17 Lesson 17: Quantity Extraction

WELCOME!

This lesson is about extracting quantity information 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 quantified and used in the cost estimate for the actual construction of the site. In this lesson you will learn how to utilize the tools for quantity extraction.

LESSON OBJECTIVES

In this lesson, the topics covered include:

- Topic 1 Computing Quantities with Design & Computation Manager
- Topic 2 Creating a Pavement Design
- Topic 3 Exporting Quantities to various formats.

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 Design Layout, Drainage Design, and Water Sewer Design for the purpose of computing quantity takeoffs. The quantity computations can then be sent to another software program which may be used by the construction management team.

QUANTITY EXTRACTION

From the desktop, launch PowerCivil from the program icon, navigate to the folder for Lesson 17 and then open the file “LAYOUT.DGN”.

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

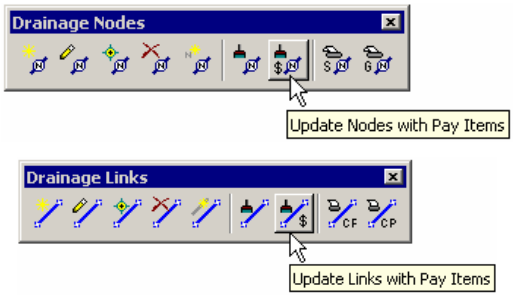
Once in the file, you will want to follow these steps:

1. Open the Civil Tools *(Civil>Civil Tools).*
2. Invoke the "Design & Computation Manager" tool *(Civil>Plans & Quantities>Design & Computation Manager).*

COMPUTE DRAINAGE QUANTITIES IN PLAN

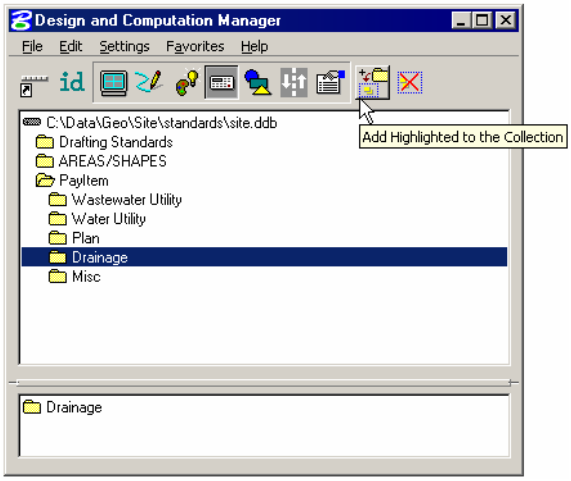
Let's step through a procedure to extract and compute the quantity of storm sewer pipe and drainage structures (catch basins, grate inlets, pits, etc.) for our design.

1. Open the Drainage Project file "DRAINAGE.GDF " from the Lesson 17 folder.
2. Access the "Drainage Nodes" tool frame *(Drainage>Tool Boxes>Nodes)* and the "Drainage Links" tool frame *(Drainage>Tool Boxes>Links).*

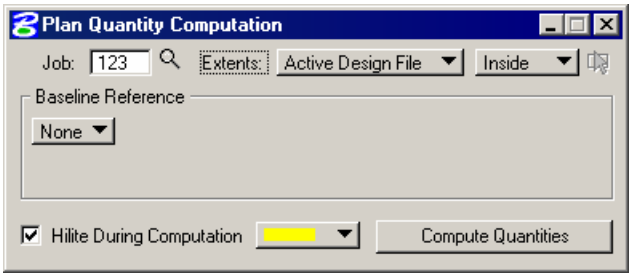


3. Click on the "Update All Nodes with Pay Items" icon and the "Update Links with Pay Items" icon. This will redraw all pipes and nodes with the symbology of the Design & Computation Manager Pay Item that they are linked to through the drainage library.

