

CHAPTER 3 – SNAP OUTPUT

RESULT SCREENS

Wall Facing Design and Serviceability Checks

As mentioned above, SNAP calculates the nominal nail head strength for all applicable facing failure modes for both shotcrete and cast-in-place concrete facing types, then selects the controlling value for the nominal strength (T_{FN}) and calculates the allowable nail head load (T_F). All of these values are shown in the program under the *Nail Head Strength tabs* for both shotcrete and CIP facing types. When a Cast-in-Place facing is chosen, the strength of the shotcrete facing is neglected, as recommended by FHWA.

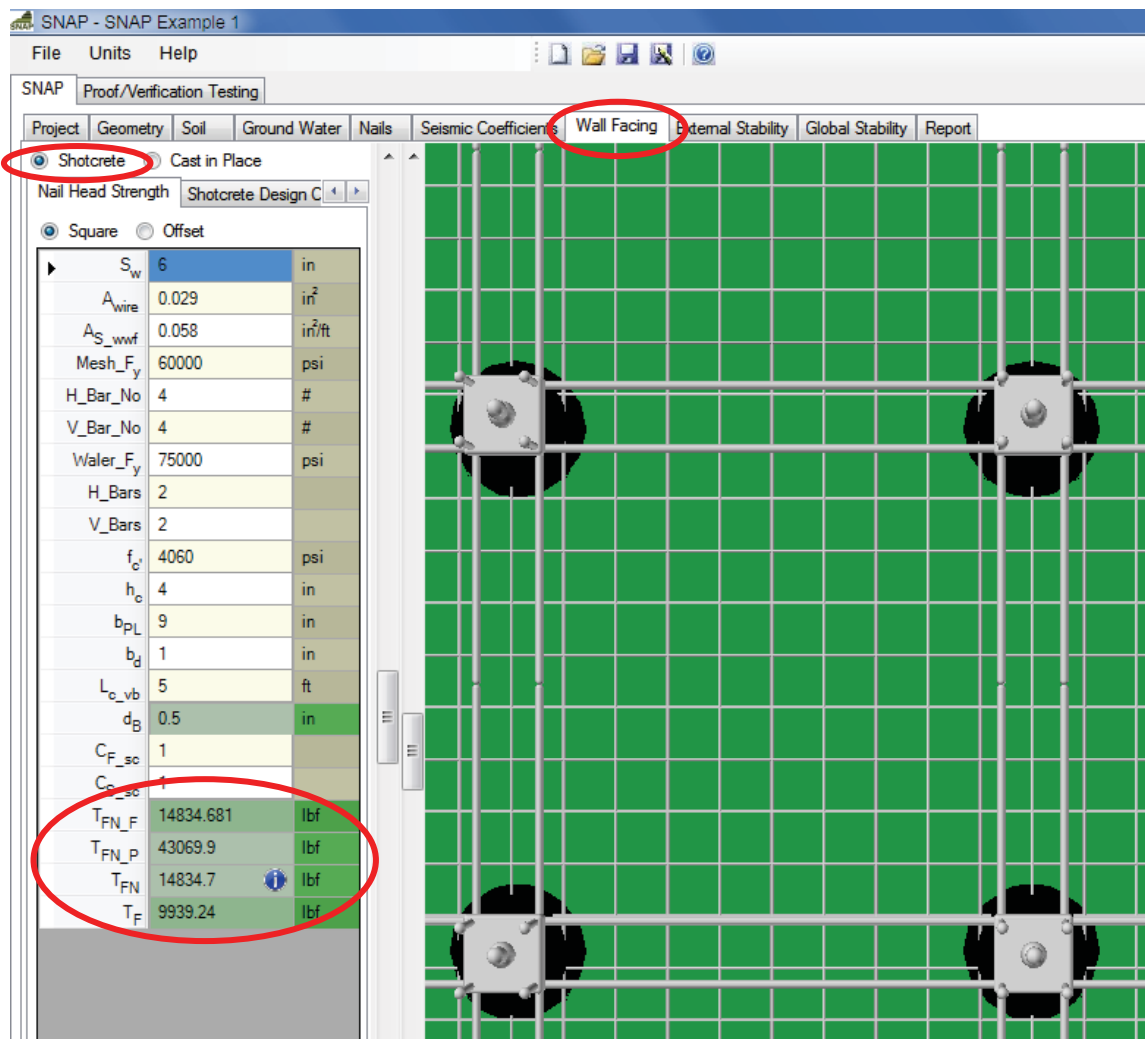


Figure 47. Screen Shot. The nominal nail head strength and allowable nail head load are shown under the Wall Facing tab, on the Nail Head Strength sub-tab.

Design and serviceability checks appear in the *Wall Facing* tab, on the *Shotcrete Design Checks* or *CIP Design Checks* sub-tabs, with small icons to the right of the values. Hold the mouse over the icon for a few seconds to view messages:

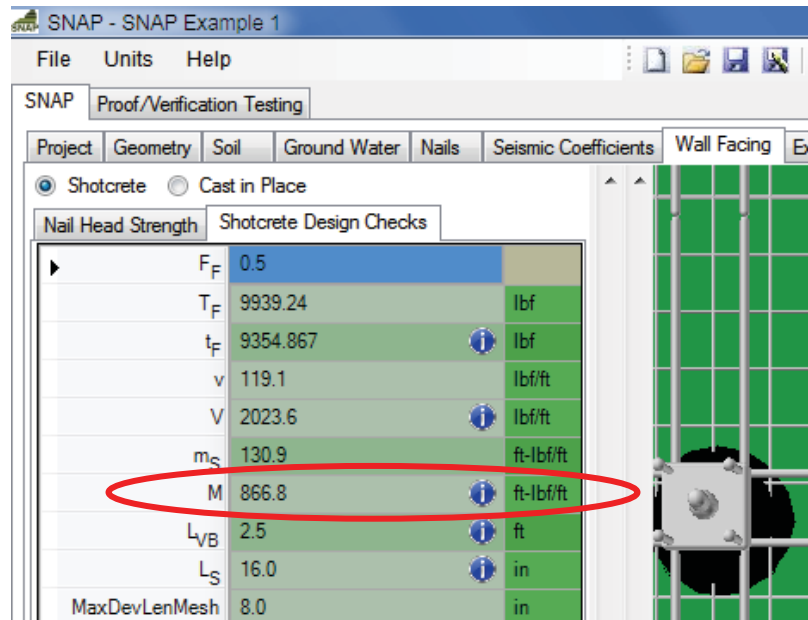


Figure 48. Screen Shot. Design and serviceability checks are shown on the Design Checks sub-tab for the appropriate facing type.

External Stability Analysis

External stability results, including sliding, overturning, and bearing capacity, can be reviewed on the *External Stability tab*. Some intermediate calculation values are shown in the table. Safety factors for external stability failure modes are given, as well as the eccentricity, vertical effective stress at the base of the wall, and ultimate and allowable bearing capacity values for the wall. Certain results have icons to the right of the numbers, indicating whether AASHTO minimum factor of safety requirements are being met (The program will change these minimum FS values depending on whether seismic coefficients are being used). Hold the mouse over the information or warning icons for a few seconds to read what they say:

Project	Geometry	Soil	Ground Water	Nails	Seismic Coefficients	Wall Facing	External Stability
B	26.9						ft
▶ ecc	4.7						⚠
σ_v	5472.4						psf
FS_{SL}	2.0						ℹ
FS_{OT}	2.9						ℹ
q_{ult}	67606						psf
q_{allow}	27043						psf
FS_{BC}	12.4						ℹ

Figure 49. Screen Shot. External stability output results are shown on the External Stability tab.

These results are provided for the designer's reference, even though overturning and sliding failure are very unlikely to control stability of a soil nail wall.

