Section 10: Basic and common symbols recognition

PURPOSE
This section aims to enable the student to extend their knowledge of Drawing Interpretation from Engineering Drawings produced to AS1100 standard.

Objectives

At the end of this section you should be able to:

- ☐ Interpret information on detail drawings of engineering components.

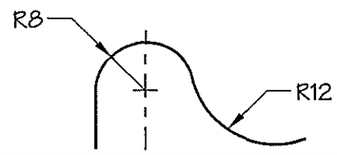
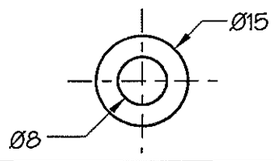
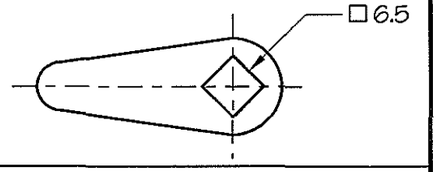
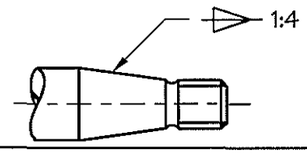
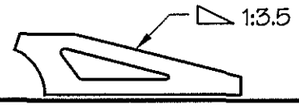
Completion guidance

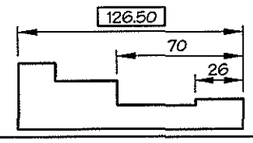
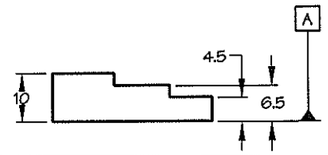
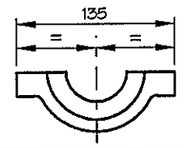
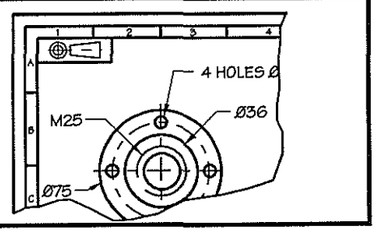
Students should attempt this section if the material relates to the engineering discipline they are employed or intend to be employed in.

Basic and Common Symbols.

Recognition.

The symbols covered in on the following pages are an example of the widespread use of symbols and abbreviations in industry. The symbols and abbreviations covered in this module relate to a few trades and professions. In some areas there are so many symbols and abbreviations that only someone who is heavily involved would know them all. If you do not know what a symbol means, do not guess, because in some industries it could lead to a serious injury or death if a wrong interpretation or decision is made. If you do not know what a symbol means, make sure you ask someone who definitely knows, not someone who does not like to admit that they do not know. You do not want the guess of someone else, you want someone who definitely knows or someone who has the latest publication containing the symbols.

Feature	Symbol	Typical Application
Radius	R	
Diameter	Ø	
Square	□	
Taper		
Slope		

Feature	Symbol	Typical Application
Feature identification		
Datum identification	▲	
Equal	=	
First angle projection		
Third angle projection		

Surface textures

Surface texture

Surface texture refers to the roughness of a surface. It can vary from very rough to very smooth, for example an aluminium casting may have the following surface textures:

- rough cast
- fine cast
- die cast
- rough machined
- medium machined
- fine machined

Standard symbols

Basic symbol: used when surface finish can be produced by any convenient technique.

Modified symbol: finish done by a machining process.

Modified symbol: indicating a surface finish without removal of material (for example, quality of an initial casting).

Roughness value chart

Roughness value	General description
50	Rough oxy cut
25	Rough casting
12.5	Rough machining
6.3	Course machining
3.2	Average machining
1.6	Good machining
0.8	Fine machining
0.4	Fine grinding
0.2	Honing
0.1	Buffing
0.05	Polishing
0.025	Super polishing

These numbers will become more relevant when the user is more conversant with the finishes they represent. Ask your teacher to supply samples of various finishes to a certain roughness value.

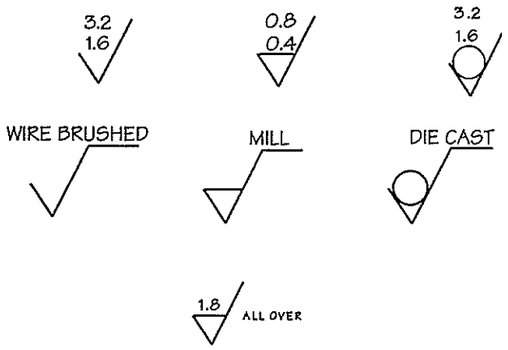
Adding the roughness value to a standard symbol

- If a particular surface finish is required, but the production technique is not important, this symbol should be used: 

- If a particular surface finish is required by using a machining operation, this symbol would be used: 

- When a surface finish is needed on a surface where no material can be removed, this symbol would be used: 

Variations to standard symbols



These symbols show maximum and minimum roughness values.

Special surface characteristics are shown here.

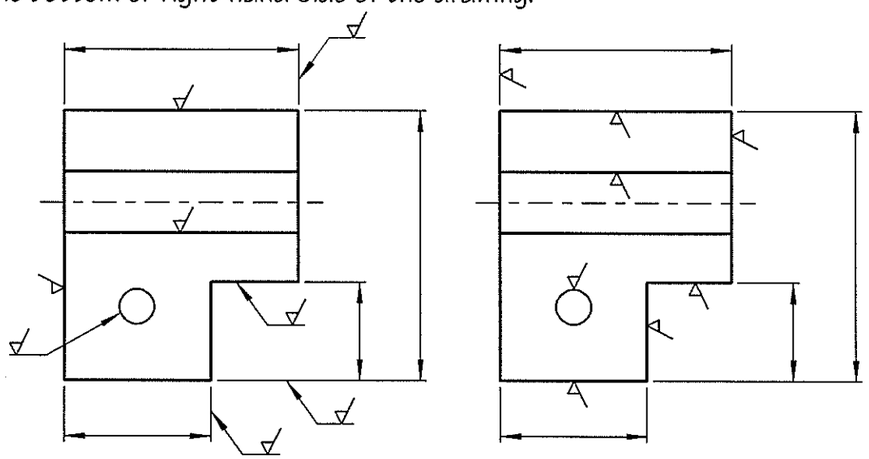
May be added to a drawing in a note form or inserted into the title block. This one is used when all the surfaces are to be machined to the same surface texture.

May be added to a drawing in a note form or inserted into the title block, when a single surface texture value applies to most surfaces. Exceptions should be indicated on the surfaces concerned.

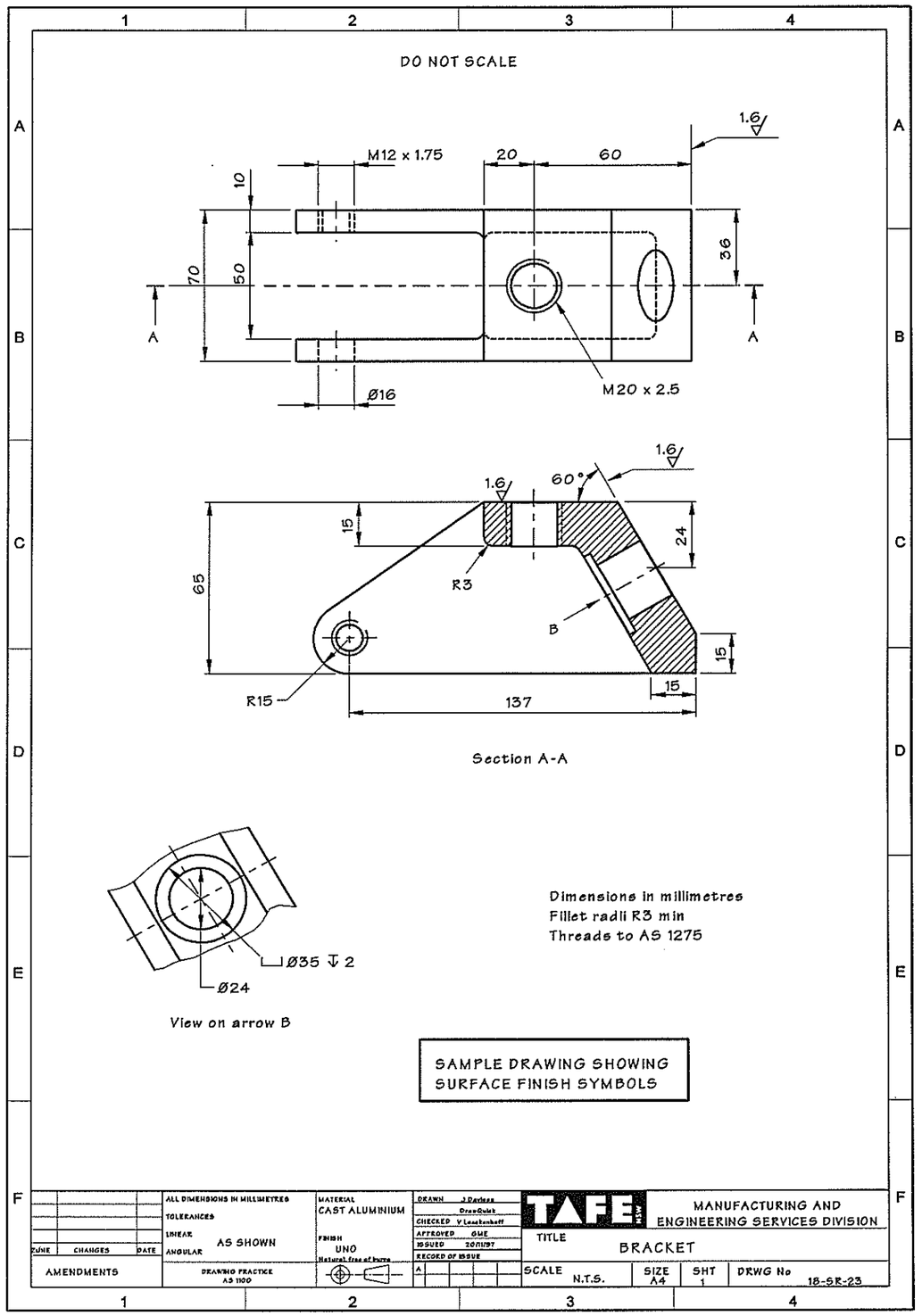
Indicates that an allowance of 3mm is to be provided for final machining.

