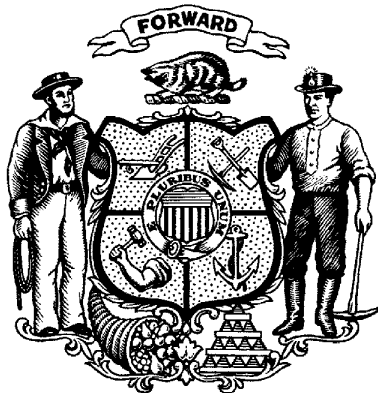


# **DFD CAD STANDARDS INSTRUCTION MANUAL**

**Date: January 13, 2015**

**Division of Facilities Development  
Department of Administration**



**State of Wisconsin**

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## **A SUMMARY OF REVISIONS MADE IN THIS UPDATE**

Some significant revisions have been made since the February 16, 2012 version of the DSF Cad Standards. Please review the entire manual.

- Revised “DSF (Division of State Facilities)” to “DFD (Division of Facilities Development”).
- Removed “File Naming” from the Standards. Refer to the AE Policy and Procedure Manual for all information concerning file naming.
- Removed requirements to cloud and tag revisions from the Revisions section of this document. This includes both Construction Drawings and Record Drawings submittals.

## **INTRODUCTION**

The DFD CAD Standards have been developed to ensure consistent preparation and submittal of electronic CAD drawings for Division of Facilities Development (DFD) projects. A consistent format will benefit everyone who will access the drawings for reference or for future projects.

A/E’s are free to utilize their own CAD methods and practices while producing DFD drawings within their own organization during the design phases of a project. **However, A/E’s must incorporate the DFD standards when submitting the final review, electronic bid documents, construction documents, and record drawings to DFD.** Electronic bid and record drawing submittals will be reviewed by DFD for conformance with the standards. Failure to conform will require a resubmittal by the A/E.

A/E’s are to use this instruction manual along with the electronic files on DFD’s CAD standards web page to prepare drawings. A list of the electronic files is included in Appendix A of this manual along with a description of their use.

DFD CAD standards are subject to change. The A/E shall use the latest version (dated on front page) that is in effect concurrent with the A/E’s consultant agreement contract date for each respective project.

Comments on the CAD standards are welcome by DFD. Suggestions will be incorporated that are beneficial to both DFD and those who will use the standards.

## **GENERAL STANDARDS**

### **Sheet Numbering:**

Sheet numbering shall follow a four character alpha-numeric.

The initial letter shall identify the discipline of the sheet according the following discipline abbreviation listing.

A	Architectural
C	Civil/Site
E	Electrical
F	Fire Protection
H	Hazardous Materials (asbestos, lead)
L	Laboratory
K	Kitchen
M	HVAC
P	Plumbing
Q	Special Equipment
R	Remediation (soil)
S	Structural
T	Title Sheet

The first number following the discipline letter shall identify the discipline’s drawing type (i.e. floor plans, sections, elevations, schedules, details, etc.) The A/E will assign the drawing type to the respective number based on their numbering preference.

The final two numbers represent the sheet number of the drawing type.

## **TITLE BLOCK TEMPLATE DRAWINGS**

DFD has developed AutoCAD™ title block template drawings for the following standard sheet sizes:

<u>File Name</u>	<u>Sheet Sizes</u>	
tb-8.5x11.dwg	8.5” x 11”	ANSI A
tb-11x17.dwg	11” x 17”	ANSI B
tb-18x24.dwg	18” x 24”	ARCH C
tb-24x36.dwg	24” x 36”	ARCH D
tb-30x42.dwg	30” x 42”	ARCH E1

