

Preservation Action Plan for Computer-Aided Design/Digital Design Records/Vector Graphics

National Archives and Records Administration (NARA)

DRAFT 20190801
Template: 201907

Electronic Record or Digital Surrogate Types and Associated Formats

Information that is accessed and updated through software (a designer and viewer) that enables users to design a product. The steps in the design process including creating, modifying, and representing the product in two and three dimensions.

Essential Characteristics of this Record Type

As a general rule, appearance characteristics for this record type are layout, fonts, images, line work, resolution, color and scale. All files need to be internally referenced only.

Appearance

Name	Definition	Function Description
Layout/Scale	Ratio of the distance on a plan, elevation or section to the corresponding distance on the surface the plan represents	
Size	pixel dimensions	
Geometry	Includes angular unit, dimensions, array, axis tripod (XYZ coordinates used to visualize)	Required to create plans and visualizations based on the underlying data.
Text	Font; Orientation: text direction (left to right, angled, vertical, etc.); Color	These characteristics may be essential if the text displayed in CAD records, such as plan legends or display headings, bears meaning through its formatting. The text itself is always essential, but the formatting may also

		be essential when it is evidence of how the maps were used or displayed by the creator.
Color	Hue; Saturation; Brightness (Light Source and Light Intensity for shadowing/shading); Contrast	Even if exact colors cannot be made persistent, distinctions between colors may be essential to understand the attributes and overlays displayed as a result of a user query. All of these characteristics are ways of measuring and making distinctions between colors. The International Color Consortium and Microsoft Windows Image Color Management profiles define standard methods of generating and interpreting numeric values that describe color to ensure color consistency across platforms and devices.

Structure

Name	Definition	Function Description
CAD Structure	<p>HEADER section – General information about the drawing. Each parameter has a variable name and an associated value.</p> <p>CLASSES section – Holds the information for application-defined classes whose instances appear in the BLOCKS, ENTITIES, and OBJECTS sections of the database. Generally does not provide sufficient information to allow interoperability with other programs.</p> <p>TABLES section – This section contains definitions of</p>	Manner in which elements are organized, interrelated, and displayed

	named items.	
--	--------------	--

Behavior

Name	Definition	Function Description
Manipulation Functionality	The ability to examine relationships within a table or between tables.	Once there is a defined schematic, the ability to manipulate exists.
Display	Graph	The only essential behavior for a digital photograph is the ability to visually render it. Other functionality, such as photo enhancement or manipulation, may be available in the user's native software environment but is not inherent to the record.

Display Graph or Plot	Features on one data layer are overlaid onto those of other data layers in order to show areas which have a certain combination of attributes: Single map; Multiple overlays; 3-dimensional display	The ability to graph and plot data is essential to the meaning of GIS map records. If there is no value to the map display, or no ability to plot, then the records could be handled much like databases.
Display Report	Report(s) from data tables	
Manipulation Functionality	Includes but not limited to: Draw; Zoom; Animate (continuous and/or step-by-step progression); Contour; Pan; Enhance (smooth, simplify, merge, dissolve, rotate, invert)	Depending on the software toolkit and data elements available to the user, a host of behaviors are possible that may be essential to the meaning or value of the records. Much CAD functionality concerns manipulation of the display, whether it be a plotted map or reported data from a query. The data elements that allow this functionality are a function of the data type and transfer format. If the records' value lies in how

		the creator manipulated plan attributes and the utilities they used to do so, these behaviors will have to be identified and articulated at appraisal or transfer.
--	--	--

Context

Name	Definition	Function Description
Series	A group of related records that are normally used and filed as a unit because they relate to a similar activity/function. The relationship between records and the series of which they are a part must be preserved.	
Descriptive Metadata	May include but is not limited to: Caption; Subject; Date; Event; Creator; Transaction.	Information contained within the record that refers to the intellectual content of material and aids discovery of such materials. Assumes that all descriptive metadata for a database is contained within the structure and content of the database itself.

Current NARA Transfer Guidance for this Record Type

Preferred:

- **Extensible 3D (X3D)**
 - ISO/IEC 19775-1:2008.

Acceptable:

- **Portable Document Format/Engineering (PDF/E)**
 - ISO 24517-1:2008

- **Product Representation Compact (PRC)**
 - Acrobat 3D PRC Specification (Version 7094):

Current NARA Public Access/Reference Format(s) for this Record Type

This Plan references existing public access file formats for electronic records at NARA, determined with a survey of the available public access formats in the National Archives Catalog. These references do not represent recommended public access formats under NARA policies. They are intended for informational purposes only.