Location of symbols on a drawing

Symbols may be located on an outline, projection line or leader line, provided that they can be read from the bottom or right hand side of the drawing.



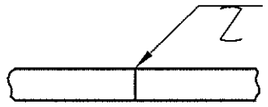
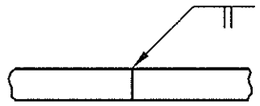
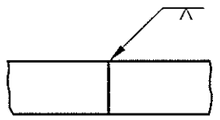
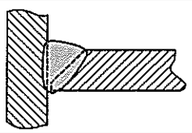
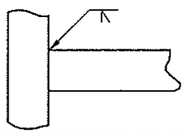
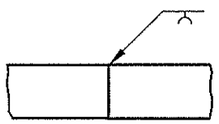
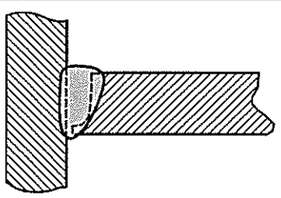
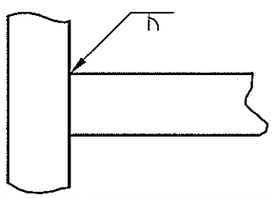
Correct Incorrect

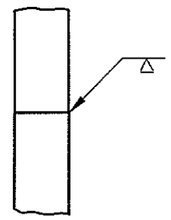
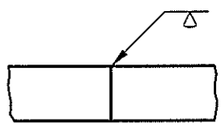
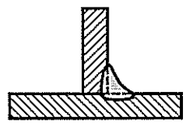
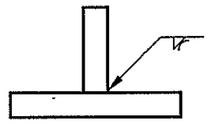


Basic Symbols for Arc and Gas Welding

Reference code
1. Symbols for Welding No AS Z6
2. Standards Association of Australia code for welding in building No AS 1554 Part 1

Butt welds

Type of weld	Sketch of weld	Symbol	Indication on drawing
General butt	Full penetration butt weld by a welding procedure to be agreed	Z	
Square butt		||	
Single V butt		V	
Single bevel butt		V	
Single U butt		Y	
Single J butt		Y	

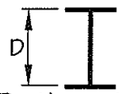
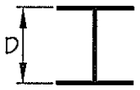
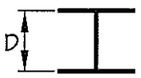
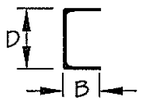
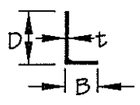
Type of weld	Sketch of weld	Symbol	Indication on drawing
Flush		—	
Convex		⌒	
Concave		⌣	

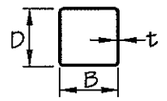
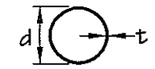
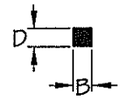
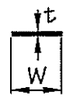
Structural Steel Profiles and Welding Symbols

The purpose of this page is to introduce you to some other symbols and abbreviations that are quite common on engineering drawings. Structural steel profiles are not drawn in most cases, nor are welds drawn or sketched as shown on the next page.

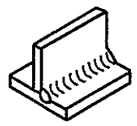
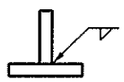
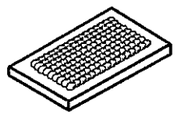
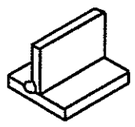
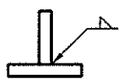
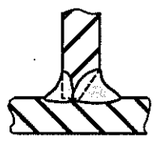
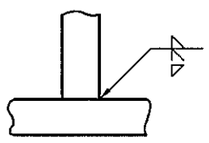
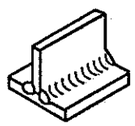
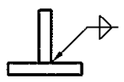
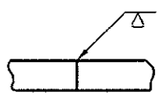
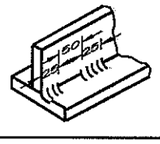
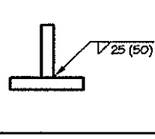
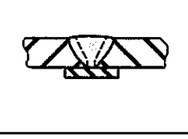
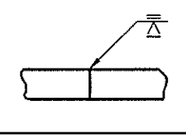
These are only a few of the total number of symbol and abbreviations available in each area, and are produced here to make you aware of what area of engineering the symbols and abbreviations belong to.

Sample of Structural Steel Shapes

Section	Profile	Symbol or abbreviation	Fully expressed example
Universal beam	 Depth greater than width.	UB	200 UB 25 where 200 = D (nominal) 25 = mass in Kg/m
Universal column	 Depth slightly greater than width.	UC	200 UC 52 where 200 = D (nominal) 52 = mass in Kg/m
Universal bearing pile	 Depth slightly less than width.	UBP	250 UBP 62 where 250 = D(nominal) 62 = mass Kg/m
Channel		C	102 x 51 x 10 C where 102 = D 51 = B 10 = mass Kg/m
Angle equal and unequal		L	127 x 75 x 10 L where 127 = D 75 = B 10 = t

Section	Profile	Symbol or abbreviation	Fully expressed example
Square hollow section or rectangular hollow section		SHS or RHS	150 x 150 x 5 SHS 150 x 75 x 5 RHS where 150 = D 75 = B 5 = t
Circular hollow section		CHS	75 OD x 5 CHS where 75 = outside diameter 'd' 5 = t
Round bar or rod		RD	20 RD where 2 = d
Square bar		SQ	20 SQ where 20 = D or B
Flat a)bar or b)plate (plate 900 to 3200 in 100mm increments)		a)FL b)PL or PL	150 x 8 FL where 150 = W 8 = t

Sample of Welding Symbols as They Would Appear on a Drawing

Applications of symbols			
Sketch of weld	Symbolic representation	Sketch of weld	Symbolic representation
			
			
			
			

Standard abbreviations (Refer to AS 1100 for the full list)

Term	Abbreviation	Term	Abbreviation
A		countersink	CSK
across flats	AF	countersunk head	CSK HD
addendum	ADD	cross-recess head	C REC HD
approximate	APPROX	cup head	CUP HD
arrangement	ARRGT	cylinder	CYL
assembly	ASSY		
automatic	AUTO	D	
auxiliary	AUX	dedendum	DED
average	AVG	detail	DET
		diagonal	DIAG
B		diagram	DIAG
bearing	BRG	diameter	DIA
bottom	BOT	dimension	DIM
bracket	BRKT	distance	DIST
brass	BRS	drawing	DRW/DRG
building	BLDG		
		E	
C		elevation	ELEV
capacity	CAP	external	EXT
cast iron	CI		
cast steel	CS	F	
centre line	CL	figure	FIG
centre-to-centre, centres	CRS	fillister head	FILL HD
chamfer	CHAM	flange	FLG
channel	CHNL	flat	FL
cheese head	CH HD		
chrome plated	CP	G	
circle	CIRC	galvanise	GALV
circular hollow section	CHS	galvanised iron	GI
circumference	CIRC	galvanised iron-pipe	GIP
cold-rolled, steel	CRS	general arrangement	GA
computer-aided design and		general-purpose outlet	GPO
drafting	CAD	geometric reference frame	GRF
computer-aided		grade	GR
manufacture	CAM	grid	GD
concentric	CONC		
counterbore	CBORE		

Term	Abbreviation	Term	Abbreviation
H		modulus of inertia	I
head	HD	mounting	MTG
height	HT	mushroom head	MUSH HD
hexagon	HEX		
hexagon head	HEX HD	N	
hexagon-socket head	HEX SOC HD	negative	NEG
high strength	HS	nominal	NOM
high-tensile steel	HTS	nominal size	NS
horizontal	HORIZ	not to scale	NTS
		number	NO
I			
inside diameter	ID	P	
internal	INT	parallel	PAR
		part	PT
J		pattern	PATT
joint	JT	pipe	P
junction	JUNC	pipeline	PL
		pitch-circle diameter	PCD
L		phosphor bronze	PH BRZ
least material condition	LMC	plate	pl
left hand	LH	position	POSN
length	LG	positive	POS
longitudinal	LONG	prefabricated	PREFAB
		pressure	PRESS
M		pressure angle	PA
machine	MACH or M/C		
malleable iron	MI	Q	
material	MATL	quantity	QTY
maximum	MAX		
maximum material		R	
condition	MMC	radius	RAD
mechanical	MECH	raised countersunk head	RSD CSK HD
mild steel	MS	rectangular	RECT
minimum	MIN	rectangular hollow section	RHS
modification	MOD	reference	REF
modulus of elasticity	E	regardless of feature size	RFS
modulus of section	Z	required	REQD
		right hand	RH

Term	Abbreviation	Term	Abbreviation
Rockwell hardness A	HRA	T	
Rockwell hardness B	HRB	tangent point	TP
Rockwell hardness C	HRC	temperature	TEMP
rolled-hollow section	RHS	thread	THD
rolled-steel angle	RSA	tolerance	TOL
rolled-steel channel	RSC	true position	TP
rolled-steel joist	RSJ	true profile	TP
roughness value	Ra		
round	RD	U	
round head	RD HD	undercut	UCUT
		universal beam	UB
S		universal column	UC
schedule	SCHED		
section	SECT	V	
sheet	SH	vertical	VERT
sketch	SK	volume	VOL
spherical	SPHER		
spigot	SPT	W	
spotface	SF	wrought iron	WI
spring steel	SPR STL		
square	SQ	Y	
square hollow section	SHS	yield point	YP
stainless steel (corrosion resistance steel)	CRES		
standard	STD		
Standards Association of Australia	SAA		
steel	ST		
switch	SW		

Isometric and Oblique Dimensioning

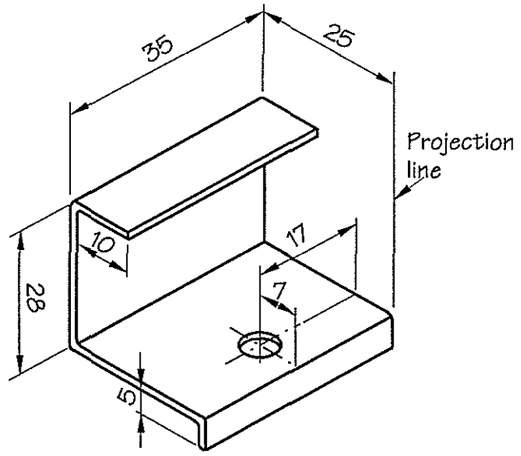
(not recommended for use in engineering)

1. Projection lines are drawn:-
   - Parallel to the plane
   - Up or down for the length and width
   - Out to the side for the height
   - Away from the object.

