

BASIC CADD DRAWING PROCEDURES

I. Set up – Electronic Drawing Environment:

- 1) SET UNITS
- 2) DETERMINE ELECTRONIC SCALE FACTOR (SF)
 - a. CALCULATE WHITE SPACE
- 3) SET LIMITS (MODEL SPACE)
- 4) ZOOM ALL, F7 (TURN ON GRID), RETRACT MOUSE ONE-CLICK
 - a. DISABLE GRID SETTINGS FOR ADAPTABILITY & EXTENDING PASTE THE “LIMITS”
- 5) SET LTSCALE (SF X .500)
- 6) CREATE LAYERS
 - a. LOAD AUTOCAD LINETYPES <*>
- 7) SET SNAP SETTING (AS NEEDED)
- 8) SET GRID SETTING (AS NEEDED)
- 9) SET APPROPRIATE DIMVARS FOR DWG. TYPE
- 10) SET DIMSCALE (DIMSCALE = ELECTRONIC SCALE)
- 11) ZOOM XP (PAPERSPACE), DISABLE PSLTSCALE = 0 (PAPER SPACE)
- 12) SAVE AS PROTOTYPE TEMPLATE (IF APPLICABLE)

II. Plan - Drawing Strategy

1. Overall structure
2. Repeated features
3. Exceptions or unique features

III. Draw - Save your work every 10-15 minutes.

1. Draw the basic structure
2. Edit as needed to refine and complete structure
3. Add unique features and details
4. Add hatching, north arrow, other special effects
5. Enter dimensions and notes

IV. Finish – Hard copy

1. Use INSERT to bring title block into Model Space
2. Use DesignCenter to bring title block into PaperSpace)
3. Use ZOOM – Extents, the ZOOM XP option to scale model to PaperSpace settings (1:1)
4. Apply plot settings to Layout Tab.
5. Add notes, bill of materials, etc.
6. Save drawing to disk
7. Plot drawing

CADD DRAWING STANDARDS

Following these drawing standards will assure consistency in your drawings.

TITLE BLOCKS (TBAL-MS, TBAP-MS, & TBAL&P-PS)

Each drawing will have a title block in Model Space (or Paperspace) on layer TITLE-BLOCK, and one or more MVIEW viewports (Paperspace only). MVIEWs shall be placed on layer VIEWPORTS.

Title block shall include the following information:

- Drawing title
- Draftsman's name
- Date of drawing
- School, class & section number
- Appropriate (correct) Scale Factor !!!

Other information may also be required for certain drawings. Spaces for text within the title block should be in multiples of .125" height. Student should prepare a set of standard title blocks (prototypes) to insert as needed, for sheet sizes A, B, C, & D. Border sizes should be determined by plotter *hard clip limits*. Each prototype should be drawn in a separate drawing file. Then when required the prototype Title Block may be inserted into the drawing and prepared for plotting.

TEXT STYLE & FONTS

Text heights (measured on the finished plotted drawing):

Name: JJC-Text, Font name: Arial.ttf, Font Style: Regular

- .0625" (1/16") minimum for plot / copy quality
- .09375 (3/32") preferred for congested drawings in general
- .125" (1/8") ANSI standard for mechanical drawings
- .1875 (3/16") Architectural (AutoCAD default dimension size) maximum

The default Text style name in AutoCAD is STANDARD. Text styles may be created by modifying the STANDARD style, or by creating a NEW text style using any of the following fonts: ROMANS, STYLUS BT, OR ARIAL. New Styles will be created during the semester and are a requirement for the course. Do not use AutoCAD's STANDARD style. When ever possible create your own text style.

Text derived from any of the script, or other "fancy" letter styles will not be accepted, except for use in logos. Text from symbol fonts will only be accepted in cases where the need for it is obvious, e.g. mapping or tolerance dimensions.

DIMENSION STYLE

Name: Archdims, Font name: Arial.ttf, Font Style: Regular (dimtxsty)

Name: Mechdims, Font name: Arial.ttf, Font Style: Regular (dimtxsty)

Dimensions shall be created using either Architectural or Mechanical style dimensions. The naming convention used for dimension styles shall be: **Mechdims** for mechanical dimensions and **Archdims** for architectural dimensions.

Your instructor will teach you how and why to set AutoCAD's dimension variables to reflect each of the two required dimension styles. The settings are reflected later in this CADD Standard.

LAYERING CONVENTIONS

Layers should be assigned for every color/line-type combination you use. You may also wish to assign layers by application function, e.g. hot wires, ground wires, etc. For this course the following layering convention shall be adhered to.

