CMW CADD PRODUCTION WORKFLOW

Version 1.0

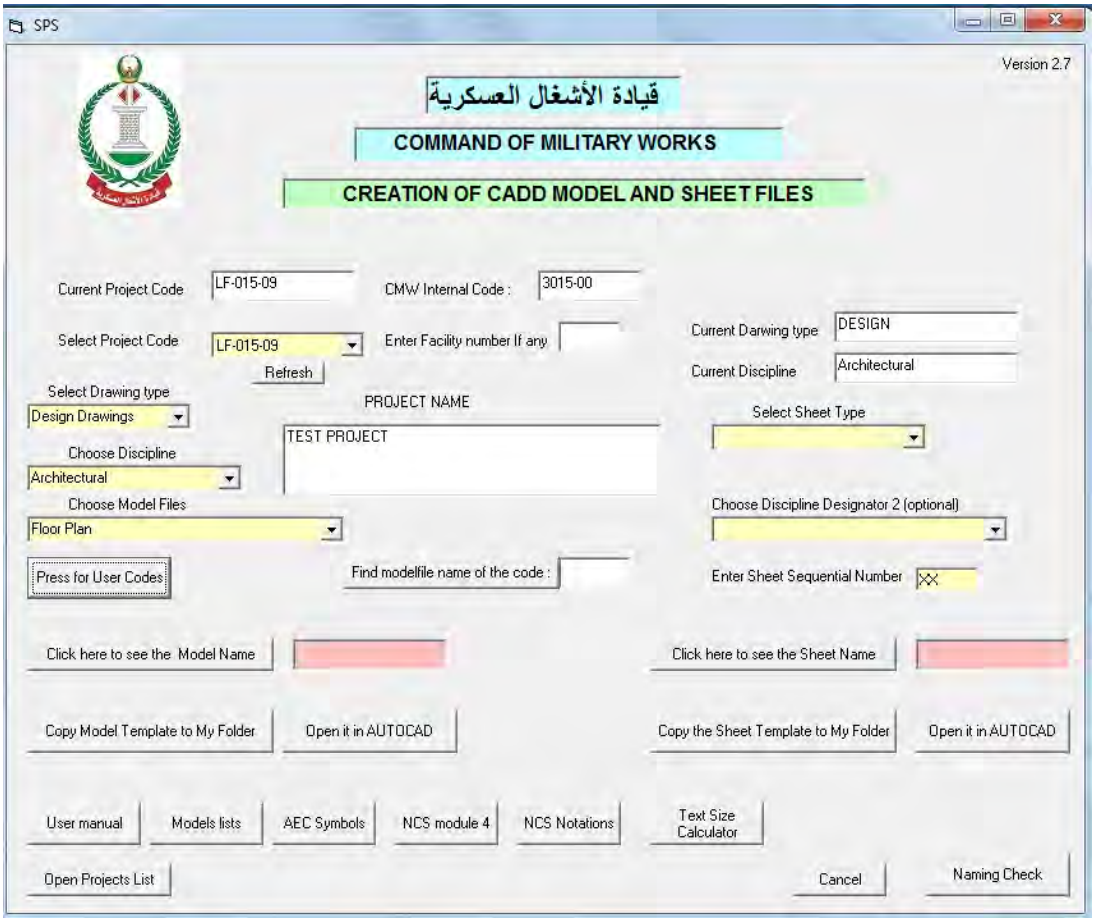
CONTENTS

1 - CREATION OF A DRAWING (for example Floor Plan drawing)

1.1 – Using SPS

The project manager assigns the project to an architect or the relevant engineer to supervise it. The architect starts by creating the Floor Plan using the CMW SPS Program.

This program will create a new DWG file, model and/or paper space-sheet.

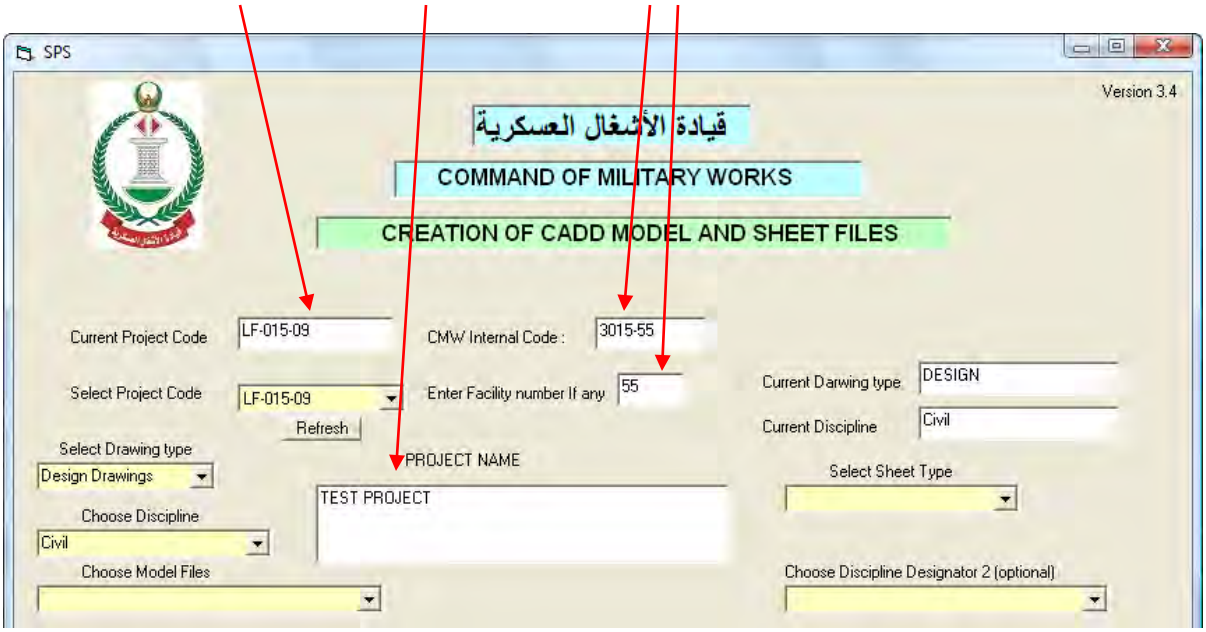


1.1.1 - Selection of the project

1.1.1.1 - If this is the ***first*** time

If this is the first project the architect should select the project code provided by the project manager in "**Select Project Code**". This will read the text file with the name of the project from:
…\CMW_Resources\projectscodes
and populate the internal code number and its name.

Next, the architect will type in the facility number in the field "**Enter Facility Number if any**". This will create a file curproj.txt under the under the SPS ProjectPath folder and records in it the project code, project name, and the drawing number currently defined. If no facility number is included, then the system will assign 00 as the facility number. For example:
"LF-015-09","TEST PROJECT","3015-55".



1.1.1.2 - If this is the ***second*** time

If this is not the first time the system simply reads the file curproj.txt and displays the previously used project code, drawing number and name.

1.1.2 - Selection of the drawing type

Specify whether DESIGN or AS-BUILT drawing

1.1.3 - Selection of the discipline

1.1.3.1 - If this is the ***first*** time

The architect should select the discipline he is working on by selecting it from the "**Choose Discipline**" field. This will then create a file curdiscipline.txt locally and records in it the current discipline

Example: Architectural

1.1.3.2 - If this is the ***second*** time

If this is not the first time the system simply reads the file curdiscipline.txt and displays the discipline used in the previous session.

1.1.4 - Selection of the Model File

To create the model file for the Floor Plan, press "**Choose Model file**" and select the option for *Floor Plan.*

If no model file is selected the system will display a message "Please Select which model file you want to copy" when you try to create a drawing.

