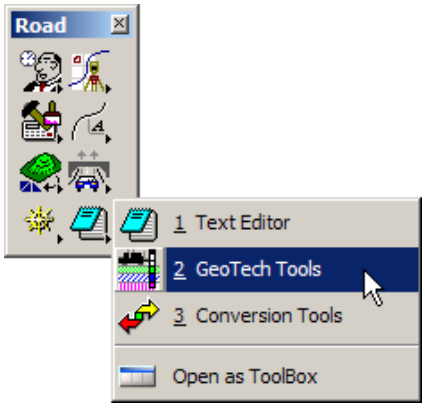
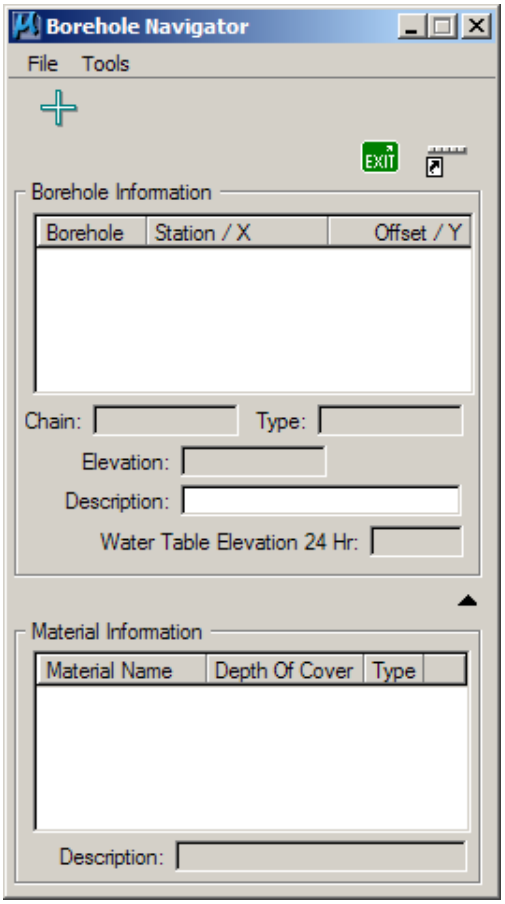
GEOPAK Borehole Navigator – Florida Local Users Group 2009

Instructor: Matt Sexton, FDOT-ECSO, (850) 245-1600, matt.sexton@dot.state.fl.us

Purpose of Course and Overview: Borehole Navigator is a tool for visualizing soil borings in Plan View, Profile View, Cross Section View and 3D. This course will provide the user a working knowledge of Borehole Navigator and a grasp of how to import data into Borehole Navigator, modify boreholes, modify the Borehole Navigator preference file, and finally how to visualize the soil borings. This course is geared towards the visualization of soil borings in Cross Section View.



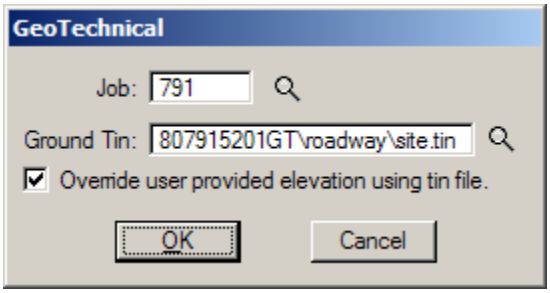
The user can access Borehole Navigator one of two ways — either from MicroStation's menu bar under *Applications* > *Road* > *Utilities* > *Geotechnical*, or by selecting the Borehole Navigator icon from bottom right portion of the Roadway Toolbox as shown.



Importing data into Borehole Navigator –

GTD Files –

To import soil boring data into Borehole Navigator, a GTD file must be created. This file contains all of the information regarding the data that Borehole Navigator can visualize. Upon creating a GTD file, Borehole Navigator will ask for a Job Number/GPK File and a TIN File. The dialog also has a checkbox labeled "Override user provided elevation using TIN file," which is used to specify whether the borehole elevation is user-provided or extracted from the TIN file.



These options can be accessed again after creating the GTD by selecting FILE > PROJECT FILES from Borehole Navigator's menu.

