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Chapter 23 - ARCHITECTURAL STANDARDS

CADD Production Criteria Handbook

23.1 GENERAL

Architectural plans consist of all sheets pertaining to Architectural (Building) design, and their component plans. These plans may be comprised of any/all of:

- General Plans
- Hazard Material Plans
- Survey Plans (Follow Survey CADD Standards)
- Geotechnical Plans (Follow Geotechnical CADD Standards)
- Civil Plans (Follow Roadway CADD Standards)
- Landscape Plans (Follow Landscape CADD Standards)
- Structural Plans
- Architectural Plans
- Interior Plans
- Fire Protection Plans
- Plumbing Plans
- Mechanical Plans
- Electrical Plans

This example plan set represents a project where the building is the focal point of the project. Architectural (often referred to as “Building”) projects within the right of way typically do not include survey, civil, geotechnical, or landscape plans. These disciplines are normally included in the Roadway Plans. However, when present in the Architectural Plans, the Computer Aided Design and Drafting (CADD) standards of the appropriate discipline shall be used.

Bascule Bridge Control House architectural plans are to be prepared using the Structures CADD Standards.

23.2 ADOPTED CADD FILE FORMAT

The Florida Department of Transportation (FDOT) has adopted AutoCAD as the standard CADD format for Architectural projects. All CADD files for Architectural plan sets, including those disciplines within the building (i.e. plumbing, mechanical, electrical and structural) shall be submitted in AutoCAD (dwg) format. Plans outside the building envelope shall follow the standard CADD format, generally MicroStation (dgn) for their discipline as defined in their respective chapters herein.

23.3 ADOPTED CADD STANDARDS

The Department has adopted the National CAD Standards as the standard format for building projects. This chapter is a synopsis of the National CAD Standards. More information can be found at:

National CAD Standard
National Institute of Building Sciences
1090 Vermont Ave., NW, Suite 700
Washington, D.C. 20005-4905
202-289-1092
Website: <http://www.buildingsmartalliance.org/ncs>

National Cad Standard also includes chapters from the following organizations:

U.S.CADD/GIS Technology Center
US Army Engineer Research and Development Center
Attn: CEERD-ID (S. Spangler)
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

CAD Layer Guidelines
American Institute of Architects (AIA)
1735 New York Ave, NW
Washington, D.C. 20006
Website: www.aia.org

Uniform Drawing System (UDS)
Construction Specifications Institute
601 Madison Street
Alexandria, Va. 22314-1791
800-689-2900
Website: <http://www.csinet.org>

23.4 ARCHITECTURAL PROJECTS

Architectural standards apply to the building and building related disciplines outlined in the following list of project types.

- **Building Projects**
 - Work Program Projects
 - *Rest Areas*
 - *Weigh Stations*
 - Fixed-Capital Outlay (FCO) Projects
 - *Office Buildings*
 - *Construction & Maintenance Facilities*
 - *Other 'Off Right Of Way (ROW)' Facilities*

23.5 DELINEATION BETWEEN ARCHITECTURAL & ENGINEERING PLANS

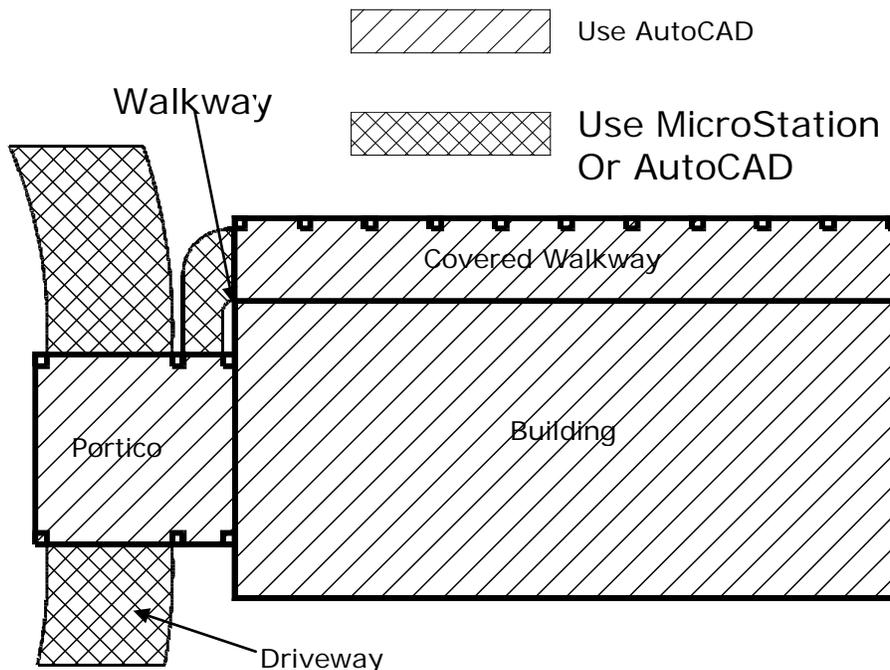
▪ Delineation Line at 'foot print' of Building

