
United States
Department of
Agriculture

**Natural
Resources
Conservation
Service**

**Part 641 Drafting and Drawings
National Engineering Handbook**

Chapter 1

**Computer Aided Design
(CAD) Standards**

Issued January 2006

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Preface

Computer Aided Design (CAD) tools are widely used by United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) employees for developing deliverables in carrying out the agency's mission of providing leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment. This document provides standards for use in the development of NRCS deliverables to ensure consistency in products nationwide.

Acknowledgments

The CAD standards provided in this document are a compilation of adaptation of technology and standards from both industry and Federal agencies. This version was prepared by the NRCS CAD Standards Development Team appointed by the Director of the Conservation Engineering Division in 2002. The team was comprised of a cross-section of NRCS employees from across the nation to provide perspectives from various CAD skill levels, usage, and all-around CAD needs for the agency. The team functioned under the leadership of the chairperson, who prepared the document with input and review from all parties.

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Chapter 1

Computer Aided Design (CAD) Standards

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641.0100 Introduction

(a) Scope

This document establishes NRCS standards for preparing Computer Aided Design (CAD) and integrally related design products within the USDA NRCS.

(b) Purpose

The purpose of this document is to set a CAD standard to ensure consistent electronic deliverables (products) within NRCS. It provides guidance for implementing the policy found in the National Engineering Manual Part 541, Drafting and Drawings. CAD standardization allows anyone in the organization to access, interpret, and disseminate information rapidly and in a uniform manner.

(c) Target systems

This document is not targeted toward any specific CAD system or software. Within the various commercially available CAD systems, many identical or related concepts are given different names. To aid users of this document, some instances of software specific examples are listed in appendix A. Any reference to software packages in this document is not an endorsement of those products.

641.0101 Graphic concepts

(a) Presentation graphics

Presentation graphics typically consist of drawing elements such as lines, arcs, shapes, text and their attributes (line color, line width, and line style). It is recommended that the drawing elements have their properties set to ByLayer/ByLevel so they utilize the line width, line type/style, and color of the layer/level they are on.

(b) Line styles

Contrasting line widths and types are used within a drawing to delineate types of information.

(1) Width

The five line widths defined below, along with options 1 through 3, are considered sufficient and should not be expanded unless an appreciable improvement in drawing clarity or contrast can be realized. Line width specification, comparison, details, and examples are shown in appendix B.

- Fine—Fine lines should be used sparingly, mostly for material indications, surface marks, hatching/patterning, fine gridlines, and minor contours. This line width typically does not reproduce well in blue-line format and/or in photocopies.
- Thin—Thin lines should be used for depicting dimension lines, dimension leader/witness lines, leader lines, line terminators, phantom lines, hidden lines, centerlines, break lines, schedule gridlines, major contours, and object lines seen at a distance.
- Medium—Medium lines should be used for depicting minor object lines, dimension text, text for notes/callouts, and schedule text.
- Wide—Wide lines should be used for major object lines, section cutting plane lines, and minor titles.

- Extra wide—Extra wide lines should be used for schedule outlines, major titles, and object lines requiring special emphasis. For large-scale details drawn at 3 inches = 1 foot or larger, the extra wide lines should be used for the object lines. Extra wide lines are also appropriate for use as an elevation grade line, building footprint, or top of grade lines on section/foundation details.
- Option 1—This line width should be used for as-built features, and separating portions of drawings.
- Option 2 and Option 3—These line widths should be used for border sheet outlines, cover sheet line work, and as an option for the designer as required.

(2) Type

Some common line types have been provided for features such as:

- existing ground surface
- bank lines in profile
- baseline
- centerline
- stations
- excavation
- fill
- existing banks
- contour lines
- work limits
- fences
- water lines
- streams

See appendix C for NRCS standard line types. Additional line types may be used if needed.

(c) Grayscale

To achieve greater contrast between features, grayscale may be utilized. When using grayscale, it is recommended that line widths be increased to the next larger width.

(d) Color

Colors should be utilized to define specific features. They are a personal preference option and are not associated with any particular drawing property.

(e) Text style

Contrasting text styles are used within a drawing to delineate types of information. Text style encompasses fonts, size, and other properties. The text type will determine the text style that is used. Text fonts and sizes shall adhere to the figures shown in appendix D. These text styles apply to the contents of the drawing and are not intended for cover sheets.

