Linework and lettering
Class 9
Drawing paper sizes

The British Standard BS8888 recommends that the area, designations and dimensions of the drawing sheet are as given in Table 5.1.

Weights are conveniently expressed in the unit grams per square metre.

Table 5.1

<table>
<thead>
<tr>
<th>Designation</th>
<th>Size (millimetres)</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>A0</td>
<td>841 × 1189</td>
<td>1 m²</td>
</tr>
<tr>
<td>A1</td>
<td>594 × 841</td>
<td>5000 cm²</td>
</tr>
<tr>
<td>A2</td>
<td>420 × 594</td>
<td>2500 cm²</td>
</tr>
<tr>
<td>A3</td>
<td>297 × 420</td>
<td>1250 cm²</td>
</tr>
<tr>
<td>A4</td>
<td>210 × 297</td>
<td>625 cm²</td>
</tr>
</tbody>
</table>

Fig. 5.1 Standard size reductions from A0 to 35 mm microfilm
Title blocks are also generally printed in the bottom right-hand corner of cut sheets and contain items of basic information required by the drawing office or user of the drawing. Typical references are as follows:

Name of firm,
Drawing number,
Component name,
Drawing scale and units of measurement,
Projection used (first or third angle) and or symbol,
Draughtsman’s name and checker’s signature,
Date of drawing and subsequent modifications,
Cross references with associated drawings or assemblies.
Presentation

Drawing sheets and other documents should be presented in one of the following formats:
(a) Landscape; presented to be viewed with the longest side of the sheet horizontal.
(b) Portrait; presented to be viewed with the longest side of the sheet vertical.
Lines and linework

Standard lead holders, inking pens for manual use, and those for CAD plotters are all available in the following millimetre sizes:

0.25, 0.35, 0.5, 0.7, 1.0, 1.4 and 2.0.

Line thicknesses of 0.7 and 0.35 are generally used and will give good quality, black, dense and contrasting lines.
Table 5.2 shows applications for different line types

<table>
<thead>
<tr>
<th>NAME</th>
<th>CONVENTION</th>
<th>DESCRIPTION AND APPLICATION</th>
<th>SAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CENTER LINES</td>
<td></td>
<td>THIN LINES MADE UP OF LONG AND SHORT DASHES ALTERNATELY SPACED AND CONSISTENT IN LENGTH</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>USED TO INDICATE SYMMETRY ABOUT AN AXIS AND LOCATION OF CENTERS</td>
<td></td>
</tr>
<tr>
<td>VISIBLE LINES</td>
<td></td>
<td>HEAVY UNBROKEN LINES</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>USED TO INDICATE VISIBLE EDGES OF AN OBJECT</td>
<td></td>
</tr>
<tr>
<td>HIDDEN LINES</td>
<td></td>
<td>MEDIUM LINES WITH SHORT EVENLY SPACED DASHES</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>USED TO INDICATE CONCEALED EDGES</td>
<td></td>
</tr>
<tr>
<td>EXTENSION LINES</td>
<td></td>
<td>THIN UNBROKEN LINES</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>USED TO INDICATE EXTENT OF DIMENSIONS</td>
<td></td>
</tr>
<tr>
<td>DIMENSION LINES</td>
<td></td>
<td>THIN LINES TERMINATED WITH ARROWS HEADS AT EACH END</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>USED TO INDICATE DISTANCE MEASURED</td>
<td></td>
</tr>
</tbody>
</table>
Lettering

Drawings need dimensions and notes and if these are added in a careless and haphazard manner, then a very poor overall impression may be given.

Much effort and thought is needed with respect to lettering, and spacing, in order to produce an acceptable drawing of high standard.
The following notes draw attention to small matters of detail and will assist the draughtsman’s technique of lettering:

1 Lettering **may be vertical or slanted**, according to the style which is customarily used by the draughtsman. The aim is to produce clear and unambiguous letters, numbers and symbols.

2 If slanted lettering is used, the slope should be approximately $65^\circ–70^\circ$ from the horizontal. The characters should be capable of being produced at reasonable speed and in a repeatable manner. **Different styles on the same drawing spoil the overall effect.**

3 Use single stroke characters **devoid of serifs and embellishments**.
4 All strokes should be of **consistent density**.