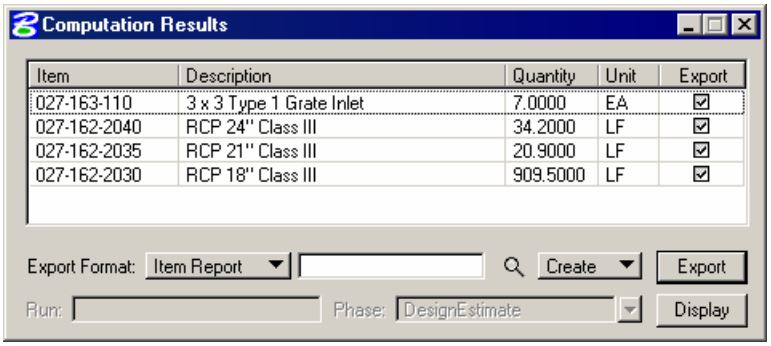
4. Returning our attention to the Design & Computation Manager dialog, we will switch to the “Compute Mode”



5. Highlight the “Drainage” folder as shown and click the “Add Highlighted to the Collection” icon.
6. On the “Plan Quantity Computation” dialog set it as shown and click the “Compute Quantities” button.



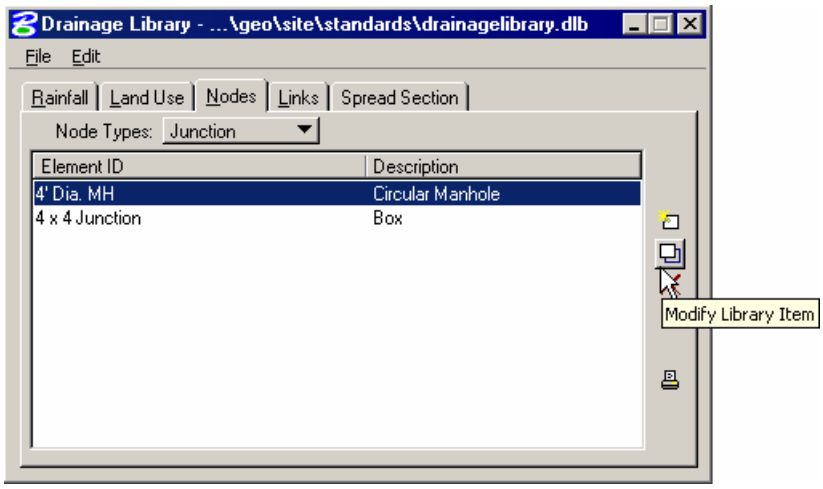
This will produce a report of the quantity of items in the Drainage folder that are in the design file.



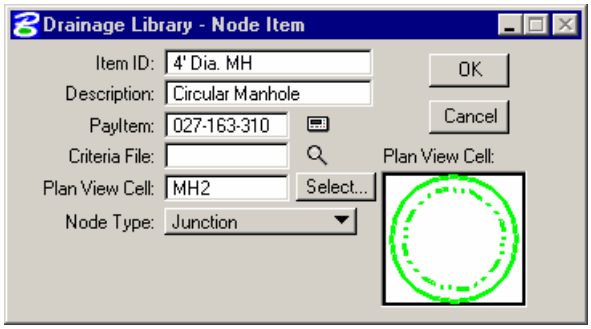
You will notice that the manholes were not counted because they were not found. We will fix this and recomputed.

7. Open the Drainage Library and navigate to the “4’ Dia. MH” Item.

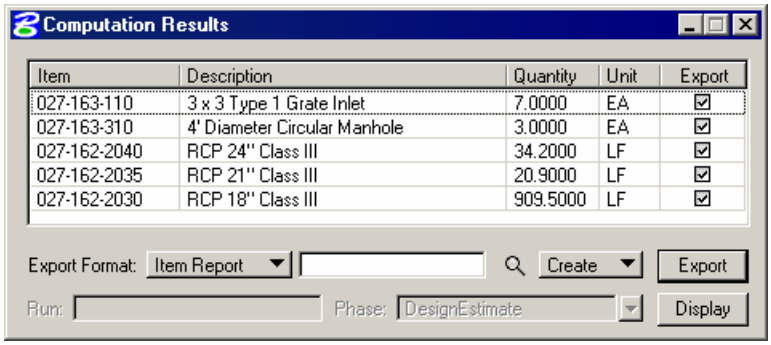
8. Highlight it and click the “Modify Library Item” icon.



