



Lesson 14: Design Reports

WELCOME!

This lesson is about producing reports from the design data generated in the tutorial. Now that you have designed the commercial site, it is possible to extract information that can be utilized in plans production and the actual construction of the site. In this lesson you will learn how to utilize the tools for producing design reports.

LESSON OBJECTIVES

In this lesson, the topics covered include:

- Topic 1 Coordinate Stake-out – providing data for construction
- Topic 2 Coordinate Table – providing coordinate tables
- Topic 3 Geometry Reports – producing road centerline data
- Topic 4 Standard Drainage Reports – standard drainage reporting
- Topic 5 Custom Drainage Report – custom drainage reports using VBA

Be sure to have a look at the context sensitive help for PowerCivil. Either while using the tutorial or in general practice with the software, you will find the help system not only includes program documentation but it also is equipped with links to online video clips (internet connection is required). Access the help from the menu bar under *Help>Civil Help*.

INTRODUCTION

This lesson will focus on extracting data from the Site Grading design we did using the PowerCivil Modeler program, PowerCivil Drainage Program, and PowerCivil Water Sewer program. The data that we extract can be placed in the CAD file as a chart or table. It can be sent to a data collector used by a survey crew in the field, or to another software program which may be used by the construction management team.

From the desktop, launch PowerCivil from the program icon, navigate to the folder for Lesson 14 and then open the file “LAYOUT.DGN”.

To view this portion of the lesson, press the play button.

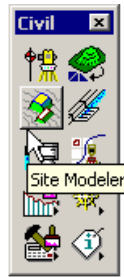


Once in the file, you will want to follow these steps:

1. Open the Civil Tools (*Civil>Civil Tools*).



2. Invoke the Modeler Tool (*Civil>Modeler*).

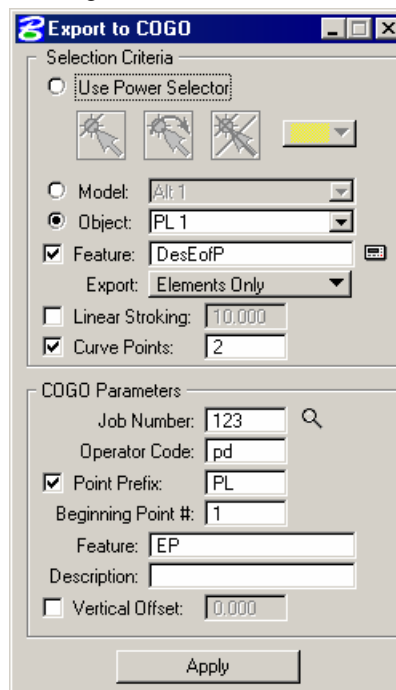


3. Open the “GSF” file “LAYOUT.GSF” from the Lesson 14 folder.

STAKING OUT THE PARKING LOT

Let’s step through a procedure to create the necessary data to stake out the parking lot for our project. We will stake out the edge of pavement for our parking lot. We need points at various locations along the edge of the parking lot and the islands.

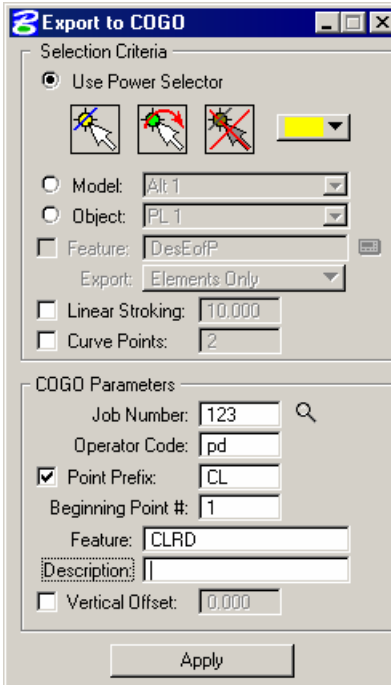
1. Access the “Export to COGO” tool from the *Modeler>Project>Export to COGO* pull down menu.
2. Fill in the dialog as shown:



3. Press “Apply”.

Now we will create points along the centerline of the south access road that we can use to set up an instrument and locate the parking lot edge of pavement points from.

- Continuing with the “Export to COGO” dialog, make the changes as shown below:

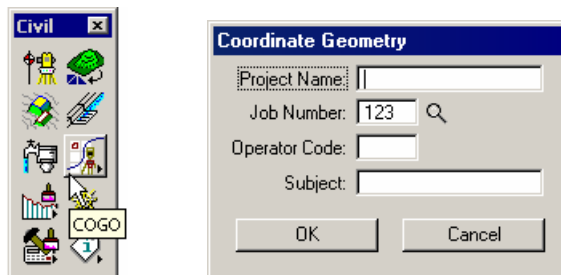


- Click the “Select Element” icon at the top of the dialog and select the centerline of the “South Access” road and then click “Apply”.