1.1.5 - Entering the four user digits

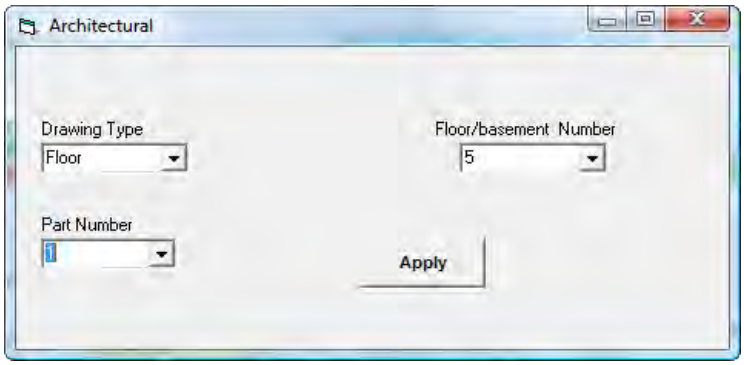
Optionally the architect can use four digits for reference by typing in the digits with the "**Press for User Codes**" button: *(i.e. XX-XX*) See Annex 6

For **Floor Plan**, **Roof Plan**, **Reflected Ceiling Plan**, **Equipment Plan**, and **Area Calculation Plan**

The four digits will be: XN-PN

X will be B for Basement
F for Floor

N will be the number of the floor or basement or the part number



For example if you have an Architectural plan of Floor 1, Facility 01 and you need to define 7 different model-DWG-files, then you must create 7 different drawings and use the "part number" 1 to 7 and you will get files named like

3015-01-AFP-F1-P1.DWG
3015-01-AFP-F1-P1.DWG
3015-01-AFP-F1-P2.DWG
3015-01-AFP-F1-P3.DWG
3015-01-AFP-F1-P4.DWG
3015-01-AFP-F1-P5.DWG
3015-01-AFP-F1-P6.DWG
3015-01-AFP-F1-P7.DWG

For Architectural models, the maximum part number is 9.

For **Elevation**, **Detail**, **Legend**, and **Schedule**

The four digits will be: XN-PN

X will be E for Elevation
D for Detail
L for Legend
S for Schedule
N will be the number Elevation, Detail Legend and Schedule or the part number

For **Section**

The four digits will be: XX-PN

XX will cross section AA BB CC DD EE FF II JJ
N will be the part number (1 2 ...) (if the plan is subdivided into parts)

If you are using another discipline (not Architectural) for example Civil, then the "**Press for User Codes**" dialog allows you to enter two digits x2:

This means you can create more than 9 model-drawings, of the form

3015-01-CAF-01-01.DWG
3015-01-CAF-01-02.DWG
…
3015-01-CAF-33-55.DWG

1.1.6 - Copy the model file template to the local directory

The model templates are created and stored under the server directory. When the architect/engineer selects the model file Floor Plan and presses "**Copy Model Template to My Folder**" the template "Floor Plan.dwg" is copied to the local directory.

"ProjectPath"\PROJECTS\"project code"\DESIGN\"discipline"\MODEL_FILES\

(if the current drawing type is DESIGN)

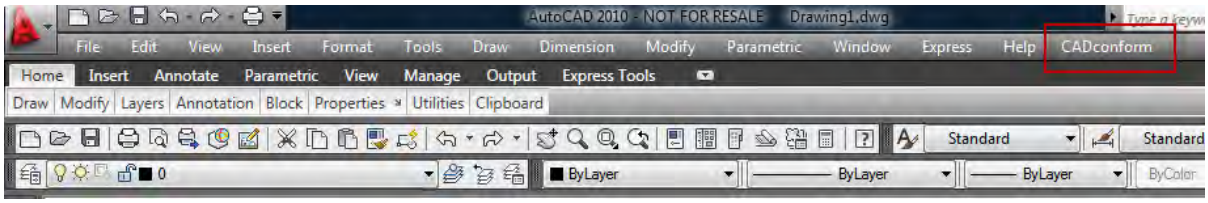
The ProjectPath setting is defined in the SPS.ini configuration file (see the installation document CMW-CADD-STD-Installation for more information on Preparing the Production Environment).

The new model file can be opened in AUTOCAD by pressing "**Open it in AUTOCAD**".

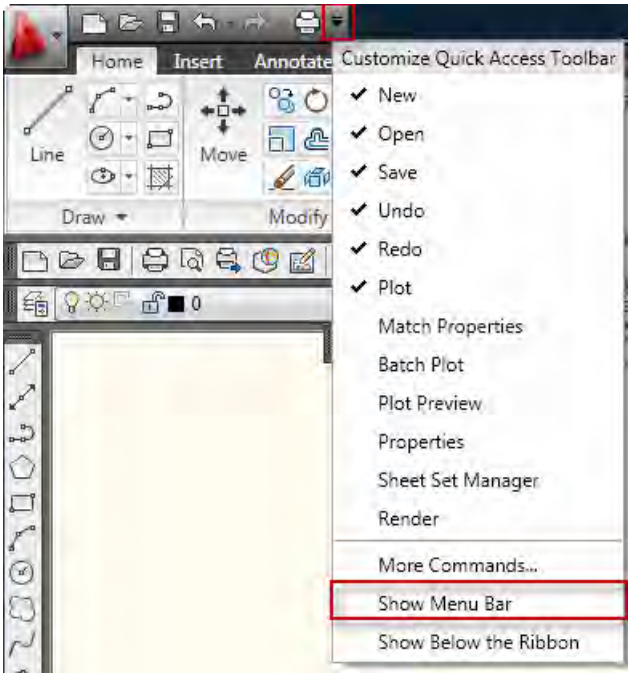
For more information on model files (units, origin, naming convention, contents, etc.) see document CMW-CADD-STD-01.

1.1.7 - Log in to CADconform

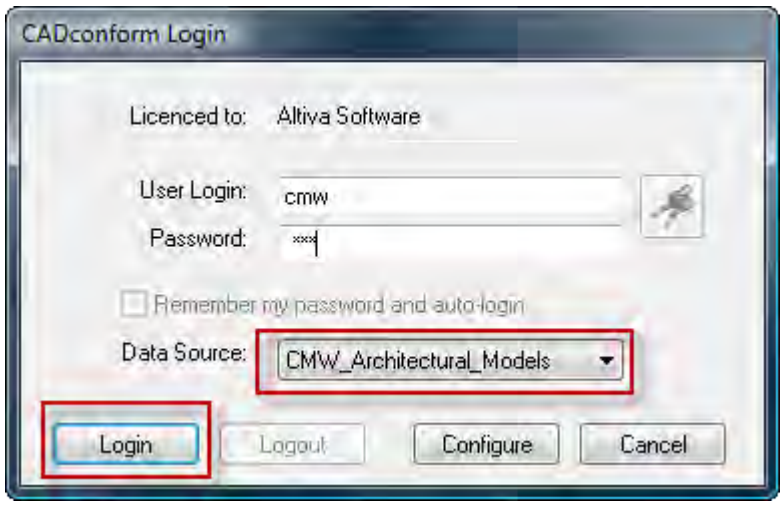
To start drafting using CADconform select the CADconform tool bar



If CADconform does not appear across the top be sure that the 'Menu' tool bar is turned on:



Select “Log In” from the CADconform menu

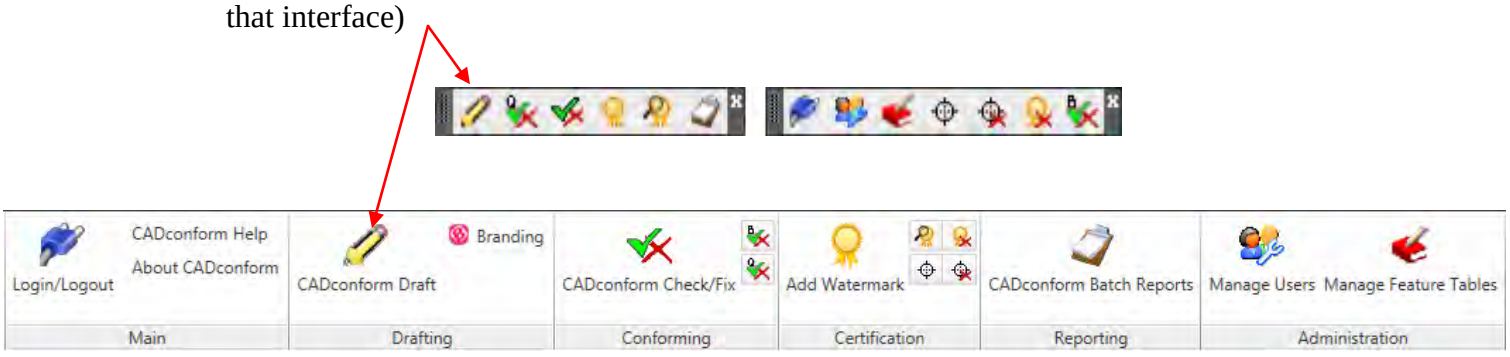


Type the username and the password (both should be “cmw”) and choose the required Data Source, in this example CMW_Architectural_Models.