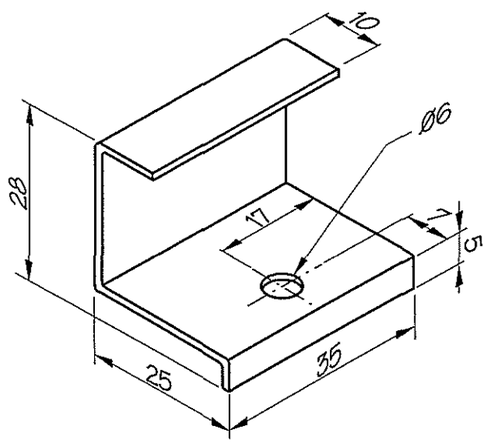
2. Alternate extensions are drawn out to the left or to the right at 30°.

3. Dimensions may be placed on the view if they are clear.

4. Dimension figures are drawn parallel to the projection lines and face the reader.



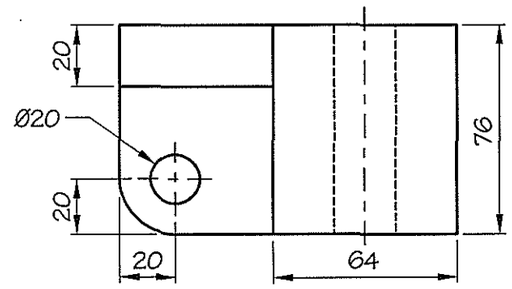
Wrong

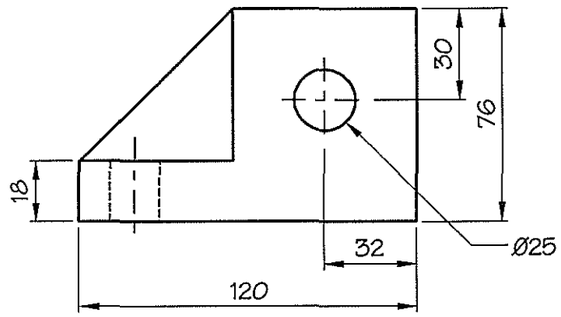


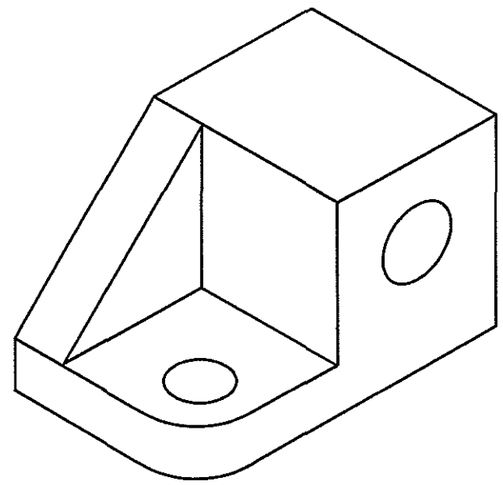
Right

Exercise 10-1

Exercise: Dimension the isometric drawing from the sizes shown on the orthogonal views.







Section 11: Interpretation of drawings/typical assessment questions

PURPOSE
In this section you will consolidate the material covered in sections 1-10

Objectives

At the end of this section you should be able to:

- ☐ Identify components, assemblies or objects.
- ☐ Explain instructions written on a drawing.
- ☐ Interpret information on detail drawings.
- ☐ Interpret information on assembly drawings.

Completion guidance

The work may need to be completed inside and outside the classroom if the majority of exercises are attempted.

Interpretation/Sample assessment questions

Completion guidance: select and attempt suitable questions.

In a title block there is a little box with letters SHT (sheet number). What would be the advantage of printing '3 of 7' instead of just 3 in the box?

In a title block there is a little box with the heading 'size' in it. If 'A3' is printed in this box, what information is being given?

The drawing you are looking at has A2 in the size box. The drawing you are looking at is not an A2 size sheet. How could this have happened?

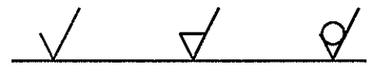
The 'scale' box has the notation 1:2 in it. What information is being indicated here?

The 'scale' box has the notation 5:1 in it. What information is being indicated here?

What is the preferred projection angle for engineering drawings?

Sketch the symbol for third angle projection.

What feature of a component is indicated by the following symbols?



What is achieved by the notation 'ALL DIMENSIONS IN MILLIMETRES' in the title block?

Why are the tolerances applied to dimensions instead of making every component to the design size?

What is one purpose for the use of a materials or parts list on a drawing?

What purpose is achieved by having numbers equally spaced along the top and bottom edge of a drawing sheet and letters on each end of the sheet?

A linear tolerance is printed as ± 0.5mm UNO. What do the letters UNO stand for?

What purpose is achieved by using different line thicknesses as well as broken lines on the drawing?

Which of the following methods of drawing presentation show all true shapes? Exploded, Isometric, Oblique, Orthogonal or Perspective.

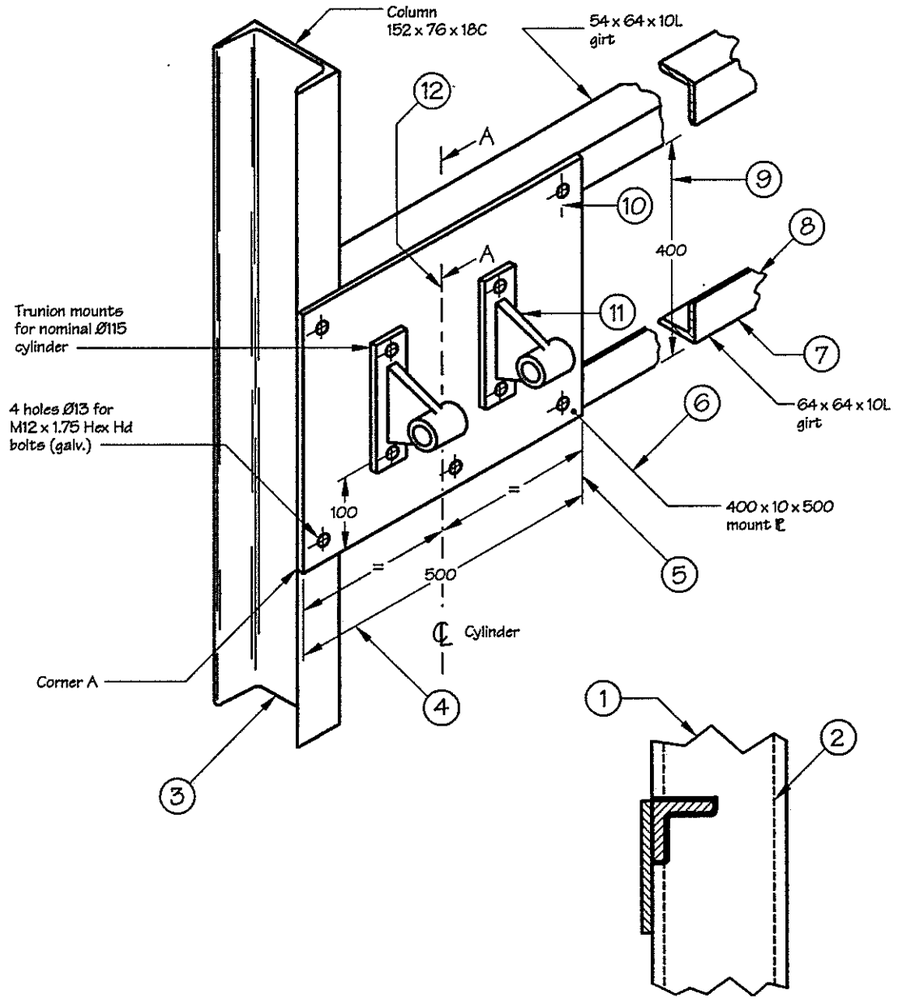
Which method of drawing tends to show each component as a complete unit and at the same time makes the finished article easy to assemble?

Which method of drawing gives the closest likeness to what the eye would actually see if looking at an object, especially a large one?

Isometric, oblique and perspective drawings are usually single view representations of an object. What is the least number of views that are possible with orthogonal drawings?

What is one advantage that oblique views have over isometric views?

Identify the different line types indicated on the following drawing. They are either an outline, hidden outline, centre line, extension line, dimension line, break line or leader line.



1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

What is one advantage that orthogonal drawings have over pictorial drawings?

_____

Why is it necessary to be very familiar with both first and third angle projection?

_____

_____

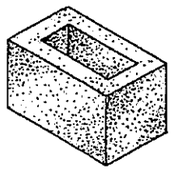
_____

What part of a component is considered to be the front view?

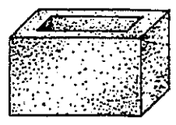
_____

_____

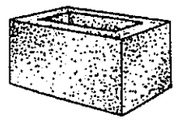
Name the following three types of drawing presentation. Choose from orthogonal, oblique, isometric, perspective, exploded.



_____

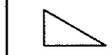
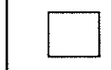


_____



_____

What do the following symbols and abbreviations mean?

Ø	_____
R	_____
PCD	_____
℄	_____
PL	_____
AF	_____
TYP	_____
(758)	_____
	
	_____
Hex	_____
56	_____

What is an auxiliary dimension?

_____

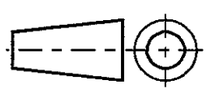
Give one advantage obtained from the practice of everyone working to the same drawing standards?

_____

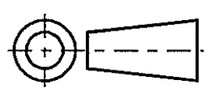
If you had a drawing with '1 of 8' printed in the SHT (sheet) box, how many sheets would need to make up a complete set of drawings for that particular project?