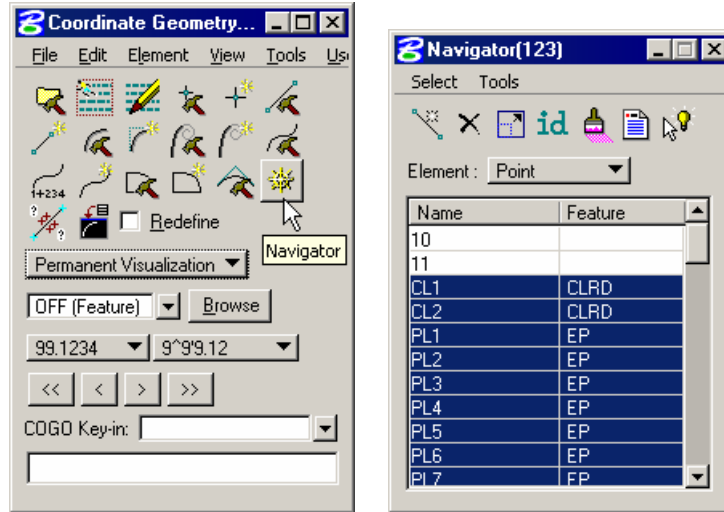
We now have several points that have been created in a coordinate geometry database (*job123.gpk*). The database was created back in Lesson 7 when we designed the Roadways. Now we are simply adding points to that database.

Next, we will open the coordinate geometry database and draw the points into the file to see where they are.

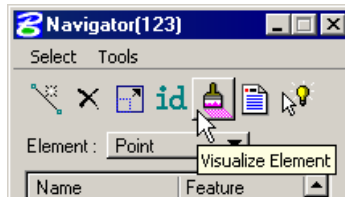
- Open “Coordinate Geometry” using the icon from the Civil tools (*Civil>Geometry>Coordinate Geometry*).



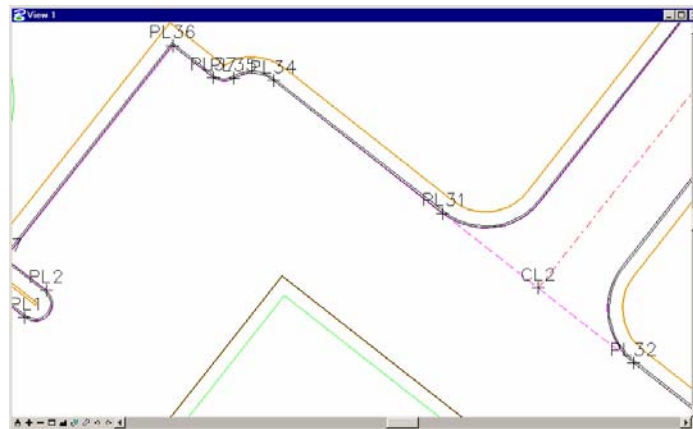
- Once the COGO dialog is present, we will set the visualization to “Permanent Visualization” and select the “Navigator” tool.



- Highlight all the newly created points and click the “Visualize Element” icon.



The points are drawn into the file and can be reviewed graphically.

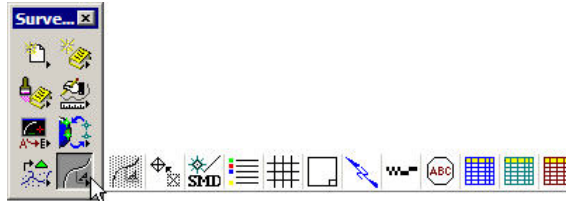


The next step is to create a Staking Report. To do this we will use a tool located in the Survey portion of PowerCivil.

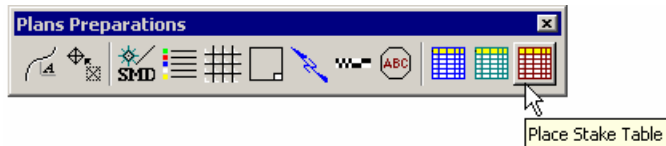
9. Select the “Survey” tool from the Civil Tools (*Civil>Survey*).



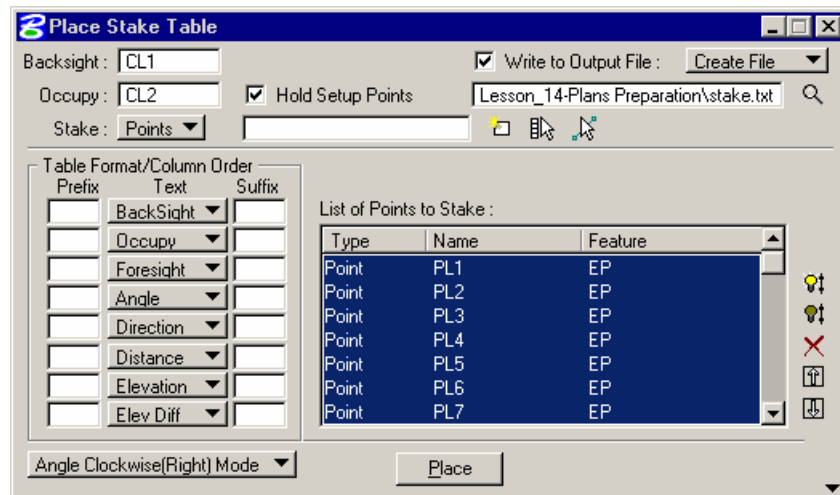
10. Tear off the “Plan Preparations” tool palette from the “Survey Tool Box”.



11. Select the “Place Stake Table” tool.



12. Fill out the dialog as shown.



To get the List of Points to Stake you will need to click the “Get Points from Navigator” icon and highlight all the points you want to add to the list in the dialog. Once highlighted then click the “Get Points from Navigator” icon again to populate the list.