CADD 101 - LAYER STANDARD

Layer Name	Color #	Line Wt. mm	Line Type
Center-lines	1	.30	Center
Cut-border	1	.30	Border
Cut-plane	5	.60	Phantom
Dimensions	5	.30	Continuous
Exist-motion	9	.30	Phantom
Hatch-patterns	15	.25	Continuous
Hidden-lines	8	.35	Hidden
Miscellaneous	10	.30	Continuous
Object-Lines	3	.60	Continuous
Revbox	13	.60	Continuous
Revbox-text	2	.35	Continuous
Symbols	9	.35	Continuous
Tables	8	.35	Continuous
Text_0625	1	.30	Continuous
Text_0938	3	.30	Continuous
Text_1250	2	.35	Continuous
Text_1875	4	.35	Continuous
Title-block	13	.60	Continuous
Viewports	4	.30	Continuous
Your name	4	.40	DashDot

LINETYPES & LINEWEIGHTS

Line type conventions and line weights for each layer are the responsibility of the design draftsman (CAD Operator). Over the years AutoCAD users have controlled drawing line weights by assigning a thickness setting to a specific AutoCAD color.

Generally this is done by modifying AutoCAD “acad.ctb” file or designing a new *.ctb file. Both are referred to as “Color Dependant Tables”. AutoCAD also supports “style dependent tables” (*.stb) that allow for controlling of line weights to a specific entity level.

Because we do not have “write” rights to the AutoCAD color dependant tables installed here at the college, we will assign our line weights to a “by object/layer” setting. When the layers of a design drawing, or prototype template, are developed, a specific line weight can be assigned to **each layer**. **The line types & line weights shown in the table on page 3 shall be adhere to during the course work this semester.**

FILE MAINTENANCE

Drawings should be saved in your own private directory as setup during our first class on the school’s server. Drawing may be worked on at home. Use a flash-drive, or email account, to transfer your drawings back and forth to the school. All drawings must be placed on the school’s server for grade. Only the drawings on the school’s server will receive a grade. You should keep ALL drawings protected after you plotted them, as drawings are allowed to be corrected and turned in for a better grade.

PLOTTING SCALES

All drawings must be plotted to a specific scale unless instructions direct otherwise. If no scale is given, use an appropriate drafting scale following standard industry practice.

Plot assignments on A-size paper whenever feasible, to ease handling. Be sure border matches the printer’s hard-clip limits. Larger drawings with more detail can be plotted on B or C sheets, but most assigned work will fit on an A size sheet.

DRAWING CRITERIA

The following criteria strongly affect the grading of your drawings:

Clarity: Is the drawing easy to read, is the layout well organized, has good use been made of layers?

Completeness: Does the drawing contain all the necessary features, or are parts missing?

Correctness: Is the drawing accurate? Are the dimensions correct? Is the drawing a true representation of what is described?

Precision: Do lines meet? Are corners trimmed? Are there stray marks? Are there multiple lines on top of each other? Did you use snap, osnap, and other editing tools?

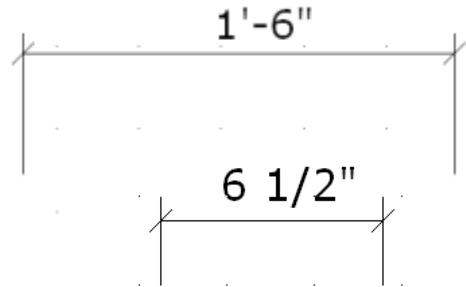
Professionalism: Did you follow specifications given in the assignment? Did you use industry standards?

Presentation: Is the drawing attractive? Did you give it a little something extra? Does it have style? Is it elegant?

Choice of subject matter: For project work and other student-selected work, the creativity and challenge level involved will greatly enhance your AutoCAD skills.

ARCHITECTURAL DIMENSION STYLE SETTINGS

Command: **dimlunit** <enter> (*Set Type, Architectural*)
Enter new value for DIMLUNIT <4>: **4** <enter>
Command: **dimtxt** <enter> (*Set Text size*)
Enter new value for DIMTXT <0'-0 3/16">: **.125** <enter>
Command: **dimtsz** <enter> (*Set Tick size*)
Enter new value for DIMTSZ <0'-0 1/16">: **.0625** <enter>
Command: **dimasz** <enter> (*Set arrow size*)
Enter new value for DIMASZ <0.1250>: **.125** <enter>
Command: **dimtad** <enter> (*Set Text above dim line*)
Enter new value for DIMTAD <1>: **1** <enter>
Command: **dimexe** <enter> (*Reduce extension overhang*)
Enter new value for DIMEXE <0'-0 1/8">: **.09375** <enter>
Command: **dimexo** <enter> (*Adjust extension line offset*)
Enter new value for DIMEXO <0.0625>: **.125** <enter>
Command: **dimzin** <enter> (*Suppress zeros*)
Enter new value for DIMZIN <7>: **7** <enter>
Command: **dimtih** <enter> (*Release horizontal hold*)
Enter new value for DIMTIH <ON>: **off** <enter>
Command: **dimtoh** <enter> (*Release horizontal hold*)
Enter new value for DIMTOH <ON>: **off** <enter>
Command: **dimfrac** <enter> (*Set to non-stacked fractions*)
Enter new value for DIMFRAC <0>: **2** <enter>
Command: **dimclrt** <enter> (*Set dimension text color to yellow*)
Enter new value for DIMCLRT <0>: **2** <enter>
Command: **dimgap** <enter> (*reduce space above dimension line*)
Enter new value for DIMGAP <0.0900>: **.06** <enter>
Command: **dim** <enter> (*Access dim: mode*)
Dim: **save** <enter> (*save the dimstyle*)
Enter name for new dimension style or [?]: **archdims** <enter>

