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**LAB #4 FORMAT A CAD DRAWING TEMPLATE FROM SCRATCH (acad.dwt)**

LEARNING OBJECTIVES:

STUDENT WILL BEGIN TO

1. LEARN THE CONCEPT OF CREATING CUSTOM CAD TEMPLATES USED TO SAVE TIME AND STANDARDIZE THE CAD DRAWING LAYOUTS. ENGINEERING COMPANIES USE CUSTOM BUILT TEMPLATES TO CONTROL THE GRAPHICS AND ANNOTATION STYLES USED ON DRAWINGS, WHILE THERE ARE SOME INDUSTRY CAD STANDARDS SET BY THE **AMERICAN INSTITUTE OF ARCHITECTS (AIA)** THE STANDARDS VARY FROM COMPANY TO COMPANY
2. CREATE A BASIC CAD TEMPLATE TO BE USED FOR THIS COURSE

[VIDEO LINK LAB #4](#)

**DEFINE THE FOLLOWING TERMS:**

ANNOTATION

LAYERS

UNITS

TEXT STYLE

DIMENSION (DIM) STYLE

MULTILEADER

**OPEN AND SAVE A BLANK CAD FILE (.DWT) FIG. 4.1**

START NEW FILE---SELECT FILE --OPEN--OPEN NEW FILE -- **acad.dwt** ----FILE ---SAVE AS (CAD-TEMPLATE.dwg)

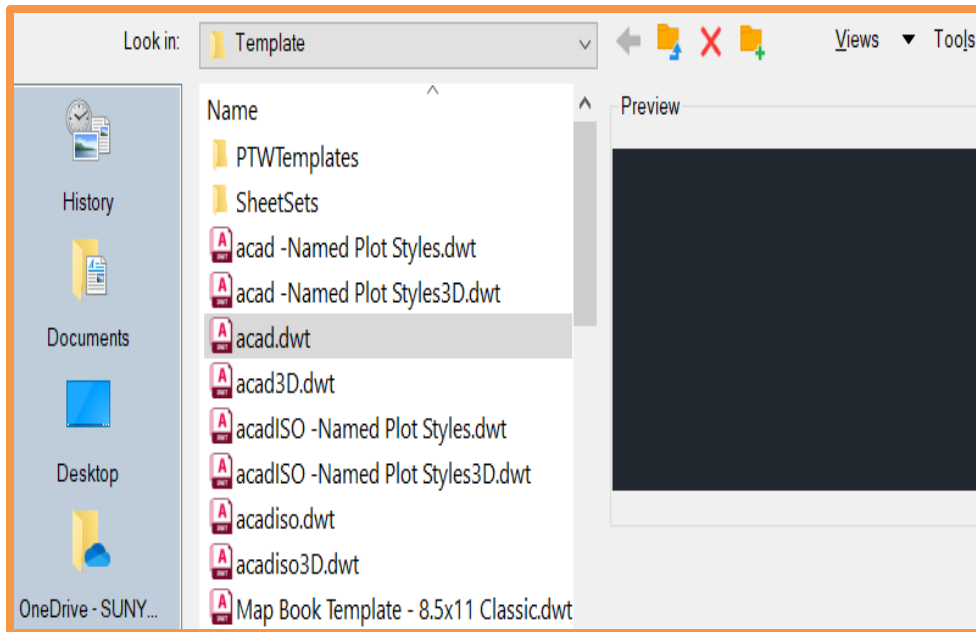


FIG-4.1

**NEW LAYERS** FIG. 4.2

BE SURE TO TURN ON YOUR PULLDOWN MENU FOR THIS LAB (ENTER MENUBAR IN THE COMMAND LINE AND CHANGE THE NUMBER FROM 0 TO 1

START WITH FORMAT PULLDOWN MENU---**LAYERS**---**CREATE LAYER NAME**---**CHANGE COLOR**---  
AND **LINE TYPE** IF APPLICABLE:

CREATE NEW LAYER BY RIGHT CLICK (RC) AND SELECT NEW LAYER OR SELECT NEW LAYER  
BUTTON

TYPE THE LAYER NAME EX. (OBJECT, DIM, TEXT)

LEFT CLICK (LC) THE COLORED BOX AND CHOOSE THE CORRECT COLOR FOR THE LAYER WHICH  
IS GIVEN BY YOUR INSTRUCTOR.

MANY COMPANIES USE THE "AIA LAYER STANDARDS OR CHOOSE THEIR OWN. YOU MUST USE  
THE STANDARDS GIVEN BY THE INSTRUCTOR FOR THIS COURSE, FAILURE TO DO SO WILL CAUSE  
GRAPHIC PRESENTATION PROBLEMS WHEN PLOTTING YOUR DRAWINGS. THIS WILL BE  
DISCUSSED IN MORE DETAIL WHEN YOU SET UP THE PEN ASSIGNMENTS (PLOT STYLE TABLES)  
IN THE (**PLOTTING IN CAD LAB**). WE WILL USE ONLY COLORS 1 THRU 8 AS IDENTIFIED IN EACH  
ASSIGNMENT

