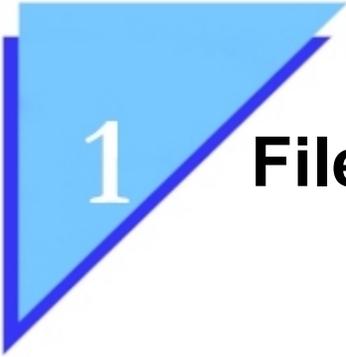


**A/E/C CADD Standard
Workspace 2.0
Course Guide**

For MicroStation

October 2001



1

File Naming Conventions

In this Chapter

In this chapter, we will go over the file naming conventions contained in the A/E/C CADD Standard. These include:

- Model file naming
- Sheet file naming

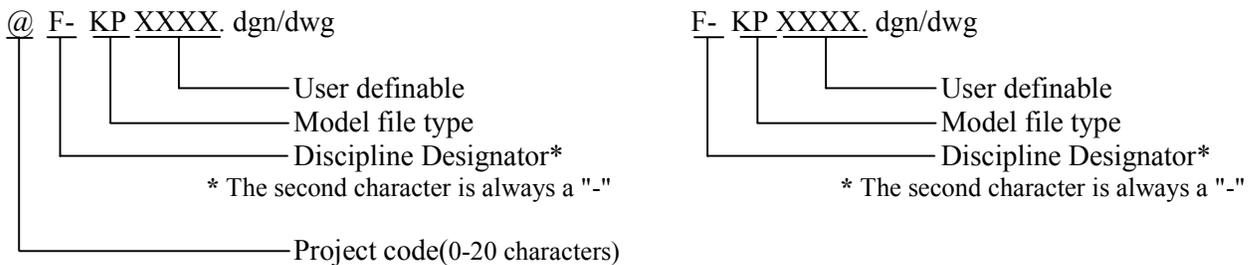
We will perform a quick exercise and then look at the File Manager program that is available.

File Names

File naming is a vital part of the A/E/C Workspace. The checker used to ensure that all model files are compliant with the A/E/C CADD Standard reviews the file name to determine what type of model file it is checking. For this purpose, it is imperative that the model file name is correct.

Model File Name

For the current release of the A/E/C CADD Standard (Release 2.0), the Checker will scan a design for compliance with the standard based on the discipline designator and model file code assigned in the file name. See Appendix A for the list of available codes. The A/E/C CADD Standard file naming convention is based on the U.S. National CAD Standard (NCS) with one exception, it has a 0-20 character Project Code field which the NCS does not.

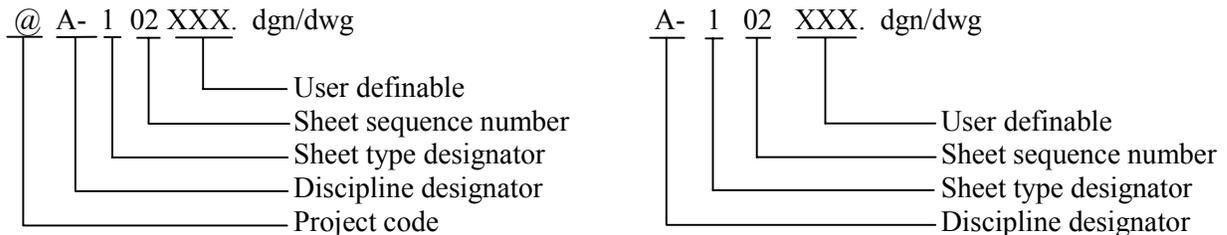


A/E/C CADD Standard Model File naming method

National CAD Standard Model File naming method

Sheet File Name

The A/E/C CADD Standard's Sheet file naming convention is also based on the NCS with one exception; it contains a field for assigning Project code. The same 0-20 character field is added to this naming method as in the Model file name convention. See Appendix A for the list of available codes.



A/E/C CADD Standard Sheet File naming method

National CAD Standard Sheet File naming method

Note: The user-defined field of both the Model Sheet file name must be filled to the maximum number of characters the fields will hold. For example DEMOA-FP001.dwg/dgn would be incorrect and DEMOA-FP001X.dwg/dgn would be correct for Model file naming. DEMOA-102X.dwg/dgn would be an incorrect Sheet file name and DEMOA-102XXX.dwg/dgn would be correct.

Exercise 1-1: A Quick File Naming Exercise

Using Appendix A in the back of this manual, generate a compliant name for the following model/sheet files. Write the name in the blank provided.

- The Project Code is **OLD** for Olmsted Locks and Dams
- Use **01** for all sheet sequence numbers if needed.
- Use **X** for all unused user definable characters.
- The Sheet Type (if needed) is a Details sheet.

Model/Sheet File	A/E/C CADD Standard
Hydrographic Survey Plan	
Civil Dredging Plan	
Civil Elevation	
Civil Detail	
Civil Site Plan	
General Border Sheet	
Geotechnical Boring Log	
Civil Transportation Site Plan	
Civil Details Sheet File	

File Manager

To assist users in naming project files that comply with the A/E/C CADD Standard file naming convention, a File Manager tool (Figure 1) was developed.

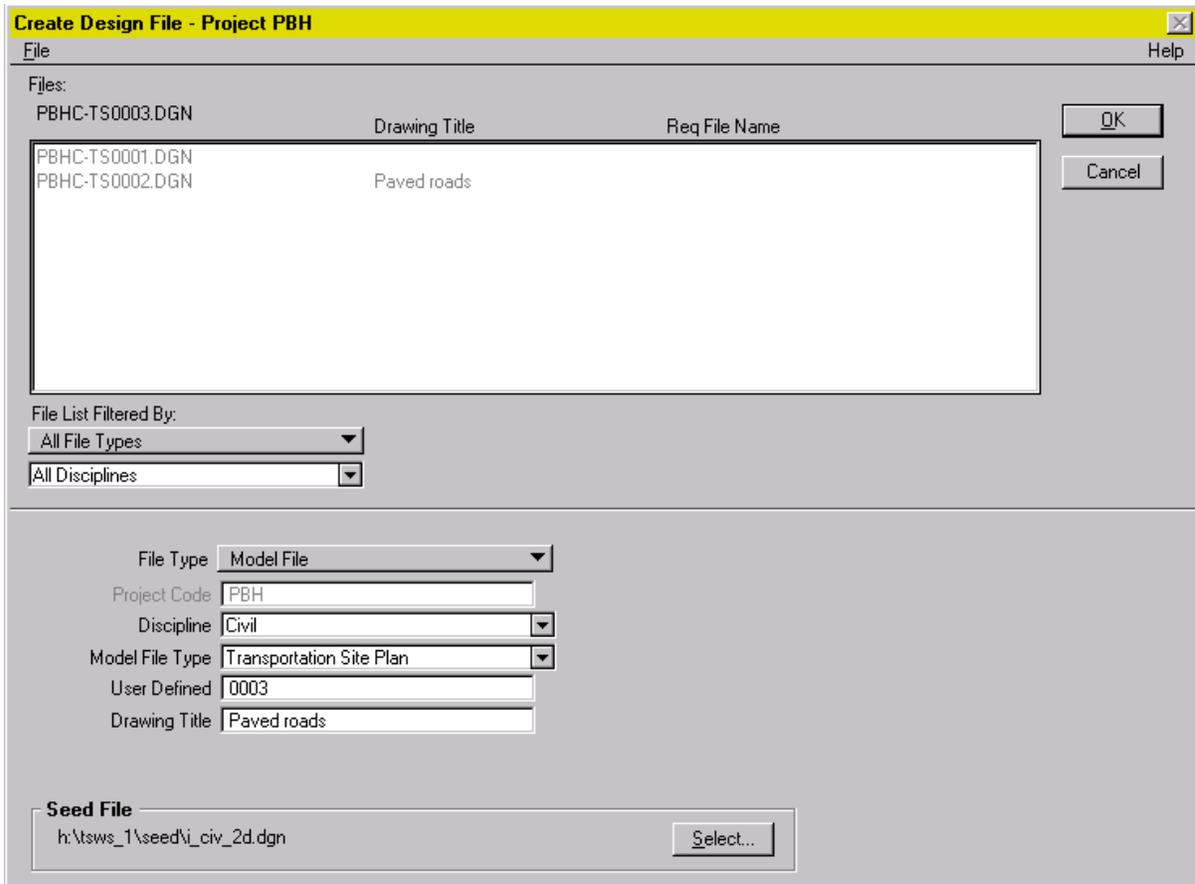


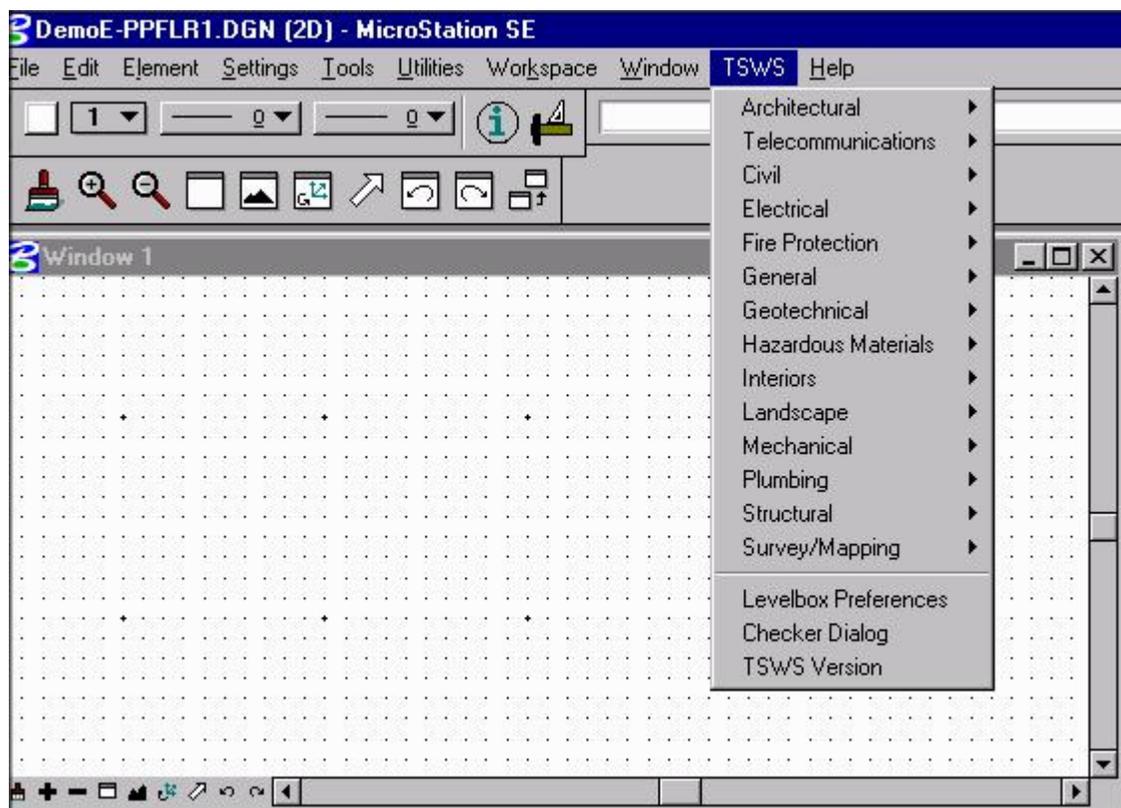
Figure 1 The File Manager interface used to name design files.

2

Workspace Functionality

Workspace Background

The Workspace consists of four major parts: menus, resource files, cell libraries and the checker. Each of these components plays a vital part in the overall functionality of the workspace. The menus are used to interface with the user. These menus pull their intelligence from the resource files and cell libraries to aid the user in creating A/E/C Standard-compliant drawings. The checker is the last step in ensuring the overall compliance to the standard by informing the user of non-compliant elements.



General Overview

The A/E/C CADD Standard is implemented transparently through the Workspace. With the Workspace, the user is no longer required to hunt through the Standard for level symbology settings. Once the Workspace is installed, the A/E/C Standard pull-down menu (Figure 1) is immediately available upon opening design files. Most of the Workspace's dialog boxes and palettes work in exactly the same manner as standard MicroStation dialog boxes and palettes and should be very easy for the experienced user to maneuver through the interface.

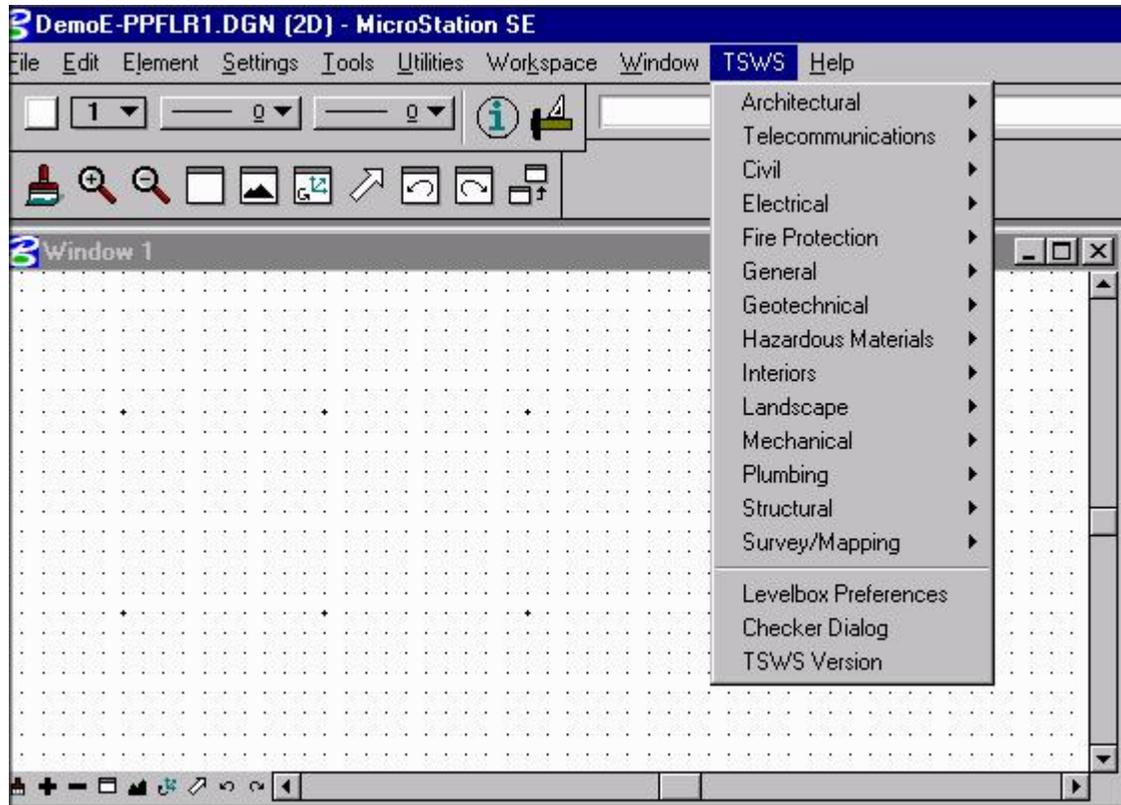


Figure 1 – MicroStation TSW Interface

Each discipline listed in the TSW pull-down menu expands to show the corresponding model files (Figure 2). For example, the Architectural discipline has a sheet file and eight model files: Area Calculations/Occupancy Plan, Details, Elevations (Exterior and Interior), Equipment Plan, Floor Plan, Reflective Ceiling Plan, Roof Plan, and Building Sections. Once a model file is selected, the user will be prompted for a drawing scale. The drawing scale selected will affect the size of placed text, symbols and patterning elements. Once the drawing scale is selected, a palette for the model file chosen will appear (Figure 3). Each palette contains icons representing the different types of elements that can be drawn in that model file (e.g., doors, windows, walls, etc.).

