

NovoLAB

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About



NovoLAB

This software is designed for processing soil mechanics tests and drafting borehole logs.


Although all efforts have been undertaken to ensure that this software is of the highest possible quality and that the results obtained are correct, the authors do not warrant the functions contained in the program will meet your requirements or that the operation of the program will be uninterrupted or error-free. The authors are not responsible and assume no liability for any results or any use made thereof, nor for any damages or litigation that may result from the use of the software for any purpose. All results to be verified independently by user.

» Purchase full version	» About Novo Tech Software Inc
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» Program's web page	» Bug report / feature request
» Terms and conditions of use	» Maintenance Plan



Vancouver, Canada

Getting Started ...

- 📖 We recommend minimum 1024*768 screen resolution for using NovoLAB.
- 📖 If you are using the dongle key version, please make sure that it is plugged to your computer before you run the program.
- 📖 To invoke the help page associated with each page of software, click on the  button on top-right corner of each page in NovoLAB.
- 📖 Make sure you prepare backup from your data periodically. Your database file is the NovoLAB.MDB file ([see more](#)).
- 📖 After the first installation on each computer, please open the [general preferences](#) pages and set the preferences. Next, open the [laboratory tests default settings](#) page and set default values. These are very important steps in NovoLAB installation and setup, otherwise you may end up with incorrect results.
- 📖 Review the [data entry and reporting steps](#) recommended for using NovoLAB.
- 📖 Please contact us at support@novotechsoftware.com with any questions or suggestions.

License Agreement

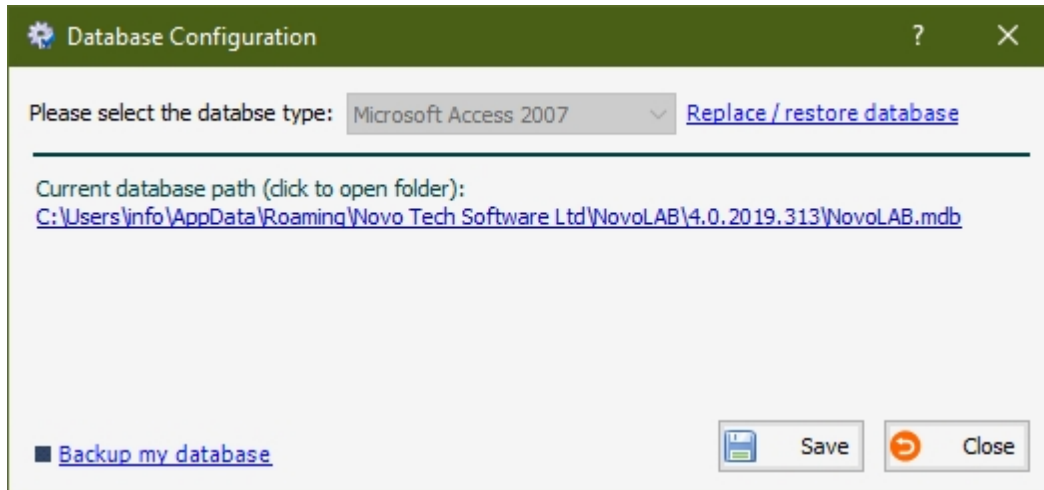
Visit our online [End User License Agreement](#)

License Manager

Visit our [online resource](#) for this item.

Backup & Restore

It is necessary to regularly backup the database and be prepared in case of hard disk failure or infection by a computer virus. By having a backup of your database you will be able to use the database by reinstalling NovoLAB. For this purpose click on "Database Configuration" from the "Tools and Options" menu on the [main toolbar](#). The following page will appear:



NovoLAB comes with Microsoft Access database, so please do not change the database type without consulting Novo Tech technical team.

Preparing a Backup

Click on the link [Backup my database](#) in the bottom left of your screen. Save the back up file in location of your choice. All your project data is stored in this database file. We recommend you save the backup file on a CD or flash drive, it is recommended to save the backup file in a folder with a name that indicates the backup date.

The second method is to click on the path shown below the "Current database path" (see the above screenshot). This will open the folder; now you can easily copy the database file to your desired location.

Database Restore

If you want to restore your data, click on the link [Replace / restore database](#) in the upper right of your screen and locate where the backup file of your database is saved. NovoLAB will replace the existing database with your backup. Please note that the actual database file extension is **.mdb** and the extension of the database backup file is **_mdb**.

Work Flow

The following describes the data entry steps using NovoLAB, starting from project initiation to reporting:

Enter new project data
([see how](#))



Enter new borehole / test pit data

[\(see how\)](#)



Enter SPT blow counts, sample list, etc



Enter laboratory test data

[\(see how\)](#)



Specify soil layers for each borehole / test pit

[\(see how\)](#)



Prepare boring log

[\(see how\)](#)



Prepare other reports, as required

[\(see how\)](#)



Prepare database backup


[\(see how\)](#)

Units System

This version of NovoLAB supports the following unit systems:

- Metric units (kg, m, cm)
- US Customary units (lb, ft, in)

NovoLAB Main Screen

The main screen of NovoLAB provides access to the main toolbar and shows additional information on the status-bar below the screen. The current project name is shown on the top-right corner of the screen. You can minimize the screen by clicking on the  icon beside the project name. The following describes the function of different tabs on the main toolbar:

File tab: this tab provides access to list of [projects](#) and [boreholes](#).

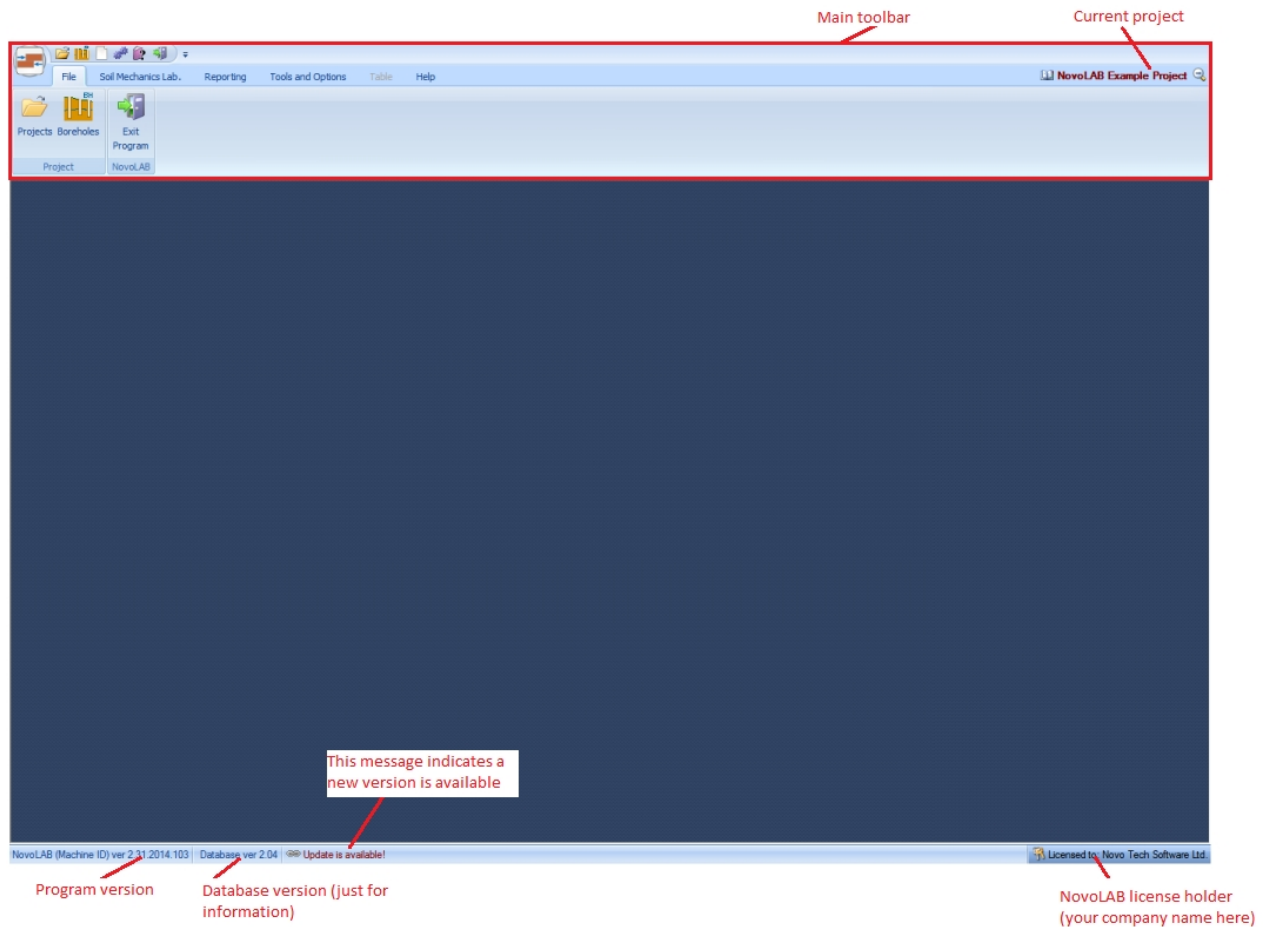
Soil Mechanics Lab. tab: this tab provides access to data entry pages for [laboratory test](#) pages, such as sieve analysis, Atterberg limits, etc. ([see more](#))

Reporting tab: this tab provides access to [boring log](#), [tests summary report](#), etc. ([see more](#))

Tools and Options tab: this tab allows you to configure [general preferences](#) and [default test settings](#).

Table tab: provides features for [working with data entry tables](#), such as deleting a row, exporting table to Excel and importing data from text file into the table.

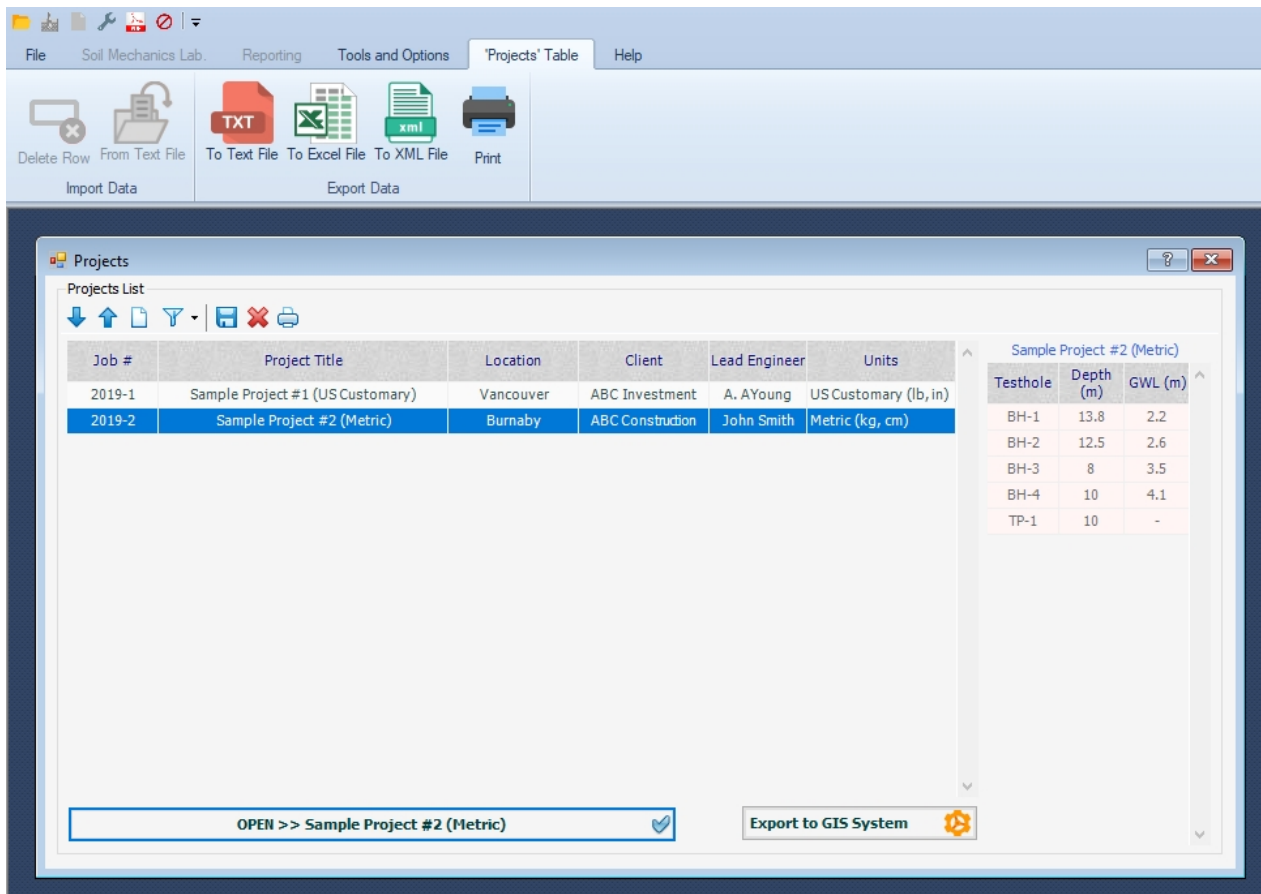
Help tab: this tab provides access to this help file, [license manager](#) page and more.



Status-bar: this is located at the bottom of the screen and provides information on versioning and type of NovoLAB license you currently use. If an update is available you will see a notification on the status bar. For more information on how to update NovoLAB, read [this article](#).

Projects List

The purpose of this page is to provide a list of projects, and can be accessed from the File tab on the [main toolbar](#). This page consists of a toolbar, list of projects and a list of test holes for the selected project.

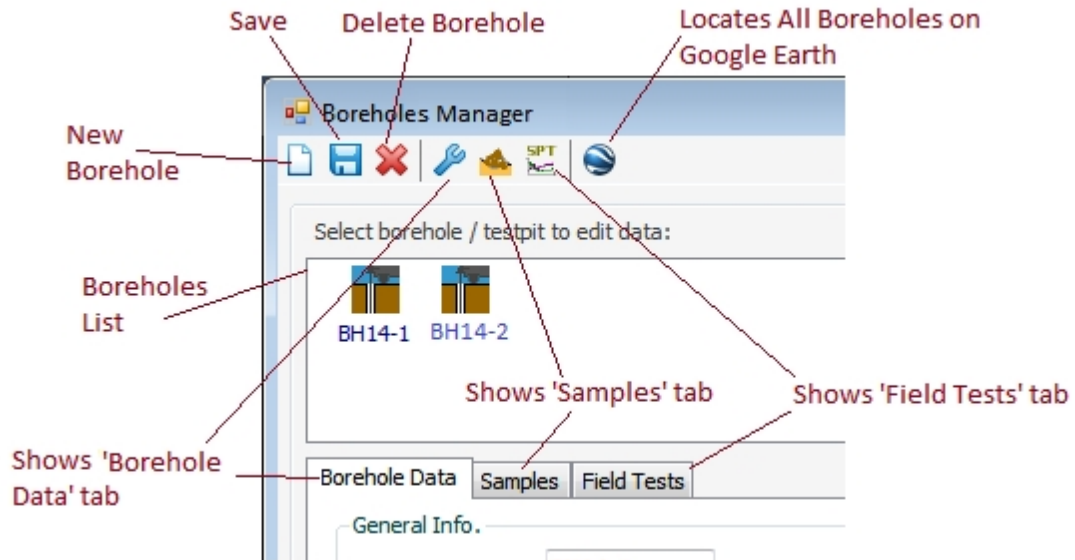


- To open a project, select the project from the list and click on "OPEN >> ..." button below the table.
- To export all projects to Google Earth KML format (also read by ArcGIS), click on "Export to GIS System" button. This will take you to [UTM Coordinates page](#).

