



# Smithsonian Institution

## Office of Facilities Engineering and Operations

### CAD Guidelines

April 9, 2009

Edit indicators:



All changes from the previous version of this document, dated August 2, 2006, are highlighted with a vertical line, as shown here.



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## Implementation of CAD

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**Introduction** The Smithsonian Institution (SI) maintains many facilities in the Washington DC area and throughout the United States. Maintenance of CAD (Computer Aided Drafting and Design) drawings for each of these facilities is the responsibility of the Smithsonian Institution's Office of Facilities Engineering and Operations (OFEO), an organization that is responsible for both in-house design efforts and administration of repair, renovation and new construction projects for the museums and other facilities. The purpose of this manual is to define information, procedures, and responsibilities relevant to CAD work completed by A/E consultants in order to assure accurate and consistent work.

OFEO's standards include guidelines for drawing appearance, CAD layering and symbology, and the use of CAD-related software. Each is discussed in a separate section of this document. Refer to the table of contents for specific information on a particular topic.



## Electronic Transmission Methods

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**Introduction** Refer to the project Scope of Work to determine which type of transmission method is required for each project submission.

**FTP Site** Due to the constraints of sending large files via e-mail, OCIO has established an FTP site to use for transferring electronic documents between OFEO and outside consultants.

The FTP site acts like any other folder in Windows Explorer. To access the site, use the following procedures:

- Open two instances of My Documents (also known as Windows Explorer).
- In one instance, navigate to the files on your hard drive where you want to upload from or download into.
- In the other instance of My Documents, copy and paste the URL:  
ftp://ofeo-gis-guest3:sharefiles@ftp.si.edu/ and hit "Enter."
- Drag and drop files from one window to another.

If you have problems accessing the site, ask your network administrator if you have the rights to access FTP sites via your network.

**To prevent unauthorized use of SI files, any files left on the FTP site for more than 48 hours will be deleted . This should give everyone ample time to send and receive daily work. Please make sure you have copies of your files stored on your personal computer or on the secure internal network.**

**E-mail** The size of attachments to e-mails on the Smithsonian network is limited to 3.5 megabytes total. Use of the FTP Site is recommended for larger transmissions.

**Compact Discs** Compact discs should be type CD-R, and include a clear plastic jewel case with a readable spine (i.e. not a thin-type case). Discs must be labeled with the following information:

- Smithsonian Institution logo
- Building Name and Number
- Project name and OFEO project number
- Submission description and date
- A/E name and/or logo
- Disk number and sequence, if applicable (i.e. 1 of 2, 2 of 2)

The jewel case must include a label with the above information.

The jewel case spine must be labeled with:

- Building name and number
- OFEO project number



**Documentation** OFEO Project Documentation form and Deliverables Matrix. These forms are similar in nature to the GSA's deliverable requirements. The Project Documentation Form identifies the personnel responsible for the project, versions of software used in its preparation, and any script files, non-AutoCAD entities (Fonts, Linetypes, Blocks, etc.) used in drawing preparation. The Deliverables Matrix identifies each drawing submitted by name, all external references by name, and the plot scale for each drawing. Refer to Appendix A for examples of the forms.



## Sheet Drawing Submission Standards

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**Introduction** These drawings serve as the official project record. Each sheet represents one and only one plotted drawing.

**File Format** All sheet drawing deliverables shall be submitted in both Adobe Acrobat format (.PDF), and in their native software format. Native format may be either AutoCAD or BIM authoring software.

**PDF Files:** All graphics in PDF files must be measurable/snap-able using markup tools in software such as Adobe Acrobat Professional. All drawing text in PDF files must be searchable. There shall be one PDF file per printed sheet in the set.

**AutoCAD:** Drawing files shall be AutoCAD 2007 format or later . This format is generated by default by the following software:

- AutoCAD 2007, 2008, 2009
- AutoCAD LT 2007, 2008, 2009
- Extended versions of any of the above, such as AutoCAD Architecture or AutoCAD Map3D.