INP Files – Ancillary Input Files

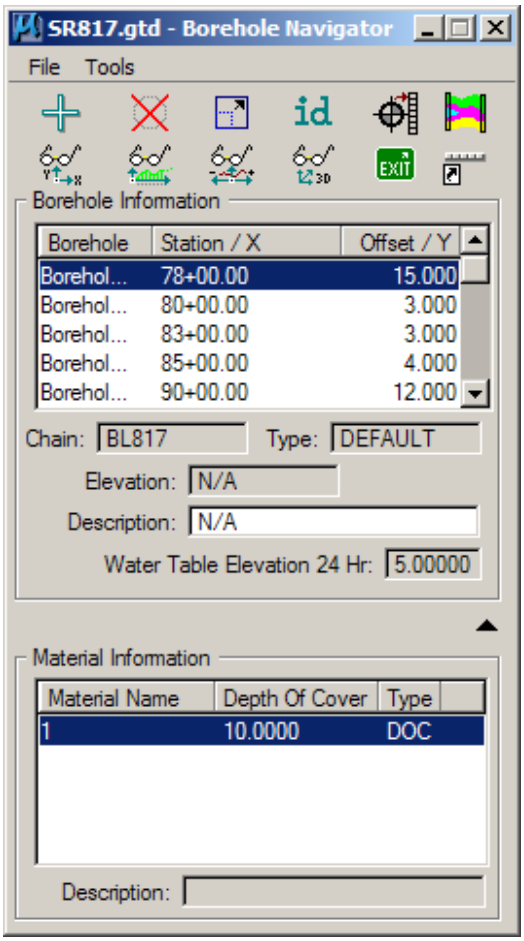
The basic borehole information, station, range, offset, material type and depth of cover, can be imported into the GTD file as an ancillary INP file. It is important to note the proper syntax for the INP file to be imported correctly. Ancillary INP input are a legacy format from Microstation/J, the use of which is no longer supported by FDOT.

BRH Files – Borehole Input Files (CSV)

Borehole or BRH files are comma separated values files that contain location information for soil borings, such as borehole name, station, offset, and chain name. Water elevation information can also be included in the BRH file. Please consult the Borehole Navigator section of the GEOPAK Help for supported fields for the BRH file.

MTL Files – Material Input Files (CSV)

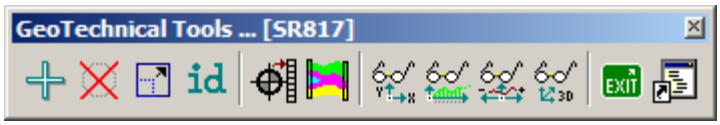
These input files can be used to import material information or append existing borehole material data. Please consult the Borehole Navigator section of the GEOPAK Help for supported fields for the MTL file.

