

Architecture, Engineering, and Construction Division

CAD Standard

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All previous versions of this document are obsolete.

A copy of this document is available for download on the AEC website. <http://aec.ldschurch.org/aec/>

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Table of Contents

Introduction	1
Purpose.....	1
Scope.....	1
CAD System	1
File Type & Naming Conventions.....	1
Project File Types	1
Naming Model Files	2
Naming Sheet Files.....	3
Sheet Organization.....	5
Standard Sheet Sizes	5
Sheet Layout.....	5
Drawing Setup	5
Template Drawings	5
Use of the Layout Tabs	6
Layer Naming	6
Objectives	6
Layer Guidelines	6
Drawing Standards.....	8
Annotation.....	8
Line Types	10
Hatching.....	10
Dimensions	10
Drawing Orientation	11
Building Grid System.....	11
Abbreviations	12
Tables.....	14
Layer Names.....	14

Introduction

Purpose

The purpose of this document is to provide consultant architects, engineers and landscape architects with the standard for project and standard plan CAD drawings.

This document is based on and utilizes the standards established by the National CAD Standard (NCS) 2008 version as created by the National Institute of Building Sciences (NIBS), American Institute of Architects (AIA), Construction Specifications Institute (CSI) and the Tri-Service CADD/GIS Technology Center and the U.S. Coast Guard.

The AEC CAD Standards represent best practices for LDS Church meetinghouse, seminary and institute and Welfare Services Department projects. This standard is to be used in all cases regardless of office standard or personal preferences.

Scope

This standard is a guide for developing architectural, engineering, and landscape CAD drawings for project and standard plan documents. This document is intended as a CAD standard reference and not as a CAD training manual.

CAD System

The CAD software used as a basis for this Standard is:

AutoCAD 2009 with AutoCAD Architecture (ACA) 2009

File Type & Naming Conventions

Project File Types

Model

- “A building model is an electronic representation of a building. Elements graphically representing the building or site should always be created at their ‘real world’ size in their ‘real world units’... These models may be 2D or 3D, but they all must be accurate, complete and in conformance to emerging industry standards in regards to layer/level usage and symbology.” (NCS pg UDS-01.17)
- The model files are references in sheet files for use in printing and also by other model files.
- Model files are created in model space.
- Model files do not have title blocks or any information which appears in paper space.
- Because these model files are referenced in other files, model naming is important. (See [Naming Model Files](#) below)
- Items to include in a model file:
 - Information to share among disciplines and multiple sheets
For example: Walls, windows, doors and etc.
 - Dimensions
 - Items referenced in automatic schedules

For example: door tags, window tags, room tags

Sheet

- Drawing sheets are the finished product of CAD file sets representing scaled drawings that are actually printed (or plotted) to paper or other drawing media.
- Sheet files are plotted at full scale (1=1).
- These files also contain the title block and project specific information located in Paper Space.
- Sheet files often contain cross-references (xref) to model files.

Model files vs. Sheet files

- Distinguishing between models and sheets is useful for several reasons:
 - CAD drawings are often developed during design, long before the organization and layout of the construction documents are known.
 - Early design models can be developed without concern for the specific layout of the individual construction documents that follow.
 - Sheets representing construction documents or other documents can be developed at a later stage, when the organization and content of the set are better understood.
 - More personnel can work on a project at the same time.
 - Coordination between disciplines is improved.
 - Duplication of efforts is eliminated.

Naming Model Files

Naming Convention

- Identify model files that are referenced into sheet files using the following format:
XXAA
Where:
 - XX Project prefix (assigned by AEC)
 - AA Discipline designator (see descriptions listed below)

Description

- Project Prefix - XX
 - Each project is assigned a two-letter or longer prefix established by AEC. Use this prefix to name each model file associated with a project.
Example: HE for Heritage meetinghouse standard plan
- Discipline Designator – AA
 - The discipline designator is the primary classification method for file names and for layer names.
 - The discipline code is a one- or two-character field and is the same for naming sheet files.
 - The discipline codes are listed as follows:

A	Architectural	L	Landscape
C	Civil	M	Mechanical
E	Electrical	ME	Mechanical Controls
F	Furnishings	P	Plumbing
FA	Fire Alarm	S	Structural
FS	Fire Sprinkler	SE	Security
G	General	T	Telecommunications

Naming Sheet Files

Naming Convention

- Name Sheet files using the following format: XXAAYNN
Where:
 - XX Project prefix
 - AA Discipline designator
 - Y Sheet type designator
 - NN Sheet sequence number

Description

- Project Prefix - XX
 - Identify each sheet file associated with a project using the two-letter, or longer, project prefix established by AEC. i.e.: HE - Heritage, LE - Legacy.
- Discipline Designator – AA
 - The discipline designator is the primary classification method used to denote the subject matter for file names and for layer names.
 - The discipline code is a one- or two-character field and is the same code used for model files.