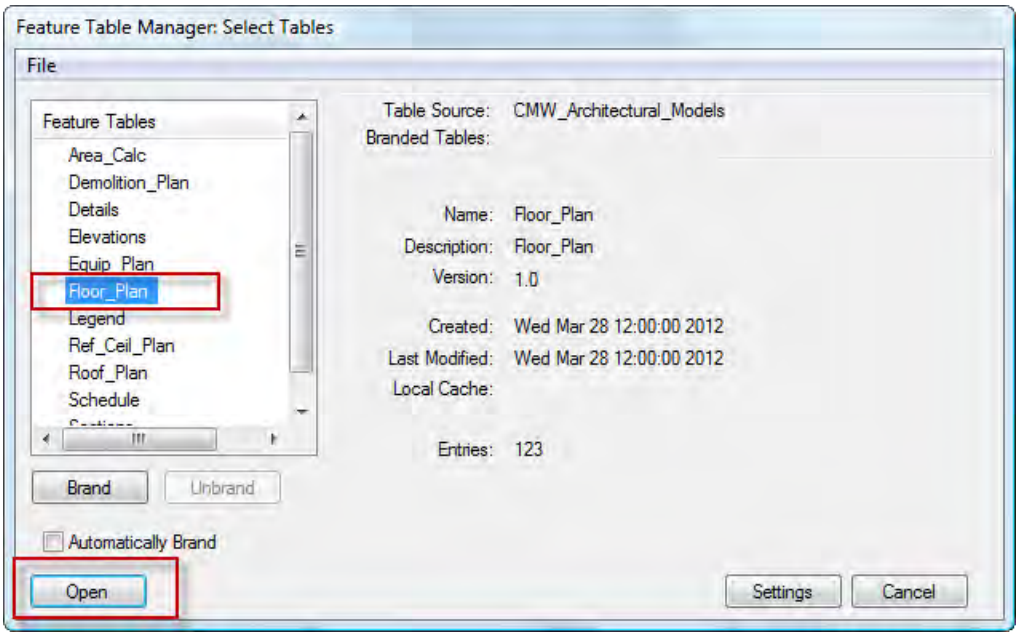
CADconform will then load with the Architectural database for use with Architectural discipline model file drawings.

1.1.8 - Open the CADconform Draft tool bar

Click the Draft icon on the CADconform User tool bar (or the Ribbon if you have loaded that interface)



Select the feature table you will be working with in this case Floor_Plan

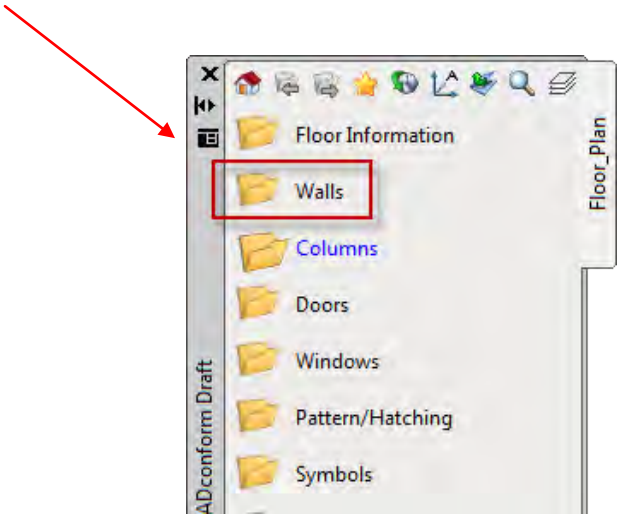


Note: Drawings created using SPS will be Branded to the particular standard they should use, so this step would be skipped automatically.

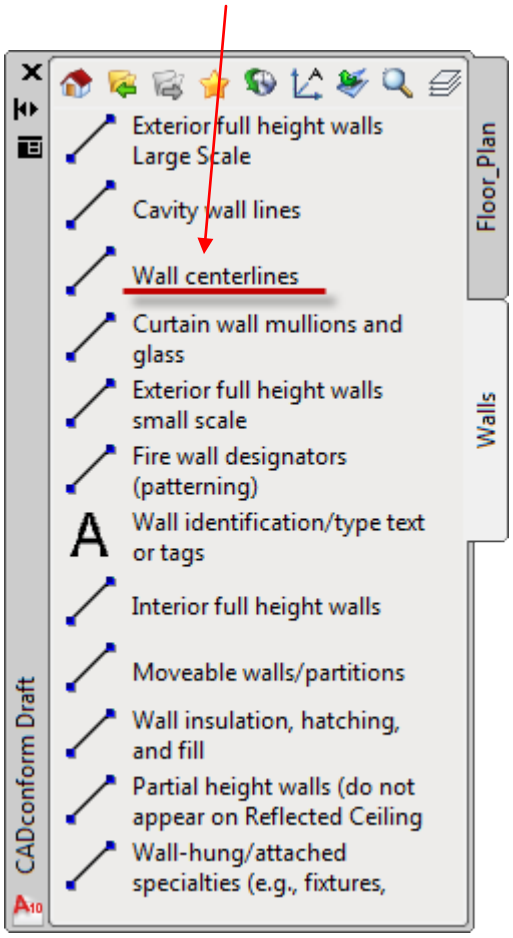
1.2 – Creation of the Floor Plan Model

1.2.1 - Drawing simple linear features (i.e. Walls)

Select *Walls* from Floor_Plan table



To draft wall centerlines click on *Wall centerlines*

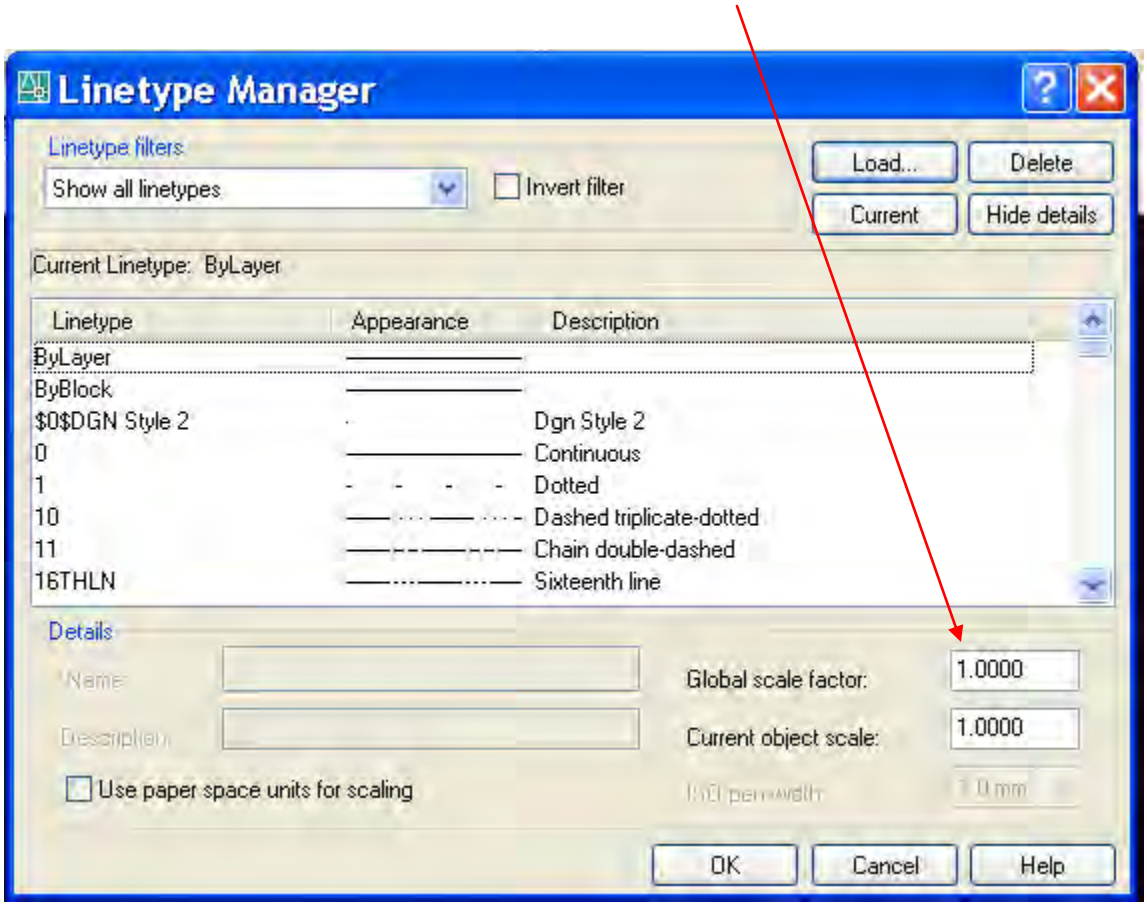


This will set the layer of the wall centerlines with its symbology

Then you can start drawing. Enter the measurement in METERS as all the drawings units are meters. No scaling takes place for linear features

1.2.2 - Drawing Linear features with a line style scale

When you draw lines that have a line style you should know the final plotting scale. This will define the LTSCALE to be used to have the correct line style presentation. See the line style guideline and enter the line style scale as global scale factor.