Using toolbar you can create new project, delete an existing project, filter projects and save change. You can also print a list of all projects. Once you click on the list of projects, you can export the project list using the Projects Table tab on the main toolbar.

Boreholes Manager

On this page you can manage the list of boreholes and edit their properties. The main parts of this page are described below:



Toolbar

This toolbar is used to insert / save /delete boreholes. The toolbar also provides quick access to the main sections of the borehole data such as "Borehole Data", "Samples" and "Field Tests". If the borehole is actually a test pit, the drilling method "Test Pit" should be selected (see all [drilling methods](#)). Please note the deleted data cannot be restored.

Borehole List Panel

This list is located below the toolbar, and lists all boreholes and test pits (with different icons). Click on any boreholes to view and edit its information.

Borehole Data tab

Using this tab you can specify name, method of drilling, total depth, groundwater level, fill thickness, coordinates, etc. Please note:

- Name of borehole should be unique in the current project
- Depth of a sample may not be greater than the total depth of borehole
- Depth of a test field may not be greater than the total depth of the borehole

Samples tab

This section is used for entering a list of samples for selected borehole by specifying their depth, type, color, sample number (Code or ID), and a visual description. If the gradation tests is previously conducted on this sample, the last column will show the USCS soil classification.

Borehole Data Samples Field Tests						
Depth (m)	Type	Color	Sample #	Sample Description	Soil Classification	
1.5	Disturbed	Grey	100		SP	
3	Disturbed	Grev	101		SC	

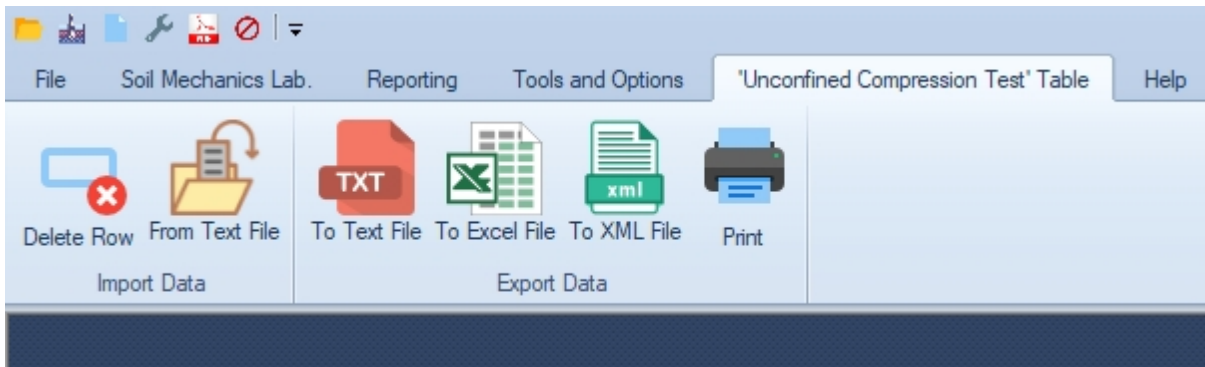
For various sample types please see [this article](#).

Field Tests tab

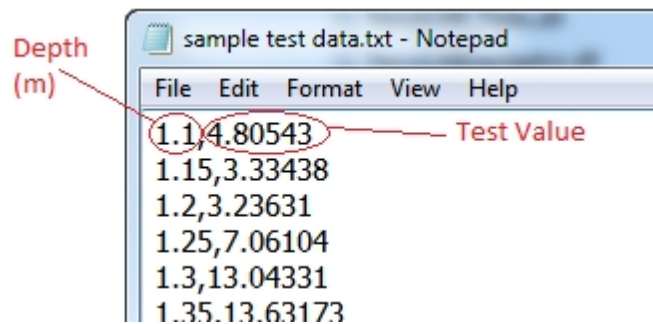
In this section, the results of standard penetration tests, or CPT, etc. can be entered.



The other field tests could consist of CPT, Vane shear, Down-hole / Cross-hole shear wave velocity and similar tests. For ease of data entry, you can also import the test result from a Text file. To do this, click on the table, then select "From Text File" menu from the [main toolbar](#).



The following described the format of the text file to be prepared for importing field test data.

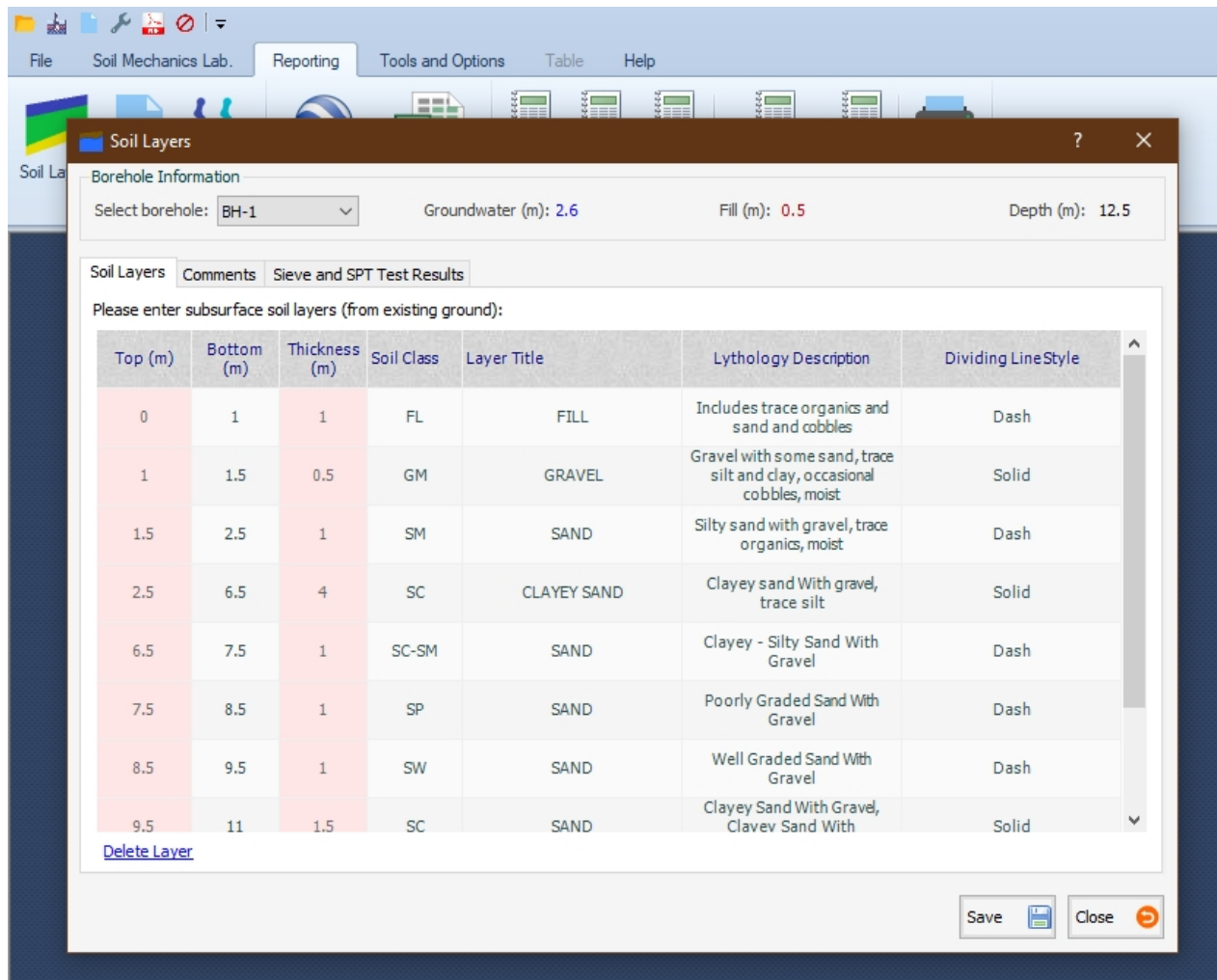


Locating Boreholes on Google Earth

To use this feature, you need the UTM coordinates of the boreholes. Click on Google Earth icon, then specify the zone name and number to open Google Earth 3D model ([more](#)).

Define Soil Layers

This page is accessed from Reporting tab of the [main toolbar](#) and is used for defining subsurface soil layers. These layers will be shown on the [boring log](#). You need to specify the bottom depth of each layer, as well as its dominant soil class, layer title and layer description. The divider line between the subsequent layers can be of type solid, dashed and dotted.



You can also use Comments tab to enter comments at certain depth. Comments will be shown on the boring log if they are selected as part of the log (see [log designer](#)).

Drilling Methods

The following drilling methods are supported in NovoLAB; if you don't see the boring method you are looking for, just [contact us](#) and we will send you a customized database with additional drilling methods:

- Mud Rotary
- Test Pit
- Solid Stem Auger (STA)
- Hollow Stem Auger (HSA)
- Hand Auger
- Sonic (vibratory)
- Direct Push (DP)
- Air Rotary
- Percussion
- Cable Tool
- Reverse Circulation
- Diamond Core
- Hydraulic Rotary

Sample Types

The following sample types are supported in NovoLAB; if you don't see the one you are looking for, just [contact us](#) and we will send you a customized database with additional drilling methods:

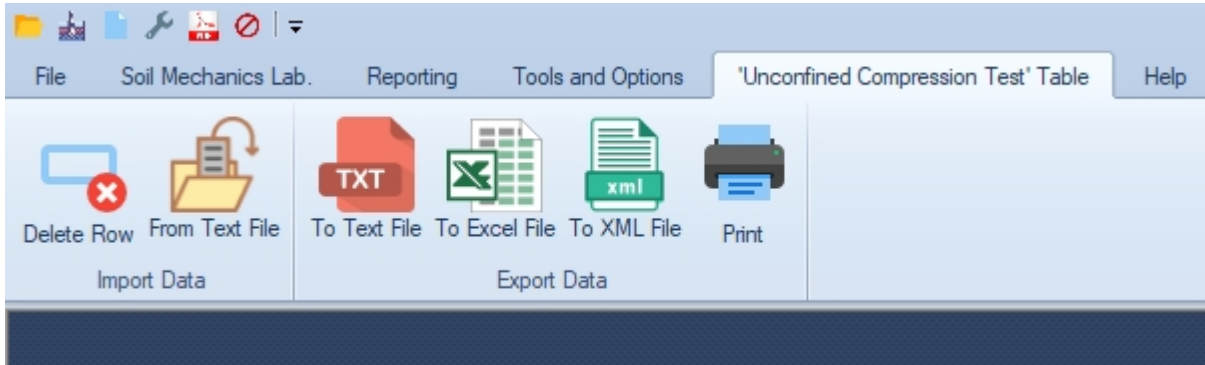
- Disturbed
- Undisturbed
- Shelby / U4
- Core Cutter (for test pits)
- SPT Split Spoon
- Percolation Test ([see more](#))
- Field Density
- Water

Working with Tables

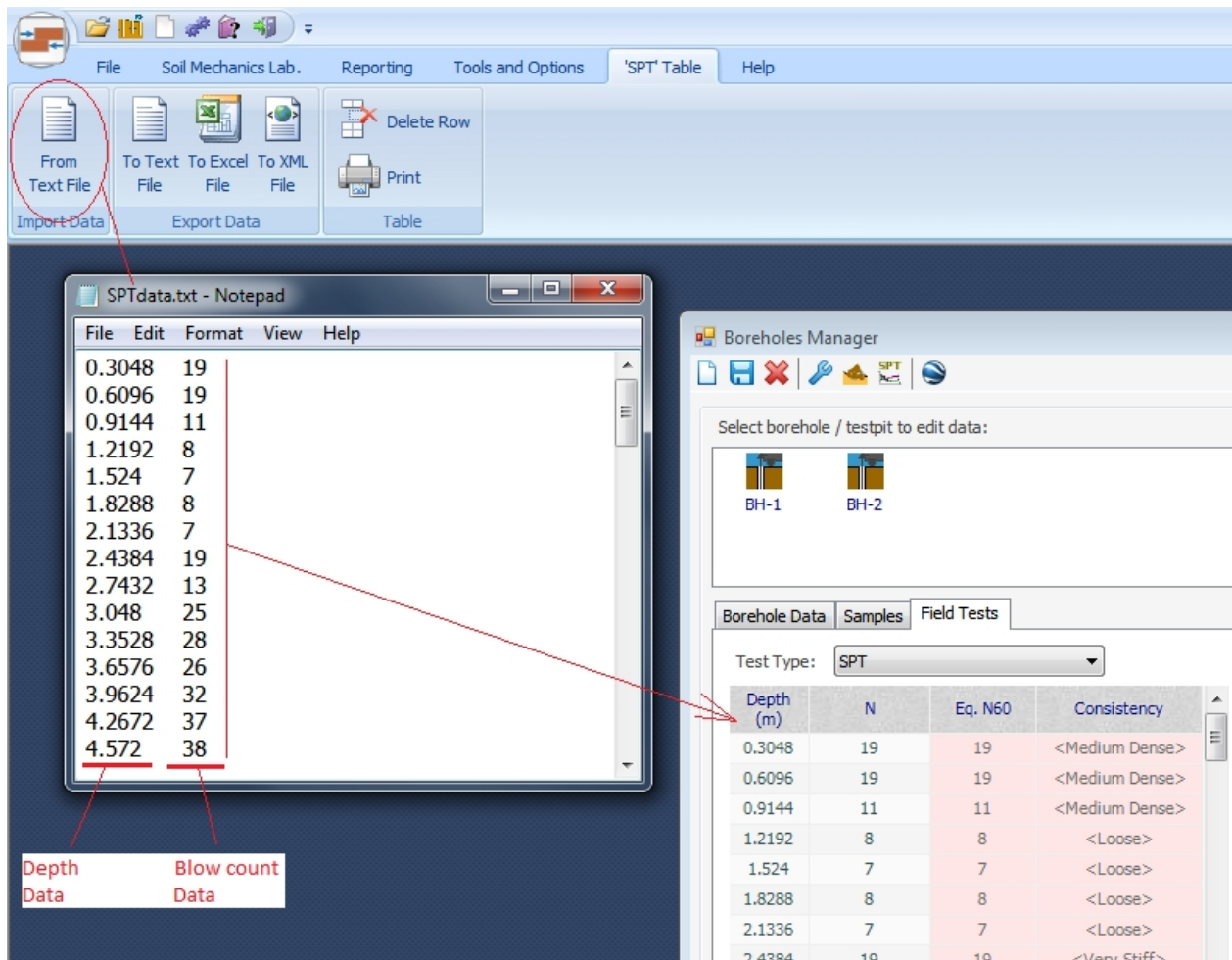
Most of the data entry and on-screen results in NovoLAB use tables. The following is an example of a table. Please note that data should be entered in the white cells. The red cells are automatically calculated by the program.