9. The “PayItem” field is empty or set to None. We will add the appropriate PayItem. Click the “Select PayItem” icon.
10. Navigate to the Payitem>Drainage>Manholes>027-163-310 4’ Diameter Circular Manhole item and highlight it.
11. Click “OK”.



12. Click “OK” on the “Drainage Library – Node Item” dialog.
13. Select *File>Save* on the “Drainage Library” dialog to save your changes.
14. Back at the “Drainage Nodes” tool frame, click the “Update Nodes with Pay Items” icon to redraw all drainage nodes.
15. Go back to the “Design & Computation Manager”, switch to the compute mode and recompute the drainage quantities. View the results.



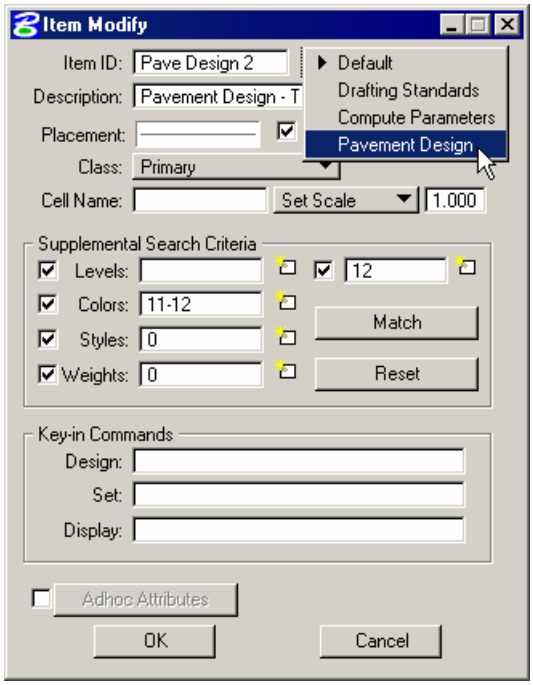
CREATING A PAVEMENT DESIGN

We will now take a look at how to create and quantify a pavement design using the Design & Computation manager.

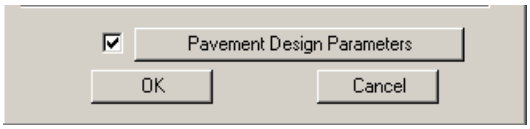
To view this portion of the lesson, press the play button.

PLAY

1. Attach the “Saved View” *(Utilities>Saved View)* titled “Pavement Design”.
2. Open “Design & Computation Manager” *(Civil>Plans & Quantities>Design & Computation Manager).*
3. Navigate to the “PayItem>Plan>Pavement Design>Pave Design 2 Pavement Design – Tons” item and highlight it.
4. Right Click on it and select “Modify Item”.

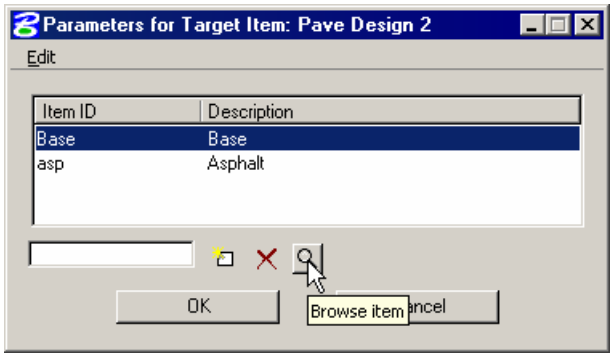


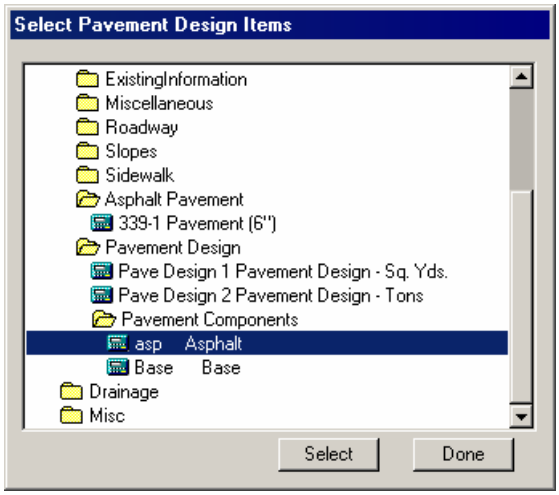
5. Change the Item to a “Pavement Design” item.
6. Toggle on the “Pavement Design Parameters” and click the “Pavement Design Parameters” button.



