CAD/BIM Taskforce Report, 2017
Aliza Leventhal, Chair

This report outlines the activity of the CAD/BIM Taskforce (currently 10 members) from August 2015 through August 2017. Due to the lapse in providing these reports, this document aims to provide a comprehensive record of the initiatives and accomplishments of this subgroup of the Architectural Records Section. There are two sections, representing the calendar years of activity discussed.

August 2015 - August 2016
Starting shortly after the 2014 SAA Annual Meeting, the CAD/BIM Taskforce established a list of potential areas and topics the group could take on. This list included:

1. Survey repositories with born-digital architectural holdings to determine what file formats institutions have and their current efforts
2. Create a shared resource listing commonly encountered CAD file formats and software that is available for viewing and transforming them
3. Checking PRONOM (and other file format identification tools) to determine which CAD file formats and versions are not currently in the database
4. Gather sample files from group members and submit them to UK National Archives to be added to PRONOM
5. Jointly lobby software vendors for open preservation licenses to software
6. Reach out to non-archivist groups that are also working on CAD preservation (such as LOTAR) to share knowledge
7. Create a shared list of groups and resources to keep an eye on (i.e. environmental monitoring)

From this list two working groups were created take on the work surveying repositories' digital design records, and an advocacy group to explore how archivists and SAA could develop partnerships around digital design records.

Two surveys were administered during the 2015- 2016 year. The first, was developed and administered by Aliza Leventhal in December 2015, to active firm archivists to understand the design software files and holdings within that setting. The second was developed and administered in April 2016 by the survey group, consisting of Emily Vigor, Sam Winn, Gwyneth Thayer, Jody Thompson, Tim Walsh, Chris Marino, and Aliza Leventhal, solicited responses from the Architectural Records Roundtable's listserv. Of the 400+ listserv and received 89 responses from archivists, librarians, educators and practicing architects. The results of this survey provided valuable insight into the trends of software types that have already made their way into the archives, and the concerns respondents have to the long-term access to the born-digital records. These results are were contextualized by the first survey to identify what software were in active firms but had not yet made their way into institutional repositories. The information gathered from this survey gave the CAD/BIM

Taskforce a powerful tool to engage the larger community in conversations at the 2016 SAA Annual Conference meeting around digital design records entering collections.

The advocacy group met monthly through conference calls to discuss the issues that archivists needed engage software vendors, allied organizations, and regulating bodies to strategically address the long-term access and preservation of digital design files.

August 2016 - August 2017

After presenting the survey results at the 2016 Annual Meeting the CAD/BIM Taskforce reviewed our priorities for the next year and decided to focus on two initiatives:

1. Follow up interviews with survey respondents
2. Begin developing a glossary of digital design software

The first effort was undertaken by a team of five: Suzanne Noruschat, Yale University; Molly Tighe, Chatham University; Pamela Casey, Columbia University; Emily Vigor, University of California, Berkeley; and Aliza Leventhal, Sasaki. The project's intention was to provide more qualitative information around the questions asked by the 2016 survey. The results of the 13 interviews were conducted from February-April 2017 were presented by Noruschat and Casey at the Research Forum of SAA's Annual Meeting. Their presentation, *Asks and Answers: Interviews with Archivists on Born-Digital Design Records,* was part of a larger section of the Forum entitled *Architectural Records and Innovation* that indicated that there is an increase in research and interest in architectural and design records.