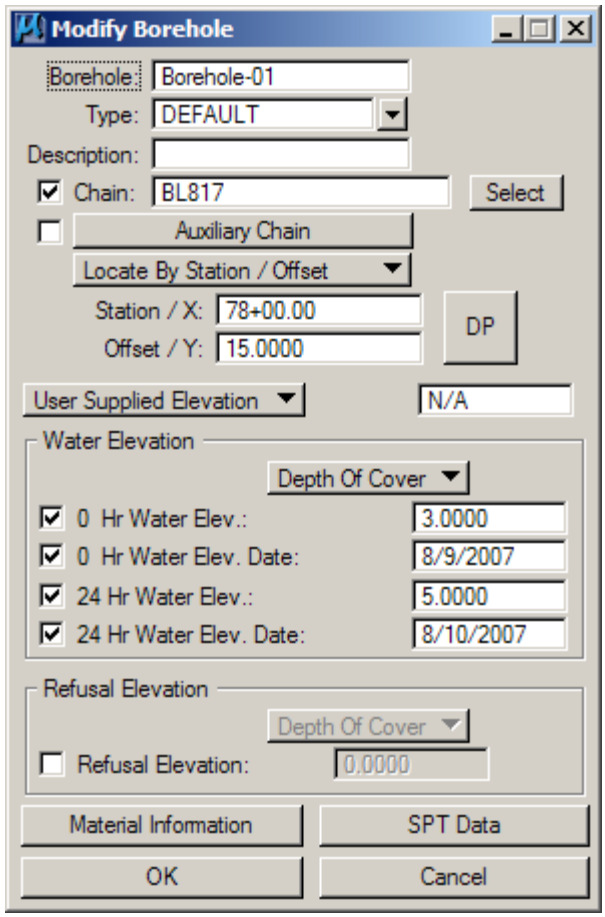


Borehole Navigator Dialog –

Borehole Navigator Toolbar – The first row of buttons on the Borehole Navigator Toolbar allows the user to Add a borehole; Delete, Modify, or ID the current selected borehole; View and modify the Material Alignment; and Interpolate Subsurfaces TIN files from the Borehole Data.

The second row of buttons on the toolbar provides access to the Visualization dialogs, and allows the user to exit Borehole Navigator, or switch to Toolbar Mode.

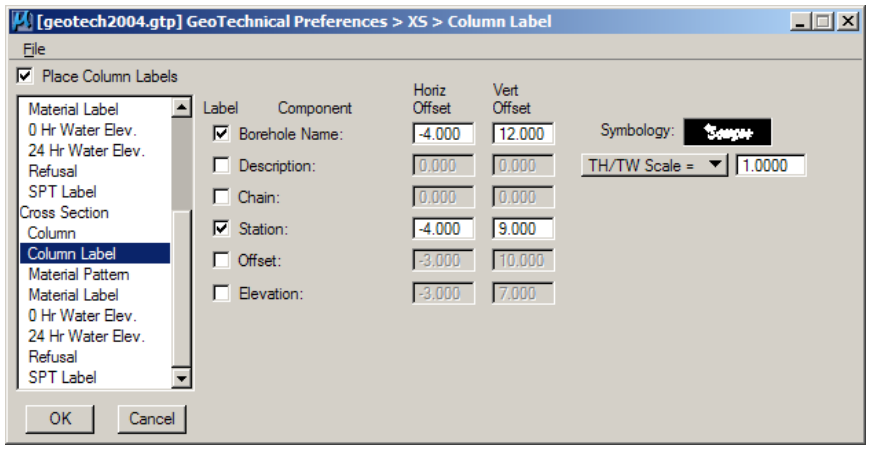




Modify Borehole Dialog –
The Modify Borehole dialog can be accessed by either double clicking on a borehole in the Borehole Navigator's Borehole Information list or by highlighting a borehole in the list and clicking the Modify Borehole button on Borehole Navigator's main toolbar.

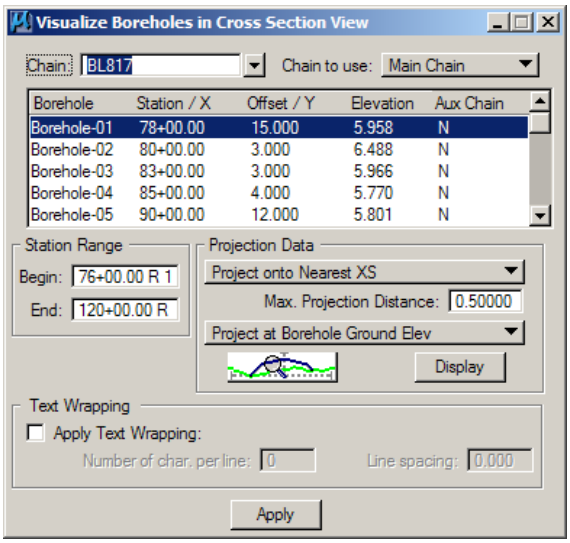
The Modify Borehole dialog allows the user to modify the borehole name, type of soil boring, description, and chain. The user may select an auxiliary chain and choose between locating the soil boring by station/offset or by coordinates (x,y). The dialog contains fields for station and offset as well as elevation.

Water elevation information, such as Seasonal High Water and Ground Water, can be entered here as well. By clicking on the Material Information button, the user can access the dialog for entering Material Information as well.



