FACILITIES MANAGEMENT

AutoCAD Guidelines & Standards

October 2023

DALHOUSIE UNIVERSITY

Table of Contents

Disclaimer

This document has been created by Dalhousie University in an attempt to standardize internal/external drawing standards. Facilities Management is undertaking a renewal project with respect to all CAD files. This will see the standardization, cataloging, and storage of all current Dalhousie University building plans in a new digital drawing software archive, and as such, a standardized drawing system is of the upmost importance to ensure both the consistency of the existing drawings being sent to the archive, and the continued quality of drawings being produced by Dalhousie University.

This guideline is part of a package created within the Dalhousie University Facilities Management CAD Group containing AutoCAD® drawing files with all standard layers, symbols, templates, and plotting files used by Dalhousie University.

If you have received this document without the aforementioned CAD files, or if you have any questions, comments, or concerns about this document or any of the files contained within the CAD package itself, please feel free to contact the CAD Group at Dalhousie Facilities Management.

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SECTION 1: General Guidelines

1.1. Verification

All drawings provided by Dalhousie should be verified on site by the consultant prior to any design work, to ensure accuracy in any and all new construction drawings.

1.2 File Format – Dalhousie Facilities Management CAD Standard AutoCAD® File

Construction project drawings must be submitted to Dalhousie University in the following manner:

- All drawings delivered to Dalhousie University must be in full compliance with AutoCAD® 2018 software.
- All AutoCAD® files delivered shall be purged of empty, unused, or non-essential drawing data prior to submittal. This includes all unused layers, line types, blocks, fonts, and entities.

1.3 Scale of Drawings

- All delivered AutoCAD® drawing models should be drafted at full scale in architectural units, such that one drawing unit equals one inch.

1.4 Fonts and Text Styles

- The use of text style ARIAL NARROW.shx is desirable for most applications. Special fonts not packaged with AutoCAD® are not suggested.
- Dimensions, labels, and notes should not be less than 3/32” height on printed drawings.

1.5 The DAL FM CAD Template

Using the DAL FM CAD Template is the preferred method when delivering AutoCAD® drawings. Included in the CAD Template are the following data:

- Dalhousie University core CAD layers, including pen assignments
- Industry standard drawing symbols
- Dalhousie University title blocks for various sheet sizes
- Annotation, text, and dimension styles
- Dalhousie Logo

Any modifications to the DAL FM CAD Template should be discussed with Dalhousie University prior to delivery.

1.6 Object Information

To ensure the integrity of delivered drawings when viewing or printing, the following guidelines should be followed:

- Object colours shall be defined by layer
- Layer colours shall fall in the range of colour numbers 1-9 (See **Appendix A**).
- The contents of blocks shall be created on layer 0, and the block itself shall be placed on the appropriate layer
- Standard drawing symbols include those for indicating power outlets, light fixtures, telecommunication locations, thermostats, fire equipment, etc. These files are contained within the model space of the DAL FM CAD AutoCAD® File.

1.7 Model and Paper Space Usage

Both model and paper spaces are to be used when creating AutoCAD® deliverables. In general, the model space will contain drafted information such as walls, doors, gridlines, etc., along with annotative dimensions. Notes & schedules are to be placed in the paper space.

General guidelines are as follows:

- Place title blocks, schedules, and general notes in paper space
- Label each viewport in the paper space with appropriate information, following the guidelines for sheet information capture, as described in Section 3.

1.8 External References (XREFs)

- Dalhousie University will not accept any AutoCAD® drawing deliverable which contains unbound references to external source drawing files (XREFs)
- All externally referenced data sources that were used during the production of the drawing set should be inserted and retained as a block within a single drawing file.

1.9 Image Files (JPGs, BMPs, TIFFs)

- Dalhousie University will not accept AutoCAD® drawings with referenced images
- All images necessary for the drawing deliverable must be cut and pasted into the drawing so that they are embedded within the CAD file.