13. Click the “Place” button and data point in the View 1 of the file to place a graphical representation of the table.

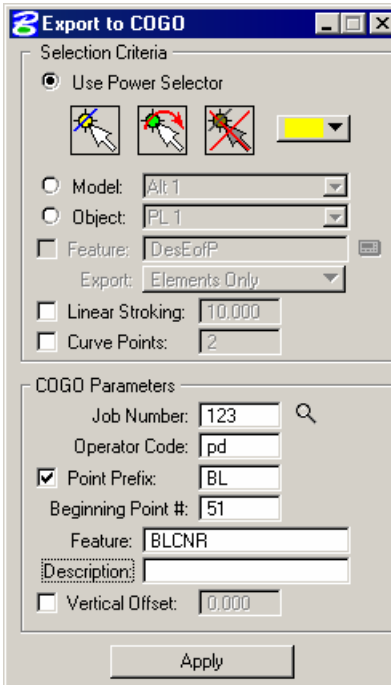
STAKE OUT THE BUILDING

For the building we will provide a coordinate table for the four corners. The procedure will be similar to the parking lot.

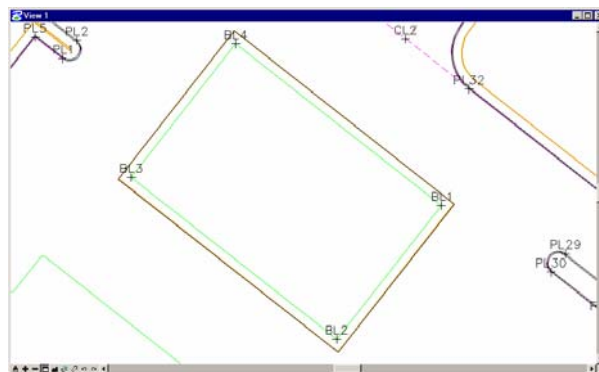
To view this portion of the lesson, press the play button.



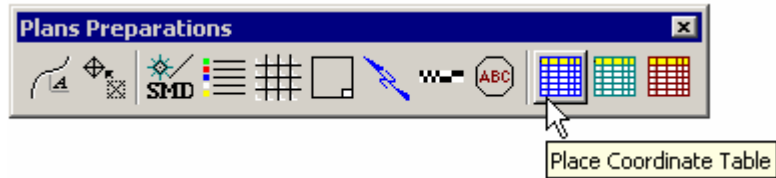
1. Use the “Export to COGO” tool (*Modeler>Project>Export>To COGO*) in Modeler to calculate points at the corners of the building element.



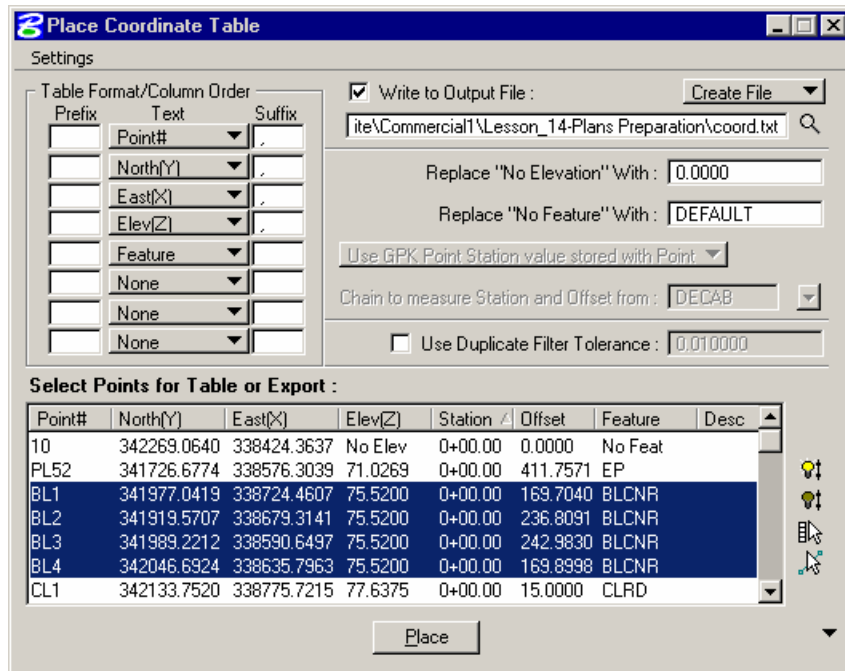
Four points are created at each corner of the building.



- Next, access the “Place Coordinate Table” tool located on the “Plans Preparations” tool palette.



- Fill in the dialog as shown. Highlight the four building points and click the Place button.



The table can be placed into the file or an ASCII text file can be created that could be uploaded to a data collector. Turn off Write to Output File to Place the table graphically.

Point	North	East	Elevation	Feature
BL1	341977.0419	338724.4607	75.5200	BLCNR
BL2	341919.5707	338679.3141	75.5200	BLCNR
BL3	341989.2212	338590.6497	75.5200	BLCNR
BL4	342046.6924	338635.7963	75.5200	BLCNR

ROADWAY CENTERLINE DATA

Turning our attention to Decab Street, we want to create a table with all the necessary geometry information for the centerline of the street. The centerline alignment was created during Lesson 7 – Designing Roadways.