There shall be one AutoCAD file per printed sheet in the set, and X-refs shall be bound.

**BIM Authoring Software:** Files may be Autodesk Revit, Graphisoft ArchiCAD, or other BIM authoring software certified as IFC 2x3 compliant.

Any disciplines not included in the BIM shall be submitted as AutoCAD files per the above.

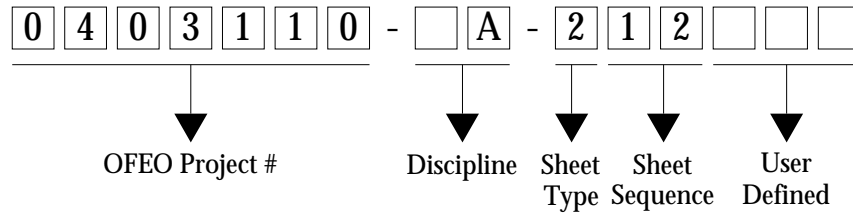
**Sheet File Names** Sheet drawing files represent the finished construction documents for a project, they are designated following sheet naming conventions that correspond to the drawing number for each sheet.

The naming convention is as follows: OFEO project number, discipline (one to two characters), sheet type (one character), and sheet sequence (two characters). The remaining three characters are user defined. A file named:

0403110-A-212.pdf

Represents the twelfth sheet of architectural elevations in a set of drawings for a project # 0403110.

Sheets stored in a BIM are not required to be submitted as separate files. The file naming convention will therefore follow that of background files, described below.



See Appendix B for a list of discipline codes and typical drawing type codes for each discipline.

**Sketches and Supplemental Drawing File Names**

Sketches and supplemental drawings shall be named in a similar manner.

- Sketch files created during design should be named with the two letter designation SK first, discipline code next, then the next consecutive number of a series:

0403110-SKI014.pdf  
 (Fourteenth in a series of Interiors sketches)

- Drawings created as part of an addendum, or supplemental drawings, should be named with the two letter designation SD first, discipline code next, then the sheet number that is referred to, and the revision number:

0403110-SDM102.3.pdf  
 (Supplemental drawing for mechanical sheet 102, revision number 3)

**Page Setups** Pages must be oriented, when displayed on-screen, in the same direction as the hard-copy would be read.

**Scale** All PDF files must be created as if being plotted at full size on the same size paper being used for the contract documents. When printed on the appropriate sized paper, all drawing scales shown in the drawing should be accurate when measured with mechanical drafting tools.

**Layers** Recent versions of Adobe Acrobat allow for the inclusion of layers from AutoCAD files in the PDF document. Use of this feature will NOT be accepted.

**Digital Signatures** TBD



**Lineweights** Acceptable lineweights on drawing deliverables occupy a range from about 0.18 mm to 1.0 mm when plotted full-size.

Only use the highest range of lineweights to indicate major dividing lines such as section-cuts and match lines.

The narrowest lineweights should be used for highly detailed items and column grids.

Within the middle-range, be sure to giving greater weight to new construction when occupying the same plan as existing construction. Give even greater weight to annotations.

On engineering drawings which reuse the partitions, ceiling grids, etc. from the architectural plans, use 50% to 75% shading on the architectural elements, to increase the readability of things like ductwork, piping, etc.

**Standard Cover Sheet & Title Block** The standard Smithsonian title block shall be used on every sheet. The first sheet (cover sheet) in any set of drawings shall be designated the Title / Cover Sheet and will be numbered according to the process outlined in the previous section. It shall contain the OFEO approval block directly above the title block.

All of the title block parameters are block attributes. To edit the attributes, use AutoCAD's DDATTE or AT command. Do not change the text size in the drawing provided (except for the A/E logo and information pertinent to consultants).

Please refer to the Special Conditions for A/E services for logo location and size, as well as the identification code.

All Smithsonian title blocks are available for download at the OFEO website, A/E Center.