SECTION 2: Layering Standards

- The Dalhousie University layering standards are based on the AIA Layering Guidelines, as documented in the AIA National CAD Standard (NCS).
- All objects shall be drawn on the appropriate AutoCAD® layer, as identified in this document
- The DAL FM CAD Template contains all standard layers used by Dalhousie University Facilities Management. Additional layers can be added to the base file as required. A complete list of all standard layers used by Dalhousie University is provided in **Appendix A.**

2.1 Layer Name Format

The AIA layering system used by Dalhousie University is organized as a hierarchy of drawing information.

Standard Layer

Nomenclature: Discipline-Descriptor-Modifier-Modifier

Basic Character

Nomenclature: X-Xxxx-Xxxx-Xxxx

Sample Layer Name: A-Wall-Full-Demo

Where:	**A**	**Discipline**
	Wall	Descriptor
	Full	Modifier
	Demo	Modifier

Dalhousie University uses ten major discipline definitions. They include:

B	Base Drawings (Internal use only)
A	Architectural
M	Mechanical
E	Electrical
P	Plumbing

S	Structural
C	Civil and Site
L	Landscaping
T	Telecommunications
G	Title Block info

2.2 Layer Attributes

The layers included in the DAL FM CAD Template have been assigned attributes based on the AIA Layer Guidelines. The specific attributes assigned are of the following type: colour, line type, and pen weight.

2.3 Special Layer Sets

A complete list of special layers used by Dalhousie University is provided in **Appendix B.**

SECTION 3: Paper/Paper Space

3.1 Paper Space Sheet Sizes

There are four sheet sizes used by Dalhousie University in the preparation of drawings.

- ARCH D sheet (24 x 36)
- ARCH C sheet (18 x 24)
- Tabloid (11 x 17)
- Letter (8.5 x 11)

*An explanation of the layout style for the ARCH C and ARCH D sheets is provided in **Appendix D.**

3.2 Paper Space Annotation and Dimensioning

When creating a deliverable drawing for Dalhousie University, ensure the DAL FM CAD Standard AutoCAD® File paper space sheet layouts contain, at *minimum*, the following information:

- Project name – as specified by Dalhousie University
- Project title – indicating the sheet content, e.g. floor plan, section, detail, etc.
- Capital projects (CP) number – as specified by Dalhousie University
- Project manager – the name of the Dalhousie University employee responsible for the CP in question.
- Date – the original issue date of the drawing, which should not change
- Revision history – as applicable
- A/E/C – if applicable, the consultant responsible for producing the drawings should be clearly identified.
- Sheet number – must follow the conventions outlined in Section 4
- Work order number – leave blank for internal use.

This data can be placed within the title block on each drawing sheet. Include:

- Drawing title
- Drawing scale
- All dimensions are to be associative with the drawing.

3.3 Dalhousie Logo

The Dalhousie University logo is provided in the DAL FM CAD Standard AutoCAD® File title blocks.

SECTION 4: Sheet and File Naming Conventions

The Dalhousie University title blocks, contained within the Dalhousie Facilities Management CAD Standard AutoCAD® File, contain a space for drawing sheet identification. Each sheet within a drawing set should be saved as an individual drawing file, as outlined in Section 1 of this document.

4.1 DWG Sheet Identification

Dalhousie University has adapted the AIA NCS sheet naming convention. This convention follows the format below;

Sheet Identification Nomenclature: Discipline-Type-Sequence

Basic Character Nomenclature: AA-NNN

Sample Name: A-101

Where:

A	Discipline Designator
1	Type Designator
01	Sequence Designator

#	TYPE	DRAWING DESCRIPTION
0	General	symbols, legends, notes
1	Plans	horizontal views
2	Elevations	vertical views
3	Sections	sectional views, wall sections
4	Details	
5	Large Scale Views	plans, elevations, stair sections
6	Schedules +	
7	Sign Layouts	
8	User Defined	
9	3D Representations	isometrics, perspectives, photos

4.2 File Naming

Dalhousie University has generated a standard file naming format for use with all drawings and image files. It follows the format below;

Sheet Identification Nomenclature: Capital Project # - Building-Floor - Sheet

Basic Character Nomenclature: YYYY-NNNN-ANNN-NN-AANNN

Sample Name:	2010-0086-E280-03-A101	
Where:	2010-0086	Capital Project #
	E280	Building code
	03	Floor
	A101	Sheet

SECTION 5: Plotting and File Delivery

All drawings submitted to Dalhousie University must use the following plot guidelines. This section will outline the types of plotting styles used, and the standard method for generating deliverables for use by Dalhousie University.