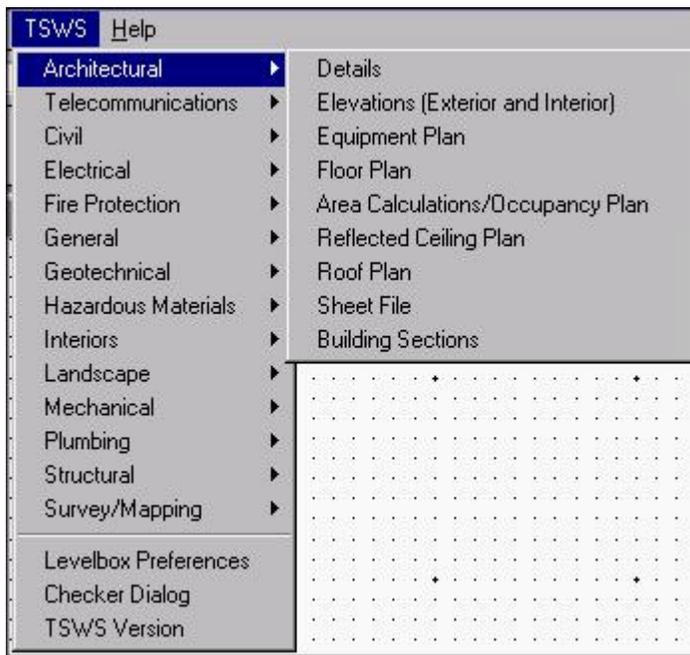


Figure 2 – Discipline Pull-Down Menu



Figure 3 – Model File Palette

Levelbox Preferences

The Levelbox (Figure 4) in the A/E/C Workspace is used for selecting the level that elements will be placed on. This will be the main utility that users will use in selecting the attributes that comply with the A/E/C CADD Standard. Levelbox Preferences, under the TSWs pull-down menu, is used to modify how the Levelbox operates.

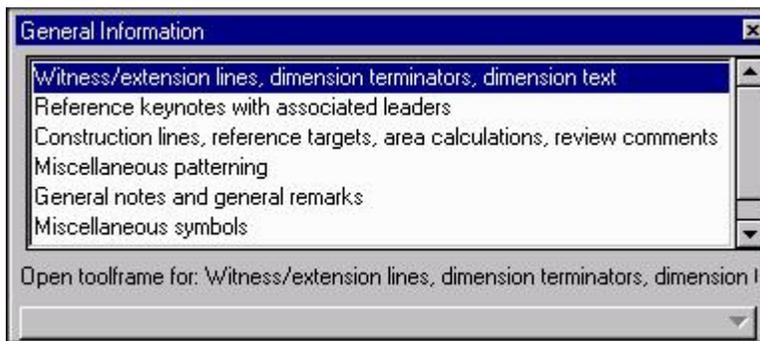


Figure 4 – Levelbox

Opening the Levelbox Preferences

1. Select *TSWS* from MicroStation pull-down menu.
2. Pick *Levelbox Preferences* from the bottom of the pull-down (Figure 5).

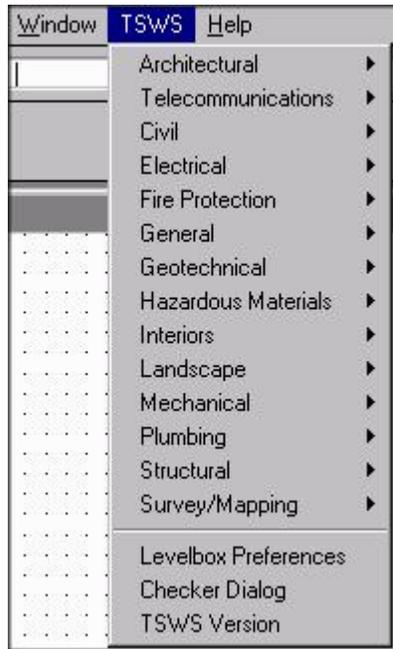


Figure 5 – Opening the Levelbox Preferences

Changing the Levelbox Preferences

The Levelbox Preferences dialog box (Figure 6) is available to allow the user to modify the vertical size and functionality of the Levelbox.



Figure 6 – Levelbox Preferences settings dialog box

Docked Row Count

The Docked Row Count setting allows the user to change the number of levels displayed in the Levelbox, when docked into the MicroStation interface (Figure 7). The default is “2”.

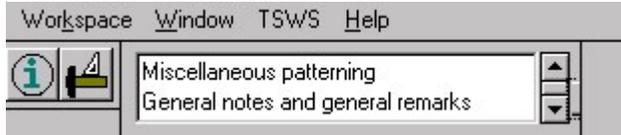


Figure 7 – Levelbox docked into MicroStation’s interface

Undocked Row Count

When the Levelbox is undocked (Figure 8), the Undocked Row Count setting allows the user to change the number of levels displayed in the dialog box. The default is “6”.

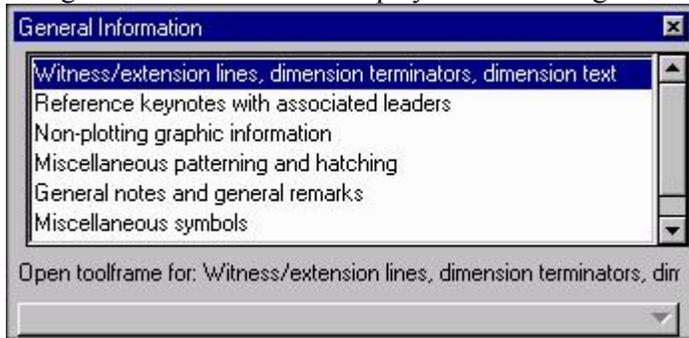


Figure 8 – Undocked Levelbox

Double Click Row to Activate

The Double Click Row to Activate setting can be used to allow for single or double clicking when selecting a level in the Levelbox.

Command Filter

Selecting an option in the Levelbox will sometimes change the active attribute and also enter the user into an element placement command. The Command Filter (Figure 9) allows for Smartline, Line or Linestring to be selected as the default element placement type for the Workspace. In addition, the Use AccuDraw setting allows the user to automatically start AccuDraw each time the default element placement type is used.

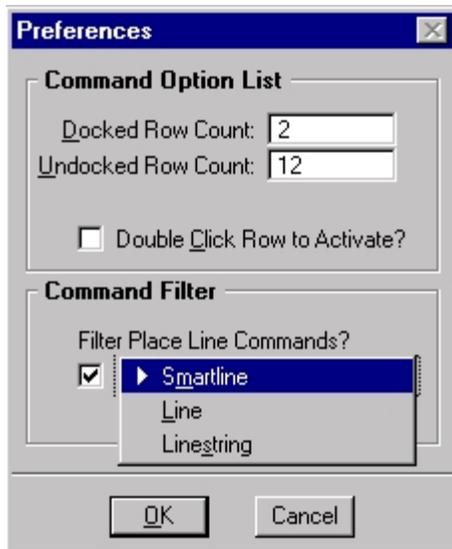


Figure 9 – Levelbox Preferences Command Filter

Workspace Version

Selecting *TSWS Version* at the bottom of the TSWS pull-down allows the user to see the current version of the Workspace in use and the database used to generate the Workspace (Figure 10). The user should have this information handy to report to the Center if an error/bug is ever found in the Workspace.



Figure 10 – Workspace Version Dialog Box

3

Architectural Discipline

In this Chapter

In this chapter, we will explore the interface, compliant element placement, and the many model files in the Architectural Discipline. Both an Architectural model and sheet file will be created. The Architectural Discipline levels are divided into the 9 model/sheet files listed below:

- Floor Plan
- Reflected Ceiling Plan
- Roof Plan
- Elevations (Exterior and Interior)
- Building Sections
- Details
- Equipment Plan
- Area Calculations/Occupancy Plan
- Sheet File

Each of these model/sheet files has the necessary symbology and standard symbols for creating standard compliant drawings.

Exercise 3-1: Creating a Model File

Creation of model files is often the first step in the process of developing engineering documents. In this exercise, we will create a model file using a standard compliant name and proceed to place elements that are compliant with the A/E/C CADD Standard.

Creating a Model File

The first step is the creation of the file. In this exercise, we will create a floor plan model file. It is very important that the proper seed file is used so that working units and other settings are accurate for this type of model file. Just as important is the name of the file. The checker uses the file name when verifying compliance with the A/E/C CADD Standard.

1. Start MicroStation.

We need to be at the MicroStation Manager dialog box.

2. Open the *Create Design File* dialog box. (*File>New*)

3. From the bottom of the *Create Design File* dialog box in the Seed File section, pick *Select*.

This will open the *Select Seed File* dialog box.

4. From the TSWS/seed directory select I_AEC_3D.DGN seed file.

This file uses inch-pound units and has working units set to feet and inches with MU:SU:PU set to 1:12:8000.

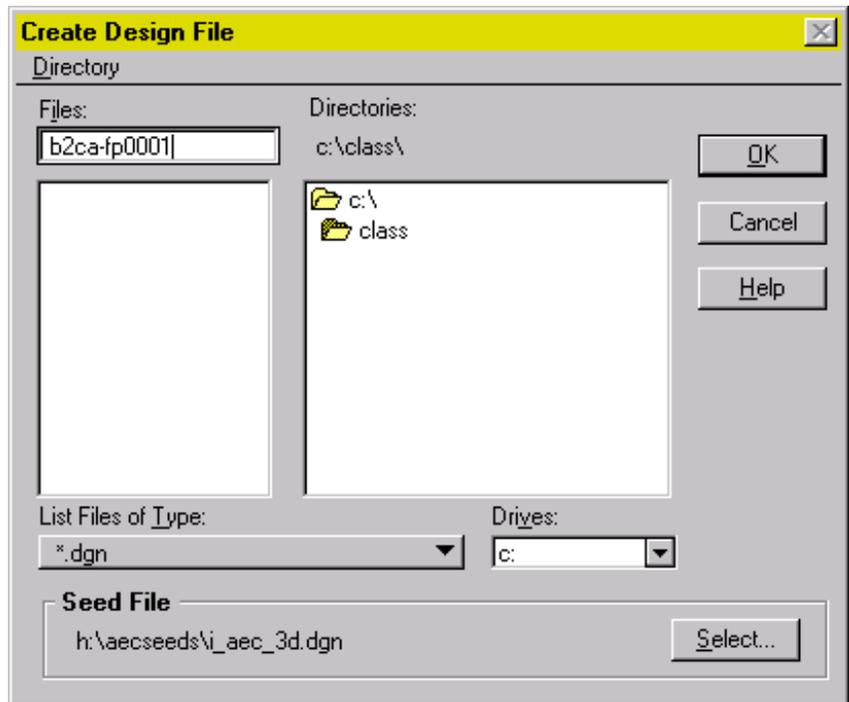
5. Select *OK*.

6. Keyin a file name of B2CA-FP0001.DGN as the new file to create.

The file B2CA-FP0001.DGN uses the optional model file naming convention (B2C = project code, A- = Architectural discipline, FP = Floor Plan model file, 0001 = user definable characters).



7. Select *OK* to create the file.
8. Select *OK* to open the file.



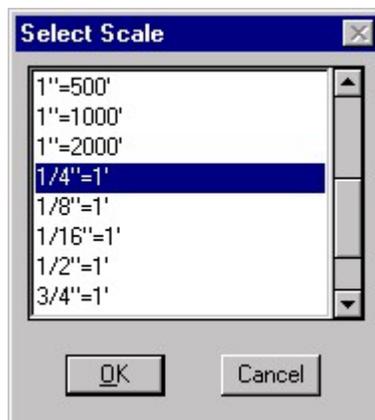
Create a Small Floor Plan

In this section, we will create a small 20' x 30' floor plan with a 3' door.

1. Select *Floor Plan* from the Architectural discipline under the TSWS pull down menu (*TSWS>Architectural>Floor Plan*).

2. From the Select Scale dialog box, select the $1/4''=1'$ scale.
3. Select *OK*.

Setting the scale will automatically adjust the placement size of certain elements (text, cells and patterns).



Once the drawing scale has been selected, the Architectural Floor Plan toolbox will display.



4. From the Floor Plan toolbox select the *Walls* icon. 

5. Inside of the Levelbox select *Exterior full height walls*.

This will change the active settings inside of MicroStation to the compliant symbology for exterior full height walls.

6. Create a 20' x 30' building outline shape using the *SmartLine* or *place block* command in the top view (Window 1).

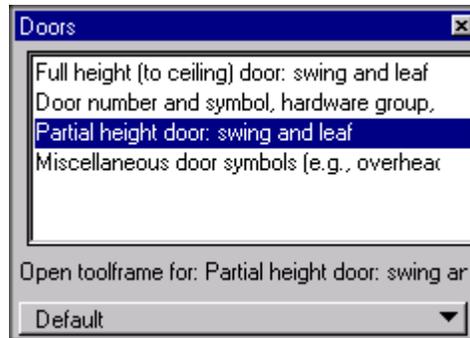
7. Using the *copy parallel* command, create a 1' thickness to the walls. 

