



PLTW Engineering

12/Detail Drawings for Production

April 22, 2020



12/EDD

Lesson: 4/22/2020

Objective/Learning Target: Students will be able to identify the seven views of a detail drawing, list important components of a detail drawing, and list the paper sizes for detail drawings.



Why are detail drawings important?

As testing wraps up and you decide what refinements need to be made to your prototype before mass production, you will need to create detail drawings so that your idea can be fully communicated not only for material and schedule logging but also for patent filings, which we will look at in a later lesson.



Why are detail drawings important?

An idea has value only if it can be effectively communicated.

For engineers to imagine, create and design the products, devices and systems that have lasting impact on society, they must know how to present and archive their designs in a way that is understood by all engineers - regardless of what language they speak or what country they live in.



Why are detail drawings important?

Given proper detail drawings, manufacturers know exactly how parts are created without the need for additional verbal explanation from engineers.

A detail drawing is self-explanatory, and provides a record or archive of the engineer's exact idea. Well-crafted detail drawings preserve creative work from one generation to the next.



Documents for manufacturing

Engineers do not manufacture their own creative work, but typically communicate their ideas to highly trained machinists and manufacturers, who then construct the various components that make up the designs.

Engineers also must present their designs in a way that is understood by engineers in different countries who may speak different languages.



Documents for archiving information

Engineers also leave a legacy of creativity through their designs. To preserve this technology from one generation to the next, it must be well-documented.

The detail drawing is the main tool used by engineers to communicate their designs to manufacturers and to preserve their work for future generations.



Standards for detail drawings

To share design information, engineers have created uniform standards, protocols and tools. One of these standards is called the ANSI Y14.5, which is a description for how to create a detail drawing.

With engineers all over the world creating detail drawings that may be manufactured far away from where the drawings are being created, it is critical for the ANSI standards to be followed in great detail.



Detail drawings

A detail drawing is a two-dimensional representation of an engineer's design that contains all the information needed to precisely reproduce it.

Detail drawings are especially useful when an engineer wants his or her design manufactured.

Given a proper detail drawing, a manufacturer knows exactly how to create a part without the need for additional verbal explanation from the engineer.

Detail drawings example

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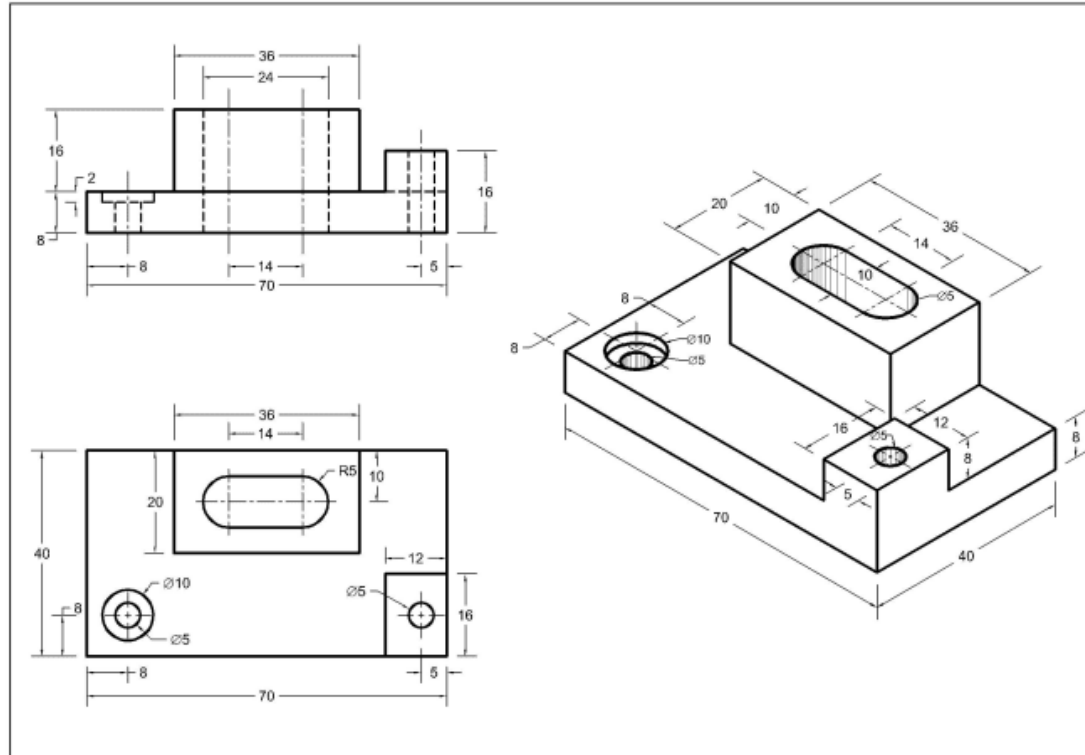
1 DETAIL - STANDED PARTITION
 2 DETAIL - FLURRED OUT WALL
 3 DETAIL - LAMINATED WALL
 4 DETAIL - 2 HOUR WALL
 5 DETAIL - TYPICAL I.M. - DOUBLE UNIT
 6 DETAIL - TYPICAL I.M. - SINGLE UNIT
 7 DETAIL - WOOD FRAME
 8 DETAIL - WOOD TRIMMED