Global Stability Analysis (Simplified Bishop Method for circular failure surfaces)

The *Global Stability* tab is divided into two sub-tabs: *Failure Circles* and *Radius Control*. The *Failure Circles* tab is an output-only tab, which provides the lowest 10 Simplified Bishop factors of safety (FS), along with information on the location and radius of each slip circle associated with these factors of safety. The slip circles for the lowest 10 FS values are also shown in the display area, with the color of each circle corresponding to its calculated FS, according to the legend bar at the bottom of the display area. Select a specific circle by clicking anywhere in that row to see the selected circle highlighted in the table, and in the display (the circle will be displayed as a much thicker line):

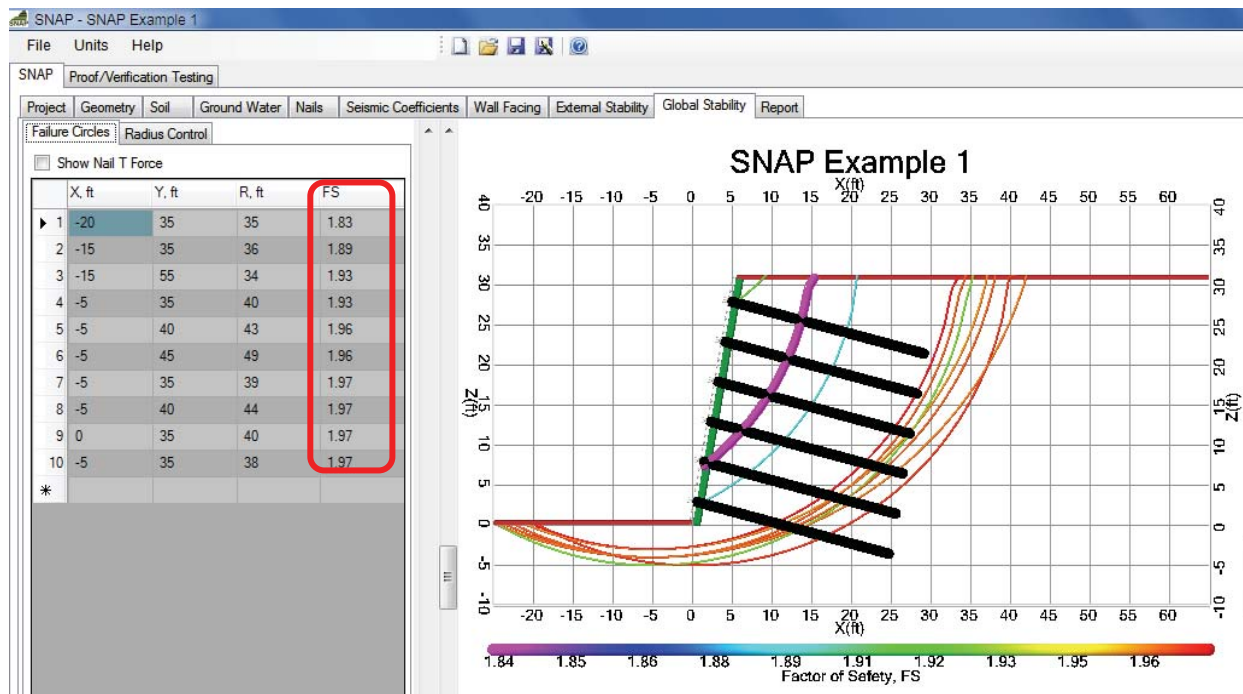


Figure 50. Screen Shot. The 10 lowest Factors of Safety, and their associated slip circles, are shown under the Global Stability tab.

When the Show Nail T Force box is checked, the variation in tensile force along the length of each nail will be shown in the display area as blue lines above the nails. This is a graphical representation of how the tensile force in each nail increases or decreases with distance from the wall face, similar to Figure 2 in Chapter 1. This gives the user the ability to determine how each nail is contributing to global stability, or whether the nails are failing in pullout.

These forces are numerically summarized under the *Nails tab* (See Chapter 1 and the Nail Data section in Chapter 2 for more information.)