- The discipline codes are listed in the following table:

A	Architectural	L	Landscape
C	Civil	M	Mechanical
E	Electrical	ME	Mechanical Controls
F	Furnishings	P	Plumbing
FA	Fire Alarm	S	Structural
FS	Fire Sprinkler	SE	Security
G	General	T	Telecommunications

- Sheet Type Designators – Y
 - A single numerical character identifies the sheet type.
 - All sheet types may not apply to all discipline designators.
 - It may not be necessary to use all sheet types for a project or within a discipline.

<u>No.</u>	<u>Type</u>	<u>Description</u>
0	General	Symbols legends, notes, etc.
1	Plans	Horizontal views
2	Elevations	Vertical views, exterior elevations
3	Sections	Sectional views, wall sections
4	Enlarged Plans	Enlarged plans, interior elevations, stair sections
5	Details	
6	Schedules	
7	User Defined	For types that do not fall in other categories
8	User Defined	For types that do not fall in other categories
9	3D Representations	Isometrics, perspectives, photographs

- The use of sheet type designators does not preclude combining different drawing types on the same sheet for simplicity.

- Sheet Sequence Number – NN
 - A two-digit sheet sequence number identifies each sheet in a series of the same discipline and sheet type.
 - Number sheets from 01 through 99. Do not use sheet number 00. Do not use a lower case letter at the end of the sheet number.
 - To permit insertion of future sheets, you do not need to number sheets sequentially.

Examples:

HTA101 Heritage Traditional, architectural, floor plan, sheet 01
HNS502 Heritage New England, structural, detail, sheet 02

Sheet Organization

Standard Sheet Sizes

- AEC uses five sizes of sheets for construction documents

ANSI D	22 x 34	
ARCH D	24 x 36	This is the preferred size sheet for projects.
ARCH 30	30 x 42	Used for large projects and to avoid break lines in the plans, elevations and sections.
12 x 18	12 x 18	Used to make half-size document sets.
8 ½ X 11	8 ½ x 11	Used as required.

Sheet Layout

Detail and Elevation Sheets

- Lay out details and elevations in a modular format.
- Identify details with a letter designation.
- Start details with 'A' in the upper left-hand corner of the sheet and continue across the sheet, from left to right, in sequential order. If another row of details is required, start it below the first row and letter the new row as described above.

Use of 'I' and 'O'

- Do not use the letters 'I' and 'O' when identifying detail locations on a sheet.
- These letters are easily confused with the numbers '1' and '0'.
- Do not use 'I' and 'O' as [building grid](#) system identifiers.

Plan Sheets

- All plans, including enlarged plans, are to be identified by a number.
- Enlarged plans will be included on the same sheet as the room's interior elevations whenever possible.

Working with Multiple Scales

- Use the same scale for all drawings on a single sheet where possible.
- Sheets may sometimes require different scale drawings on the same sheet.
- In all cases, show the scale for each drawing or view on a sheet.
- When necessary, you can set different scales for different view ports.
- When setting various scales for view ports, place all text in the view port (model space).
- All view ports shall be locked.

Drawing Setup

Template Drawings

- Template or prototype drawings are used to begin all new drawings.

- The Template drawings contain all the AEC standard settings including:
 - Layers
 - Font Style
 - Dimension Style
- Template files are located on the CD in the Templates folder.
- There are eight AEC template files.
- All templates are identified with a .dwt extension.

<u><i>File Name</i></u>	<u><i>Description</i></u>
PFD 11x17.dwt	11 x 17 sheet size
PFD Arch B.dwt	12 x 18 sheet size
PFD ANSI D.dwt	22 x 34 sheet size
PFD Arch D.dwt	24 x 36 sheet size
PFD Arch E.dwt	30 x 42 sheet size

Use of the Layout Tabs

Number of Tabs

- Limit the number of layout tabs to two:
 - one for the model (Model Space)
 - one for the page layout (Paper Space)

Tab Names

To facilitate coordination and allow the Sheet Set Manager to work properly:

- Rename the layout tabs to match the sheet number by right-clicking the desired tab and selecting RENAME.
- The layout tab should be renamed to match the sheet number.
- This facilitates coordination and allows the Sheet Set Manager to work properly.
Example: A101, A501

Layer Naming

Objectives

- Naming layers that follow the NCS enables multiple users of drawings to work efficiently with a minimum of downtime.
- Use intuitive layer names and group them together with like layers.