Time (sec)	H1 (cm)	H2 (cm)	K (cm/sec)
10800	62	61.5	$K = 1.1 \times 10^{-6}$
9000	61.5	61.1	$K = 1.06 \times 10^{-6}$
9000	61.1	60.8	$K = 8.01 \times 10^{-7}$

You can add / delete rows to most of tables (if they are used for data entry). All tables can be exported to Excel, XML and Text formats. Tables such as SPT blow counts or other field tests can import data from a tabular text file. In order to work with a table, click on it. The following menu on the main toolbar allows you to perform several functions:

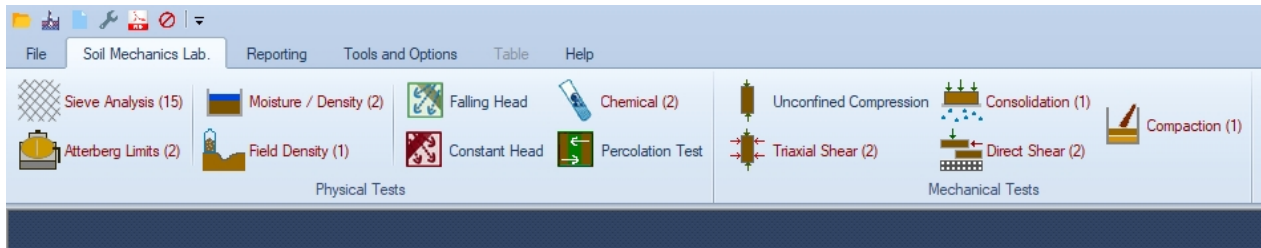


Importing from Text File: When importing from a text file to a table (such as SPT blow counts), the text file needs to be comma or tab separated and each line should contain the same numbers as in the table. The following screenshot shows importing Depth and SPT Blows data from a text file when on the [boreholes manager](#) page:



Getting Started

In order to access data entry pages for soil mechanics tests, please use "Soil Mechanics Lab." menu from the [main toolbar](#).



The numbers in bracket show the total number of tests for each test. For example the above screenshot indicates data for 3 direct shear tests are entered into this project.

Tests Toolbar

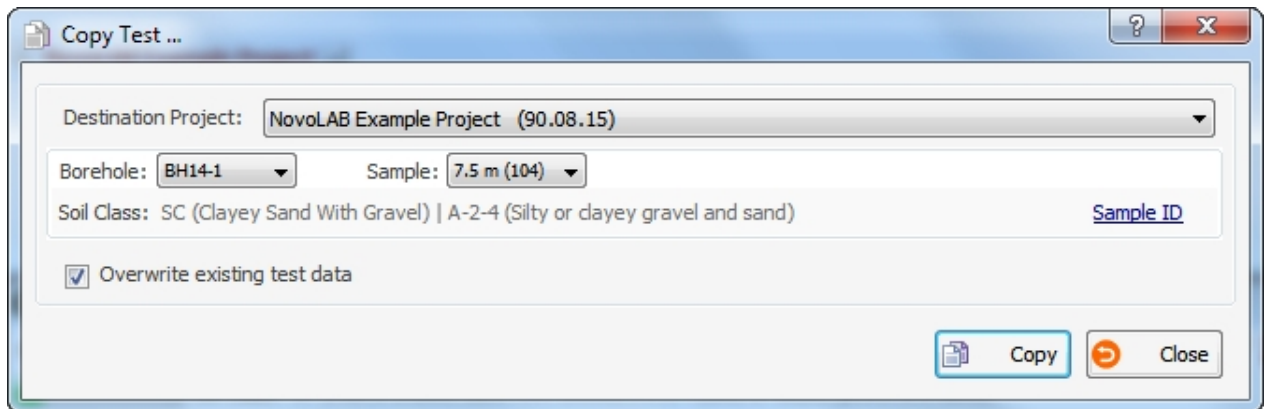
This toolbar is shown at the top of all test pages and allows you to navigate through the tests, save, delete, [copy](#) and [print](#) the test results.



In order to enter new test data select the borehole and sample from the lists on the left side of the test toolbar; this will clear all fields and you can start data entry for this new test. Please note deleted test data cannot be recovered.

Copying a Test

This feature is used to copy all test data from one sample to another sample (even in a different project), and can be accessed through the [test toolbar](#).



Sieve Test

This page is used for data entry of sieve analysis test and to view / print the test results. This page can be accessed from the [Soil Mechanics Lab.](#) menu. The main input data consists of sample weight, Atterberg limits and hydrometer data.

Weights: In most cases one sample is used for sieve analysis. However, if the sample is divided to two parts (i.e. retained above the sieve #4 (4.75 mm opening) and below sieve #4) select the "2-Part Sieve Test (#4)" checkbox and enter the weight of the second sample as well. In addition, please enter the weight of the retained soil on each sieve in the table. Please note that data should be entered in the white cells. The red cells are automatically calculated by the program.

Sieve Analysis Test

Borehole: **BH14-1** Sample: **3 m (101)**

Soil Class: **SC (Clayey Sand With Gravel) | A-2-6 (Silty or clayey gravel and sand)**

Dry Weight (gr): **3000** 2-Part Sieve Test (#4)

Tested By:

Atterberg Limits

Test Results Not Available None LL, PI None PI

LL: **32.4** PL: **19.1**

Sieve	Opening (mm)	Retained (gr)	Passed (gr)	Percent Passing
3"	76.1			
2"	50.08			
1.5"	38.1		3000	100
1"	25.4	63	2937	97.9
3/4"	19	128	2809	93.6
1/2"	12.57	254	2555	85.2
3/8"	9.51	153	2402	80.1
# 3	6.35			
# 4	4.75	369	2033	67.8
# 8	2.36	344	1689	56.3
# 10	2			
# 12	1.5			
# 16	1.18	324	1365	45.5
# 20	0.85			
# 25	0.707			
# 30	0.6			
		Total=2268 (gr)	Pan=732 (gr)	

Hydrometer Double Hydrometer

Time (min)	Reading
0.5	43
1	40
2	36
3	34
4	32
8	30
15	25
30	21
60	16
120	13
240	11

Weight (gr): **50**

Tempr (oc): **15**

Type: **152 H**

Gs: **2.8**

Meniscus: **0**

Zero Corr.: **0**

Solution: **sodium hexametapho**

example : 23.16

Only Used Sieves Only Active Sieves Show Filters

D10 (mm)	0.005
D30 (mm)	0.305
D50 (mm)	1.575
D60 (mm)	2.958
Clay (%)	8
Silt (%)	16.4
Sand (%)	43.4
Gravel (%)	32.2
USCS	SC
AASHTO	A-2-6
Cc	6.29
Cu	591.6
PI (%)	13.3

Atterberg Limits: If Atterberg limits test is done on this sample you can click on "Read From Atterberg Test" button, and LL and PL will be automatically retrieved from database and will be placed in the corresponding fields. If Atterberg limits data for this sample has not been entered in NovoLAB, simply enter LL and PL values or select from the appropriate checkboxes on the left.

Hydrometer: If hydrometer test (below sieve #200) is conducted, enter data in the corresponding tables. Please note depending on type of hydrometer used (151H or 152H) data with different formats should be entered (follow the example shown on screen when selecting the hydrometer type).

- Only Used Sieves: select this checkbox to see only those sieves with non-zero retained weights. This allows you to quickly check your input data with the laboratory sheets for any data entry error.
- Only Active Sieves: select this checkbox to only show the sieves mostly used in your laboratory (hence, a faster data entry). See [this article](#) for more information.
- Show Filters: if this checkbox is selected, filter curves are shown on the sieve analysis report. To edit the filter curves data click on "Edit Filter Curves" button.

Test Results

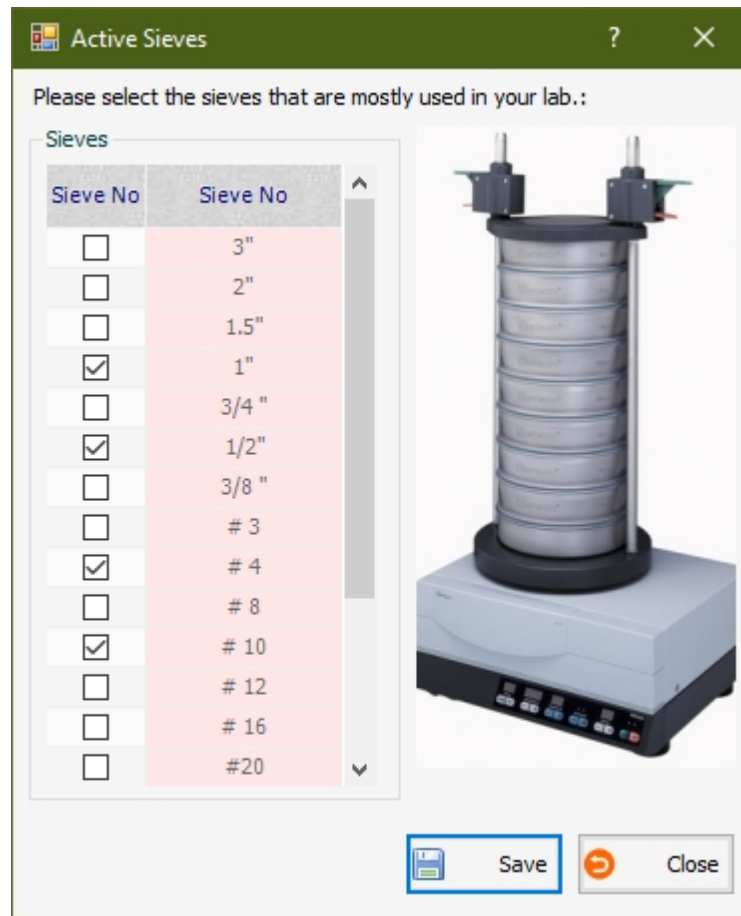
After data entry, click on calculate button from the [tests toolbar](#). Test results will be shown in the table on the bottom-right corner of the screen. You can print the unconfined compression test report by using the [tests toolbar](#).

My Sieves

This page is used to specify the sieves you use in your laboratory. To access this page click

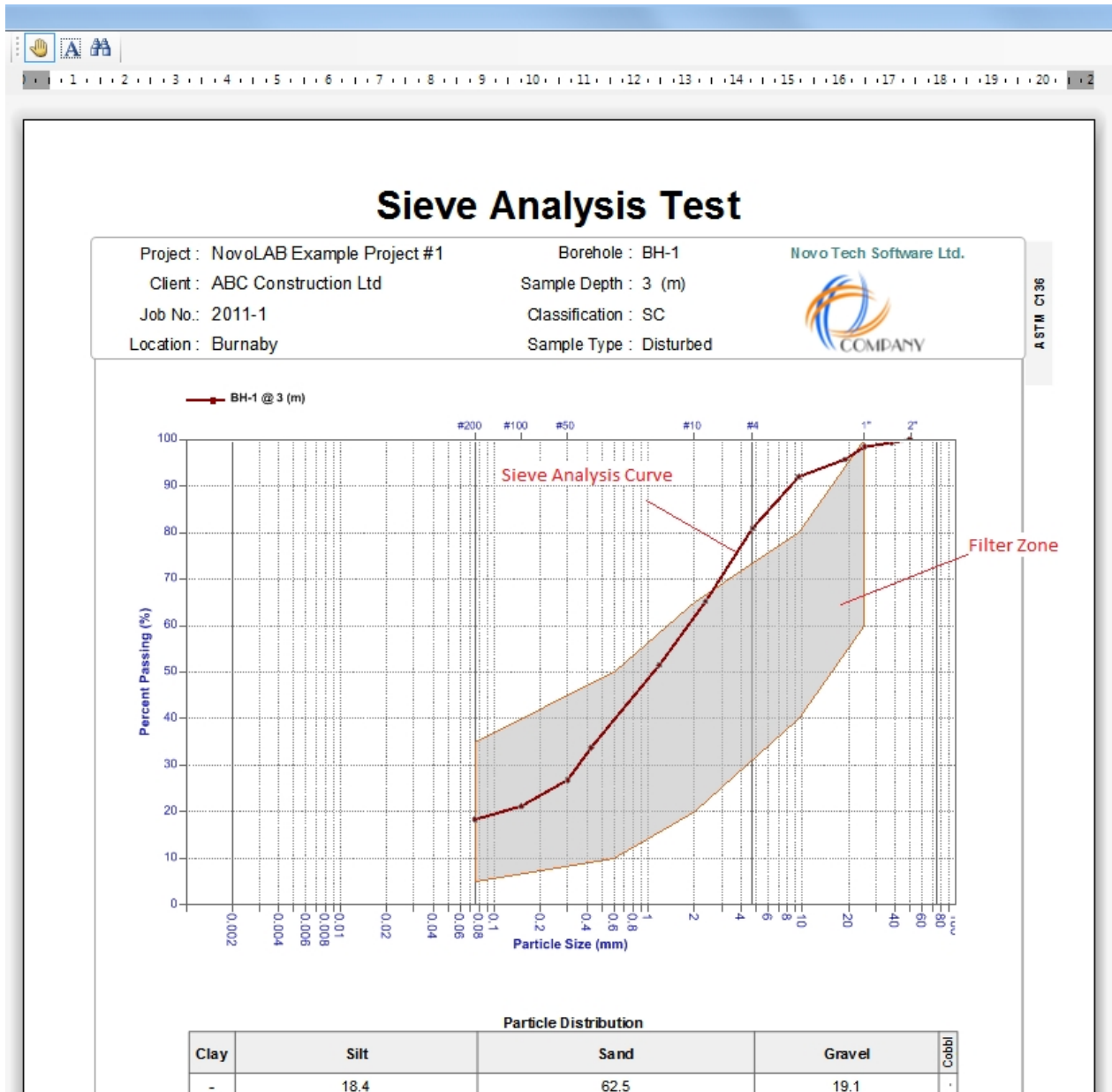
on "My Sieves" buttons from the "Tools and Options" menu on the [main toolbar](#).

Although NovoLAB database includes a complete list of all standard sieves, if you don't use all these sieves in your laboratory you can deselect them from this list. The advantage is that on sieve analysis page, you can select to show the "active sieves" only; this will ease data entry.



Filter Zones

This feature is used to plot filter zones on sieve analysis curve in order to determine if the material being tested conforms with certain particle size distribution criteria. This feature can be accessed from [sieve analysis](#) page.



Moisture and Density Test

This page is used for data entry of moisture / density determination test and to view / print the results. This page can be accessed from the [Soil Mechanics Lab](#). menu. Please enter the required input data and press calculate button to see the results. If the actual input data is not available (e.g. test is conducted by another laboratory) click on "Input data not available" checkbox and enter the test results manually.

Density & Moisture Test

Borehole: **BH14-1** Sample: **1.5 m (100)** **1 / 1**

Soil Class: **SP (Poorly Graded Sand With Gravel) | A-2-4 (Silty or clayey gravel and sand)** [Sample ID](#)

Input Data

Cont. Weight: (gr)

Wet Weight + Cont. Weight: (gr)

Dry Weight + Cont. Weight: (gr)

Dry Sample Volume: (cm3)

Input Data Not Available

Test Results

Dry Density: (gr/cm3)

Moisture Content (%):

Tested By:

After data entry, click on calculate button from the [tests toolbar](#). Test results will be shown on the right side of the screen. You can print the test report by using the [tests toolbar](#).