(1) Type

The following types of text shall be used:

- Notations—Notes, dimensions, and annotations shall be sentence case. An oblique font may be used for notation text; however, the font used should be consistent throughout the entire drawing set.
- Subtitles—Denotes secondary drawing elements and shall be uppercase.
- Titles—Denotes primary drawing elements and shall be uppercase.

(2) Font

In most drawings, the four fonts listed below should be sufficient.

- Proportional font—This font creates text where the characters are proportionally spaced. It is appropriate for general notes, labels, or title blocks.
- Oblique font—A slanted font is used where text needs to be easily distinguished from other text. This font can be created by using a proportional font with an oblique angle set to 22 degrees.
- Monotext font—This font creates text characters that are evenly spaced. Monotext font should be used where text fields need to be monospaced (vertically aligned), such as in schedules, tables, or similar instances.
- Filled font—Filled fonts are used primarily for cover sheets.

(3) Size

Drawing text size for each type of text should be consistent throughout the drawing set.

(f) Border sheets

Custom NRCS border sheets have been created to ensure consistency within the agency's drawing sets. These sheets are available through the National Design, Construction, and Soil Mechanics Center (NDCSMC) Web site.

(1) Sheet size

All drawings in a set shall be prepared on the same size sheets. Sheet sizes used within NRCS are identified in NEM Part 541, Drafting and Drawing Policy.

(2) Title block

Title block sheets used with NRCS drawings are identified in NEM Part 541, Drafting and Drawing Policy. The text font used in the project identification information shall be consistent with the drawing text. Title block fonts should be consistent throughout the drawing set.

(g) Drawing scales

All drawing objects should be drawn at full scale (1=1) and plotted at the selected scale. Standard bar and graphic scales will be included in the standard block/cell libraries provided.

(h) Dimension styles

Dimensions must be accurate and adequate. Care must be taken to show a single dimension only once in its proper location. Avoid the tendency to over dimension. Dimensioning examples and dimension style settings are shown on appendix E, figure 1. Dimension style naming convention is shown on appendix E, figure 2.

(1) Placement

Generally, dimensions should be located outside of the object being dimensioned. This minimizes clutter and overlap with other graphics. Dimensions outside the object should be located at the top and/or the right side of the object whenever possible. When dimen-

sions must be shown on the interior of the object, they should be arranged for clarity and consistency.

(2) Terminators

Terminators define the junction between a dimension line and the extension lines leading to the start and finish of the dimension. These terminators are in the form of a leader arrow or a short slanted line (slash). Consistency in terminator form should be achieved throughout the drawing set.

(3) Text style and location

Dimension text style shall match the text style in the drawing. Where possible, the text should be centered and above the dimension line, as well as aligned with the dimension line. The text shall be readable from the bottom of the sheet or right hand side of the sheet.

(4) Leader lines

Leader line terminators should be consistent with dimensioning settings. Either straight or spline leader lines may be used; however, they shall be consistent throughout the drawing.

641.0102 Drawing file organization

(a) Directory structure

Organizing drawing files within project directories should provide a convenient and clear structure for file management. A typical directory structure may include the following:

(Drive):\Projects\State\County\Project Identifier\User Definable Filename

(b) Electronic drawing file naming

Naming electronic drawing files allows CAD users to determine the contents of a drawing without actually displaying the file. Following is a suggested file naming example:

{Two-letter state abbreviation}{Fiscal Year}{project identifier}

(c) Standard drawing identification

(1) National drawings

Digitized/Scanned National Standard Drawings are identified by filenames based on the existing engineering standard (ES) drawing numbers, as outlined in Design Note 18, Group A – Schedules of National Standard Detail Drawings.

(2) State drawings

As developed, these drawings should be identified by the following:

Two letter state abbreviation-user definable (practice code and drawing description)

(d) File transfer

When transferring project files to another office, it is suggested that the project name and/or file names be renamed to reflect that it is no longer the official copy of the project. Special attention should be given to en-

sure that all associated referenced and support files are transferred with the project files or are available to the recipient.

(e) File archiving and storage

The General Manual Title 120, Part 408, Subpart B gives the policy for file maintenance of electronic drawings. Files should be stored in a location where they will be backed up and archived according to State practices. Electronic records must be easily retrievable until their authorized disposition date. When automated systems are upgraded or replaced, action must be taken to ensure that records continue to be usable until their authorized disposition date. Disposition schedules are provided in General Manual Title 120, Part 408, Subpart D, NRCS Records Guide.

