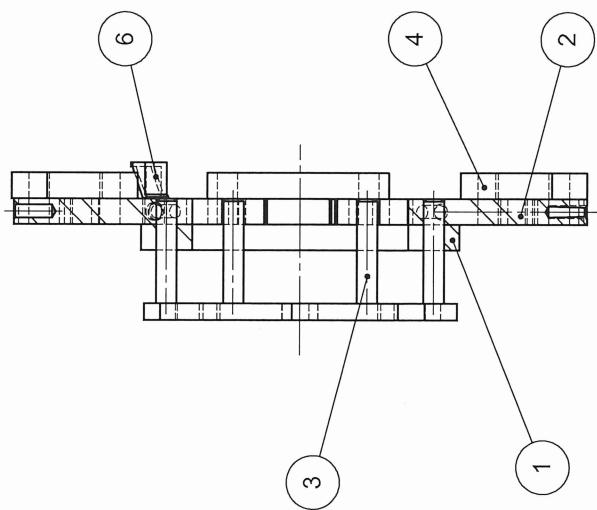
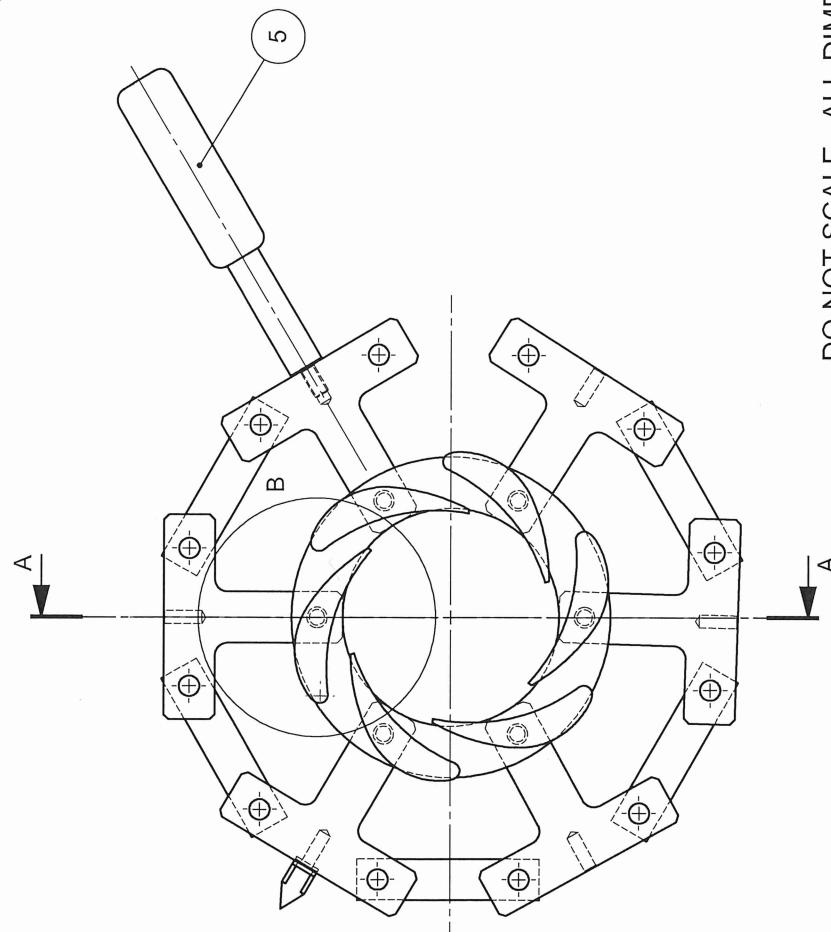
## RADIAL FLOW WATER TURBINE

### Drawing Pack

Drg No	Title
<u>GV000</u>	<u>Guide Vane Mechanism Assembly</u>
GV001	Guide Vane Crank
GV002	Handle
GV003	Guide Vane Link
GV004	Indicator
GV005	Guide Vane
GV006	Guide Vane Sealing Ring
<u>TC000</u>	<u>Turbine Assembly</u>
DT002	Draft Tube Reducer
DT001	Simple Draft Tube
RU001	Runner
VC001	Volute Casing Front
VC002	Volute Casing Rear
MP001	Mounting Plate
SP001	Sealing Plate
DS001	Drive Shaft

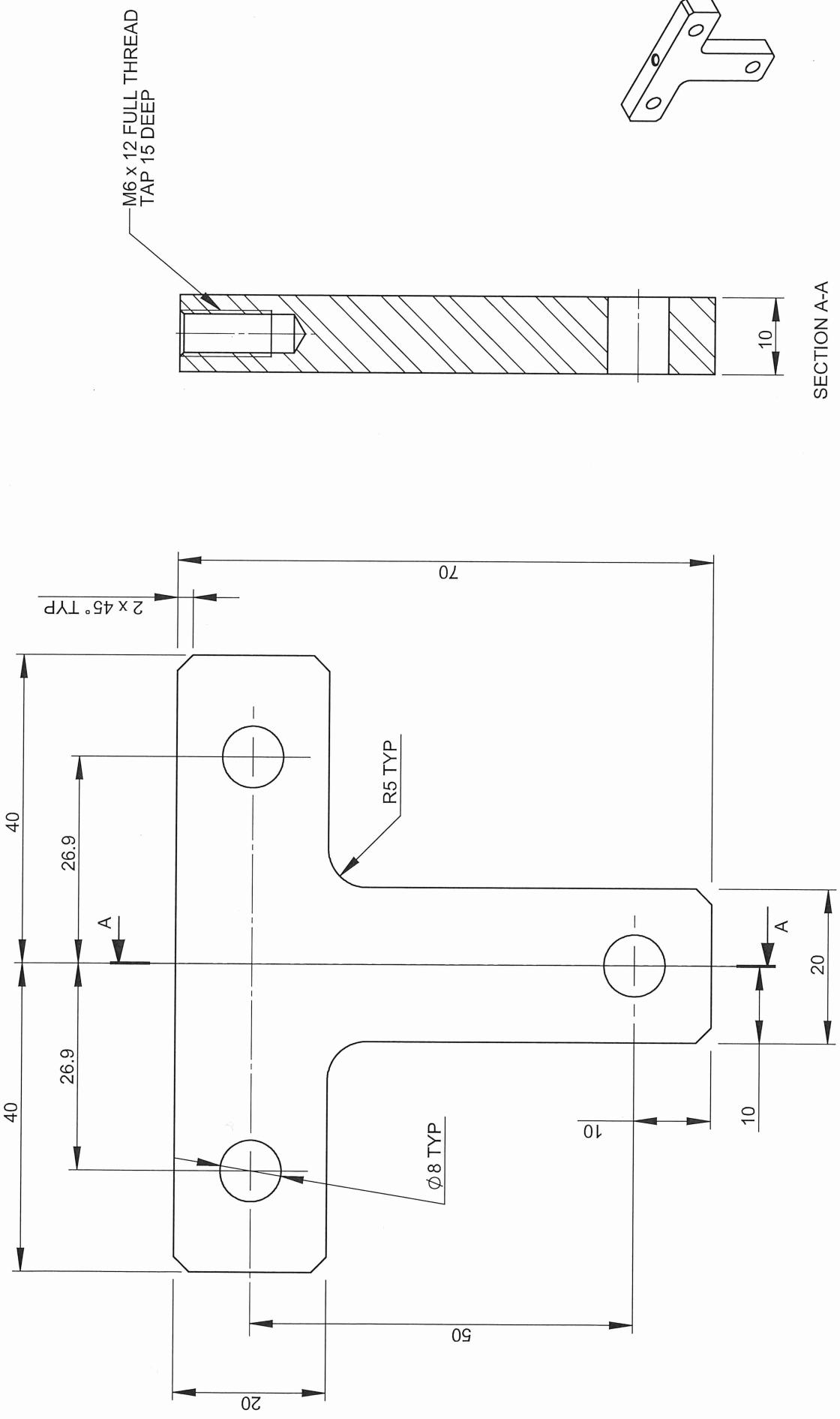


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GV006	SEALING RING	1
2	GV001	CRANK	6
3	GV005	GUIDE VANE	6
4	GV003	LINK	5
5	GV002	HANDLE	1
6	GV004	INDICATOR	1