8. From the Floor Plan toolbox, select the *Doors* icon. 

This will open the Doors Levelbox with the door levels listed.

9. Select the *Partial height door: swing and leaf level* from the levelbox.

This will open the toolbox for partial height doors.

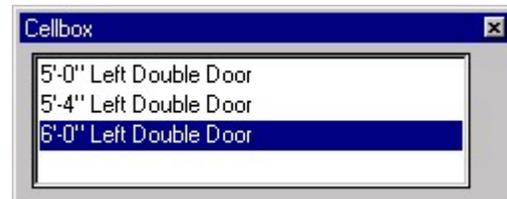


10. From the *Partial Height Doors* toolbox, select the *Left Double Door* icon. 

This will open the cellbox with the options for the door size.

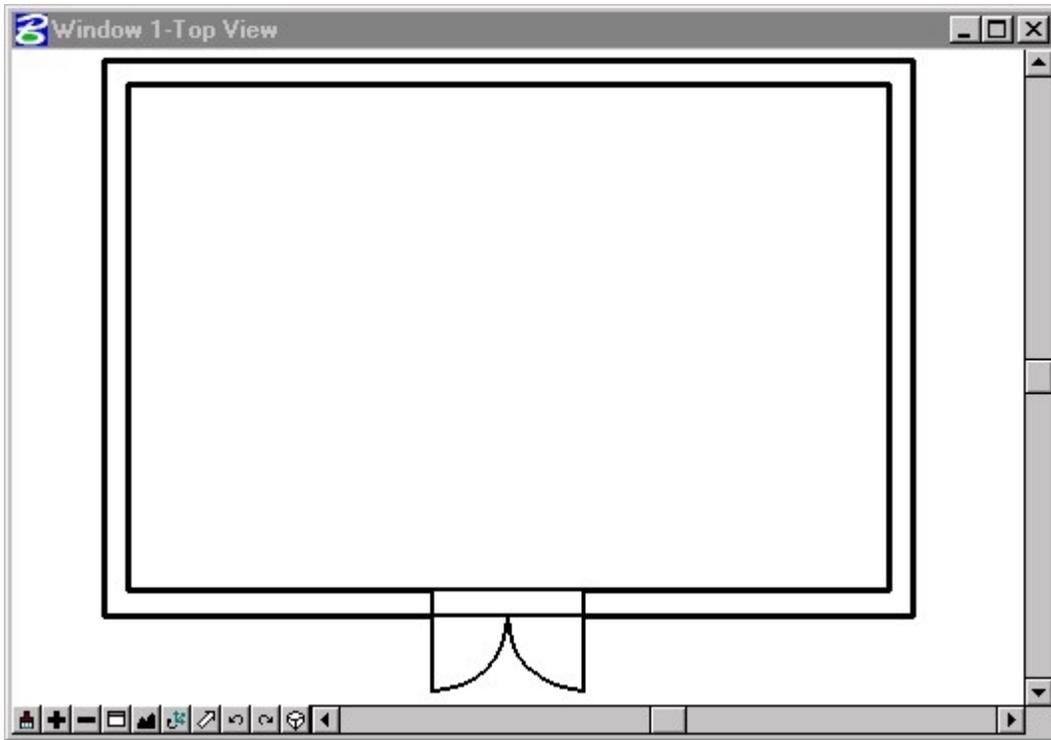
11. From the Cellbox, select the *6'-0" Left Double Door*.

At this point, MicroStation will activate the place active cell command with the proper cell name (DORDBL) and scale.



12. Place the door at the bottom center of the floor plan.

Your design should look like the following:

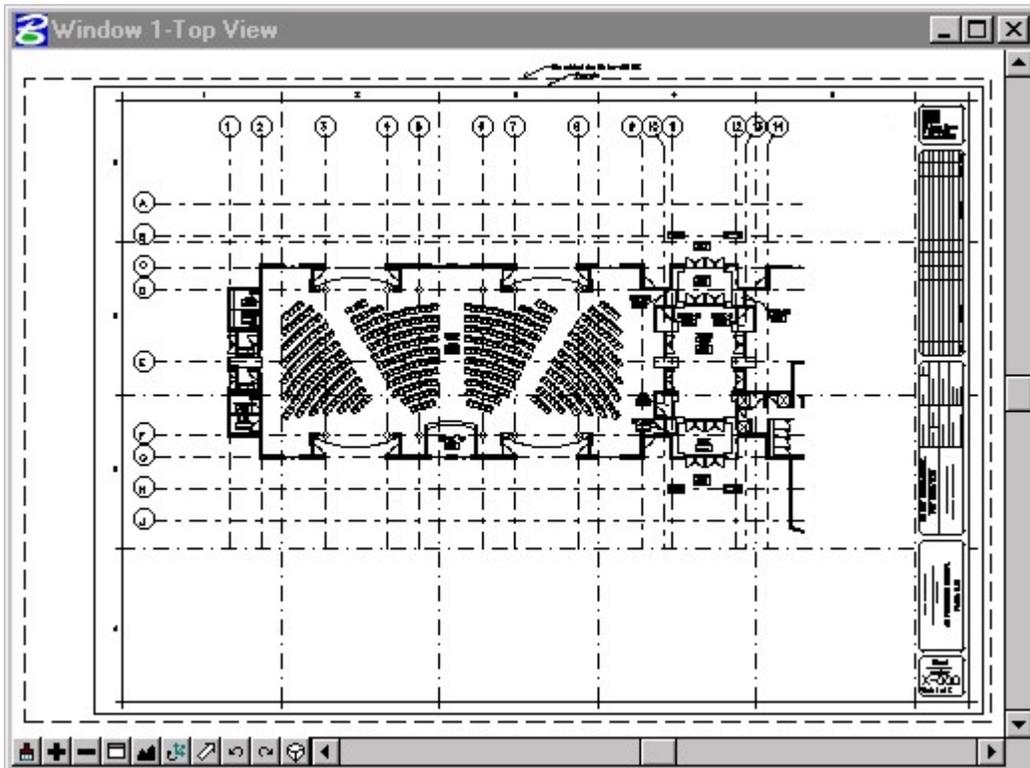


13. It will be necessary to clean up the existing wall with the partial delete command, trim off any excess lines, and place the door header lines.

Notes:

Exercise 3-2: Creating a Sheet File

A sheet file is a file used for plotting final construction documents. Creation of a sheet file involves referencing various model files and editing the reference file attachments with clipping, scaling and layer display functions in order to create the desired construction document. Finally, sheet file specific information is placed in the active design (border sheet text, scales, north arrows, etc). In this exercise, we will be referencing four (4) model files and adding sheet file specific text to create a sheet file.



Create a New Sheet File

In this next section we will create a sheet file. For this sheet file we will be using a metric seed file to match the model files' working units. The creation of the sheet file will have less detail than the previous exercise.

1. Start MicroStation

We need to be at the MicroStation Manager dialog box.

2. Open the *Create Design File* dialog box. (*File>New*).
3. From the bottom of the *Create Design File* dialog box in the Seed File section, pick *Select*.

This will open the *Select Seed File* dialog box.

4. From the TSWS/seed directory select M_AEC_3D.DGN seed file.

This file uses metric units and has working units set to mm with MU:SU:PU set to 1:1:100.

5. Select *OK*.

6. Keyin a file name of FWAA-101AXX.DGN.dgn as the new file to create.

The file FWAA-101A.DGN uses the optional sheet file naming convention (FWA = project code, A- = Architectural discipline, 1 = Plan, 01 = sheet sequence number, AXX = user definable character).

7. Select *OK* to create the file.

8. Select *OK* to open the file.

Once we have the sheet file opened, we need to reference all four (4) of the model files used in this sheet file.

Attaching the Floor Plan Model File

1. Open the *Reference Files* dialog box (*File>Reference*).
2. Open the *Attach Reference File* dialog box (*Tools>Attach*).
3. Navigate to the class directory and select the floor plan model file FWAA-FP0001.DGN.
4. Select *OK*.
5. Keyin a logical name of *AFP* in the *Attach Reference File* dialog box.
6. Keyin a description of *FLOOR PLAN* in the *Attach Reference File* dialog box.
7. Verify that the Nest Depth is set to 0.

A nest depth greater than 0 will result in any reference file that is attached to the file also being attached as a separate reference file attachment. This is usually not the desired result.

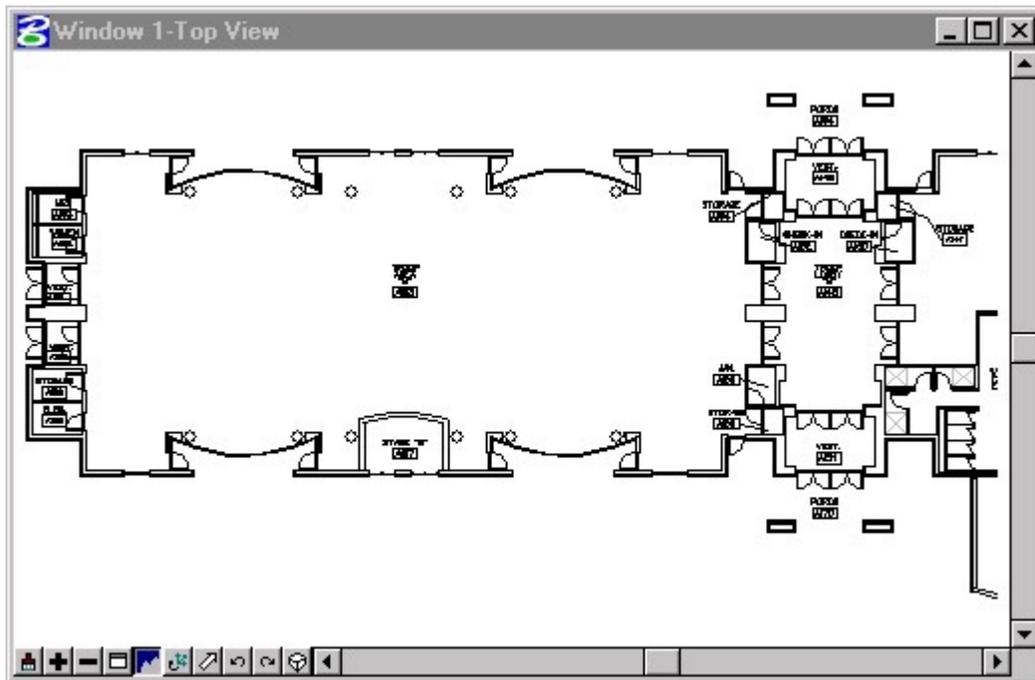
8. Select *OK*.

9. Use the *Fit* command to view the reference file.

10. Place a fence around the area on the far-left side of the floor plan to be used.

11. From the *Reference Files* dialog box, select the *Clip Boundary* command (*Tools>Clip Boundary*).

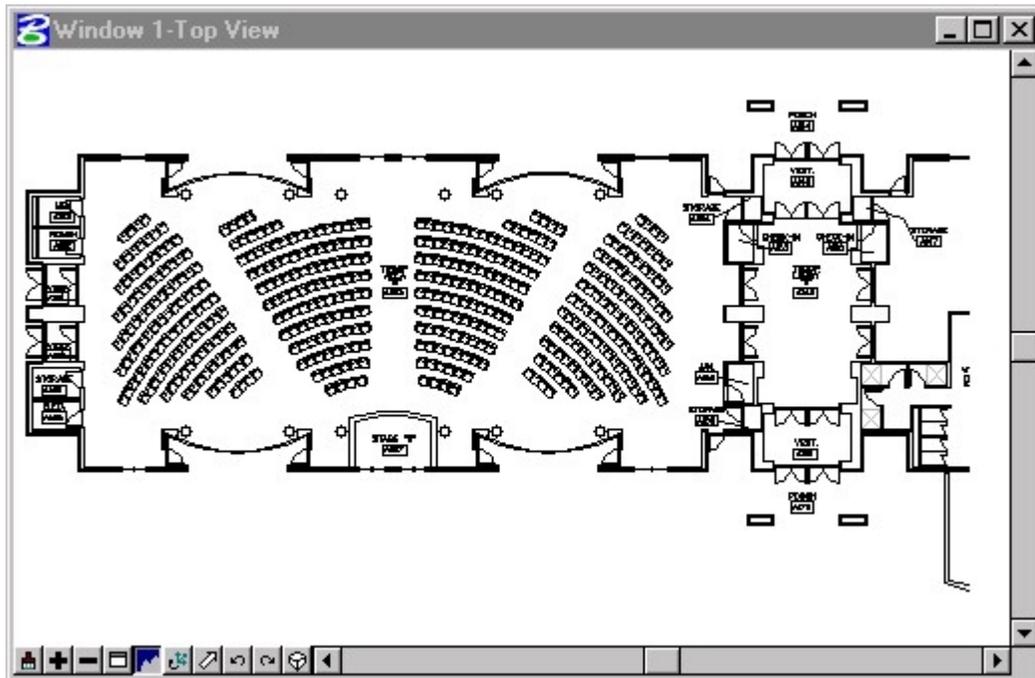
Your drawing should look like the following:



Attaching the Furniture Plan Model File

1. Open the *Reference File* dialog box (*File>Reference*).
2. Open the *Attach Reference File* dialog menu (*Tools>Attach*).
3. Navigate to the class directory and select the furniture plan model file FWAI-RP0001.DGN (Note: this is an Interior Design model file, I- = Interior Design, RP = Furniture Plan).
4. Select *OK*.
5. Key in a logical name of IRP in the *Attach Reference File* dialog box.
6. Key in a description of *FURNITURE PLAN* in the *Attach Reference File* dialog box.
7. Verify that the Nest Depth is set to 0.
8. Select *OK*.
9. Place a fence around the area of the furniture plan to be used.
10. From the Reference Files dialog box select the *Clip Boundary* command (*Tools>Clip Boundary*)