Line scale factors for each scale

1:10	0.1
1:20	0.2
1:30	0.3
1:50	0.5
1:100	1
1:200	2
1:300	3
1:400	4
1:500	5
1:1000	10

1.2.3 – Drawing True Dimension Symbols

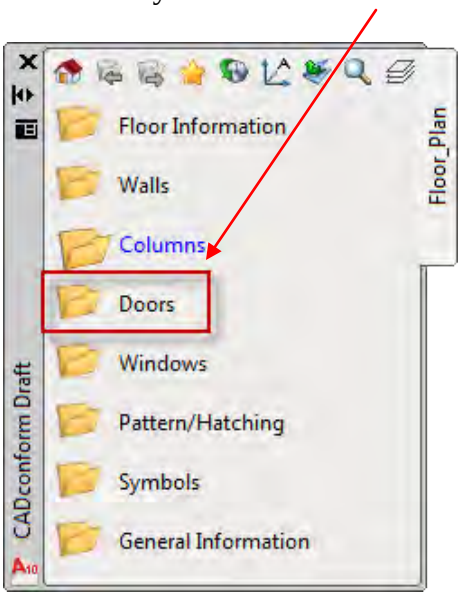
True dimension Symbols are like doors and windows whose dimensions are in meters and they can be scaled to have any other dimension.

For doors and Windows , their symbols are all to scale. Draw a symbol for example Door Double and measure its dimensions. If needed you may scale it to fit the required measurements. Otherwise you have to draw it at scale; or create a symbol with the required measurement and ask CMW to include it in the standard.

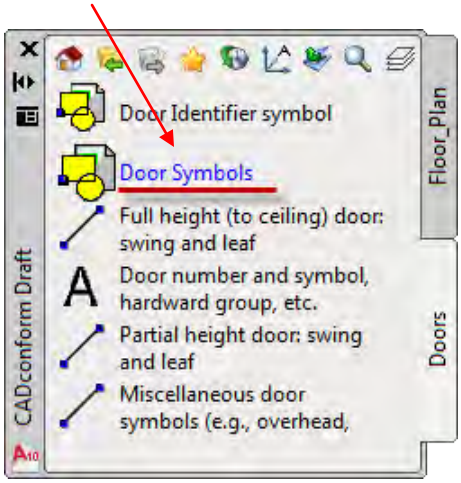
To scale symbols for Architectural discipline are stored as Architectural_Objects that you can trigger by selecting the **Floor Plan**/**Symbols**/**Architectural_Objects**

Refer to the Symbol and Objects lists from ("**AEC Symbols**" button in SPS) to find out the required symbols.

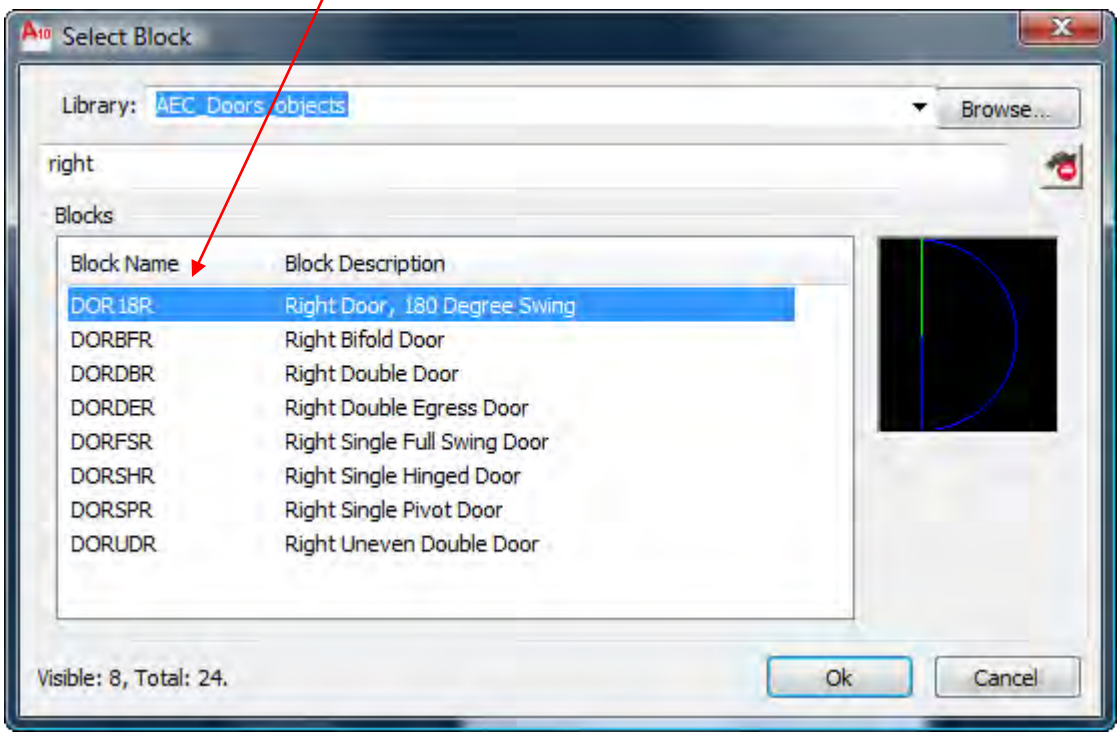
For example to place a door symbol click on Doors



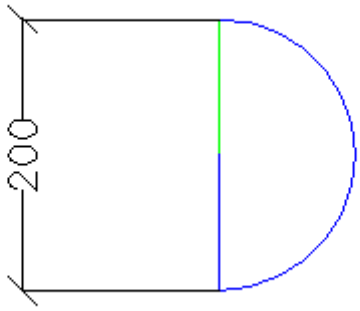
And choose the Door Symbols library



Select the right door symbol



This will place the door symbol with its real measures here 200 cm = 2m

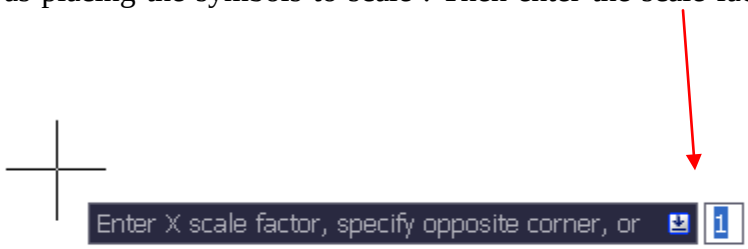


1.2.4 – Placing a symbol that is Not to scale

Each discipline has a symbol library with its name for example Architectural_symbols

Refer to the Symbol and Objects lists from ("**AEC Symbols**" button in SPS) to find out the required symbols.

Follow the same procedure as placing the symbols to scale . Then enter the scale factor until it fits the drawing



1.2.4.1 - Architectural Symbols

- Door symbols are placed on A-DOOR-SYMB layer
- Door identifier is placed on A-DOOR-IDEN layer
- Windows symbol are placed on A-GLAZ-PRHT layer
- Window identified symbol is placed on A-GLAZ-IDEN layer
- Room Identifier Symbol is placed on A-FLOR-NUMB
- Other architectural symbols and objects are placed in A-ANNO-SYMB layer

1.2.4.2 - General Symbols

Some symbols that can be used by several disciplines are in each symbol library of each discipline.