Layer Guidelines

- Use alphanumeric layer names and abbreviations that are easy to remember.
- This alphanumeric arrangement accommodates expansion and addition of user-defined extensions to the layer list.

- There are four defined layer name data fields:
 - Discipline Designator
 - Major Group
 - Minor Group
 - Status
- The full layering system may not need to be used in all situations.
- The layering system is flexible to allow project adaptations within layering system guidelines.

Naming Convention

- For a listing of approved layer naming – See [Layer Names](#) section below.
- Follow this convention for naming layers:

A-MMMM-NNNN-S

Where:

A	Discipline Designator
MMMM	Major Group
NNNN	Minor Group
S	Status Field (Optional)

- Discipline Designator: A
 - The discipline designator is the same as the discipline designator used in the [file naming](#) conventions previously discussed.
 - It is a two-character field with the second character a hyphen. The defined discipline codes are the same for layers and for file names.
Example: The file LEA101.dwg might contain layers A-WALL, A-DOOR and A-CLNG.
- Major Group: MMMM
 - The Major Group is a four-character field that identifies a major building system.
Example: Doors, Windows, Wall, etc.
 - Although major groups are logically grouped with specific discipline codes, it is possible to combine major group codes with any of the discipline codes.
Example: Architectural Columns: A-Cols; Structural Columns: S-Cols
 - User defined major group fields are not permitted.
 - **Example:** a drawing might contain the following layers:

<u>Layer Name</u>	<u>Description</u>	<u>Layer Name</u>	<u>Description</u>
A-WALL	<i>Walls</i>	A-DOOR	<i>Doors</i>
E-LITE	<i>Light fixtures</i>	G-NOTE	<i>Text, Annotation</i>

- Minor Group (OPTIONAL): NNNN
 - This is an optional, four-character field to further define the major groups.
 - Although minor groups are logically grouped with specific discipline codes, it is possible to combine major group codes with any of the discipline codes.

Example: A-WALL-PART indicates architectural, new wall, and partial height. The following are examples of common modifiers that are defined for use in the minor group field:

<u>Modifier</u>	<u>Description</u>	<u>Modifier</u>	<u>Description</u>
IDEN	<i>Identification</i>	SYMB	<i>Symbols</i>
PATT	<i>Pattern</i>	DIMS	<i>Dimensions</i>
NOTE	<i>Notes</i>		

- Status Field (OPTIONAL): S
 - The status field is an optional single-character field that distinguishes the data contained on the layer according to the work or the construction phase status.
Example: The status identifies whether the work remaining is temporary, demolition or existing.

- Do not use the status field on new standard plan documents.
- Examples of the defined values for this field are as follows:

<u>Modifier</u>	<u>Description</u>	<u>Modifier</u>	<u>Description</u>
E	<i>Existing</i>	M	<i>Items to be moved</i>
T	<i>Temporary work</i>	D	<i>Demolition work</i>

Drawing Standards

Annotation

Font Style

- All disciplines should use **SIMPLEX** as the standard font for all drawings.
- Dimensions use a text style called **SIMPDIMS** that is based on the **SIMPLEX** font with a narrower width.
- The **SIMPLEX** font remains clearer and avoids confusion when the documents are printed as half-size sets.
- The font sizes and locations used are as follows:

Text notes	3/32"
Detail titles	7/32"
Mid size text	5/32"

Plotted Font Sizes

Drawing scale	Standard text	Title text	Mid size text
1/16" = 1'-0"	1'-6"	3'-6"	2'-6"
3/32" = 1'-0"	1'-0"	2'-4"	1'-8"
1/8" = 1'-0"	9"	1'-9"	1'-3"
3/16" = 1'-0"	6"	1'-2"	10"
1/4" = 1'-0"	4-1/2"	10-1/2"	7-1/2"
3/8" = 1'-0"	3"	7"	5"
1/2" = 1'-0"	2-1/4"	5-1/4"	3-3/4"
3/4" = 1'-0"	1-1/2"	3-1/2"	2-1/2"
1" = 1'-0"	1-1/8"	2-5/8"	1-7/8"
1-1/2" = 1'-0"	3/4"	1-3/4"	1-1/4"
3" = 1'-0"	3/8"	7/8"	5/8"
6" = 1'-0"	3/16"	7/16"	5/16"
FULL	3/32"	7/32"	5/32"