To view this portion of the lesson, press the play button.



The following is a detailed description of the alignment geometry:

Chain DECAB contains:

10 CUR DECAB-1 CUR DECAB-2 11

Beginning chain DECAB description

=====
 Point 10 N 342,269.0640 E 338,424.3637 Sta 0+00.00
 Course from 10 to PC DECAB-1 N 89° 45' 35.03" E Dist 132.6798

Curve Data

Curve DECAB-1

P.I. Station 2+02.31 N 342,269.9124 E 338,626.6732
 Delta = 38° 23' 30.72" (RT)
 Degree = 28° 38' 52.40"
 Tangent = 69.6315
 Length = 134.0129
 Radius = 200.0000
 External = 11.7747
 Long Chord = 131.5199
 Mid. Ord. = 11.1201
 P.C. Station 1+32.68 N 342,269.6204 E 338,557.0423
 P.T. Station 2+66.69 N 342,226.8980 E 338,681.4299
 C.C. N 342,069.6222 E 338,557.8810
 Back = N 89° 45' 35.03" E
 Ahead = S 51° 50' 54.25" E
 Chord Bear = S 71° 02' 39.61" E
 Course from PT DECAB-1 to PC DECAB-2 S 51° 50' 54.25" E Dist 184.7492

Curve Data

Curve DECAB-2

P.I. Station 4+99.12 N 342,083.3158 E 338,864.2078
 Delta = 26° 49' 06.12" (RT)
 Degree = 28° 38' 52.40"
 Tangent = 47.6806
 Length = 93.6138
 Radius = 200.0000
 External = 5.6051
 Long Chord = 92.7615
 Mid. Ord. = 5.4523
 P.C. Station 4+51.44 N 342,112.7702 E 338,826.7128
 P.T. Station 5+45.06 N 342,040.1131 E 338,884.3811
 C.C. N 341,955.4944 E 338,703.1639
 Back = S 51° 50' 54.25" E
 Ahead = S 25° 01' 48.12" E
 Chord Bear = S 38° 26' 21.19" E
 Course from PT DECAB-2 to 11 S 25° 01' 48.12" E Dist 293.0391
 Point 11 N 341,774.5944 E 339,008.3640 Sta 8+38.09

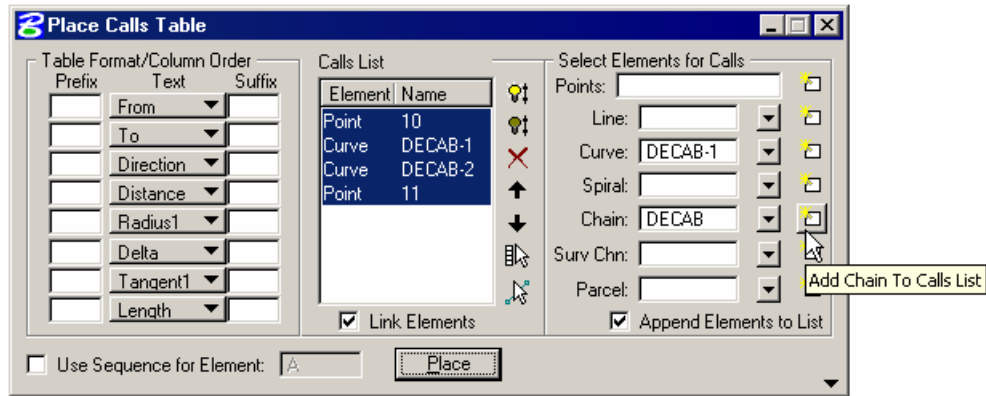
=====
 Ending chain DECAB description

To create a graphical table that can be placed in the file we can use a tool titled "Place Calls Table" located in the "Plans Preparation" tool palette.

1. Access the "Place Calls Table" tool on the "Plans Preparations" tool palette.



2. Fill out the dialog as shown.



Set the “Table Format/Column Order”, the click the “Add Chain to Calls List” icon to populate the Calls List in the middle of the dialog.

3. Highlight all items in the “Calls List” and Click “Place”. Place the Table in the file and review.

From	To	Direction	Distance	Radius	Delta	Tangentl	Length
10	PC DECAB-1	N 89° 45' 35.83" E	132.6798				
PC DECAB-1	PT DECAB-1	S 71° 2' 39.61" E	131.5199	200.0000 R	38° 23' 38.72"	69.6315	134.0129
PT DECAB-1	PC DECAB-2	S 51° 58' 54.26" E	184.7492				
PC DECAB-2	PT DECAB-2	S 38° 26' 21.19" E	92.7615	200.0000 R	26° 49' 6.12"	47.6806	93.6138
PT DECAB-2	11	S 25° 1' 48.12" E	293.0391				

CREATE REPORTS FROM DRAINAGE DESIGN DATA

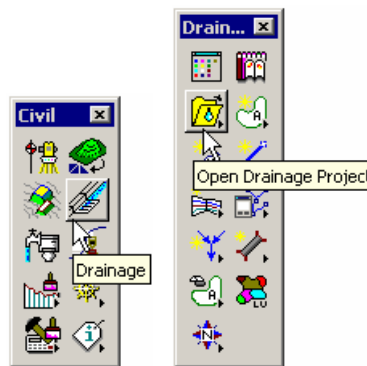
We will look at a few ways to create reports from the Drainage Design we did in Lesson 12 – Drainage Design.