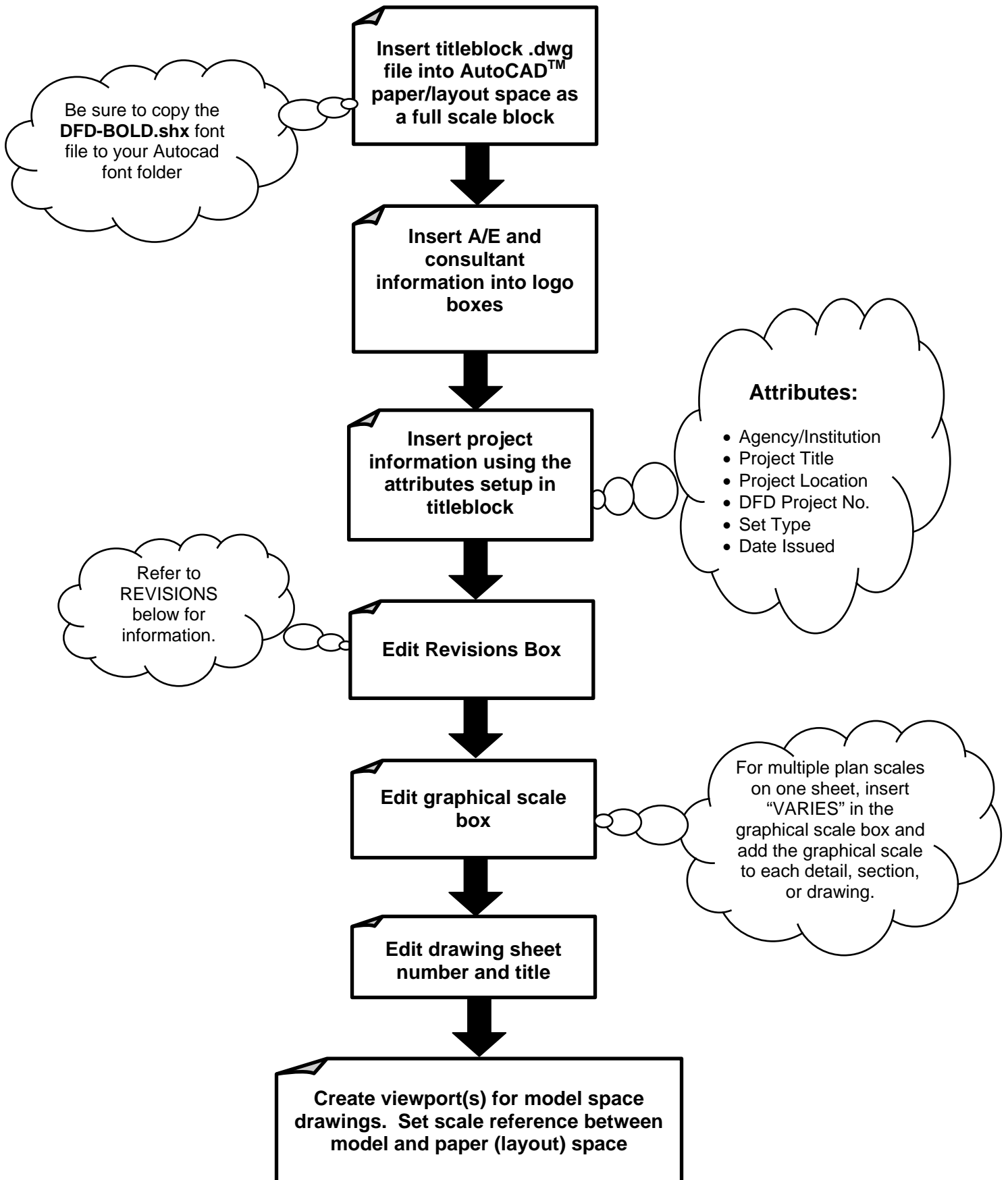
A/E’s are to select a project sheet size from this list. **Other sheet sizes are not allowed.**

The title block drawings are set up to contain all essential DFD project information in a consistent format and also allow space for A/E logos and company information.

The title block text uses the font style **DFD-Bold.shx**. This font file resides in the listing “Other Files” on the DFD CAD standards web page. A/E’s should download this file into their AutoCAD™ font folder so this font style is available when using the title block templates. If this is not done, a substitute font will be inserted in the title block which may not fit in the title block spaces.

The following flow chart shows the intended procedural steps for using the title block template drawings.

# Using DFD Standard Title Block Template Files



**NOTE:**

The title block template drawings have been set up with their extents matching the outer edge of their respective sheet sizes. Select expanded sheet sizes and select 0, 0 as the insertion point.

Since different plotters and printers have varying printable areas, the A/E may need to make adjustments to the title block size and the insertion point origin in order for the template to fit within the printable area of the A/E's plot equipment.

If necessary, changes can be made to the title block size by reducing the A/E logo section and/or project/sheet title section.

## **DFD PEN ASSIGNMENTS**

To insure consistent viewing and plotting, DFD has developed a pen assignment chart using AutoCAD's™ full color palette.

The following AutoCAD™ drawing file contains the pen assignment chart:

### **DFD-PEN-ASSIGN.dwg**

It is located under the listing "Other Files" on the cad standards page of DFD's website and may be downloaded, viewed and plotted by A/E's for reference.

The selection of pen widths and shading factors for each color was established with both viewing and plotting in mind. All of DFD's basic layers that reside in the titleblock and template drawings reference pen numbers from this chart. Pen colors were selected for layers to view well on an AutoCAD™ screen with a black background. Also, these colors were assigned pen widths and shading factors to enhance plotting of certain layers while screening (shading) others. The idea is to create a drawing with some depth that will emphasize certain features and make them easy to read.