Borehole Navigator Preferences –
The user can access the preferences dialog for Borehole Navigator by selecting FILE > PREFERENCES from the Borehole Navigator menu. In the preferences dialog, the user can modify the appearance and the placement of the various labels associated with soil borings, as well as the water elevation cells and information.

It is important for all label information to be legible, and label placement may need to be slightly modified in the preferences dialog to account for existing elements that may obstruct the legibility of soil boring labels. In Borehole Navigator's preferences, horizontal offset and alignment of labels varies slightly depending on which label's offset is being adjusted. For certain labels, negative values offset the label to the left, and other labels are offset to the left using positive values.



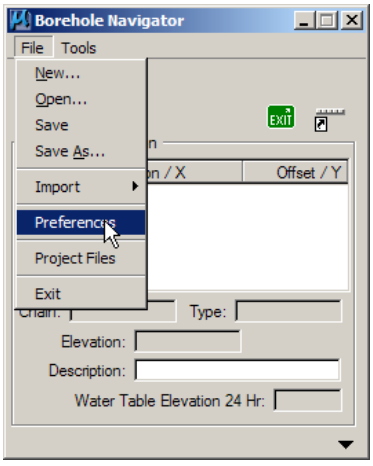
Visualizing Boreholes –
Soil borings can be visualized in Plan, Profile and Cross-Section Views or in 3D. This course is concerned mainly with the visualization of soil borings in Cross-Section View. The *Visualize Boreholes in Cross Section View* dialog may be accessed from the button located on Borehole Navigator's dialog.

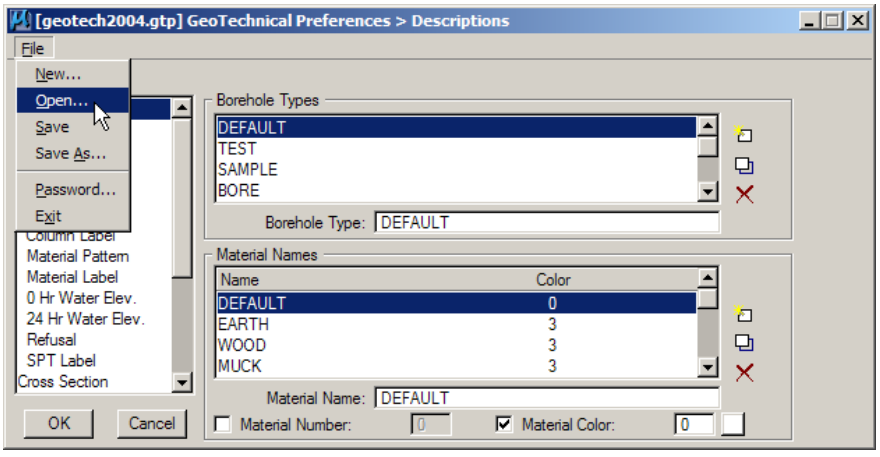
Within the Visualization dialog, the chain is selected as well as the station range. The user may chose to plot only one borehole, a few boreholes, or visualize the entirety of the listed boreholes by selecting all of them. Selecting "Project onto Nearest XS" will visualize the borehole on the cross section nearest to the station on which the borehole is.

After visualizing the boreholes, the user may use Cross-Section Navigator to browse through the Cross-Sections and view the soil borings. At this point, using Borehole Navigator's ID tool to select a borehole in the Cross-Sections will highlight the corresponding borehole in Borehole Navigator's Borehole Information list.

Borehole Navigator Exercise

1. After opening C:\e\Projects\22807915201GT\RDXSRD01.DGN and selecting the cross section model RDXSRD, access Borehole Navigator using either method described earlier in this handout.
2. Ensure that the correct preference file is loaded by selecting ***FILE > PREFERENCES*** from Borehole Navigator's menu.