_____

Name the two projection symbols below.



_____



_____

How is a reference dimension shown on a drawing?

_____

If a dimension is underlined, what does it mean?

_____

What needs to be checked if using a drawing that has been in the workshop for a considerable time, to manufacture a part?

_____

What is one function of a materials list?

_____

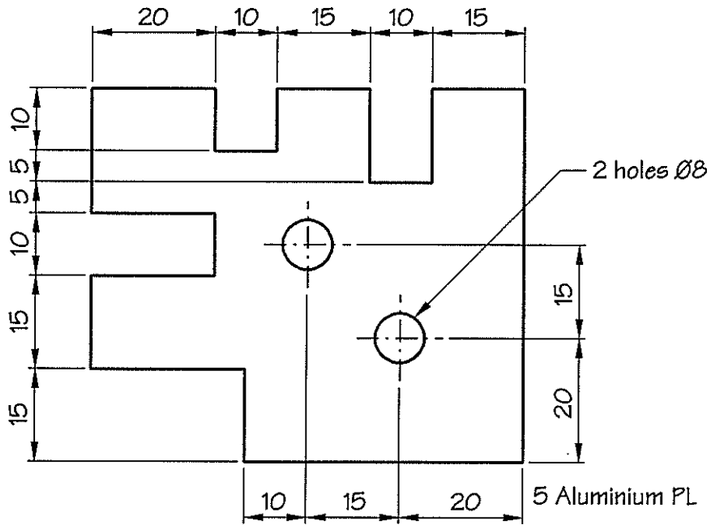
What is meant by a grid system on a drawing sheet?

_____

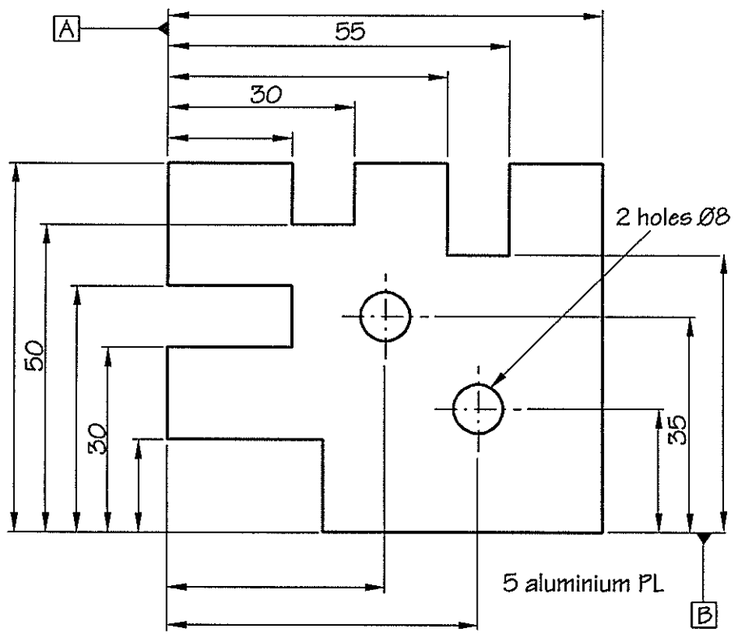
Give the thickness of the following line types. (Thick or thin).

- Hidden outline. _____
- Centre line. _____
- Dimension line. _____
- Outline. _____

The drawing on the following page is dimensioned by using what is called chain dimensioning.
Complete the dimensioning of the component (by showing the missing sizes) using datum dimensioning.

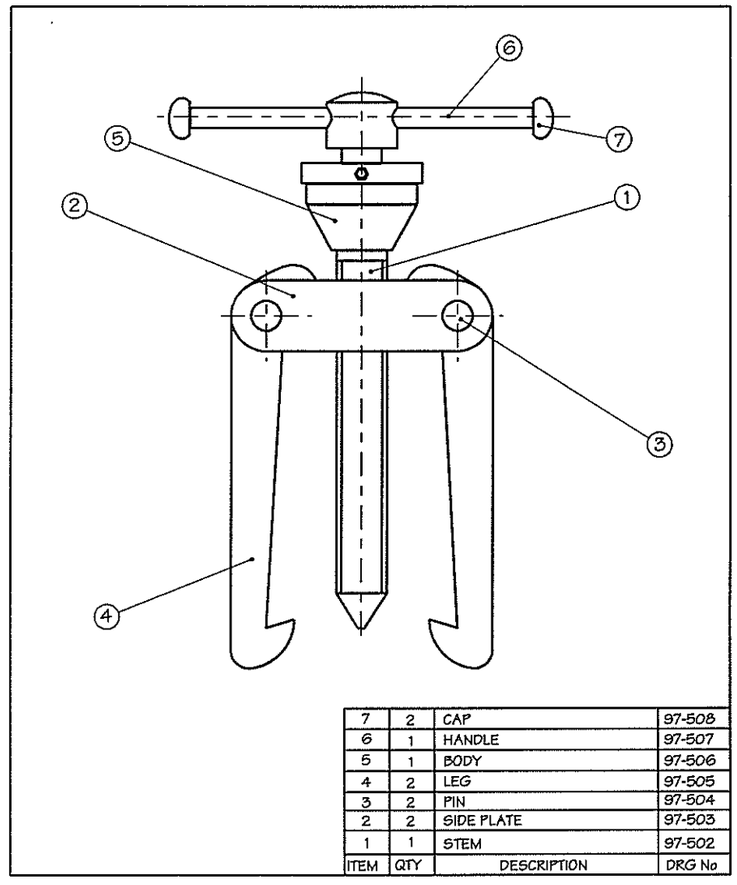


Chain dimensioning



Datum dimensioning

What type of drawing is the one shown below?
(Assembly, sub-assembly, detail assembly or detail.)



ITEM	QTY	DESCRIPTION	DRG No
7	2	CAP	97-508
6	1	HANDLE	97-507
5	1	BODY	97-506
4	2	LEG	97-505
3	2	PIN	97-504
2	2	SIDE PLATE	97-503
1	1	STEM	97-502

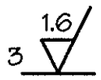
What type of tolerancing would be applied to a component if it had a box of information like the one shown here or similar to it?

//	0.05	A

What information is indicated by the following symbols?

_____

_____



_____

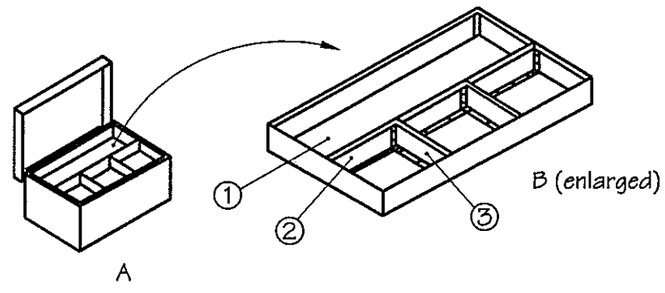
What is indicated by the note '46mm was 50mm at C/5' on a drawing?

_____

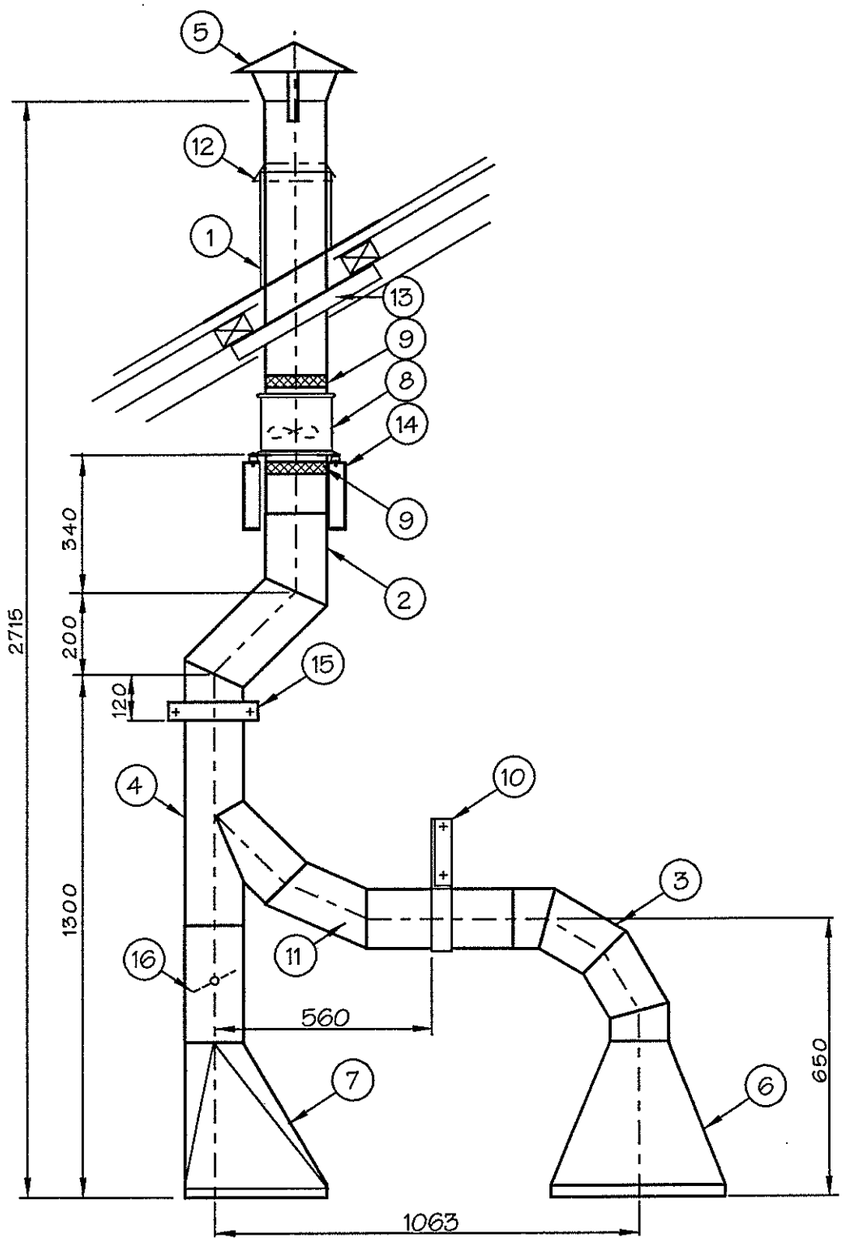
Below are two pictorial drawings, 'A' and 'B'.

