

Fundamentals of Drafting - Orthographic Projection with Hidden Details

Objectives:



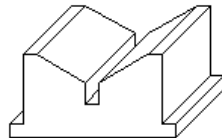
1. To extend the principle of orthographic projection for hidden details.
2. To illustrate the representation of hidden details in engineering drawings.
3. To identify the precedence of hidden lines over other types of lines.
4. To draw views in orthographic projection with hidden details.

Representation of invisible outlines

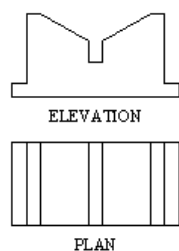
Dashed narrow lines are used on an external view (i.e. elevation, plan, end view, etc.) of an object to represent surfaces, intersections and limits invisible at the point from which the view is taken.

Example:

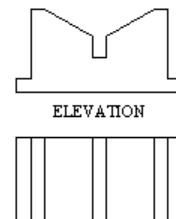
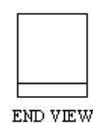
The object



Presentation in First Angle Orthographic Projection



(without hidden details)

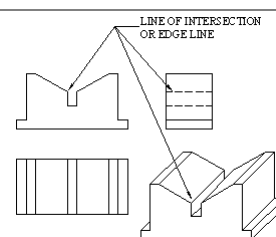


(with hidden details)

In the example, there are two dashed narrow lines in the end view. They are:

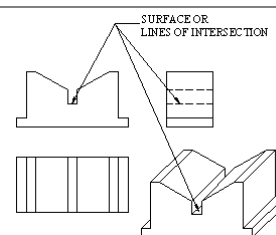
The upper dashed narrow line

represents the line of intersection or edge line



The lower dashed narrow line

represents the surface or lines of intersection

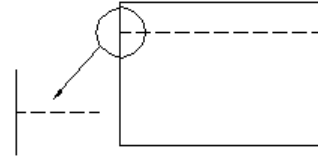


Drawing dashed narrow lines

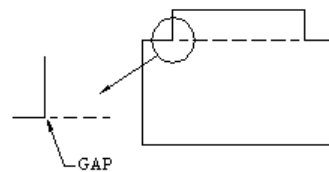
Dashed narrow lines should comprise short dashes of consistent length and spacing, approximately to the proportion of the drawing size.

When drawing hidden details using dashed narrow lines, the following techniques should be noted.

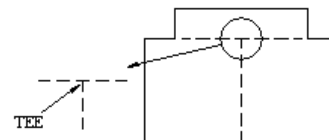
1. Dashed narrow line meets visible outlines.



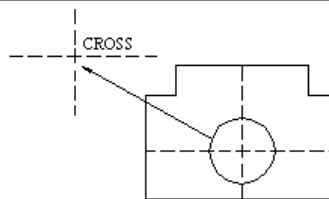
2. Allow a gap when a dashed narrow line continues a visible outline.



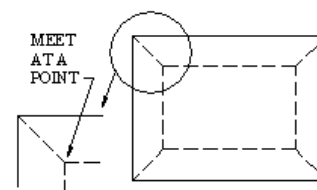
3. Dashed narrow line tees from another short dashed line.



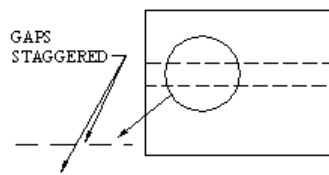
4. Dashed narrow lines cross at a point.



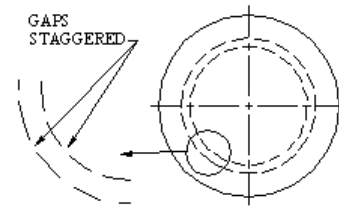
5. Dashed narrow lines meet at a point.



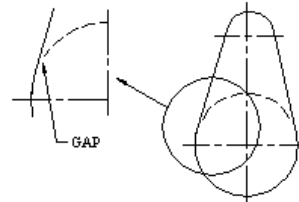
6. Allow a gap staggered for adjacent parallel dashed narrow lines.



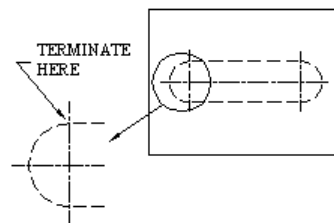
7. Allow a gap staggered for adjacent concentric dashed narrow circles.



