

CAD and Vector Graphics Procedures

Version 1.134

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1 Purpose of this document

This page is designed to document the current ADS procedures for production of dissemination and preservation copies of CAD and Vector Images. It contains a list of current dissemination/preservation formats and how to migrate files to these formats. For brevity, these two data types have been dealt with in a single document.

For more information, please refer to the:

- G2GP for CAD¹
- And the *Guides to Good Practice for Vector Images*²
- For paper on CAD Migration³

Software available:

- AnyDWG batch converters⁴
- AutoCAD 2014/15/16 available under educational licence.. Versions prior to 2014 SP1 will stamp plotted output with an 'educational version' stamp. This stamp isn't created in later versions but you also won't see a stamp if it exists. Check early files in Trueview 2013 for stamps. Migration in later versions will remove the stamp.
- Autodesk TrueView from Autodesk website. Previous versions (i.e. 2013) available.

2 Formats

¹ http://guides.archaeologydataservice.ac.uk/g2gp/Cad_Toc

² http://guides.archaeologydataservice.ac.uk/g2gp/VectorImg_Toc

³ See Green, K., Niven, K. and Field G. (2016) 'Migrating 2 and 3D Datasets: Preserving AutoCAD at the Archaeology Data Service'. *ISPRS Int. J. Geo-Inf.*, **5(4)**, 44. <https://doi.org/10.3390/ijgi5040044>. Further documentation available in the internal ADS wiki.

⁴ Details available in the internal ADS wiki.

Offered format	Accepted	Preservation	Presentation	Notes
Autodesk .dwg	YES	Autodesk .dwg (2010)	Autodesk .dwg (2010), Autodesk .dxf (2010) and Portable Document Format A .pdf where auxiliary files are included zip	Any linked auxiliary files are taken. Even if the original version is later CAD files should be checked for 3D content and disseminated as 3DPDF if possible.
Autodesk .dxf	YES	Autodesk .dwg (2010)	Autodesk .dwg (2010), Autodesk .dxf (2010) and Portable Document Format A .pdf where auxiliary files are included zip	a/a
Scalable Vector Graphics .svg	YES	Scalable Vector Graphics .svg	Scalable Vector Graphics svg and Portable Document Format A .pdf where auxiliary files are included zip	Fine as is. There may be additional functionality provided by Javascript, if the svg is specifically built to be viewed within a web page, or similar container. The container and svg must be treated as linked files and both preserved and/or presented together. See ADS Data Procedures: HTML (or markup, or whatever it is to be called) for web pages.
Adobe Illustrator .ai	NO	N/A	N/A	Please note as of September 2015 we are not accepting these files in the SIP. ⁵

⁵ For material within accessioned archives the choice of formats should be dictated by the content (raster/vector). Preservation should be as DWG (2010) or TIFF, dissemination should be as DWG or DXF (2010), SVG, PNG, or PDF. Where files have been created as page illustrations a TIFF export of the file will be adequate for preservation, and JPG or PNG suitable for presentation. Ideally the depositor should create these files. If the vector content is significant then the files should be converted to SVG or, where layered, DXF. AI is a proprietary format but is in fact a minor variation of postscript. Change the extension to ps or eps and programmes such as GhostScript can display (at

Coreldraw .cdr	NO	N/A	N/A	a/a
Rhino3D .3dm	NO	N/A	N/A	Rhinoceros CAD file. Fully-functional CAD application producing 3D wire or textured models. Files can be imported into AutoCAD (tested on v.2014, type IMPORT command and select, takes a long time).
Design Web Format .dwf	NO	N/A	N/A	DWF has progressed over the past few years and the latest incarnation can hold 3D data. ⁶
Portable Document Format .pdf	NO	Portable Document Format /A 2 .pdf	Portable Document Format /A 2 .pdf	We can accept this, but it can only preserved in PDF/A 2 form

3 Documentation / Metadata

The following documentation is required for any CAD.

Element	Description
Filename	
Caption	
Description	
Creation date	
Creator	
Copyright Holder	
Software	

least partially) the content. Illustrator files can contain scripts in AppleScript/OSA, JavaScript or VBScript. These scripts are aids to editing the document and hence do not add to the meaning so should be discarded.

⁶ Also the file format is compressed XML (much the same as OpenOffice documents), although it does to have binary elements, and is an open format. Depositors wishing to deposit DWF we would recommend that they deposit the original DWG / DXF rather than an effectively pointless format like this.

Software version	
Convention Documentation	
Convention Name	
Convention Description	
Convention Type	
External filename	

Additional supporting documentation can also be added.