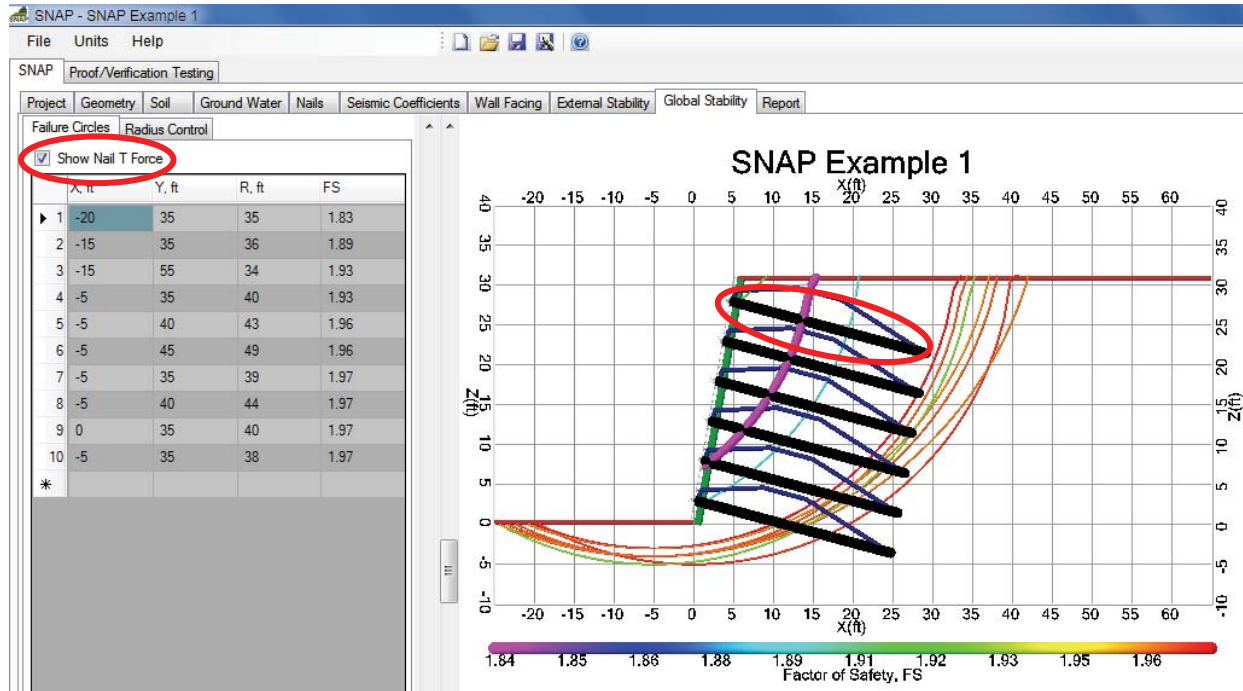


Figure 51. Screen Shot. Display the nail support diagram for each nail by checking the “Show Nail T Force” box.

The program analyzes slip circles with centers in a certain range and radii within a certain range (see Chapter 1 for a discussion). The *Radius Control* tab allows the user to change the limits of where slip circles can intersect the entire zone (down slope, wall, or back slope). This allows the exclusion of slip circles that only intersect the top nail, or slip circles that are too far away from the wall, for instance. *Upper Fail. Circle Min* and *Max* indicate a user-defined acceptable range of failure circle intersections with respect to the upper part of the slope given in terms of X coordinates. Likewise *Lower Fail. Circle Min* and *Max* indicate a user-defined acceptable range of failure circle intersections with the lower part of the slope given in terms of X coordinates

To have manual control over this aspect of the program, uncheck the box next to *Auto Calc Ranges*. The limits can be changed either by typing the values into the table, or by clicking and dragging the left and right points (shown in bright purple). These limits will be automatically selected if the Auto Calc Ranges checkbox is checked (See Chapter 1 for how this is done).