Reference Format: Varies by the original source software and based on the request.

Public Access Format: NARA does not currently provide digital design viewer/access software through the National Archives Catalog, only file downloads. Formats vary by the source software.

Comments and Notes:

- <https://docplayer.net/8758892-The-art-institute-of-chicago-department-of-architecture-collecting-archiving-and-exhibiting-digital-design-data-section-4-looking-forward.html>
- https://ils.unc.edu/digccurr2007/papers/dougherty_paper_4-2.pdf
- https://practicaltechnologyforarchives.org/issue4_cocciolo/
- https://www.bitarchivist.net/docs/walsh_CADArchiving2015_final.pdf

CorelDraw 8.0; 9.0 Compressed Drawing

NARA Format ID: NF00147

Extension(s)

- cdr

Documentation

- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=1254>
- <https://www.coreldraw.com/en/pages/open-cdr-file/>
- <https://www.online-convert.com/file-format/cdr>
- <https://cloudconvert.com/cdr-to-anything>
- <https://en.wikipedia.org/wiki/CoreDRAW>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 34 Numeric Risk Rating
-42 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format: TBD, possibly PDF, TIFF
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: The file format is proprietary with limited open or available documentation. It may not be possible to transform this format into anything other than static image or PDF files.

Preferred Processing and Transformation Tool(s)

The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

- <https://www.online-convert.com/file-format/cdr>

Preferred Viewer/Access Software

- None - NARA does not currently provide viewer/access software through the National Archives Catalog, only file downloads.

Corel CMX Compressed

NARA Format ID: NF00148

Extension(s)

- cmx

Documentation

- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=1254>
- <https://en.wikipedia.org/wiki/CorelDRAW>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 29 Numeric Risk Rating**
-37 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format: TBD, possibly PDF, TIFF
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is proprietary with limited open or available documentation. It may not be possible to transform this format into anything other than static image or PDF files.

Preferred Processing and Transformation Tool(s)

The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

- <https://www.online-convert.com/file-format/cdr>

Preferred Viewer/Access Software

- None - NARA does not currently provide viewer/access software through the National Archives Catalog, only file downloads.

DesignCAD Drawing

NARA Format ID: NF00157

Extension(s)

- dcd
- dc
- dc2
- dc3
- dw2
- dw3

Documentation

- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=470>
- <http://downloads.imsidesign.com/DesignCAD/DesignCAD3DMax2018ReleaseNotes.pdf>
- <https://books.google.com/books?id=mVAEAAAAMBAJ&pg=PA69&lpg=PA69&dq=DesignCAD+Drawing&source=bl&ots=4XHicxfse&sig=ursLyK4MkyLuldXK22FcA7tSrdw&hl=en&sa=X&ved=2ahUKEwik0uStrcXeAhXH0VMKHxbOBnc4ChDoATAlegQIABAB#v=onepage&q=DesignCAD%20Drawing&f=false>
- <https://en.pdf24.org/dw2-2-pdf.html>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 34 Numeric Risk Rating
-39 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format: TBD, possibly PDF
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is proprietary with limited open or available documentation. It may not be possible to transform this format into anything other than static image or PDF files.

Preferred Processing and Transformation Tool(s)

The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

Preferred Viewer/Access Software

The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

Micrografx Draw 2.0

NARA Format ID: NF00250

Extension(s)

- drw

Documentation

- https://community.coreldraw.com/talk/technical_graphics_products/f/older-versions-of-designer/38381/reading-files-from-old-versions-of-micrografx-designer

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 22 Numeric Risk Rating**
-27 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format: TBD
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is proprietary with limited open or available documentation, so migration is recommended, but at the time of this plan, no format options are available that retain fidelity. The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

Preferred Processing and Transformation Tool(s)

- TBD
- Under consideration:
 - FME Desktop or Server

- o Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

Micrografx Draw 3.0

NARA File Format ID: NF00251

Extension(s)

- drw

Documentation

- https://community.coreldraw.com/talk/technical_graphics_products/f/older-versions-of-designer/38381/reading-files-from-old-versions-of-micrografx-designer

Risk and Prioritization Analysis

Low Risk

Moderate Risk

High Risk

22 Numeric Risk Rating

-27 Numeric Prioritization Rating

Proposed Preservation Plan

Retain file format in its existing format.

Transform file to a new format.

Selected Format: TBD

Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.

