

Managing digital records: 5.3

5.3 Managing CAD files

CAD (computer aided design) software is used to develop engineering and technical design documents. Literally hundreds of work hours can go into developing CAD drawings. They are valuable and important work resources but they can also be very difficult to manage. Common problems associated with the management of CAD files include:

- CAD file size
- version control
- useability and accessibility
- maintaining context
- system integration
- managing file storage
- enforcing filing standards.

The following table lists these issues and provides some ideas on how to manage them.

| <i>Issue:</i> | <i>Resolution:</i> |
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| CAD file size | <p>Each CAD file is generally a very large document. Large projects can also generate vast numbers of CAD files, many of which need to be kept for long periods to aid building or product maintenance and for insurance purposes. You need to ensure that you have adequate processing and storage capacity to allow these files to be created and then maintained, often for very long periods.</p> <p>Files created using 3D CAD software are particularly large and complex. If you use 3D tools you need to ensure that you have adequate technological capacities for the use of these tools and the ongoing management of the files they create. You may also want to develop business rules to ensure that only necessary files are created using 3D tools.</p> |
| Version control | <p>Large building projects can generate literally thousands of versions of CAD documents, with changes ranging from miniscule to momentous.</p> <p>It is critical to have good rules and systems in place to assist in your CAD file version control.</p> <p>Version control is important internally, so that staff can easily and accurately access the most recent version of a design and so that time and money are not wasted by one or more staff members inadvertently working on different versions of the same design.</p> <p>Version control is also critical when dealing with clients or customers. If an unapproved version of a design is sent to a client, there is the potential for significant financial</p> |

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| | <p>risk.</p> <p>Strategies you might like to consider for implementing version control include:</p> <ul style="list-style-type: none"> • using strong titling conventions that are rigorously enforced • using records management or other software to control versioning • using automated plan revision history and plan revision management metadata in your software • implementing procedures that specify when a new version of a CAD file needs to be saved • controlling 'parallel revisioning', to ensure that two or more users across different locations cannot edit the same file at the same time. <p>Notes on the face of drawings or on hard copies cannot be relied on for version control. More effective methods of control are required.</p> |
| Useability and accessibility | <p>The useability and accessibility of your CAD files is critically important. Organisations using CAD generally have thousands of CAD files and each individual file can be of critical importance to a building or design project. Strategies to improve the useability and accessibility of your CAD files include:</p> <ul style="list-style-type: none"> • using records management software to store and manage CAD files • using strong titling conventions that are rigorously enforced • deploying powerful search tools • encouraging rigorous version control • converting CAD files in proprietary CAD format to standard formats, such as PDF, TIFF, HTML or JPG – this means they can be accessed by non-CAD users in your organisation and can help to manage their long term accessibility • attaching description fields to CAD files to allow more detailed descriptions to be applied where appropriate <p>CAD file exchange between vendors, architects, engineers and other parties associated with design and construction can be difficult. It can be useful at the project design phase or at contract development to specify file exchange formats, to avoid an unmanageable combination of CDs, emails and other mechanisms being used for the exchange of files and to avoid costly and time consuming file reformatting. IT, project and records staff should generally liaise to determine the most manageable and appropriate formats.</p> |
| System and | Integrating your CAD system with records management |

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| application integration | <p>software or with other business systems can:</p> <ul style="list-style-type: none"> • improve workflows • enable better information access, and • facilitate comprehensive management of your CAD files. <p>However, because it is proprietary, it can be difficult to integrate CAD software with other software or systems. If you do require system integration, ensure you allow an appropriate budget to enable this integration to be developed.</p> <p>Other common integration issues relate to the integration of 2D and 3D tools. If you use both 2D and 3D CAD software, you need to ensure that files can be easily moved backwards and forwards through these applications and that the supporting applications you use for the management of your CAD files have the capacity to manage large and complex 3D files.</p> |
| Maintaining context | <p>CAD files may not make sense in isolation. Sometimes it may be necessary to read related emails, project management reports, site surveys etc in conjunction with CAD files to fully understand the meaning of the CAD file. CAD systems can also be used to output invoices or manufacturing specifications – records that have immediate financial and accountability implications for the organisation. It is important that these records are connected to the CAD files to which they relate.</p> <p>Building connections between related records can be achieved by:</p> <ul style="list-style-type: none"> • creating metadata fields in your CAD management software to list identifiers of related files • implementing records management software to connect and co-locate related files • establishing interfaces where appropriate between financial, records and CAD systems • implementing strict procedures that require the maintenance of all associated correspondence. |
| Managing file storage | <p>CAD files are large and organisations tend to have large numbers of them. Their long term storage can therefore be difficult. Where possible, it is preferable that CAD files are not stored long term on removable storage media but are stored in active systems or in a RAID hard drive array. This is because removable storage media are more easily compromised, easier to lose or overwrite and are not regularly backed up. If removable storage media are used, strict controls must be employed to ensure the security and preservation of both the storage media and the records it contains.</p> |
| Enforcing filing | <p>Standards that establish clear, simple and workable rules for file titling, version control and CAD file management</p> |

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| standards | <p>can provide significant productivity and efficiency dividends.</p> <p>Ways to encourage the adoption of your requirements include:</p> <ul style="list-style-type: none"> • have management strongly support your requirements • make your requirements documents succinct and simple • automate requirements wherever possible • try to configure requirements as close to current work practices as possible • try to establish standards that make work faster and easier. Requirements that slow work practices down will not be implemented • seek user feedback on how to best implement requirements • offer rewards and positive feedback when requirements are effectively implemented.¹ |
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¹ Tips derived from Robert Green, *CAD standards*, Part 5: Enforcement, 8 August 2007, accessible via the CAD Manager column on the Cadalyst website, viewed September 2008, <<http://management.cadalyst.com>>. Other advice in this section draws on issues discussed in numerous editions of Robert Green's *Cadalyst* column.