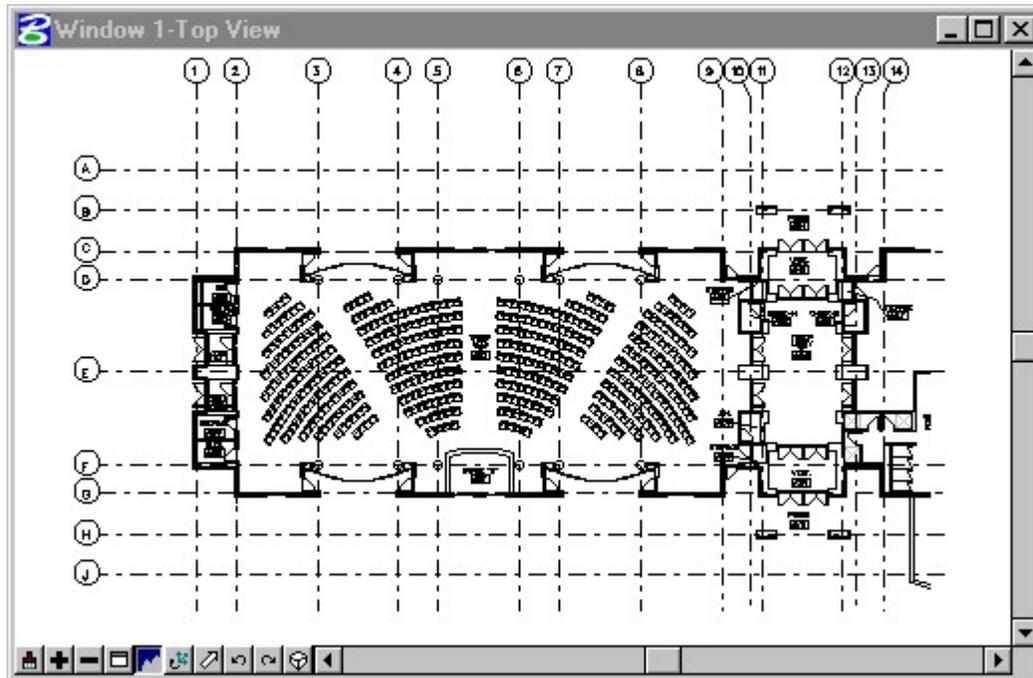
Your drawing should look like the following:



Attaching the Column Plan Model File

1. Open the *Reference File* dialog box (*File>Reference*).
2. Open the *Attach Reference File* dialog box (*Tools>Attach*).
3. Navigate to the class directory and select the column plan model file FWAS-CP0001.DGN (Note: this is a Structural model file, S = Structural, CP = Column Plan).
4. Select *OK*.
5. Key in a logical name of *SCP* in the *Attach Reference File* dialog box.
6. Key in a description of *COLUMN PLAN* in the *Attach Reference File* dialog box.
7. Verify that the Nest Depth is set to 0.
8. Select *OK*.
9. Place a fence around the area of the column plan to be used.
10. From the Reference Files dialog box select the *Clip Boundary* command (*Tools>Clip Boundary*)

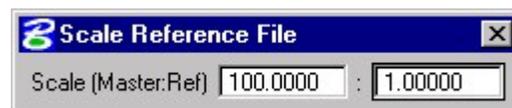
Your drawing should look like the following:



Attaching the Border Sheet model file

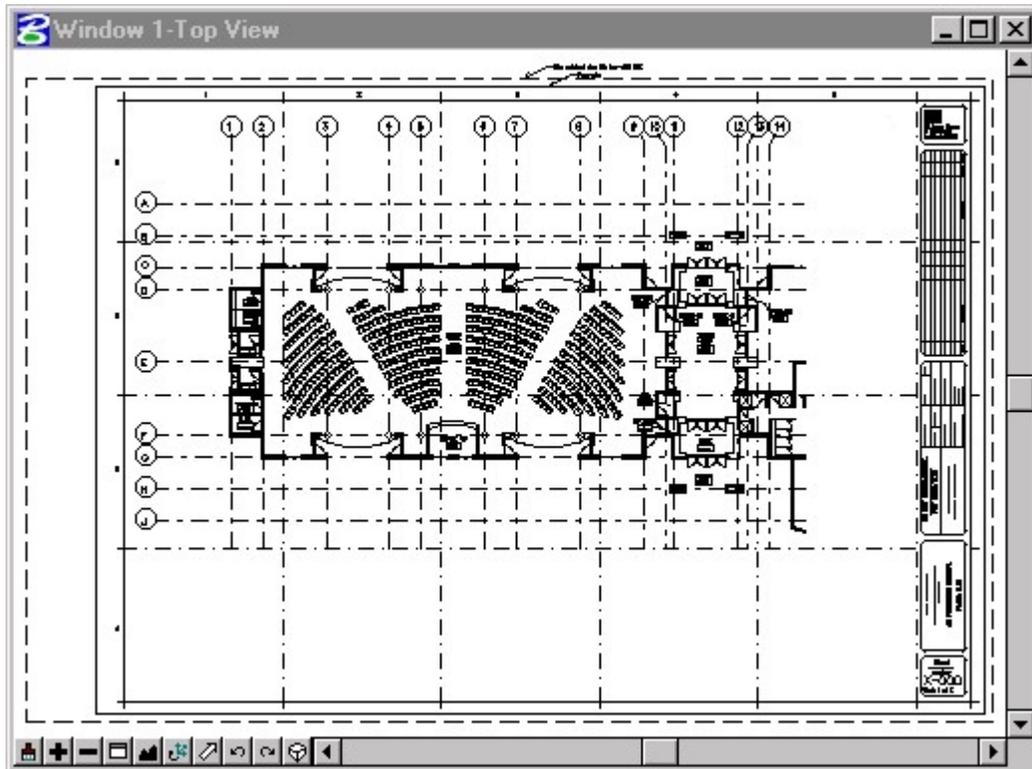
1. Open the *Reference File* dialog box (*File>Reference*).
2. Open the *Attach Reference File* dialog box (*Tools>Attach*).
3. Navigate to the class directory and select the border sheet model file FWAG-BS0000.DGN (Note: this is a General model file, G- = General, BS = Border Sheet).
4. Select *OK*.
5. Key in a logical name of GBS in the *Attach Reference File* dialog box.
6. Key in a description of BORDER SHEET in the *Attach Reference File* dialog box.
7. Verify that the Nest Depth is set to 0.
8. Select *OK*.
9. Scale the reference file up to fit around the floor plan. Select the *Scale Reference File* command from the *Reference Files* dialog box (*Tools>Scale*).

10. Enter in a scale of 100 to 1.



11. Identify a point to scale the reference file about with a data point inside of the view.
12. Move the Border Sheet model file to the proper location using the *Reference Move* command (*Tools>Move*).

Your drawing should look like the following:

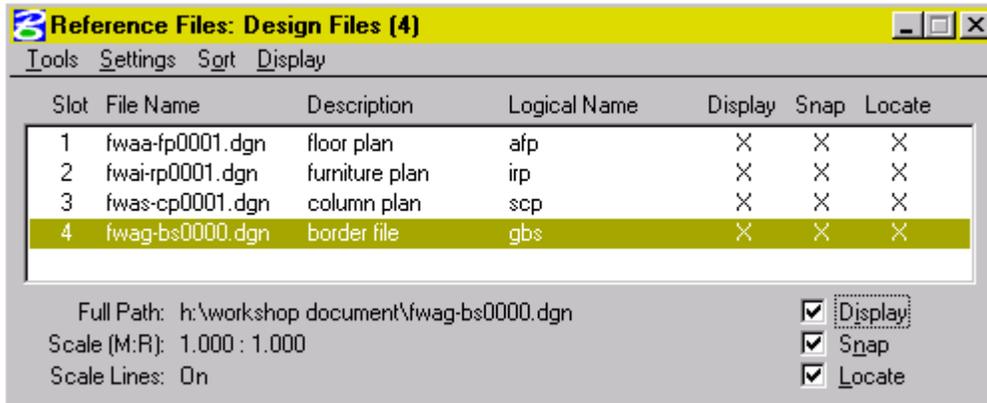


Turn off the Border Sheet Grid Lines

If desired, the border sheet grid lines can be turned off. These lines reside on level 3 of the border sheet model file. Using the reference file dialog box, we can turn off and on levels in a reference file without affecting the active file's elements.

1. Open the *Reference Files* dialog box (*File>Reference*).

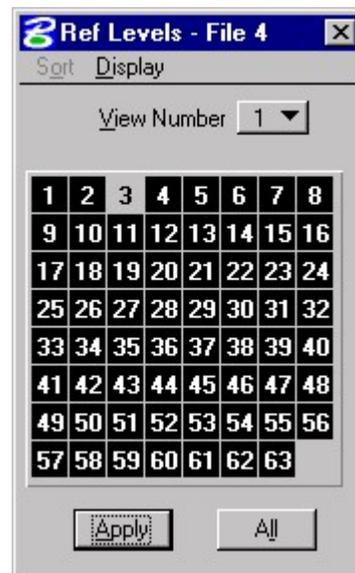
2. Select the border sheet model file reference attachment.



3. Open the *Reference Levels* dialog box (*Settings>Levels*).
4. Toggle level 3 off.
5. Select *All*.

Selecting *All* will make the change effective on all windows (1 through 8) of the active design file. Selecting the *Apply* button will only affect the view that is currently selected at the top of the dialog box.

6. Dismiss the dialog box by selecting the *X* at the top right side of the *Reference Levels* dialog box.



This method of turning off and on levels of attached reference files has no effect on the elements in the active file.

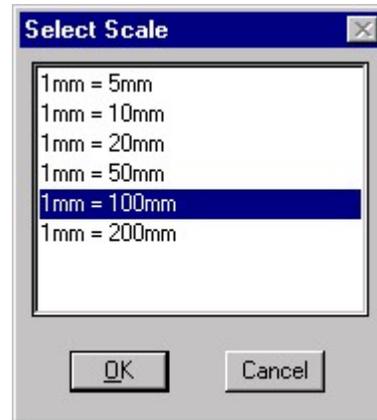
Adding Title Block Text

Inside of the title block you would need to add a few lines of text. For example, a drawing description of FLOOR PLAN needs to be added. For additional practice, place text in the design file information area, such as name, date, file name, etc.

1. Open the Floor Plan toolbox (*TSWS>Architectural>Sheet File*).

2. Select the 1mm = 100mm scale from the *Select Scale* dialog box.

This is the plot scale of the sheet file. It also corresponds to the current scale of the border file used. This will change the size of the text to be correct upon placement.



3. Select the *General Information* icon from the Sheet File toolbox. 
4. From the levelbox, select the *Sheet-specific text and callouts with associated leaders* (e.g., *title block text, legend and schedule text*) level.
5. Select the *Place Text* command. 
6. Keyin *FLOOR PLAN* in the text editor.
7. Set the active angle to 90°.
8. Place the text below the line that has AIR PASSENGER TERMINAL.
9. Practice using the place text command for placing other text in the title block.

Notes:

4

Electrical Discipline

In this Chapter

In this chapter, we will explore the Electrical Discipline of the Workspace. This chapter will contain less detail on many of the commands covered in the previous chapter. The Electrical Discipline levels are divided into the 10 model/sheet files listed below:

- Lighting Plan
- Power Plan
- Special Systems Plan
- Grounding System
- Electrical Utilities Plan
- Exterior Communication Systems Plan
- Riser/One-Line Diagrams
- Airfield Lighting Plan
- Details
- Sheet File

Each of these model/sheet files has the necessary symbology and standard symbols for creating standard compliant drawings.

We will first add compliant elements to finish an existing model file. Then we will create a new sheet file by attaching the necessary model files.

Exercise 4-1: Working with Model Files

Working with model files represents a majority of the use of the Workspace. In this exercise, we will open an existing model file and complete the design using compliant elements selected with the workspace.

Opening the Model File

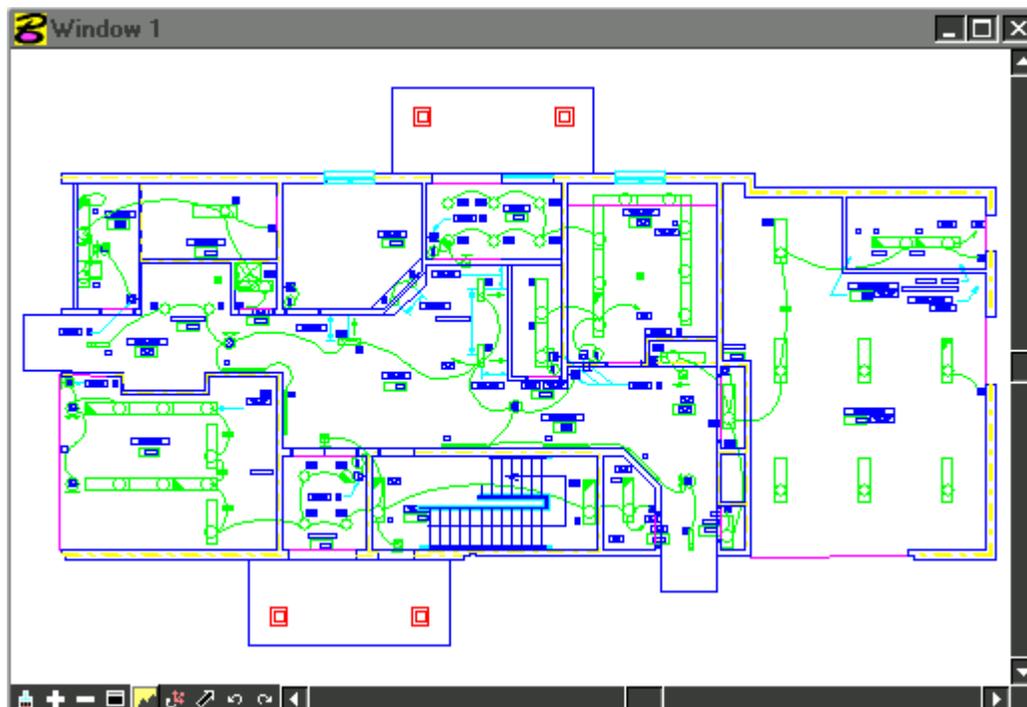
We need to first open the model file and select the proper model file toolbox.

1. Start MicroStation

We need to be at the MicroStation Manager dialog box.

2. Select file E01E-LP0001.DGN from the class directory.
3. Select *OK*.
4. Based on the file name E01E-LP0001.DGN select the correct model file from the TSWS pull-down menu (*TSWS>Electrical>Lighting Plan*). This will open the toolbox for this model file.
5. Turn the display on for the floor plan reference file E01A-FP0001.DGN

This will display the Architectural floor plan model file. Model files from other disciplines can be referenced to create other discipline's model and sheet files.