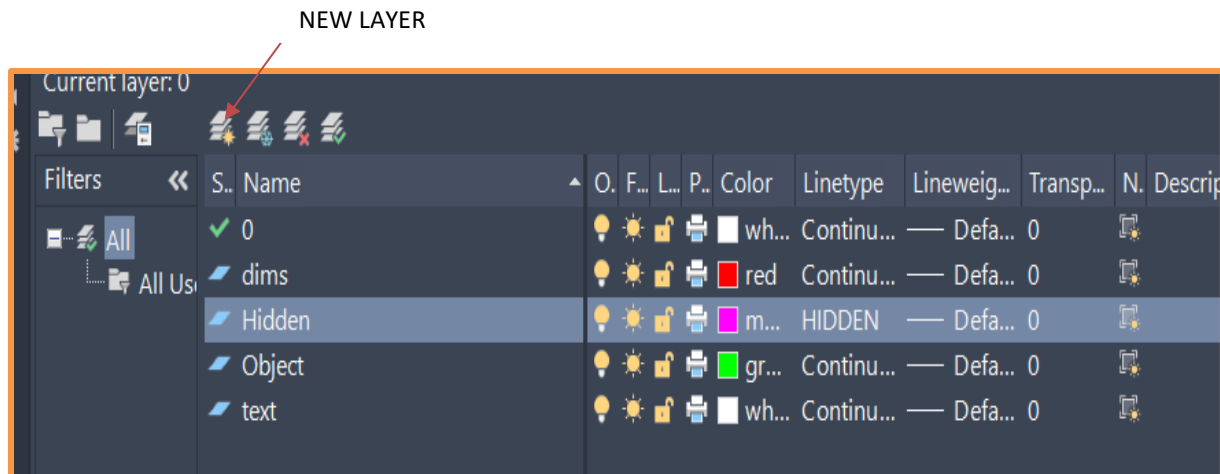


FIG 4.2

| <u>LAYER NAME</u> | <u>LAYER COLOR</u> | <u>LAYER LINETYPE</u> |
|-------------------|--------------------|-----------------------|
| OBJECT            | GREEN              | CONTINUOUS            |
| TEXT              | WHITE              | CONTINUOUS            |
| DIMS              | RED                | CONTINUOUS            |
| HIDDEN            | MAGENTA            | HIDDEN                |
| VPORT             | RED                | CONTINUOUS            |

LAYER "0" IS OFTEN RESERVED FOR MISCELLANEOUS OBJECTS THAT DON'T NECESSARILY NEED A SPECIFIC LAYER ALL TO THEMSELVES.

### **FORMAT DRAWING UNITS** \_FIG. 4.3

FORMAT---UNITS----DECIMAL---PRECISION = AS INDICATED ON DRAWING FOR EX. 0.00  
 ARCHITECTURAL UNITS ALLOWS THE INPUT OF FOOT ( ' ) AND INCH ( " ) MARKS IN THE  
 COMMAND LINE AND DYNAMIC INPUT (DYN) INPUT

THE UNITS COMMAND CAN ALSO BE USED TO FORMAT PRECISION UNIT TYPE COORDINATES  
 INSERTION SCALE AND LIGHTING INTENSITY.