What type of drawing is at A? _____

What type of drawing is at B? _____

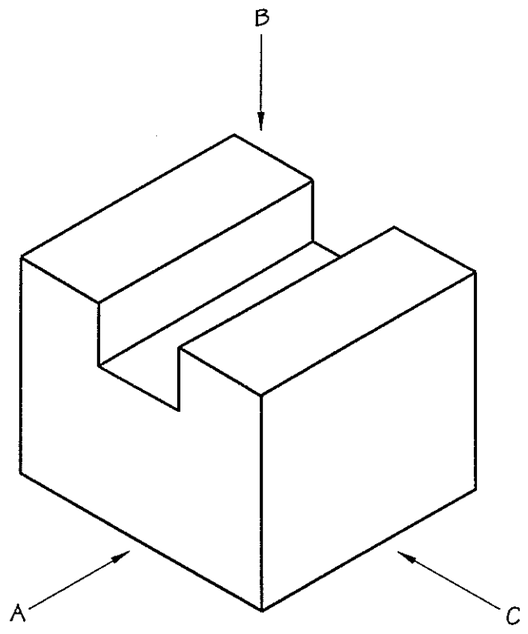


What type of drawing is shown below? _____

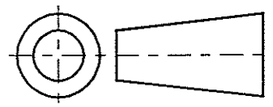


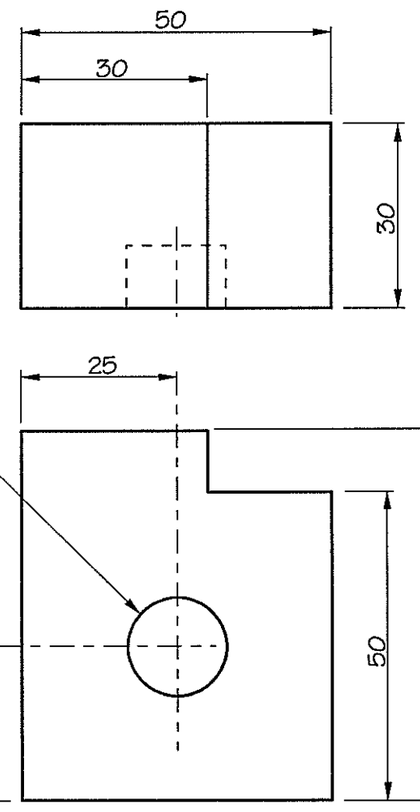
You are asked to make a component to drawing number eg. (2468/3 issue G).
How would you know that the drawing you have been given is the correct drawing?

On a separate sheet, draw a third angle orthogonal drawing of the following component.
There are to be three views; a front view 'A', a top view 'B', and a right side view 'C'.
Draw or sketch full size and fully dimension.
Take your dimensions, to the nearest mm, from the drawing below.



On a separate sheet and using the orthogonal views given below produce an isometric drawing or cabinet oblique drawing. Complete either a freehand sketch or a drawing using equipment. Name the pictorial shape as isometric or oblique.





Answer the questions related to drawing: 993367

What type of view is A-A?

What is the name for the diagonal lines in view A-A?

Why do some sizes have a number both above and below the dimension line?

What is the name given to the line A-A in the front view?

What does the symbol (N) indicate?

What size sheet was this originally drawn on?

Why is the 380 dimension in brackets?

What is the symbol at location A5 called?

What size of thread is required?

How long is the thread?

Why is the dimension 263 underlined?

What scale is this item drawn to?

What do you call the feature 2 x 45°.

The steps in the shaft have an engineering name. What is it?

What is the overall length of the part?

What will be the maximum length of the left end of the shaft?

What material is specified?

What is the general linear tolerance?

How many sheets make up a full set of drawings?

What issue is this drawing?

_____

What is the drawing number?

_____

What are the initials of the drafter?

_____

What angle of projection is indicated?

_____

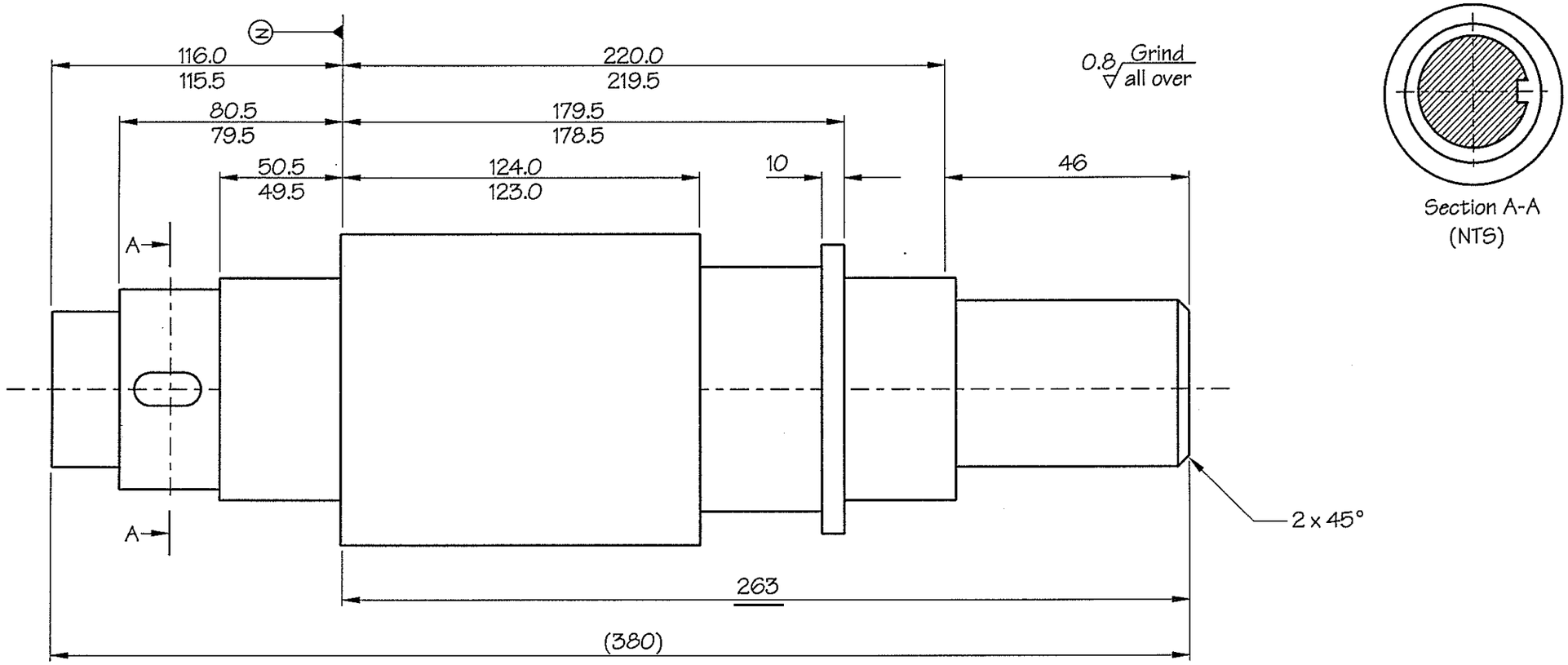
The drawing is missing 8 similar items of information regarding the sizes for the part. What similar items are missing?

_____

What does NTS mean? (Section A-A)

_____

DO NOT SCALE



Section A-A
(NTS)

ISSUE	DATE	ZONE	CHANGE	ECN	BY	CKD
A	20 - 8 - 97		FIRST ISSUED		J D	W L

AMENDMENTS

UNLESS NOTED OTHERWISE TOLERANCES ARE:

LINEAR ± 0.1 UNO

ANGULAR N/A

DRAWING PRACTICE AS 1100

MATERIAL: MILD STEEL

FINISH: AS NOTED

DRAWN	J D
TRACED	W P
CHECKED	W L
APPROVED	K A
ISSUED	20 - 8 - 97

RECORD OF ISSUE: A

TAFE — MANUFACTURING AND ENGINEERING EDUCATIONAL SERVICES CONSORTIA

TITLE: SHAFT

SCALE 1:2 | SIZE A3 | DRG N° 993367 | SHT 4 OF 7

Answer the questions related to drawings 124 sheet 1 and 2 of 2

Drawing 124 sheet 1 of 2

What type of drawing is this?
(Assembly, detail assembly, detail, pictorial)

_____

What is the latest issue?

_____

How many washers (Item 5) are required for each assembly?

_____

What do the numbers inside circles with a leader pointing to a part represent?

_____

Was the drawing made to scale?

_____

How many parts make up one full assembly?

_____

What drawing number would you need to obtain to manufacture Item 6?

_____

What units are the dimensions in?

_____

What item number does Item 3 screw onto?

_____

What is the purpose of Item 7?

_____

Drawing 124 sheet 2 of 2

What type of drawing is this?
(Assembly, detail assembly, detail, pictorial)

_____

What date was issue A released on?

_____

What are the initials of the drafter?

_____

In zone A1 what does $\sqrt{0.4}$ Grind mean?

a) $\sqrt{}$ _____ b) 0.4 _____ c) Grind _____

Some information relating to Item 1 in the notes is given twice (repeated). Is this good practice?

_____

Zones D3 and B5 have letters AS in them. What does AS stand for?

_____

What material is Items 2, 3, 5, 6, 7, and 8 made from? Give the full description.

_____

If Item 4 was to be made from HSS, what would the full description be?