See Annex 5 for the list of these symbols.

All the symbols are placed in ANNO-SYMB layer.

1.2.4.3 - Structural Symbols

Structural symbols are gathered from AEC and NCS as well as CMW symbols.

To access the symbols press on symbols from the feature table for the following symbols:

- *Structural symbols*: These are the AEC symbols they can be viewed from the "**AEC Symbols**" button in SPS
- CMW_Structural_symbols: See Annex 5 - *Concrete, Metals, wood plastic composite, exterior improvements*

All the symbols are placed in S-ANNO-SYMB layer **except** the following:

- *Column I.D. tags (horizontal)* is placed in S-GRID-HORZ-IDEN
- *Column I.D. tags (vertical)* is placed in S-GRID-VERT-IDEN

1.2.4.4 - Landscape Symbols

- *landscape symbols:* a collection of landscape symbols.

All the symbols are placed in L-ANNO-SYMB layer

1.2.4.5 - Surveying Symbols

- *Survey Symbols:* this is a combination of:
- the AEC survey symbols ("**AEC Symbols**" button in SPS and see survey symbols)
- the CMW surveying symbols (see Annex 5)

All the symbols are placed in V-ANNO-SYMB layer.

1.2.4.6 - Electrical Symbols

- *CMW Electrical_symbol:* from the feature table, select the required symbol. To place text select "Text" and type in the required text and adjust the location
- AEC Electrical symbols: for symbols that do not exist in the CMW Electrical symbols you can choose from the AEC Electrical Symbols directly accessed from the AEC Electrical Symbols feature table
- All the symbols are placed in E-ANNO-SYMB layer.

1.2.4.7 - Other disciplines Symbols

All the remaining disciplines have the AEC symbols. That can be selected from the model files table. And can be previewed from the "**AEC Symbols**" button in SPS.

All the symbols are placed in ANNO-SYMB layer.

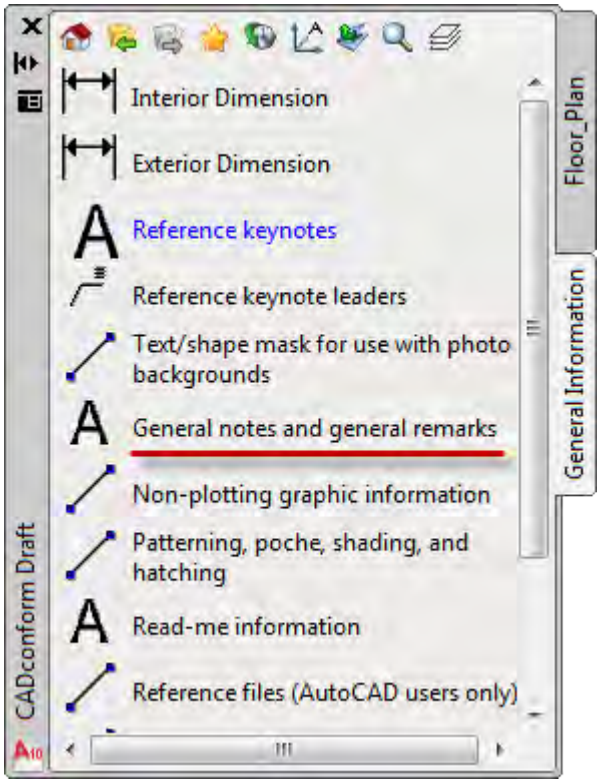
1.2.5 - Add Annotations

The following fonts are considered :

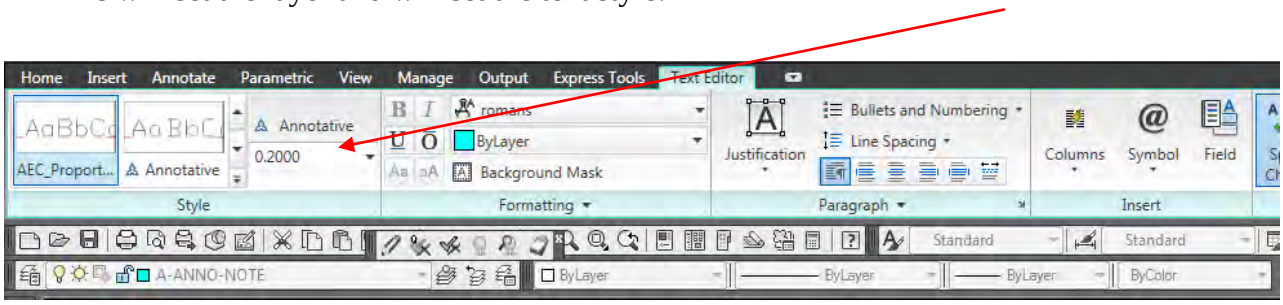
- **Monotext** font for schedules and some cases in title blocks. This font provides text with evenly spaced characters
- **Proportional** font for general notes, labels, and title blocks. It creates text with characters that are proportionally spaced
- **Slanted** font to be used where text needs to be easily distinguished from other text
- **dmw_romant** for Titles
- **mj** for block annotation

To add annotation you should know the scale of the final plot

Select the annotation from the CADconform drafting tool palette, for example “General notes and general remarks”

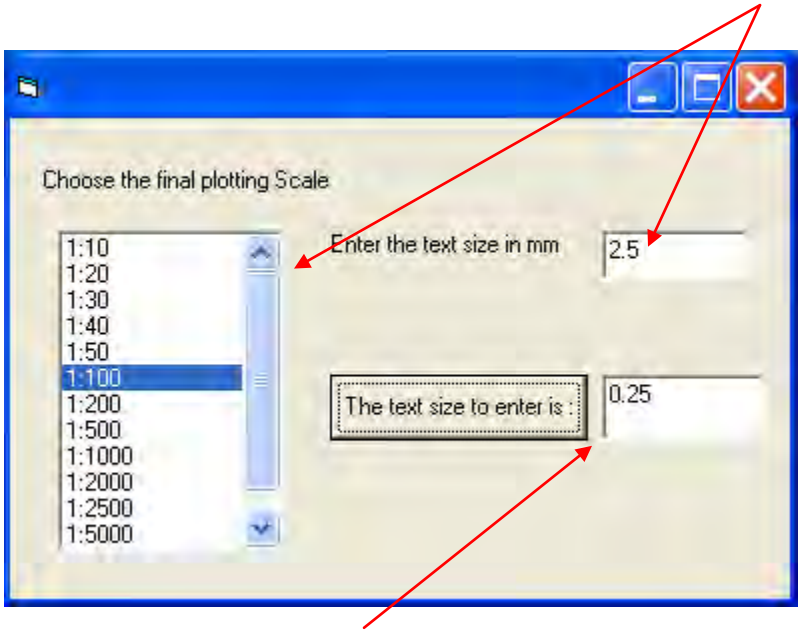


This will set the layer and will set the text style.



The user has to enter the size of the text according to the scale of the final plot. There is a tool in the SPS program to calculate the correct size for the text based on the plot scale. Select the "**Text Size Calculator**" on the main SPS dialog to open this tool.

The user needs to know what size the text will be in the plot and what scale. By using the Text Size Calculator the user enters the scale and the text size in the plot in mm



Then the calculator provides the text size to enter in the drawing.

1.2.5.1 - Text Placement

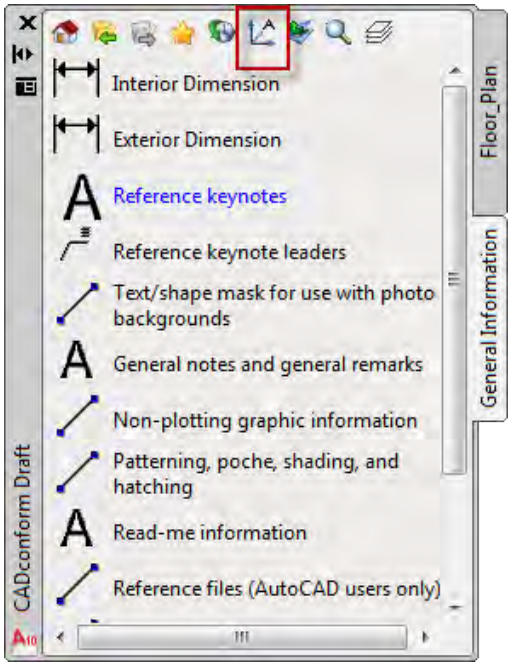
Text in the drawings should follow as much as possible the guidelines provided in the NCS Notations module that can be triggered from the "**NCS Notations**" button in SPS.