Procure/develop tools to transform the format to the preferred normalized form.

Provide Additional Information so that the record type remains understandable/usable over time.

Explore Additional Options

Justification: The file format is proprietary with limited open or available documentation, so migration is recommended, but at the time of this plan, no format options are available that retain fidelity. The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

Preferred Processing and Transformation Tool(s)

- TBD
- Under consideration:
 - FME Desktop or Server

- o Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

Micrografx Draw 3.1

NARA File Format ID: NF00249

Extension(s)

- drw

Documentation

- https://community.coreldraw.com/talk/technical_graphics_products/f/older-versions-of-designer/38381/reading-files-from-old-versions-of-micrografx-designer

Risk and Prioritization Analysis

Low Risk

Moderate Risk

High Risk

22 Numeric Risk Rating

-27 Numeric Prioritization Rating

Proposed Preservation Plan

Retain file format in its existing format.

Transform file to a new format.

Selected Format: TBD

Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.

Procure/develop tools to transform the format to the preferred normalized form.

Provide Additional Information so that the record type remains understandable/usable over time.

Explore Additional Options

Justification: The file format is proprietary with limited open or available documentation, so migration is recommended, but at the time of this plan, no format options are available that retain fidelity. The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

Preferred Processing and Transformation Tool(s)

- TBD
- Under consideration:
 - FME Desktop or Server

- o Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

Micrografx Draw 4.0

NARA File Format ID: NF00252

Extension(s)

- dsf
- ds4

Documentation

- https://community.coreldraw.com/talk/technical_graphics_products/f/older-versions-of-designer/38381/reading-files-from-old-versions-of-micrografx-designer

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 22 Numeric Risk Rating**
-27 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format: TBD
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is proprietary with limited open or available documentation, so migration is recommended, but at the time of this plan, no format options are available that retain fidelity. The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

Preferred Processing and Transformation Tool(s)

- TBD
- Under consideration:

- o FME Desktop or Server
- o Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

3D Studio Shapes

NARA Format ID: NF00100

Extension(s)

- 3DS

Documentation

- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=48>
- <https://help.sketchup.com/en/sketchup/importing-and-exporting-3ds-files>
- <https://en.wikipedia.org/wiki/.3ds>
- https://www.okino.com/conv/exp_3ds.htm
- <https://www.safe.com/integrate/3ds-max/>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 22 Numeric Risk Rating
-30 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format: shapefile
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: The file format is proprietary with limited open or available documentation.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

AutoCAD components, including Script, Block Attribute Template, Colour-Dependant Plot Style Table, Named Plot Style Table, Compiled Menu, Custom Dictionary, dbConnect Template Set, Linetype Definition File (Compound)

NARA Format ID:

- **NF00122 (Block Attribute Template)**
- **NF00123 (Colour-Dependant Plot Style Table)**
- **NF00124 (Compiled Menu)**
- **NF00125 (Custom Dictionary)**
- **NF00126 (dbConnect Template)**
- **NF00127 (Linetype Definition File)**
- **NF00128 (Named Plot Style Table)**
- **NF00132 (Script)**

Extension(s):

- scr
- bkl
- dll
- ctb
- stb
- cus
- dbq
- lin

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000445.shtml>
- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=148>
- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=70>

Risk and Prioritization Analysis

Low Risk

Moderate Risk

High Risk

-14 Numeric Risk Rating

-22 Numeric Prioritization Rating

Proposed Preservation Plan

Retain file format in its existing format.

Transform file to a new format.

Selected Format: TBD

Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.

Procure/develop tools to transform the format to the preferred normalized form.

Provide Additional Information so that the record type remains understandable/usable over time.

Explore Additional Options

Justification: The file format is proprietary with limited open or available documentation, so migration is recommended, but at the time of this plan, no format options are available that retain fidelity. The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

Preferred Processing and Transformation Tool(s)

- TBD
- Under consideration:
 - Autodesk DWG TrueView
 - AutoDWG DWGSee DWG Viewer
 - FME Desktop or Server
 - Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

AutoCAD Drawing (2000-2002), (R10), (R11-12), (2004-2005), (2007-2008), (2010/2011/2012), (R14)

NARA Format ID:

- NF00118 (Versions 2000-2002, 2004-2005, 2007-2008, 2010/2011/2012)
- NF00129 (R10)
- NF00130 (R11/12)
- NF00131 (R14)

Extension(s):

- dwg

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000445.shtml>
- https://www.opendesign.com/files/guestdownloads/OpenDesign_Specification_for_.dwg_files.pdf
- <https://www.autodesk.com/products/dwg>

Risk and Prioritization Analysis

Version 2000-2002:

- Low Risk
- Moderate Risk
- High Risk
- 5 Numeric Risk Rating
- 9 Numeric Prioritization Rating

Versions 2004-2005, 2007-2008, R10, R11/12, R14:

- Low Risk
- Moderate Risk
- High Risk
- 1 Numeric Risk Rating
- 6 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format: possibly pdf or kml

- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is proprietary with limited open or available documentation.