**OFEO Sheet Sizes** One of the following sheet sizes should be used for all projects. The preferred standard is Arch D (24 x 36 in). If a project requires an alternate size, approval must be obtained from the COTR. All title blocks and cover sheets are provided in metric and imperial versions. All drawings in a submission shall be produced in a consistent format and drawing size. Sketches should be one of the Letter or Tabloid formats.

Paper Size	Dimensions	File Name
Arch D (Standard)	24 by 36 inches	Cover: ST-CVR_in.dwg Sheet: ST-TTL_in.dwg
	610 by 914 mm	Cover: ST-CVR_mm.dwg Sheet: ST-TTL_mm.dwg
Arch E	36 by 48 inches	Cover: E-CVR_in.dwg Sheet: E-TTL_in.dwg
	914 by 1219 mm	Cover: E-CVR_mm.dwg Sheet: E-TTL_mm.dwg
Arch F (Arch 30)	30 by 42 inches	Cover: F-CVR_in.dwg Sheet: F-TTL_in.dwg
	762 by 1067 mm	Cover: F-CVR_mm.dwg Sheet: F-TTL_mm.dwg
Tabloid	11 by 17 inches	Vertical: 11x17-V_in.dwg Horizontal: 11x17-H_in.dwg
	279 by 432 mm	Vertical: 11x17-V_mm.dwg Horizontal: 11x17-H_mm.dwg
Letter	8½ by 11 inches	Portrait: 8x11-P_in.dwg Landscape: 8x11-L_in.dwg
	216 by 279 mm	Portrait: 8x11-P_mm.dwg Landscape: 8x11-L_mm.dwg

**Text Sizes and Fonts** For the purpose of microfilm storage and reduced document reading, all drawing notes shall be given in simple AutoCAD text fonts or True-Type fonts Arial, Times or Verdana. Fonts that are not standard to AutoCAD or True-Type fonts Arial, Times or Verdana are not acceptable for use in OFEO drawings.

Upper-case lettering shall be used on drawings unless lower-case letters are required to conform to other established standards, equipment nomenclature, or marking.

All construction document main titles shall use **Roman Duplex** (ROMAND) font or True-Type font Arial. All other lettering shall be **Roman Simplex** (ROMANS) font or True-Type fonts Arial, Times or Verdana.

The plotted text strings for main drawing titles shall be no smaller than 6.4 (1/4 inch) mm high. All other lettering shall be a minimum of 3.2 mm (1/8 inch) high with a 2mm (1/16 inch) space between lines of text.

**Symbols** Always use the standard symbols listed in Appendix C. Do not redefine these symbols. No substitutions will be permitted.



## Background Drawing Submission Standards

**Introduction** Background drawings are by definition, re-usable. The requirements in this section are intended to be applied to drawings for new buildings. Areas where choices can be made are left up to the discretion of the A/E. For existing buildings, the Smithsonian will provide drawings at project startup. While editing these SI-supplied background drawings, the A/E must maintain the standards in keeping with the way the drawings were received.

**File Format** All background drawing deliverables shall be submitted in their native software format. These must adhere to the same standards described in the File Format section with the Sheet Drawing Submission Standards described above.

**Drawing Setup** The origin of every file in the background drawing submission shall be at coordinates (0,0,0) located at the lowest left-hand column line intersection that is consistent on each floor of a given building.

Drawings inserted into one another at (0,0,0) shall always accurately represent the vertical alignment of floors in the built reality of the building.

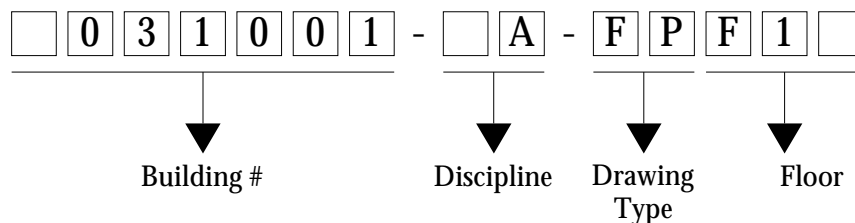
There must be a one-to-one relationship between files and floors.