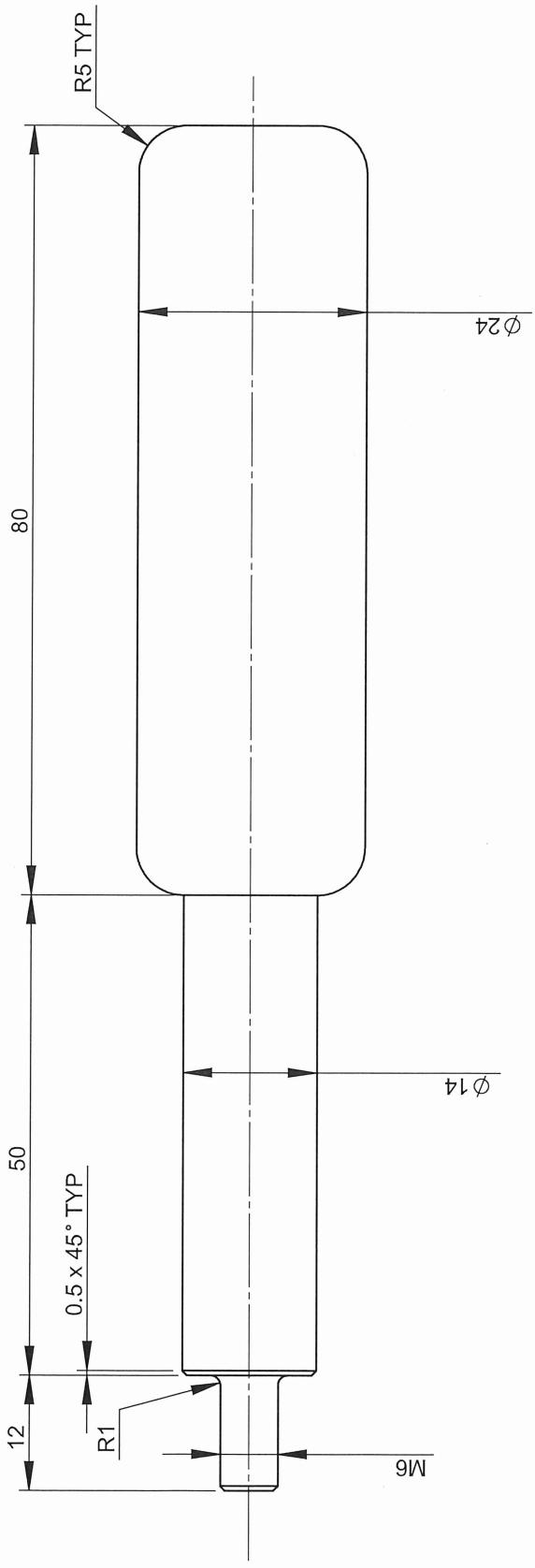
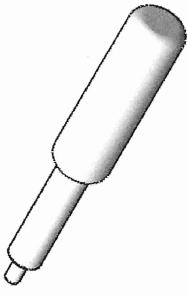


## SECTION A-A

DO NOT SCALE. ALL DIMENSIONS IN MM

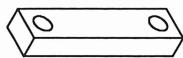


DO NOT SCALE. ALL DIMENSIONS IN MM



DO NOT SCALE. ALL DIMENSIONS IN MM

MATERIAL PVC Rigid		THIRD ANGLE PROJECTION	SCALE 2:1	DRAWN DATE 23MAR23	APPROVED BY	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY	TITLE HANDLE
FINISH	DEBURN; CLEAN			DATE	PROJECT	COLLEGE	DES
						DRAWING NO. <b>GV002</b>	

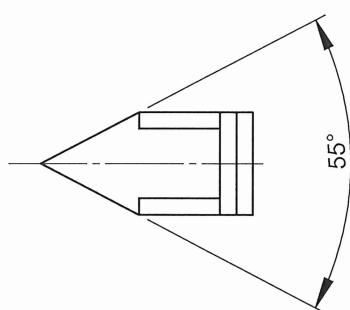
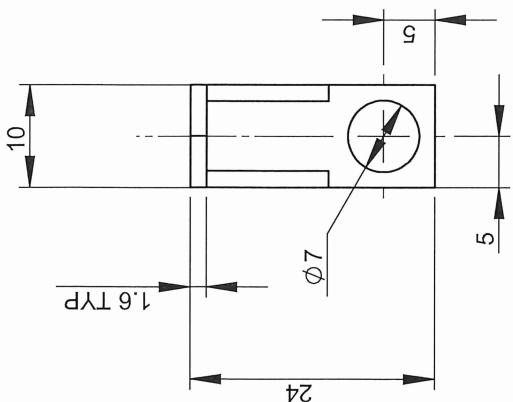
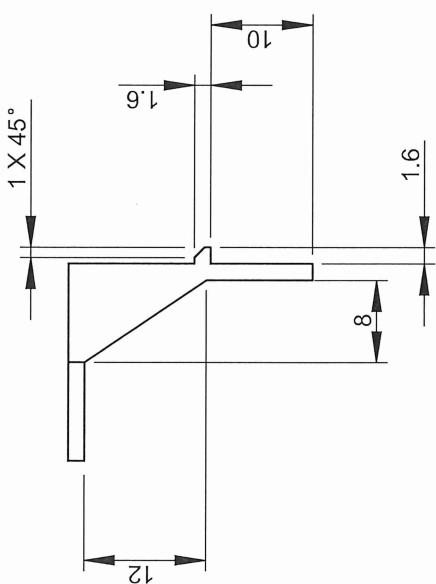
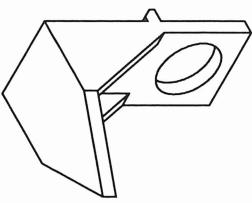


A graph showing a constant function  $y = 10$ . The x-axis is labeled from 0 to 10. The y-axis has an arrow pointing up and a tick mark at 10. A horizontal line is drawn at  $y = 10$ .

A technical drawing of a rectangular component. The width is labeled as 55.4 and the height as 16. Two circular holes, each labeled with a diameter of 8 TYP, are positioned on the top edge. A dimension of 71.4 is shown between the bottom edges of the two holes.