641.0103 Layer/level assignments

(a) Layer/levels

CAD layers or levels are analogous to overlays in manual drafting systems and serve to separate graphic elements (lines, shapes, and text) according to the design discipline they represent. They are used to optimize efficiency and organization of the drawing. Appendix F gives a detailed explanation of abbreviations for layer/level naming.

(1) Naming convention

A naming convention needs to allow for easy filtering and should be descriptive of the objects on that layer/level. The layer/level naming system defined below is based on conventions presented by the American Institute of Architects (AIA) and the CADD/GIS Technology Center, Vicksburg, Mississippi. This method allows similar items to be grouped together. It allows for filtering of layer/level names in the layer manager to display customized lists of layers/levels.

This method consists of:

- a single character *discipline code* (C for civil site, W for civil works, S for structural)
- a four-character *major group* (Plan for plans, Prof for profiles)
- an additional four-characters for a *minor group*
- an additional four character *additional descriptor* to further differentiate items within the minor group

A period is used as a delimiter between the group descriptors.

Example of layer/level naming convention:

C.Topo.Ognd.Indx

This example has:

C = civil site (*discipline code*)

Topo = topography (*major group*)

Ognd = original ground surface (*minor group*)

Indx = index contours (*additional descriptor*)

641.0104 Symbology

(a) Symbology library

CAD software packages include common industry standard symbology, as well as allowing the user to define custom symbology. An NRCS standard symbology library will be provided to enhance productivity and ensure uniform drawing standards within the agency. This library will contain custom block/cell, hatching/patterning, and line types/styles. Links to the library can be found on the NDCSMC Web site.

(1) Block/cell

A block/cell is a group of graphical elements that can be manipulated as a single entity. Blocks/cells are saved for efficient repetitive use in more than one drawing, and therefore, enhance productivity and provide an excellent opportunity for CAD standardization. Blocks/Cells are saved in a separate file as part of a symbol library. They should be created at a 1:1 scale with a base point of 0,0,0 and inserted into the drawing at a scale that corresponds to the drawing plotting scale.

(2) Hatching/patterning

Hatching/patterning is defined as repeated drawing elements (lines, dot, circles) within a defined area.

(3) Line types/styles

Line types/styles are a graphical representation of linear drawing features.

641.0105 Implementation tools

National tools will be available to implement these standards. These tools may include:

- drawing templates
- prototypes
- title blocks
- symbology files (custom line types/styles, block/cell libraries, and custom hatching/patterning files)
- charts and tables that include calculated settings for text and dimension styles
- expanded layer/level naming conventions
- example field code format and symbology
- documentation explaining how to use the above mentioned tools

Links to these tools are available on the NDCSMC Web site.

641.0106 References

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Appendix A

Interchangeable Terminology

Interchangeable Terminology		
AutoCAD	MicroStation	Definition
64-bit floating point d/b	Integer d/b	The method for storing drawing attribute data.
Memory-based	Disk-based	Where drawing data are stored until the active file is closed.
User Coordinate System (UCS)	Auxiliary Coordinate System (ACS)	An XYZ coordinate system where the origin is selected by the user.
Current	Active	File or object in use.
Block	Cell	Single or multiple entities grouped together to create a single element.
Dimensions styles	Dimension attributes	Controls the appearance of dimension elements.
.dwg	.dgn	A DOS-based extension for drawing files.
Explode	Drop	Converts an element into multiple entities.
Dragmode/rubberbanding	Dynamic update	Display of elements(s) being drawn or modified as pointer/cursor moves on the screen.
Entity	Element	A single object contained in a drawing.
Zoom all	Fit	Displays all graphics currently in the drawing file.
World Coordinate System/Origin	Global origin/ design cube	Defines the location(s) of all entities in a design/drawing using the Cartesian coordinate system.
Select/pick	Identify/accept	Entity or entities chosen for manipulation or modification.
Slide	Image	A screen capture of graphics in raster format.
Command prompt	Key entry field	Allows for keyboard input from users.
Object snap (Osnap)	Key point snap	Controls the selection location for entities.
Layers	Levels	Used as transparent overlays for display graphics.
Linetype	Line style	Defines the appearance of lines.
Polyline	Linestring	Connected line segments.
Pickbox	Locate tolerance	Identification/selection limits for the drawing cursor.
ARX/AutoLISP	MDL/Visual BASIC	System-specific command language.
Status line	Message field	Displays current drawing status and/or text output from the application.
Insertion point	Monument point	Benchmark point used to place objects in a drawing.
Move	Move element	Relocation of entities.
Hatching	Patterning	To fill an area within a drawing with a symbolic texture.
Coordinate entry	Precision key in	User-defined XYZ values.
External reference	Reference file	A design/drawing file attached to an active drawing.
Prototype drawing	Seed file	A drawing design template file.
Pointing/pick point	Tentative/Data point	A point within the drawing selected using a pointing device.
Redraw/Regenerate	Update	Refereshes screen display.