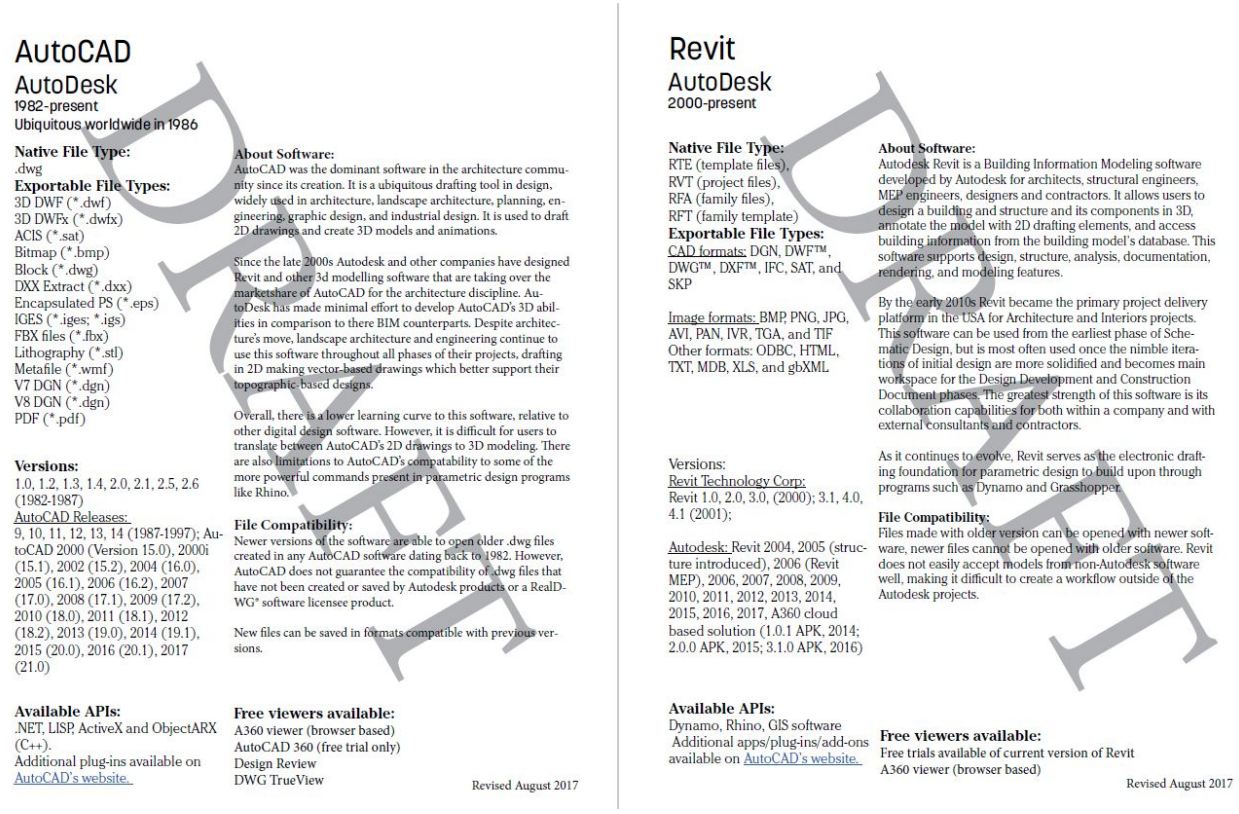
The major takeaways of archivists' concerns and needs from this research are:

1. Need to understand what **donor documentation** we should be gathering
2. Need for **training and understanding of basic competencies** for archivists with design software
3. Concerns about **software preservation** (vs migration) and **accessing legacy proprietary software**
4. Internal and external **advocacy** for these needs and resource allocation
5. How can we develop an understanding of **future research interests**?

The glossary working group was also a small group of volunteers: Tim Walsh, Canadian Centre of Architecture; Chris Marino, University of California, Berkeley; Pamela Casey, Columbia University; Aliza Leventhal, Sasaki; and Leilani Dawson, Wildlife Conservation Society. This group developed a robust list of design software ranging from modeling, scripting, animation, and rendering; as well as the types of information about the history and functionality of those programs that archivists would benefit from knowing about. The group divided up the list of 21 software to research the version releases, functionality updates, intention and uses for each type of software. The early output of this work was briefly shared at the Architectural Record Section's meeting at the 2017 SAA Annual

Meeting, as well as in the meeting minutes over the listserv following that meeting.

The glossary will continue to develop, as it currently consists of three mostly finished reference sheets. The resource is intended to be a dynamic document stored on the Section's SAA-hosted website, and updated as new information or software are identified.