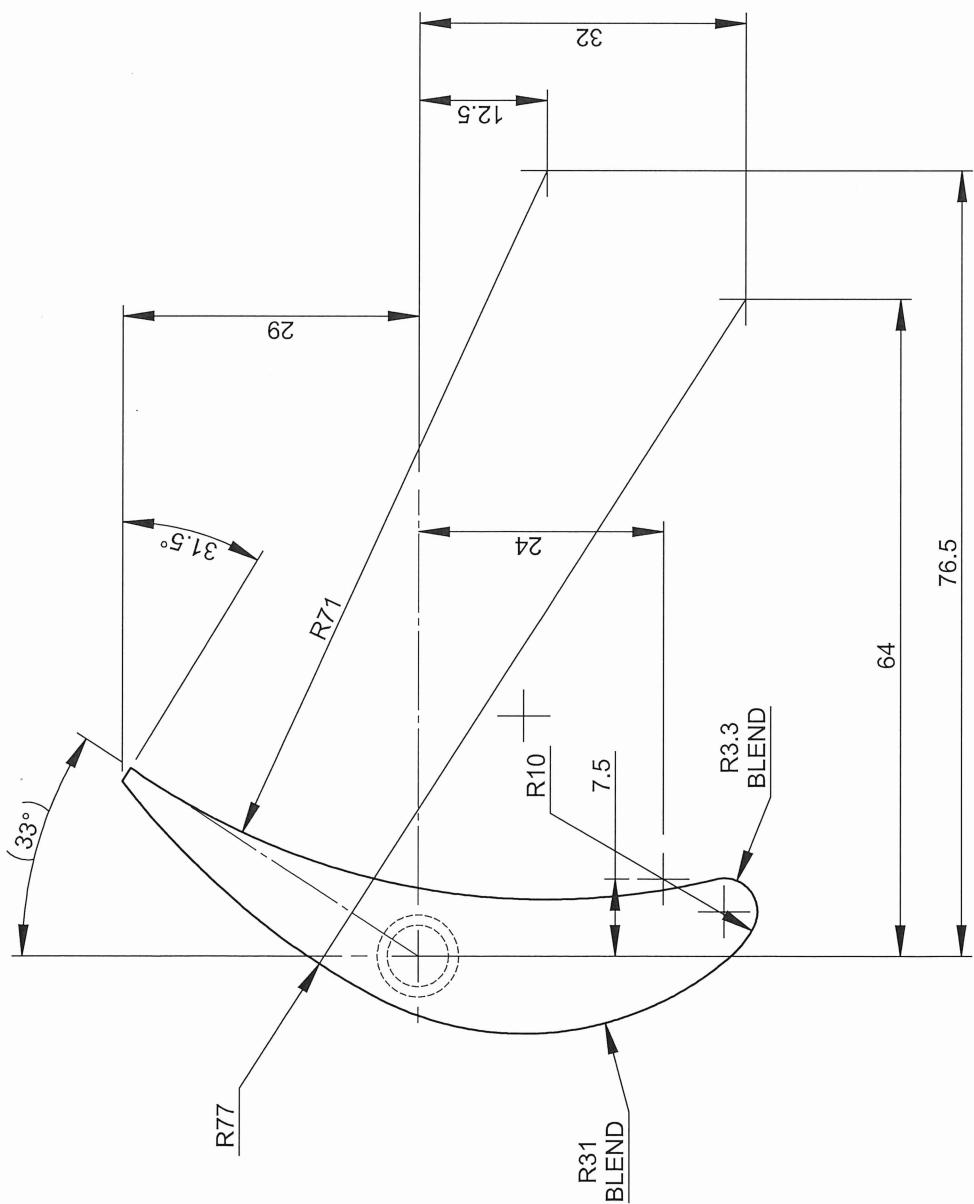
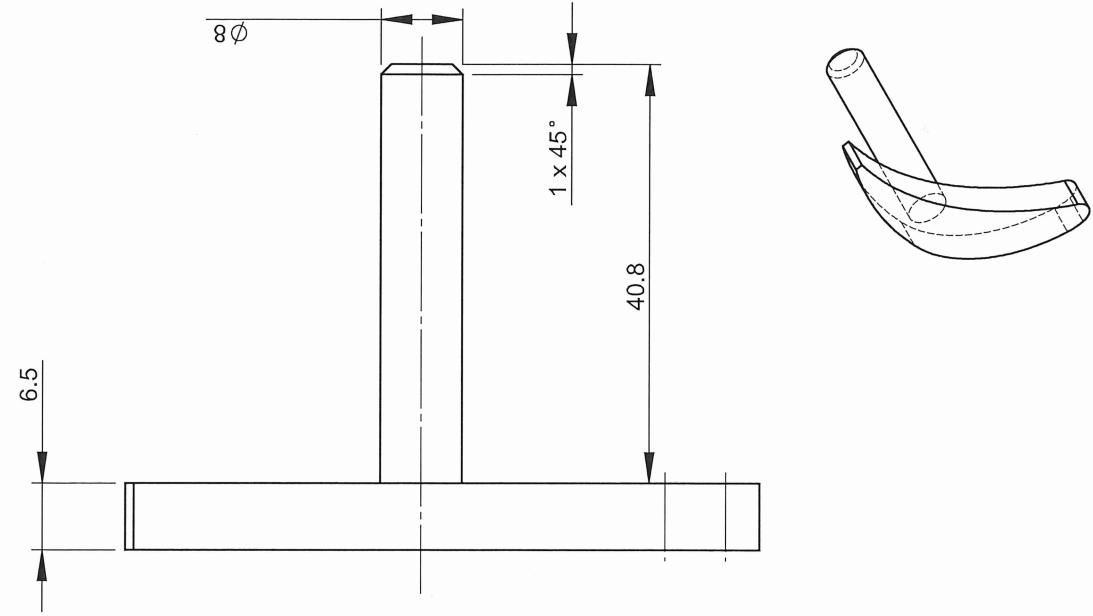
DO NOT SCALE. ALL DIMENSIONS IN MM

MATERIAL	FINISH	THIRD ANGLE PROJECTION		APPROVED BY	DRAWN DATE 23MAR23	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY	
		SCALE 2:1	DATE			DRAWN BY	BHS
ALSI 304 SS	DEBURR; CLEAN	+/- 0.1 (UNLESS STATED)	PROJECT	COLLEGE	DES	DRAWING NO.	GV003



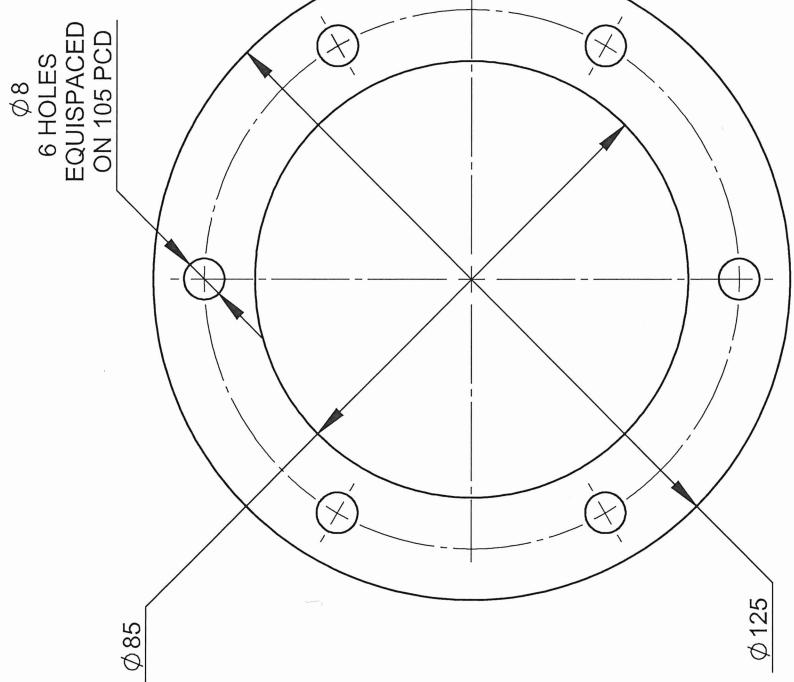
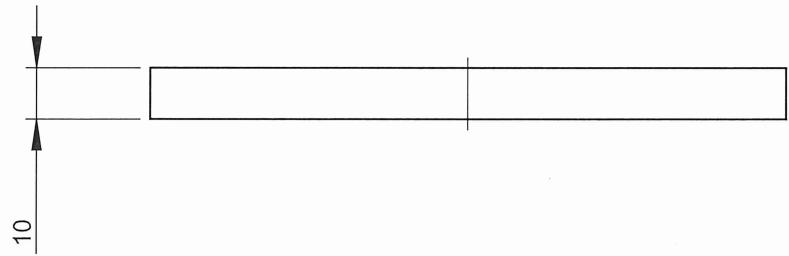
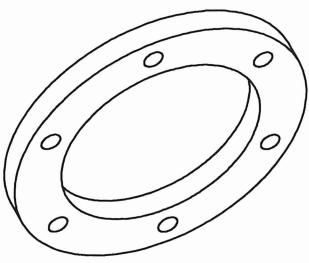
DO NOT SCALE. ALL DIMENSIONS IN MM

MATERIAL FINISH	ABS - YELLOW DEBURR; CLEAN	THIRD ANGLE PROJECTION	SCALE APPROVED BY PROJECT	DRAWN DATE 23MAR23	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY	TITLE INDICATOR
				DATE	BHS	
				COLLEGE	DES	DRAWING NO. <b>GV004</b>