Areas of a floor that occur at different elevations relative to each other without overlapping should be in the same drawing. Areas that occur as mezzanines, no matter how small, should be relegated to a separate drawing, with the full building column grid included to help with spatial reference.

**File Naming** Each file name has four components: the full building number (minus the hyphen), a one-to-two-character discipline code, a two-character drawing type code and 2 to 3 characters that identify the floor. For example, a drawing named

031001-A-FPF1.dwg

represents the first floor architectural background drawing for National Museum of American History (031) – Main Building (001).





See Appendix B for a list of discipline codes and typical drawing type codes for each discipline.

Floor identification is dependent on what the occupants of a particular building choose to call the various levels, but certain terms appear regularly. The following are examples of abbreviations already in use at the Smithsonian:

Third Floor:	F3
Basement:	B1
Parking Level 2:	P2
Lower Level:	LL
First Floor Mezzanine:	F1M
Penthouse:	PH

If a BIM is submitted, all disciplines designed using BIM must be included in the same model file. The naming convention replaces the discipline, drawing type, and floor indicators with simply the word, "Model." For example:

031001-Model.rvt

All disciplines not designed using BIM must be submitted in AutoCAD as described above.

- \* The following requirements refer only to AutoCAD drawings. In the future, requirements for BIMs will likely involve the use of Smithsonian-provided templates.

**Object Color** Avoid changing the color of an object, all objects shall be created with all properties BYLAYER.

**Drawing Techniques, Accuracy and Consistency** If the CAD drawings are based on well-dimensioned archives, the accuracy shall be +/- 25 mm between major structural elements. Wall thickness shall be to the nearest 10 mm. The tolerance for furniture placement is typically 100 mm. The Smithsonian will specify procedures and accuracy requirements for drawings based on field verification and for new construction drawings.

Do not change the drawing's insertion point, or origin. Temporary changes in the insertion point are permitted as long as the default (0,0) coordinate is reestablished prior to drawing submission. The insertion point is used as the reference point for connecting various drawing sections together, as well as for merging drawings/reference files from various disciplines.

Prior to submission, all final drawings shall be purged of all the un-referenced line types, blocks, layers, views, shapes, and text styles and all CAD drawings shall be saved and submitted with the zoom display set to drawing "*extents*."



**Units** Drawings submitted to OFEO may be metric or imperial, which is determined by the COTR on a project-by-project basis. Metric drawings shall have the units set to decimal, with a precision of 0.0. Block insertion units shall be millimeters. Imperial drawings shall have the units set to architectural, with a precision of 1/64.” Block insertion units shall be inches.

**Blocks** Blocks shall be created for all entities that are used repeatedly on a drawing, such as doors, windows, furniture and other plan elements. Blocks should be created with logical insertion points that are consistent with their placement in a drawing, such as the bottom left corner, center of circle or radius, etc.

Blocks should be inserted on the correct layer (i.e. doors should be inserted on layer A-DOOR-).

Any temporary blocks used in drawing creation should be exploded and purged out of the drawings.

When defining new blocks, they shall be defined on layer "0" with the color and line type parameters set to BYLAYER.

**Lines and Line Types** All entities shall be drawn with the LINE command or POLYLINE command with a "0" thickness and a "0" elevation. Walls are to be drawn with two lines the appropriate distance apart, not as a single polyline with thickness. Line weight will be assigned in plotting.

All lines must properly connect, i.e. corners should meet without overshooting.

Do not duplicate lines. Construction lines should be placed on a separate non-plotting layer.

Always use the AutoCAD default line types found in ACAD.LIN. Any new line types shall be approved by the OFEO Design Manager prior to use.



**Dimensions** Background Drawings, by definition, contain few dimensions. When dimensions are required by the SOW, they shall be associative.