Atterberg Limits Test

This page is used for data entry of Atterberg limits test and to view / print the results. This page can be accessed from the [Soil Mechanics Lab](#).

Data entry should be done in separate tables for liquid limit and plastic limit tests. Input data simply consists of container weight as well as dry and wet weight of soil samples. Enter minimum 3 samples to obtain a reasonable test results. Please note that data should be entered in the white cells. The red cells are automatically calculated by the program.

Atterberg Limits Test

Borehole: **BH14-1** Sample: **1.5 m (100)** **1 / 6**

Soil Class: **SP (Poorly Graded Sand With Gravel) | A-2-4 (Silty or clayey gravel and sand)** [Sample ID](#)

Liquid Limit Test


Con. weight (gr)	Con.+ wet weight (gr)	Con.+ dry weight (gr)	No. Blows	Moisture (%)
50.1	94.62	83.13	17	34.8
59.01	94.68	85.65	23	33.9
48.42	90	79.61	30	33.3
				-

LL = 33.7 %

Plastic Limit Test

Con. weight (gr)	Con.+ wet weight (gr)	Con.+ dry weight (gr)	Moisture (%)
8.34	9.16	9.04	17.1
8.72	9.39	9.29	17.5

PL = 17.3 %



Tested by :

After data entry, click on calculate button from the [tests toolbar](#). Test results including LL and PL will be shown below each table. You can print the compaction test report by using

the [tests toolbar](#).

Field Density Test

This page is used for data entry of field density test and to view / print the results. This page can be accessed from the [Soil Mechanics Lab](#). menu. Please enter the required input data and press calculate button to see the results.

Field Density Test ? X
Borehole:
Sample:

1 / 1

Soil Class: SP (Poorly Graded Sand With Gravel) | A-2-4 (Silty or clayey gravel and sand)
[Sample ID](#)

Input Data

Sand Unit Weight: (gr/cm³)

Excavated Soil Weight: (gr)


Wet: Dry:

Weight of Bottle and Sand: (gr)

After: Before:

Weight of Sand in Cone: (gr)

Tested By:



Test Results

Moisture (%): 7.6 Dry Density : (gr/cm³) 1.91

After data entry, click on calculate button from the [tests toolbar](#). Test results will be shown at the bottom of the screen. You can print the test report by using the [tests toolbar](#).

Chemical Test

This page is used for data entry of soil and water chemical test results ([see how](#) to specify a sample as type of 'water'), and to view / print the report. This page can be accessed from the [Soil Mechanics Lab](#). menu. For data entry simply find the desired chemical test and enter the corresponding test results in front of it.

Soil Chemical Tests	Test Result
pH value	7.5
Electrical Conductivity	
Test 4	
Test 5	
Solubale Sulphate Content	0.11
Gypsum Content (BS 1377)	
Gypsum Content (FAO)	
Chloride Content (ASTM D1411)	0.004
Organic Matter (AASHTO T194)	
Test 11	
Total Carbonate (BS 1377)	
Dissolved Carbonate/Bicarbonate	
Nitrate Content	
Test 15	
Test 16	
Test 17	
Test 18	
Test 19	
Test 20	

You can print the compaction test report by using the [tests toolbar](#).

Hydraulic Conductivity Test

This page is used for data entry of falling head and constant head permeability test, and to view / print the test results. This page can be accessed from the [Soil Mechanics Lab](#) menu. After entering the sample and apparatus information, please enter water head and time readings in the table. Please note that data should be entered in the white cells. The red cells are automatically calculated by the program.

Permeability Test (Falling Head)

Borehole: **BH01** Sample: **1.5 m (50)** | **1 / 2**

Soil Class: **SC (Clayey Sand With Gravel) | A-2-6 (Silty or clayey gravel and sand)** [Sample ID](#)


Sample Info.

Diameter (cm): **10.52** Specific Gravity Gs: **2.57**
 Height (cm): **12.1** Pipe Diameter (cm): **3.66**
 Dry Weight (gr): **1680** Temp (oC): **28**
 Wet Weight (gr): **1932** Insitu Dry Density (gr/cm3): **2.57**

Test Readings

Time (sec)	H1 (cm)	H2 (cm)	K (cm/sec)
10800	62	61.5	K = 1.1×10^{-6}
9000	61.5	61.1	K = 1.06×10^{-6}
9000	61.1	60.8	K = 8.01×10^{-7}

Test Results



Moisture Content: **15**
 Void Ratio: **0.61**
 Saturation %: **63.2**
 Dry Density (gr/cm3): **1.6**
 Relative Density %: **62.26**
 Permeability Coeff.: **9.87×10^{-7}**

Tested By:

Percolation Test

This page can be accessed from the [Soil Mechanics Lab.](#) menu and is used to enter hydraulic conductivity of soil to be shown on the borehole logs when:

- This represents a field test results such as percolation test
- This is a laboratory test results but details of data is not available to be used in Permeability Test page

In order to enter permeability of soil make sure the sample is defined as [Percolation type](#) on [borehole manager page](#). Select the sample from the [test toolbar](#) and enter the test results.

Field Permeability Test

Borehole: **BH-1** Sample: **10 m (S11)** | **0 / 0**

Soil Class: **SC (Clayey Sand With Gravel) | A-4 (A-4, Silty soils)** [Sample ID](#)

Test Results

This is a lab. test

K = X 10[^]

Tested By:

Only samples of type 'Percolation' will be shown here

Test results entered on this page will be shown on the [borehole log](#).

Unconfined Compression Test

This page is used for data entry of Unconfined Compression Test and to view / print the test results. This page can be accessed from the [Soil Mechanics Lab.](#) menu. After entering the sample information and moisture data, please enter data for force reading and axial displacement. Please note that data should be entered in the white cells. The red cells are automatically calculated by the program. You can also specify a picture of the sample

(typically taken after the test).

Soil Class: SP (Poorly Graded Sand With Gravel) | A-2-4 (Silty or clayey gravel and sand)

Sample Info:

Diameter (cm): 3.8 Height (cm): 8.2

Ring Factor: 0.045 Gauge Factor: 0.01

Gauge Step: 5 Moisture: Moist

Loading Rate (mm/min): 1 Tested By:

Moisture Content

Cont. Weight (gr): 6.5

Cont. & Dry Weight (gr): 159

Cont. & Wet Weight (gr): 195

Results

Qu (kg/cm2)	0.65
Cu (kg/cm2)	0.32
Moisture	23.61
Dry Density (gr/cm3)	1.64

Sample Photo

Axial Def. Readings	Force Readings	Axial Strain (%)	Shear Stress (kg/cm2)
0	0	0	0
6	12	0.07	0.048
15	33	0.18	0.131
23	55	0.28	0.218
30	75	0.37	0.296
37	94	0.45	0.371
44	110	0.54	0.434
53	124	0.65	0.489
63	133	0.77	0.524
73	143	0.89	0.562
81	152	0.99	0.597
91	160	1.11	0.628
99	166	1.21	0.651
107	166	1.3	0.65

Shift + Ins : insert a row

- Please enter zero for both force reading and axial displacement for the first reading.
- In order to delete a row of data, select the row and press Shift+Delete buttons. Please note deleted data cannot be recovered.
- In order to insert a new row in between existing rows, press Shift+Insert.

After data entry, click on calculate button from the [tests toolbar](#). Test results including unconfined shear strength (Qu) will be shown in the table on the bottom of the screen. You can print the unconfined compression test report by using the [tests toolbar](#).

Triaxial Compression Test

This page is used for data entry of Triaxial shear test and to view / print the results and can be accessed from the [Soil Mechanics Lab](#). menu. After selecting the test type and entering gauge settings you need to enter sample information for each step of the test. You should enter minimum 2 sample data; though most tests have 3 samples tested. Please follow this steps for data entry:

1. Enter general information required for Test Data section on left side of the page
2. Enter samples information
3. Enter vertical displacement and force reading for each sample

Actual force (kgf) for each sample= "load reading" x "Ring factor"

Actual vertical displacement (mm) is automatically calculated based on "Vertical gauge step" x "Vertical gauge factor"

Please note that data should be entered in the white cells. The red cells are automatically calculated by the program. Also start the test readings of each sample from zero.

Test Data

Test type : CU
 Moisture : Saturated
 Vertical gauge step: 20
 Vertical gauge factor: 0.01
 Specific Gravity (Gs): 2.7
 Tested by:

Readings

Sample	Sample #1	Sample #2	Sample #3
Conf. Stress (kg/cm ²)	0.5	1	1.5
Diameter (cm)	3.8	3.8	3.8
Height (cm)	8	8	8
Ring Factor	1	1	1
Wet Weight Before (gr)	165	177.2	177.2
Wet Weight After (gr)	163	165	165
Dry Weight (gr)	150	155	155
B (%)	100	100	100
Dry Density (gr/cm ³)	1.65	1.71	1.71
Moisture Before	10	14.32	14.32
Moisture After	8.67	6.45	6.45

Vertical Reading	Pore Pressure	Load	Pore Pressure	Load	Pore Pressure	Load
0	0	7.76	0	3.21	0	4.5
20	0	8.85	0	8.88	0	12.45
40	0	9.47	0	11.9	0	16.69
60	0	9.78	0	13.55	0	18.98
80	0	10.15	0	14.5	0	20.31
100	0	10.45	0	14.99	0	21.02
120	0	10.6	0	15.6	0	21.85
140	0	10.77	0	16.01	0	22.44
160	0	10.9	0	16.3	0	22.86

C (kg/cm²) 0
 Phi (deg) 49.8
 C' (kg/cm²) 5.08
 Phi' (deg) 49.8

Edit reading of sample:
 Multiply by: 1
 Mirror
 Delete Readings

You can adjust the readings of a sample by selecting it from the list below the table, choosing the multiplier and clicking on [Multiply by](#) hyperlink. This will adjust all force readings of the sample accordingly, hence, adjusting friction angle and cohesion. You can also delete the entire data of a sample by selecting it from the same list and clicking on [Delete Readings](#) hyperlink. Please note deleted data cannot be recovered.

After data entry, click on calculate button from the [tests toolbar](#). Test results including ϕ and cohesion for effective and total stress condition (depending of type of Triaxial test) will be shown in the table on the left-bottom corner of the screen. You can print the compaction test report by using the [tests toolbar](#).

Consolidation Test

This page is used for data entry of 1-D consolidation test and to view / print the results. This page can be accessed from the [Soil Mechanics Lab](#). menu. After entering the sample information please enter vertical displacement gauge readings for each step of the loading. You can enter as many loads as you want but please follow this steps for data entry:

1. Enter sample information
2. Enter loads (normal stresses) in the left table
3. After all loads are entered, click on each load and enter vertical displacement reading in the right table
4. Please note that the first reading (representing zero pressure) should be entered in the first reading for the first pressure (see 0 gauge reading for 0.25 kg/cm² pressure, in the screenshot below)

Please note that data should be entered in the white cells. The red cells are automatically calculated by the program.

Soil Class: SP (Poorly Graded Sand With Gravel) | A-2-4 (Silty or clayey gravel and sand)

Sample Info.

Diameter (cm): 6.15
 Height (cm): 2
 Gs : 2.7
 Ver. gauge factor: 0.01
 Tested By:
 Test Type: Consolidation
 Drainage: One way
 Dry weight (gr): 87.72
 Wet weight before (gr): 109.12
 Wet weight after (gr): 109.13

Stress (kg/cm2)	Calibration Reading	Time (min)	Reading	Settlement (mm)
0.25		0	0	0
0.5		0.1	0.4	0.004
1		0.25	0.7	0.007
2		0.5	0.95	0.01
4		1	1.15	0.012
8		2	1.35	0.014
16		4	1.5	0.015
8		8	1.65	0.016
4		15	1.75	0.018
2		30	1.82	0.018
1		60	1.9	0.019
0.5		120	1.95	0.02
0.25		240	1.98	0.02
		480	2	0.02
		1440	2	0.02

Cc 0.162
 Cs 0.014
 Pc (kg/cm2) 1.316
 Dry Density 1.48
 Void Ratio 0.829
 Saturation(%) 79.5

In order to delete a reading, simply press Delete button. Please note deleted data cannot be recovered. The time intervals for recording the vertical gauge readings can be set in [Tests Default Settings](#) page.

After data entry, click on calculate button from the [tests toolbar](#). Test results including Cc, Cs, Pc, dry density, void ratio (e) and degree of saturation of this sample will be shown in the table on the right-bottom corner of the screen. You can print the compaction test report by using the [tests toolbar](#).

Direct Shear Test

This page is used for data entry of direct shear test and to view / print the results and can be accessed from the [Soil Mechanics Lab.](#) menu. After selecting the test method, shear box type, gauge factors, etc. you need to enter sample information for each step of the test. You should enter minimum 2 sample data; though most tests have 3 samples tested. Please follow this steps for data entry:

1. Enter general information required for Test Data section on left side of the page
2. Enter samples information
3. Enter vertical displacement and force reading for each sample

Actual force (kgf) for each sample= "force reading" x "Ring factor"

Actual vertical displacement (mm) = "vertical displacement" x "Vertical gauge factor"

Actual horizontal displacement (mm) is automatically calculated based on "Horizontal gauge step" x "Horizontal gauge factor"

Please note that data should be entered in the white cells. The red cells are automatically calculated by the program. Also start the test readings of each sample from zero.

Direct Shear Test

Borehole: **BH14-1** Sample: **1.5 m (100)** 1 / 3

Soil Class: **SP (Poorly Graded Sand With Gravel) | A-2-4 (Silty or clayey gravel and sand)** Sample ID

Test Data

Moisture: **Saturated**
 Test Method: **Slow**
 Specific Gravity (Gs): **2.65**
 Horizontal Gauge Factor: **0.01**
 Horizontal Gauge Step: **1.05**
 Vertical Gauge Factor: **0.01**
 Tested By:

Type of Shear Box: **Square**
 B (cm): **30**
 H (cm): **15**

Sample is remoulded
 Calculate effective area

Test Results
 C = **0.1 (kg/cm²)** $\phi =$ **35.2 deg.**

Sample	Sample #1	Sample #2	Sample #3
Normal Stress (kg/cm ²)	3	3.5	4
Wet Weight Before (gr)	26230	26312	26312
Wet Weight After (gr)	26240	26260	26250
Dry Weight (gr)	25300	25300	25300
Ring Factor	12.18	12.18	12.18
Moisture Before	3.68	4	4
Dry Density (gr/cm ³)	1.87	1.87	1.87
Void Ratio	0.41	0.41	0.41

Hor. Disp.	Ver. Disp.	Force Reading	Ver. Disp.	Force Reading	Ver. Disp.	Force Reading
0		0		0		0
1.05		26.3		58.12		55.79
2.1		46.69		85.73		85.09
3.15		66.06		98.5		104.51
4.2		84.87		110.51		117.27
5.25		95.9		123.28		128.13
6.3		113.31		132.47		143.29
7.35		121.21		139.57		152.25
8.4		135.17		145.93		162.2
9.45		143.35		153.05		172.61

Readings of sample #: Multiply by:

NovoLAB supports any type and size of shear box, just select the type and enter width (B) and height (H) of the box.