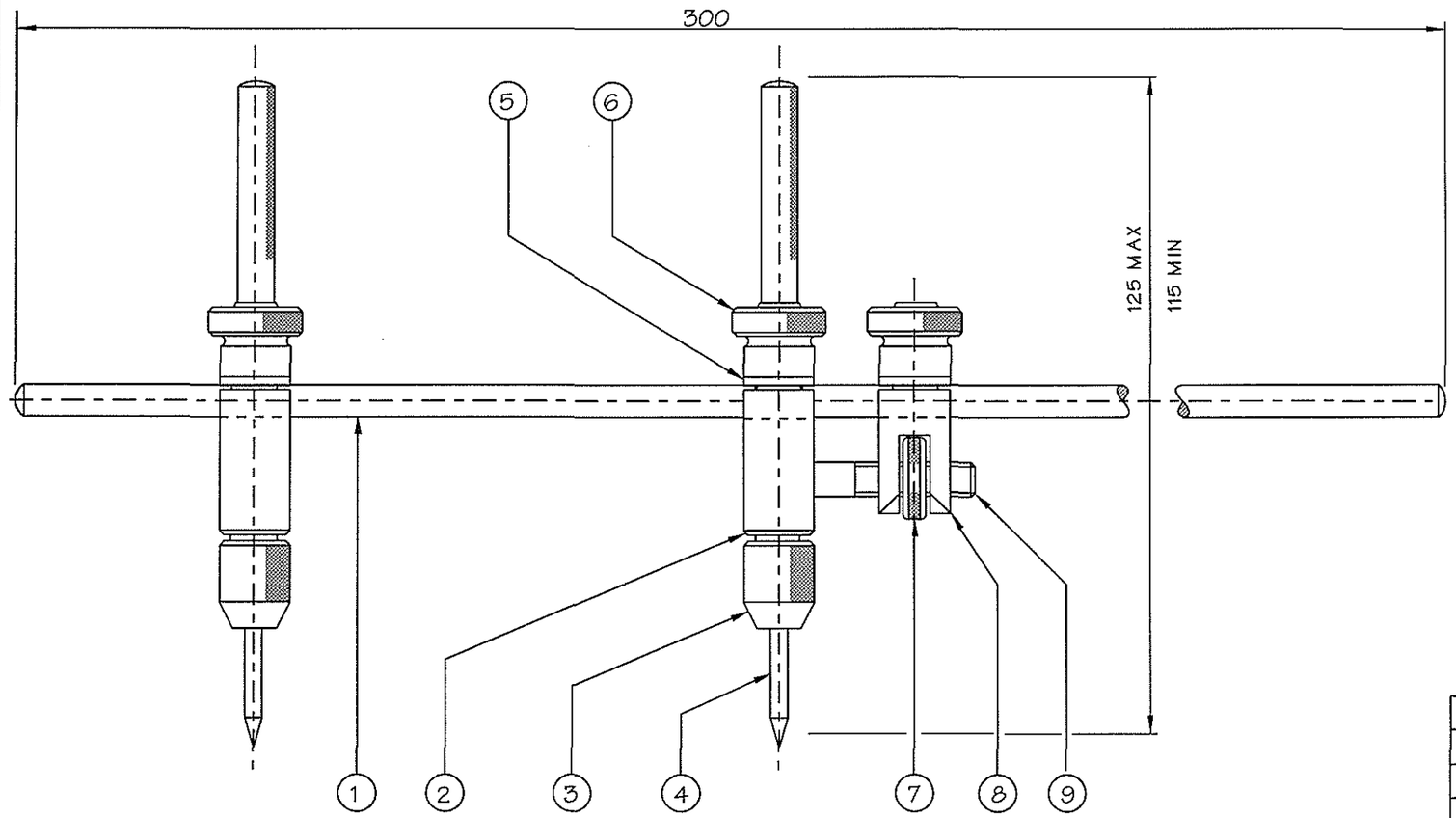
_____

Zone B1 Item 3 has thin lines at 45° across it. What are these lines called?

_____

What is the maximum & minimum of size 13 on Item 2 in zone B3? _____

ALL DIMENSIONS ARE IN MILLIMETRES
DO NOT SCALE



ASSEMBLY

ITEM	DESCRIPTION	No OFF	REF DRWG No	MATERIAL
9	ADJUSTING SCREW	1	124 SHT 2 ITEM 9	
8	" BLOCK	1	124 SHT 2 ITEM 8	
7	" NUT	1	124 SHT 2 ITEM 7	
6	NUT - TRAVERSE LOCKING	3	124 SHT 2 ITEM 6	
5	WASHER	3	124 SHT 2 ITEM 5	
4	SCRIBER	2	124 SHT 2 ITEM 4	
3	NUT	2	124 SHT 2 ITEM 3	
2	LEG	2	124 SHT 2 ITEM 2	
1	BEAM	1	124 SHT 2 ITEM 1	

ISSUE	DATE	ZONE	CHANGE	ECN	BY	CKD
A	22/12/97	ZONE	ORIGINAL ISSUE		JR	WC

AMENDMENTS

UNLESS NOTED OTHERWISE TOLERANCES ARE:
LINEAR N/A
ANGULAR N/A

DRAWING PRACTICE AS 1100

MATERIAL N/A

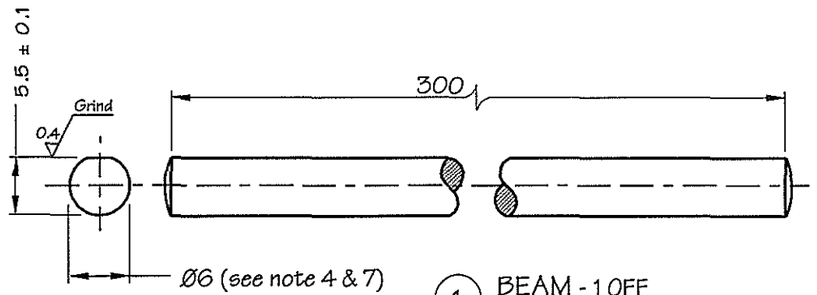
FINISH N/A

DRAWN JR
TRACED
CHECKED WC
APPROVED TC
ISSUED 20 - 12 - 97
RECORD OF ISSUE

TAFE NSW
MANUFACTURING AND ENGINEERING
EDUCATIONAL SERVICES DIVISION

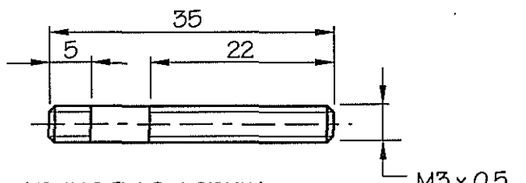
TITLE
TRAMMEL

SCALE NTS | SIZE A3 | DRG N° 124 | SHT 1 OF 2

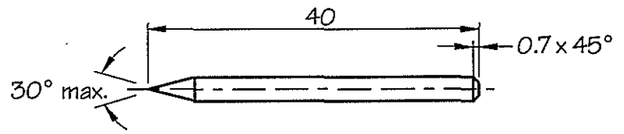


1 BEAM - 1 OFF
MAT'L: SILVER STEEL

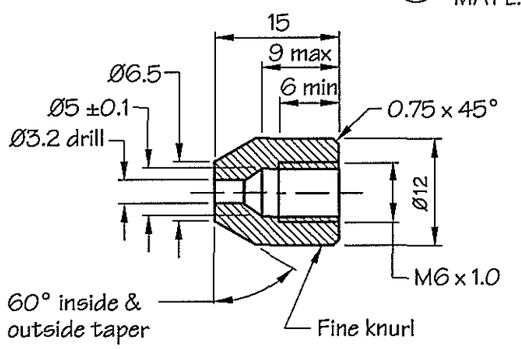
DO NOT SCALE



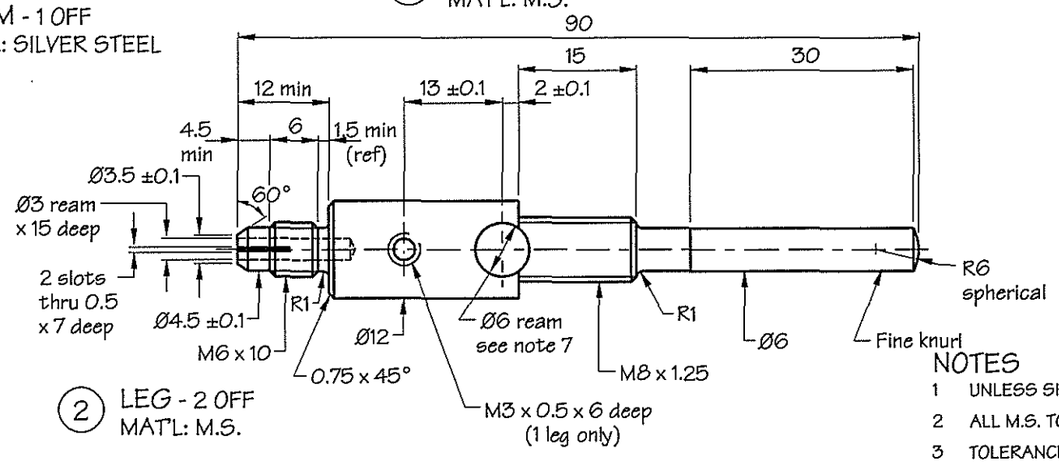
9 ADJUSTING SCREW - 1 OFF
MAT'L: M.S.



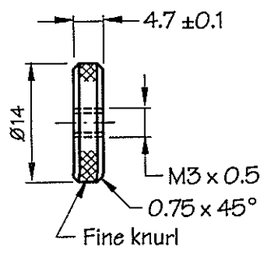
4 SCRIBER - 2 OFF
MAT'L: Ø3 H.S.S. OR SILVER STEEL
HARDEN AND TEMPER



3 NUT - 2 OFF
MAT'L: M.S.



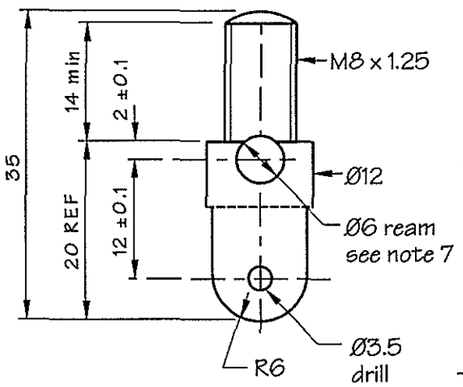
2 LEG - 2 OFF
MAT'L: M.S.