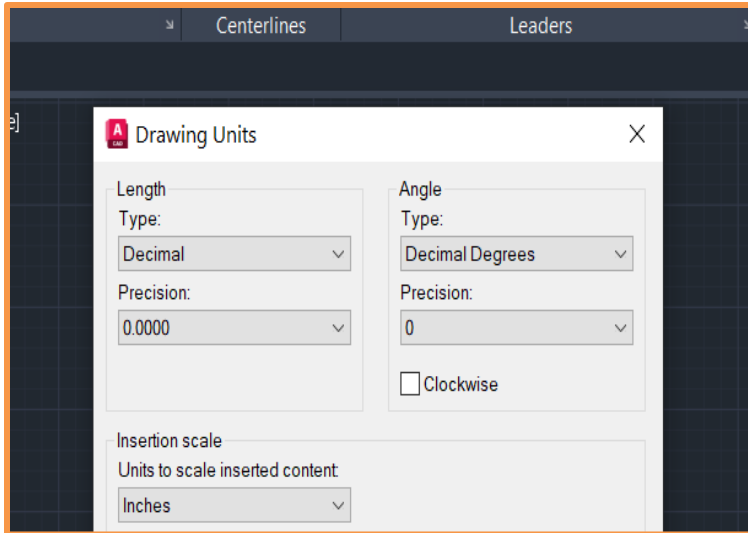


FIG. 4.3

**UNIT TYPES:**  
 DECIMAL  
 ARCHITECTURAL  
 ENGINEERING  
 FRACTIONAL  
 SCIENTIFIC

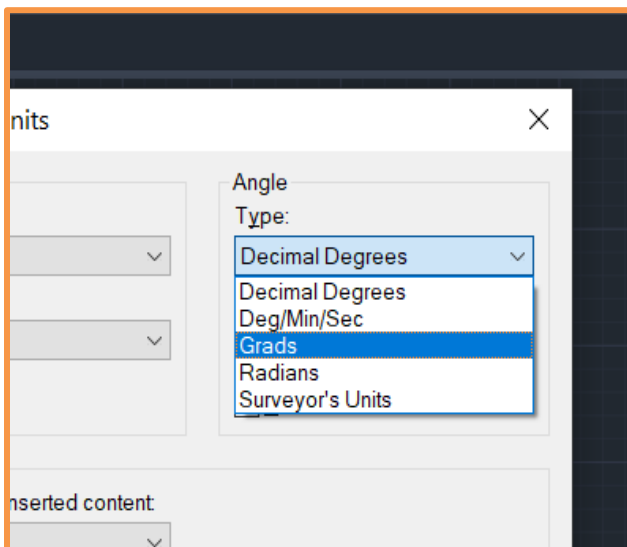


FIG. 4.4

**ANGLE TYPE:** FIG 4.4  
 OPTIONS SUCH AS SURVEYOR'S  
 UNITS, GRADS ARE ALSO FOUND  
 UNDER UNITS DIALOG BOX

**FORMAT TEXT STYLE** FIG. 4.5

NAME EACH TEXT STYLE: EX. **48\_ARIAL**, (THE 48 IS THE SCALE FACTOR (SF) AND SIMPLEX IS THE FONT STYLE) WE WILL CONINUE DISCUSS THE SCALE FACTOR AND TEXT SIZE IN MORE DETAIL IN ANOTHER LAB.

REMEMBER THAT SCALE FACTOR COMES FROM THE DRAWINGS SCALE FOR EXAMPLE:  
**(1/4"=1'-0") 1/4" x 1/12" = 48 (SF/SCALE FACTOR)**

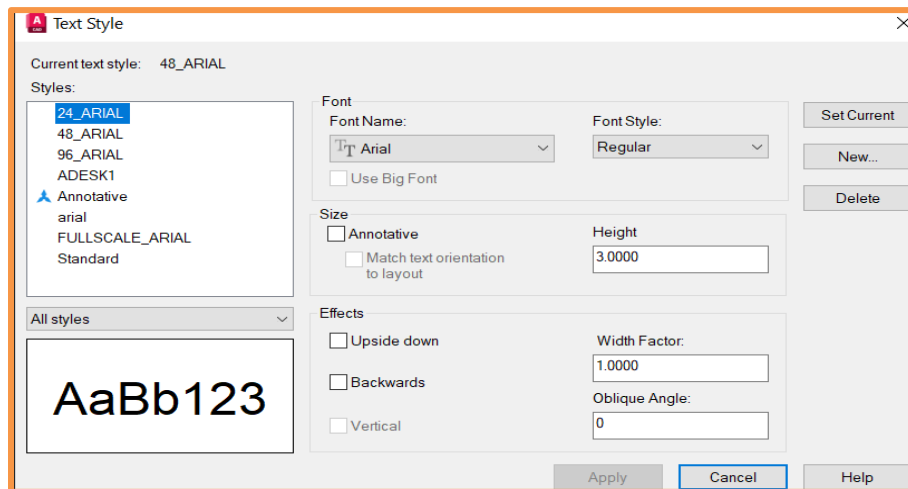


FIG 4.5

CREATE A STYLE FOR **24, 48, 96 & FULL\_SCALE** (.125 TEXT HEIGHT WHEN PLOTTED)  
 METHOD FOR DETERMINING THE TEXT HIEGHT FOR THE NEW TEXT STYLES YOU ARE FORMATING:

**EXAMPLE:**

$$1/2" = 1'-0"$$

$$1/2" \times 1/12" = 1/24$$

24 x .125 (1/8") = 3" IS THE TEXT HIEGHT FOR A **(1/2" = 1'-0')** SCALE DRAWING

**EXAMPLE:**

$$1/4" = 1'-0"$$

$$1/4" \times 1/12" = 1/48$$

48 x .125 (1/8") = 6" IS THE TEXT HIEGHT FOR A **(1/4" = 1'-0')** SCALE DRAWING

**EXAMPLE:**

$$1/8" = 1'-0"$$

$$1/8" \times 1/12" = 1/96$$

96 x .125 (1/8") = 12" IS THE TEXT HIEGHT FOR A **(1/8" = 1'-0')** SCALE DRAWING

**EXAMPLE:**

1"=1" (FULL-SCALE)

1" x .125 (1/8") = 1/8" IS THE TEXT HIEGHT FOR A (1"=1") SCALE DRAWING

**FORMAT DIMENSION STYLE (REPEAT FOR 48, 96, & {FULL SCALE=1 ON FIT TAB}): FIG. 4.6**

**STYLE NAME:** 24\_SCALE (THE 24 IS THE SCALE FACTOR)

**LINES TAB:** SET DIMENSION LINES AND EXTENTION LINES TO -BYLAYER. THIS WILL MAKE THE DIMENSIONS THE COLOR OF THE LAYER THEY ARE PLACED ON.