To view this portion of the lesson, press the play button.

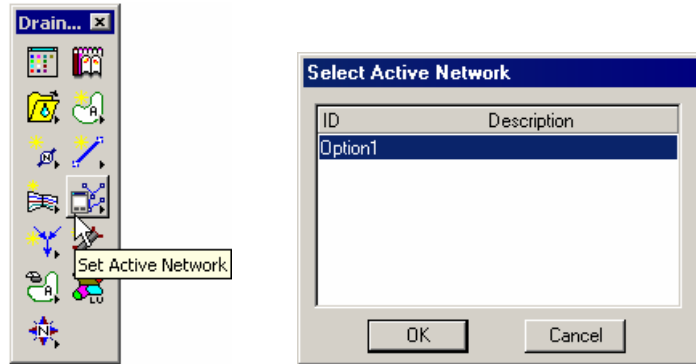


To get started we need to open the Drainage Project.

1. Access the Drainage tools from the main menu *Civil>Drainage* and open the Drainage Project file “DRAINAGE.GDF”.



2. Select the “Set Active Network” tool and set the Network “Option 1” to be active.



Once the Network is active we can access several standard reports created by the software.

3. Pull out the “Drainage Reports” tool frame from the main “Drainage Tool Box”.



4. Click on each of the first 5 icons to bring up the standard reports. The “Storm Drain Hydraulic Summary report” is shown below.

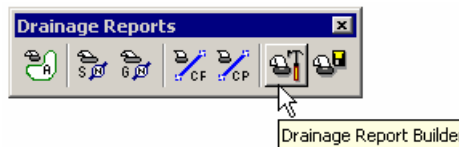
The image shows a window titled 'Storm Drain Hydraulic Calculation Summary for Network Option1 - Calculations Current'. It contains a table with hydraulic data for various components in a network. The table has columns for 'ID', 'Upstream', 'Downstream', 'Upstream HGL', 'Downstream HGL', 'Discharge', 'Capacity', 'Slope', 'Loss', 'Uniform Velocity', 'Uniform Depth', 'Actual Velocity', and 'Actual Depth'. Below the table are options for 'Window Center', 'Highlight', and an 'Apply' button. An 'ASCII File:' field shows 'Option1 Hydraulic Summary.txt' and an 'Edit' button.

ID	Upstream	Downstream	Upstream HGL	Downstream HGL	Discharge	Capacity	Slope	Loss	Uniform Velocity	Uniform Depth	Actual Velocity	Actual Depth
SS-1	MH-3	Outlet	67.575	67.303	11.244	11.790	0.210	0.000	4.072	1.643	5.695	1.203
SS-2	CB-6	MH-3	67.618	67.575	5.558	8.258	0.200	0.000	3.477	1.104	3.296	1.156
SS-3	MH-1	MH-3	68.439	67.840	3.574	5.474	0.202	0.000	3.129	0.924	4.249	0.722
SS-12	CB-7	MH-3	69.330	68.857	2.112	5.474	0.191	0.000	2.702	0.682	3.610	0.549
SS-8	CB-5	CB-6	67.981	67.618	4.975	5.474	0.190	0.000	3.203	1.232	4.451	0.907
SS-4	CB-1	MH-1	68.678	68.439	3.574	5.474	0.202	0.000	3.129	0.924	3.126	0.925
SS-9	MH-2	CB-5	68.101	67.981	2.967	5.474	0.207	0.000	3.029	0.814	2.135	1.101
SS-5	CB-2	CB-1	68.871	68.678	2.835	5.474	0.207	0.000	2.995	0.792	2.457	0.932
SS-10	CB-4	MH-2	68.266	68.101	2.967	5.474	0.207	0.000	3.029	0.814	2.506	0.953
SS-11	CB-3	CB-4	68.273	68.266	1.401	5.474	0.199	0.000	2.452	0.539	1.311	0.874

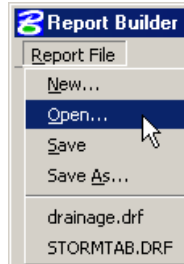
Each report can be saved off as an ASCII file. There is a Highlight and Window Center option that allows you to navigate the system graphically in the file. There is a modify icon which will bring up the appropriate component dialog to make changes to the system.

We can also create customized reports for use with another software package. For example we can extract certain drainage design data from the system in a user defined order and send it to an Excel spreadsheet.