4 Accessioning checks

- Hidden layers within these files. Some layers can be hidden by the depositor but appear again when you migrate the file to a new format. We would currently assume that they were intended for deposition.
- Fonts/text are rendered correctly: should be obvious as software will prompt you to replace fonts
- Examine files for material for which the depositor does not own copyright (specifically OS vector data). Any Vector data from a third party cannot be achieved without permission/licensing of said party. Background Raster data is more complex: we cannot disseminate this content in the normal manner (see below) as we'll effectively be distributing separate files of OS/BGS data. There is a way round this, we are allowed to archive 'flat' files (i.e. pdf) that would be used as figures in a report. We could do this as a last resort, but best course is to raise this with depositor and get them to resolve.
- Auxiliary files should be supplied where appropriate with relative links used within the drawing/file.

Significant properties

The significant properties of vector images and CAD are described in detail in:

- JISC's The Significant Properties of Vector Images⁷
- The Vector Images *Guides to Good Practice*⁸

⁷ Coyne, Mike; Duce, David; Hopgood, Bob; Mallen, George and Stapleton, Mike (2007) *JISC Digital Preservation Programme: Study on the Significant Properties of Vector Images*.

http://www.jisc.ac.uk/media/documents/programmes/preservation/vector_images.pdf

⁸ http://guides.archaeologydataservice.ac.uk/g2gp/VectorImg_3

5 How to convert files

CAD files

Following discussion at the CATS Week (08/2017) it was agreed that files would be preserved in DWG (2010), and that files would be disseminated in DWG (2010), DXF (2010) and PDF. It was agreed we should NOT be creating thumbnail or preview images.

If we have been given a file as both DWG and DXF: MIGRATE THE DWG. We should only be migrating DXF files if they have not been given to us as DWG.

Before converting files

- Check layers in the file and examine contents in invisible layers
- Check for any dependencies (linked files, object libraries, bitmaps, custom line styles; shapes)
- Bind external references (x-refs)⁹

Notes

- If auxiliary files ,including Raster images, exist; ZIP all files together, creating one ZIP of DWG + auxiliary files (raster converted to dissemination format and link reference changed in the DWG) and another ZIP for DXF + auxiliary files (again raster converted and link reference changed accordingly).
- For the PDF conversion use Any DWG to PDF Converter - this saves both the modal and all layouts in a single file
- Auxiliary files such as shx do not need to be converted, just leave alone!
- Raster files need to be converted to their appropriate pres and diss formats and any references to these files in the pres/diss dwgs/dxfs need to be updated accordingly.
- A preservation version should only exist as a DWG; a dissemination version will exist as three 'flavours'.

File-naming

Where possible files should retain the same name as the original (though the file extension may be different). This should be possible if the file being converted is simple (i.e. has no shared linked files).

If the file includes auxiliary files that are shared by more than one drawing then the file will need to be duplicated in original, preservation and dissemination and the process recorded in the CMS (these files should be stored according to the Storage section below. Where files include auxiliary or linked content then these disseminated as a zipped archive with the name of the original drawing AND include the extension of the disseminated drawing e.g.

original_drawing_name_dwg.zip

original_drawing_name_dxf.zip

6 Post-migration checking

- Open the file in AutoCAD and compare with original - are all layers there?

⁹ Use the Help or http://www.mycadsite.com/tutorials/level_4/4-7.htm

- Any broken references to fonts or images?
- Does the PDF have all content?

Storage

Data should be stored in appropriately named folders, as described in the ADS Repository Operations manual¹⁰. Any directory structure from the SIP should be retained in the AIP. In some cases editing/restructuring may be necessary, but such restructuring should be recorded in the Processes section of the CMS.

Otherwise, store data in one of the following directory structure:

```

/preservation
  /{original_structure}
    mycad_drawing.dwg
  /documentation
    mycad_drawing_metadata.csv
    mycad_drawing_conventions.txt

/dissemination
  /{original_structure}
    mycad_drawing.dwg
    mycad_drawing.dxf
    mycad_drawing.pdf
  /documentation
    Mycad_drawing_metadata.csv

/dissemination
  /{original_structure}
    /mycad_drawing_dwg.zip
      mycad_drawing.dwg
      mycad_drawing_embedded_image.jpg
      mycad_drawing_fonts.shx
    /mycad_drawing_dxf.zip
      mycad_drawing.dxf
      mycad_drawing_embedded_image.jpg
      mycad_drawing_fonts.shx
    mycad_drawing.pdf
  /documentation
    mycad_drawing_metadata.csv

```

¹⁰ <http://archaeologydataservice.ac.uk/advice/RepositoryOperations.xhtml>