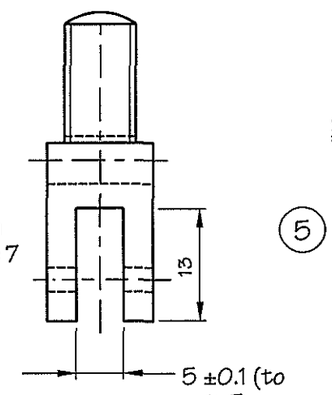
7 ADJUSTING NUT - 1 OFF
MAT'L: M.S.

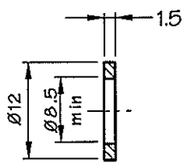
NOTES

1. UNLESS SHOWN OTHERWISE DIMENSIONS IN MILLIMETRES.
2. ALL M.S. TO BE PER A.S. 1442-1973/S1020.
3. TOLERANCES TO BE WITHIN ±0.5 UNLESS SHOWN OTHERWISE.
4. SURFACE FINISH GENERAL TO BE $\sqrt{}^{1.6}$
   BEARING SURFACES (ITEM 1) TO BE $\sqrt{}^{.4}$
5. REMOVE ALL SHARP CORNERS WITH A SMOOTH FILE.
6. DO NOT SCALE OFF DRAWING - WORK TO DIMENSIONS.
7. ITEM 1 TO BE A "SLIDE FIT" IN ITEMS 5 & 8. THIS CAN BE PRODUCED BY REAMING TO SUIT THE Ø6 BEAM, OR BY BUFFING THE BEAM WITH FINE EMERY TO SUIT A Ø6 REAMED HOLE.

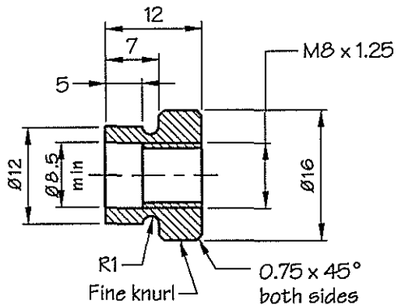


8 ADJUSTING BLOCK -1 OFF
MAT'L: M.S.





5 WASHER -3 OFF
MAT'L: M.S.



6 NUT TRAVERSE LOCKING - 3 OFF
MAT'L: M.S.

ITEM	DESCRIPTION	QTY	MATERIAL
9	ADJUSTING SCREW	1	35 x Ø3.5 M.S. BAR
8	" BLOCK	1	35 x Ø12 M.S. BAR
7	" NUT	1	4 x Ø14 M.S.
6	NUT - TRAVERSE LOCKING	3	12 x Ø16 M.S.
5	WASHER	3	12 O.D. x 8.5 I.D. x 1.5 M.S.
4	SCRIBER	2	Ø3 H.S.S. OR SILVER STEEL
3	NUT	2	15 x Ø12 M.S.
2	LEG	2	90 x Ø12 M.S.
1	BEAM	1	300 x Ø6 SILVER STEEL BAR

ISSUE	DATE	ZONE	CHANGE	ECN	BY	CKD
A	15 - 5 - 97		ISSUED FOR PRODUCTION		J D	W L

AMENDMENTS

UNLESS NOTED OTHERWISE TOLERANCES ARE:

LINEAR ± 0.5 UNO

ANGULAR ± 0° 15'

DRAWING PRACTICE AS 1100

MATERIAL: AS LISTED

FINISH: SEE NOTES

DRAWN	J D
TRACED	W P
CHECKED	W L
APPROVED	J R P
ISSUED	15 - 5 - 97

RECORD OF ISSUE: A

TAFE NSW

MANUFACTURING AND ENGINEERING
EDUCATIONAL SERVICES DIVISION

TITLE

TRAMMEL DETAILS

SCALE	SIZE	DRG N°	SHT
1:2	A3	124	2 OF 2

Answer the questions below related to drawing 02-MF1-MY98

When was this drawing issued?

What is the name of the component?

What size is the oil hole?

How many holes have to be drilled Ø12?

What is the overall height of the finished item?

What is indicated by the projection symbol at position D4 in the Title Block?

What is the name given to dimensions like Ø44?

What do you call the symbol marked B?

What welding is specified by the symbol marked A?

How far is the oil hole from the edge of the cylinder?

What do you call the diagonal lines in Section A-A?

How many pieces are used to make this item?

What sizes of welds are used?

How thick is item 2?

What are the overall dimensions of item 1?

What material is specified?

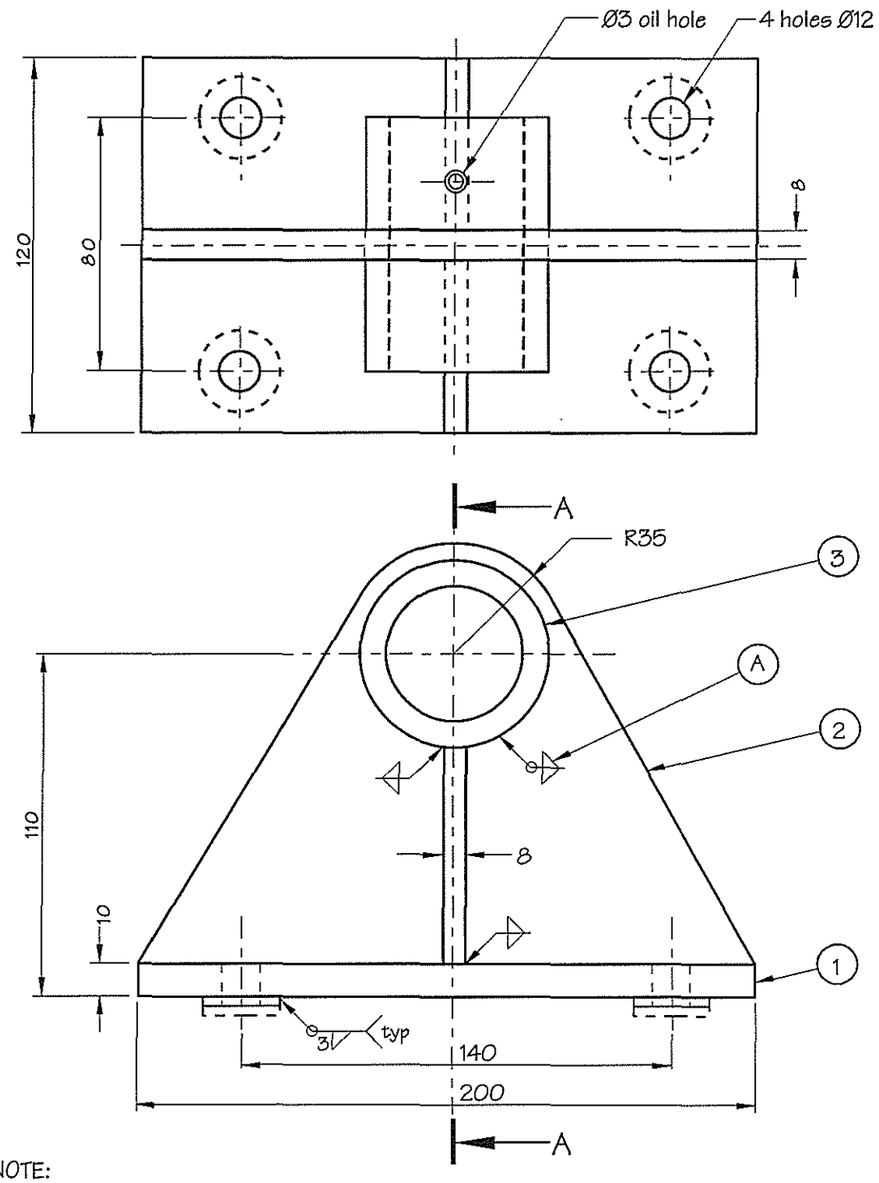
What are the general tolerances?

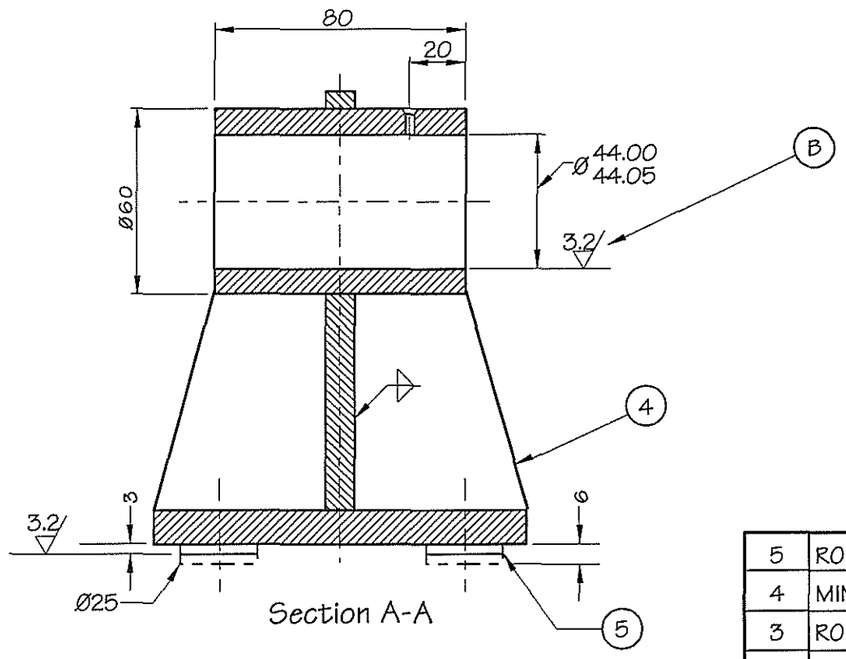
What does UNO mean?

What issue is this drawing?

What distance are the Ø12 holes in from the two edges?

Long edge _____ Short edge _____





NOTE:
All welds 6 fillet unless indicated otherwise

PARTS LIST

ITEM	DESCRIPTION	SIZE	MAT'L
5	ROUND BAR	Ø25x6	MS
4	MINOR WEBS	70x8x56	MS
3	ROUND BAR	Ø60x80	MS
2	MAIN WEB	200x8x135	MS
1	BASE PLATE	200x10x120	MS

ISSUE	DATE	ZONE	CHANGE	ECN	BY	CKD
A	7/3/98		First issue		LZ	BB

AMENDMENTS

UNLESS NOTED OTHERWISE TOLERANCES ARE:
LINEAR: ± 0.5
ANGULAR: ± 0° - 30'

DRAWING PRACTICE AS 1100

MATERIAL: M.S.