**SYMBOLS /ARROWS TAB:** ARROW SIZE = .125 (1/8")

**TEXT TAB:** TEXT COLOR = WHITE, TEXT HIEGHT = .125 (1/8")

**FIT TAB:** USE OVERALL SCALE FACTOR OF 24

**PRIMARY UNITS TAB:** ARCHITECTURAL FORMAT WITH 1/16" PRECISION. FOR THE FULL\_SCALE DIM STYLE USE DECIMAL FOR THE PRIMARY UNITS.

SELECT THE LINES TAB FIRST CHANGE EXTEND BEYOND DIM LINES TO .125 (1/8")

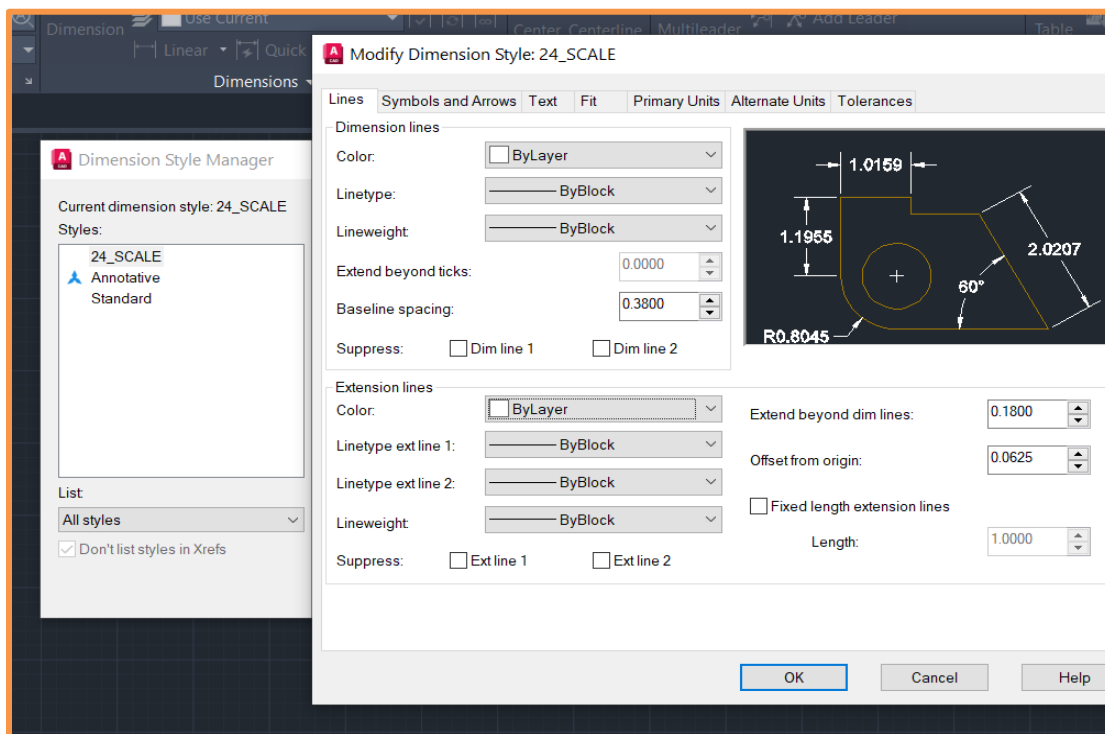


FIG.4.6

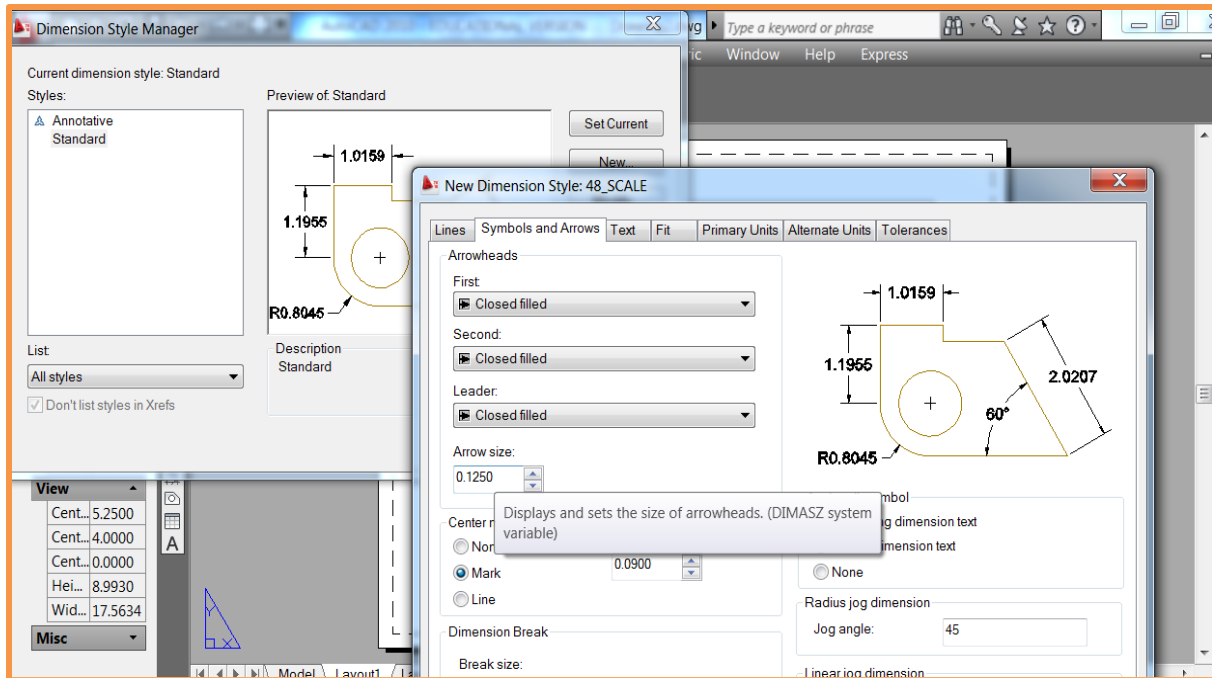


FIG 4.7

**SELECT THE TEXT TAB ENTER .125 FOR TEXT HEIGHT AND CHANGE TEXT COLOR TO WHITE**  
 FIG. 4.8

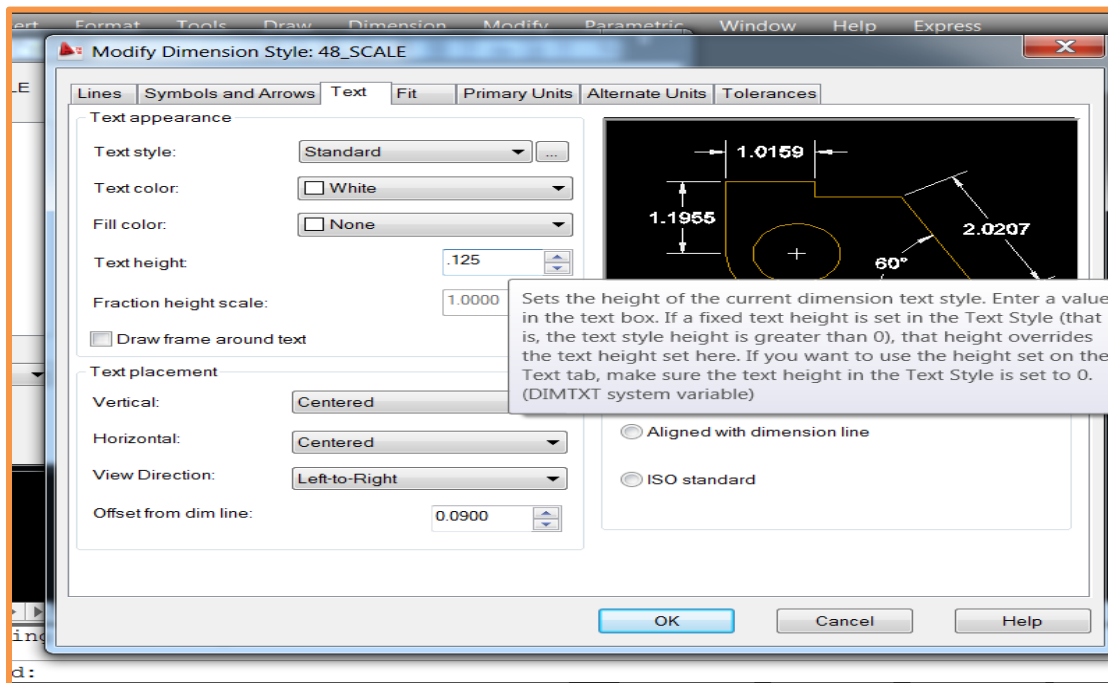


FIG 4.8

**SELECT THE FIT TAB** FIG. 4.9

THIS IS WHERE WE CHANGE THE PHYSICAL/ACTUAL HIEGTH AND OR SIZE OF THE TEXT, ARROWS, EXTENSIONS LINES. BY ENTERING THE SCALE FACTOR IN “USE OVERALL SCALE OF” WE ALLOW THE SOFTWARE TO CALCULATE THE CORRECT SIZE FOR YOUR SCALE ON ITS OWN. AUTOCAD HAS A CALCULATOR BUILT IN THAT IS TAKING YOUR SCALE FACTOR AND MULTIPLING IT BY THE SIZES YOU PUT IN THE TEXT/ARROWS/DIM LINES (.125) RESULTING IN THE CORRECT SIZE WHEN PLOTTED.

IN THIS EXAMPLE THE OVERALL SCALE OF **48** IS MULTIPLIED BY .125 SO THAT THE TEXT AND ARROWS WILL BE DRAWN AT 6” IN THE MODEL SPACE. WHEN YOU SCALE THE VIEWPORT IN PAPER SPACE THE TEXT/ARROWS WILL PRINT AT THE .125-1/8” SIZE THAT WE ARE STRIVING FOR WHEN WE GET THE HARD COPY