5.1 Plotting Styles

Dalhousie uses a standard plot style table for all drawings in monochrome, which is included in the DAL FM CAD Standards package.

Plot Style Table: DAL FM CAD Plotstyle.ctb

5.2 Delivery of PDF and DWG Files

Design and Construction Phase:

- All drawings delivered to Dalhousie University during the design and construction phases will be in PDF format,
- Each project sheet should be named and saved in an individual file. Only one drawing sheet should occur in each PDF.
- Any space considered an *assembly space* should have the occupant load indicated on the drawing.
- All spaces should have square footage, room numbers (as per the Dalhousie room numbering guidelines), and room name, indicated on the construction set.
- Associated reports should be included with AutoCAD® drawings – washroom counts, exiting capacities, program, etc.

As Built Deliverables:

- When a project is complete, each drawing sheet will have a single AutoCAD® file and a single PDF file, both with the same name.
- Each AutoCAD® file shall contain only a single title block and drawing.
- Dalhousie University will perform automated standardized checking of all delivered AutoCAD® files, and reserves the right to request revisions to the drawing sets should they fail to comply with the standards set forth in this document.

DALHOUSIE UNIVERSITY

APPENDIX A – DAL FM - CAD Standard Layers

LAYER NAME	COLOUR		LAYER DESCRIPTION
A-Anno		8	architecture: layer for annotative drawing
A-Anno-Dims		7	architecture: model space dimensions
A-Anno-Note		7	architecture: model space notes
A-Anno-Symb		7	architecture: model space symbols
A-Anno-Text		7	architecture: model space text
A-Area		7	architecture: area calculations
A-Area-Iden		7	architecture: room identification
A-Area-Occp		7	architecture: occupant names
A-Area-Patt		5	architecture: area hatching
A-Clng		5	architecture: ceilings
A-Clng-Grid		5	architecture: ceiling grid
A-Clng-Lite		1	architecture: ceiling lighting
A-Clng-Panl		1	architecture: ceiling panels
A-Clng-Patt		5	architecture: ceiling hatching
A-Clng-Susp		2	architecture: suspended ceiling elements
A-Door		2	architecture: doors
A-Door-Iden		7	architecture: door annotation
A-Eqpm		1	architecture: equipment
A-Eqpm-Clng		2	architecture: ceiling mounted equipment
A-Eqpm-Iden		7	architecture: equipment annotation
A-Eqpm-Fixd		1	architecture: fixed equipment
A-Eqpm-Move		1	architecture: free equipment
A-Flor		1	architecture: floors
A-Flor-Abov		8	architecture: floors above
A-Flor-Evtr		1	architecture: elevators
A-Flor-Hral		3	architecture: handrails
A-Flor-Levl		3	architecture: floor level changes
A-Flor-Otln		4	architecture: adjacent building outline
A-Flor-Patt		5	architecture: hatch pattern
A-Flor-Pfix		1	architecture: plumbing fixtures
A-Flor-Sign		1	architecture: signage
A-Flor-Strs		2	architecture: stairs
A-Flor-Tptn		3	architecture: toilet partition
A-Flor-Wdwk		1	architecture: built-in cabinetry
A-Furn-File		1	architecture: filing cabinets
A-Furn-Fixd		1	architecture: fixed furniture
A-Furn-Iden		7	architecture: furniture annotation
A-Furn-Move		1	architecture: moveable furniture
A-Furn-Pnls		3	architecture: system panels
A-Furn-Seat		1	architecture: seating