- Face of Exterior Wall
- Area enclosed by buildings Columns and/or Walls; i.e. Porticos, Carports, covered Walkways and Covered Patios
- Roof and Building Overhangs

Use AutoCAD *inside* the Delineation Line and MicroStation *outside* the Delineation Line.

Items inside the Delineation Line Includes 'Building-Oriented' Facilities & Equipment that are typically designed by an Architect, including but not limited to, picnic shelters, planters which are part of the building and site furniture in covered areas.

CADD Delineation Example



Items outside the delineation or "foot print" of Building shall be produced and submitted following the CADD standards for their discipline as defined in their respective chapters herein, including but not limited to:

- **Pavement**
 - Driveways, Parking, Sidewalks
- **Landscape Plans**
- **Site Utilities**
 - Electrical, Water, Sanitary Sewer, Storm Sewer, Drainage
- **Site Fencing and Walls**

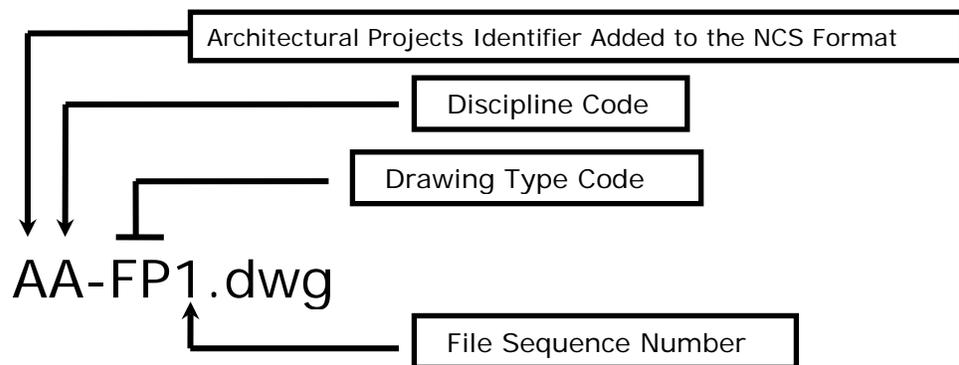
23.6 STANDARD FILE NAMES

23.6.1 Standard Model File Names

Model files are 3D for large plans, elevations or sections that contain the physical building components (walls, doors, water piping, beams...). These files are drawn at full scale. These files are referenced in whole or part into sheet files where text and dimensions are added, then printed.

▪ Naming components

- Architectural Projects Identifier
- Discipline Codes
- Drawing Type Codes (General and Discipline related)
- File Sequence Number



Note Architectural Projects Identifier: A _ _ _ .dwg

Add "A" before Discipline Code as published in National CAD Standards. This distinguishes Building drawings from Roadway and Structures Plans.

Examples: Project Identifiers, Codes and File Sequence Numbers. For more detailed information refer to National CADD Standards.

▪ Architectural Project Identifier

A _ _ _ .dwg Architectural, this differentiates architectural building projects from bridges and roadway projects.

▪ Discipline Code

_ E- _ _ .dwg Electrical
 _ M- _ _ .dwg Mechanical
 _ P- _ _ .dwg Plumbing
 ETC.