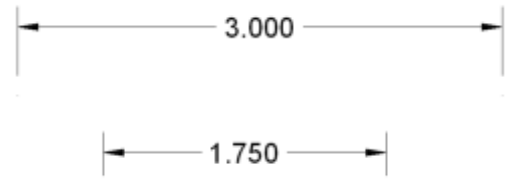


NOTES:

1. Set the **DIMSCALE** DimVar to match the scale factor for the drawing your dimension.
2. Once the DimVars are set “save” the dimstyle from the DIM: line as archdims
3. Remember to use AutoCAD’s “continue” dimensioning technique when creating architectural dimensions.
4. When performing a ‘radius’ or ‘diameter’ dimension be sure to change **DIMTIH** and **DIMTOH** to ON to cause the dimensions to be forced horizontally.
5. When a dimension appears outside its extension lines but no dimension is shown outside the extension line with it consider the various levels of **DIMTMOVE** to correctly place/adjust the dimension.
 - a. DIMTMOVE = 0 (attach dimension to dimension line)
 - b. DIMTMOVE = 1 (attach a “leader” to the dimension line when moving the dimension)
 - c. DIMTMOVE = 2 (free float the dimension without connecting to the dimension line)

CREATE MECHANICAL DIMENSION STYLE SETTINGS

Command: **dimstyle** <enter> (*Set the global scale factor*)
Enter new value for DIMSCALE <1.0000>: **1** <enter>
Command: **dimlunit** <enter> (*Set dimension type – decimal*)
Enter new value for DIMLUNIT <2>: **2** <enter>
Command: **dimdec** <enter> (*Set the linear decimal place accuracy*)
Enter new value for DIMDEC <4>: **3** <enter>
Command: **dimadec** <enter> (*Set the angle decimal place accuracy*)
Enter new value for DIMADEC <0>: **0** <enter>
Command: **dimtxt** <enter> (*Set the size of dimension text*)
Enter new value for DIMTXT <0.1800>: **.125** <enter>
Command: **dimasz** <enter> (*Set the arrowhead size*)
Enter new value for DIMASZ <0.1800>: **.125** <enter>
Command: **dimtad** <enter> (*Set dimension text inside dimension line*)
Enter new value for DIMTAD <0>: **0** <enter>
Command: **dimexe** <enter> (*Adjust extension line overhang*)
Enter new value for DIMEXE <0.1800>: **.125** <enter>
Command: **dimexo** <enter> (*Adjust extension line offset*)
Enter new value for DIMEXO <0.0625>: **.125** <enter>
Command: **dimzin** <enter> (*Suppress leading / trailing zeros*)
Enter new value for DIMZIN <0>: **7** <enter>
Command: **dimtih** <enter> (*Force inside dimensions horizontal*)
Enter new value for DIMTIH <ON>: **on** <enter>
Command: **dimtoh** <enter> (*Force outside dimensions horizontal*)
Enter new value for DIMTOH <ON>: **on** <enter>
Command: **dimgap** <enter> (*Reduce gap between dimension & dimension line*)
Enter new value for DIMGAP <0.0900>: **.06** <enter>
Command: **dimcen** <enter> (*Cause center-mark overhang*)
Enter new value for DIMCEN <0.0900>: **-.09** <enter>
Command: **dimatfit** <enter> (*Adjust to move arrows first*)
Enter new value for DIMATFIT <3>: **1** <enter>
Command: **dimtmove** <enter> (*Cause dimension to stay with dimension line*)
Enter new value for DIMTMOVE <0>: **0** <enter>
Command: **dimclrt** <enter> (*Set dimension text color to yellow*)
Enter new value for DIMCLRT <0>: **2** <enter>
Dim: **dimtxsty** <enter> (*Create & set dimension “text style” to mechdims*)
Enter new value for dimension variable <Standard>: **mechdims** <enter>
Command: **dim** <enter> (*Access dim: mode*)
Dim: **save** <enter> (*Name & Save DimStyle for later use*)
Enter name for new dimension style or [?]: **mechdims** <enter>



NOTES:

1. Set the **DIMSCALE** DimVar to match the scale factor for the drawing your dimension.
2. Once the DimVars are set “save” the dimstyle from the DIM: line as mechdims
3. Remember to use AutoCAD’s “baseline” dimensioning technique where possible when creating mechanical dimensions.
4. Adjust **DIMGAP** (override) when dimensions appear to pop outside the dimension’s extension lines to get the dimension to return to “home” position.
5. When a dimension appears outside its extension lines but no dimension is shown outside the extension line with it consider the various levels of **DIMTMOVE** to correctly place/adjust the dimension.
 - a. DIMTMOVE = 0 (attach dimension to dimension line)
 - b. DIMTMOVE = 1 (attach a “leader” to the dimension line when moving the dimension)
 - c. DIMTMOVE = 2 (free float the dimension without connecting to the dimension line)