Since AutoCAD 2004, the term “associative” has referred to two different dimension characteristics. The first describes dimensions whose text is provided by AutoCAD automatically. These dimensions can be updated simply by selecting and moving the dimension’s defining points (grips).

The second describes a feature new to AutoCAD 2004 which allows the dimension’s grip-points to be linked directly to other AutoCAD objects, so that if, potentially, a wall position is changed, the dimension will shift automatically without any further user involvement.

The first characteristic is required in all drawings. Dimensions should never be exploded, and text may only be entered manually if the dimension is intended to be an approximate, minimum, or maximum distance.

Use of the second characteristic is left to the A/E’s discretion.

**Layers** Layer names must adhere to the most recent version of the AIA Layer Guidelines, as included in the National CAD Standard.

Building elements must be placed on the correct layers. Do not repeat similar information among different layers.

Do not store information on Layer "0."



## Standard Base Plans

- \* The following requirements refer only to AutoCAD drawings. In the future, requirements for BIMs will likely involve the use of Smithsonian-provided templates.

**Introduction** OFEO maintains drawings that are basically a subset of the Architectural Base Plans, with standardized Layer Naming, Contents of the layers, and Graphics that depict the content. The Standard Base Plans describe the configuration of the facility inventory, and provide a single foundation for the wide range of work on facilities:

- Planning/Design activities, including defining Existing Conditions
- Operations, Maintenance, Security, etc.
- As-Built Drawings
- Display of database information on drawings.

For this reason, the following requirements will be enforced with particular stringency for all new and existing drawings that fall within the category of Standard Base Plans.

**Layers** The following charts list the layers for site plans and floor plans that are considered the Standard Base Plans. Only these layers are required to meet the specifications of this section

Site Plan Layers	Description	Linetype	Color
C-BLDG-OTLN	Building Footprints	Continuous	W/7
C-PKNG-OTLN	Parking Lots	Continuous	C/4
C-PKNG-CURB	Parking Curbs and Gutters	Continuous	G/3
C-PROP-LINE	Property Lines (check Benchmarks)	Continuous	Y/2
C-ROAD-OTLN	Roads	Continuous	C/4
C-ROAD-CURB	Curbs	Continuous	M/6
L-PLNT-TREE	Trees	Continuous	83
L-PLNT-GRND	Ground Covers & Vines	Continuous	82
L-PLNT-BEDS	Landscaping Beds	Continuous	M/6
L-PLNT-BUSH	Bushes and Shrubs	Continuous	83
L-PLNT-TURF	Lawn Areas	Continuous	23
L-SITE-BRDG	Bridges	Continuous	22
L-SITE-EWAT	Water features	Continuous	162
L-SITE-FENC	Fencing	Continuous	Y/2
L-SITE-DECK	Decks	Continuous	232
L-SITE-POOL	Pools & Spas	Continuous	162
L-SITE-ROCK	Boulders and cobble	Continuous	R/1
L-SITE-RTWL	Retaining Walls	Continuous	C/4
L-SITE-SPRT	Sports Fields	Continuous	Y/2
L-SITE-WALK	Walks & Steps	Continuous	R/1