Appendix B

Line Width/Weight

Figure B-1 Comparison of line widths/weights

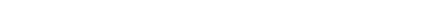
Comparison of Line Widths					
Line Thickness	Leroy Pen Designation	(mm)	(in.)	Microstation Line Weight	Line Weight Example
Fine	0000	0.18	0.007	wt = 0	
Thin	000	0.25	0.010	wt = 1	
Medium	0	0.35	0.014	wt = 2	
Wide	1	0.50	0.020	wt = 3	
Extra Wide	2.5	0.70	0.028	wt = 5	
Option 1	3.5	1.00	0.040	wt = 7	
Option 2	n/a	1.40	0.055	wt = 10	
Option 3	n/a	2.00	0.079	wt = 15	

Figure B-2 Line width/weight examples

Line Width/Weight Examples			
Line Thickness	Examples of Typical Usage	Line Width/Weight for 8.5" x 11" (Size A) 11" x 17" Sheets (Size B)	Line Width/Weight for 22" x 34" Sheets (Size D)
Fine	Fine Grid Lines Hatching/Patterning Minor Contours Material Indications Surface Marks	0.004 (in.) 0.09 (mm)	0.007 (in.) 0.18 (mm)
Thin	Dimension Lines Leader Lines Line Terminators Schedule Grid Lines Major Contours Phantom Lines Hidden Lines Centerlines Break Lines	0.005 (in.) 0.13 (mm)	0.010 (in.) 0.25 (mm)
Medium	Minor Object Lines Notations	0.007 (in.) 0.18 (mm)	0.014 (in.) 0.35 (mm)
Wide	Section Cutting Plane Lines Subtitles Major Object Lines	0.010 (in.) 0.25 (mm)	0.020 (in.) 0.50 (mm)
Extra Wide	Titles Schedule Outlines Special Emphasis Object Lines Large Scale Details	0.014 (in.) 0.35 (mm)	0.028 (in.) 0.70 (mm)
Option 1	Partitioning Lines Asbuilt Features	0.020 (in.) 0.50 (mm)	0.040 (in.) 1.00 (mm)
Option 2	Border Sheet Outlines Cover Sheet Linework	0.028 (in.) 0.70 (mm)	0.055 (in.) 1.40 (mm)
Option 3		0.040 (in.) 1.00 (mm)	0.079 (in.) 2.00 (mm)

Appendix C

NRCS Standard Line Types

<u>Sample Line</u>	<u>Line Style Name</u>	<u>Line Use</u>
	Continuous	A solid line for most drawing purposes.
	Bank_Profile	Bank line in a profile view.
	BK	Bank line in a plan view.
	BORDER	Border of unknown type.
	BU	Buried utility line (label type of utility).
	CL	Centerline of structure in a plan view, or alignment.
	CLXS	Centerline in a section or profile sheet.
	County_Line	County boundaries.
	Diversion	Diversion in a plan view.
	FC	Existing fence in a plan view.
	Fence_New	Indicates fence to be constructed.
	Fence_Remove	Indicates existing fence to be removed
	FL	Stream flow line.
	FL1	One dot flow line.
	FL2	Two dot flow line.
	FLProfile	Flowline profile.
	Ground	Ground line in a section view.
	Ground_Profile_Minor	Ground line in a profile view.
	Culvert_Existing	Existing culvert.
	Culvert_New	New Culvert
	GRID1	Large Gridline.
	GRID2	Small Gridline.
	HIDDEN	Hidden line in all views.
	PHANTOM	Phantom line in all views.
	Terrace	Terrace in a plan view.
	Tile_Existing	Existing tile line in a plan view.
	Tile_Proposed	Proposed tile line in a plan view.
	Township_Line	Township boundary.
	RR_Tracks	Railroad tracks.
	RR_Tracks_Abandoned	Abandoned railroad tracks.
	Water_Line	Underground water line.
	Work_Limits	Work limits on a plan view.
	STANDARD	Multi-line style, default.
	DIRTROAD	Multi-line style, dirt road on location map.
	RoadImproved	Multi-line style, improved road on location map.
	RoadPaved	Multi-line style, paved road on location map.
	Open_Ditch	Multi-line style, open ditch on plan view.
	Open_DitchC	Multi-line style, open ditch to be cleaned on plan view.