▪ Drawing Type Code (general and discipline related)

_ _ -FP _ .dwg Floor Plan
 _ _ -DP _ .dwg Dimension Plan
 _ _ -XP _ .dwg Existing Plan
 ETC.

▪ File Sequence Number

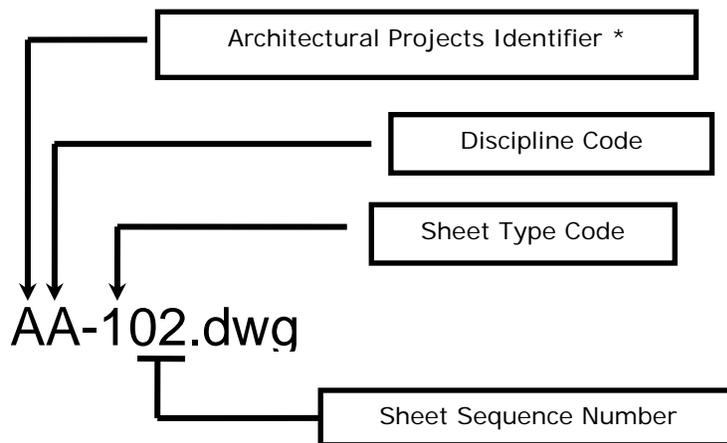
_ _ - 1.dwg 1st drawing file in sequence
 _ _ - 2.dwg 2nd drawing file in sequence
 _ _ - 3.dwg 3rd drawing file in sequence

23.6.2 Standard Sheet File Names

A sheet file is a border sheet with dimensions and/or text added to a portion of a referenced model file. Plotted sheet files make up the plans set.

- **Naming Components**

- Architectural Projects Identifier
- Discipline Code
- Sheet Type Code
- Sheet Sequence Number



* See Section 23.6 for Architectural Projects Identifier details.

Examples: Project Identifiers, Codes and Sheet File Sequence Numbers. For more detailed information refer to National CAD Standards.

- **Architectural Project Identifier**

A _-_-_.dwg Architectural, this differentiates architectural building projects from bridges and roadway projects.

- **Discipline Code**

E--_.dwg Electrical
 M--_.dwg Mechanical
 P--_.dwg Plumbing

- **Drawing Type Code (general and discipline related)**

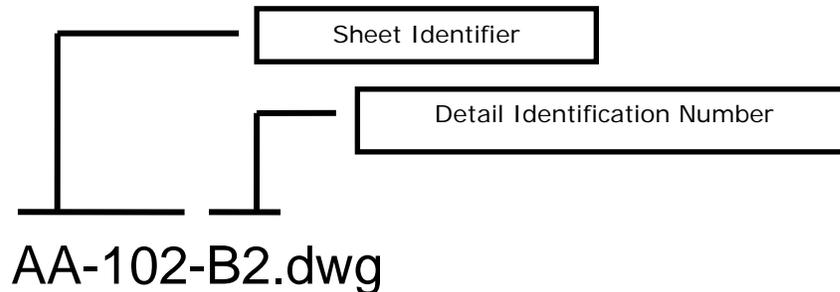
_ -1 _ .dwg Floor Plan
 _ -2 _ .dwg Elevation
 _ -3 _ .dwg Sections

- **File Sequence Number**

_ - 0 1.dwg 1st sheet in sequence
 _ - 0 2.dwg 2nd sheet in sequence
 _ - 0 3.dwg 3rd sheet in sequence

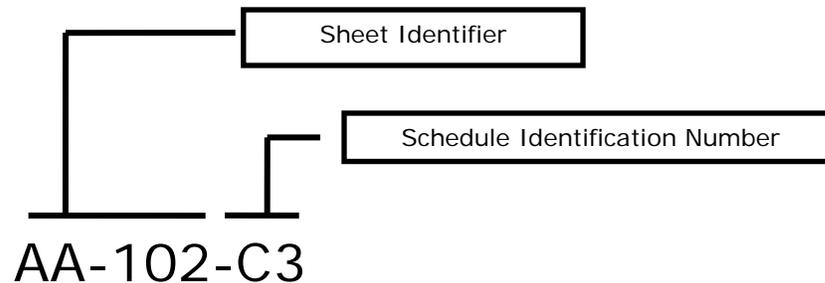
23.6.3 Detail File Name Format

The Detail File Name includes the sheet identifier and the detail identification number. Sheet Identifier is the sheet file that the detail is placed in. The detail identification number represents the location of the detail within the sheet file border.