IN THIS EXAMPLE WE ARE USING **1/4”=1’-0”** WHICH HAS A SCALE FACTOR (SF) OF 48 (**1/4 X1/12=1/48**) OR **48**

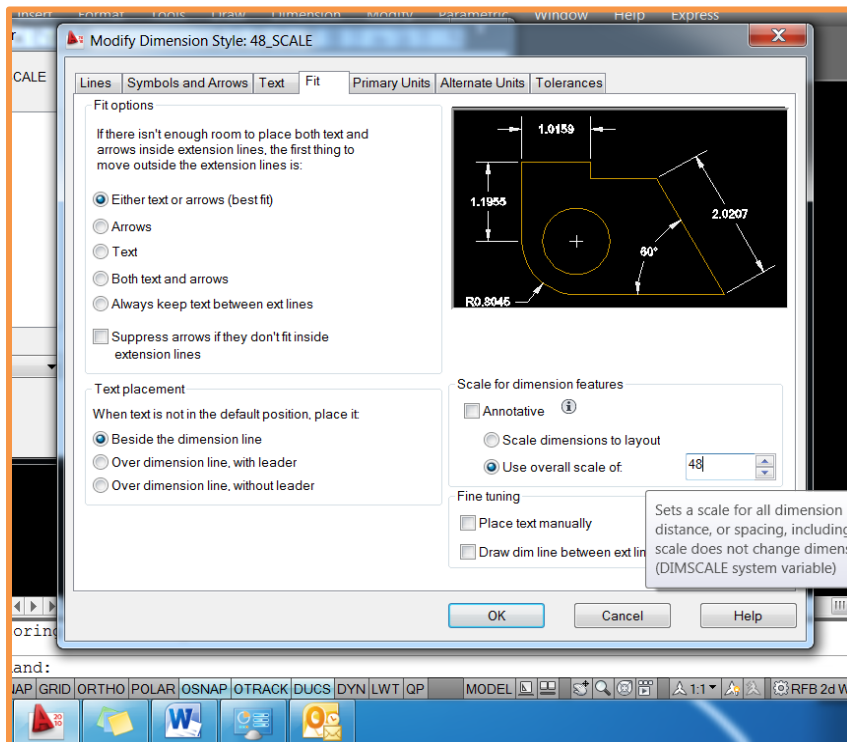
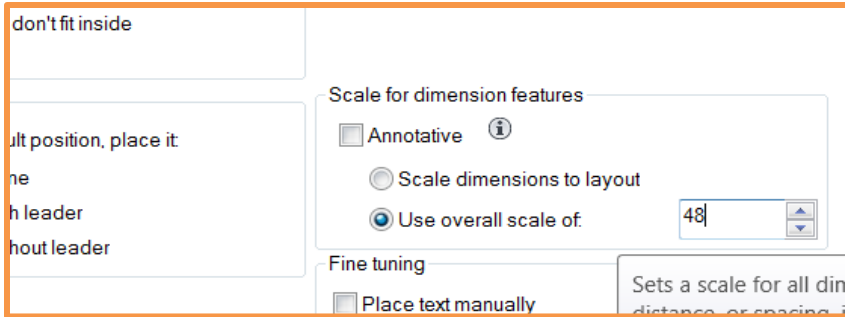


FIG 4.9





### PRIMARY UNITS TAB FIG. 4.10

CHANGE UNIT FORMAT TO DECIMAL OR ARCHITECTURAL, DEPENDING ON DRAWING UNITS

THIS CHANGE WILL MAKE THE DIMENSIONS SHOW UP ON THE SCREEN WITH THE ( ' ) AND ( " ) MARKS, EX. 1'-0" . IF WE LEAV IT AS DECIMAL 1'-0" WOULD APPEAR AS 12.00.