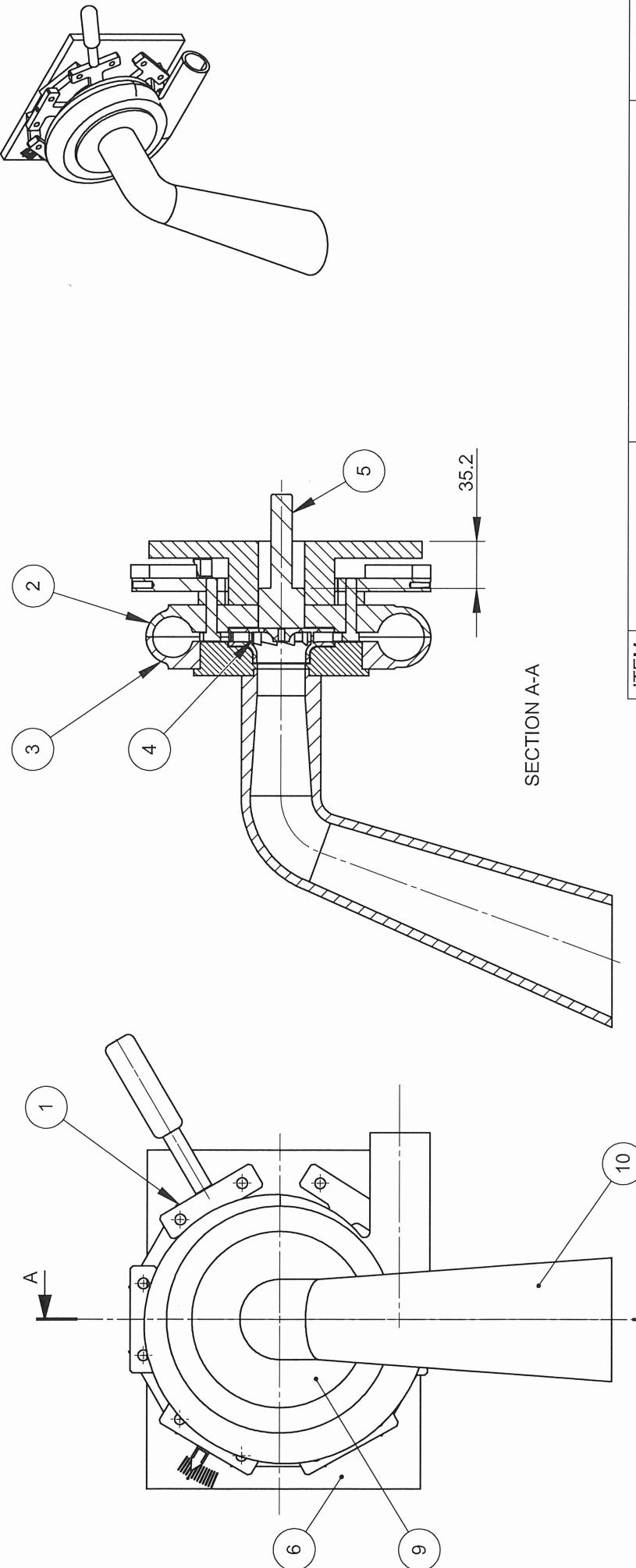
DO NOT SCALE. ALL DIMENSIONS IN MM

MATERIAL FINISH	BRASS DEBURR; CLEAN	THIRD ANGLE PROJECTION TOLERANCE (UNLESS STATED)	SCALE APPROVED BY PROJECT	DRAWN DATE DATE	DRAWN BY BHS	COLLEGE DES	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY TITLE GUIDE VANE	DRAWING NO. <b>GV005</b>
				2:1 23MAR23			UNIVERSITY SEAL	



DO NOT SCALE. ALL DIMENSIONS IN MM

MATERIAL	AI SI 304 SS	THIRD ANGLE PROJECTION	SCALE 1:1	DRAWN DATE 23MAR23	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY
FINISH	DEBURR; CLEAN	APPROVED BY	DATE	DRAWN BY BHIS	TITLE GV SEALING RING
		PROJECT		COLLEGE DES	DRAWING NO. GV006

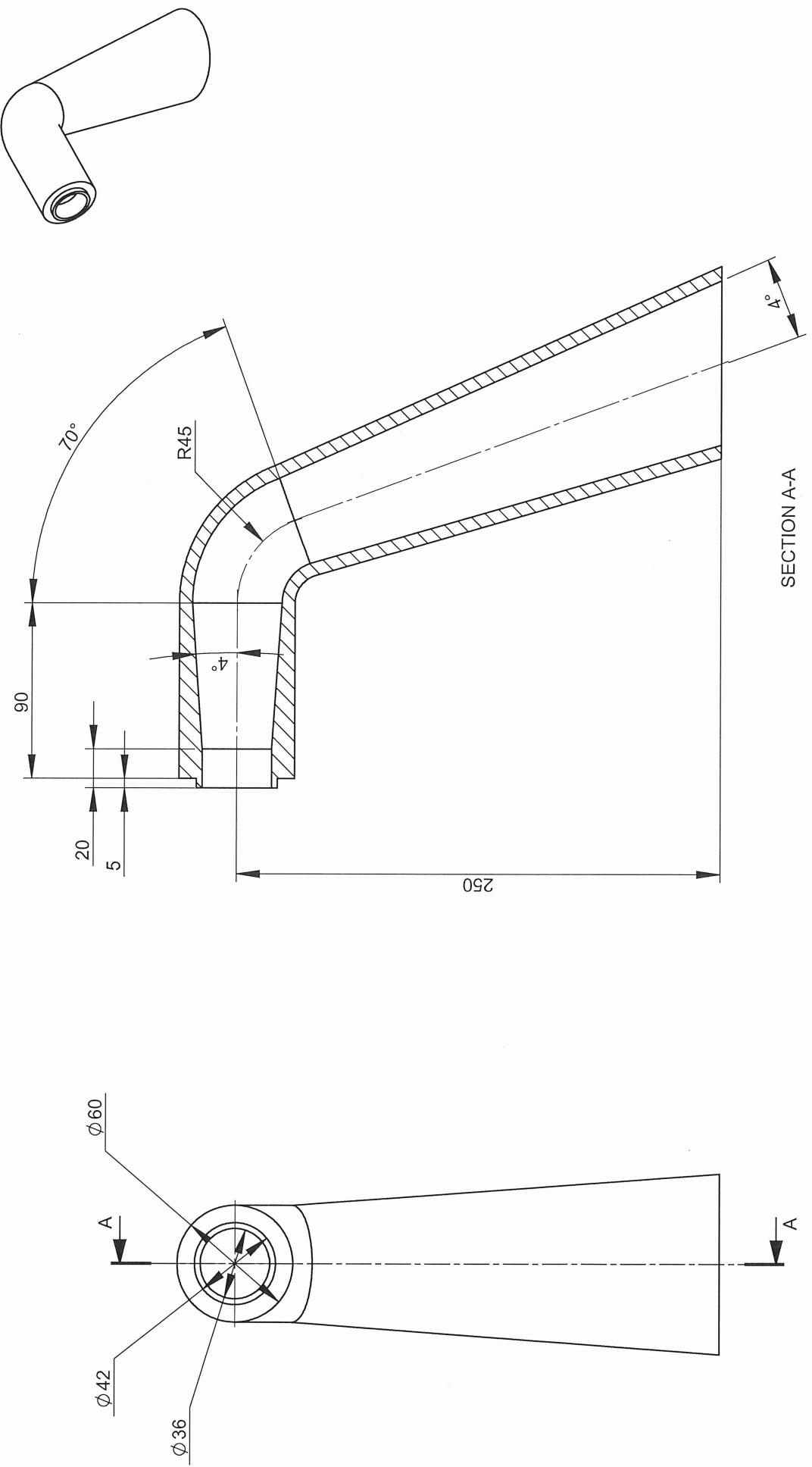


ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	GV000	GV MECHANISM ASSY	1
2	VC002	VOLUTE CASING REAR	1
3	VC001	VOLUTE CASING FRONT	1
4	RU001	RUNNER	1
5	DS001	DRIVE SHAFT	1
6	MP001	MOUNTING PLATE	1
9	SP001	SEALING PLATE	1
10	DT002	DRAFT TUBE REDUCER	1

