

WASHINGTON STATE STANDARDS AND GUIDELINES FOR COMPUTER-AIDED-DRAFTING

NOVEMBER 2000

To make the most use of our time and the drafting software available, it is important to follow some standards for ease in sharing drawings statewide. A section on Washington State's Internet Homepage contains approved standard drawings and details; therefore, the following are the established standards that should be followed:

GENERAL INFORMATION

All drawings and details will be drawn to **REAL WORLD DIMENSIONS**. This allows users to add details and/or symbols without trying to manipulate the scale. Plotting/printing allows you to fit this on a standard drawing sheet (1 plotted inch = 100 drawing units means 1"=100', if units are in feet). If paper space is used the plot will be 1 plotted inch = 1 drawing unit.

Text will be either **ROMANS** in the vertical position or **ROMANS** with a 22 degree obliquing angle. This is your choice, but it should be consistent throughout the entire project. Minimum text height will be .06 in (or units). Range for small text height is 0.06 to 0.12 in., for medium text (1.5 times small text height) and for large text (2 times small text height). If using 22x34-sheet size, the minimum text height will be 0.12 for small text, 0.18 for medium text and 0.24 for large text. This allows the text size to meet national standards if the drawing is reduced 50%. The drawing shall be uncluttered and easily read.

Hatch pattern scale is sometimes hit and miss. Use your best judgment as to how it looks. Rule of thumb is hatch scale is 1/2 of plotted scale (example: plot scale is 1"=100'; therefore, hatch pattern scale is 50).

When drawing in real world dimensions, the line types may appear as continuous lines. The **LTSCALE** command will need to be changed from the default value of "1" to 1/2 of the plot scale. (Example: plot scale is 1"=100'; therefore, LTSCALE = 50).

Color and linetype to be set to **BYLAYER**. The American Standards Association recommends three line widths for finished drawings: thin, medium and thick. NRCS CAD drawings should follow this convention. The following pen sizes are recommended for making thin, medium and thick lines:

PEN ASSIGNMENTS FOR PLOT/PRINT

SIZE	COLOR	PEN	LINE WIDTH (RECOMMENDED)	*(ALTERNATE)
THIN	Color 1 (r)	7	Line width .005 in (.127 mm / Leroy size 5x0)	.002 in
THIN	Color 2 (y)	7	Line width .007 in (.18 mm / Leroy size 4x0)	.003 in
THIN	Color 3 (g)	7	Line width .010 in (.25 mm / Leroy size 3x0)	.005 in
THIN	Color 4 (c)	7	Line width .012 in (.30 mm / Leroy size 00)	.007 in
MED	Color 5 (b)	7	Line width .014 in (.35 mm / Leroy size 0)	.010 in
MED	Color 6 (m)	7	Line width .020 in (.50 mm / Leroy size 1)	.012 in
MED	Color 7 (w)	7	Line width .024 in (.60 mm / Leroy size 2)	.014 in
THICK	Color 8	7	Line width .028 in (.70 mm / Leroy size 2.5)	.020 in
THICK	Color 9	7	Line width .031 in (.80 mm / Leroy size 3)	.024 in
THICK	Color 10	7	Line width .047 in (1.2 mm / Leroy size 4)	.028 in

PEN corresponds to the **plotted** color. If using a color printer, PEN 7 would output black lines. If color is desired for the output, the PEN would be the same number as the **COLOR**.

*The alternate pen widths may be used if your printer prints the recommended lines too thick. **The standard is: Color 1 will be the thinnest line and color 10 the thickest line.**

After color 10, the pattern is repeated. Example: Color 1, 11, 21, 31...251 will have a line width of .005 in; and Color 2, 12, 22, 32 ...252 will have a line width of .007 in; etc.

DIMENSION STYLE

Name style	NRCS??	?? Would represent the plotted scale of the drawing or detail	
Dimension Line	Spacing	0.375 to 0.50	
Extension Lines	Extension	0.075	
	Origin offset	0.075	
	Center mark	0.10	
Arrows	Arrow size	1.5 times greater than small text height	
Text	Text height	0.06 to 0.12 (.12 for 22x34 sheet size) or same as small text	
	Style	romans (same as small text)	
	Vertical	Above (most common agency practice)	
	Alignment	Align with dimension line (most common agency practice)	
Scale and Colors	Text gap	0.0625	
	Overall scale	dependent on plot scale of object	
	Colors	Dimension Line Color	(0.007 in or color 2)
		Extension Line Color	(0.007 in or color 2)
	Dimension Text Color	(0.010 in or color 3)	

LAYER NAMES

Layer names should be descriptive of the objects on that layer.

These following layers can be combined and/or expanded as needed. For example: An existing fence might be on a layer called XIST-FENCE; or, a woody debris structure might be on a layer called STRUC-WOODY.

Use the main item first and expand from there. This allows better layer management since ACAD LT alphabetizes the layers. An example with expanded hatch layers might be as follows:

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HATCH-GABION
HATCH-RIPRAP
HATCH-FILL
HATCH-EXC
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New or proposed objects will have a thicker line width than existing objects. Most existing objects will have a line thickness of 0.007 in. In this case, you may want to expand layers with XIST before the main item as follows:

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XIST-DIKE
XIST-FENCE
XIST-RIPRAP
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LAYERS CONTINUED

LAYER NAME	DESCRIPTION	COLOR	LINETYPE
ARW-N	North arrow	3	
ARW-S	Section arrow	3	
BLDG	Building	6	
BORDER	Title block border	9	
BOULDER	Boulders or large rock	5	
CL	Centerline	2	center
CNTY	County lines	2	
CONLIMITS	Construction limits	8	dashedx2
CONT	Contour lines	1 and/or 2	continuous and/or contour
DEFPOINTS	<i>this layer does <u>not plot</u> even when turned on</i>		
DTCH	Ditch or creek	3	trpldot
ESMT	Easement		
FENCE	Fence line	3	
GEOLOGY	Geology information	3	
GRID	Grid lines	1 and/or 2	
HATCH	Hatch patterns	1	
HIDDEN	Hidden object lines	2 or 3	hidden
MTCH	Match lines	9	
PIPE	Pipeline	4 or 5	
PL	Property line	5	phantom
PNTS	Points	1	
PROFILE	Ground line or profile line	3	center2
REBAR	Rebar reinforcement	7	
RIPRAP	Riprap	6	
RIVER	River boundary	3	
RLRD	Railroad	2	
ROAD	Roads	3	
RW	Right-of-way	7	dashed
SCALE	Bar scale	3	
SLOPE	Slope arrows	2 or 3	
STATE	State boundary	5	
STRUC	Structures	6	
TBK	Top of bank	5 or 6	
TBM	Temporary benchmark	3	
TOE	Toe of slope	5 or 6	
TXT-L	Large text (2X small text ht)	7	
TXT-M	Medium text (1.5X small text ht)	5	
TXT-S	Small text (including dimensions)	3	
UTIL	Utilities	2 or 3	
VEGE	Vegetation	2 or 3	
XIST	Existing	2	

REFERENCES

Where to find information on agency standards and guidelines related to drafting:

- National Engineering Manual (NEM) Part 541, Drafting, (210-541)
- TR-73 Computer-Aided-Drafting Standards
- Engineering Field Manual (EFM) Chapter 5, Part 3
- National Engineering Handbook (NEH) Part 6, Chapter 4.4, Detailing reinforced concrete structures
- General Manual (GM) Part 408, Records, (120-408)
- National Map Symbol Handbook, Title 170, Part 601
- Washington State Handbook of Engineering Design Aids