23.6.4 Schedule File Name Format

The Schedule File Name includes the sheet identifier and the schedule identification number. Sheet Identifier is the sheet file that the detail is placed in. The detail identification number represents the location of the schedule within the sheet file border.



23.7 ENGINEERING DATA

The Architectural discipline directory contains an additional sub-directory named **leng_data**. This sub-directory is designated to contain the sheet image files of the plan sheets for the Architecture design, quality control reports, ASCII Engineering Data output files and other data pertinent to the overall design.

23.8 LEVEL AND SYMBOLOGY STANDARDS

Refer to the National CAD Standards and Layer Symbology produced by the U.S.CADD/GIS Technology Center, US Army Engineer Research and Development Center for Symbology standards. These standards include model file names, sheet file names, detail file names, schedule file names, abbreviations, symbols, layers, line and line attributes, text and text attributes.

All drawings should be drawn at Full Scale. Large drawings (model files) are normally brought (whole or part) into sheet files where text and dimensions are added, then plotted. Sheet files are 1:1, the model files are scaled when referenced into the sheet file.

23.8.1 Architectural Scale Chart

The following chart is intended to aid the user in determining the appropriate scale for placing the border and text on a drawing based on the actual size of the drawing. Calculations are based on a 9 1/2" x 15 1/2" drawing area inside the border.

Drawing Scales for Sheets			
<i>Note: Sheet files shall be assembled in paper space & plotted at 1:1</i>			
Architectural Scales		Engineering Scales	
Drawing Scale	Plot Scale	Drawing Scale	Plot Scale
Full size	1	1" = 5'	60
6" = 1'-0"	2	1" = 10'	120
3" = 1'-0"	4	1" = 20'	240
1 1/2" = 1'-0"	8	1" = 30'	360
1" = 1'-0"	12	1" = 40'	480
3/4" = 1'-0"	16	1" = 50'	600
1/2" = 1'-0"	24	1" = 100'	1200
3/8" = 1'-0"	32	1" = 200'	2400
1/4" = 1'-0"	48	1" = 500'	6000
3/16" = 1'-0"	64	1" = 1000'	12000
1/8" = 1'-0"	96	1" = 1250'	15000
3/32" = 1'-0"	128	1" = 2500'	30000
1/16" = 1'-0"	192	1" = 5000'	60000

FORMULAS: AS = 12 x Drawing Scale, Ex. 1" = 10', then 12 x 10 = 120, Therefore AS = 120.

23.8.2 Text Type, Size and Line Weight

Use the following table to determine the appropriate line weight for each text height. Text line weights are applicable for text places in model and sheet files. Text heights in this chart are used for text in sheet files that are places in paper space.

Text Type	Line Weight (In) All Scales	Height (In) 1:1 Scale
Special Small/Revisions	0.18 mm/ 0.007 in	3/32"
Annotation	0.25 mm/ 0.010 in	1/8"
View/Sheet/Sect Titles	0.35 mm/ 0.014 in	5/32"
Large	0.50 mm/ 0.020 in	3/16"

Note Sizes shown are a 1:1 ratio.