5. Click the “Drainage Report Builder” icon from the Drainage Reports tool frame.

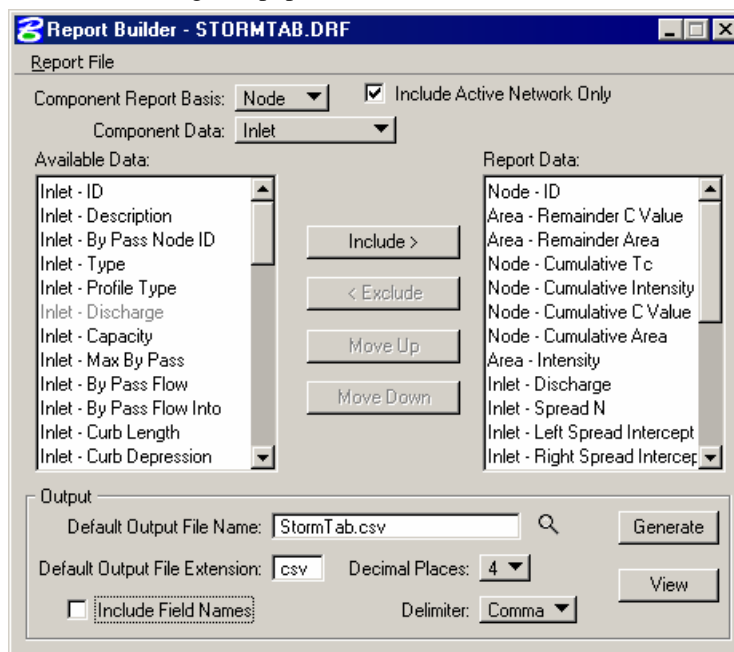


- From the “Report File” pull down menu in the dialog, select “Open” and select the “StormTab.drf” file from the lesson 14 folder.



The StormTab.drf file is a saved off list of drainage data that we would like to report on. The user would simply compile a list of report data and save it off to a drainage report file that could then be recalled on subsequent drainage projects.

- The dialog will populate as shown.



- Click the “View” button to create the “StormTab.csv” file and review it.

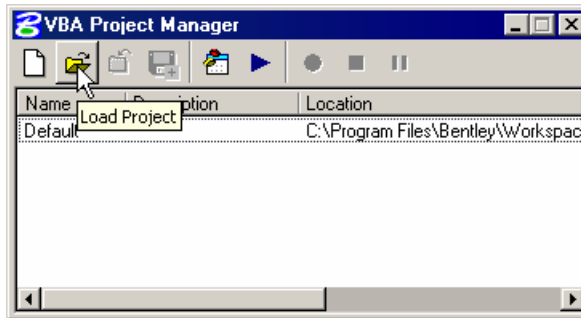
CUSTOM REPORT OUTPUT EXAMPLES

At this point there are various ways to create an Excel Spreadsheet in the format one would desire. We will run a Visual Basic Application that takes the “StormTab.csv” file and creates a spreadsheet.

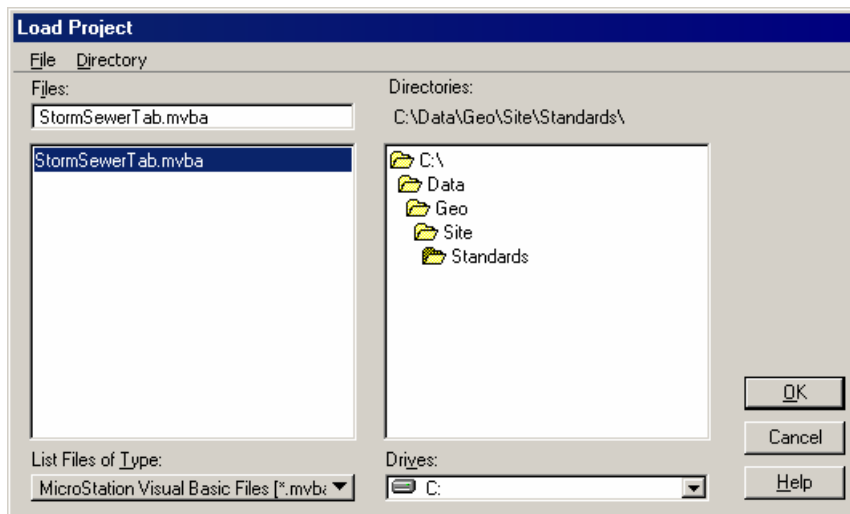
To view this portion of the lesson, press the play button.



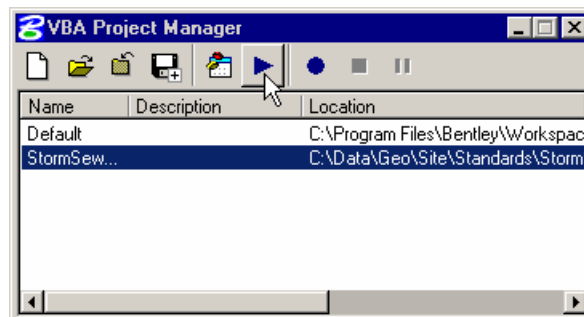
1. From the main menu, select the *Utilities>Macro>Project Manager* to activate the “VBA Project Manager” tool.