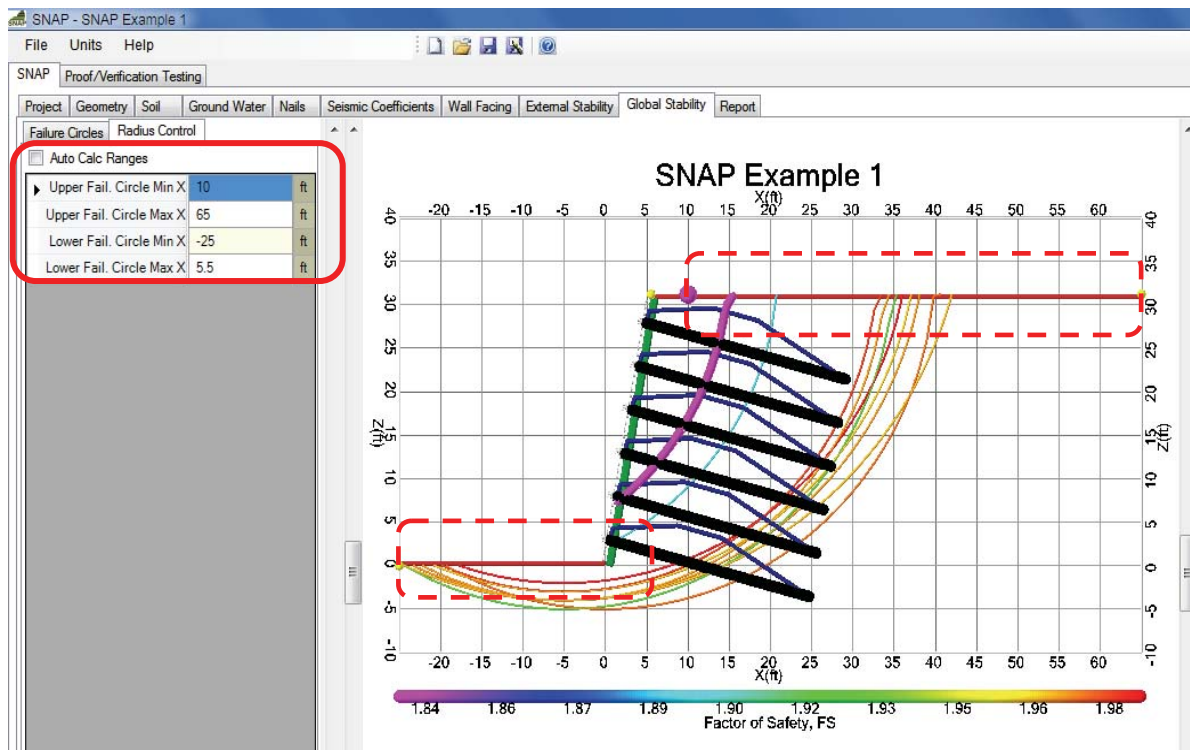


Figure 52. Screen Shot. The user has some control over how the program searches for slip circles.

REPORT GENERATION

On the *Report tab*, click on *Generate* to generate and view the report. This may take up to a few minutes to generate. The report includes all of the input information, as well as all of the output results, in a format that is easier to print or copy into another program. Tables and text can be copied and pasted into other programs for use in documents, presentations, etc.