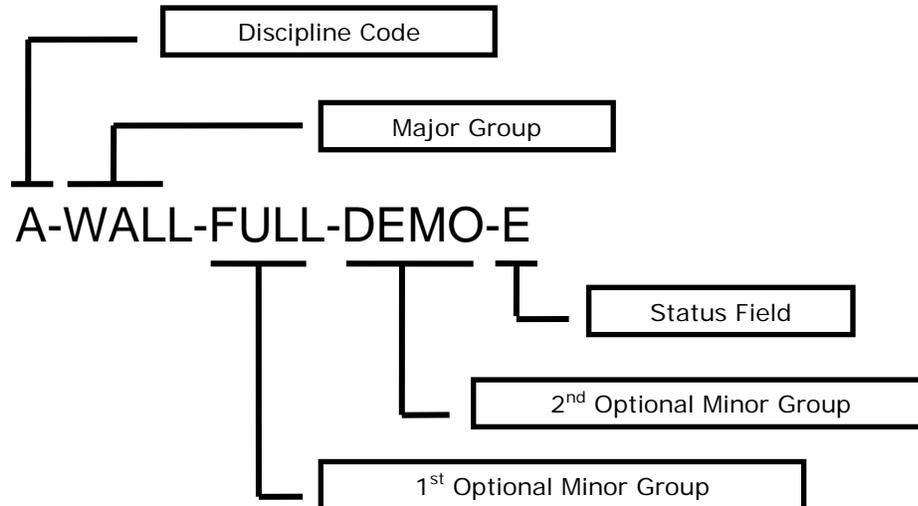
The following charts are intended to aid the user in determining the appropriate text size when placing common text in the Model File. Scale for placing the border and text on a drawing based on the actual size of the drawing. Calculations are based on a 9 1/2" x 15 1/2" drawing area inside the border.

Text Size for Sheets Using Architectural Scales				
<i>Note: For text placed in model files, text in paper space at 1:1</i>				
Drawing Scale	Text Size			
	3/32"	1/8"	5/32"	3/16"
Full size	3/32"	1/8"	5/32"	3/16"
6" = 1'-0"	3/16"	1/4"	5/16"	3/8"
3" = 1'-0"	3/8"	1/2"	5/8"	3/4"
1 1/2" = 1'-0"	3/4"	1"	1 1/4"	1 1/2"
1" = 1'-0"	1 1/8"	1 1/2"	1 7/8"	2 1/4"
3/4" = 1'-0"	1 1/2"	2"	2 1/2"	3"
1/2" = 1'-0"	2 1/4"	3"	3 3/4"	4 1/2"
3/8" = 1'-0"	3"	4"	5"	6"
1/4" = 1'-0"	4 1/2"	6"	7 1/2"	9"
3/16" = 1'-0"	6"	8"	10"	1'
1/8" = 1'-0"	9"	1'-0"	1'-3"	1'-6"
3/32" = 1'-0"	1'	1'-4"	1'-8"	2'
1/16" = 1'-0"	1'-6"	2'	2'-6"	3'

Text Size for Sheets Using Engineering Scales				
<i>Note: For text placed in model files, text in paper space at 1:1</i>				
Drawing Scale	Text Size			
	3/32"	1/8"	5/32"	3/16"
1" = 5'	5 5/8"	7 1/2"	9 3/8"	11 1/4"
1" = 10'	11 1/4"	1'-3"	1'-6 3/4"	1'-10 1/2"
1" = 20'	1'-10 1/2"	2'-6"	3'-1 1/2"	3'-9"
1" = 30'	2'-9 3/4"	3'-9"	4'-8 1/4"	5'-7 1/2"
1" = 40'	3'-9 1/2"	5'	6'-3"	7'-6"
1" = 50'	4'-8 1/4"	6'-3"	7'-9 3/4"	9'-4 1/2"
1" = 100'	9'-4 1/2"	12'-6"	15'-7 1/2"	18'-9"
1" = 200'	18'-9"	25'	31'3"	37'-6"
1" = 500'	46'-10 1/2"	62'-6"	78'-1 1/2"	93'-9"
1" = 1000'	93'-9"	125'	156'-3"	187'-6"
1" = 1250'	117'-2 1/4"	156'-3"	195'-3 3/4"	234'-4 1/2"
1" = 2500'	234'-4 1/2"	306'-6"	390'-7 1/2"	468'-9"
1" = 5000'	468'-9"	625'	781'-3"	937'-6"

23.9 LAYERING STANDARDS

All layer names shall follow the format detailed in the National CAD Standards. Below is a brief description of the layer naming convention.



Examples: Codes, Groups and Fields.