Types of Annotation

- Annotation comprises text, dimensions, sheet borders, detail references and other elements on CAD drawings that don't represent physical aspects of a building.
 - Types of annotation are designated by the following layer names:

<u>Layer Name</u>	<u>Description</u>
G-DIMS	Dimensions
G-NOTE	Notes
G-SYMB	Symbols
G-TITL	Drawing Titles

Location of Annotation

- **Annotation in Model Space:** Place all annotation, including dimensions, notes, callouts, etc., in Model Space only.
 - Always place dimensions in Model Space. They are linked to the dimensioned object.
- **Annotation in Paper Space:** Place only the title block and project information in Paper Space.
- **Sheet File vs. Model Files:**
 - Place annotation in either the [model](#) file or in the [sheet](#) file.
 - Model file annotations:
 - Include annotations that apply to the project such as dimensions, notes, grids and symbols in the model file.
 - Place any annotation information that will be shared between multiple sheets in model file.
 - Place items that read information from an object in the model file.
 - Example:** Door numbers read information from the doors.
 - Sheet file annotation:
 - Include more specific types of annotation such as drawing titles, legends, symbols, and sheet specific notes in the sheet file.

- **Notes**
 - Left-justify all notes.
 - Locate the leader from the top front of the first line of text when the note is located to the left of the referenced item.
 - Locate the leader from the bottom end of the first line of the text when the note is located to the right of the referenced item.
 - Match drawing note terminology to that used in the specifications.
 - Do not use the @ symbol use the word “at”.
- **Graphic Elements**
 - Place all graphic elements (walls, doors, grid, furniture, flooring, etc.) and annotation anchored to plan elements (wall, door, room tags, wall tags etc.) in Model Space and ensure they are drawn at full scale.
 - Establish a scale for the drawing in Paper Space.

Line Types

There are various line types used throughout a drawing.

- The scaling used is different between Paper Space and Model Space.
- Ensure the line type space is at 1 to ensure proper plotting and translation to other CAD formats.
- To view the line types properly in Model Space, adjust your LTSCALE according to the scale of the drawing. Set the LTSCALE to 1 for plotting.
- In the LINETYPE MANAGER, ensure that the following are set:
 - Global Scale Factor 1
 - Current Object Scale 1
 - Use Paper Space units for scaling (the box should contain a check)

Hatching

Standards

- Hatching in AutoCAD can be either associative or non-associative.
- When picking the area to hatch, AutoCAD remembers the objects that bound the area. If one of these boundaries is removed, the association is lost. At this point, the hatching becomes a block and remains in its current configuration.

Dimensions

Dimension Style

- The AEC office dimension style is called **AEC_ARCH_1** and is set as the default in the [template](#) files.
- All settings for the standard dimension style (color of lines, text color, height, arrowheads, appearance, etc.) are saved in the [template](#) files. Do not modify the template files.
- Ensure that dimensions are adequate and accurate.
- Place all dimensions on the G-DIMS layer.
- Do not override the default dimension when preparing construction documents.

Associative Dimensions

- Use associative dimensions at all times.
 - CAD programs allow us to draw precisely and accurately.
 - With associative dimensioning, if a wall is stretched, the dimensions change automatically.

Standards

- **Format:** Write all dimensions out in FEET and INCHES (1'-6") unless the dimension is less than 12".
- **Location:**
 - Measure dimensions on plans from the face of studs, concrete, CMU, etc., not from the finished face of the wall, unless specifically identified.
Example: 5'-0" clear from face of wall.
 - Relate dimensions on elevations to an established reference plane, such as the finished floor level, a grid line, or criteria established that is appropriate to the project.
- **Hierarchy:** Dimension hierarchy is:
(1) Overall (2) Structural grid (3) Openings & wall locations
- **Precision:**
 - Set the dimension precision to 1/32" for all drawings.
 - If the precision is set any higher, the dimensions round up, causing a string of associative dimensions to total up incorrectly.
 - Adding up the dimensions in a string may not total up to the same measurement as the overall dimension.

Drawing Orientation

- Ideally, show the floor plan on one sheet.
- Use of match lines:
 - If the floor plan cannot fit on one sheet, subdivide it into convenient areas and provide match lines to reference where the floor plan continues.
 - Include a key plan on all plan sheets that continues on multiple sheets.
 - Use match lines to signify the division between two or more areas of continuous structure that shows on separate sheets due to sheet size limitations
 - Do not place match lines on column lines, grid lines, or expansion joints.
 - Place match lines at the centerline of a wall or corridor.
 - Display match lines in the same location on both sheets containing adjacent segments of the plan.
 - Jog match lines to avoid important plan elements.
- To avoid confusion, maintain a consistent plan orientation throughout the drawing set.
Example: Display an enlarged plan in the same orientation as shown on the overall floor plan.