This will allow us to select the various sub layer items in out pavement design.

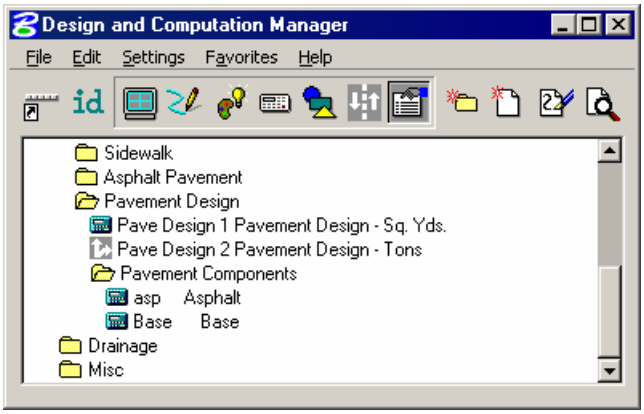
7. Fill in the table by using the “Browse Item” icon and going to the “Pavement Components” category located under the Pave Design 2 D&C PayItem that was selected earlier.



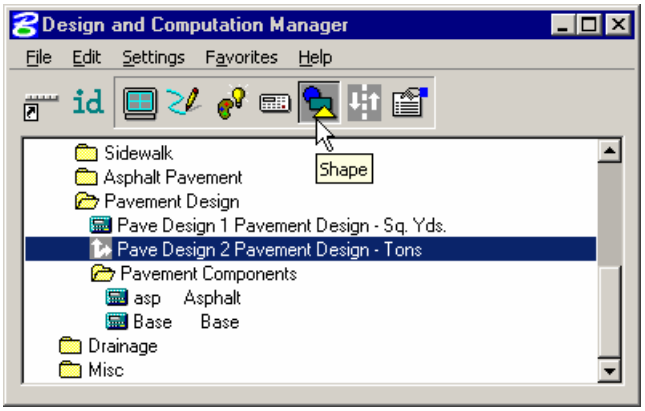


8. Select each component by highlighting it then clicking the “Select” button. Click “Done” when finished
9. Click “OK” to close the Parameters dialog and click “OK” on the “Item Modify” dialog.
10. Save the DDB file in the “Design and Computation Manager”.

    Notice that the Pave Design 2 icon is different now.

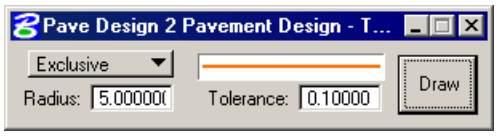


11. With the Pave Design 2 item highlighted, switch “Design & Computation Manager” to the “Shape” mode.

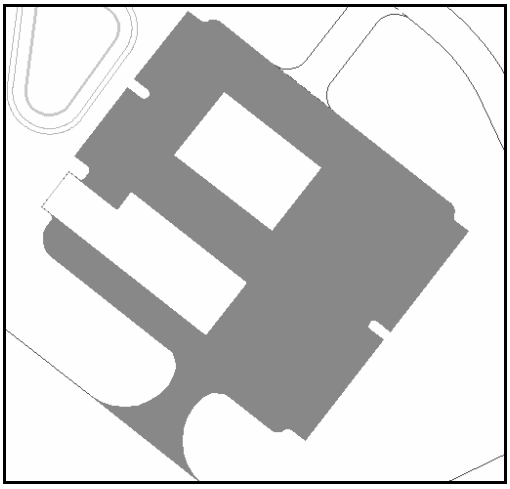


This tool will create a shape in the symbology of the Pave Design 2 PayItem.

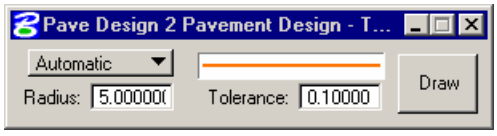
12. Set the Shape Tool settings as shown below.



13. Click “Draw” and then place a data point near the south end of the parking lot. Next, place a data point in the middle of the building pad location. The shape is created.