KATHERINE LEE INTERIOR DETAILING	4/28/11 SCALE 3" = 1'-0"	DETAILING ASSIGNMENTS 1 & 3	PARTITIONS & DOORS	A1
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Detail drawings example





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Size and scale of detail drawings

Based on the size of the part on the detail drawing, the paper it is printed on may need to be changed.

The engineer making the detail drawing will manipulate the scale of the drawing.

A drawing for the components that make up a syringe are too small to draw to scale due to feature sizes that are not easily seen unmagnified. An appropriate scale, like $1/10$ inch = 1 inch, will better convey the necessary details, and then an appropriate paper size is chosen.



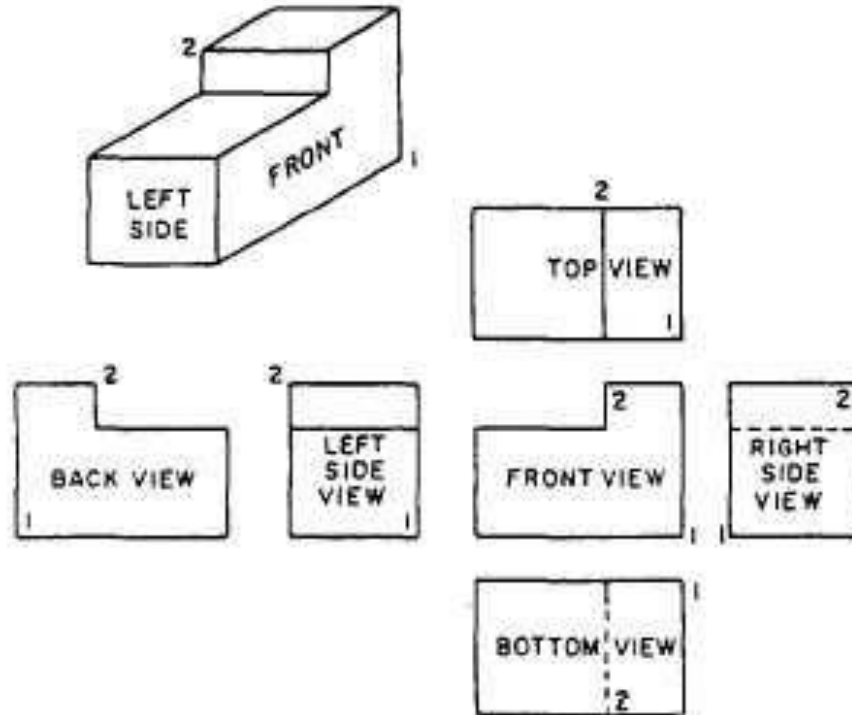
Views on a detail drawing

In a detail drawing, views are included to clearly describe a three-dimensional object through the medium of two-dimensional paper.

The front view is the first view that is chosen and it should be the most descriptive view - meaning the view that shows the most recognizable features of the part.

All other views are based off of the chosen front view. There may need to be up to 7 views to show all features of a part.

Views on a detail drawing





Additional information on a detail drawing

Besides the drawing views themselves, the detail drawing should also include the following information:

- Engineer's name
- Part name
- Material type
- Drawing scale
- Date and/or revision
- All necessary dimensions (width, depth, height, size, etc.)
- All dimension tolerances



Quiz yourself

1. List one reason detail drawings are an important part of product design.
2. List two job professionals other than engineers who can use multi-view drawings.
3. What is the purpose of standards - specifically ANSI Y14.5?
4. What is the maximum number of views on a detail drawing?
5. List 3 pieces of information that should be included on a detail drawing besides the views themselves.



Helpful Links

[Youtube video tutorial for making a detail drawing](#)

[Reference sheet for drawing scales and sheet sizes](#)