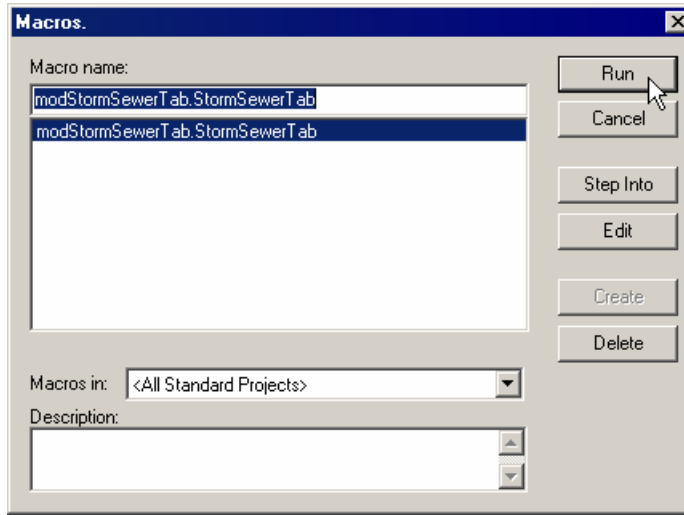
2. Click the “Load Project” icon and select the following VBA Project.
C:\Data\Geo\Site\Standards\StormSewerTab.mvba



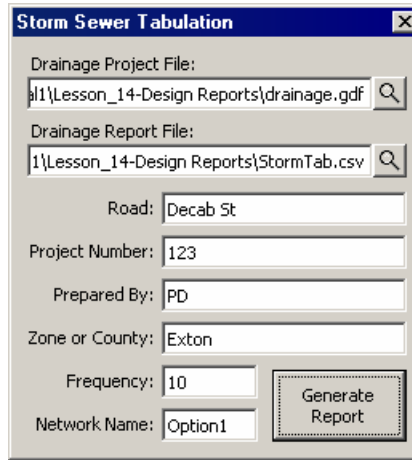
3. Highlight the “StormSewerTab.mvba” file in the Project Manager dialog and click the “Run” icon.



- Next highlight the macro and click the “Run” button.



- Fill in the dialog as shown.



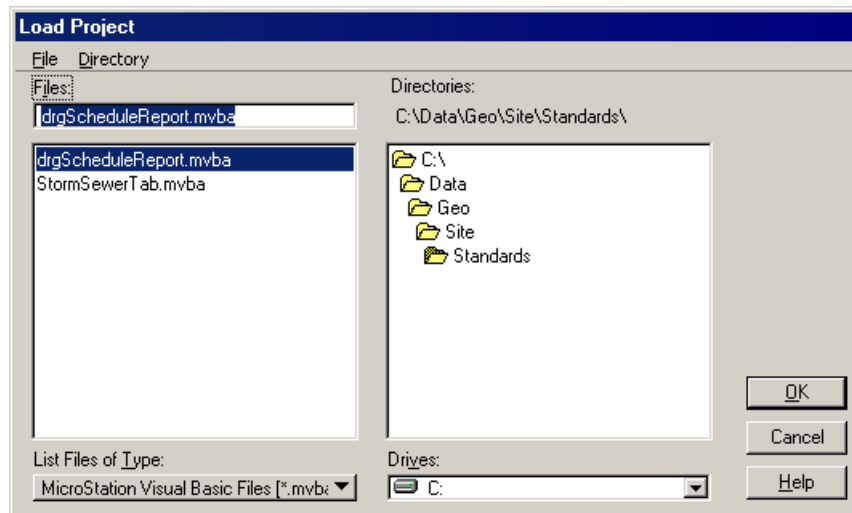
- Click the “Generate Report” button and when prompted for an Excel file name key in “StormTabulation.xls”.
- Use Windows Explorer and review the Excel file.

STORM SEWER TABULATION FORM																												
Road: Decab St		Units: Metres (SI)		Metric (SI) US Customary		Sheet: 1 of 1		Prepared by: JTG		Date: 03/02/2005		Project #: 022		Checked by:		Zone of County: Exton		Notes and Remarks										
STATION	CHAIN NAME	LOCATION OF UPPER END	STRUCTURE NO.	STRUCTURE END	NAME OF STRUCTURE	TYPE OF STRUCTURE	LENGTH (ft. or m.)	DRAINAGE AREA (ft. or m.)			COMB. AVE. TIME OF CONCENTRATION (min)	TIME OF FLOW IN SECTION (min)	INTENSITY (in/hr or mm/hr)	TOTAL (ft. or m.)	TOTAL NUMBER (ft. or m.)	NET DEPTH (ft. or m.)	HYDRAULIC GRADELINE ELEVATION			ACTUAL SLOPE (ft. or m.)	HYDRAULIC VELOCITY (ft. or m./sec)	VELOCITY (ft. or m./sec)	FREQ. (ft. or m.)	NET WORK NAME	ZONE OF COUNTY	NOTES AND REMARKS		
								BASE	COMPOSITE	AREA							UPPER END (ft. or m.)	LOWER END (ft. or m.)	FARE (ft. or m.)									
+	0	LI	M4-0	4 Dia. Man	Junction	36.20	0.000	0.000	0.000	7.47	0.95	0.47	1362	1124	74.10	47.87	47.20	0.27	0.79%	4.97	0.78							
+	0	LI	M4-0	3x3 Type1	Grave	25.42	0.000	0.000	0.000	7.32	0.12	0.47	0.960	5.56	73.95	48.21	48.17	0.04	0.20%	5.63	0.20%	4.60	8.250					
+	0	LI	M4-0	4 Dia. Man	Junction	202.31	0.000	0.000	0.000	7.32	1.08	0.47	0.830	3.97	74.47	48.44	47.94	0.60	0.20%	4.26	0.20%	4.26	5.474					
+	0	LI	M4-1	3x3 Type1	Grave	19.79	0.000	0.024	0.007	6.25	0.64	0.47	0.830	3.57	73.56	48.10	48.44	0.24	0.20%	4.26	0.20%	4.26	5.474					
+	0	LI	M4-1	3x3 Type1	Grave	105.09	0.000	0.105	0.030	5.81	0.81	0.47	0.500	2.04	73.45	48.10	47.76	0.23	0.20%	3.96	0.20%	3.96	5.474					
+	0	LI	M4-2	3x3 Type1	Grave	69.51	0.000	0.000	0.000	7.86	0.47	0.47	0.077	4.90	73.41	48.10	47.82	0.28	0.20%	4.78	0.20%	4.78	5.474					
+	0	LI	M4-2	4 Dia. Man	Junction	105.50	0.000	0.000	0.000	6.93	0.76	0.47	0.020	2.97	73.86	48.10	47.99	0.10	0.00%	3.93	0.00%	3.93	5.474					
+	0	LI	M4-2	3x3 Type1	Grave	126.76	0.000	0.000	0.000	5.97	0.70	0.47	0.020	2.97	73.80	48.10	48.06	0.04	0.00%	4.00	0.00%	4.00	5.474					
+	0	LI	M4-3	3x3 Type1	Grave	25.59	0.000	0.000	0.000	5.07	0.17	0.47	0.247	1.40	72.80	48.10	48.09	0.05	0.00%	4.40	0.00%	4.40	5.474					