DALHOUSIE UNIVERSITY

APPENDIX A – DAL FM - CAD Standard Layers

LAYER NAME	COLOUR	LAYER DESCRIPTION
A-Furn-Stor	1	architecture: storage
A-Furn-Wksf	1	architecture: work surfaces
A-Glaz	2	architecture: glazing
A-Glaz-Iden	7	architecture: glazing annotation
A-Glaz-Sill	1	architecture: glazing sills
A-Grid	5	architecture: grids
A-Roof	1	architecture: roofs
A-Roof-Otln	1	architecture: roof outline
A-Roof-Patt	5	architecture: roof hatching
A-Site	6	architecture: property lines
A-Wall	4	architecture: walls
A-Wall-Extr	3	architecture: walls exterior
A-Wall-Iden	7	architecture: wall annotation
A-Wall-Intr	3	architecture: walls interior
A-Wall-Move	3	architecture: moveable partition walls
A-Wall-Patt	7	architecture: wall hatching
G-Anno-Dims	7	general: paper space dimensions
G-Anno-Legn	7	general: paper space legend
G-Anno-Note	7	general: paper space notes
G-Anno-Nplt	8	general: paper space non-print information
G-Anno-Patt	5	general: paper space hatching
G-Anno-Symb	7	general: paper space symbols
G-Anno-Text	7	general: paper space text
G-Anno-Ttlb	9	general: paper space title block
G-Anno-Vprt	8	general: paper space printable viewport

APPENDIX B – DAL FM - CAD Special Layers

LAYER NAME	COLOUR	LAYER DESCRIPTION
A-Elec	6	architecture: electrical elements
A-Fire	6	architecture: fire safety elements
A-Land	6	architecture: landscaping elements
A-Mech	6	architecture: mechanical elements
A-Plum	6	architecture: plumbing elements
A-Stru	6	architecture: structural elements
A-Tele	6	architecture: telecom elements
A-Elev	1	architecture: elevations
A-Elev-Hevy	2	architecture: close objects
A-Elev-Lite	5	architecture: distant objects
A-Elev-Medm	1	architecture: mid range objects
A-Elev-Minr	8	architecture: minor objects
A-Elev-Otln	4	architecture: section outline
A-Detl	1	architecture: details
A-Detl-Iden	7	architecture: component identification
A-Detl-Mbnd	8	architecture: material beyond detail
A-Detl-Patt	5	architecture: detail hatching
A-Sect	1	architecture: sections
A-Sect-Mbnd	8	architecture: material beyond section cut
A-Sect-Mcut	3	architecture: material cut by section
A-Sect-Patt	5	architecture: section hatching
A-Sect-Iden	7	architecture: component identification

APPENDIX C: DAL FM - CAD Pen Weights

PEN #	COLOUR	WEIGHT (mm)	LINE WEIGHT
1	RED	0.150	
2	YELLOW	0.250	
3	GREEN	0.250	
4	CYAN	0.400	
5	BLUE	0.050	
6	MAGENTA	0.100	
7	WHITE	0.150	
8	DARK GRAY	0.000	
9	LIGHT GRAY	1.000	

APPENDIX D – DAL FM - CAD Standard Symbols

SYMBOL	DESCRIPTION
E	Existing Entity
N	New Entity
D	Demolition Entity
R	Relocate Entity
	Door Tag
	Wall Tag
	Window Tag
	Annotative Note Tag
	Single Outlet
	Single Outlet, Switched
	Duplex Outlet
	Duplex Outlet, Switched
	Quad Outlet, Ceiling Drop
$	Electrical Switch, Single
$2	Electrical Switch, Double
$4	Electrical Switch, 4-way
$4	Electrical Switch, Dimmer
$F	Electrical Switch, Fan
	Data/Telephone Outlet