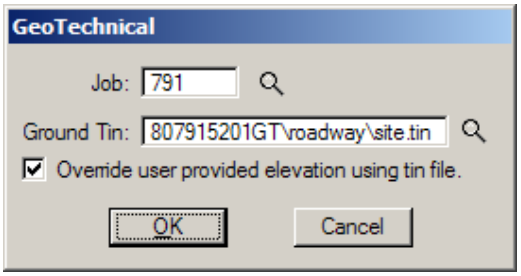




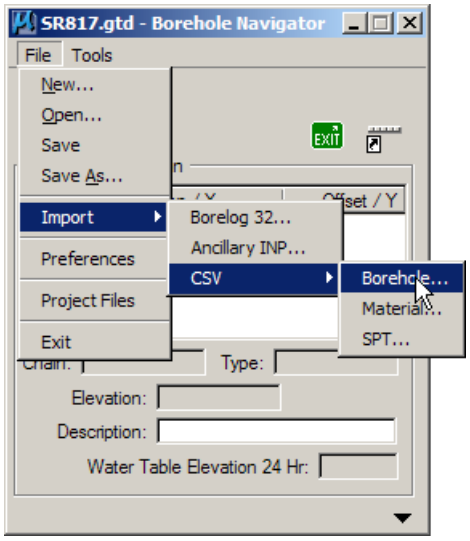
3. Select ***FILE > OPEN*** from Borehole Navigator's Preferences dialog. Navigate to and select ***C:\FDOT2008\GEOPAK\BIN\GEOTECH2004.GTP***.

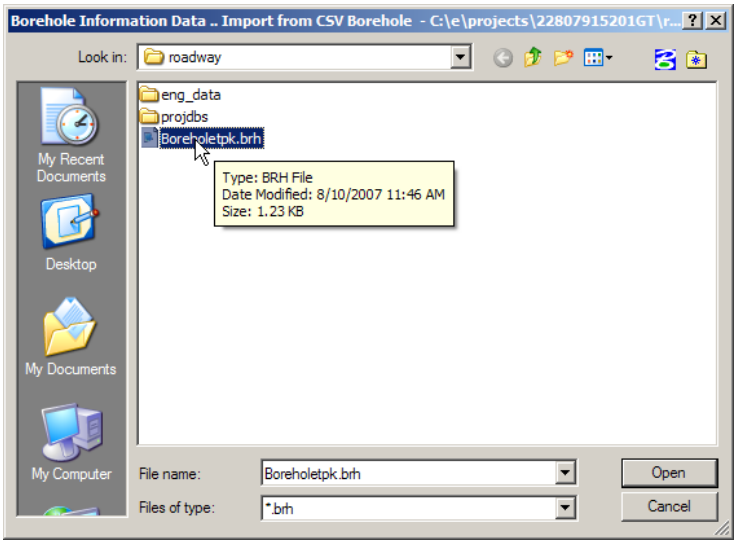
4. Click ***OK*** to close the Preferences dialog.
5. Select ***FILE > NEW*** in Borehole Navigator, and enter the file name SR817.gtd. If this GTD file already exists, an alert message warns that the existing file will be overwritten; select ***OK***.
6. GEOPAK's Geotechnical Project Files dialog appears. Enter the requested information; specify the Job Number and TIN file (c:\e\project\22807915201GT\site.tin).

   This dialog can be accessed again later by selecting ***FILE > PROJECT FILES*** *from Borehole Navigator's menu.*

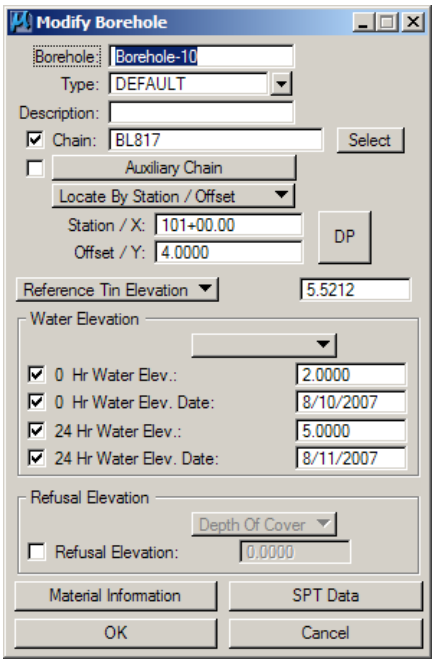


7. Select ***FILE > IMPORT > CSV > BOREHOLE…*** from Borehole Navigator's menu. The Import from CSV Borehole dialog appears. Select *Boreholetpk.BRH* as shown below, and click ***OPEN***.