1.2.6 - Add Dimensions

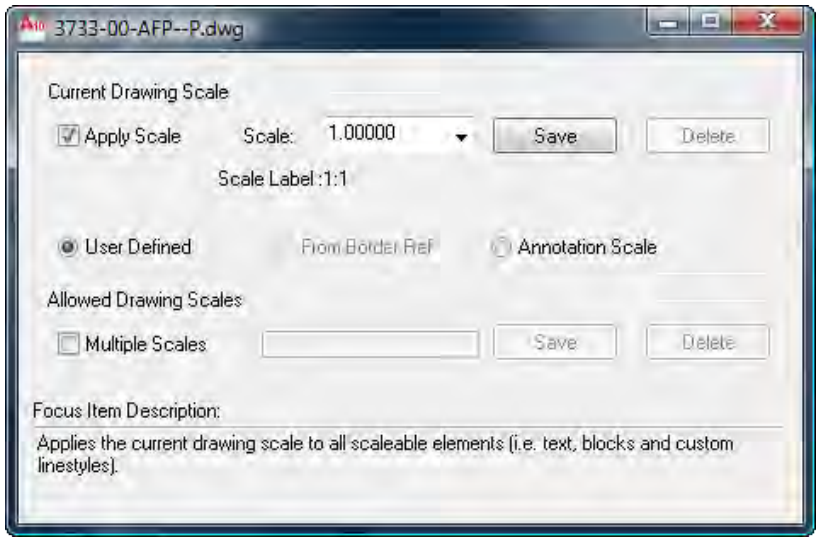
To add dimensions use the Draft tool palette. The General Information of all the models contains an Interior dimension feature and/or an Exterior dimension feature. However first we need to define the scale to be used.

1.2.6.1 – Setting the Drawing Scale

Open the Drawing Scale dialog from the Draft tool palette.



Select or enter the scale to be used and Save it to the drawing.



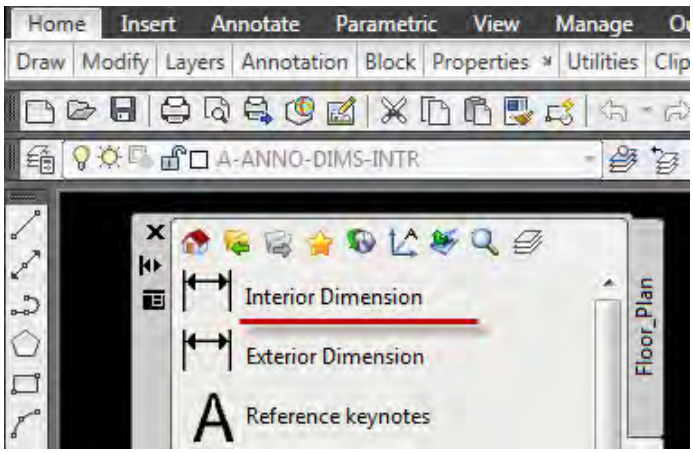
If more than one scale is defined in one CAD file, then each scale can be defined in the "Multiple Scales" section of the Drawing Scale dialog box, separated by commas. If Annotation Scale is being used, it will automatically populate as the user changes between different AutoCAD Annotation Scales.

Defining multiple scales effectively means that all features in the CAD file can be interpreted at any of the multiple scales defined. This can create ambiguity if only specific areas of the drawing are at different scales and should be used with caution.

Although features are allowed at any of the multiple scales for matching purposes, they are only ever drafted or checked at the active scale. For more examples of this, see the YouTube video located - http://www.youtube.com/watch?v=xB4ENMj_yro

1.2.6.2 – Selecting the dimension feature

Select the Interior Dimension feature. This will set all the required properties for the dimensioning including the layer and the dimension style.



Note: Unlike previous versions of the CMW CADD Standards you should not change the dimension style.

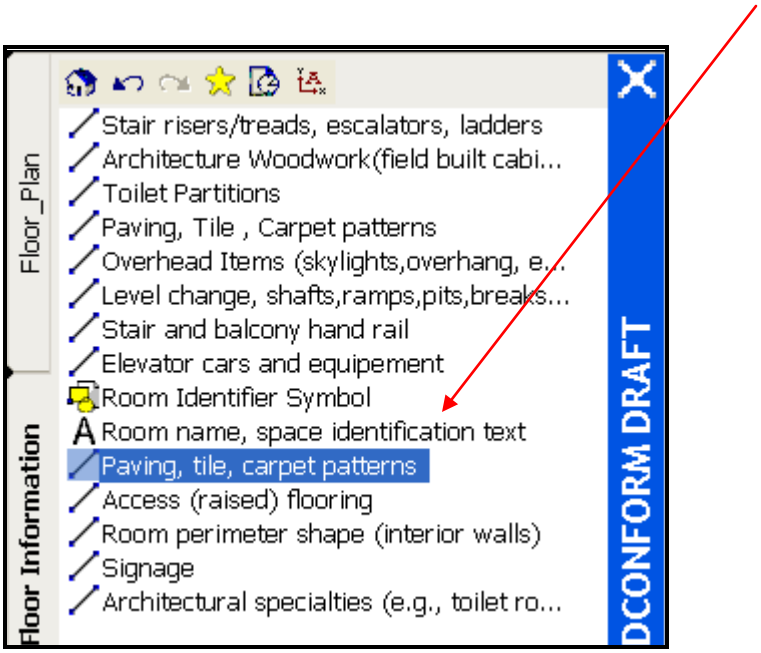
If there are exterior dimensions in your drawing choose the Exterior dimension feature, however some model files have only the Interior dimension feature. In this case you can also use it to place the exterior dimensions as both are placed on the same layer

1.2.6.1 - Dimension placements guidelines

Notation in the drawings should follow as much as possible the guidelines provided in the NCS drafting conventions (page 19). This document can be opened from the "**NCS module 4**" button on the SPS program dialog.

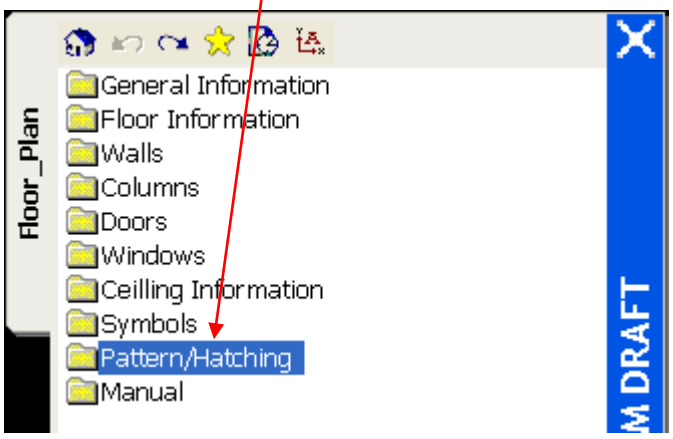
1.2.7 - Add Patterns

To add patterns from Draft tool select the pattern outline. For example: carpet pattern

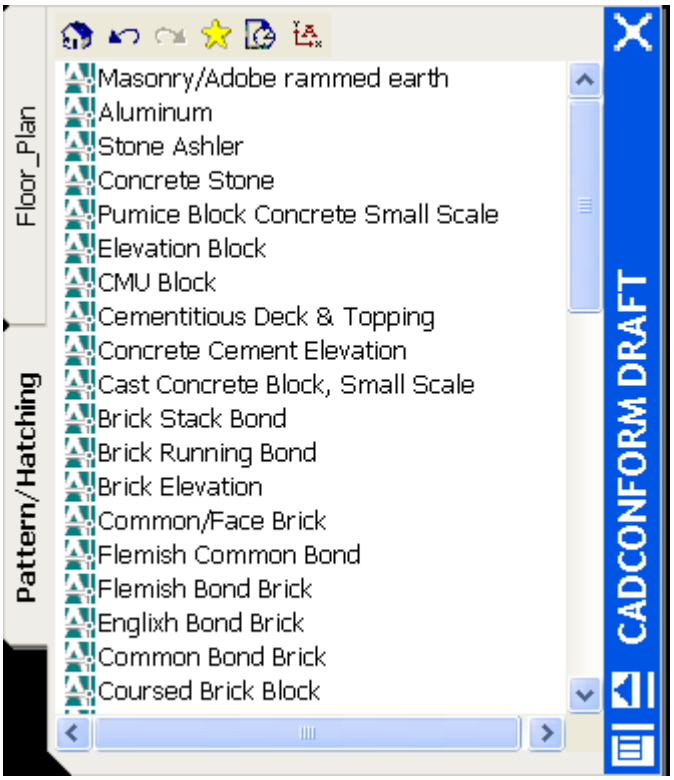


This will set the layer where the pattern outline will be placed

Then from CADconform draft select the patterns



This will display all the available patterns from the standard.