Base Plan Layers	Description	Linetype	Color
A-AREA-IDEN	Room Numbers	Continuous	Y/2
A-DOOR-FULL	Full-height doors	Continuous	G/3
A-DOOR-PRHT	Partial-height doors	Continuous	M/6
A-FLOR-EVTR	Elevators, wheelchair lifts	Continuous	Y/2
A-FLOR-LEVL	Floor level changes, shafts, ramps	Continuous	M/6
A-FLOR-OVHD	Overhead items	ACAD_ISO02W100	Gr/8
A-FLOR-SPCL	Architectural specialties (e.g. toilet room accessories, display cases)	Continuous	G/3
A-FLOR-STRS	Stairs, escalators	Continuous	Y/2
A-FLOR-TPTN	Toilet room partitions	Continuous	R/1
A-GLAZ-PRHT	Window glazing	Continuous	R/1
A-GLAZ-SILL	Window sills	Continuous	B/5
A-ROOF-WALL	Parapet walls (for reference on partial floors)	Continuous	Y/2
A-WALL-CWMG	Curtain wall mullions and glass	Continuous	R/1
A-WALL-FULL-EXTR	Exterior Walls	Continuous	Y/2
A-WALL-FULL-INTR	Full-height Interior Walls	Continuous	G/3
A-WALL-MOVE	Movable partitions	Continuous	B/5
A-WALL-PRHT	Partial-height walls	Continuous	R/1
S-COLS-PRIM	Primary columns	Continuous	M/6
S-COLS-SCND	Secondary columns	Continuous	Y/2
A-AREA-LINE	Lines defining room areas that are not walls	Continuous	C/4
A-FLOR-FIXT	Plumbing Fixtures	Continuous	201
A-FLOR-HRAL	Handrails	Continuous	R/1
A-FLOR-WDWK	Built-in cabinets and counters	Continuous	G/3
A-WALL-HEAD	Door headers	Continuous	R/1
S-GRID-HORZ	Horizontal column grid lines	ACAD_ISO08W100	B/5
S-GRID-IDEN	Column identifiers	Continuous	R/1
S-GRID-VERT	Vertical column grid lines	ACAD_ISO08W100	B/5



Appendix A: Project and Drawing Documentation Report and Deliverables Matrix

Below are representations of typical Drawing Documentation Report and Deliverables Matrix that would accompany a required electronic deliverable.

<b>PROJECT NAME - PROJECT LOCATION</b>	<b>XXXX</b>
<b>PROJECT AND DRAWING DOCUMENTATION REPORT</b>	<b>BUILDING NO</b>

Building Name:	xxxxx	Smithsonian COTR:	xxxx
Building Address:	xxxxx	Smithsonian COTR Phone:	xxxx

A/E Name:	xxxxx	CAD software/version:	xxxx
A/E Address:	xxxxx	Third party software/version*:	xxxx
Work Order No.:	xxxxx	Virus scanning software/version:	xxxx
A/E Contact:	xxxxx		
A/E Contact Phon	xxxxx		

<b>SCRIPT FILES</b>	<b>NON AUTOCAD ENTITIES*</b>
File name	Fonts
Description	xxxx
xxxx	Linetypes
xxxx	Blocks
xxxx	Other
xxxx	xxxx

\* Must be pre-approved in writing by the SI COTR

*The undersigned certifies the following:*

\_\_\_\_\_ All documents comply with OFEO CAD Standards  
 \_\_\_\_\_ All electronic files have been scanned, and are virus free

**Name** \_\_\_\_\_

**Title** \_\_\_\_\_

**Signature** \_\_\_\_\_

**Date** \_\_\_\_\_

*Form created 6/19/01*



PROJECT NAME - PROJECT LOCATION

XXXX

DELIVERABLES MATRIX

BUILDING NO

Building Name: xxxxx  
Building Address: xxxxx

Smithsonian COTR: xxxxx  
Smithsonian COTR Phone: xxxxx

A/E name: xxxxx  
Work order no.: xxxxx  
A/E contact: xxxxx  
A/E contact phone: xxxxx

Sheet Size: xxxxx  
File Format: xxxxx  
No of Files: xxxxx  
Total File Volume: xxxxx  
Date of Submission: xxxxx