Preferred Processing and Transformation Tool(s)

- AutoCAD
- Autodesk DWG TrueView
- AutoDWG DWGSee DWG Viewer
- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- AutoCAD
- Autodesk DWG TrueView
- AutoDWG DWGSee DWG Viewer
- FME Desktop or Server
- Global Mapper

Microstation CAD Drawing (95)

NARA Format ID: NF00333

Extension(s)

- dgn

Documentation

- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=510>
- <https://www.safe.com/fme/formats-matrix/#search=microstat>
- https://www.cadac.com/media/3081/brochure_microstation.pdf

Risk and Prioritization Analysis

- Low Risk
- Moderate Risk
- High Risk
- 3 Numeric Risk Rating
- 11 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
 - Selected Format:** shapefile or pdf
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: Transformation required as the software is no longer supported by the manufacturer or sold in the marketplace.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper
- Open Design Alliance's Teigha viewer

Drawing Interchange File Format 2011-2012

NARA Format ID: NF00163

Extension(s):

- dxf

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000291.shtml>
- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=710>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 6 Numeric Risk Rating**
-2 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format:
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: This is a well-documented, commonly used format.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server

- Global Mapper
- Open Design Alliance's Teigha viewer

Drawing Interchange File Format ASCII 2004/2005/2006

NARA Format ID: NF00164

Extension(s):

- dxf

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000291.shtml>
- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=710>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 6 Numeric Risk Rating**
-2 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format:
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: This is a well-documented, commonly used format.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server

- Global Mapper
- Open Design Alliance's Teigha viewer

Drawing Interchange File Format ASCII Generic

NARA Format ID: NF00165

Extension(s):

- dxf

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000291.shtml>
- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=710>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 6 Numeric Risk Rating**
-2 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format:
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: This is a well-documented, commonly used format.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server

- Global Mapper
- Open Design Alliance's Teigha viewer

Universal 3D

NARA Format ID: NF00431

Extension(s):

- u3d

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000491.shtml>
- <http://www.ecma-international.org/publications/standards/Ecma-363.htm>
- <http://www.ecma-international.org/publications/files/ECMA-ST/ECMA-363%203rd%20edition.pdf>
- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=1501>
- <http://vaastavanand.com/blog/2017/12/30/Introduction-to-U3D-file-format>

Risk and Prioritization Analysis

- Low Risk**
 - Moderate Risk**
 - High Risk**
- 19 Numeric Risk Rating**
19 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format:
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is well documented, and it is commonly accepted as a format throughout the federal government.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server

- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

Portable Document Format/Engineering (PDF/E)

NARA Format ID: NF00373

Extension(s)

- pdf/e

Documentation

- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=1280>
- <https://www.pdf3d.com/about-pdf/e/>
- <https://www.pdfa.org/category/pdf/e/>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 45 Numeric Risk Rating**
43 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format:
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: The file format is well documented, is a preferred preservation format, and it is commonly accepted as a format throughout the federal government.

Preferred Processing and Transformation Tool(s)

- Adobe Acrobat

Preferred Viewer/Access Software

- Adobe Acrobat

- Adobe Acrobat Viewer
- Supported by all web browsers

Product Representation Compact

NARA Format ID: NF00388

Extension(s)

- prc

Documentation

- <https://www.safe.com/integrate/adobe-product-representation-compact-prc/>
- [https://en.wikipedia.org/wiki/PRC_\(file_format\)](https://en.wikipedia.org/wiki/PRC_(file_format))
- https://www.pdf3d.com/pdf3d_blog_prc_format_approved/

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 24 Numeric Risk Rating
24 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format:
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: The file format is well documented, and it is commonly accepted as a format throughout the federal government.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

Scalable Vector Graphics 1.0

NARA Format ID: NF00401

Extension(s)

- **svg**

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000020.shtml>
- <https://www.w3.org/Graphics/SVG/>