By selecting "Calculate effective area" checkbox, the effective contact area between the top and bottom half of the box is calculated, and normal and shear stress will be corrected accordingly.

You can also adjust the readings of a sample by selecting it from the list below the table, choosing the multiplier and clicking on [Multiply by](#) hyperlink. This will adjust all force readings of the sample accordingly, hence, adjusting friction angle and cohesion.

You can also delete the entire data of a sample by selecting it from the same list and clicking on [Delete](#) hyperlink. Please note deleted data cannot be recovered.

After data entry, click on calculate button from the [tests toolbar](#). Test results including ϕ and cohesion will be shown in the table on the left-bottom corner of the screen. You can print the compaction test report by using the [tests toolbar](#).

Compaction Test

This page is used for data entry of compaction test and to view / print the results. This page can be accessed from the [Soil Mechanics Lab](#). menu. After entering the test type, mold volume and specific gravity, please enter data for each test. This page accepts up to 5 tests while minimum 3 tests are required to obtain the test results. Please note that data should be entered in the white cells. The red cells are automatically calculated by the program. The following types of compaction tests are covered in NovoLAB:

- AASHTO T-99 (ST.)
- AASHTO T-180 (MOD.)
- ASTM D-1557 (MOD.)
- ASTM D-698 (ST.)

Compaction Test

Borehole: **BH-1** Sample: **1 m (S1)** 1 / 1

Soil Class: SM (Silty Sand With Gravel) | A-7-5 (Clayey soils) Sample ID

Test Type: **AASHTO T-99 (ST.)**

Mold Volume (cm³): **944**

Specific Gravity: **2.67**


Tested By: **Andrew Milani**

Test Details

Test	#1	#2	#3	#4	#5					
Mold + Wet Soil W (gr)	5726	5836	5902	5956	5892					
Mold W (gr)	4050	4050	4050	4050	4050					
Wet Soil (gr)	1676	1786	1852	1906	1842					
Wet Density (gr/cm ³)	1.78	1.89	1.96	2.02	1.95					
Cont. + Wet Soil W (gr)	74.76	74.76	71.32	71.32	70.28	70.28	69.42	69.42	94.26	94.26
Cont. + Dry Soil W (gr)	71.93	71.93	68.55	68.55	67.24	67.24	64.99	64.99	87.95	87.95
Cont. W (gr)	45.85	45.85	46.23	46.23	44.8	44.8	35.3	35.3	48.54	48.54
Water W (gr)	2.83	2.83	2.77	2.77	3.04	3.04	4.43	4.43	6.31	6.31
Soil Dry W (gr)	26.08	26.08	22.32	22.32	22.44	22.44	29.69	29.69	39.41	39.41
Moisture Content (%)	10.9	10.9	12.4	12.4	13.5	13.5	14.9	14.9	16	16
Average Moisture (%)	10.9	12.4	13.5	14.9	16					
Dry Density (gr/cm ³)	1.61	1.68	1.73	1.76	1.68					

Delete Test Data:

# Layers	3
Drop Height (cm)	30.48
Hammer Weight (gr)	2.5
Blows/Layer	25
Max. Dry Density (gr/cm ³)	1.76
Optimum Moisture	14.7

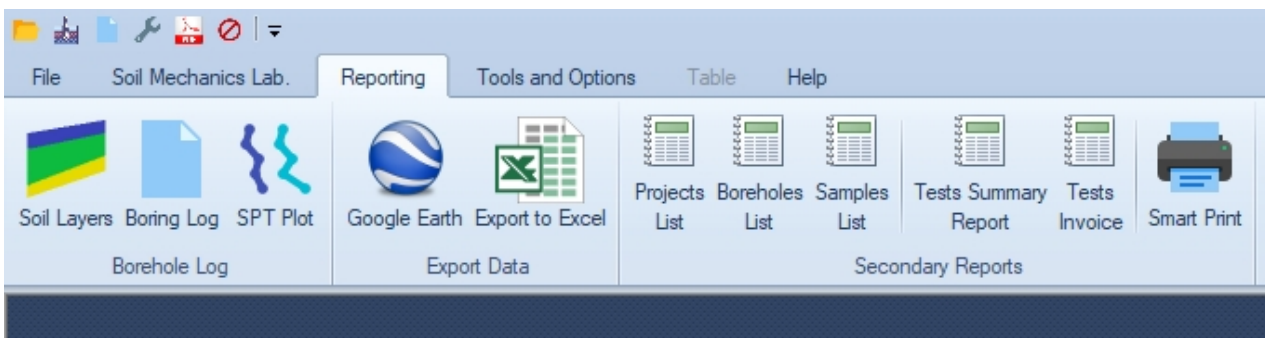


In order to delete one of the tests, select the test number from the list below the main table and click on **X** button. Please note deleted data cannot be recovered.

After data entry, click on calculate button from the [tests toolbar](#). Test results including optimum moisture content and maximum dry density of soil will be shown in the table on the right-bottom corner of the screen. You can print the compaction test report by using the [tests toolbar](#).

Reporting

NovoLAB offers a variety of reports. These can be accessed from "Reporting" tab of the [main toolbar](#), as shown below:



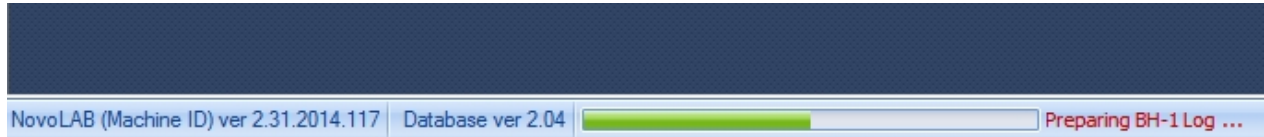
File Soil Mechanics Lab. **Reporting** Tools and Options Table Help

Soil Layers Boring Log SPT Plot Google Earth Export to Excel Projects List Boreholes List Samples List Tests Summary Report Tests Invoice Smart Print

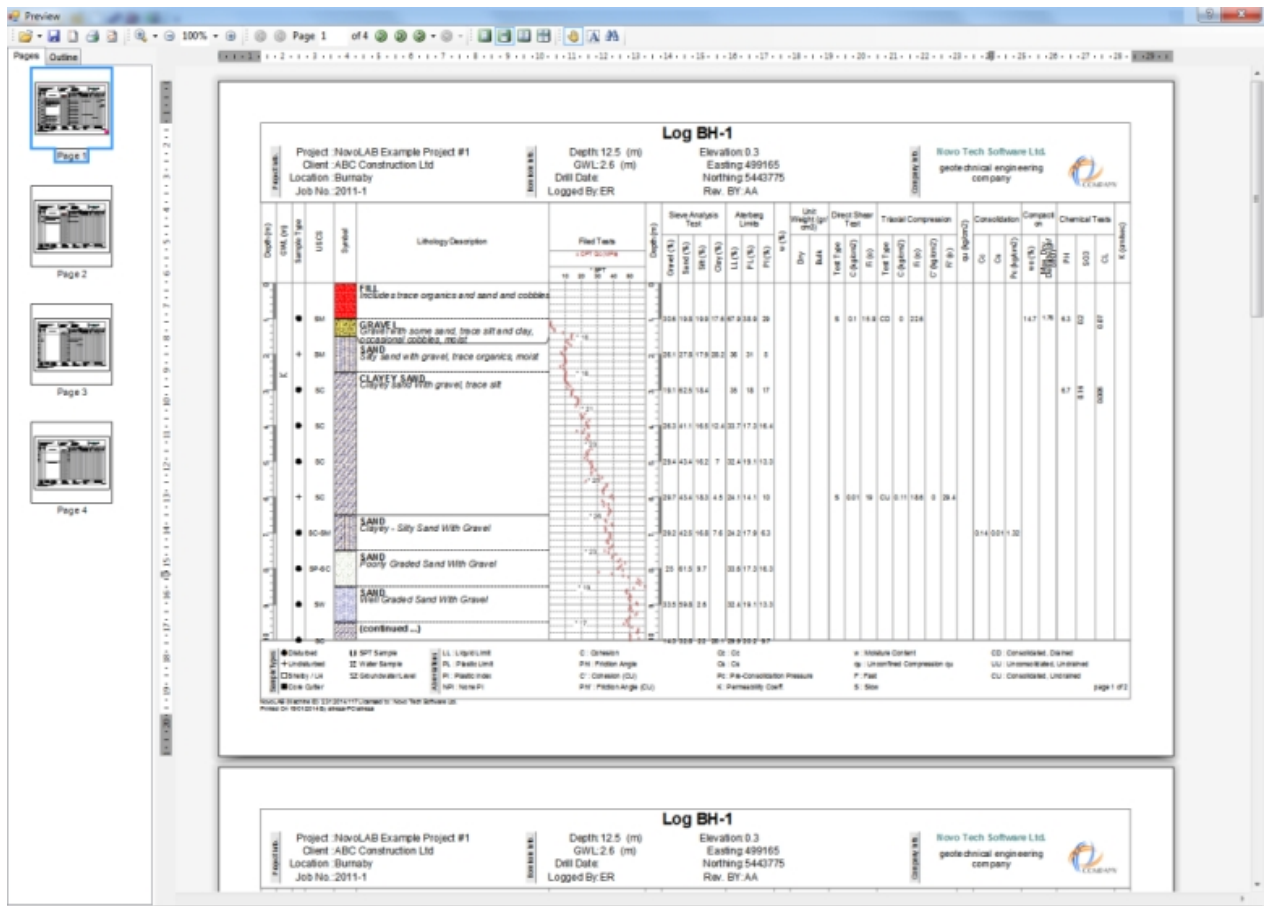
Borehole Log Export Data Secondary Reports

Boring Log

Boring log is the main part of a geotechnical report. In order to prepare the boring log choose Reporting tab of the main toolbar, and click on Boring Log button. This makes some time depending on number of boreholes and tests in current project. In the meanwhile you will notice the progress report on the bottom of your screen:



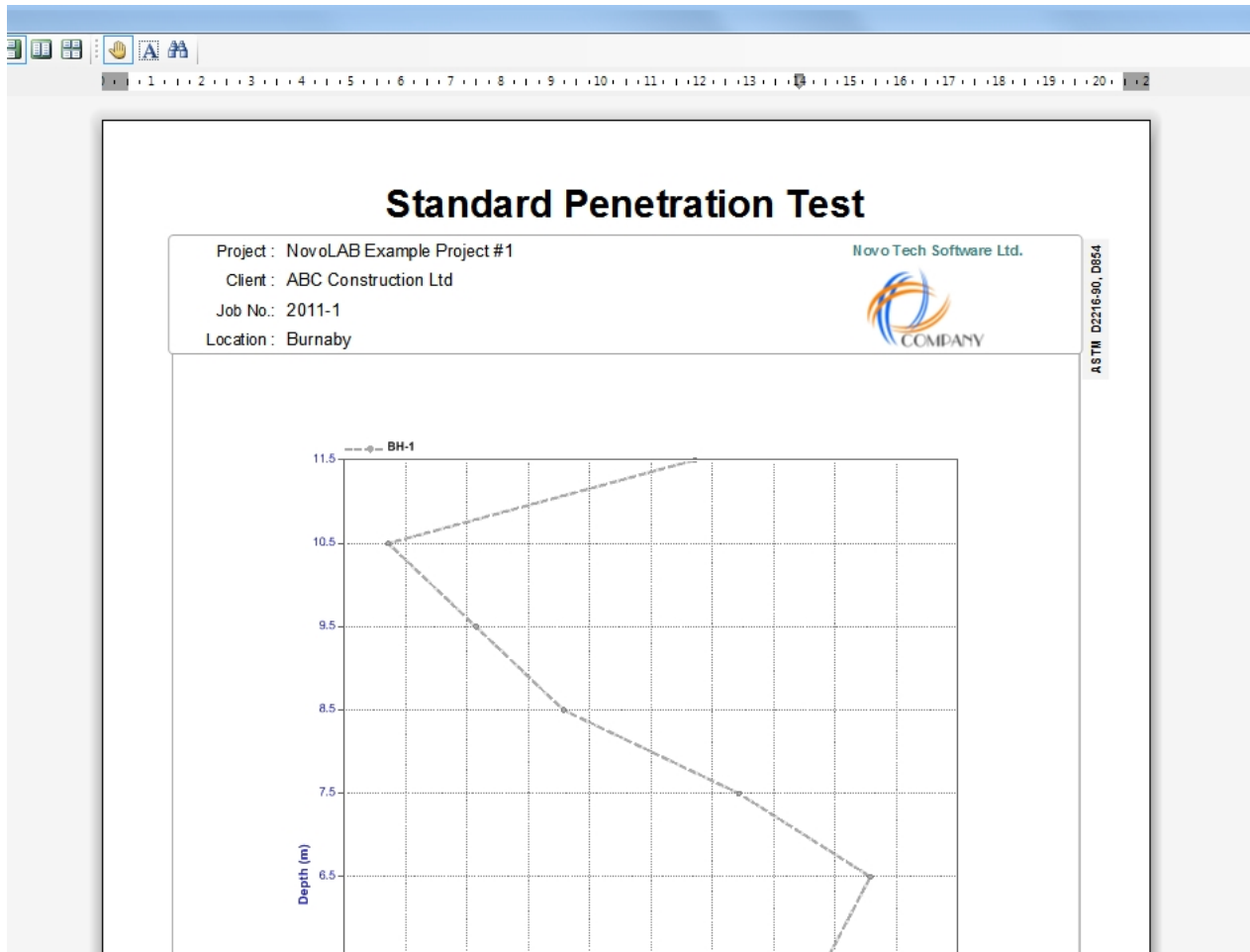
Prior to preparing the boring log make sure you have defined the subsurface soil layers for each borehole / test pit using the [Soil Layering](#) page. The following is a sample screenshot of boring log:



You can specify the columns presented on the boring log using the [log designer](#) feature.