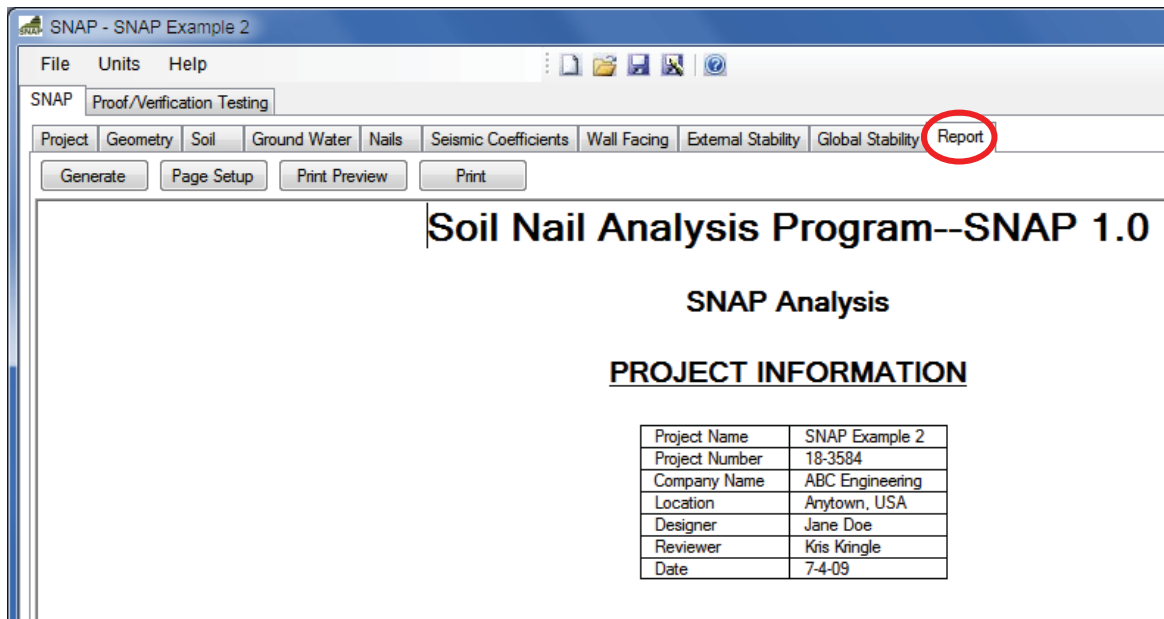


Figure 53. Screen Shot. Select the “Report” tab to generate, view, and print all input and output information in a format that is also easier to copy into another program.

Within the report, information or warning messages will appear in text below tables, with yellow or red backgrounds:

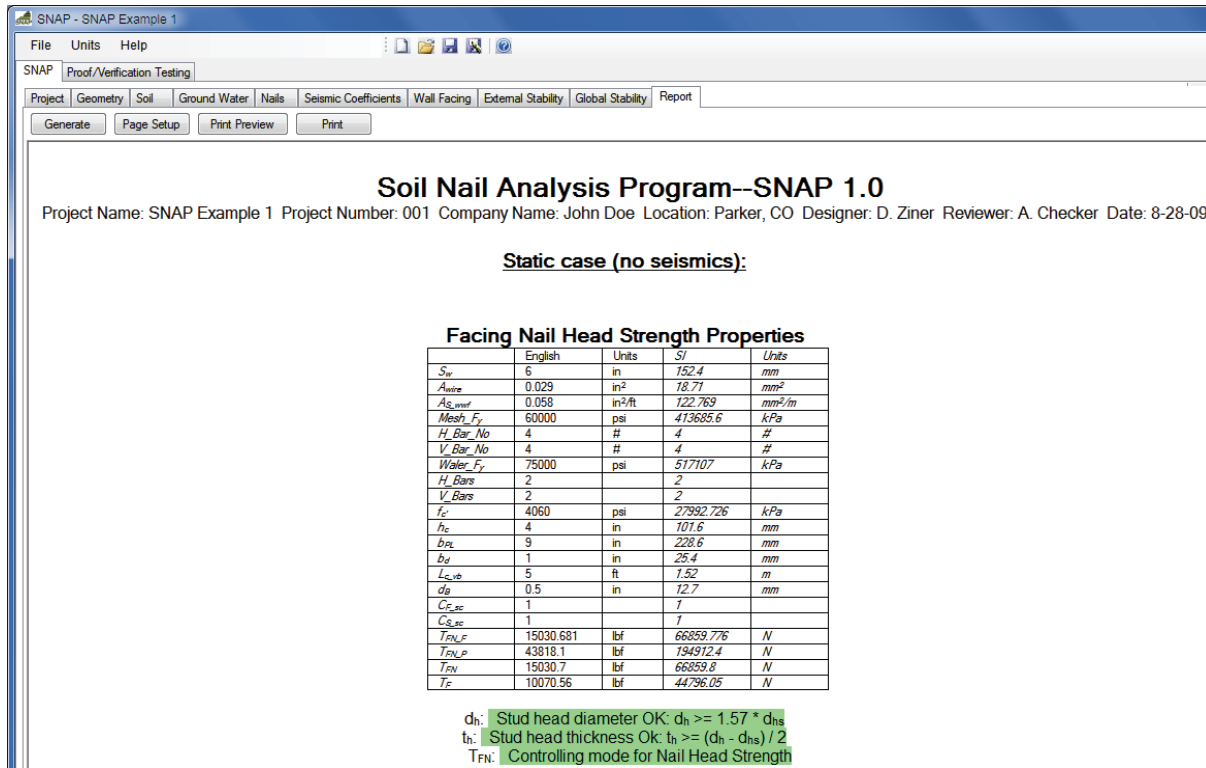


Figure 54. Screen Shot. Warning messages and other information are highlighted in the report.

While viewing the report, standard printing functions are available, such as Page Setup, Print Preview, and Print.