SHEET	NO/ Total No.	SHEET TITLE	FILE NAME	XREFS FILE NAMES	PLOT SCALE	SUBJECT
G-001	1/22	COVER SHEET	G-001.dwg		1=1	Plot Sheet
				G-SP.dwg		Vicinity Plan
G-002	2/22	SYMBOLS & ABBREVIATIONS	G-002.dwg		1=1	Plot Sheet
A-101	3/22	EAST ENTRY REMODEL PLAN	A-101.dwg		1=1	Plot Sheet
				A-FP01.dwg		1st Floor plan & demo plan
				A-DT014a.dwg		1/4" Drawings
A-501	4/22	DETAILS	A-501.dwg		1=1	Plot Sheet
				A-DT034a.dwg		3/4" Details
				A-DT112a.dwg		1 1/2" Details
				A-DT300a.dwg		3" Details
A-502	5/22	DETAILS	A-502.dwg		1=1	Plot Sheet
				A-DT014b.dwg		1/4" Details
				A-DT112b.dwg		1 1/2" Details
L-101	6/22	EXISTING SITE CONDITIONS	L-101.dwg		1=1	Plot Sheet
				L-SP.dwg		Exist. Site Information
				L-SH.dwg		Landscape Legend
				G-SH.dwg		Detail Box Background
				C-UPsan.dwg		San. Sewer Plan
				C-UPssw.dwg		Storm Sewer Plan
				C-UPwat.dwg		Water Utility Plan
L-102	7/22	SITE DEMOLITION	L-102.dwg		1=1	Plot Sheet
				L-SP.dwg		Exist. Site Information
				L-DP.dwg		Site Demolition plan
				G-SH.dwg		Detail Box Background
				L-SPa.dwg		Limits of Construction Plan
				L-SHa.dwg		Landscape Notes



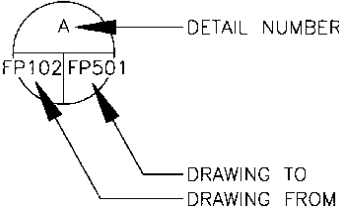
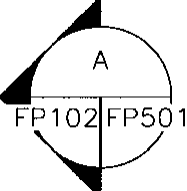
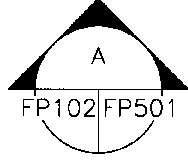
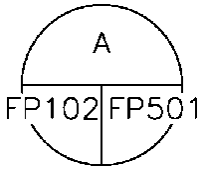
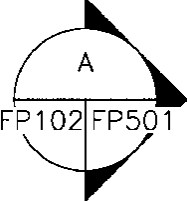
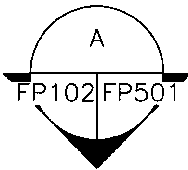
## Appendix B: Discipline Codes for File Naming Conventions

<p><b>DISCIPLINE CODES</b> (for both model and sheet files)</p> <p>A Architectural B Geotechnical C Civil E Electrical F Fire Protection G General H Hazardous Materials I Interiors L Landscape M Mechanical O Operations P Plumbing Q Equipment R Resource S Structural T Telecommunications U Utilities V Survey/Mapping W Civil Works X Other Disciplines Z Contractor/Shop Drawings</p> <p><b>DISCIPLINE CODES</b> (for both model and sheet files-- Smithsonian only)</p> <p>AA Accessibility EV Elevator EX Exhibits GR Graphics HP Historic Preservation SC Security SS Special Systems</p>	<p><b>SHEET TYPE DESIGNATORS</b> (for sheet files only)</p> <p>0 General (Symbols, notes, etc.) 1 Plans 2 Elevations 3 Sections 4 Large Scale (plans, elevations, etc.) 5 Details 6 Schedules and Diagrams 7 User Defined 8 User Defined 9 3D Views</p> <p><b>DRAWING TYPE CODES</b> (for model files, specific to all disciplines)</p> <p>FP Floor Plan DP Demolition Plan SP Site Plan QP Equipment Plan XP Existing Plan RO Roof Plan EL Elevation SC Section DT Detail SH Schedule 3D Isometric/3D DG Diagrams</p>	<p><b>DRAWING TYPE CODES</b> (discipline specific)</p> <p><b>General</b> BS Border Sheet KP Key Plan</p> <p><b>Architectural/Interiors</b> EP Enlarged Plan CP Ceiling Plan RP Furniture Plan NP Finish Plans</p> <p><b>Civil</b> EP Environmental Plan GP Grading Plan RP Road/Topographic Plan SV Survey UP Utility Plan</p> <p><b>Structural</b> FP Framing Plan NP Foundation Plan</p> <p><b>Fire Protection</b> VP Evacuation Plan KP Sprinkler Plan</p> <p><b>Mechanical</b> CP Control Plan HP HVAC Ductwork Plan PP Piping Plan</p> <p><b>Plumbing</b> PP Plumbing Plan</p> <p><b>Electrical</b> CP Communication GP Grounding LP Lighting PP Power</p> <p><b>Telecommunications</b> DP Data TP Telephone</p>
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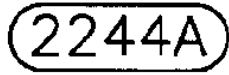
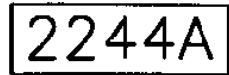