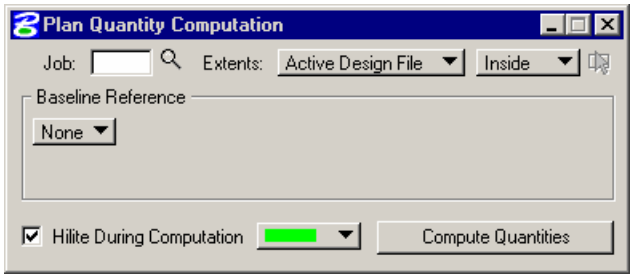
14. Switch the dialog as follows and data point in the South Access Road.



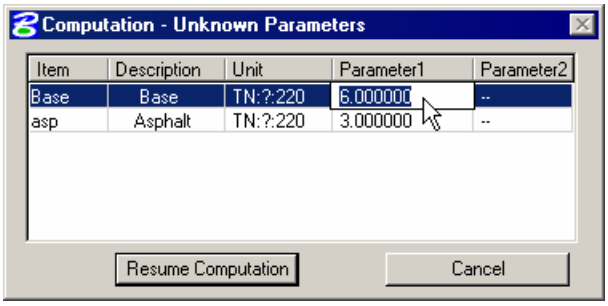
15. Repeat this for Decab Street.

Now that the Pavement areas have been shaped we can calculate quantities.

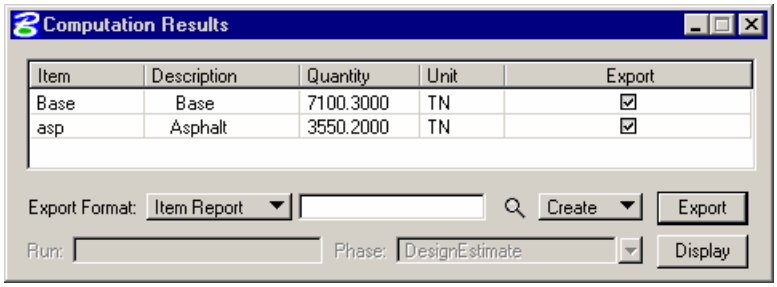
16. Switch to the Compute mode in the “Design & Computation Manager” and set the “Plan Quantity Computation” dialog as follows.



17. Click the “Compute Quantities” button. Click in the “Parameters 1” row on each item and set the depth in inches as shown.



18. Click “Resume Computation” to see the results.



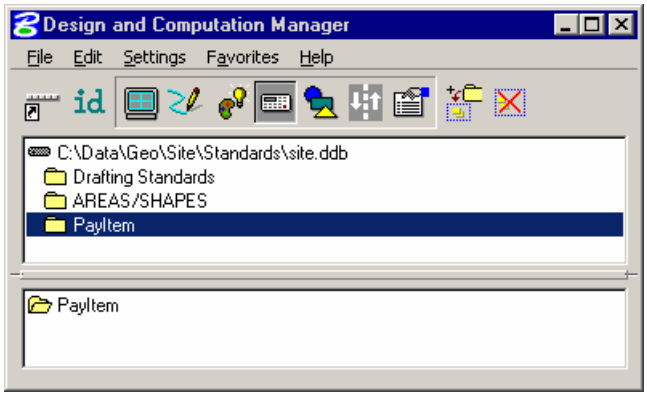
EXPORTING QUANTITIES TO VARIOUS FORMATS

We will take a look at how to export out the quantities that are computed to various formats.

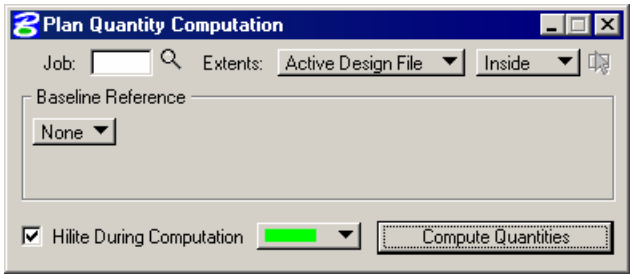
To view this portion of the lesson, press the play button.

1. Close all dialogs and open the saved view *(Utilities>Saved Views)* named “Export Quantities”. Then turn on the display of the Drainage and Water Sewer reference files *(File>Reference).*
2. Open “Design & Computation Manager” *(Civil>Plans & Quantities>Design & Computation Manager)* and switch to the “Compute” mode.