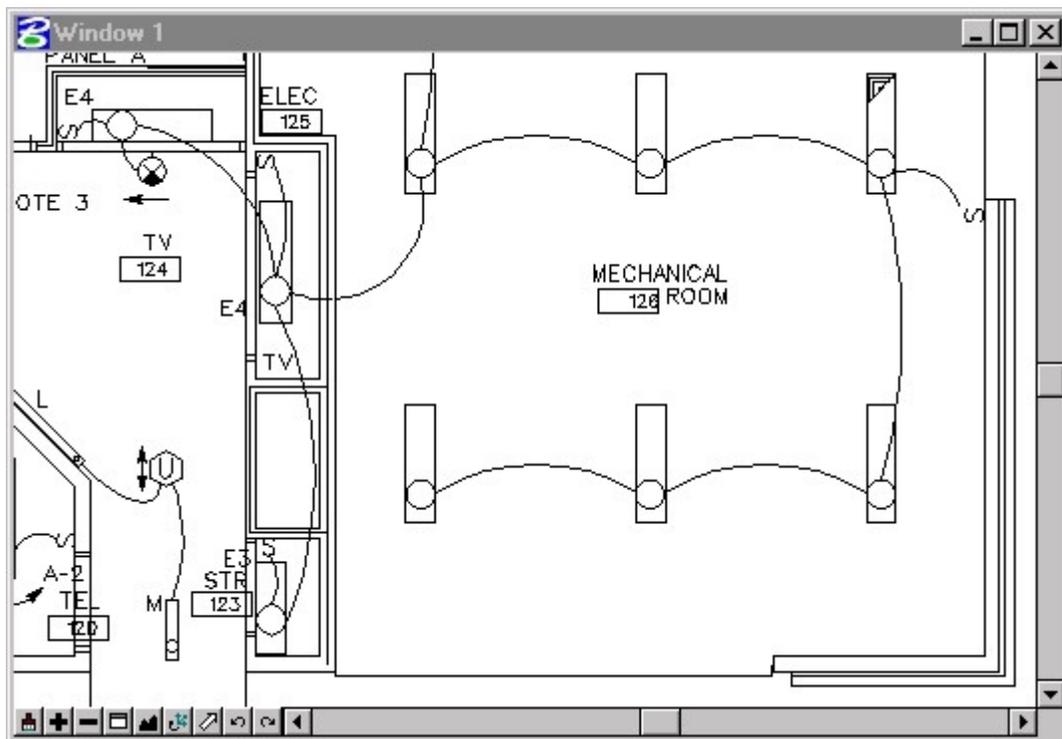


Adding Lighting Circuits

In this section you will add the lighting circuits that are missing.

1. Zoom into the bottom right side of the floor plan (Mechanical Room).
2. Select the *Circuit Lines* icon from the *Lighting Plan* toolbox. 
3. From the levelbox, select *Lighting Circuits*. Then select the line command from the palette.
4. Create the missing lighting circuits.

Your completed circuits should look like the following:



Adding Light Fixtures and Circuits

1. Zoom into the office in the top left side of the building.
2. From the *Lighting Plan* toolbox select the *Lighting* icon. 
3. Select *Ceiling Mounted Fixtures* from the levelbox.

4. Select the *2 X 2 Light Fixture* icon.



Then select *600 X 600 Light Fixture* from the Cellbox. This places a 600 x 600 fluorescent fixture. After placing one, continue placing the remaining three fixtures in the office.

Add Lighting Circuits for the Light Fixtures

1. Select the *Circuit Lines* icon from the *Lighting Plan* toolbox.
2. From the levelbox, select *Lighting Circuits*.
3. Create the missing lighting circuits.



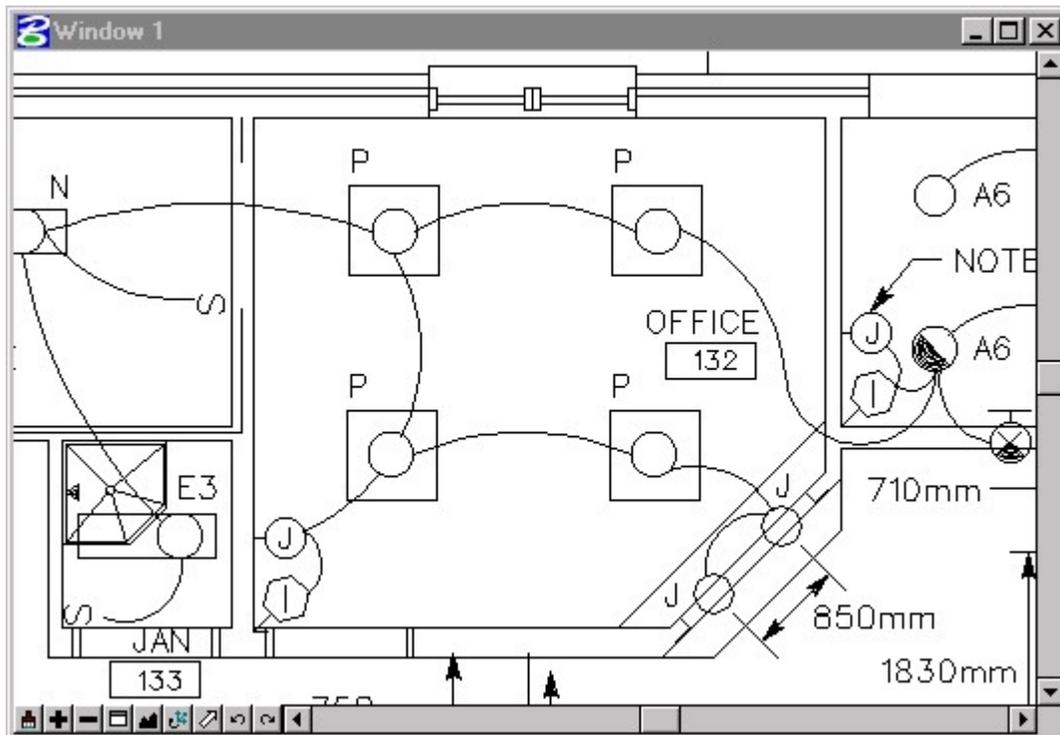
Place Light Fixture Identification Tags

In this section we will place light fixture identification tags to correspond with the lighting schedule.

1. From the *Lighting Plan* toolbox select the *Lighting* icon.
2. Select *Light fixture identifier tags* from the levelbox.
3. Place the letter “P” next to each of the newly placed light fixtures.

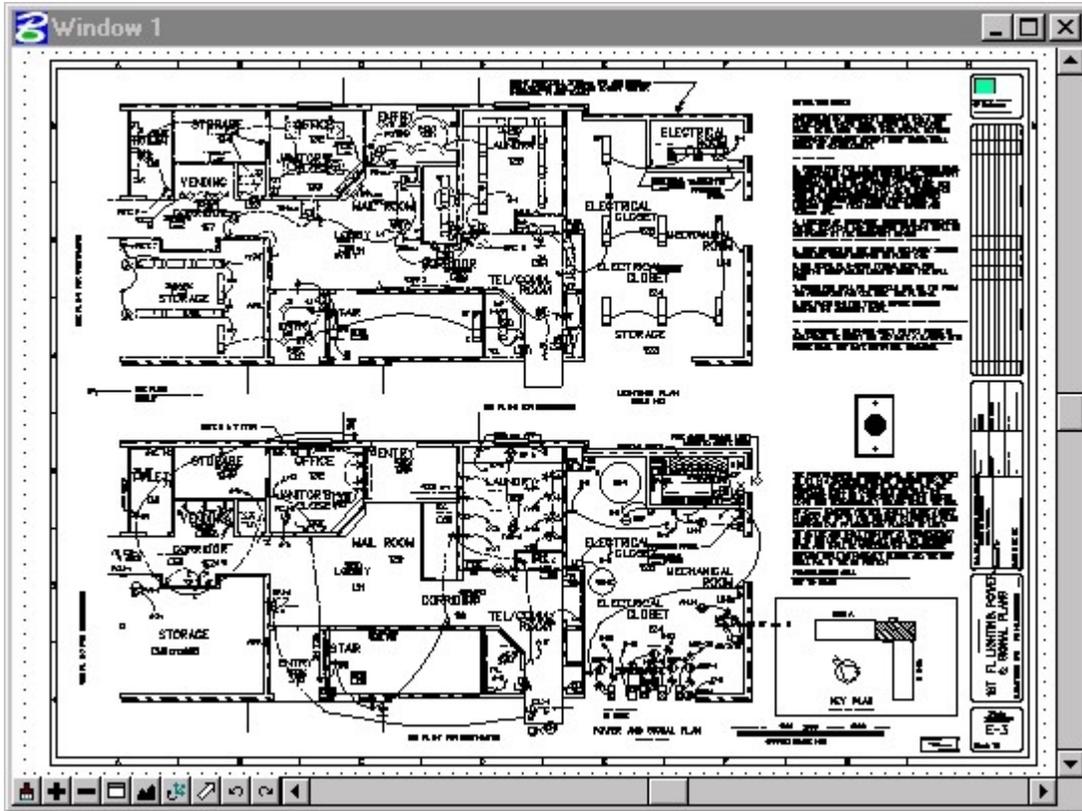


Your completed lights and circuits should look like the following:



Exercise 4-2: Creating Electrical Sheet Files

In this exercise, we will create a new sheet file, then reference all necessary model files. The completed sheet file should look like the following:



Create a New Sheet File

In this next section, we will create a sheet file. For this sheet file, we will be using a metric seed file to match the referenced model files' working units.

1. Start MicroStation.
We need to be at the MicroStation Manager dialog box.
2. Open the *Create Design File* dialog box (*File>New*).
3. From the bottom of the *Create Design File* dialog box in the Seed File section, pick *Select*.

This will open the *Select Seed File* dialog box.

4. From the TSWS/seed directory select the file M_AEC_2D.DGN from the list.

This file uses metric units and has working units set to mm with MU:SU:PU set to 1:1:100.

5. Select *OK*.

6. Keyin a file name of E01E-401AXX.DGN as the new file to create

The file E01E-401AXX.DGN uses the optional sheet file naming convention (E01 = project code, E- = Electrical discipline, 4 = Large scale plan, 01 = sheet sequence number, AXX = user definable character).

7. Select *OK* to create the file
8. Select *OK* to open the file

Attaching the Model Files

Once we have the sheet file opened, we need to attach all of the model files used for this sheet file. The model files used for this sheet file include:

- E01A-FP0001.DGN (Two times)
- E01E-LP0001.DGN
- E01E-PP0001.DGN
- E01E-DT0001.DGN
- E01G-BS0001.DGN
- E01G-KP0001.DGN

1. Open the *Reference Files* menu (*File>Reference*) or (*TSWS>Electrical>Sheet File*).
2. Open the *Attach Reference File* dialog box (*Tools>Attach*).
3. Navigate to the class directory and select the floor plan E01A-FP0001.DGN
4. Select *OK*
5. Keyin a logical name of AFP1 in the *Attach Reference File* dialog box
6. Keyin a description of TOP FLOOR PLAN in the *Attach Reference File* dialog box
7. Verify that the Nest Depth is set to 0
8. Select *OK*
9. Use the *Fit* command to view the reference file
10. Place a fence around the floor plan to be used
11. From the *Reference Files* dialog box, select the *Clip Boundary* command (*Tools>Clip Boundary*).

Repeat these steps to model files E01A-FP0001 (second attachment), E01E-LP0001, and E01E-PP0001.

Move and Scale Model Files

1. Attach the border sheet model file and scale it 50:1. Move the border sheet so that it contains the plans you referenced in the above steps.
2. Attach the Electrical Detail model file and the Keyplan model file. Scale them 50:1 if necessary.
3. Move all reference files to the proper locations.
4. Create clip boundaries where needed.
5. Adjust reference file levels where needed.

5

Civil Discipline

In this Chapter

In this chapter, we will explore the Civil Discipline of the Workspace. The Civil Discipline levels are divided into the 18 model/sheet files listed below:

- Site Plan
- Grading Plan
- Dredging Plan
- Transportation Site Plan
- Joint Layout Plan
- Airfield Plan
- Airfield Paving Plan
- Domestic Water Plan
- Sanitary Sewer Plan
- Storm Sewer Plan
- Industrial Waste Water Plan
- Natural Gas Utilities Plan
- Liquid Fuel Utilities Plan
- Profiles
- Elevations
- X-Sections
- Details
- Sheet File

Each of these model/sheet files contains the necessary symbology and standard symbols for creating standard compliant drawings.

We will first place compliant elements to finish an existing model file. Then we will create a new sheet file by attaching the necessary model files.

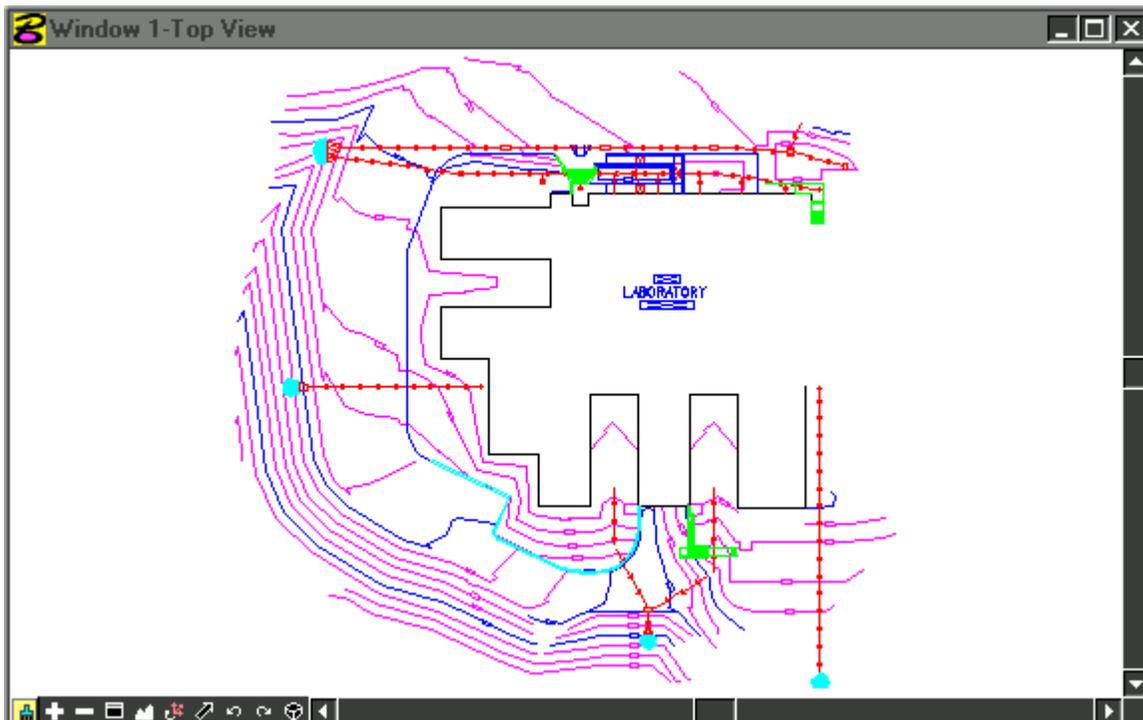
Exercise 5-1: Working with Model Files

In this exercise we will use a pre-existing civil model file to demonstrate working with existing data.