8. Allow a gap when a dashed narrow arc continues a visible arc.



9. Dashed narrow arcs terminate at tangent points.



Precedence of dashed narrow lines

When dashed narrow lines and other types of line coincide, follow the order of priority:

- i) visible outlines
- ii) **hidden outlines**
- iii) cutting planes
- iv) centre lines
- v) outlines and edges of adjacent parts
- vi) projection lines

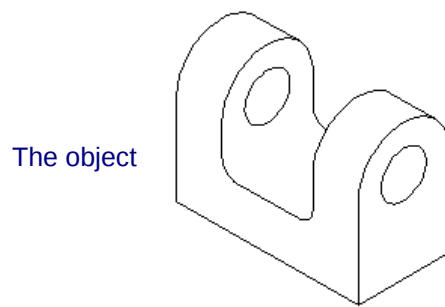
Omission of dashed narrow lines

Although it is a common practice for a draughtsman to omit hidden lines when their use tends to further confuse an overburdened view or when the graphical representation of a feature is sufficiently clear in another view, it is not advisable for students to do so.

The following drawings / views, however, generally require no hidden details to be added.

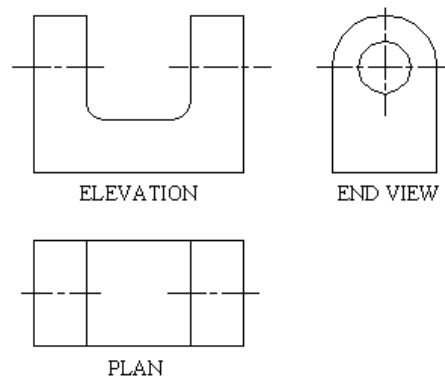
- i) **sectional views**
- ii) **pictorial views, i.e. isometric drawing, oblique projection, etc.**
- iii) **arrangement drawing**

Worked example

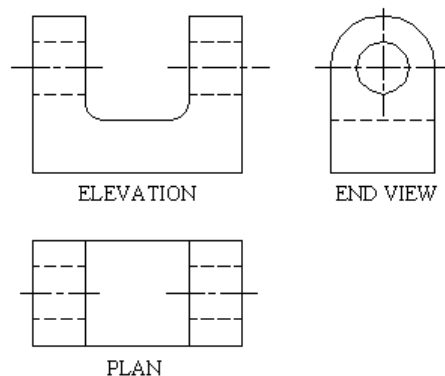


Presentation in First Angle Orthographic Projection

i) without hidden details

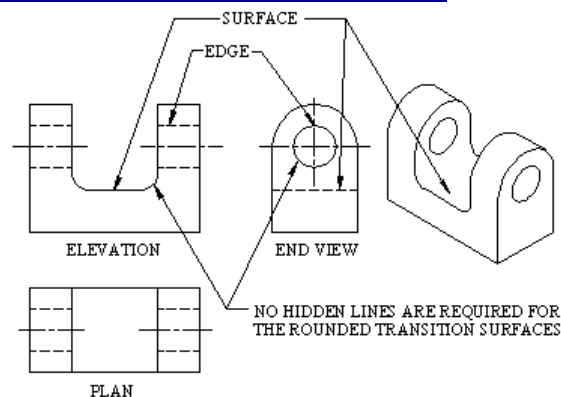


ii) with hidden details



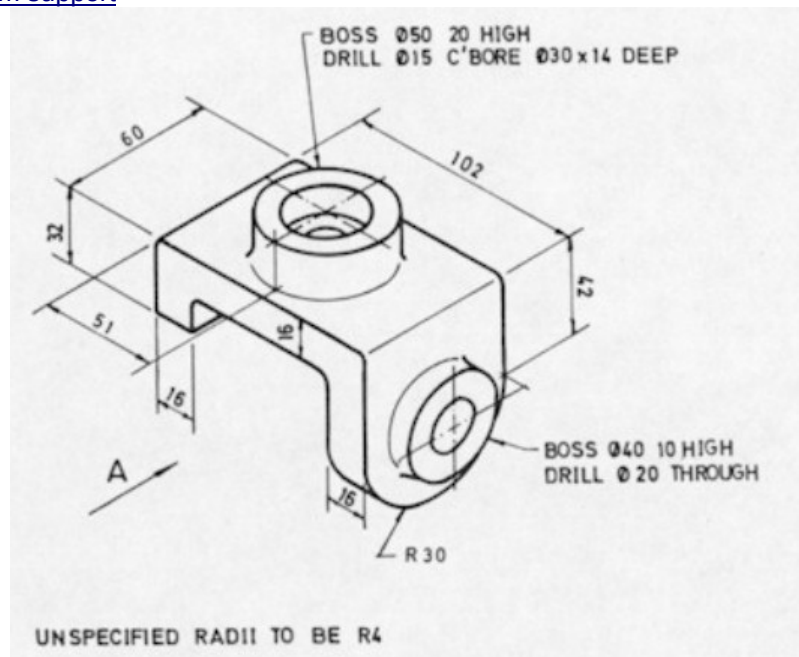
Special notes:

- i) Unless otherwise instructed, students should include all hidden details in all views.
- ii) Hidden line should not be added to a rounded transition.



Assignment 2

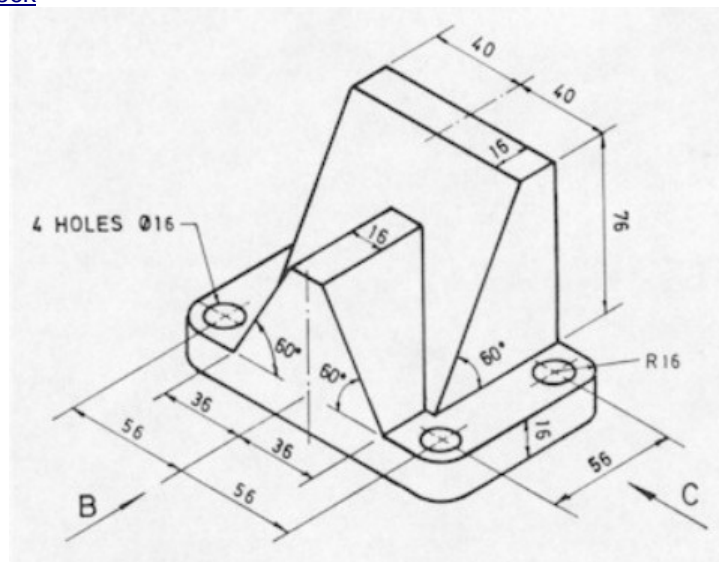
No. 1 Fulcrum support



Draw the following views full size in Third Angle Orthographic Projection.

- an elevation on A
- a plan projected from the elevation
- both end views

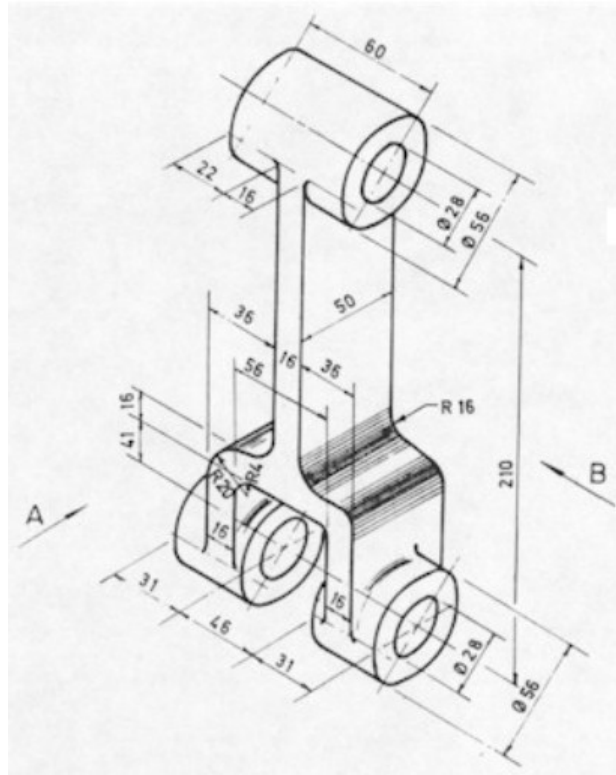
No. 2 Bolster block



Draw the following views full size in First Angle Orthographic Projection.

- an elevation on B
- a plan projected from the elevation
- an end view on C

No. 3 Forked lever



Draw the following views half full size in Third Angle Orthographic Projection.

- i) an elevation on A
- ii) an end view on B
- iii) a plan

You may download or print the Assignment 2 work sheet from the "ACTION MENU".

(Follow your tutor's instruction to attempt any 2 questions out of the 3 given and draw the views as required.)