Building Grid System

- Use a building grid system to indicate structural columns, load-bearing walls, shear walls, and other structural elements on the drawings.
- Use a building grid as a basis for dimensioning.
- The grid system includes the following guidelines:

- Place designators at the top of the grid, numbered sequentially from left to right, for grid lines that run vertically on the building.
- Place designators at the right side of the grid, alphabetized sequentially from top to bottom, for grid lines that run horizontally on the building.
- To avoid confusion with the numbers 0 (zero) and 1 (one), do not use the letters O and I in the building grid.
- In some cases, you may show grid line designators at both ends of the grid line for reference purposes.
- Where additional structural support elements occur between grid lines, use a fractional designation.
Example: Identify a column occurring at the mid-point between grid 2 and 3 as 2.5. If it is located between grids B and C identify it as B.5.

Abbreviations

General Rules for Abbreviations:

- Only abbreviate terms with six or more letters.
- Do not abbreviate terms with five letters or less. Exceptions are noted in the list below.
- Avoid using abbreviations with more than one meaning.
- Do not use an abbreviation if doubt or confusion exists regarding the meaning.
- Keep abbreviations to a minimum and limit them to common industry standard abbreviations.

Approved Abbreviations

Acceptable and approved abbreviations and their meaning are as follows:

Abbreviations					
Abbrev.	Item	Abbrev.	Item	Abbrev.	Item
Alum	Aluminum	Ft/lbs	Foot pounds	RA	Return air
BO	Bottom of	GA	Gage	REF	Refrigerator
BTU/HR	British thermal units per hour	GALV	Galvanized	RCP	Reflected ceiling plan
CFM	Cubic feet per minute	H	High	REQD	Required
CLR	Clear	HSS	Hollow structural section	SA	Supply air
CO	Cleanout	L	Angle	SST	Stainless steel
CONC	Concrete	LL	Live load	SCHED	Schedule
CONT	Continuous	LBS	Pounds	SECT	Section
COTG	Clean out top of grade	LSL	Laminated strand lumber	SIM	Similar
CU. FT.	Cubic foot	LVL	Laminated veneer lumber	SPEC	Specification
D	Deep	MAX	Maximum	SF	Square foot
DL	Dead load	MECH	Mechanical	STD	Standard
DIA	Diameter	MIN	Minimum	SYS	System
DIV	Division	MISC	Miscellaneous	TO	Top of
DWV	Drain waste and vent	NIC	Not in contract	TYP	Typical
EWC	Electric water cooler	OA	Outdoor air	VERT	Vertical
EA	Each	OC	On center	VEST	Vestibule
ELEC	Electrical	OD	Outside diameter	VTR	Vent through roof
EQUIP	Equipment	OPP	Opposite	W	Wide
ETC	Et cetera	PLF	Pounds per linear foot	W/	With
EXA	Exhaust air	PSF	Pounds per square foot	W/O	Without
EXT	Extinguisher	PSI	Pounds per square inch	WCO	Wall cleanout
FEC	Fire extinguisher cabinet	PSIG	PSI gage		
FLEX	Flexible	PVC	Polyvinyl chloride		
FT	Foot	R	Radius		

Tables

Layer Names

Architectural (Model)				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
A-Area	Areas	173	No Plot	Continuous
A-Area-Bdry	Space boundaries	140	No Plot	Continuous
A-Area-Rnam	Room tags	Yellow	.45	Continuous
A-Area-Rnum	Room number	Green	.30	Continuous
A-Area-Pref	Large plan reference	Green	.30	Continuous
A-CIng	Ceiling objects	150	.30	Continuous
A-CIng-Grid	Ceiling grids	232	.30	Continuous
A-Cols	Columns	Red	.30	Continuous
A-Door	Doors	Cyan	.18	Continuous
A-Elev	Elevations	140	.13	Continuous
A-Elev-Iden	Elevation marks	Green	.3	Continuous
A-Flor-Case	Casework	91	.20	Continuous
A-Flor-Eqpm	Equipment	140	.13	Continuous
	Appliances			
A-Flor-Evtr	Elevators	91	.20	Continuous
A-Flor-Open	Floor openings	Yellow	.45	Continuous
A-Flor-Ovha	Overhead elements	140	.13	Hidden
A-Flor-Pews	Pews on chapel floor	140	.13	Continuous
A-Flor-Hral	Stair handrails	140	.13	Continuous
A-Flor-Pfix	Plumbing fixtures	Cyan	.18	Continuous
A-Flor-Ramp	Ramps	Red	.30	Continuous
A-Flor-Seat	Seating other than pews	140	.13	Continuous
A-Flor-Spcl	Arch. specialties	Cyan	.18	Continuous
A-Flor-Strs	Stairs	Red	.30	Continuous
A-Flor-Tptn	Toilet partitions	91	.20	Continuous
A-Glaz	Windows	Cyan	.18	Continuous
	Curtain wall layouts			
	Window assemblies			
	Curtain wall units			