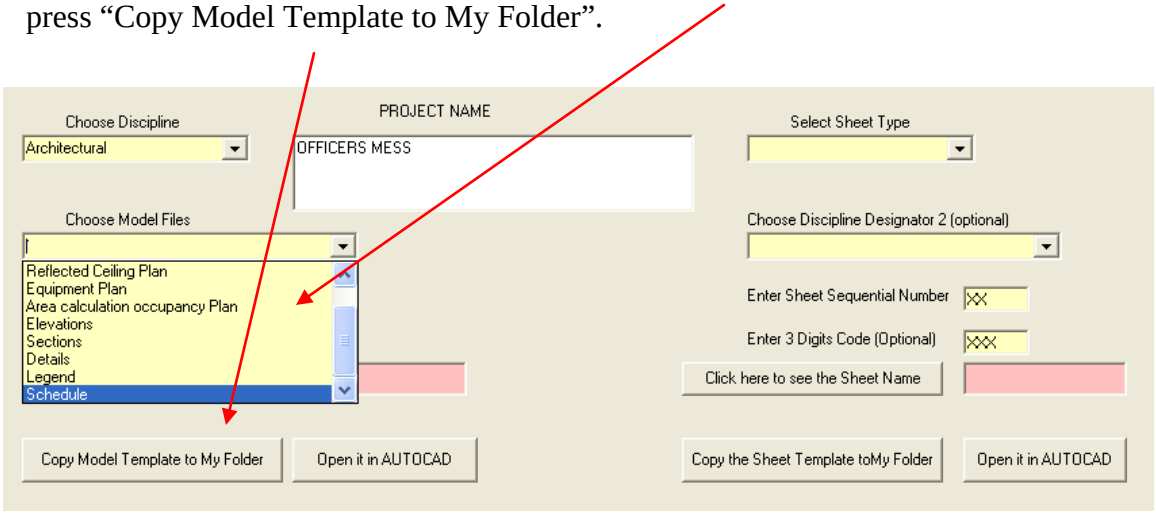


To preview the patterns see the document accessed via the "**AEC Symbols**" button on the SPS program dialog.

Selecting a pattern feature will start the placement command for that pattern. The scale for the pattern will be defined by the current active drawing scale (see section 1.2.6.1 in this document for information about the drawing scale).

1.3 – Adding Schedule, Elevations, Sections, and Legend

From the SPS program select Schedule, Details, Legend, Elevations, or Sections. Then press “Copy Model Template to My Folder”.



This will copy, for example, the Schedule template to the local folder with its correct naming convention, i.e. 900101_A-SHF1XX.

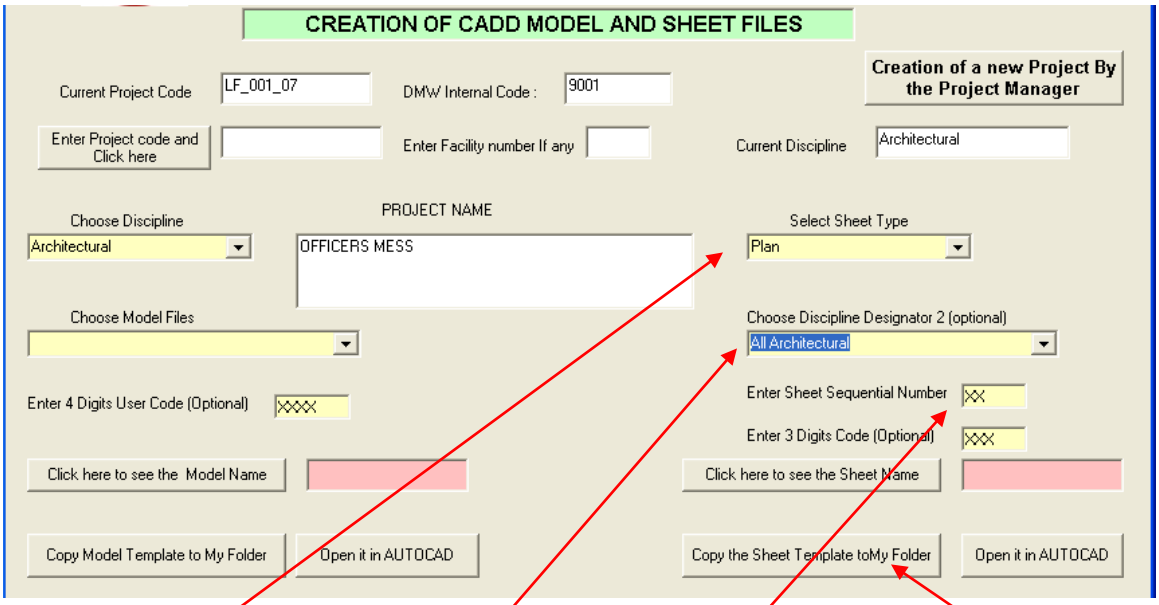
Drawing of features will be carried out through the CADconform Drafting tools as above.

For Legend, lines can be drawn in their respective model files and then copied to the Legend model file.

2 - CREATION OF THE PLOTTING SHEET

Once the Floor Plan, Sections, Details, Schedule, and Legend model files are ready, the composition of the sheet file can be done by triggering the CMW SPS Program.

2.1 - Creation of x-reference sheet file



Select the sheet type Select the designator Enter the sheet serial Copy the sheet

This will copy the sheet template to the local folder:

"ProjectPath"\PROJECTS\"project code"\DESIGN\"discipline"\SHEET_FILES

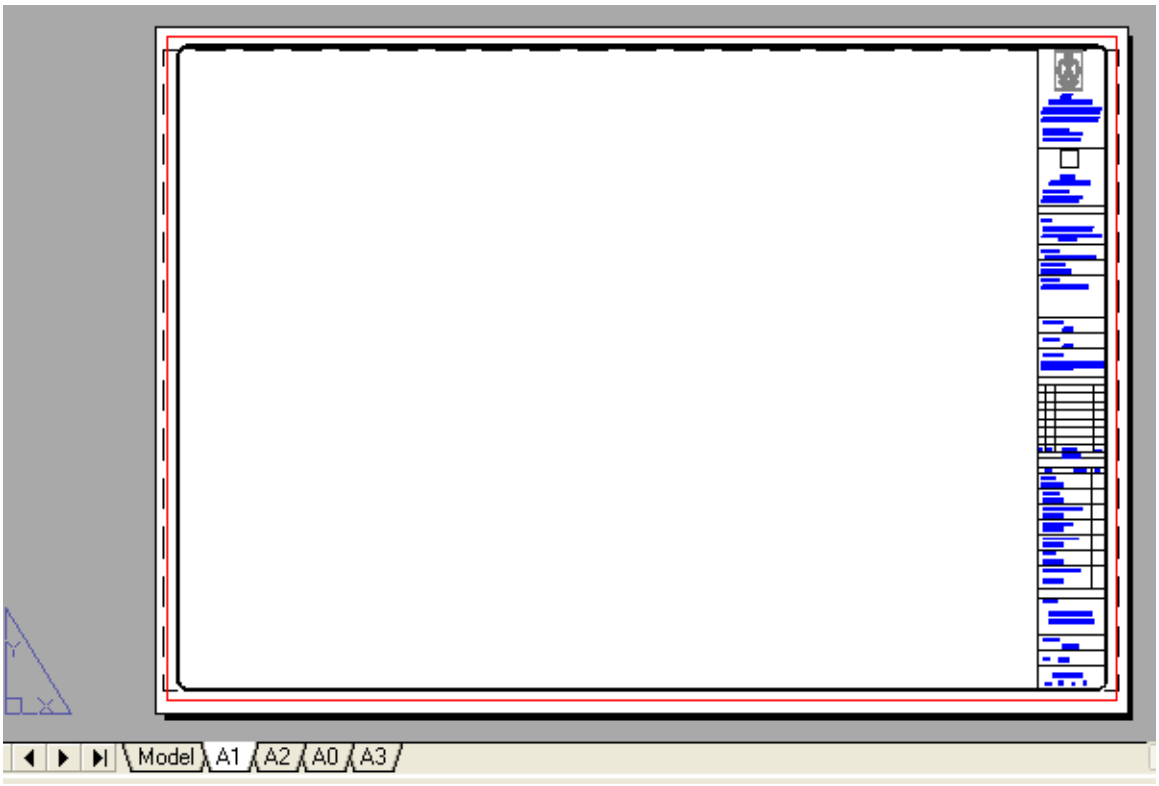
(if the current drawing type is DESIGN)