DEPARTMENT OF ENGINEERING SCIENCE  
OXFORD UNIVERSITY

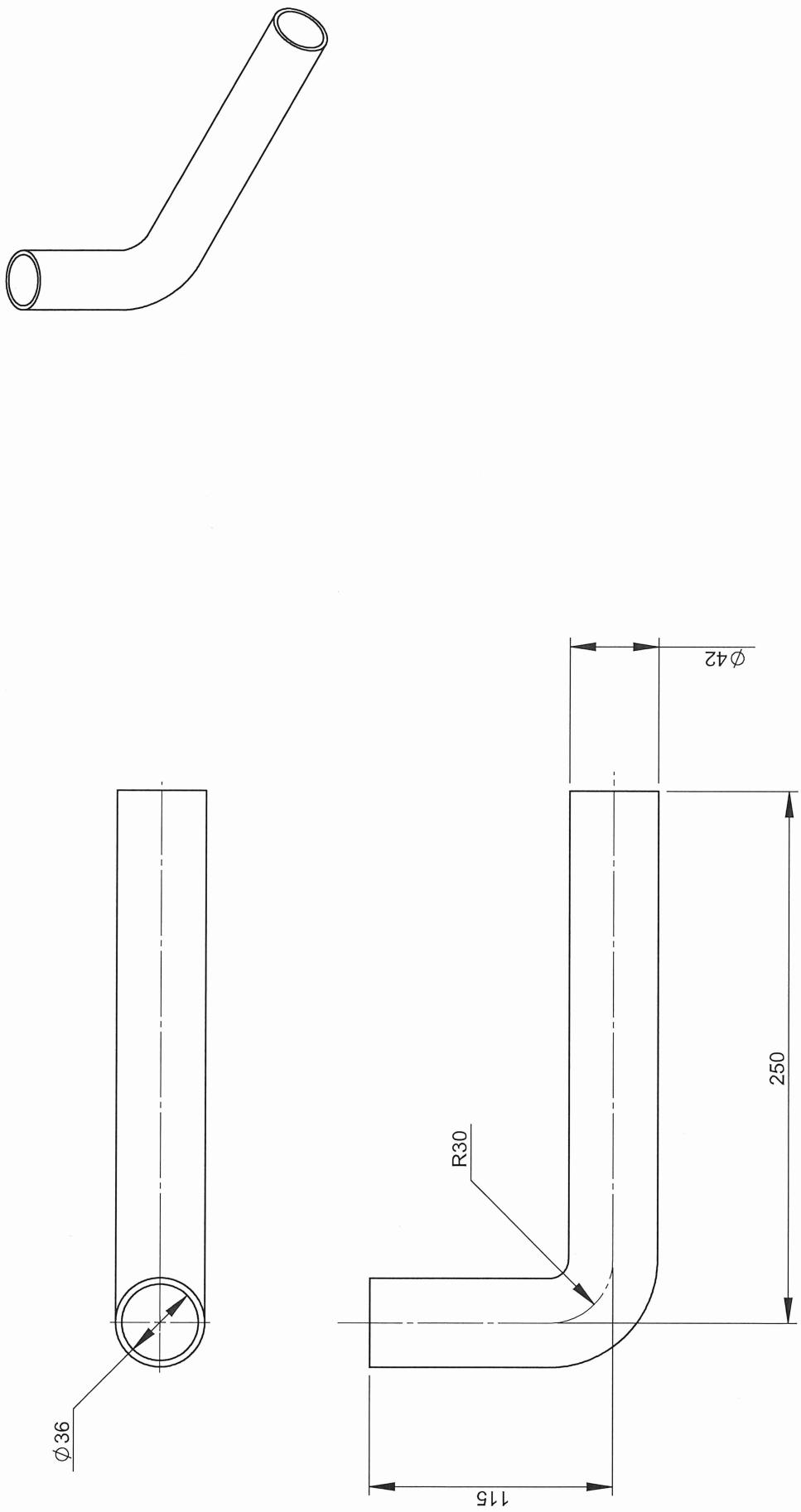
MATERIAL	THIRD ANGLE PROJECTION	SCALE 1:3	DRAWN DATE 28MAR23	DRAWN BY BHS	
				APPROVED BY	DATE
FINISH	TOLERANCE (UNLESS STATED)		PROJECT	COLLEGE	DES
	+/- 0.1				

TITLE TURBINE ASSEMBLY  
DRAWING NO. TC000



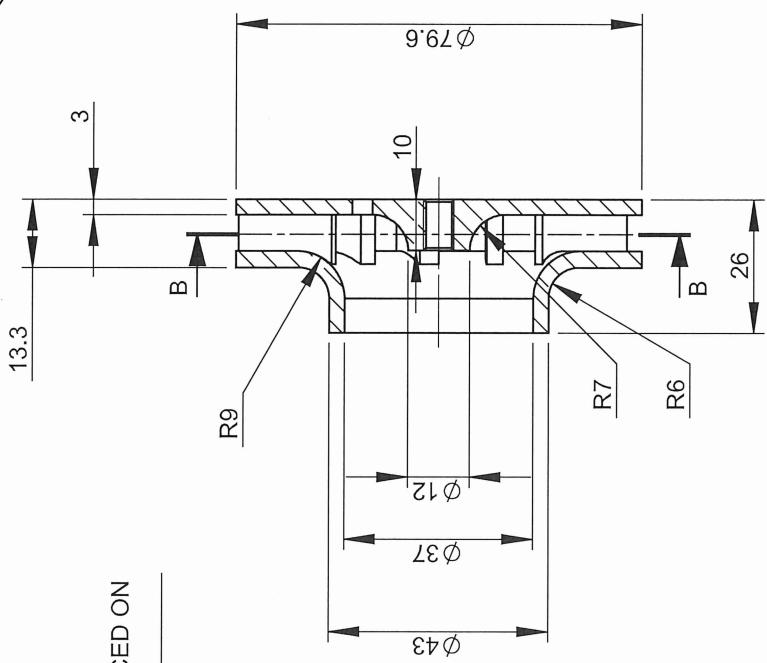
DO NOT SCALE. ALL DIMENSIONS IN MM

MATERIAL	Perspex (TM) GS Acrylic Cast Sheet	THIRD ANGLE PROJECTION	SCALE 1:2	DRAWN DATE 31MAR23	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY
FINISH	DEBURR; CLEAN	APPROVED BY	DATE	DRAWN BY BHS	TITLE DRAFT TUBE REDUCER
	+/- 0.1 (UNLESS STATED)	PROJECT	COLLEGE DES	DRAWING NO. DT002	



DO NOT SCALE. ALL DIMENSIONS IN MM

MATERIAL	Perspex (TM) GS Acrylic Cast Sheet	THIRD ANGLE PROJECTION	SCALE 1:2	DRAWN DATE 31/MAR/23	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY
FINISH	DEBURR; CLEAN	APPROVED BY	DATE	DRAWN BY BHS	TITLE <b>DRAFT TUBE (SIMPLE)</b>
	+/- 0.1 (UNLESS STATED)	PROJECT	COLLEGE DES	DRAWING NO. DT001	

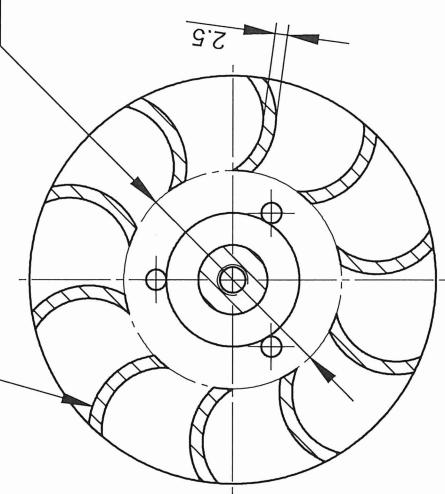
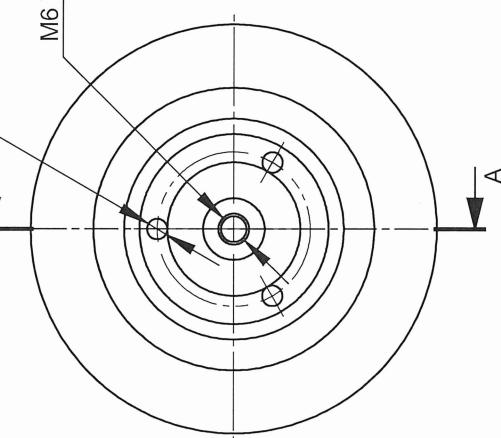