A-Tags	Door tags	Green	.30	Continuous
	Window tags			
	Wall tags			
	Visual Display board tags			
A-Legn	Schedules	Blue	.80	Continuous
A-Nplt	Cameras	7	No Plot	Continuous
A-Roof	Roofs	20	.13	Continuous
A-Roof-Slab	Roof slabs	22	.13	Continuous
A-Sect	Sections	240	.13	Continuous
A-Slab	Slabs	162	.13	Continuous
A-Wall	Walls	Yellow	.45	Continuous
A-Wall-Chas	Chases	9	.13	Continuous
A-Wall-Patt	Wall hatch patterns	9	.13	Dashed2
A-Wall-Open	Wall openings	13	No Plot	Continuous

Electrical				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
E-Legn	Legend of symbols	Green	.30	Continuous
E-Lite	Lighting fixtures – ceiling	Yellow	.45	Continuous
E-Lite-Symb	Lighting fixture callouts	Green	.30	Continuous
E-Lite-Circ	Lighting circuits and home runs	32	.25	Continuous
E-Lite-Circ-Numb	Lighting circuit numbers	Green	.30	Continuous
E-Lite-Wall	Wall mounted fixtures not on ceiling	Yellow	.45	Continuous
E-Lite-Swch	Lighting switches	Green	.30	Continuous
E-Pwr-Devc	Power devices – outlets, j-box, etc.	Yellow	.45	Continuous
E-Pwr-Circ	Power circuits and home runs	32	.25	Continuous
E-Pwr-Circ-Numb	Power circuit numbers	Green	.30	Continuous
E-Pwr-Pnls	Electrical panels and switchgear	Red	.30	Continuous

General (Details)				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
G-Dims	Dimensions	Green	.30	Continuous
G-Grid	Building grids	9	.13	Center2
G-Grid-Iden	Column grid tags	21	.45	Center2
G-Note	Notes & leaders	Green	.30	Continuous
G-Revs	Revision symbol	Green	.30	Continuous
G-Sect-Iden	Section marks	Yellow	.45	Continuous
G-Symb	Annotation marks	Green	.30	Continuous
	Break lines			
	Detail marks			
G-Ttle	Detail titles	Green	.30	Continuous
Border	Border and title block	Blue	.80	Continuous
A-Detl-Hevy	For heavy lines in details and elev	Blue	.80	Continuous
A-Detl-Med1	For medium lines in details and elev	14	.53	Continuous
A-Detl-Med2	For medium lines in details and elev	Yellow	.45	Continuous
A-Detl-MedD	For medium lines in details and elev	21	.45	Dash
A-Detl-Lit1	For light lines in details and elev	Magenta	.30	Continuous
A-Detl-Lit2	For light lines in details and elev	Red	.30	Continuous
A-Detl-LitD	For light lines in details and elev	91	.30	Dash
A-Detl-Fin1	For fine lines in details and elev	Cyan	.18	Continuous
A-Detl-Fin2	For fine lines in details and elev	140	.13	Continuous
10-Hatch-.18	Hatch	8	.18	Continuous
11-Hatch-.13	Hatch - light lines	9	.13	Continuous
Viewport	Viewport	15	No Plot	Continuous