DFD has created ".ctb" files and ".pcp" which have the DFD pen chart features built into them. The following files are located under the listing "Other Files" on the cad standards page of DFD's website.

**DFD.ctb**

**DFD-half.ctb**

**DFD.pcp**

**DFD-half.pcp**

The DFD.ctb and DFD.pcp files are for standard size drawings. Use the DFD-half.ctb and DFD-half.pcp files when reducing standard size drawings to half scale. This will reduce the line widths proportionally from standard to half scale.

Load these files into AutoCAD's™ plot configuration window or plot style table to set the DFD pen assignments when plotting.

**IMPORTANT:**

**All A/E's will need to review and update their respective plotter configurations for the appropriate pen shading in the DFD pen assignment chart. Pen shading is not automatically updated by merging the ".ctb" and ".pcp" files in the plot configuration window.**

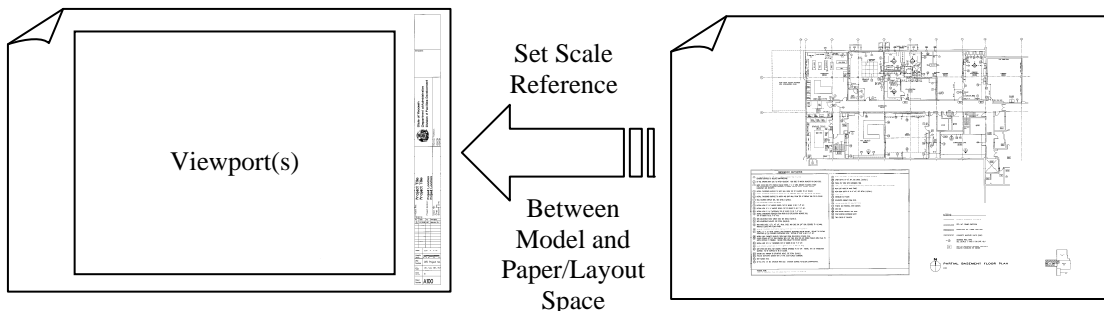
## **DRAWING STANDARDS**

### **Model Space/Paper (Layout) Space:**

Title block template drawings shall be prepared in AutoCAD™ paper (layout) space at full scale. Besides the title block template, features such as North arrows, general plan notes, keyplans, or other items that are repetitive throughout the drawing set may be included in paper (layout) space.

Discipline drawings shall be prepared in AutoCAD™ model space at full scale. Drawing elements such as floor plans, details, elevations, sections, schedules, etc. should all be included in model space.

Set the scale reference between model space and paper (layout) space through the title block paper (layout) space viewport(s) using the Zoom, Scale function.



Paper Space Title Block Drawing  
Full Scale

Model Space Drawing  
Full Scale

For a detailed explanation of how model space and paper (layout) space drawing environments function together, reference the AutoCAD™ User's Guide.

## **Fonts:**

### **Custom font styles are not allowed.**

A/E's must use standard AutoCAD™ font styles for all drawings.

Custom font styles are not allowed because:

- 1) Custom fonts will not be available to everyone who uses the drawings. Drawings prepared with some custom fonts will not allow proper viewing and plotting without the custom font file located in the font folder of the AutoCAD™ directory.
- 2) Exchange of custom fonts will not be allowed since many custom fonts are copyrighted. DFD can not police the use of copyrighted custom fonts.

## **Text Size:**

Minimum text size for notes and lettered drawing information shall be 1/12 of an inch on the plotted drawing. Text sizes smaller than this will be illegible if the drawings are reduced in scale.

Recommended text size is 1/8 of an inch on plotted drawing.

Larger text sizes may be used for plan titles, special notes, etc. where a larger text is needed.

## **Layers:**

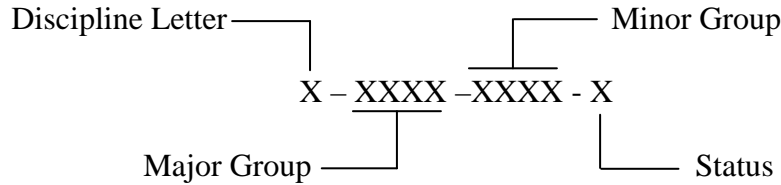
A/E's shall develop their respective discipline layer lists for each project.