The ProjectPath setting is defined in the SPS.ini configuration file (see the installation document CMW-CADD-STD-Installation for more information on Preparing the Production Environment).

The new sheet file can be opened in AUTOCAD by pressing "**Open it in AUTOCAD**".

For more information on sheet files (sizes, naming convention, plotting, etc.) see document CMW-CADD-STD-01.

Then the user attaches the content of the Floor Plan, Schedule, Legend, Elevations, Details to the sheet file model as an XREF. There are 4 sizes A0, A1, A2, and A3.



Open the layout to be used for plotting.

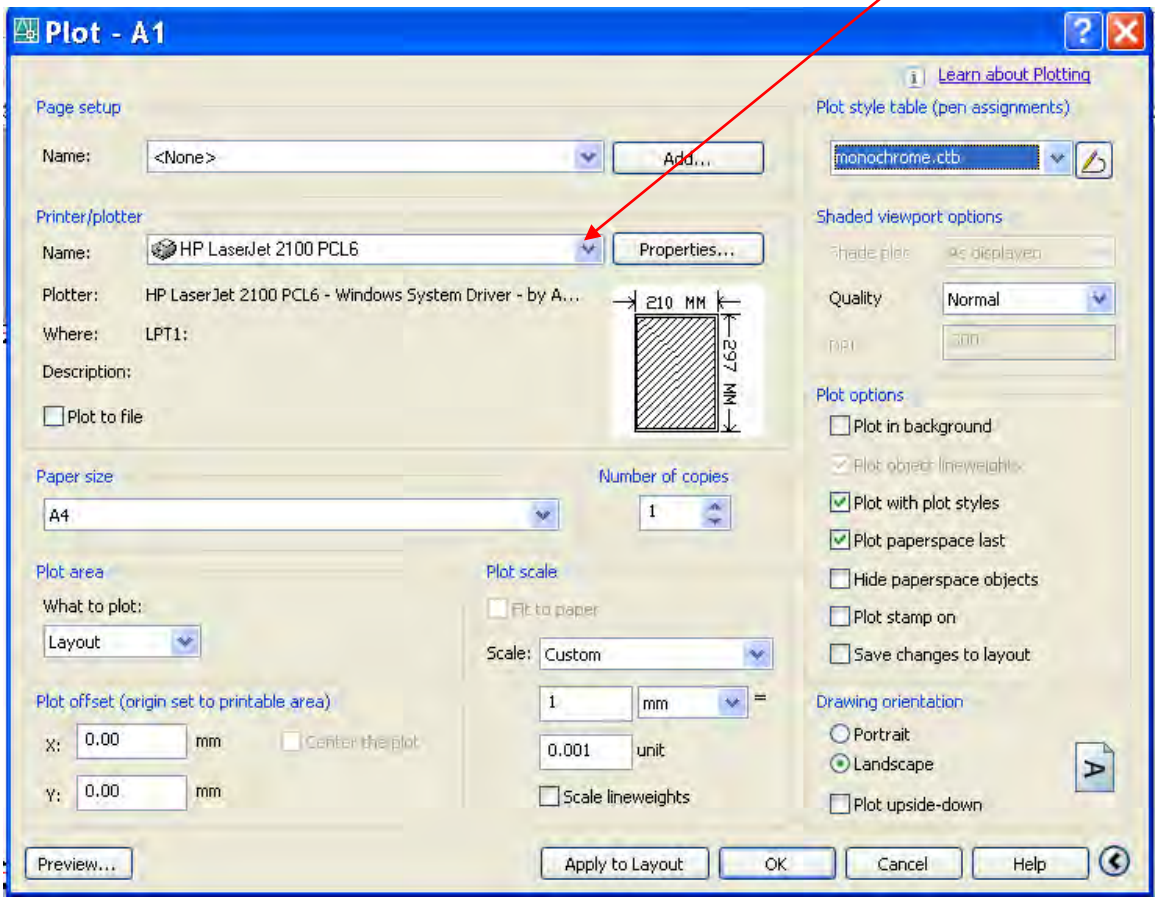
The border texts are **NOT** filled in by the SPS program. You need to fill them in yourself.

At this time you XREF in all the drawings from the disciplines.

The user creates as many viewports as needed to place all the components Floor Plan, Sections, Details, Schedule, and Legend and arranges these in the sheet file.

Be sure to change and enter the relevant elements in the marginal information such as sheet number, revisions, etc.

Then the plot is sent directly to the plotter by selecting only the plotter and not changing any settings.



4 - CREATION OF SITE PLAN IMPORTED FROM SURVEY SECTION

4.1 - Creation of Site Plan

Survey section will provide the following model files according to the segregation in the model list: CMW-CADD-STD-02.xls under …\Standard_documents and referring to Survey_section_layers.doc under …\Standard_documents also:

- s_survey_and mapping
- s_existing_airfield lighting
- s_existing communication systems
- s_existing utilities plan
- s_existing HTCW utilities plan
- s_existing electrical utilities plan

Using SPS, create the corresponding model file (i.e. Survey and Mapping).

Copy the contents of s_survey_and_mapping into the new Survey and Mapping model file.

Use CADconform to confirm the file complies with the CMW CADD Standard.

Then create the sheet file for the site plan and reference the relevant model files.

5 - CREATION OF ROAD PROFILES IMPORTED FROM SURVEY SECTION

5.1 - Creation of Road Profiles

Survey section will provide the different road profiles as drawing files, i.e.

- road_profile_1
- road_profile_2
- etc.

Create Civil Profiles model files from SPS and assign the number of the profile in the 01 using the user four digits (i.e. 900100_C-PR01XX).

Copy the contents of the s_road_profile_1.dwg into the new 900100_C-PR01XX file.

Create the sheet to produce the profile x-reference all the model files.

Plot the profile.

6 - CREATION OF DEMOLITION PLAN

6.1 - Creation of Demolition Plan

Example: The creation of an Architectural Demolition file for the Floor Plan

Create a model file Demolition Plan called for example 3000-01-AXD-F9-P1.

Open the Demolition model file for Floor Plan and x-reference the Floor Plan.

Draw line to be demolished over the one in the Floor Plan.

Draw area to be demolished and assign proper hatching.

Then create the sheet file and x-reference the Demolition model file.

Then select all the layers of the Floor Plan x-referenced and change their color to a light gray

7 - QUALITY CONTROL OF THE CADD DRAWING

7.1 – Quality Control as per CADD Deliverable document

For Quality Control, refer to the "CMW Deliverables Specification" document code: CMW-CADD-STD-06 under …\Standard_documents.

8 - CONVERSION OF EXISTING DRAWINGS

8.1 – How to convert existing drawings to CMW standard

For existing drawings the conversion process steps are as follows:

- Use the SPS program to create the empty model files
- Then copy the content of the existing drawing into the corresponding model file
- Use CADconform check/fix tool to fix incorrect objects and verify all objects match the CAD standard

NOTE: Some objects may need to be redrafted using the CADconform draft tool.