Mechanical				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
M-Chim	Chimney & stacks	52	.46	Continuous
M-Cwtr-Pipe	Chilled water: Piping	21	.45	Continuous
M-Cwtr-Eqpm	Chilled water: Equipment	Magenta	.30	Continuous
M-Elht	Electric heat systems	21	.45	Continuous
M-Exhs-Cgrl	Exhaust: Ceiling grilles	40	.45	Continuous
M-Exhs-Duct	Exhaust: Ducts	40	.45	Continuous
M-Exhs-Eqpm	Exhaust: Equipment	Red	.30	Continuous
M-Hotw-Eqpm	Hot water heating: Equipment	Red	.30	Continuous
M-Hotw-Pipe	Hot water heating: Piping	Yellow	.45	Continuous
M-Hvac-Rfeq	HVAC: Rooftop equipment	21	.45	Continuous
M-Hvac-Eqpm	HVAC: Equipment	40	.45	Continuous
M-Hvac-Door	HVAC: Equipment doors	91	.20	Continuous
M-Hvac-Odff	HVAC: Other diffusers	21	.45	Continuous
M-Hvac-Rgrl	HVAC: Return grilles	21	.45	Continuous
M-Hvac-Retrn	HVAC: Return ducts	21	.45	Continuous
M-Hvac-Supp	HVAC: Supply ducts	Yellow	.45	Continuous
M-Hvac-Sdff	HVAC: Supply diffusers	Yellow	.45	Continuous
M-Mkup	Make-up and/or outside air systems	54	.45	Continuous
M-Ngas	Natural gas: Piping	40	.45	Continuous
M-Rair	Relief air systems	54	.45	Continuous
M-Rcov	Energy recovery systems	54	.45	Continuous
M-Refg-Eqpm	Refrigeration: Equipment	Yellow	.45	Continuous
M-Refg-Pipe	Refrigeration: Piping	Yellow	.45	Continuous
ME-Cont-Wire	Control systems: Wiring and conduit	Blue	.80	Continuous
ME-Cont-Eqpm	Control systems: Equipment	Yellow	.45	Continuous

Plumbing				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
P-Domw-Cpip	Domestic water: Cold water piping	Yellow	.45	Centerx2
P-Domw-Eqpm	Domestic water: Equipment	Red	.30	Continuous
P-Domw-Hpip	Domestic water: Hot water piping and recirculating piping	21	.45	Phantomx2
P-Domw-Risr	Domestic water: Hot and cold water pipe risers	Magenta	.30	Continuous
P-Sanr-Pipe	Sanitary drainage: Piping	171	.70	Continuous
P-Sanr-Fldr	Sanitary drainage: Floor drains	Red	.30	Continuous
P-Sanr-Risr	Sanitary drainage: Risers	Magenta	.30	Continuous
P-Sanr-Vent	Sanitary drainage: Vent piping	Yellow	.45	Dashed
P-Strm-Pipe	Storm drainage: Piping	Blue	.80	Continuous
P-Strm-Risr	Storm drainage: Riser	Magenta	.30	Continuous
P-Strm-Rfdr	Storm drainage: Roof drains	21	.45	Continuous
Fire Sprinklers				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
F-Sprn-Eqpm	Fire sprinkler: Equipment	Red	.30	Continuous
F-Sprn-Clhd-Othd	Fire sprinkler: Ceiling and other heads	Yellow	.45	Continuous
F-Sprn-Pipe	Fire sprinkler: Piping	Blue	.80	Continuous
F-Sprn-Stan	Fire sprinkler: Standpipe	Red	.30	Continuous
F-Sprn-Othd	Fire sprinkler: Other heads	Yellow	.45	Continuous

Structural				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
FOOTING AND FOUNDATION PLANS				
S-Ablt	Anchor bolts	Magenta	.30	Continuous
S-Cntr	Centerline of footings or anchor bolts	91	.20	Centerline
S-Cols	Columns	Magenta	.30	Continuous
S-Fenc	Fence and posts	Red	.30	Continuous
S-Fndn-Main	Main building foundation	Yellow	.45	Continuous
S-Fndn-Minr	Foundation not associated with building	21	.45	Continuous
S-Fndn-Recs	Recess in foundation at doors and other openings	Red	.30	Continuous
S-Foot-Main	Main building footings	91	.20	Hidden2
S-Foot-Minr	Footing not associated with main building	91	.20	Hidden2
S-Mech-Pads	Mechanical pads	Red	.30	Continuous
S-Slab	Slab not associated with building	Red	.30	Continuous
S-Slab-Opng	Opening or recessed areas in slab	Red	.30	Continuous
Framing Plans				
S-Beam	Beams (wood, steel and concrete)	14	.53	Continuous
S-Cols	Columns	Magenta	.30	Continuous
S-Fram-Blck	Blocking	21	.45	Continuous
S-Fram-Gird	Girders at roof or floor framing	14	.53	Continuous
S-Fram-Jois	Roof joists, floor joists or ceiling joists	Yellow	.45	Continuous
S-Fram-Strt	Continuous strut at shear walls	Red	.30	Hidden2
S-Fram-Trus	Trussed rafters or steel trusses	Yellow	.45	Continuous
S-Obld-Blck	Overbuild blocking	21	.45	Continuous
S-Obld-Jois	Overbuild joists	Yellow	.45	Continuous
S-Obld-Trus	Overbuild trussed rafters	Yellow	.45	Continuous
S-Plan-Ceil	Floor plan background for ceiling framing	140	.13	Continuous
S-Plan-Roof	Floor plan background for roof framing	140	.13	Continuous