FINISH UNO 12.5

DRAWN LZ
TRACED
CHECKED JB
APPROVED BB
ISSUED 7 - 3 - 98
RECORD OF ISSUE

TAFE NSW
MANUFACTURING AND ENGINEERING EDUCATIONAL SERVICES CONSORTIA

TITLE
SHAFT SUPPORT BEARING

SCALE 1:2 | SIZE A3 | DRG N° 02 - MF 1 - MY 98 | SHT 1 OF 1

Answer the questions related to drawing: A671-3

What type of material is used to manufacture the scrubber?

_____

How many mounting brackets are required?

_____

What thickness of material is used to manufacture the mounting brackets?

_____

What type of weld is used to weld the mounting brackets on to the scrubber body?

_____

Item H refers to the 200 OD (outside diameter) cylinder. What is its length?

_____

Item F is a square to round transition. What are the following dimensions?

bottom diameter _____ top square _____

What type of weld is used to join the transition item F to the spigot item E?

_____

What after-weld treatment is given to the inside of the vessel?

_____

What surface treatment is given to the completed assembly?

_____

What diameter hole is required in the mounting bracket?

_____

What are the dimensions of the scrubber cylinder, item D?

diameter _____ length _____

What size mild steel angle is used to fabricate the diameter Ø800 ID (inside diameter) flange?

_____

Why is the drawing classed as a detail assembly?

_____

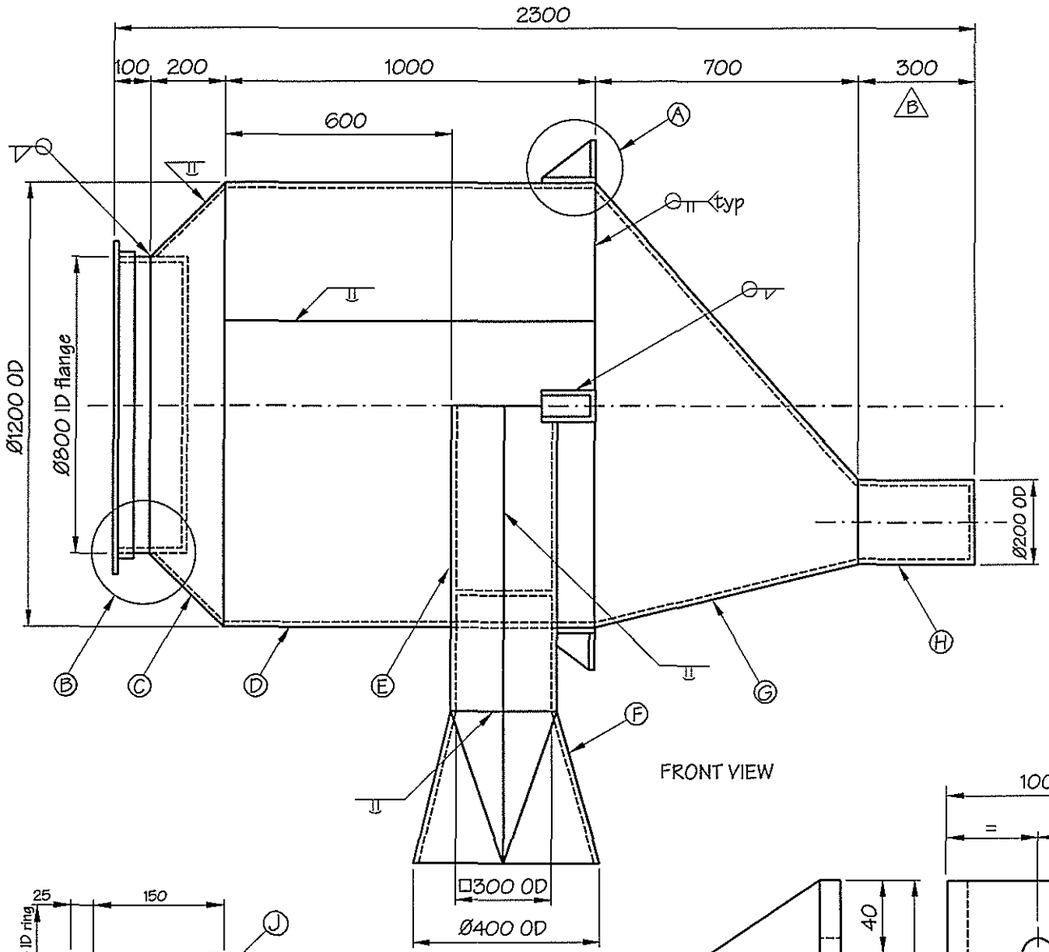
What issue is the drawing?

_____

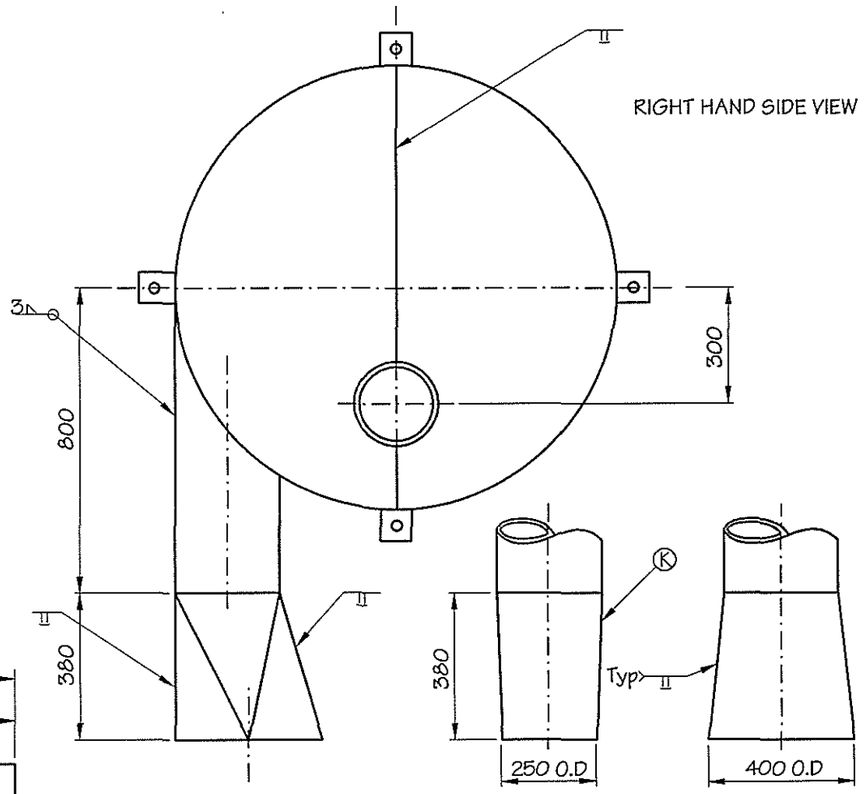
What scale is used?

_____

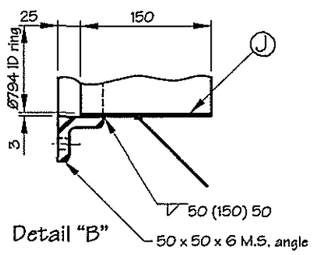
DO NOT SCALE



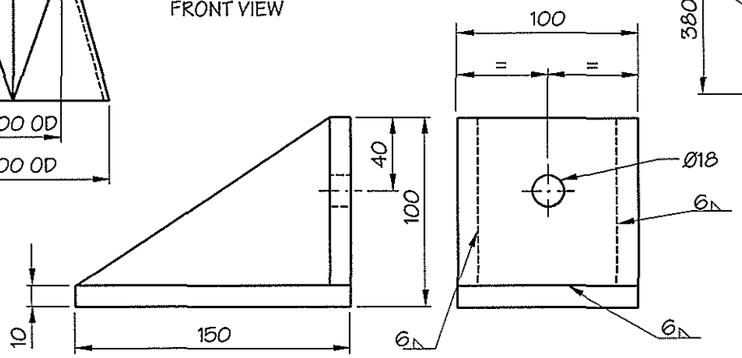
FRONT VIEW



Alternate transition



Detail "B"



DETAIL "A"
Mounting bracket 4 required

Details:
1. material 3 mild steel plate. (UNO)
2. completed assembly to be hot dipped galvanised.
3. all seams either metallic arc or MIG welded and ground flush on the inside of the vessel.

ISSUE	DATE	ZONE	CHANGE	ECN	BY	CKD
B	10 - 4 - 95	A3	300 WAS 290	147/95	J D	KA
A	10 - 3 - 93		ISSUED FOR PRODUCTION		J D	W L

AMENDMENTS

UNLESS NOTED OTHERWISE TOLERANCES ARE:
LINEAR ± 0.5
ANGULAR 0.5°

DRAWING PRACTICE AS 1100

MATERIAL AS LISTED

FINISH 12.5 UNO

DRAWN	J D
TRACED	W P
CHECKED	W L
APPROVED	K A
ISSUED	10 - 3 - 83
RECORD OF ISSUE	

A B

TAFE NSW — MANUFACTURING AND ENGINEERING EDUCATIONAL SERVICES CONSORTIA

TITLE: AIR POLLUTION CONTROL SYSTEM SCRUBBER DETAIL ASSEMBLY

SCALE 1:10 | SIZE A3 | DRG N° A671-3 | SHT 3 OF 8

Answer the questions relating to the diagram

The diagram shown is an architectural diagram. They have another common name. What is it?

_____

What is the purpose of an architectural diagram?

_____

What do the dashed lines inside the various rooms represent? (- - - - - -)

_____

How many ceiling lights are required? _____

What does the symbol [MSB] Represent? _____

How many ceiling fans are required? _____

What additional information would you require to work out what minimum length of wiring you would need to take?

_____

What does this symbol represent?  _____

How many single power points are required? _____