Opening the Model File

1. Start MicroStation
2. Open file ITLC-SP0001.DGN from the class directory

You should see the following drawing:

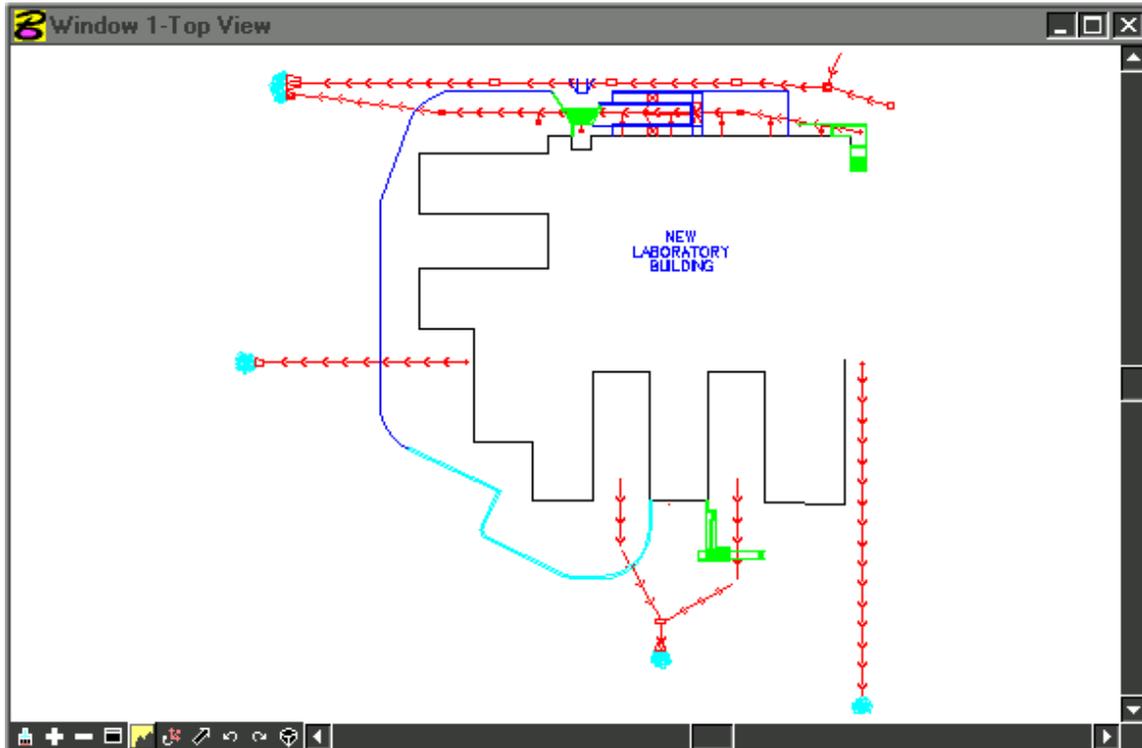


In this next section, we will attach other reference files and finish placing elements using the workspace in this Site Plan model file.

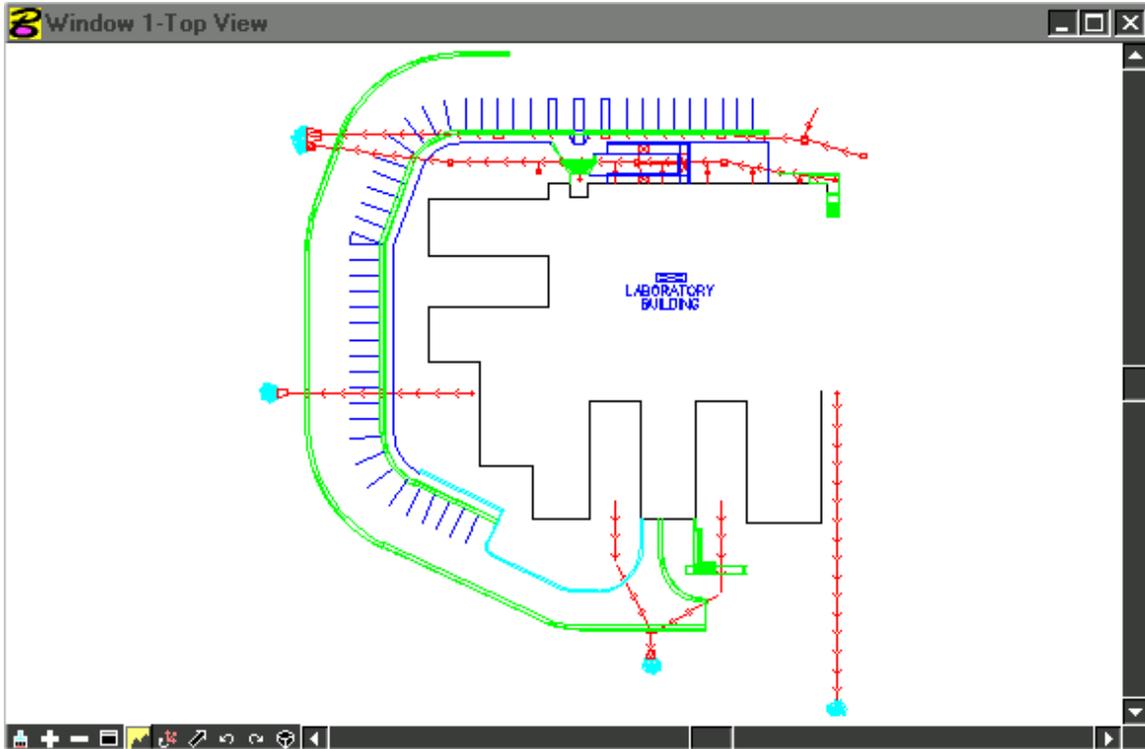
Referencing other Model Files

Model files can be used to create both sheet files and other model files. For this exercise, we will reference in a Civil Transportation Site Plan model file, to assist in the placement of fencing.

1. Since we will not need the Topography levels for this exercise, turn off those levels so the design file can be easily read (LV 41-44).

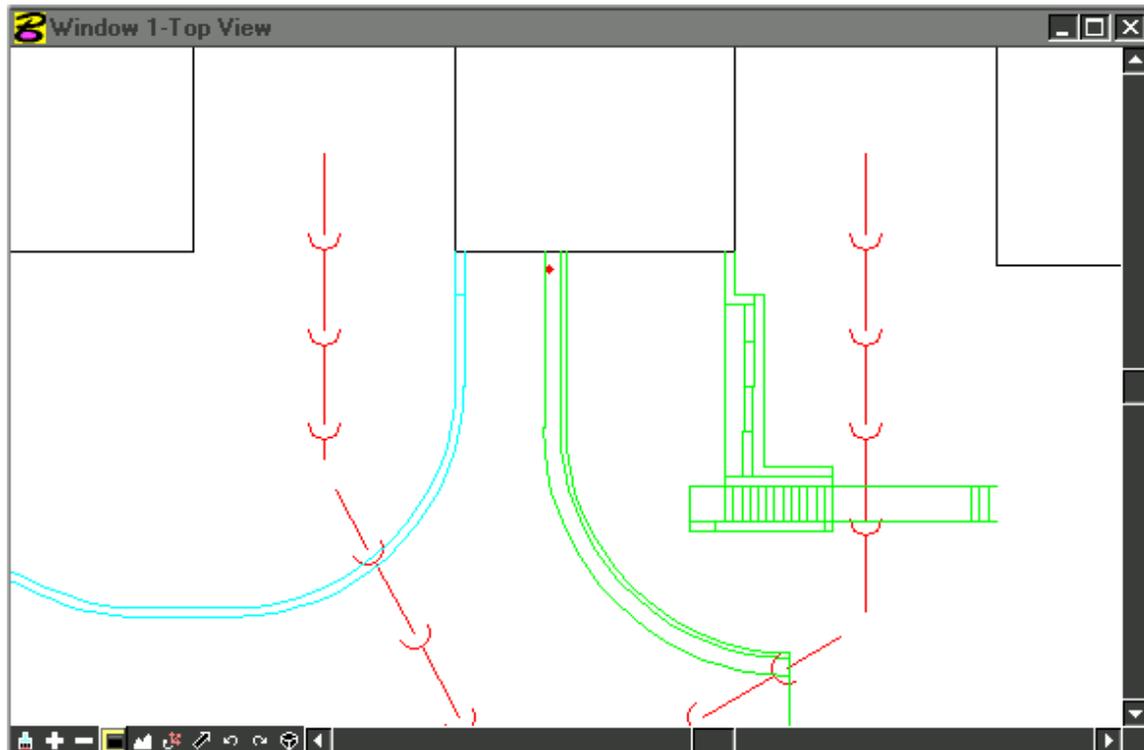


2. We could start placing fencing now, but the current design file does not contain the linework for the parking lot or driveways. So, we will have to reference in the Transportation Site Plan.
3. Open the *Reference File* dialog box (*File>Reference*).
4. Open the *Attach Reference File* dialog box (*Tools>Attach*), and select ITLC-TS0001.DGN.
5. Select *OK*.
6. Key in a logical name in the *Attach Reference File* dialog box.
7. Key in a description in the *Attach Reference File* dialog box.
8. Verify that the nest depth is set to 0.
9. Select *OK*.
10. Use the *Fit* command to view all files.



Adding Elements into the Model File

1. Zoom into the bottom center of the file where the two storm drainage lines are located.



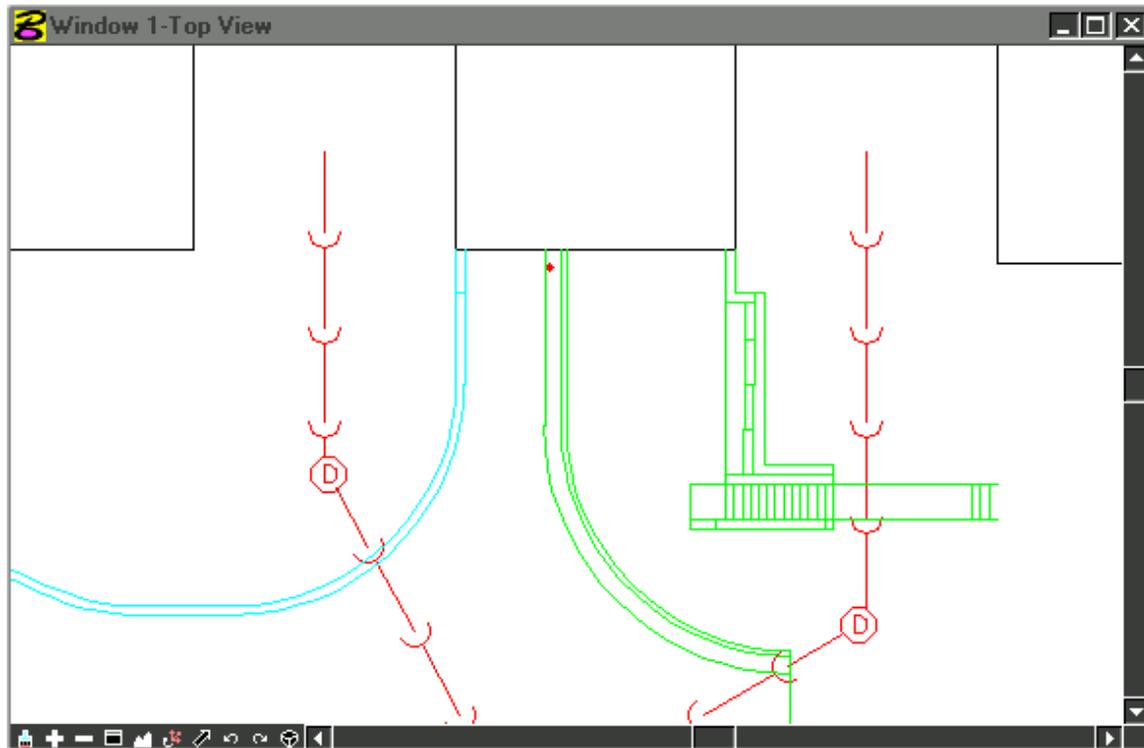
- The storm drainage lines are there, but there are not any catch basins or manholes! We will now add these items using the workspace. Select the *Storm Drainage* icon from the Site Plan toolbox (*TSWS>Civil>Site Plan*).



- From the levelbox, select *Storm drainage, headwalls, inlets, manholes, culverts, and drainage structures*. A palette will appear with the option to either draw linework or place an existing symbol from the Civil/Site library. In this case, we want to use the *Storm drainage manhole* symbol.