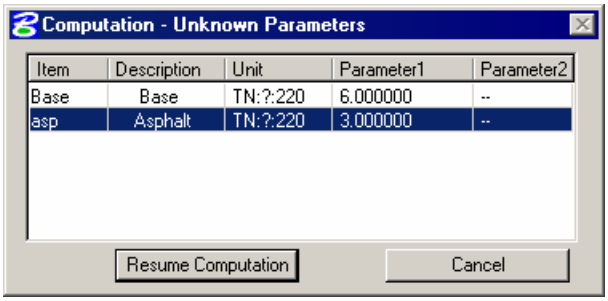
3. Highlight the “PayItem” category and click the “Add Highlighted Folder to the Collection” icon.



4. Click the “Compute Quantities” button.

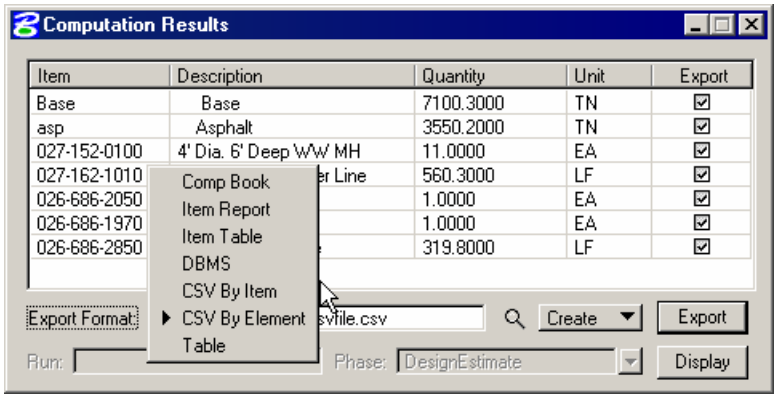


5. Set the Base and Asphalt Parameters as we did previously.



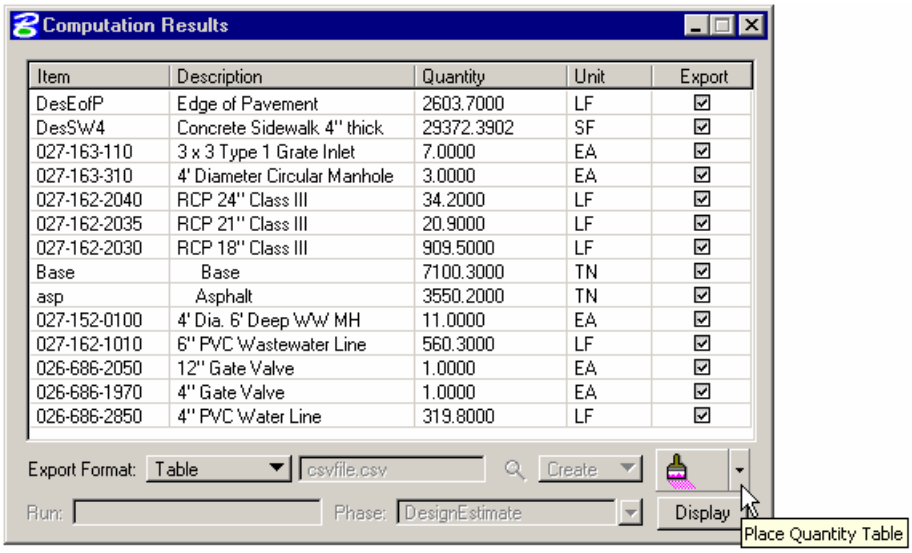
Click “Resume Computation”.

6. Select the “CSV by Item” report format.



7. Key in a file name and click the “Export” button.

8. Open the file with Microsoft Excel.
9. Change the Export Format to Table.



10. Click the “punch down arrow” next to the paintbrush to review the display settings. Click the “paintbrush” to create the graphic table and then data point in the file to place it.

SUMMARY

The main points to remember are:

- The PowerCivil Design & Computation Manager tool provides the way to extract data from the design and use that data for construction cost estimates and construction management.
- 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