SPT Plot

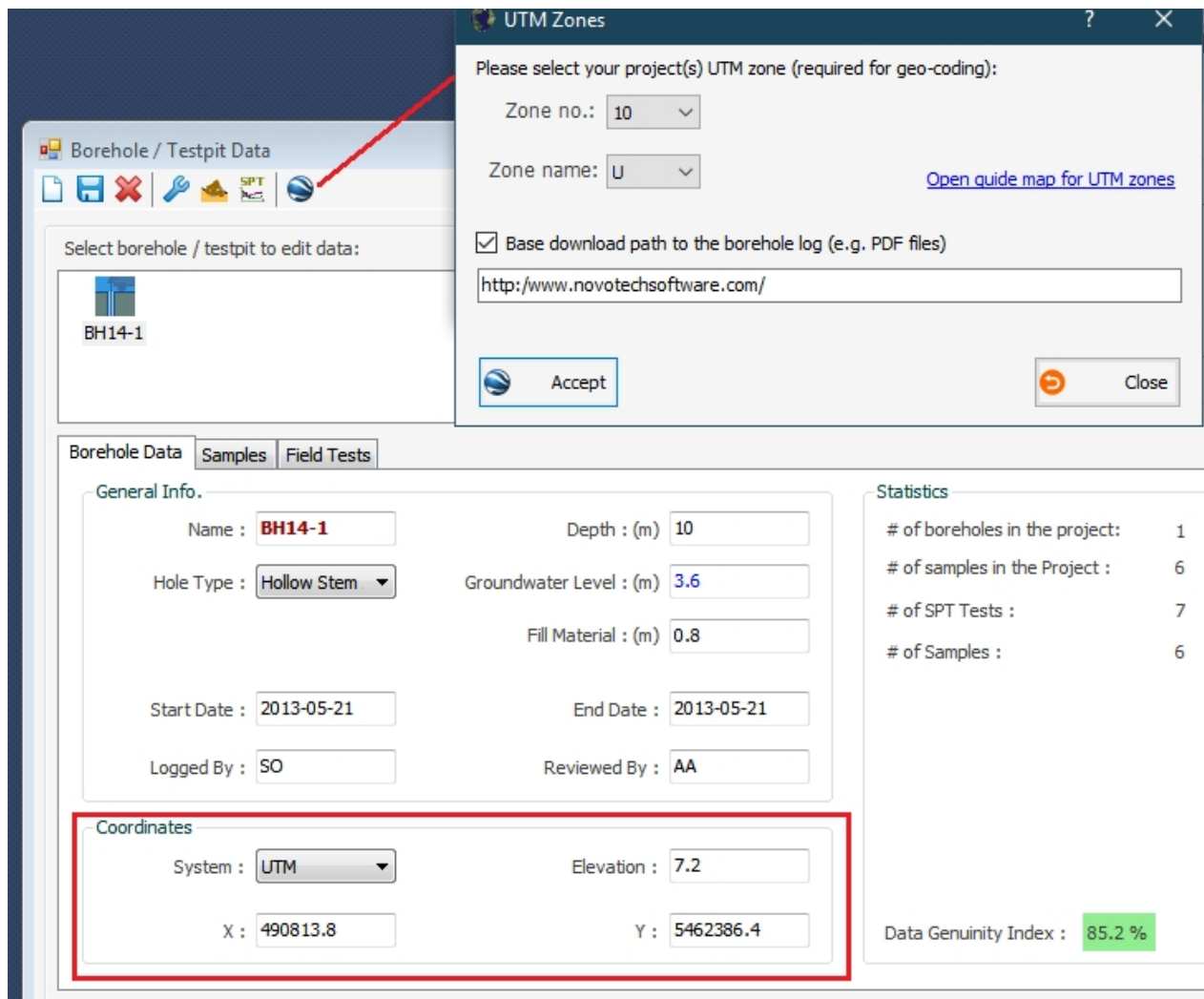
To prepare a report consisting a plot of SPT blow counts versus depth for all boreholes of the current project, from the [main toolbar](#), click on "SPT Plot" button from the "Reporting" tab. This will show the following report:



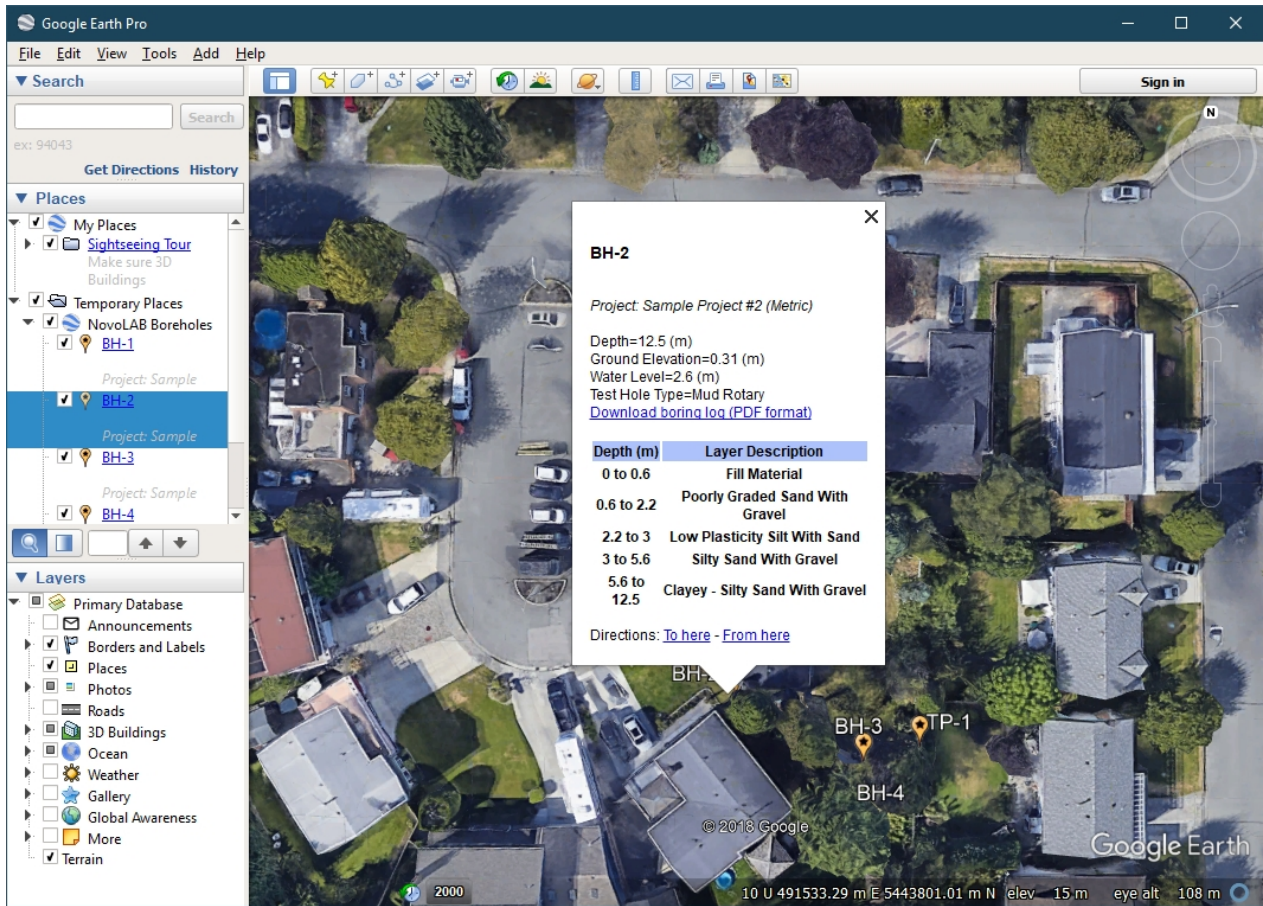
Google Earth Model

This feature is designed to locate the boreholes on Google Earth 3D map. If you don't have Google Earth installed on your computer you can install it from [this page](#).

In order to access this feature, choose Reporting tab of the [main toolbar](#) and click on Google Earth button. Alternatively you can open [Boreholes Manager](#) page and click on the Google Earth icon (see below). To use this feature, you need the UTM coordinates of the boreholes.

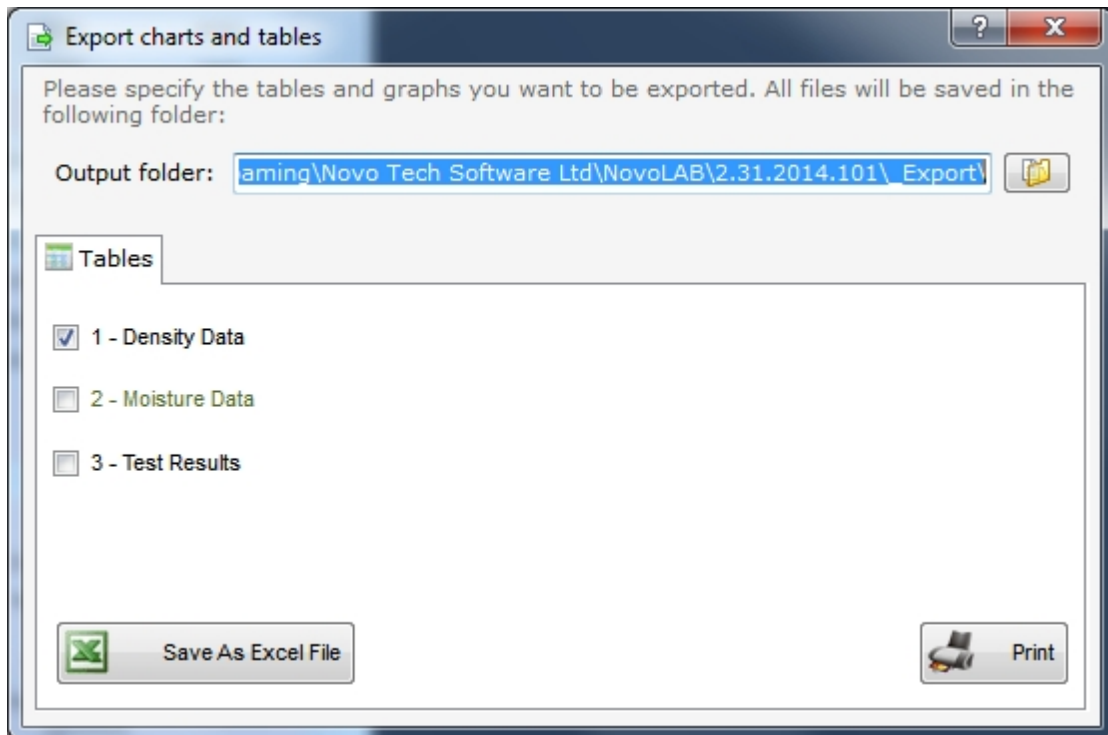


You can also enter the download link for the borehole logs. In this case, the download link will be added to the borehole information in the Google Earth file (see below). After clicking on Google Earth button, you need to specify the zone name and number of the project site ([see more](#)). Then Google Earth will open and show the boreholes on 3D map.



Export to MS Excel

All tables in NovoLAB can be exported to Excel. In order to export a table, click on "Export to Excel" on the Reporting tab of the [main toolbar](#). Another page pops up:



Now select the output folder and choose tables to export, then click on "Save as Excel File"

button.

Projects List

To prepare a report listing all the projects saved in the database select "Projects List" button from the "Reporting" tab on the [main toolbar](#). This will show the following report:

Job No.	Project	Client	Location	Engineer	# of Boreholes
2011-1	NovoLAB Example Project #1	ABC Construction Ltd	Burnaby	John Smith	2
80.10.12	NovoLAB Example Project #2	XYZ Consulting Inc.	Vancouver	Alex Amengour	3

Boreholes List

To prepare a report listing the current project boreholes from the [main toolbar](#), click on "Boreholes List" button from the "Reporting" tab. This will show the following report:

Project: NovoLAB Example Project #1
 Client: ABC Construction Ltd
 Job No.: 2011-1
 Location: Burnaby


Coordinates	# SPTs	# Samples	GWL (m)	Fill Material (m)	Depth (m)	Type	Title
X=499185 Y=5443775 Z=0.3	11	11	2.8	0.6	12.5	Mud Rotary	BH-1
X=499181 Y=5443724 Z=0.2	0	7	3.5	0.6	13.5	Mud Rotary	BH-2

Samples List

To prepare a report listing the current project's samples click on "Samples List" button from the "Reporting" tab on the [main toolbar](#). This will show the following report:

PROJECT SAMPLES LIST

Project : NovoLAB Example Project #1
 Client : ABC Construction Ltd
 Job No.: 2011-1
 Location : Bumaby

Novo Tech Software Ltd.

 COMPANY

BH-1

Description	USCS	Type	Depth (m)
	SM	Disturbed	1
	SM	Undisturbed	2
	SC	Disturbed	3
	SC	Disturbed	4
	SC	Disturbed	5
	SC	Undisturbed	8
	SC-SM	Disturbed	7
	SP-SC	Disturbed	8
	SW	Disturbed	9
	SC	Disturbed	10
	ML	Disturbed	12

BH-2

Description	USCS	Type	Depth (m)
	SP	Disturbed	1.5
organic silt	ML	Disturbed	2.5
		Disturbed	3.7

Tests Summary

This report provides a summary of all laboratory tests in the current project. To access this report choose "Reporting" tab from the [main toolbar](#), and click on "Tests Summary Report". The following shows a similar report:

Summary of Lab. Tests


Project : NovoLAB Example Project #2

Client : XYZ Consulting Inc

Job No.: 90.10.12

Location : Vancouver

NovoTech Software Ltd.



COMPANY

Sieve Analysis Test

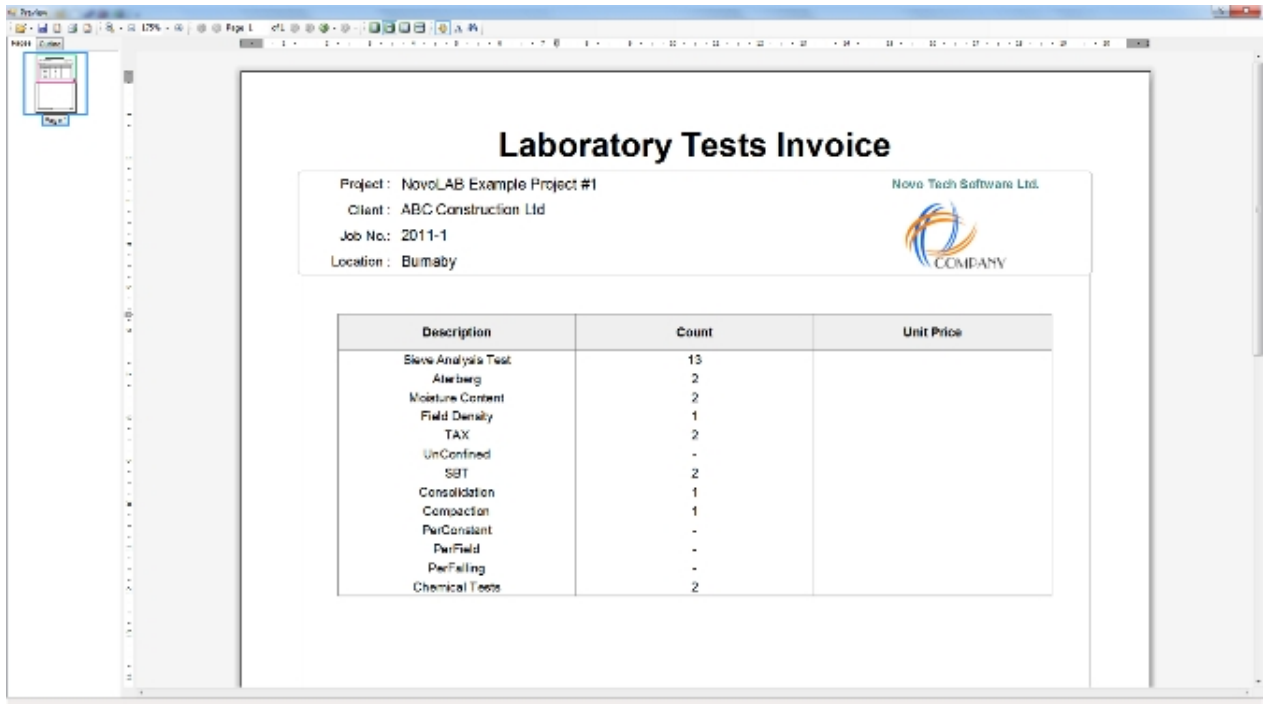
Borehole	Sample Depth (m)	Soil Class	D10	D30	D60	Clay (%)	Silt (%)	Sand (%)	Gravel (%)	Cobble (%)	LL	PL
BH01	1.5	SC (A-2-6)		0.351	3.749	9.2	13.4	41.1	36.3		33.6	17.3
BH01	3	SC (A-2-6)		0.39	3.595	6	15.2	43.4	35.4		32.4	19.1
BH01	4.5	SW-SC (A-2-4)	0.31	2.887	13.05	1.1	4.9	31.2	62.8		23.1	14.8
BH01	6	SW-SC (A-2-4)	0.339	3.282	12.824	2.5	4.4	28.1	65		24.1	14.1
BH01	7.5	SC (A-2-4)		0.662	5.879	4.6	11.5	40.5	31.1	12.3	25	16.3
BH02	2	SC (A-2-4)		1.077	12.084		6.5	27.3	66.2		24.2	17.9
BH02	4	SW (A-2-4)	0.445	2.43	12.85		4.6	34.6	60.8		24	15.1
BH02	6	SC (A-2-4)		0.41	4.068		19.7	42.5	37.8		25.2	15.8
BH02	8	SW (A-2-4)	0.559	4.775	19.524		4	25.9	70.1		22.3	14.3
BH02	10	SC-SM (A-2-4)		0.311	3.329		22.2	43	34.7	0.1	23.4	17.5
TP01	2	SC (A-2-6)		0.351	3.749	9.2	13.4	41.1	36.3		33.6	17.3
TP01	4	SW (A-2-6)	0.445	2.43	12.85		4.6	34.6	60.8		32.4	19.1
TP01	6	SC (A-2-4)		0.41	4.068		19.7	42.5	37.8		25.2	15.8
TP01	8	SW (A-2-4)	0.559	4.775	19.524		4	25.9	70.1		22.3	14.3
TP01	10	SC-SM (A-2-4)		0.311	3.329		22.2	43	34.7		23.4	17.5