### **Two Rules for Layers:**

- 1) **Layers must follow the naming format established below. Arbitrary layer names or formats will not be accepted. Record drawing submittals not following this layering convention will be rejected.**
- 2) **Line colors and weights selected layers MUST be selected from DFD's pen assignment chart. This is to insure that drawing features will have consistent plotting results when using the .pcp and .ctb plot files. If this requirement is not followed, line weights and shading features will not be retained when plotted by others using the standards.**



The layer naming format is based on the AIA layering guidelines and begins with a single letter designating the discipline of work, taken from the discipline abbreviation list on page 5. This is followed by a series of four letter fields, separated by hypens, to further identify the building system (major group) and a sub-descriptor of the building system (minor group if necessary). A single letter identifies the status (“N”- New, “E” – Existing, “T” – Temporary, and “D” - Demolition) of work for the respective layer.



The four letter fields are A/E defined abbreviations that should be selected to help identify the contents on the respective layer as clearly as possible. The A/E may determine the extent of the layer description, this will depend on how detailed the A/E needs to get with the layer name. Here are some typical examples:

Layer Name	Layer Description
A-WALL-D	Architectural Wall Demolition
A-WALL-N	New Walls
A-WALL-T	Temporary Walls
A-DOOR-IDEN	Door Identification
S-COLS-E	Existing Columns
S-FNDN-RBAR-N	New Foundation Reinforcing
P-FIXT-E	Existing Plumbing Fixtures
P-SANT-N	New Sanitary System
M-DUCT-D	Ductwork Demolition
M-PIPE-CHWR-E	Existing Chilled Water Piping
M-EQPM-N	New HVAC Equipment
M-SCHD	HVAC Schedules
M-DETL	HVAC Details
E-LTNG-N	New Lighting
E-POWR-TEXT	Power Systems Text

### Line Types:

A/E’s are free to use standard line types offered by AutoCAD™ or their own customized line types for respective layers.

### X - References:

When submitting the electronic .dwg record drawings, A/E’s must bind all x-references to the drawing. **Drawings submitted without x-references bound will be rejected.** DFD

has had many electronic drawings sets submitted in the past without x-references bound or attached making it impossible to view and utilize these drawings.

## **TITLE SHEETS**

DFD does not currently have a standard title sheet. When a title sheet is required, the A/E shall prepare the project title sheet using the standard title block template drawings.

The following minimum information shall appear on the title sheet:

- Project Title
- Agency Name
- Project Location
- Date
- State of Wisconsin - Division of Facilities Development
- DFD Project Number
- Site Location Map
- Drawing Index
- A/E's name, address, telephone number
- Sub-consultant's names, addresses, telephone numbers
- Professional Registration Stamps, signed and dated (for Department of Safety and Professional Services (DSPS) and bid sets)

All information furnished on the title sheet must be identical and consistent with the drawing sheet title blocks and the cover of the specification manual.

## **REVISIONS**

### **Construction Drawings**

- Refer to the CD revision block example listed on the following page.
- The first revision listed in the revision block shall always be the BD set and associated issue date. The revision number shall be listed as BD.
- Addenda shall be listed next. All addenda shall be listed in order in the revision block. All addenda listed in the revision block shall be specific to the drawing. No addenda shall be listed in the revision block if not applicable to the drawing.
- Value Enhancement proposals shall be listed last. All value enhancement proposals shall be listed in order in the revision block. All value enhancement proposals listed in the revision block shall be specific to the drawing. No value enhancement proposal shall be listed in the revision block if not applicable to the specific drawing.

## **Record Drawings**

- Refer to the RD revision block example listed on the following page.
- Remove all information from the revision block previously included on the construction drawings.
- The first revision listed in the revision block shall always be the CD set and associated issue date. The revision number shall be listed as CD.
- Change orders shall be listed next. All change orders shall be listed in order in the revision block. All change orders listed in the revision block shall be specific to the drawing. No change orders shall be listed in the revision block if not applicable to the specific drawing.



## APPENDIX A

### Electronic Files on DFD Cad Standards Webpage

Electronic File Name	Explanation
<b>manual.pdf</b>	<b>Instruction manual to be used in conjunction with electronic files for producing DFD standardized cad drawings. (Adobe Acrobat™)</b>
<b>tb-8.5x11.dwg tb-11x17.dwg tb-18x24.dwg tb-24x36.dwg tb-30x42.dwg</b>	<b>Title block template files (AutoCAD™)</b>
<b>DFD-Bold.shx</b>	<b>DFD font file for title block templates (AutoCAD™)</b>
<b>DFD-PEN-ASSIGN.dwg</b>	<b>DFD pen assignment chart (AutoCAD™)</b>
<b>DFD.ctb DFD-half.ctb DFD.pcp DFD-half.pcp</b>	<b>Plot configuration files for DFD pen assignment chart (AutoCAD™)</b>