AutoCAD

AutoDesk

1982-present
Ubiquitous worldwide in 1986

Native File Type:
.dwg
Exportable File Types:
3D DWF (*.dwf)
3D DWFx (*.dwfx)
ACIS (*.sat)
Bitmap (*.bmp)
Block (*.dwg)
DXX Extract (*.dxx)
Encapsulated PS (*.eps)
IGES (*.iges; *.igs)
FBX files (*.fbx)
Lithography (*.stl)
Metafile (*.wmf)
V7 DGN (*.dgn)
V8 DGN (*.dgn)
PDF (*.pdf)

Versions:
1.0, 1.2, 1.3, 1.4, 2.0, 2.1, 2.5, 2.6 (1982-1987)
AutoCAD Releases:
9, 10, 11, 12, 13, 14 (1987-1997); AutoCAD 2000 (Version 15.0), 2000i (15.1), 2002 (15.2), 2004 (16.0), 2005 (16.1), 2006 (16.2), 2007 (17.0), 2008 (17.1), 2009 (17.2), 2010 (18.0), 2011 (18.1), 2012 (18.2), 2013 (19.0), 2014 (19.1), 2015 (20.0), 2016 (20.1), 2017 (21.0)

Available APIs:
.NET, LISP, ActiveX and ObjectARX (C++).
Additional plug-ins available on AutoCAD's website.

About Software:
AutoCAD was the dominant software in the architecture community since its creation. It is a ubiquitous drafting tool in design, widely used in architecture, landscape architecture, planning, engineering, graphic design, and industrial design. It is used to draft 2D drawings and create 3D models and animations.

Since the late 2000s Autodesk and other companies have designed Revit and other 3d modelling software that are taking over the marketshare of AutoCAD for the architecture discipline. AutoDesk has made minimal effort to develop AutoCAD's 3D abilities in comparison to there BIM counterparts. Despite architecture's move, landscape architecture and engineering continue to use this software throughout all phases of their projects, drafting in 2D making vector-based drawings which better support their topographic-based designs.

Overall, there is a lower learning curve to this software, relative to other digital design software. However, it is difficult for users to translate between AutoCAD's 2D drawings to 3D modeling. There are also limitations to AutoCAD's compatability to some of the more powerful commands present in parametric design programs like Rhino.

File Compatibility:
Newer versions of the software are able to open older .dwg files created in any AutoCAD software dating back to 1982. However, AutoCAD does not guarantee the compatibility of .dwg files that have not been created or saved by Autodesk products or a RealDWG® software licensee product.

New files can be saved in formats compatible with previous versions.

Free viewers available:
A360 viewer (browser based)
AutoCAD 360 (free trial only)
Design Review
DWG TrueView

Revised August 2017

Revit

AutoDesk

2000-present

Native File Type:
RTE (template files),
RVT (project files),
RFA (family files),
RFT (family template)
Exportable File Types:
CAD formats: DGN, DWF™, DWG™, DXF™, IFC, SAT, and SKP

Image formats: BMP, PNG, JPG, AVI, PAN, IVR, TGA, and TIF
Other formats: ODBC, HTML, TXT, MDB, XLS, and gbXML

Versions:
Revit Technology Corp:
Revit 1.0, 2.0, 3.0, (2000); 3.1, 4.0, 4.1 (2001);

Autodesk: Revit 2004, 2005 (structure introduced), 2006 (Revit MEP), 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, A360 cloud based solution (1.0.1 APK, 2014; 2.0.0 APK, 2015; 3.1.0 APK, 2016)

Available APIs:
Dynamo, Rhino, GIS software
Additional apps/plug-ins/add-ons available on AutoCAD's website.

About Software:
Autodesk Revit is a Building Information Modeling software developed by Autodesk for architects, structural engineers, MEP engineers, designers and contractors. It allows users to design a building and structure and its components in 3D, annotate the model with 2D drafting elements, and access building information from the building model's database. This software supports design, structure, analysis, documentation, rendering, and modeling features.

By the early 2010s Revit became the primary project delivery platform in the USA for Architecture and Interiors projects. This software can be used from the earliest phase of Schematic Design, but is most often used once the nimble iterations of initial design are more solidified and becomes main workspace for the Design Development and Construction Document phases. The greatest strength of this software is its collaboration capabilities for both within a company and with external consultants and contractors.

As it continues to evolve, Revit serves as the electronic drafting foundation for parametric design to build upon through programs such as Dynamo and Grasshopper.

File Compatibility:
Files made with older version can be opened with newer software, newer files cannot be opened with older software. Revit does not easily accept models from non-Autodesk software well, making it difficult to create a workflow outside of the Autodesk projects.

Free viewers available:
Free trials available of current version of Revit
A360 viewer (browser based)

Revised August 2017