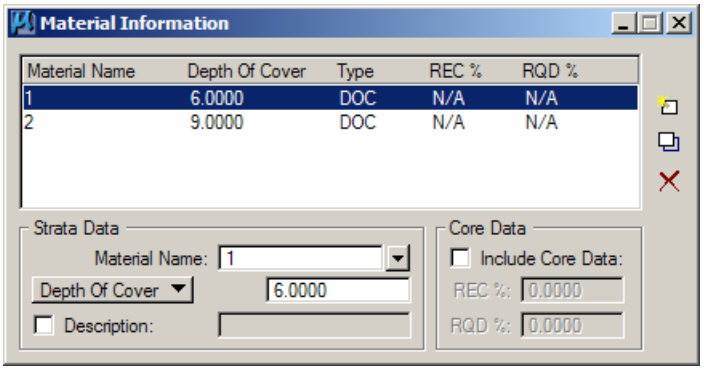




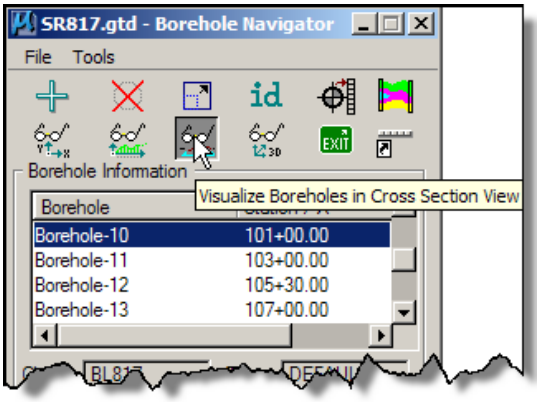
8. To import the material information, select ***FILE > IMPORT > CSV > MATERIAL…*** from Borehole Navigator's menu. Select the file ***MATERIAL.MTL*** in the project's roadway folder and click ***OPEN***. The material information is appended to the respective boreholes that were imported from the ***BOREHOLETPK.BRH.***



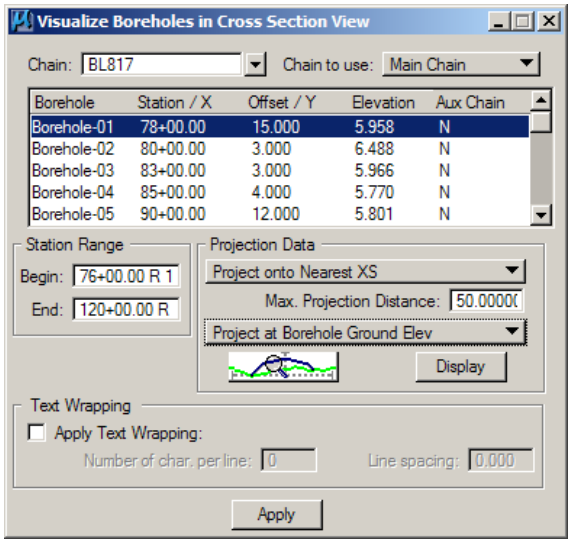
9. Double click on any borehole in Borehole Navigator's dialog to access the Modify Borehole dialog and view the borehole information.
10. Select the button marked "Material Information," to view and edit the material information for the borehole.



11. Close the Material Information and Modify Borehole dialogs.



12. Click the icon for "Visualize Boreholes in Cross Section View." The ***Visualize Boreholes in Cross Section View*** dialog appears.
13. Select ***BL817*** as the chain and highlight all of the boreholes listed.



14. Set the first Projection Data dropdown to ***Project onto Nearest XS*** with a Max. Projection Distance of ***50***.
15. Set the second Projection Data dropdown to ***Project at Borehole Ground Elev***.
16. Click ***Apply***, and Borehole Navigator will draw the boreholes in Cross Section View.