Appendix D

Text Sizes and Styles

Figure D-1 Text style types and sizes

Type of Text	22" x 34" Drawing (ANSI Size D)		8.5" x 11" Drawing (ANSI Size A) 11" x 17" Drawing (ANSI Size B)	
	Plotting Text Height	Plotting Text Weight	Plotting Text Height	Plotting Text Weight
Notation (Option A)	0.125" (1/8")	0.35 (mm) 0.014 (in.)	0.063" (1/16")	0.18 (mm) 0.007 (in.)
Notation (Option B)	0.156" (5/32")	0.35 (mm) 0.014 (in.)	0.078" (5/64")	0.18 (mm) 0.007 (in.)
SUBTITLE	0.188" (3/16")	0.50 (mm) 0.020 (in.)	0.094" (3/32")	0.25 (mm) 0.010 (in.)
TITLE	0.219" (7/32")	0.70 (mm) 0.028 (in.)	0.109" (7/64")	0.35 (mm) 0.014 (in.)

Figure D-2 Text style naming

AutoCAD Template drawings contain preset text styles for varying scales. The text style name reflects the intended scale and sheet size as well as the type of text that is used.

```

graph TD
    A[010xB_Notation(A)] --- B[010xB]
    A --- C[_Notation(A)]
    B --- D[Drawing Scale]
    C --- E[A]
    C --- F[Notation]
    E --- G[Sheet Size]
    F --- H[Type of Text]
    
```

Text that is placed in modelspace needs to be inserted based on the plot scale of the view.
 Example: Use the 010xB_Notation(A) text style for text that is placed in modelspace which is intended to appear in a viewport plotted at a 1"=10' scale on an (ANSI Size B) 11" X 17" size drawing.
 Use the 001x version of a text style for paper space dimensioning.

Figure D-3 Text style fonts

<p>Proportional Font: A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z</p> <p>In AutoCAD, use the RomanS (Roman Simplex) font with a width of 1.0. In Microstation, use Font #1.</p>
<p><i>Oblique Font:</i> A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z</p> <p>In AutoCAD, use the RomanS font with the Obliquing Angle set to 22 degrees. In Microstation, use Font #23.</p>
<p>Monotext Font: A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R S, T, U, V, W, X, Y, Z</p> <p>In AutoCAD, use the Monotxt font. In Microstation, use Font #3.</p>
<p>Filled Font: A,B,C,D,E,F,G,H,I,J,K,L,M,N,O,P,Q,R,S,T,U,V,W,X,Y,Z</p> <p>In AutoCAD, use the Swis721 BlkBT. In Microstation, use Font #43.</p>