Telecommunications				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
T-Comm	Communication	150	.30	Continuous

Landscaping				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
L-Irrg-Covr	Irrigation: Coverage	Cyan	.18	Dashed
L-Irrg-Drip	Irrigation: Drip irrigation tubing	Magenta	.30	Dashed
L-Irrg-Eqpm	Irrigation: Equipment (pumps, etc.)	Red	.30	Continuous
L-Irrg-Ltrl	Irrigation: Lateral pipe	Green	.30	Continuous
L-Irrg-Main	Irrigation: Mainline	Blue	.80	Dashed
L-Irrg-Slve	Irrigation: Pipe sleeve	Yellow	.45	Short Dash
L-Irrg-Spkl	Irrigation: Sprinklers (rotors, heads)	Red	.30	Continuous
L-Plnt-Beds	Landscape: Perennial & annual beds	Cyan	.18	Continuous
L-Plnt-Edgr	Landscape: Planting bed edger	Red	.30	Continuous
L-Plnt-Evgr	Landscape: Evergreen trees (broadleaf)	Green	.30	Continuous
L-Plnt-Grnd	Landscape: Ground covers	Cyan	.18	Continuous
L-Plnt-Palm	Landscape: Palm trees	91	.20	Continuous
L-Plnt-Remv	Landscape: Materials to be removed	9	.13	Dashed
L-Plnt-Shad	Landscape: Shadow area	8	.18	Dashed
L-Plnt-Shrb	Landscape: Shrub symbols	Green	.30	Dashed
L-Plnt-Tree	Landscape: Trees	Green	.30	Continuous
L-Plnt-Turf	Landscape: Lawn areas	Green	.30	Continuous
L-Site	Site improvements	Magenta	.30	Continuous

Civil (suggested layer names. Site information is project specific)				
LAYER NAME	DESCRIPTION	COLOR	PLOT	LINETYPE
C-Bldg	Buildings & primary structures	Yellow	.45	Continuous
C-Comm	Communications	Magenta	.30	Dashed
C-Dfld	Drain fields	Yellow	.45	Dashed
C-Eros	Erosion & sediment control	9	.13	Dashed
C-Esmt	Easements	Red	.30	Dashed
C-Fenc	Fences	8	.18	Long/short dash
C-Fire-Undr	Fire sprinkler underground pipe	Blue	.80	Dashed
C-Ngas-Undr	Natural gas underground pipe	Yellow	.45	Dashed
C-Prkg	Parking lots	Magenta	.30	Continuous
C-Prkg-Conc	Parking lots: concrete surface	Cyan	.18	Continuous
C-Prkg-Curb	Parking lots: curb	Magenta	.30	Continuous
C-Prkg-Sign	Parking lots: signs	Yellow	.45	Continuous
C-Prkg-Strp	Parking lots: striping	9	.13	Continuous
C-Powr-Undr	Power: underground lines	Red	.30	Dashed
C-Prop	Property lines	Red	.30	Long/short dash
C-Road	Roadways	Magenta	.30	Continuous
C-Road-Cntr	Roadway centerline	Yellow	.45	Centerline
C-Rrap	Riprap	8	.18	Continuous
C-Sswr-Undr	Sanitary sewer underground pipe	21	.45	Dashed
C-Strm-Undr	Storm sewer underground pipe	Cyan	.18	Dashed
C-Swlk	Sidewalks	Magenta	.30	Continuous
C-Topo-Depr	Topography: Depression contours	Yellow	.30	Dashed
C-Topo-Majr	Topography: Major contours	40	.45	Dashed
C-Topo-Minr	Topography: Minor contours	44	.30	Dashed
C-Topo-Spot	Topography: Spot elevations	Green	.30	Continuous
C-Wall-Rtwl	Walls: Retaining	Yellow	.45	Continuous
C-Watr-Undr	Water supply system Underground pipe	Blue	.80	Dashed
C-Topo-Exst	Topography: Existing contours	246	.30	Dashed