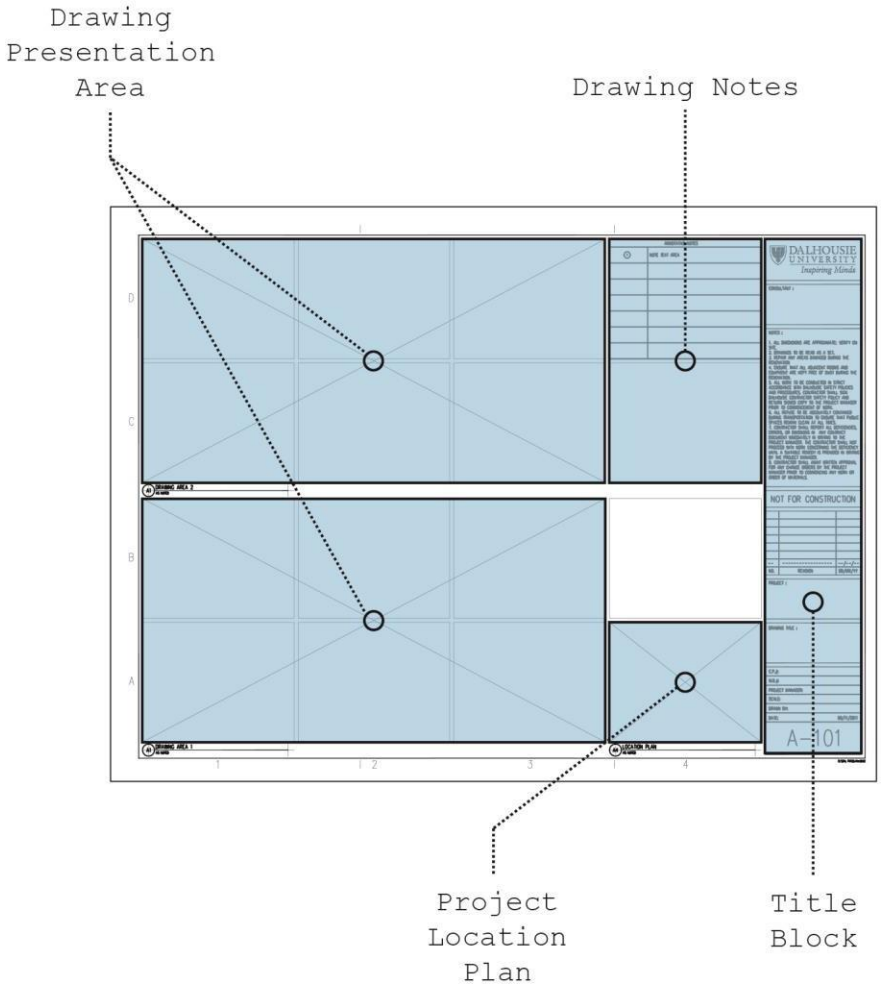
APPENDIX D: DAL FM CAD Standard Symbols

SYMBOL	DESCRIPTION
	Light, Fluorescent
	Light, Recessed Pot
	Thermostat
	Heat Detector
	Smoke Detector
	Sprinkler Head
	Natural Gas Supply
	Compressed Air Supply
	Specialty Gas Supply
	HVAC Supply Air
	HVAC Return Air
	Door Electric Hinge
	Door Electric Latch
Rx	Reader #
Px	Entry Port #
Ax	Door Address #
	Crash Bar Exit Device
	Contact, keyed lock, with local alarm (DETEX)
	Programmable Interface Module
	Multi-door Controller

APPENDIX D: DAL FM CAD Standard Symbols

SYMBOL	DESCRIPTION
CR M	Security Access Card Reader, mag stripe, wall mount
CR HDX	Security Access Card Reader, multi technology, wall mount, c/w electric strike
CR K	Security Access Card Reader with PIN pad
DC A	Door Contact for Access Card Reader
DC I	Door Contact for Intrusion Alarm System
DC C	Door Contact for Combination Access Card Reader & Intrusion Alarm System
	Security Camera
AV###	AV Room Amber Strobe Light
S AV###	AV Room Alarm Siren
AV###	AV Room Number
PK	Partition Keypad
PK G	Global Partition Keypad
PC	PC Tab
M	Motion Sensor
	Amber Strobe Light
S	Alarm Siren
REX	Request to Exit Motion Sensor

APPENDIX E: DAL FM CAD ARCH C Sheet Layout
(SAMPLE)



APPENDIX E: DAL FM CAD ARCH D Sheet Layout
(SAMPLE)