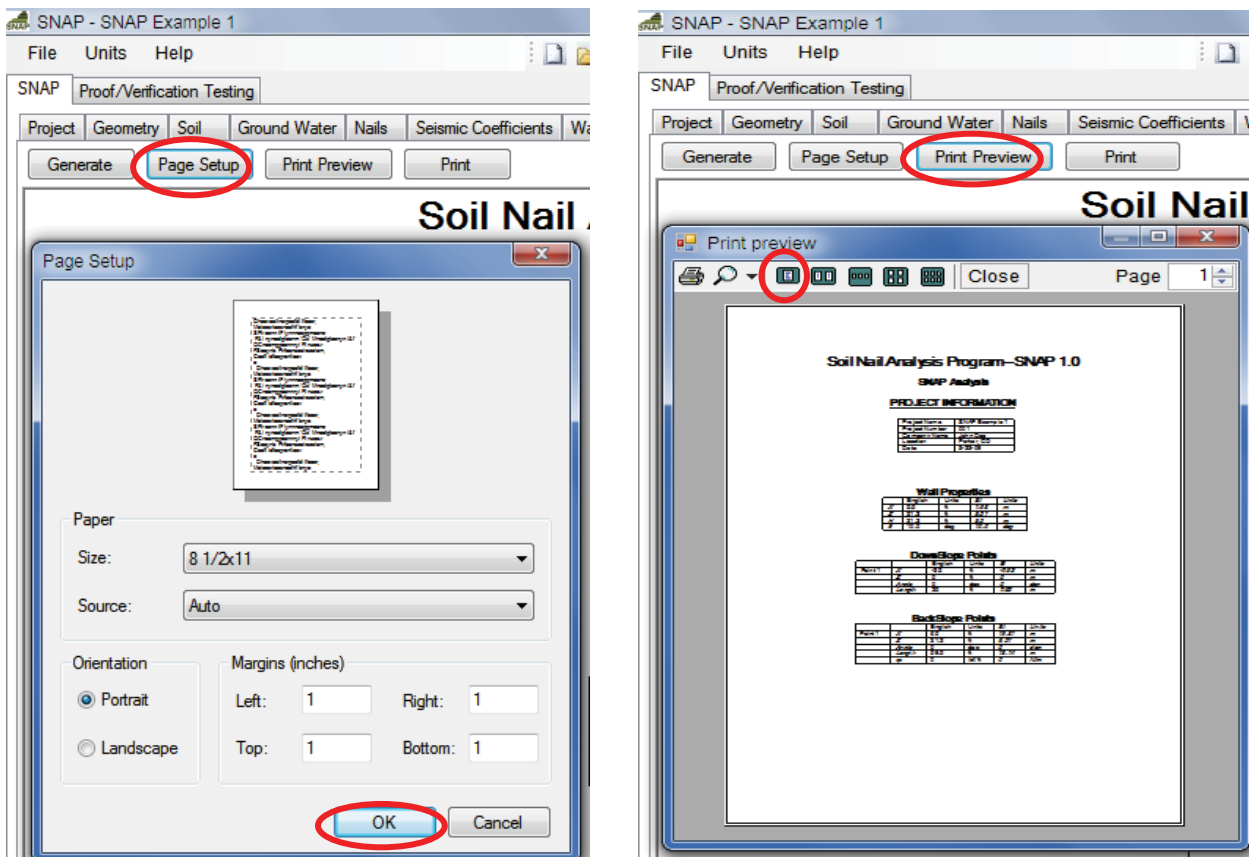


Figure 55. Screen Shot. Standard print functions such as Page Setup and Print Preview are available.

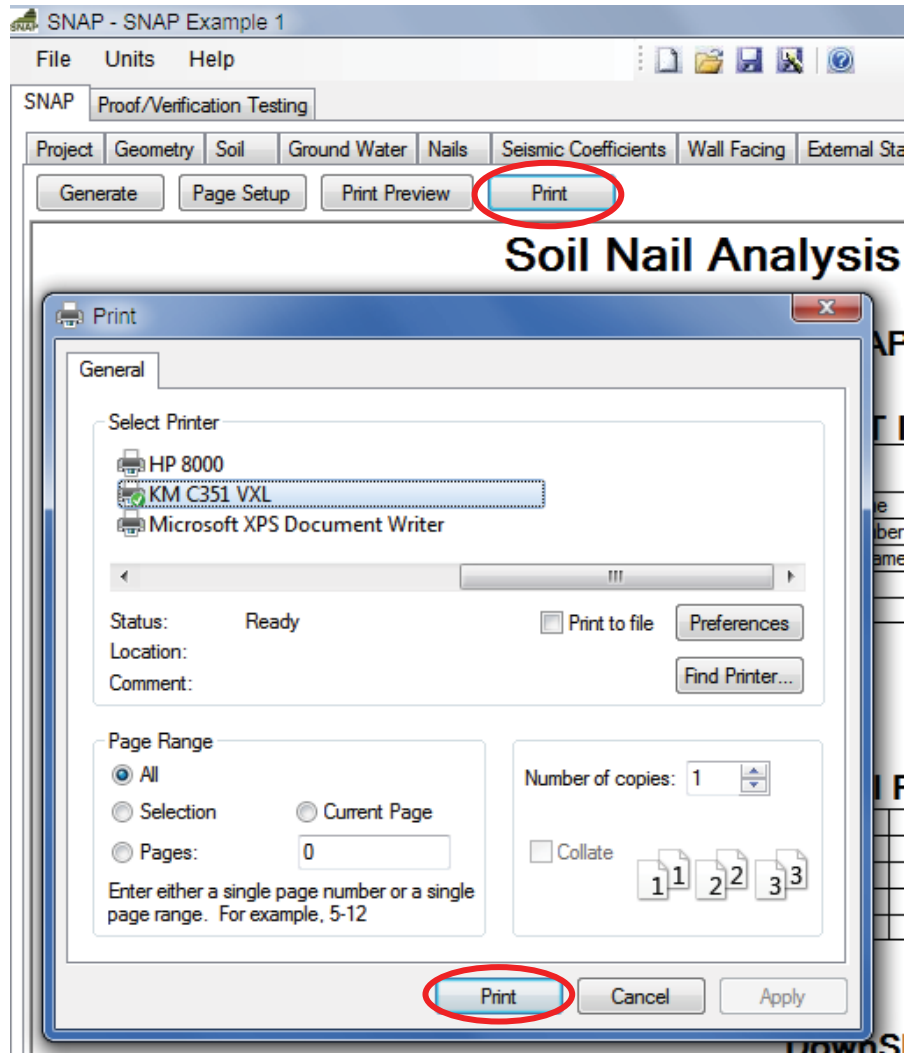


Figure 56. Screen Shot. Select “Print” to print the entire Report.