

Section 3: CAD systems#

3.1 Choosing CAD Software and Hardware#

This section looks at some of the differences between CAD packages and emphasises the importance of choosing a system that is suitable for the proposed task. Computer hardware and software are both constantly developing and specifications change rapidly. When establishing a CAD system it is important to check that the components are compatible, including those elements that allow models to be viewed on other platforms such as the file format and layer-naming conventions used.

3.1.1 Choosing CAD Software

The most obvious consideration when choosing CAD software is whether it will do everything that you need it to. Different packages have different capabilities and it is not always obvious whether a specific program will meet all the requirements for a given job or how easy it is to use for your purposes. For example:

Will the software accept data input from keyboard, mouse and digitiser?

- Users intending to use CAD for design should look for programs that ease data input using the mouse and the graphical user interface
- CAD users intending to input data points using the keyboard should experiment with programs to make sure that it is easy to enter absolute data points or define points in relation to others
- CAD users intending to enter data using a digitiser require an interface system that accepts input from the digitiser in place of a mouse and permits scanned drawings to be scaled, related and traced. Not all CAD software allows this, especially cheaper packages.

Some CAD packages automate the creation of regular shapes; irregular shapes create more problems. Different CAD software has differing capabilities for two-dimensional, three-dimensional wire-frame, surface and solid modelling. Not all CAD software can be connected to external data tables and this capability is an important consideration if it is intended to link site plans or models to materials, context or artefact data. Users should experiment with inputting typical data to be sure that the proposed system meets their needs and may wish to take advice from a colleague who is familiar with the program and the intended work.

Less popular CAD software may not support the full array of peripheral equipment and users may be restricted to specific graphics cards, plotters, or input devices which in turn may have limited availability or be expensive. With most operating systems, connections to peripheral devices do not normally depend on the CAD program; however, it is important to be certain that proper use is made of data from peripheral devices.

CAD software uses proprietary file formats and these do not necessarily transfer successfully between different programs (see [Section 3.2](#)). Users are recommended to check that the available file formats are appropriate for their needs. For example, drawings from a CAD model are often exported to illustration programs like Adobe Illustrator, Freehand, or CorelDraw where text and other features are added for publication. CAD users should check that the proposed program will be able to export files in appropriate formats and that an appropriate format for deposit with a data archive can be produced.

Those who are planning to use a total station for survey work should check the availability of a program to accept data from a total station and format it appropriately for the proposed CAD system.

Data are often collected from a total station and converted to DXF files which may not transfer successfully into all CAD software.

CAD users should consider the medium- to long-term stability of the manufacturing company and arrangements for support, including the availability of training and instruction manuals for users. Commercial training in CAD can be very expensive and users may wish to consider the availability of alternative options.

Finally, more expensive CAD packages generally offer more facilities than cheaper packages, but these may not be necessary for the intended purpose. Users should check the facilities included against their requirements.

3.1.2 Choosing CAD Hardware

As computer hardware develops rapidly and costs go down, when choosing hardware it is important to check the minimum specification required to run a particular CAD program but then to check whether a higher specification machine is available. Software requirements will generally direct CAD users to PCs rather than Apple Mac computers or those using Unix, Linux or other operating systems. Factors which should be taken into consideration are processing power, RAM and the size of the hard drive. Working with large models (changing points of view, making hidden line drawings, rendering the model, etc.) requires a fast computer although the hardware requirements will be reduced if the model is solely in two dimensions or three-dimensional visualisations are not used. Upgrades to new and improved CAD software may also increase the hardware specification required. Laptops used for work on site should incorporate a good size screen and a large hard drive.

Monitors should be free from distortion and be the largest affordable. Larger screens make it easier to see larger images and to deal with small details.

Plotters produce their output with either pens, an electrostatic charge, or ink jets. Large plotters make it possible to output very large drawings, although bureau services are available if large drawings are rarely needed. Good ink jet or laser printers and colour ink jet plotters can produce excellent drawings in small sizes at modest prices.

Scanners and digitisers vary in size and in terms of the resolution at which they can process an image and it may be desirable to scan an image at a higher resolution if it contains complex detail which is later to be vectorised. In all cases it is important to check that the digitiser will offer the required output and it may be advantageous to hire bureau services rather than purchasing expensive equipment.