Risk and Prioritization Analysis

- Low Risk**
 - Moderate Risk**
 - High Risk**
- 28 Numeric Risk Rating**
28 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format:
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is well documented, and it is commonly accepted as a format throughout the federal government.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server

- Global Mapper

Scalable Vector Graphics 1.1

NARA Format ID: NF00402

Extension(s)

- **svg**

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000020.shtml>
- <https://www.w3.org/TR/SVG11/>
- <https://www.w3.org/Graphics/SVG/>

Risk and Prioritization Analysis

- Low Risk**
 - Moderate Risk**
 - High Risk**
- 28 Numeric Risk Rating**
28 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format:
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is well documented, and it is commonly accepted as a format throughout the federal government.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

Scalable Vector Graphics Tiny 1.2

NARA Format ID: NF00403

Extension(s)

- **svg**

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000020.shtml>
- <https://www.w3.org/Graphics/SVG/>

Risk and Prioritization Analysis

- Low Risk**
 - Moderate Risk**
 - High Risk**
- 32 Numeric Risk Rating**
32 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format:
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is well documented, and it is commonly accepted as a format throughout the federal government.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server

- Global Mapper

Extensible 3D

NARA Format ID: NF00184

Extension(s):

- x3d
- x3dv
- x3db
- x3dz
- x3dbz
- x3dvz

Documentation

- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=1367>
- <http://www.web3d.org/x3d/what-x3d>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 5 Numeric Risk Rating**
37 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain** file format in its existing format.
- Transform** file to a new format.
Selected Format:
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- Explore Additional Options**

Justification: The file format is well documented, is identified as a preservation format, and it is commonly accepted as a format throughout the federal government.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server

- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

Standard for the Exchange of Product Model Data (STEP)

NARA Format ID: NF00409

Extension(s):

- step
- stp
- p21

Documentation

- <http://www.loc.gov/preservation/digital/formats/fdd/fdd000448.shtml>
- <https://www.iso.org/standard/63141.html>
- <http://www.nationalarchives.gov.uk/PRONOM/Format/proFormatSearch.aspx?status=detailReport&id=1497>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 39 Numeric Risk Rating
39 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format:
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: The file format is well documented, is identified as a preservation format, and it is commonly accepted as a format throughout the federal government.

Preferred Processing and Transformation Tool(s)

- FME Desktop or Server
- Global Mapper

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

Initial Graphics Exchange Specification (IGES)

NARA Format ID: NF00212

Extension(s):

- igs
- iges

Documentation

- <http://fileformats.archiveteam.org/wiki/IGES>

Risk and Prioritization Analysis

- Low Risk
- Moderate Risk
- High Risk
- 5 Numeric Risk Rating
- 15 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
 - Selected Format:** TBD, pdf or kml if possible
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: IGES (Initial Graphics Exchange Specification) is a text-based CAD format developed in part by the U.S. military was involved in its development. This format was abandoned in 1998.

Preferred Processing and Transformation Tool(s)

- Unknown. This will require testing.

Preferred Viewer/Access Software

- Unknown

AutoDesk Revit Template

NARA Format ID: NF00133

Extension(s):

- rte

Documentation

- https://en.wikipedia.org/wiki/Autodesk_Revit

Risk and Prioritization Analysis

- Low Risk
- Moderate Risk
- High Risk
- 1 Numeric Risk Rating
- 7 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format: TBD, pdf or kml
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: The file format is proprietary with limited open or available documentation. Revit is still sold and supported in the marketplace, so transformation may be possible.

Preferred Processing and Transformation Tool(s)

- The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace. Autodesk Revit or AutoCAD may work.

Preferred Viewer/Access Software

- FME Desktop or Server
- Global Mapper

Vista Pro

NARA Format ID: NF00436

Extension(s)

- van

Documentation

- <https://en.wikipedia.org/wiki/VistaPro>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 13 Numeric Risk Rating
-21 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format: TBD, pdf or kml
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: The file format is proprietary with limited open or available documentation. Vista Pro is no longer sold or supported in the marketplace. It will require testing to find a transformation tool and identify the feasible target format.

Preferred Processing and Transformation Tool(s)

- The tools to be used to migrate this category of formats is still under review, as there are very limited options available to NARA in the marketplace.

Preferred Viewer/Access Software

- FME Desktop or Server

- Global Mapper

Microsoft Visio

NARA Format ID: NF00299

Extension(s):

- vsd

Documentation

- https://en.wikipedia.org/wiki/Microsoft_Visio

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 9 Numeric Risk Rating
7 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format: pdf
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: The file format is proprietary with limited open or available documentation.