3 HOLES EQUISPACED ON  
Ø4  
Ø30 PCD

M6 THRO

10 BLADES  
EQUISPACED  
SEE NOTES  
FOR PROFILE  
Ø42.6

SEE NOTES  
FOR PROFILE

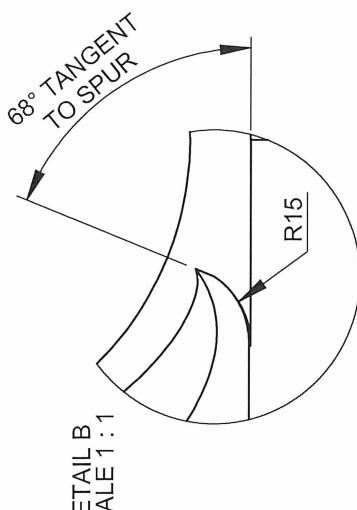
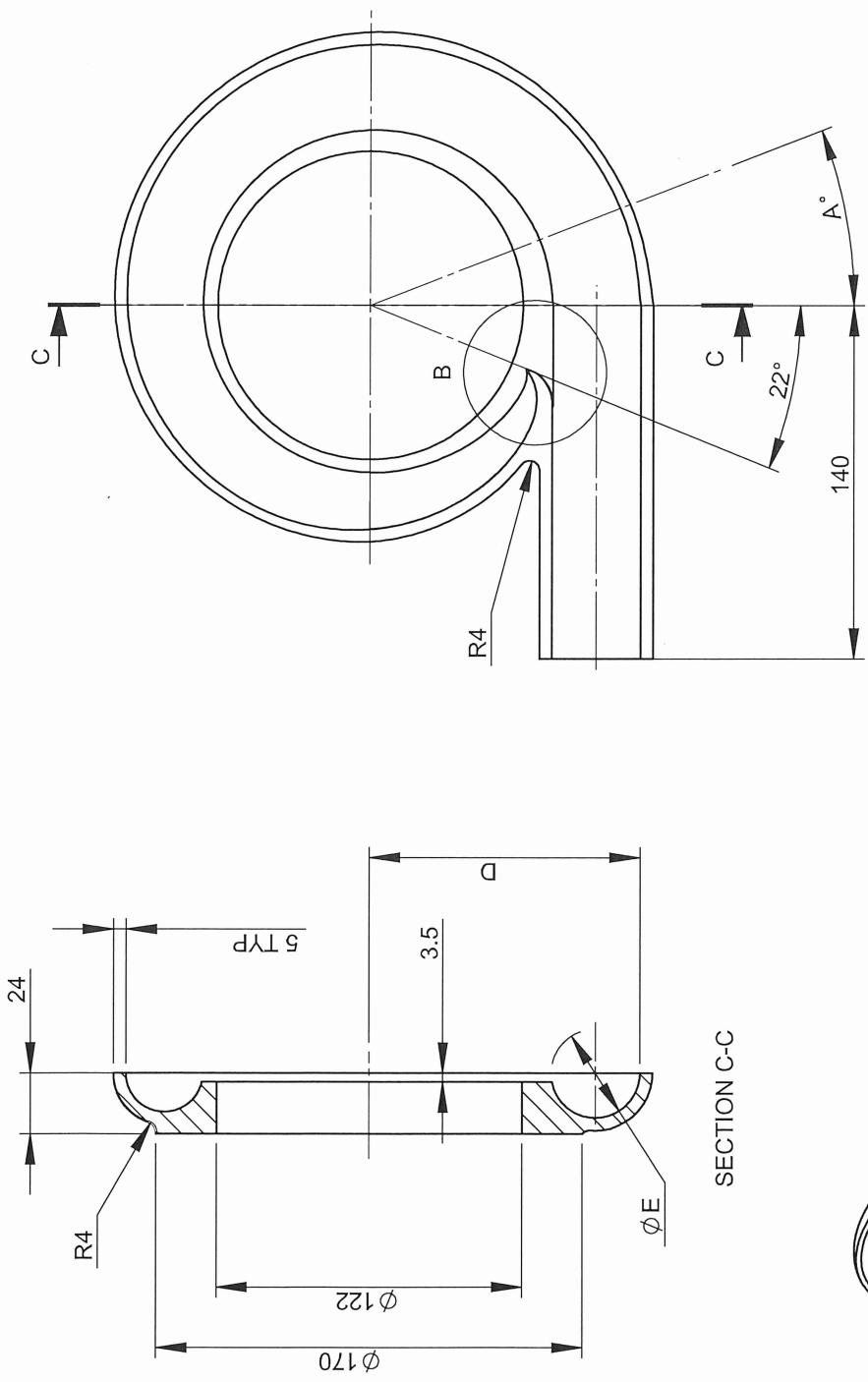


SECTION A-A

DO NOT SCALE. ALL DIMENSIONS IN MM

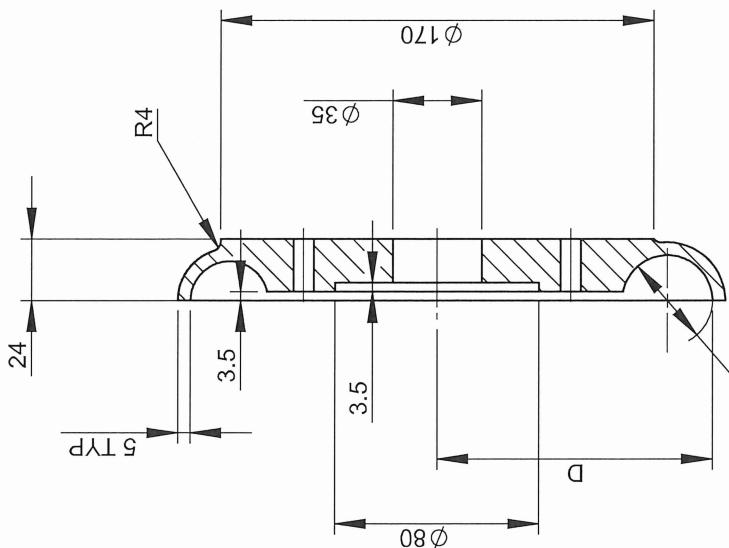
MATERIAL	PP COPOLYMER	THIRD ANGLE PROJECTION	SCALE 1:1	DRAWN DATE 30MAR23	DEPARTMENT OF ENGINEERING SCIENCE		RUNNER
					APPROVED BY	DATE	
FINISH	DEBURR; CLEAN	TOLERANCE (UNLESS STATED)	+/- 0.1	PROJECT	COLLEGE	DES	DRAWING NO. <b>RU001</b>

$A^\circ$	$\phi E$	D
0	35.4	108
15	35.2	107.3
30	35.0	106.5
45	34.9	105.6
60	34.7	104.8
75	34.3	103.9
90	34.0	103
105	33.6	102.1
120	33.1	101.1
135	32.6	100.2
150	32.0	99.1
165	31.4	98.1
180	30.6	96.9
195	29.8	95.8
210	28.8	94.6
225	27.7	93.2
240	26.4	91.8
255	24.9	90.3
270	23.1	88.7
285	20.9	86.8
300	18.1	84.7
315	14.4	82.1
330	8.8	76.6
338	-	67.0

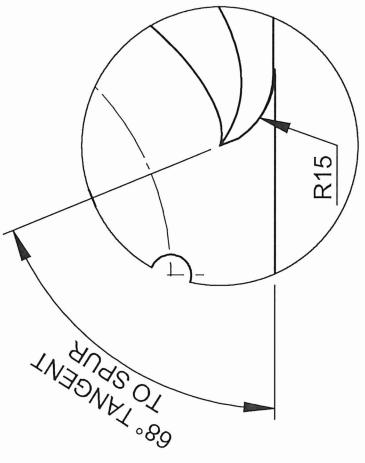


MATERIAL Perspex (TM) GS Acrylic Cast Sheet	FINISH DEBURR; CLEAN	THIRD ANGLE PROJECTION 	SCALE 1:2	DRAWN DATE 28MARCH23	DRAWN BY BHS	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY 	TITLE VOLUME FRONT
APPROVED BY PROJECT	DATE	COLLEGE	DES	COLLEGE	DES	DRAWING NO. VC001	
TOLERANCE (UNLESS STATED) +/- 0.1							

<b>A°</b>	<b>D</b>	<b>E</b>	<b>Φ</b>	<b>D</b>
<b>0</b>	<b>108</b>	<b>35.4</b>		
15	107.3	35.2		
30	106.5	35.0		
45	105.6	34.9		
60	104.8	34.7		
75	103.9	34.3		
<b>90</b>	<b>103</b>	<b>34.0</b>		
105	102.1	33.6		
120	101.1	33.1		
135	100.2	32.6		
150	99.1	32.0		
165	98.1	31.4		
<b>180</b>	<b>96.9</b>	<b>30.6</b>		
195	95.8	29.8		
210	94.6	28.8		
225	93.2	27.7		
240	91.8	26.4		
255	90.3	24.9		
<b>270</b>	<b>88.7</b>	<b>23.1</b>		
<b>285</b>	<b>86.8</b>	<b>20.9</b>		
<b>300</b>	<b>84.7</b>	<b>18.1</b>		
<b>315</b>	<b>82.1</b>	<b>14.4</b>		
<b>330</b>	<b>78.6</b>	<b>8.8</b>		
<b>338</b>	-			<b>67.0</b>