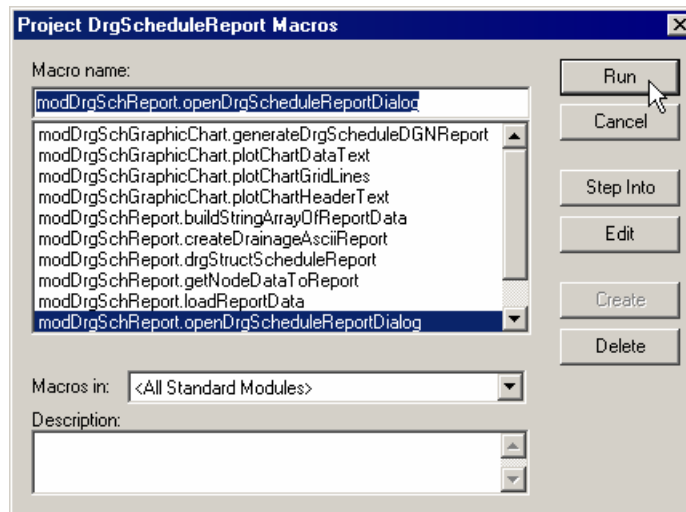


Now we will take a look at how we can use VBA to create a custom table that can be plotted in the design file along with a custom ASCII report.

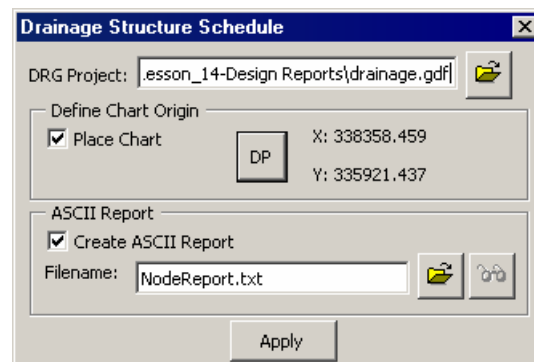
- From the “VBA Project Manager” dialog, click the “Load Project” icon and select the following VBA Project:



- Click the “Run” icon and select the following macro then click Run.



- Fill out the “Drainage Structure Schedule” dialog as shown:



11. Data point in blank location of the view to place a graphic table.

STRUCTURE SCHEDULE												
Struct No.	DESCRIPTION	INTERNAL DIMENSIONS		INLET		OUTLET		BRANCH CONNECTION		TOP OF Struct	DEPTH OF Struct	REMARKS
		L	W	DIA	LEVEL	DIA	LEVEL	DIA	LEVEL			
CB-1	3 x 3 Type 1			1500	67.75	1500	67.75			73.56	5.81	
CB-2	3 x 3 Type 1					1500	67.95			73.45	5.5	
CB-3	3 x 3 Type 1					1500	67.43			72.93	5.5	
CB-4	3 x 3 Type 1			1500	67.39	1500	67.39			73.0	5.61	
CB-5	3 x 3 Type 1			1500	66.88	1500	66.88			73.41	6.53	
CB-6	3 x 3 Type 1			1500	66.71	1750	66.46			73.95	7.24	
CB-7	3 x 3 Type 1					1500	68.57			74.07	5.5	
MH-1	4' Dia. MH			1500	67.51	1500	67.51			74.47	6.96	
MH-2	4' Dia. MH			1500	67.15	1500	67.15			73.66	6.51	
MH-3	4' Dia. MH			1750	66.42	2000	66.17	1500	67.12	74.12	7.70	
Outlet	Std Outlet			2000	66.1			1500	68.31	70.02	3.92	

SUMMARY

The main points to remember are:

- PowerCivil provides many ways to extract data from the proposed grading project and provide that information to the construction team.
- Visual Basic Applications provide us a way to extend the program and data contained with in the program to many user defined applications.
- You can create reports and/or extract information from PowerCivil into a usable and customizable format.

For more video instruction please visit the following web page...

<http://65.217.17.142/downloads/sitemodeler/GEOPAK%20Site%20Modeler%20Training%20Videos.htm>