Preferred Processing and Transformation Tool(s)

- Microsoft Visio
- Libre Office

Preferred Viewer/Access Software

- Adobe Acrobat

Microsoft Visio XML

NARA Format ID: NF00300

Extension(s):

- vsdx

Documentation

- https://en.wikipedia.org/wiki/Microsoft_Visio

Risk and Prioritization Analysis

- ✓ **Low Risk**
- Moderate Risk**
- High Risk**
- 37 Numeric Risk Rating**
- 35 Numeric Prioritization Rating**

Proposed Preservation Plan

- Retain** file format in its existing format.
- ✓ **Transform** file to a new format.
Selected Format: pdf
- Procure/develop tools** to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools** to transform the format to the preferred normalized form.
- Provide Additional Information** so that the record type remains understandable/usable over time.
- ✓ **Explore Additional Options**

Justification: The file format is proprietary with limited open or available documentation.

Preferred Processing and Transformation Tool(s)

- Microsoft Visio
- Libre Office

Preferred Viewer/Access Software

- Adobe Acrobat

Open Document Format Graphic

NARA Format ID: NF00347

Extensions:

- odg
- fodg (graphics)

Documentation

- <https://file.org/extension/odg>
- <https://en.wikipedia.org/wiki/OpenDocument>
- [https://en.wikipedia.org/wiki/OpenDocument technical specification](https://en.wikipedia.org/wiki/OpenDocument_technical_specification)
- [https://en.wikipedia.org/wiki/OpenDocument software](https://en.wikipedia.org/wiki/OpenDocument_software)

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 45 Numeric Risk Rating
37 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format:
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: ODG files contain vector graphics that have been saved using XML formatting specifications.

Preferred Processing and Transformation Tool(s)

- List of software can be found here:
https://en.wikipedia.org/wiki/OpenDocument_software

Preferred Viewer/Access Software

- List of software can be found here:
https://en.wikipedia.org/wiki/OpenDocument_software

Lotus 1-2-3 Chart

NARA Format ID: NF00233

Extension(s):

- pic
- wk5

Documentation

- Lotus 1-2-3 Chart is a vector graphic file produced from a Lotus 1-2-3 spreadsheet.
- [ArchiveTeam entry for Lotus 1-2-3](#)
- [Wikipedia entry for Lotus 1-2-3](#)
- [IANA entry for Lotus 1-2-3](#)
- http://fileformats.archiveteam.org/wiki/Lotus_1-2-3_Chart
- <http://sunsite.icm.edu.pl/ftp/pub/coast/msdos/lotus123/picfile.txt>
- <http://www.fileformat.info/format/lotuspic/egff.htm>

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 6 Numeric Risk Rating
-14 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format: TBD, preferably PDF
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: Lotus 1-2-3 Chart is a proprietary vector image format. The specification was never released, but there is an incomplete reverse-engineered specification. This may assist in identifying a tool for conversion.

Preferred Processing and Transformation Tool(s)

- TBD

Preferred Viewer/Access Software

- TBD

Microsoft Enhanced Metafile graphics file

NARA Format ID: NF00258

Extension(s)

- emf

Documentation

- <https://www.paintshoppro.com/en/pages/emf-file/>
- https://en.wikipedia.org/wiki/Windows_Metafile
- https://docs.microsoft.com/en-us/openspecs/windows_protocols/ms-wmf/4813e7fd-52d0-4f42-965f-228c8b7488d2

Risk and Prioritization Analysis

- Low Risk
 - Moderate Risk
 - High Risk
- 14 Numeric Risk Rating
-19 Numeric Prioritization Rating

Proposed Preservation Plan

- Retain file format in its existing format.
- Transform file to a new format.
Selected Format: TBD
- Procure/develop tools to preserve, manage and provide access to records of this type in their existing form.
- Procure/develop tools to transform the format to the preferred normalized form.
- Provide Additional Information so that the record type remains understandable/usable over time.
- Explore Additional Options

Justification: EMF, acronym of “Enhanced MetaFile” is an image format most used in Windows OS for printing purposes. This device independent format was developed as an improved version of Windows Metafile (WMF) format. Windows Metafiles are intended to be portable between applications and may contain both vector graphics and bitmap components. It is unclear if these files are permanent records or represent temp production files.

Preferred Processing and Transformation Tool(s)

- Windows OS

Preferred Viewer/Access Software

- Windows OS