Figure E-1 Dimensioning examples and style settings

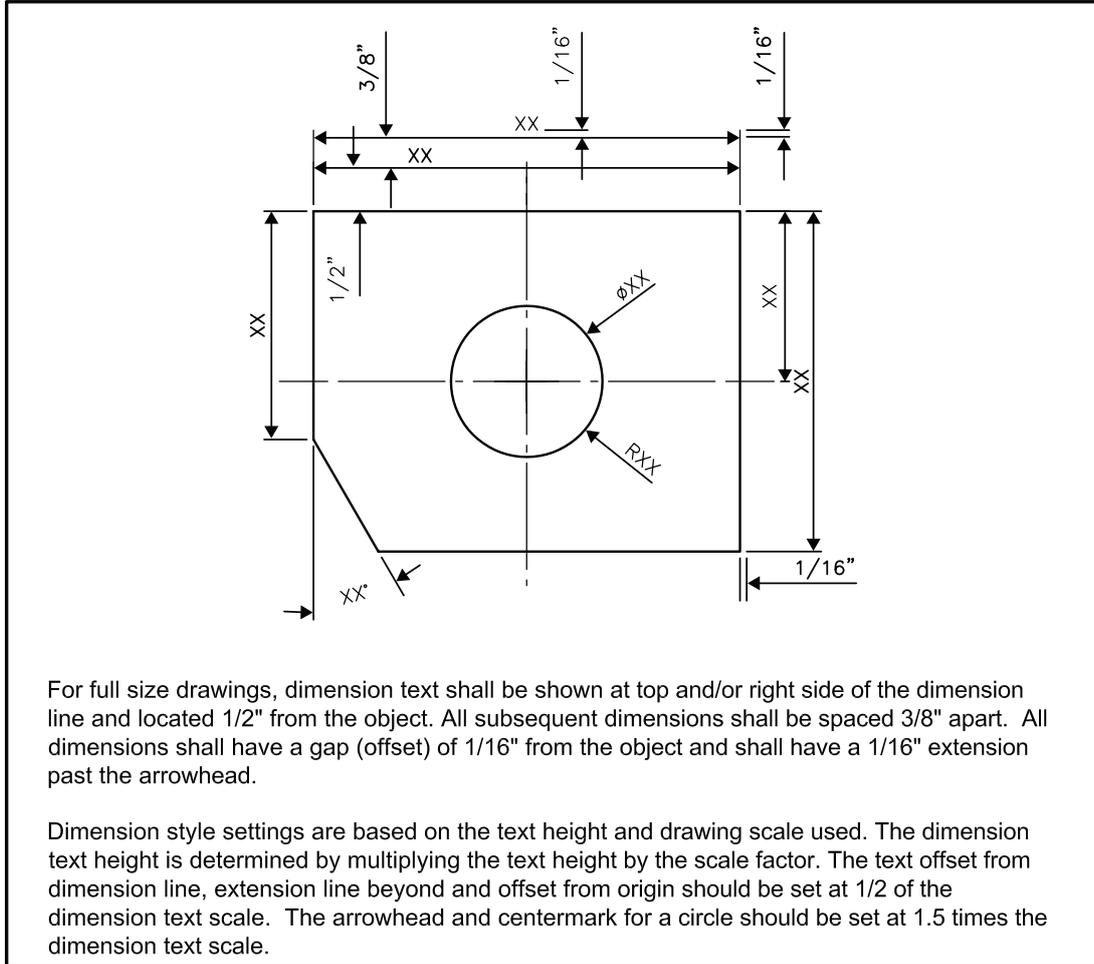
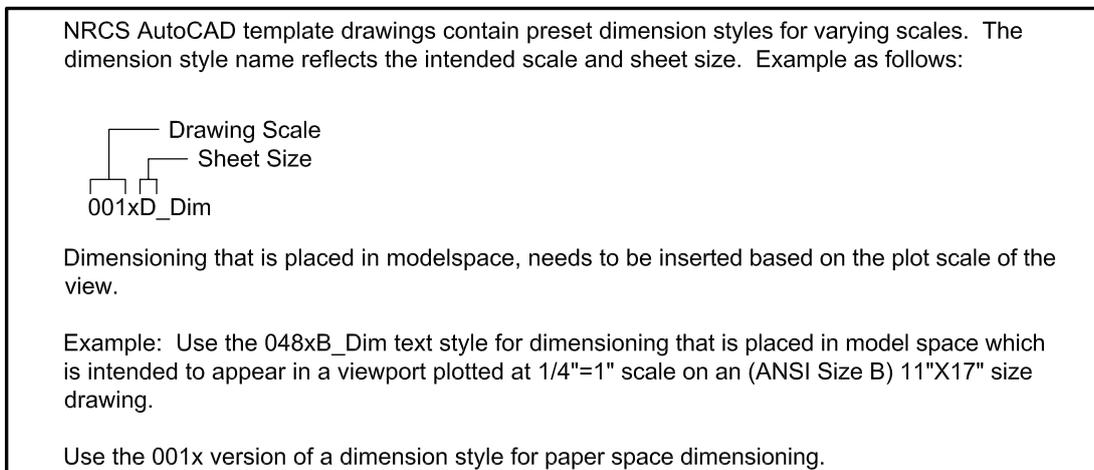


Figure E-2 Dimensioning style naming



Appendix F

Layer/Level Naming (Explanation of Abbreviations)