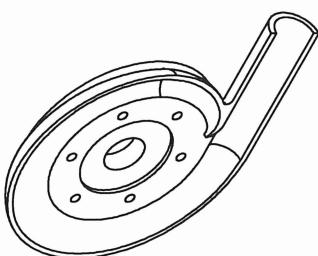
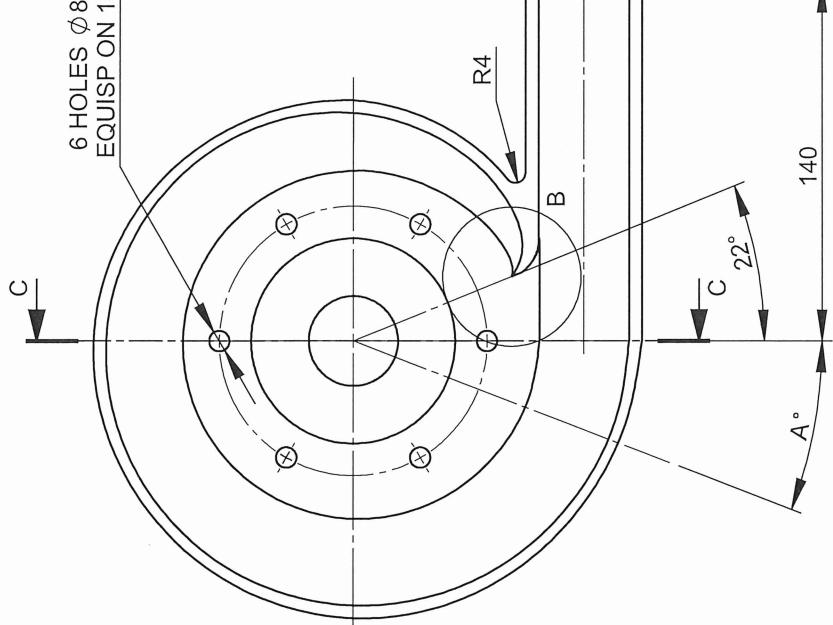