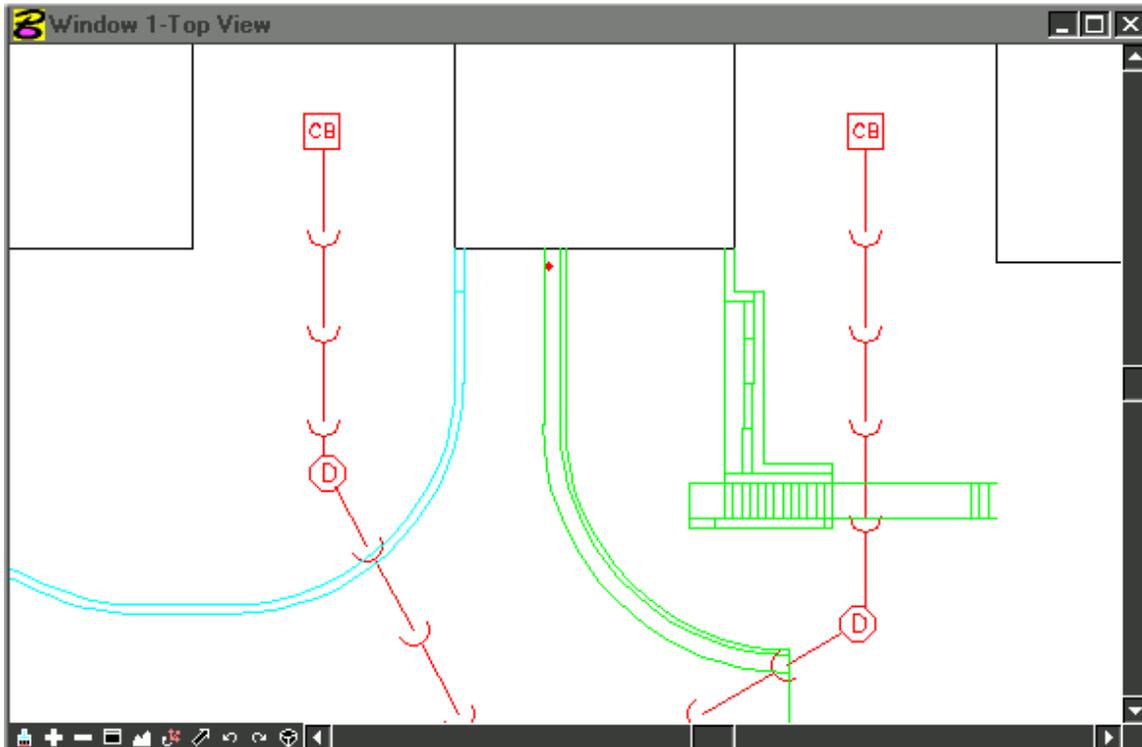


- Place storm drainage manholes at both junctures of the storm drainage lines.



- Now to place the Catch Basins. From the *Storm drainage, headwalls, inlets, manholes, culverts, and drainage structures* palette, select the symbol for square Catch Basins.

- Now, place the Catch Basins at the upper ends of the two Storm Drainage lines.

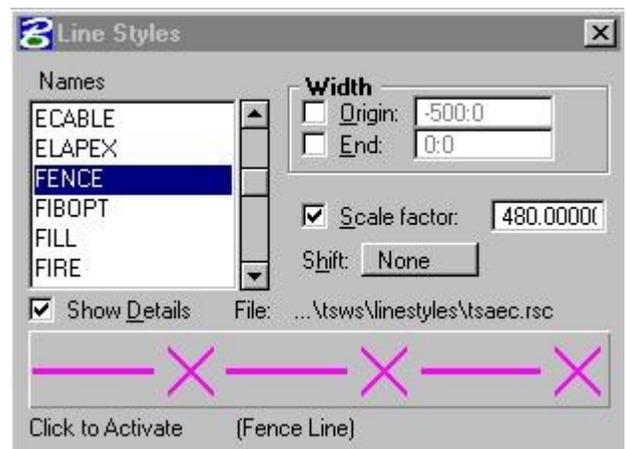
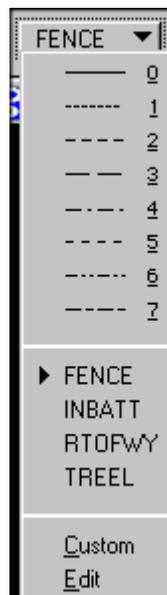


- We will now place a partial fence line around the Site Plan. Select the *Site Improvement* icon from the Site Plan toolbox.

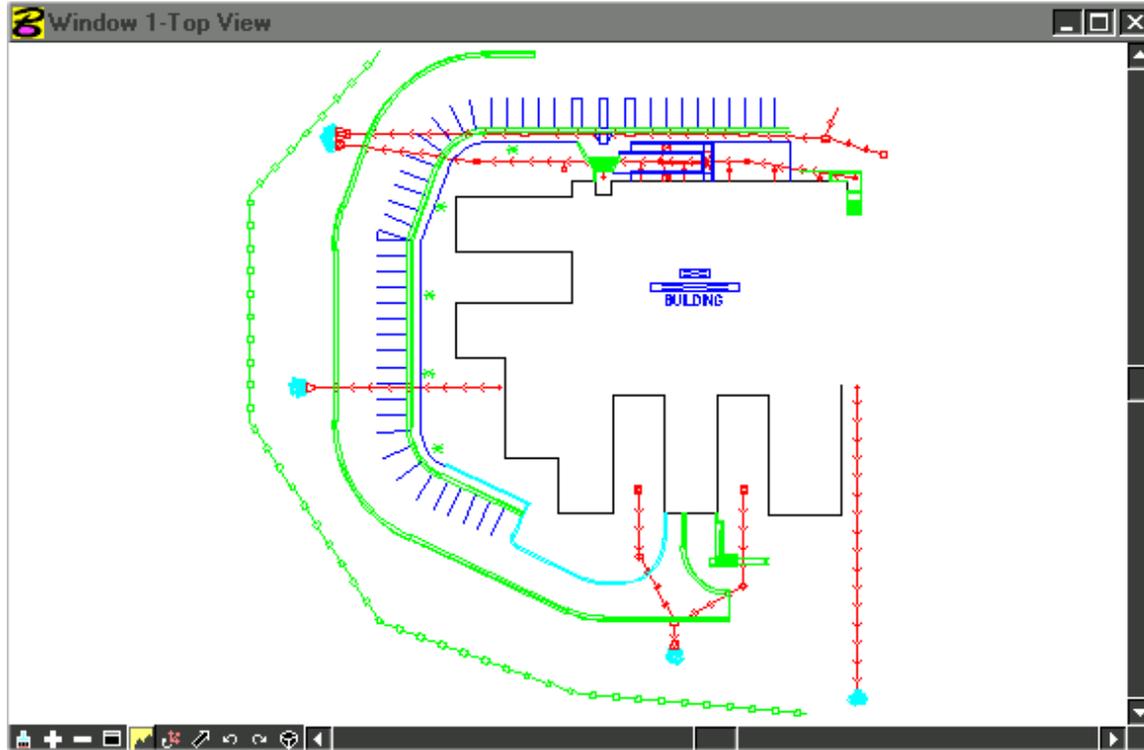


- From the levelbox, select *Fences and handrails*.

- Note that when you selected this level, you have a choice of using either a single line (continuous) or the FENCE custom linestyle. Select the Fence linestyle. Let's verify that the linestyle will be placed at the correct scale factor. Click on the FENCE linestyle name and then select Custom. On the *Line Styles* dialog box, click on the *Show Details* box. The scale factor should be 480 since the design file was created for a plot scale factor of 1" = 40'.



10. Select the Fences level again from the levelbox and begin drawing a fence around the exterior of the driveway. When you finish, you should have something like this:

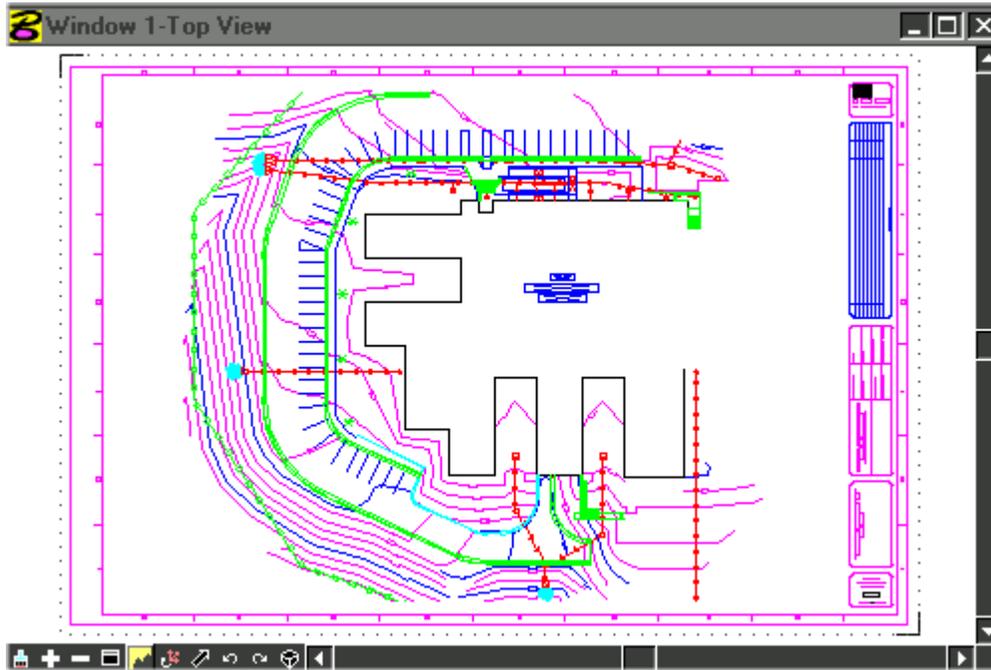


11. Detach the Transportation Site Plan reference file and save the Site Plan. **Remember:** a model file should never be saved with reference files attached.

Exercise 5-2: Creating Civil Sheet Files

In this exercise we will create a new Civil sheet file using files from the previous exercise.

The completed sheet file should look like the following:



Create a New Sheet File

In this next section we will create a sheet file. For this sheet file we will be using an inch-pound seed file to match the model files' working units.

1. Start MicroStation
2. Open the *Create Design File* menu (*File>New*)
3. From the bottom of the dialog box in the *Seed File* section, pick *Select*.

This will open the *Select Seed File* dialog box.

4. From the TSWS/seed directory select the file I_CIV_3D.DGN from the list

This file uses inch-pound units and has working units set to ft with MU:SU:PU set to 1:100:10.

5. Select *OK*

6. Keyin a compliant name for a Civil sheet file with a Plan being the dominant feature on the sheet.
7. Select *OK* to create the file
8. Select *OK* to open the file

Attaching the model files

Once we have the sheet file created we need to attach all of the model files used for this sheet file. The model files used for this sheet file include:

- ITLC-SP0001.DGN
- ITLC-TS0001.DGN
- ITLG-BS0001.DGN

1. Open the *Reference File* menu (*File>Reference*) or (*TSWS>Civil>Sheet File*)
2. Open the *Attach Reference File* dialog box (*Tools>Attach*)
3. Navigate to the class directory and select one of the reference files.
4. Select *OK*
5. Keyin a logical name in the *Attach Reference File* dialog box
6. Keyin a description in the *Attach Reference File* dialog box
7. Verify that the Nest Depth is set to 0

A nest depth of greater than 0 will result in any reference file that is attached to the file will also be attached as a separate reference file attachment. This is not usually the desired result.

8. Select *OK*
9. Use the *Fit* command to view the reference file
10. Place a fence around the area to be used
11. From the Reference Files dialog box select the *Clip Boundary* command (*Tools>Clip Boundary*)

Repeat these steps to attach all of the model files listed above

Move and Scale Model Files

1. Scale the border model file to fit around the design. We will scale the border at half the size of the plot scale. (Hint: the plot scale used is 1" = 40').
2. Move reference files to the proper locations.
3. Create clip boundaries where needed
4. Adjust reference file levels where needed

This completes the Civil chapter.

6

Checker Dialog Box

A/E/C Standard Checker

This chapter is designed to familiarize the user with the A/E/C Standard Checker. We will examine the Checker interface and interpret the output results in the Checker report.

The Checker is a tool that is intended to give the user feedback on how compliant design files are with the A/E/C CADD Standard. The Checker is automatically executed upon startup of any MicroStation design file (unless disabled). The Checker should be used only to test model files (without any reference files attached). It should not be used on sheet files, due to the various disciplines that could be referenced together to create a sheet file.

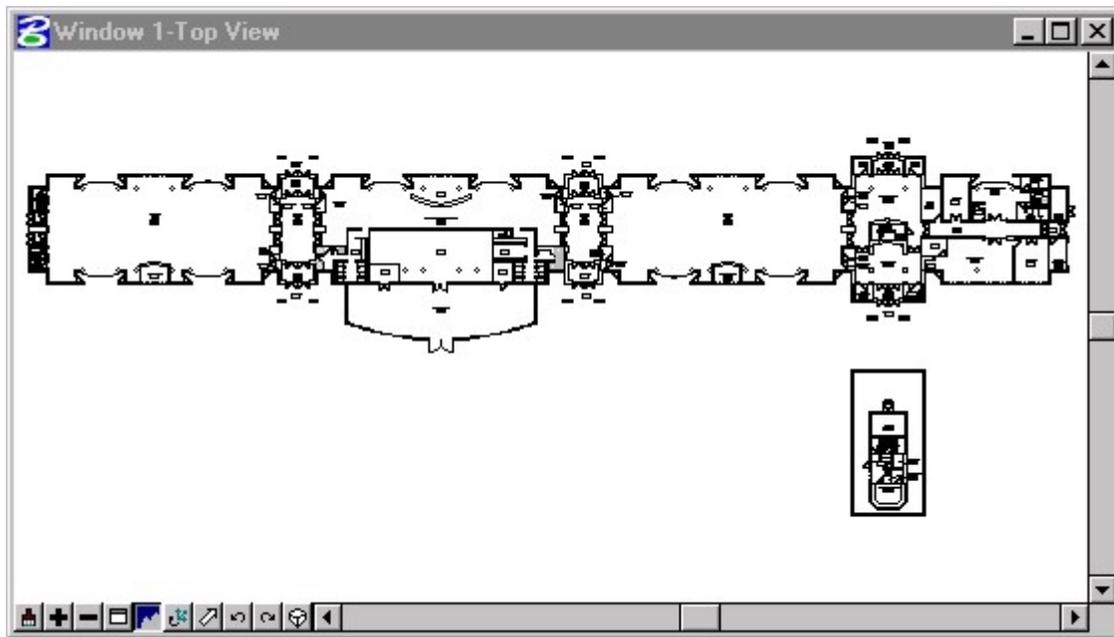
Exercise 6-1: Using the Checker Dialog Box

In this exercise, we will open an Architectural model file and work through the interface of the checker.

Using Locate

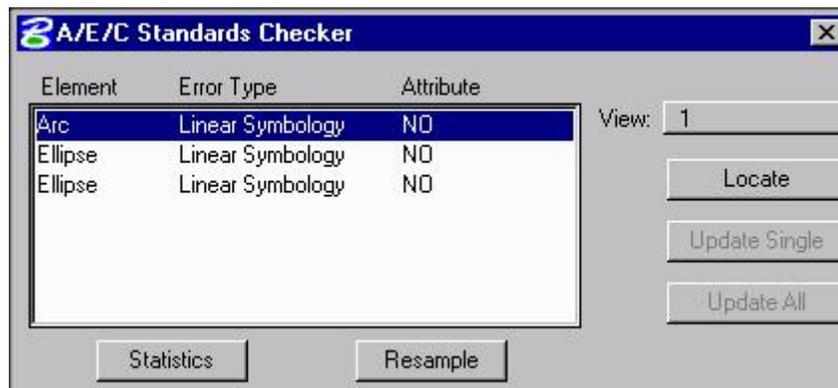
1. Start MicroStation
2. Open the file FWAA-FP0001.DGN from the class directory

This design file is a large floor plan. It is a compliant drawing with a few non-compliant elements placed inside.