- **Discipline Code**

A-_____	Architectural
E-_____	Electrical
F-_____	Fire Protection
M-_____	Mechanical
ETC.	

- **Major Group**

__-WALL-__	Walls
__-DOOR-__	Doors
__-LITE-__	Lighting fixtures
__-COLS-__	Columns
ETC.	

- **1st Optional Minor Group**

__-_____-FULL-__	Full height
__-_____-DIMS-__	Dimension
ETC.	

- **2nd Optional Minor Group**

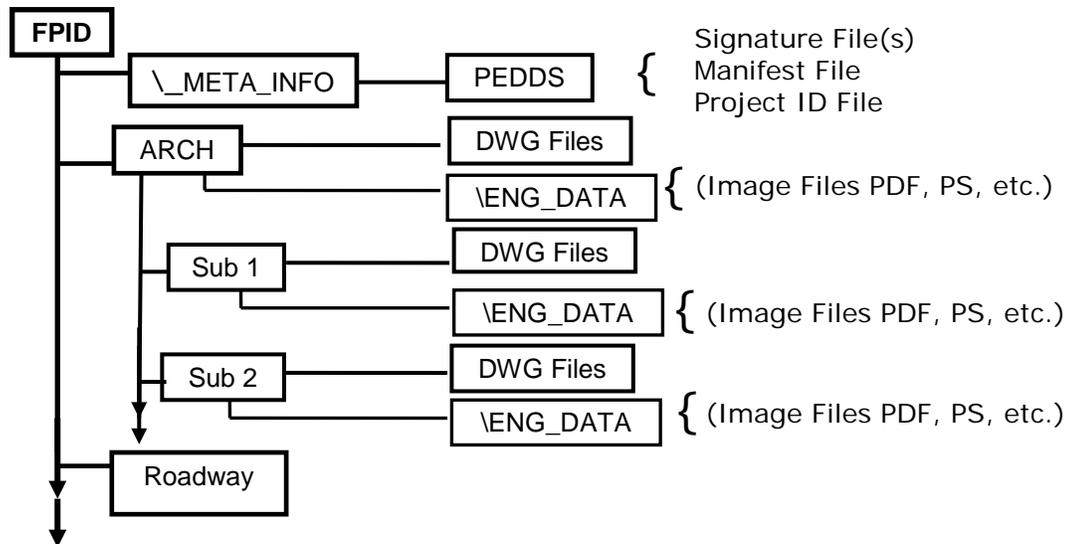
__-_____-_____-IDEN-__	Identification
__-_____-_____-PATT-__	Pattern
ETC.	

- **Status Field**

__-_____-_____-N	New work
__-_____-_____-D	Demolition
__-_____-_____-T	Temporary work
__-_____-_____-F	Future work
ETC.	

23.10 FILE STRUCTURE

The DOT uses a specific file structure for all electronic submittals. The following file structure shall be used for all architectural projects.



23.11 ELECTRONIC SIGNING AND SEALING

The Florida Department of Business and Professional Regulation (BPR) has approved architects to electronically signing and sealing of plans and specifications. See 2010 Florida Statutes Part 1 ELECTRONIC SIGNATURES Chapters 668.001-668.006 for more information.

Helpful link:

[2010 Florida Statutes Part 1 ELECTRONIC SIGNATURES Chapters 668.001-668.006](#)

23.12 ELECTRONIC SUBMITTAL

The Office of Design and Structures have defined the procedures for Structure As-built retention in a memorandum.

Drawing files used to create a project should be submitted on CD. The CD shall have all files in a directory tree as described Chapter 13, Roadway Standards. The delivery CD is the “official” CD and should be kept in a safe place during the life of the project.

When the office responsible for the Structures project receives the CD, the contents of the CD shall be authenticated using PEDDS to ensure the data on the CD has not been modified.

The next step in the process is to create a project on the server or workstation that meets the FDOT directory structure standards. Using the Create Project Application provided with the FDOT CADD Software ensures adherence to this standard. See documentation on the Create Project Application for complete details.

Copy files from the delivered CD into the corresponding project directory created above.