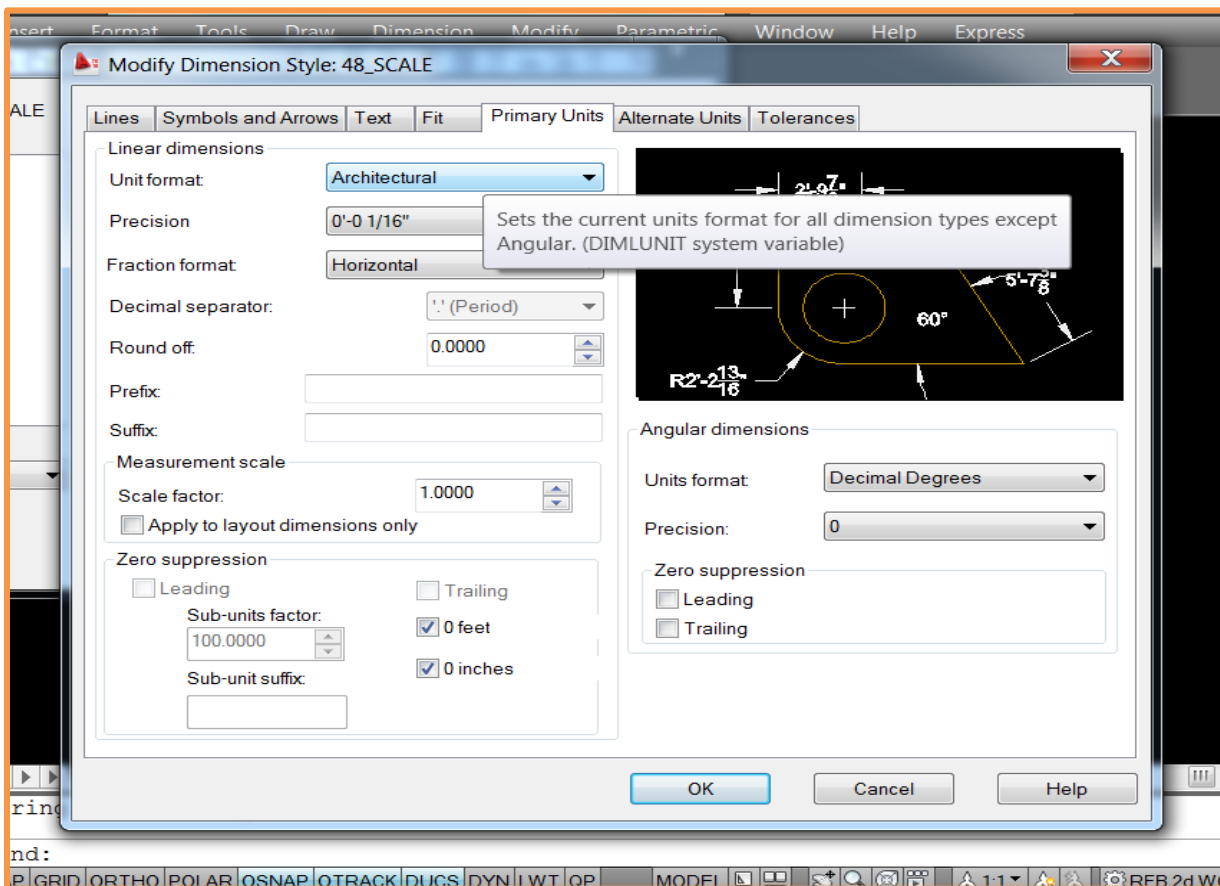


FIG 4.10

NOTE: ON THIS PRIMARY UNIT TAB THERE IS AN OPTION CALLED SCALE FACTOR, THIS IS NOT THE NUMBER WE CHANGE TO MODIFY THE SIZE OF OUR DIM STYLE TEXT/ARROWS ETC. THIS VALUE SHOULD NOT BE CHANGED IT IS ACTUALLY LABELLED BY AUTODESK AS IT IS EASILY CONFUSED WITH "OVER ALL SCALE" ON THE FIT TAB. WHEN THIS VALUE IS CHANGED IT HAS NO IMPACT ON THE TEXT/ARROWS PHYSICAL SIZE IN MODEL SPACE, WHAT IT DOES DO IS CHANGE THE ACTUAL VALUE.

FOR EXAMPLE, IF WE CHANGE THE DEFAULT NUMBER IN THE SCALE FACTOR BOX WHICH IS 1 TO THE NUMBER 12, THE NUMBERS IN THE DIMENSIONS WILL BE MULTIPLIED BY 12 SO A 2'-0" DIMENSION WILL COME OUT AS 24'-0". AVOID CHANGING THAT NUMBER, IT'S OF VERY LITTLE TO NO USE FOR MOST DRAWINGS.

**FORMAT MULTILEADER (REPEAT FOR 48, 96, & FULL SCALE):**

**LEADER FORMAT:** COLOR = RED  
ARROWHEAD SIZE = .125

**LEADER STRUCTURE:** MAXIMUM LEADER POINTS = 3  
SECOND SEGMENT = 0  
UNCHECK AUTOMATIC LANDING

**SCALE:** SPECIFY SCALE = 24

**CONTENT TAB:** COLOR = WHITE  
TEXT HEIGHT = .125

**SELECT LEADER FORMAT TAB** FIG 4.11

CHANGE TEXT SIZE FROM .1800 TO .125 (1/8") JUST LIKE YOU DID ON THE DIM STYLE

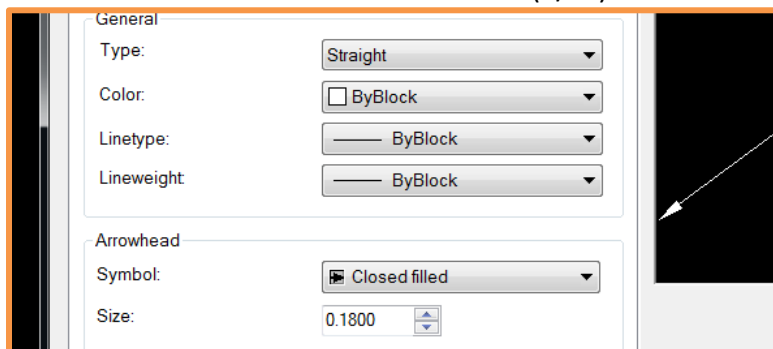


FIG 4.11

**SELECT THE LEADER STRUCTURE TAB** FIG. 4.12CHANGE THE MAXIMUM LEADER POINTS TO **3**CHECK MARK THE SECOND SEGMENT ANGLE AND SET TO **0**

UNCHECK AUTOMATICALLY INCLUDE LANDING

CHANGE SPECIFIC SCALE TO SCALE FACTOR (EX 48)