ATTERBERG LIMITS TEST

Borehole	Sample Depth (m)	Soil Class	Liquid Limit (LL)	Plastic Limit (PL)
BH01	1.5	SC (A-2-6)	33.6	17.3
BH01	3	SC (A-2-6)	32.4	19.1

Tests Invoice

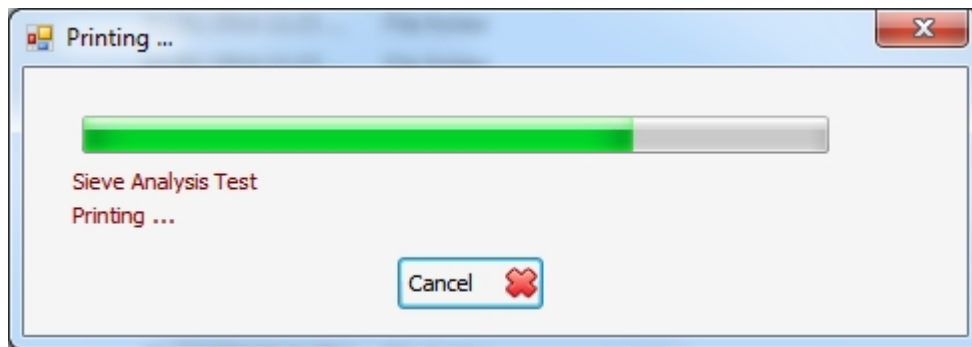
To prepare a simple report showing the number of each laboratory test conducted for the current project click on "Tests Invoice" button from the "Reporting" tab on the [main toolbar](#). This will show the following report:



Smart Print

This feature allows you to print all laboratory tests and boring logs in just one click. To access this page click on "Reporting" tab from the [main toolbar](#) and click on Smart Print button.

NovoLAB opens each test page and prepares the reports, so please be patient while program is working as depending on size of the project this may take some time.

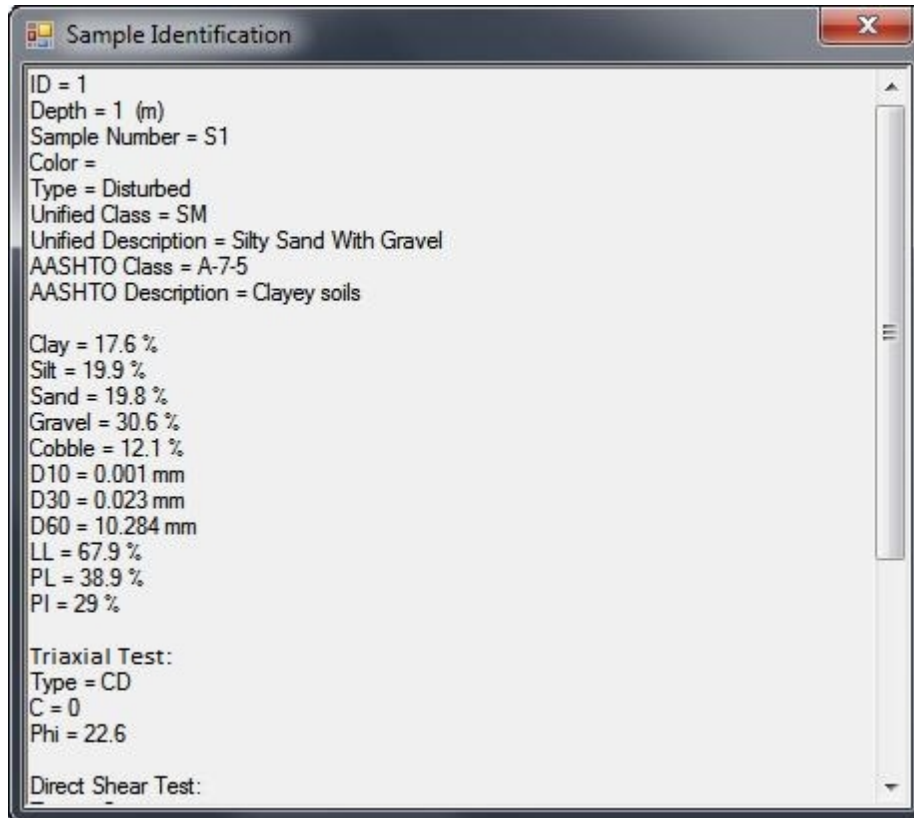


Sample Identification

The Sample ID link located on the right end of the [test toolbar](#) on laboratory test pages of NovoLAB and provides more information about the results of tests done on this sample:



The summary includes sieve test analysis, Atterberg limits, moisture content, compaction and all other mechanical properties of this sample:

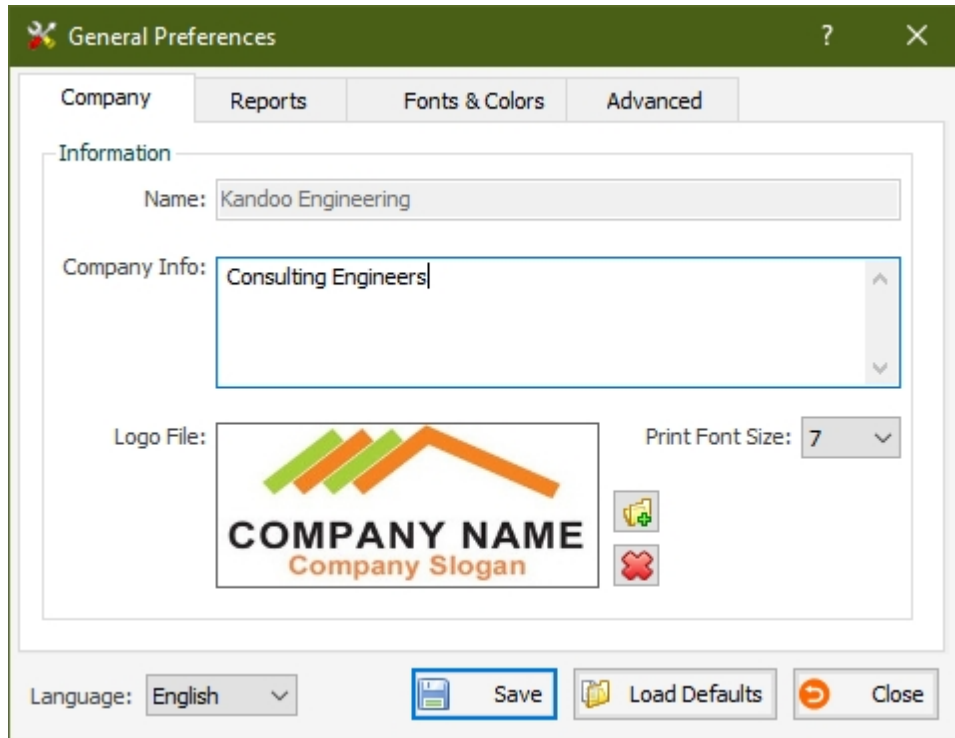


Preferences

This page can be reached from "Tools & Options" tab on the [main toolbar](#) and is designed to set the general preferences such as your company information, fonts, etc. and is described below:

Company tab

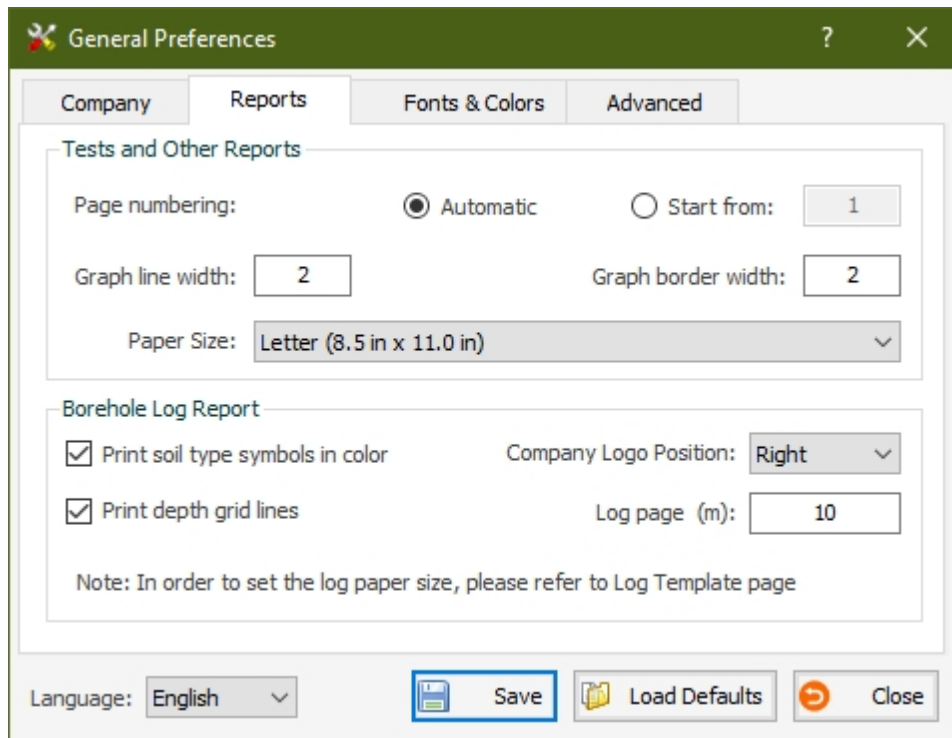
This tab is used to enter your company information including a brief text and company logo. You can also specify the size of your company name printed on the reports. Please note that company name is fixed in the [license file](#) you received during activation of NovoLAB. If you want to change company name, [contact us](#).



Reports tab

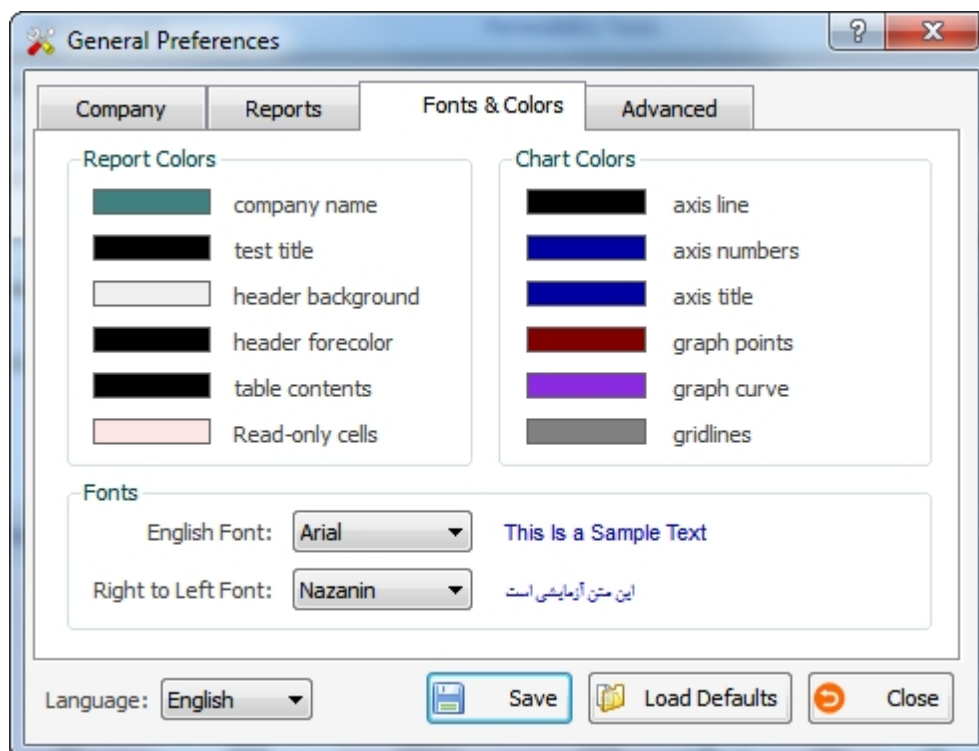
This tab is used for report settings as described below:

- Page numbering: if 'Automatic' is selected, page number in a report starts from 1. If you want to start page numbers from a different number, select 'Start From' option.
- Graph curve width: is used to set the line width of the plots shown on the reports. Choose between a range of 1 to 4.
- Paper size: choose between A4 (210 mm x 297 mm) or Letter size (8.5" x 11").
- Soil type symbols in color: if selected, soil type shading column in boring log will be shown in color, otherwise it will be black and white.
- Print depth grid lines: if selected, a horizontal grid line will be printed on the log for each 2 m of depth.
- Log page interval: this specifies the page length of boring logs.



Fonts and Colors tab

This tab is mainly used to select fonts and colors used in the reports and on data entry pages.