5 **The spacing round each character is important** to ensure that ‘filling in’ will not occur during reproduction.

6 Lettering **should not be underlined** since this impairs legibility.

7 On parts lists or where information is tabulated, the letters or numerals **should not be allowed to touch the spacing lines**.
8 All drawing notes and dimensions **should remain legible on reduced size copies** and on the screens of microfilm viewers.

9 **Capital letters are preferred to lower case letters** since they are easier to read on reduced size copies of drawings. **Lower case letters** are generally used only where they are parts of **standard symbols, codes or abbreviations**.

10 When producing a manual drawing the draughtsman should take care to **select the proper grade of pencil** for lettering. The pencil **should be sharp**, but with a round point which will not injure the surface. Mechanical pencils save time and give consistent results since no resharpening is necessary.

11 **Typewritten, stencilled or letters using the ‘Letraset’ adhesive letter system may be used** since these provide uniformity and a high degree of legibility.
Minimum character height for capital letters and numerals

Table 5.3 gives the minimum recommended character heights for different sizes of drawing sheet and it is stressed that these are minimum sizes. If lower case letters are used then they should be proportioned so that the body height will be approximately 0.6 times the height of a capital letter.

<table>
<thead>
<tr>
<th>Application</th>
<th>Drawing sheet size</th>
<th>Minimum character height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drawing numbers etc.</td>
<td>A0, A1, A2 and A3</td>
<td>7 mm</td>
</tr>
<tr>
<td>Dimensions and notes</td>
<td>A4</td>
<td>5 mm</td>
</tr>
<tr>
<td></td>
<td>A0</td>
<td>3.5 mm</td>
</tr>
<tr>
<td></td>
<td>A1, A2, A3, and A4</td>
<td>2.5 mm</td>
</tr>
</tbody>
</table>
The **stroke thickness** should be approximately 0.1 times the character height.

The **clear space between characters** should be about 0.7 mm for 2.5 mm **capitals** and other sizes in proportion.

The **spaces between lines** of lettering should be consistent and preferably **not less than half the character height**. In the case of titles, this spacing may have to be reduced.

**All notes** should be placed so that they may be read from the same **direction** as the format of the drawing.

There are cases, for example when a long **vertical object** is presented, where it may be **necessary to turn the drawing sheet through 90° in the clockwise direction**, in effect, to position the note. The note is then read from the right hand side of the drawing sheet.
The shape and form of an acceptable range of letters and numbers is illustrated in Fig. 5.6.
Drawing modifications

Revisions and modifications are regularly made to update a product, due for example, to changes in materials, individual components, manufacturing techniques, operating experience.

It is vital that a note is given on the drawing describing briefly the reason for change and the date that modifications were made.

If a component drawing is substantially altered, it would be completely redrawn and given an entirely new number.
The **following suggestions** are offered to assist in the preservation of drawings when erasures have to be made.

1 **Use soft erasers** with much care. Line removal without damaging the drawing surface is essential.

2 An **erasing shield will protect areas adjacent** to modifications.

3 **Thoroughly erase the lines**, as a ghost effect may be observed with incomplete erasures when prints are made.
Care and storage of original drawings

Drawings may be used and reused many times and **minimum wear and tear is essential**

The following simple **rules will assist in keeping drawings in favorable conservation condition.**

1 **Never fold** drawings.

2 Apart from the period when the drawing is being prepared or modified, it is good policy to **refer to prints** at other times when the drawing is required for information purposes.

3 The drawing board **should be covered outside normal office hours**, to avoid the collection of dust and dirt.
4 Too many drawings **should not be crowded in a filing drawer**. Most drawing surfaces, paper or plastics, are reasonably heavy and damage results from careless manipulation in and out of drawers.

5 **Do not roll drawings tightly** since they may not lie flat during microfilming.

6 **Do not use staples or drawing pins**. Tape and drawing clips are freely available.

7 When using drawings, try to **use a large reference table**. **Lift the drawings rather than slide them**, to avoid smudging and wear.

8 Drawings should be stored under **conditions of normal heat and humidity**, about 21°C and 40 to 60% relative humidity