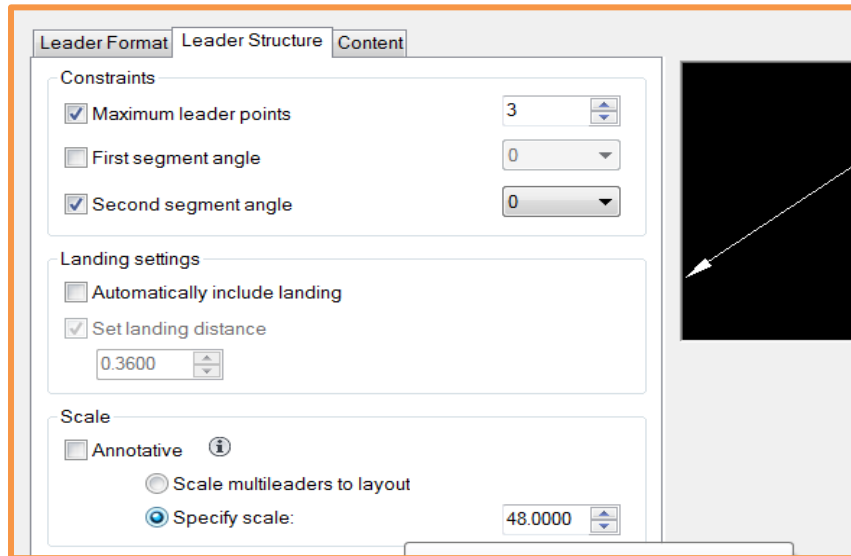


FIG 4.12

CHANGE THE TEXT SIZE TO .125 (1/8") JUST LIKE YOU DID IN THE DIM STYLE: FIG. 4.13

CHANGE THE TEXT COLOR TO WHITE JUST LIKE YOU DID IN THE DIM STYLE

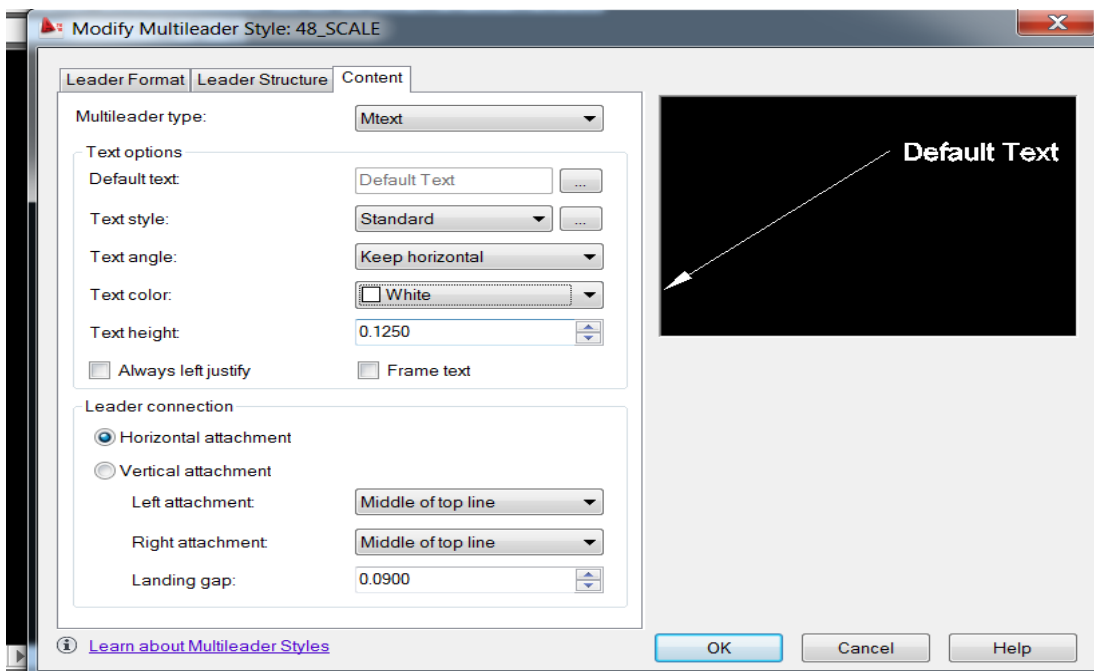


FIG 4.13

Instructor resources:

**DEFINE THE FOLLOWING TERMS:**

**ANNOTATION-**

Text, notes symbols use to describe or comment on the drawing

**LAYERS-**

In general CAD layers can be used to separate objects in the drawings into categories, layers can be assigned line types, line weights, colors. Layers can be made hidden, isolated among many other uses.

**UNITS-**

CAD drawings are developed using Decimal, fractions Engineering or Architectural units. For example, the Architectural format produce feet-and-inches displays and assume that each drawing unit

**TEXT STYLE-**

Used to create text styles with specific fonts and text heights, based on drawing scales.

**DIMENSION (DIM) STYLE-**

Used to create your custom dimension style and set it as current then close the dimension style manager dialog box. Also based on drawing scales

**MULTILEADER-**

Used to create an arrow or symbol point to and object with text or notes attached describing something about the object.