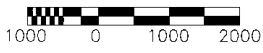
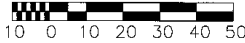

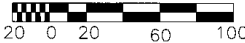


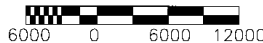
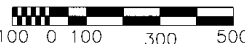




### Appendix C: Required Symbols

The following symbols are available from OFEO Website – A/E Center.

<p><b>Section Mark Blocks</b></p> 	<p><b>Block Name: SEC-L</b>  <b>Insertion Point: Center of Circle</b>  <b>Scale 1:1</b></p> 	<p><b>Block Name: SEC-T</b>  <b>Insertion Point: Center of Circle</b>  <b>Scale 1:1</b></p> 
<p><b>Block Name: SE</b>  <b>Insertion Point: Center of Circle</b>  <b>Scale 1:1</b></p> 	<p><b>Block Name: SEC-R</b>  <b>Insertion Point: Center of Circle</b>  <b>Scale 1:1</b></p> 	<p><b>Block Name: SEC-B</b>  <b>Insertion Point: Center of Circle</b>  <b>Scale 1:1</b></p> 



<p><b>General Notes Call Out</b> Block Name: <b>GNOTEN</b> Insertion Point: <b>Center</b></p> 	<p><b>Window Call Out</b> Block Name: <b>WINDN</b> Insertion Point: <b>Center</b></p> 	<p><b>Wall Type Tag</b> Block Name: <b>WALL-T</b> Insertion Point: <b>Center</b></p> 	
<p><b>North Arrow</b> Block Name: <b>NARROW</b> Insertion Point: <b>Center</b></p> 	<p><b>Revision Call Out</b> Block Name: <b>REV</b> Insertion Point: <b>Center</b></p> 	<p><b>Door Number Tag</b> Block Name: <b>DOORN</b> Insertion Point: <b>Center</b></p>  <p><b>Room Number Tag</b> Block Name: <b>ROOMN</b> Insertion Point: <b>Center</b></p> 	
<p><b>Drawing Title</b> Block Name: <b>PLAN-T</b> Insertion Point: <b>Center</b></p>	 <p style="text-align: right;"><b>FLOOR PLAN</b> SCALE = 1:100</p>		
<p><b>Detail Title</b> Block Name: <b>DETAIL-T</b> Insertion Point: <b>Center</b></p>	 <p style="text-align: right;"><b>DETAIL</b> SCALE = 1:5</p>		
<p><b>DRAWING SCALES</b></p>	<p><b>Scale 1:50</b> <b>GS50.DWG</b></p>		
<p><b>Scale 1:1</b> <b>GS1.DWG</b></p>		<p><b>Scale 1:100</b> <b>GS100.DWG</b></p>	
<p><b>Scale 1:2</b> <b>GS2.DWG</b></p>		<p><b>Scale 1:200</b> <b>GS200.DWG</b></p>	
<p><b>Scale 1:5</b> <b>GS5.DWG</b></p>		<p><b>Scale 1:300</b> <b>GS300.DWG</b></p>	
<p><b>Scale 1:10</b> <b>GS10.DWG</b></p>		<p><b>Scale 1:500</b> <b>GS500.DWG</b></p>	
<p><b>Scale 1:20</b> <b>GS20.DWG</b></p>		<p><b>Scale 1:1000</b> <b>GS1000.DWG</b></p>	