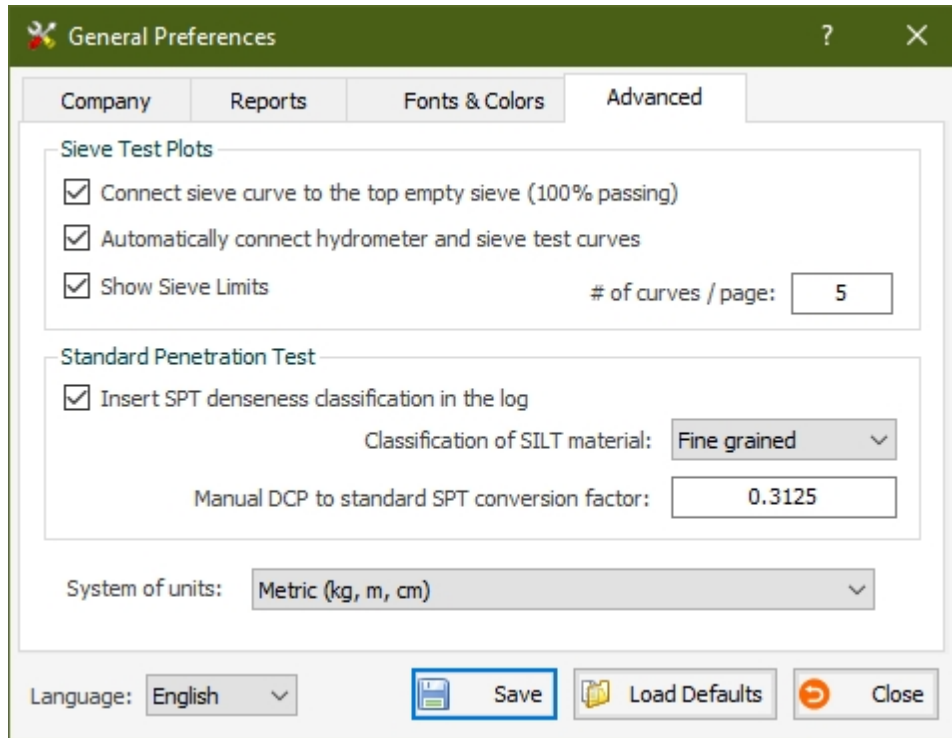
Advanced tab

This tab is used for sieve analysis and SPT settings as described below:

- Connect sieve curve: if selected, the first empty sieve above the first used sieve (with

a non-zero retained weight) will be assigned to 100% passing when plotting the sieve curve

- Automatically connecting hydrometer and sieve: these two curves usually do not match on the sieve analysis graph at the particle size of 0.075 mm (#200). If this option is selected, NovoLAB automatically adjusts the hydrometer to percent passing at sieve #200.
- Show filter zones: you can define upper bound and lower bound for filter. This will be printed on sieve analysis report for comparison of material particle size distribution to the sieve requirements ([read more](#)).
- # of curves / page: up to 5 sieve tests can be plotted on the same plot. NovoLAB will automatically group the tests based on the desired number.



Lab. Tests Default Settings

This page can be reached from "Tools & Options" tab on the [main toolbar](#) and it is designed to specify the default input data for laboratory tests. Setting default values will facilitate data entry. For example, parameters such as gauge factors and ring factors rarely change in a laboratory unless the equipment are replaced. We recommend you set these default values first thing after you install NovoLAB. This way you don't need to enter these parameters each time you input data for tests.

Default Lab. Test Settings
?
×

Please enter the default settings for soil tests. These values will be used when loading test forms:

Triaxial, Direct Shear, Unconfined
Permeability, Field Density, Consolidation, Compaction
Sieve Analysis, Hydrometer
Test Methods

Direct Shear Test

Horizontal Gauge Step:

Horizontal Gauge Factor:

Vertical Gauge Factor:

Ring Factor:

Size (cm):

Height (cm):

Calculate Effective Area

Unconfined Test

Loading Rate (mm/min):

Vertical Gauge Factor:

Vertical Gauge Step:

Ring Factor:

Triaxial Test

Vertical Gauge Step:

Vertical Gauge Factor:

Ring Factor:

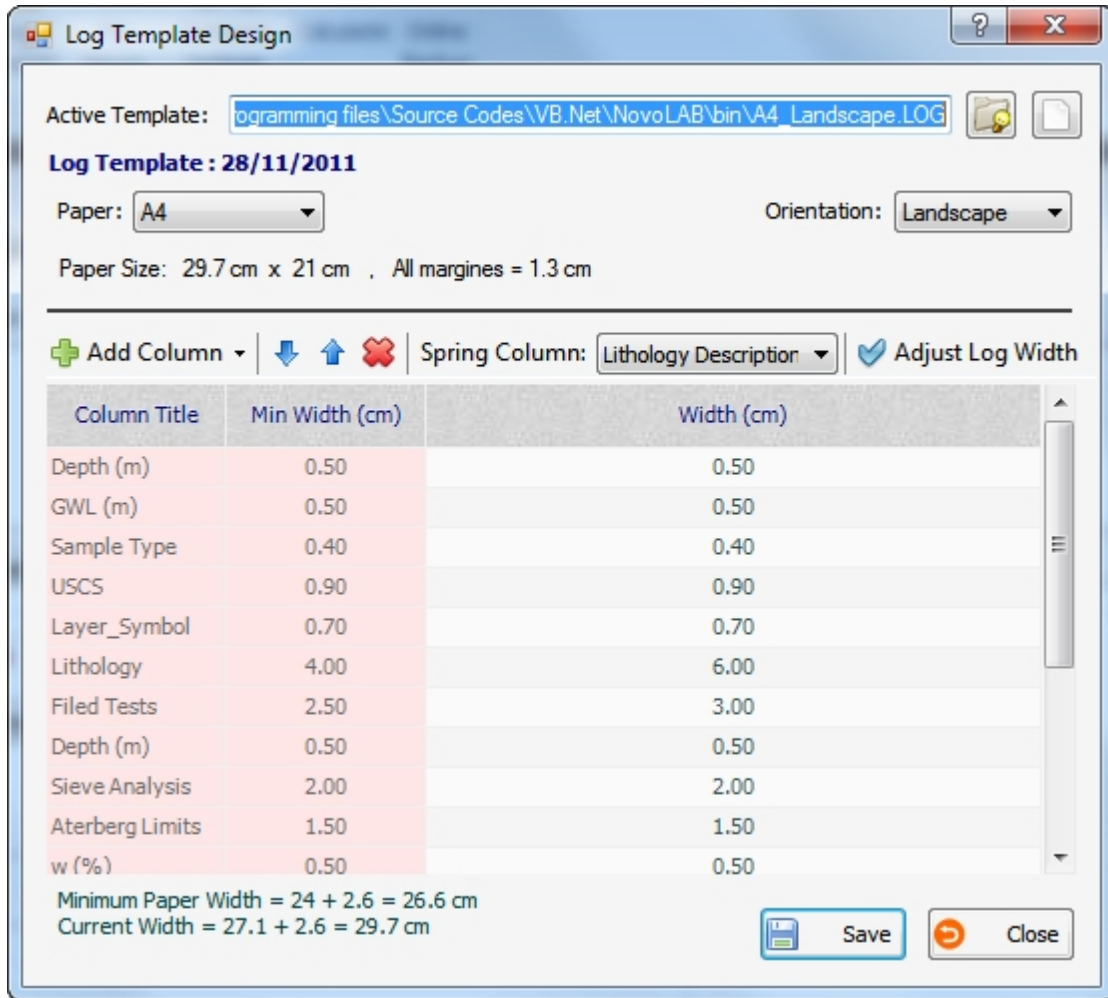
Gauge factors are in 0.01mm

Ring factors are in kgf/div

[Load Default Settings](#)

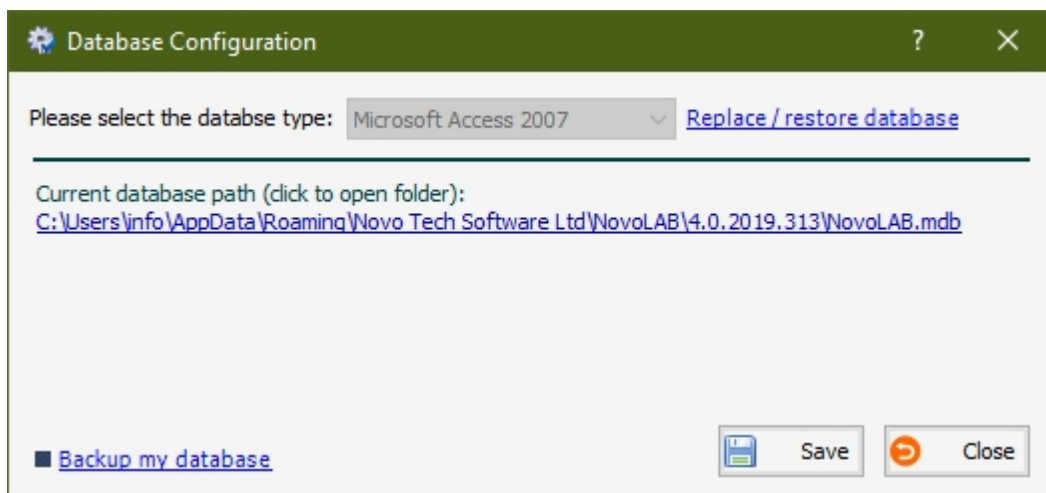
Log Template Designer

This page is used for designing the boring log template and can be accessed from the Tools & Options tab on the [main toolbar](#). To add a column to the log template click on the green + icon and select the column to add. You can specify the column order and remove a column from the log template. We recommend specifying one column as 'Spring column' so the program can adjust the width of this column to fit the paper size.



Database Settings

It is necessary to regularly backup the database and be prepared in case of hard disk failure or infection by a computer virus. By having a backup of your database you will be able to use the database by reinstalling NovoLAB. For this purpose click on "Database Configuration" from the "Tools and Options" menu on the [main toolbar](#). The following page will appear:



NovoLAB comes with Microsoft Access database, so please do not change the database type without consulting Novo Tech technical team.

Preparing a Backup

Click on the link [Backup my database](#) in the bottom left of your screen. Save the back up file in location of you choice. All your project data is stored in this database file. We recommend you save the backup file on a CD or flash drive, it is recommended to save the backup file in a folder with a name that indicates the backup date.

The second method is to click on the path shown below the "Current database path" (see the above screenshot). This will open the folder; now you can easily copy the database file to your desired location.

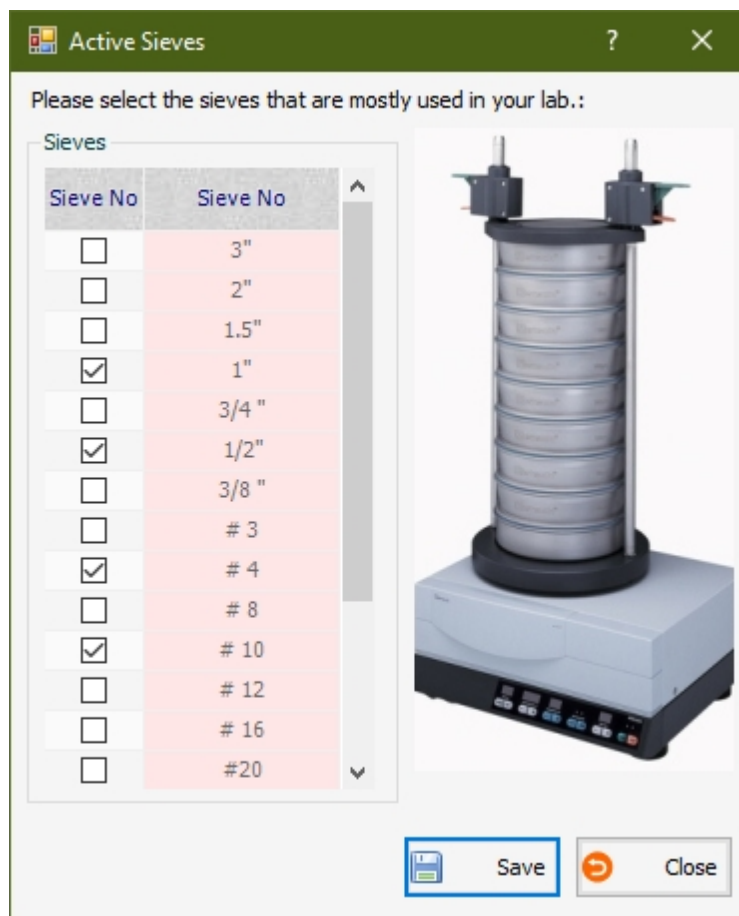
Database Restore

If you want to restore your data, click on the link Replace / restore database in the upper right of your screen and locate where the backup file of your database is saved. NovoLAB will replace the existing database with your backup. Please note that the actual database file extension is .mdb and the extension of the database backup file is _mdb.

Active Sieves

This page is used to specify the sieves you use in your laboratory. To access this page click on "My Sieves" buttons from the "Tools and Options" menu on the [main toolbar](#).

Although NovoLAB database includes a complete list of all standard sieves, if you don't use all these sieves in your laboratory you can deselect them from this list. The advantage is that on sieve analysis page, you can select to show the "active sieves" only; this will ease data entry.



Windows Calculator

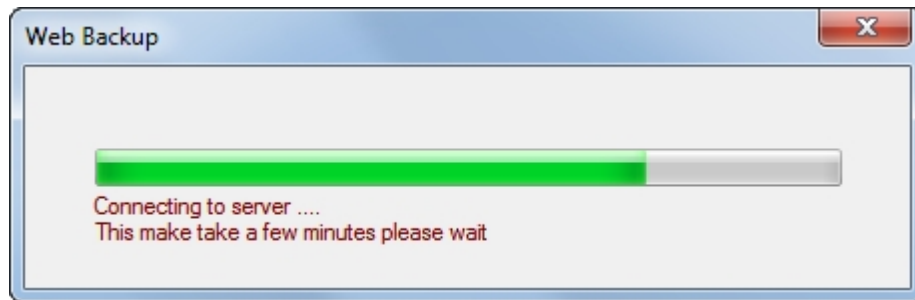
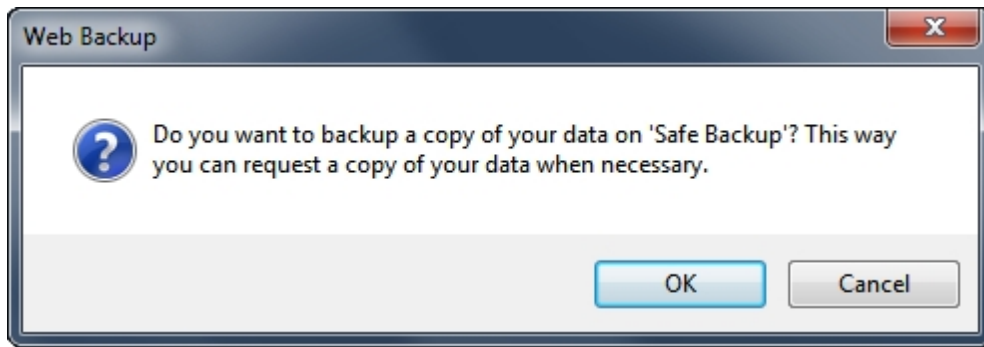
In order to open Windows calculator click on Settings and Tools menu from the main toolbar,

and click on Calculator button.

Online Backup

Users can backup a copy of their data on Novo Tech web server. In case you loose your data you can ask us for a copy of the file; you can then [restore](#) your database.

Disclaimer: You are not charged by Novo Tech for the Online Backup feature. We do not guarantee your data file will be available upon request (in case of server failure, etc.), however, we consider this as an additional factor of safety that helps our users to restore their data if they choose to leave a copy of their database on our server. This feature is currently free, and optional.



Novo Tech Software Website

Visit our website at <http://www.novotechsoftware.com>

Contact Us

Send a support request at <http://www.novotechsoftware.com/contact-us/>