- From the TSWS pull-down menu, select the Checker (*TSWS>Checker Dialog*)

This will open the Checker dialog box.

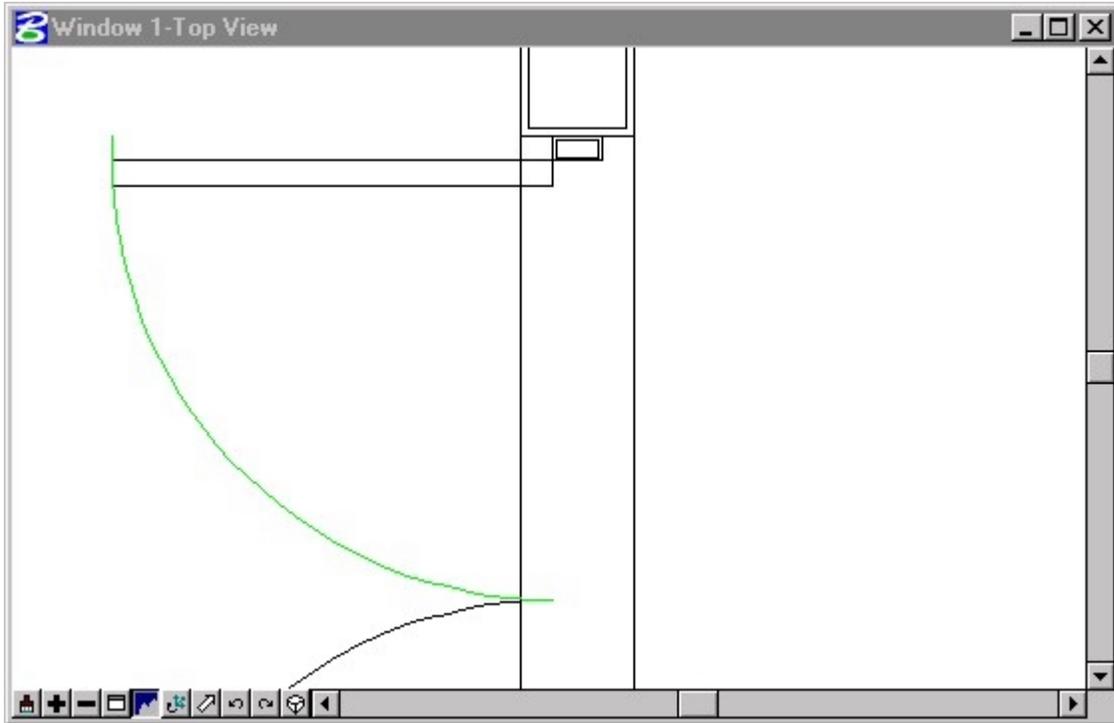


Notice the three elements that are listed inside of the *A/E/C Standards Checker* dialog box. These three items have some property that is non-compliant with the A/E/C CADD Standard. The three columns in the dialog box have information about the elements that are found to be non-compliant. The first column is the type of element (Arc, Ellipse, Cell, etc.). The second column lists the type of error that the checker found. The last column tells whether the item has an attribute linked to it.

- Verify that the view number listed at the top right matches the view you have open.
- Select the first element in the list. This will be the Arc.

- Click on the *Locate* button.

MicroStation will now zoom into the area around the Arc and highlight the Arc element. From looking at this item, we now know that there is something non-compliant with the symbology of this door swing.



- Repeat the process of locating each element in the list

Using Statistics

In this section, we will check the statistics for the design file, correct a non-compliant element, and recheck the statistics.

- From the TSWS pull-down menu, select the *Checker (TSWS>Checker Dialog)*
- From the *Checker* dialog box, select *Statistics*

You should see the following information box:



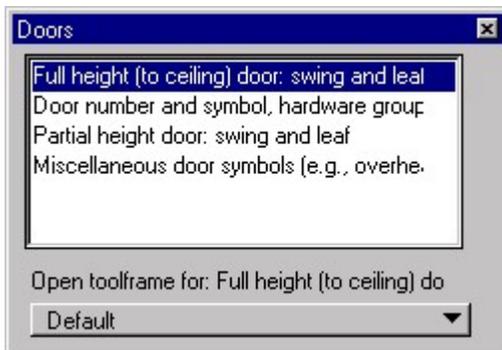
This information tells us that the design file contains 3 non-compliant elements at the time of the Checker scan (8832 total items - 8829 compliant items = 3 non-compliant items). This information is sent to a database for record keeping.

☞ The Elapsed time will be different each time the statistics are displayed.

3. Select *OK* to dismiss the *Information* dialog box.

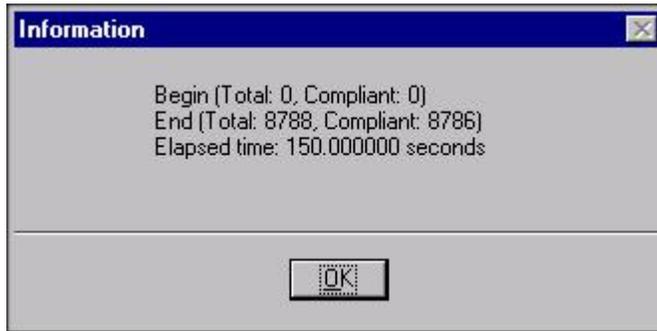
Changing Elements and Resample

1. From the *A/E/C Standards Checker* dialog box, select the first element in the list. This will be the Arc used for a door swing.
2. Select *Locate* to zoom in to the non-compliant arc.
3. Open the *Architectural Floor Plan* toolbox (*TSWS>Architectural>Floor Plan*)
4. Select the *Doors* icon 
5. From the Levelbox, select *Partial height door: swing and leaf* then click on the line icon in the *Partial Height Doors* palette. This will change the active symbology inside of MicroStation.



6. Using the *Change Element Attribute* command,  modify the Arc's symbology.

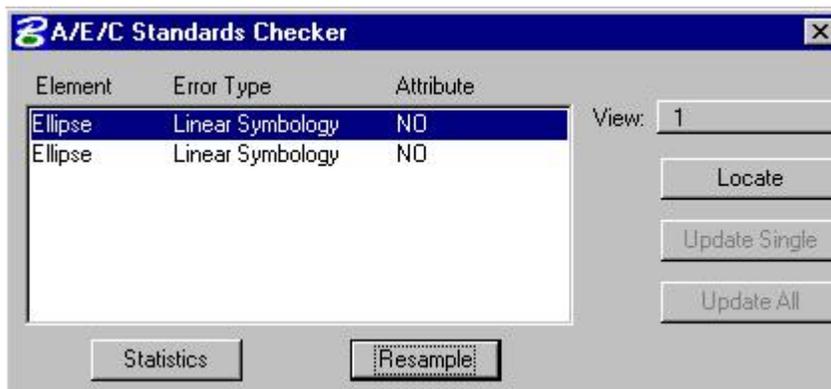
7. Select *Statistics* from the checker dialog box.



This time the statistics reflect the change in compliant element total (there are now only two non-compliant elements).

8. Select *Resample*

This will update the listing in the *Checker* dialog box to reflect the new compliance status of the design file. Both *Statistics* and *Resample* force the checker to re-check the design file. On very large drawings or slower machines it may be necessary to avoid selecting these commands repetitively.



Change the Symbology of the Two Non-Compliant Ellipses

1. Use the *Locate* on the *Checker* dialog box to find the ellipses

Circles are displayed as an ellipse internally to MicroStation.

2. Select the *Columns* icon from the *Floor Plan* toolbox. 

3. From the Levelbox, select *Column enclosures/fire protection*.

This will adjust the active symbology to the proper settings.

4. Using the *Change Element Attribute* command, modify the non-compliant column enclosure's symbology. 
5. Verify the compliance by using the *Resample* command inside of the *A/E/C Standards Checker* dialog box. Repeat the above process on the other non-compliant column enclosure.

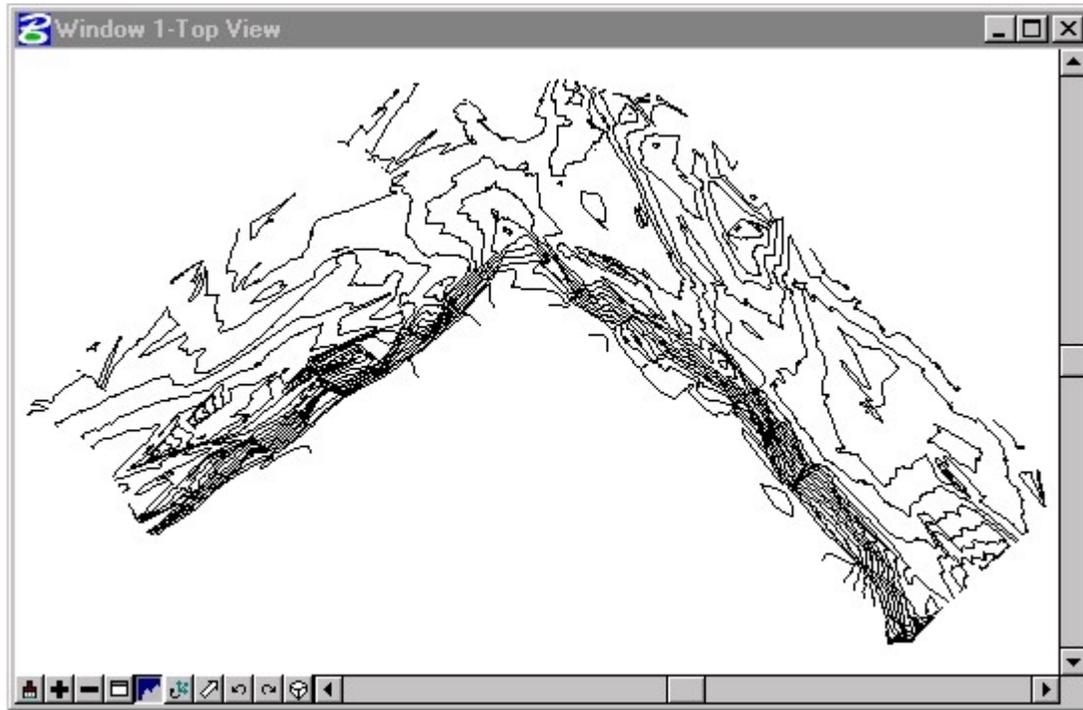
Statistics and Resample

At this point in the design file, when the floor plan is Resampled, the model file should be 100% compliant with the A/E/C CADD Standard.



Exercise 6-2: Checking an Existing Civil Model File

In the following Civil Grading Plan model file, we will change non-compliant elements to be compliant. Less detail will be given during this exercise than with exercise 6-1. The final outcome of this exercise should be a 100% compliant drawing.



1. Start MicroStation
2. Open the file EJAC-GP0001.DGN from the class directory

This design file is a Grading Plan. It is a compliant drawing with three non-compliant elements placed inside (contour lines).

3. Open the *Civil Grading Plan* toolbox (*TSWS>Civil>Grading Plan*)



4. Select the *Topography* icon
5. From the Levelbox, use the Major Contour and Minor Contour levels to set correct symbology.



6. Using the *Change Element Attributes* command, modify the symbology of the non-compliant elements.



The final result should be a 100% A/E/C CADD Standard-compliant model file.



File Naming Guide

TABLE 1 Discipline Designators	
Discipline	Character
General	G
Hazardous Materials	H
Survey/Mapping	V
Civil Works	W
Civil	C
Geotechnical	B
Landscape	L
Structural	S
Architectural	A
Interiors	I
Equipment	Q
Fire Protection	F
Plumbing	P
Mechanical	M
Electrical	E
Telecommunications	T
Resource	R
Other Disciplines	X
Contractor/Shop Drawings	Z
Operations	O

TABLE 2 Model File Types		
Discipline	Code	Definition
General (G)		
	BS	Border Sheet
	KP	Keyplan
Survey/Mapping (V)		
	CP	Existing Communication Plan
	EU	Existing Electrical Utilities Plan
	FU	Existing Liquid Fuel Utilities Plan
	HP	Hydrographic Survey Plan
	IW	Existing Industrial Waste Water Plan
	NG	Existing Natural Gas Utilities Plan
	PR	Existing Profile
	SC	Existing Section
	SP	Survey/Mapping Plan
	SS	Existing Sanitary Sewer Plan
	ST	Existing Storm Sewer Plan
	WA	Existing Domestic Water Plan
Civil (C)		
	LG	Legend
	AF	Airfield Plan
	AM	Airfield Pavement Marking Plan
	CP	Channel Plan
	DT	Detail
	DP	Dredging Plan
	EL	Elevation
	FU	Liquid Fuel Utilities Plan
	GP	Grading Plan
	SH	Schedule
	IP	Installation Plan/Base Map
	IW	Industrial Waste Water Plan
	JP	Joint Layout Plan
	KP	Staking Plan
	NG	Natural Gas Utilities Plan
	PL	Project Location Map
	PR	Profile
	QP	Equipment Plan
	SC	X-Section
	SP	Site Plan
	SS	Sanitary Sewer Plan
	ST	Storm Sewer Plan
	TS	Transportation Site Plan
	WA	Domestic Water Plan
	XD	Existing/Demolition Plan

TABLE 2 Model File Types		(Continued)
Discipline	Code	Definition
Geotechnical (B)		
	BL	Boring Location Plan
	LB	Boring Log
	LG	Legend
	SH	Schedule

TABLE 3 Sheet Type Designators	
Sheet Type	Character
General (symbols, legend, notes, etc.)	0
Plans (horizontal views)	1
Elevations (vertical views)	2
Sections (sectional views)	3
Large Scale Views (plans, elevations, or sections that are not details)	4
Details	5
Schedules and Diagrams	6
User Defined	7
User Defined	8
3D Views (isometrics, perspectives, photographs)	9

For more information and additional model file types, see A/E/C CADD Standard Release 2.0 or the National CAD Standard, Release 2.0.