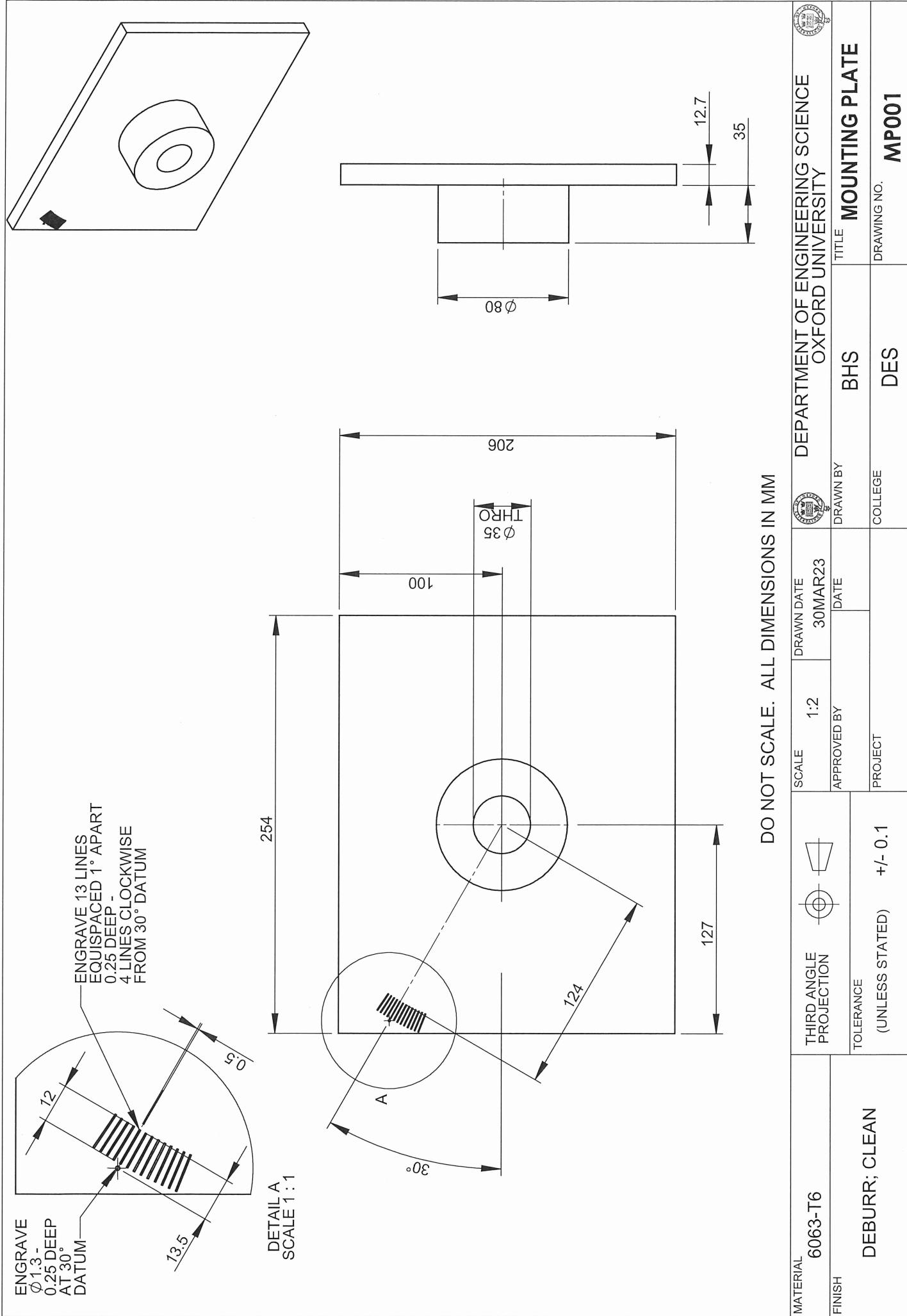
SECTION C-C

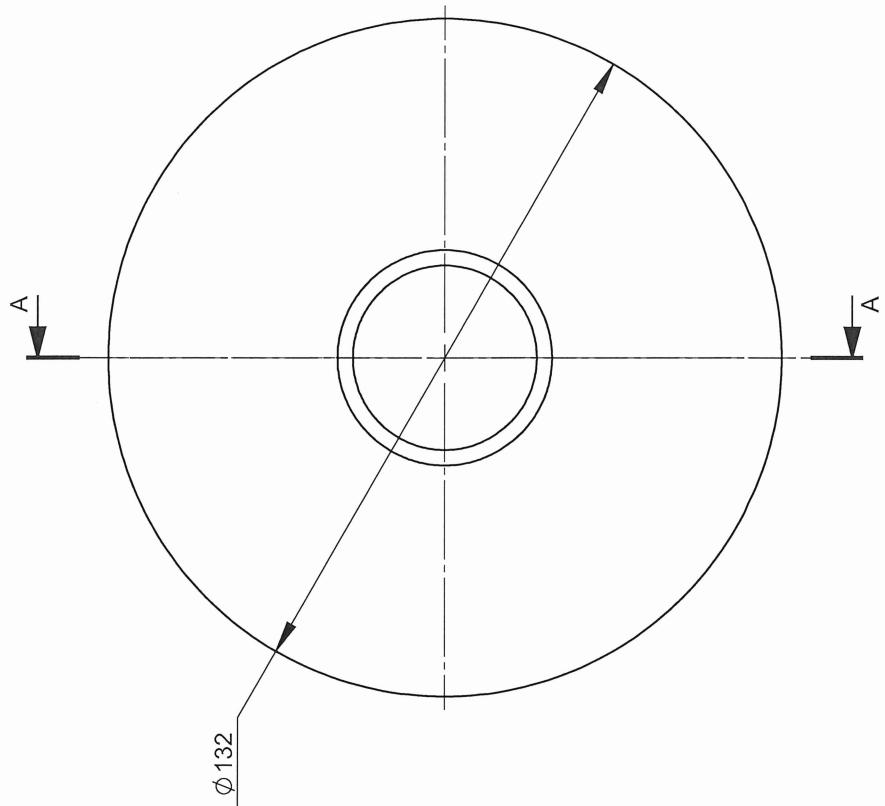
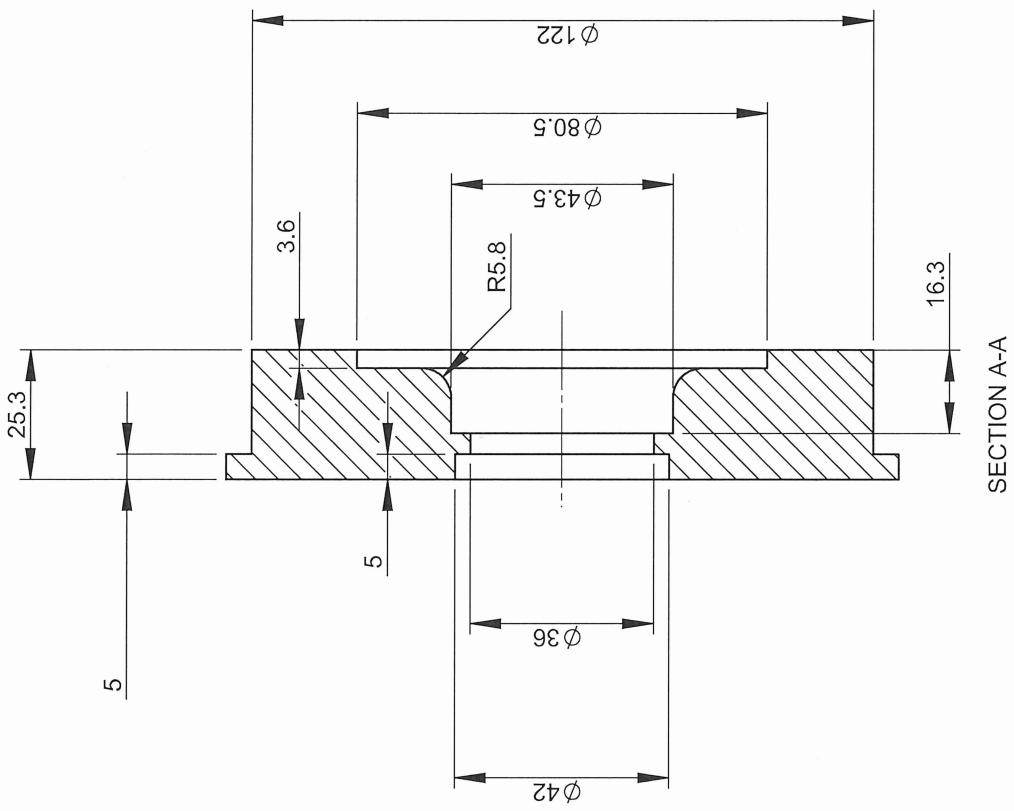
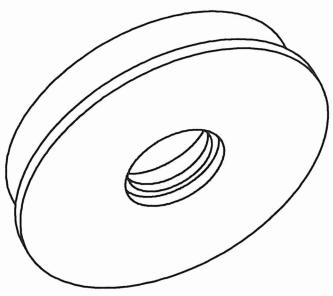


DETAIL B  
SCALE 1:1

DO NOT SCALE. ALL DIMENSIONS IN MM

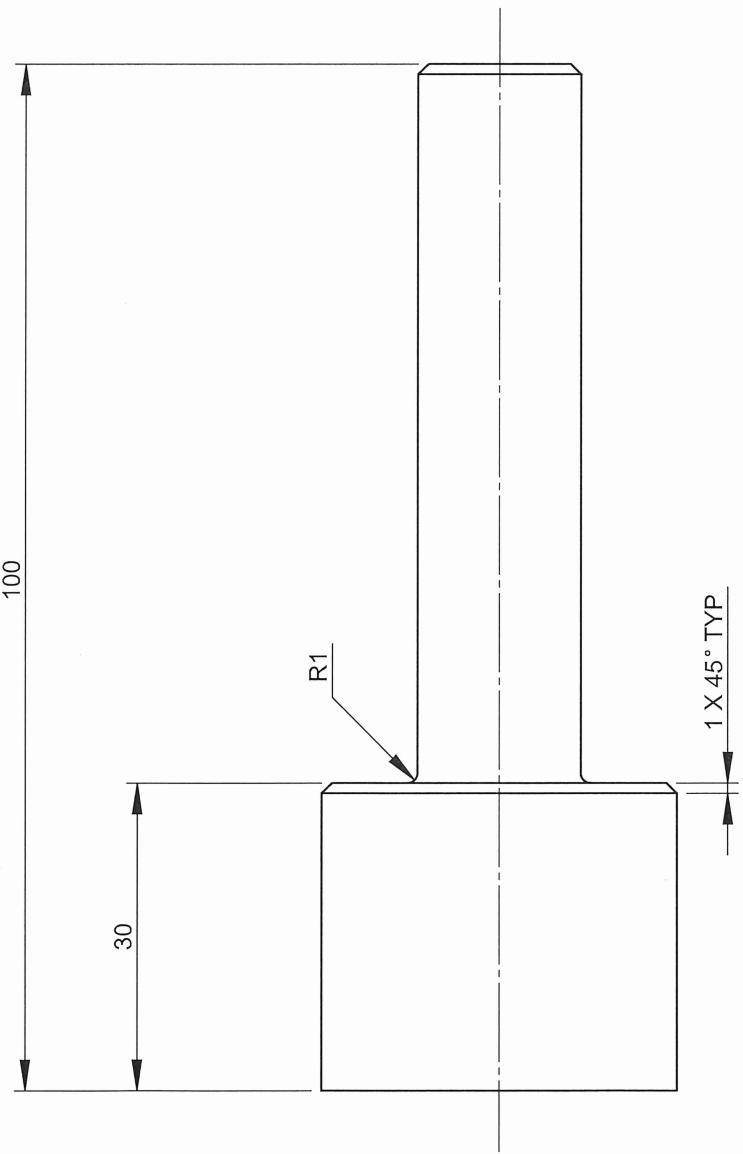
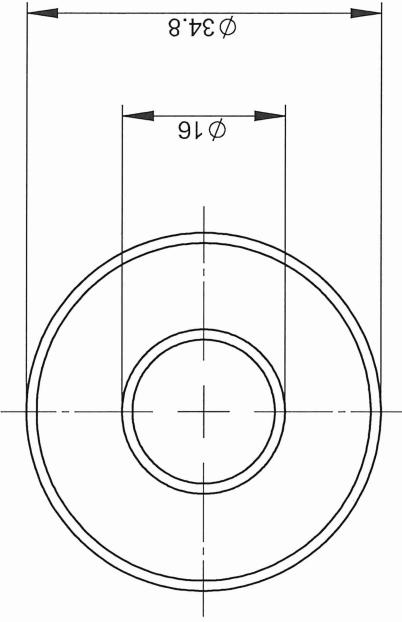
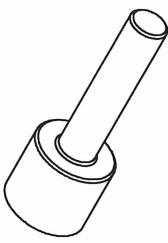






DO NOT SCALE. ALL DIMENSIONS IN MM

MATERIAL	PERSPEX	THIRD ANGLE PROJECTION	SCALE 1:1	DRAWN DATE 30MAR23	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY
FINISH	DEBURR; CLEAN	APPROVED BY	DATE	DRAWN BY BHS	TITLE <b>SEALING PLATE</b>
		PROJECT		COLLEGE DES	DRAWING NO. <b>SP001</b>



DO NOT SCALE. ALL DIMENSIONS IN MM

MATERIAL AISI 304	FINISH DEBURR; CLEAN	THIRD ANGLE PROJECTION	SCALE 2:1	DRAWN DATE 30MARCH23	DRAWN BY BHS	DEPARTMENT OF ENGINEERING SCIENCE OXFORD UNIVERSITY	TITLE DRIVE SHAFT	DRAWING NO. DS001
		APPROVED BY PROJECT	SCALE 2:1	DATE	COLLEGE DES	COLLEGE DES		