Layer/ Level Name Position	Abbreviation	Explanation
Separate	O	AutoCAD's default layer
Separate	Defpoints	AutoCAD's default non-plotting layer
1st Discipline Code	1	Model space layers
	2	Paper space layers
	3	Grid layers
	4	Title blocks/borders
	B	Soil boring/getoechnical Info
	C	Civil site earthwork information such as contours and land forms
	S	Structure (structural concrete & steel)
	V	Survey and mapping information such as field codes and breaklines
	W	Civil works information such as pipes, drains, rock, utilities, fences
2nd Major Group	Blks	Symbols and blocks
	Bndr	Boundaries
	Brkl	Breaklines
	Clin	Centerlines
	Conc	Concrete
	Ctrl	Horizontal or vertical control
	Dims	Dimensions
	Doqs	Frames for DOQs and other image files
	Drgs	Frames for digital raster graphics (USGS maps, etc.)
	Erro	Error markers
	Fcod	Field code
	Grph	Graphs
	Grid	Gridlines and grid borders
	Hdwe	Hardware
	Htch	Hatch patterns and hatch boundaries (hatch boundaries are normally not plotted)
	Join	Joint
	Misc	Miscellaneous or un-categorized objects
	Mtch	Match lines and match line information
	Plan	Plan view objects
	Poin	Points
	Prof	Profiles and cross sections
	Prop	Property limits such as property lines, seeding and clearing and grubbing areas, and work limits
	Rebr	Rebar
	Soil	Soil and geotechnical information such as soil boring locations and profiles
	Surf	Surface information
	Tabl	Tables and related information
	Tblk	Title block items
Temp	Temporary objects that will be moved to other layers or deleted	
Text	Text	
Topo	Topographic surface modeling information such as contours, catch lines, feature lines and slope lines	
Void	Void regions	
Vprt	Viewports (this layer is normally not plotted)	
3rd Minor Group	Actu	Actual surface model
	Alin	Alignment objects (normally contains the centerline alignment of a project)
	Anod	Anodes for cathodic protection
	Area	Areas to delineate limits
	Auxs	Auxiliary spillway
	Bank	Bank lines
	Beam	Beam
	Bldg	Buildings
	Bolt	Bolt
	Bore	Soil boring & geotechnical
	Borr	Borrow area surface model
	Brdr	Borders
	Clin	Centerlines
	Clmn	Column
	Clvt	Culvert
	Cxls	Centerline cross section
	Cnst	Construction
	Conc	Concrete
	Cord	Coordinate grid surface
	Cort	Core trench
	Covr	Cover
	Ctrl	Horizontal or vertical control
	Cut_	Cut portions of surface model comparisons

Layer/ Level Name Position	Abbreviation	Explanation
3rd Minor Group	Topo	Field code attribute style of topography
	Trav	Traverse survey
	Tree	Tree
	Trsh	Trash rack
	Twall	Toe wall
	Util	Field code attribute style or Utility objects (i.e. gas, electric, water, etc.)
	Vege	Vegetation
	Wlin	Water line delineation
	Work	Work limit delineation
	Wwall	Wing wall
	Wway	Waterway
4th Additional Descriptor	Anot	Annotation (labelling of contours, etc.)
	Arro	Arrows
	Asbl	Asbuilt
	Brdr	Border on title block sheet
	Conc	Concrete
	Cord	Coordinates (northing, easting)
	Ctch	Catch lines
	Demo	Demolition
	Desc	Description of survey shot
	Dpth	Depth
	Drai	Drains
	Edge	Edges (of waterways, road, etc.)
	Elev	Elevation
	Exst	Existing
	Feat	Feature lines
	Flod	Flooded pool delineation
	Flow	Flowlines
	Grid	Grid of a topographic surface
	Hach	Slope hachures
	Htch	Hatch patterns
	Ifac	Inside face
	Indx	Index contours
	Intr	Intermediate contours
	Line	Lines
	Long	Logitudinal steel
	Mark	Tick marks
	Mfac	Mid face
	Mod	Modification
	Muuu	User defined mark layers
	Mud	Mud
	New	Planned or new objects
	Nmbr	Point number
	Norm	Normal pool delineation
	Ofac	Outside face
	Part	Border sheet partition line
	Pipe	Pipe
	Rack	Trash rack
	Ridg	Ridge
	Slop	Slope lines projected to
	Strp	Stirrup
	Ston	Stone hatch patterns (riprap)
Text	Text	
Ties	Ties	
Tin	Triangulated irregular network	
Toe	Structure/terrace toe lines	
Trks	Railroad tracks	
Uuuu	User defined contours (the user should replace the U's with numbers to indicate the elevation)	