Dartis Soil Lab

User Manual Help
2022

Table of content

Overview

This software is designed for processing multiple common Geotechnical tests and reporting.

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.

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Program's web page | Bug report / Feature request

Test	ASTM Standard
Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass	D-2216
Specific Gravity of Soil Solids by Water Pycnometer	D-854 , C-157
Particle-size Analysis of Soils	D-422
Liquid Limit, Plastic Limit	D-4318
Proctor (Standard , Modified)	D-698 , D-1557, D-4718
Classification of Soils and Soil-aggregate Mixtures for Highway Construction Purposes (AASHTO)	D-3282
Classification of Soils andSoil-aggregate Mixtures for Engineering Purposes (Unified Soil Classification System)	D-2487
Direct Shear Test of Soil under Consolidated Drained Condition	D-3080
Standard Test Method for Permeability of Granular Soils(Constant Head)	D-2434
Standard Test Method for Unconfined Compression Strength for Cohesive Soil	D-2166
Standard Test Method for One-dimensional Consolidation Properties of Soils Using Incremental Loading	D-2435

1. Licensing

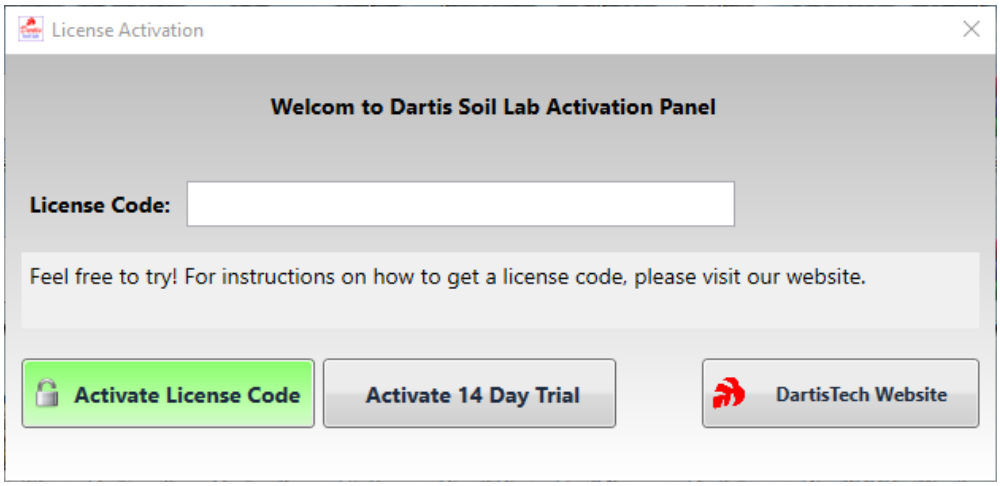
1.1. License Agreement

Visit our online End User License Agreement

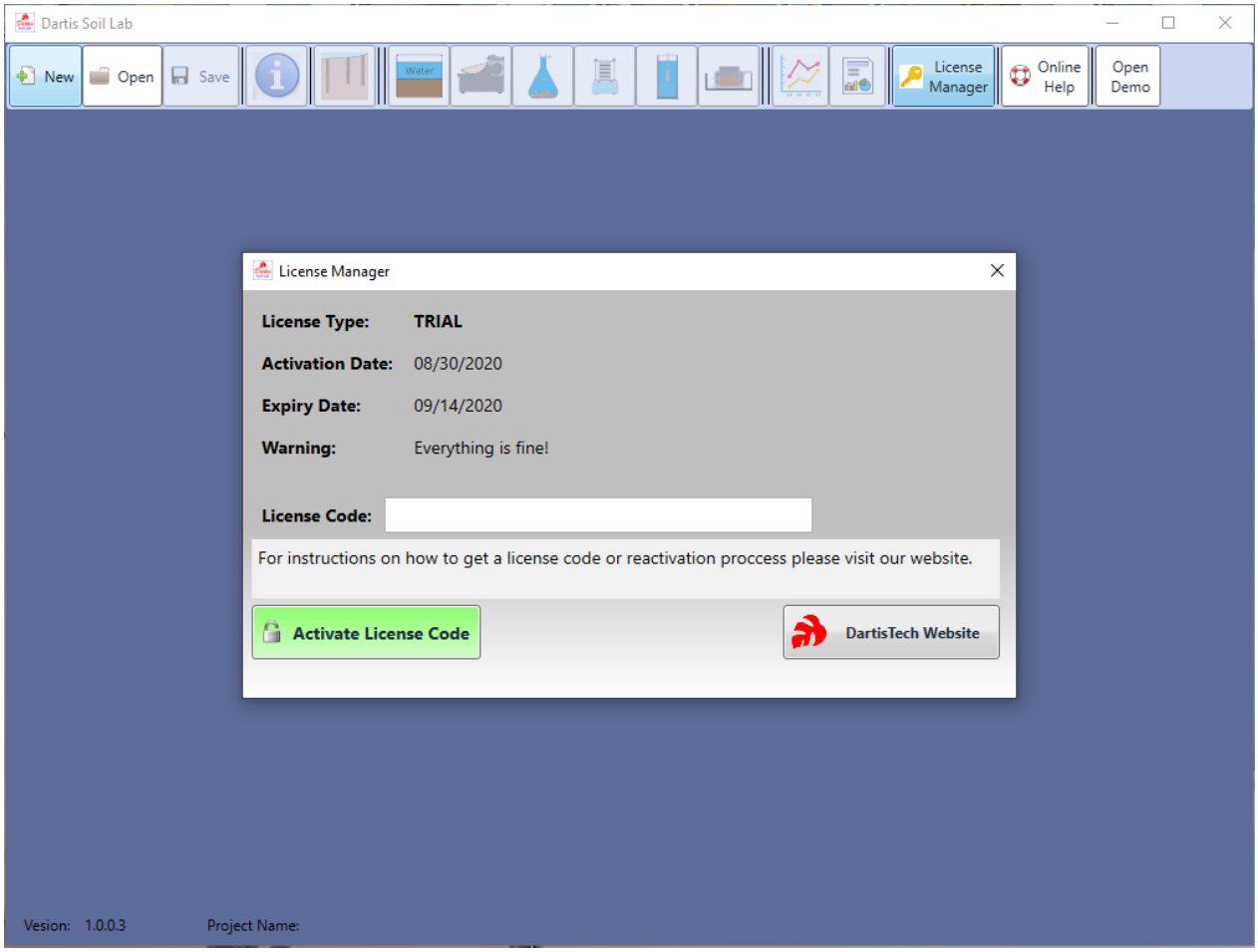
1.2. Licensing

There are two types of license available for this product; **Trial** and **Full** license.

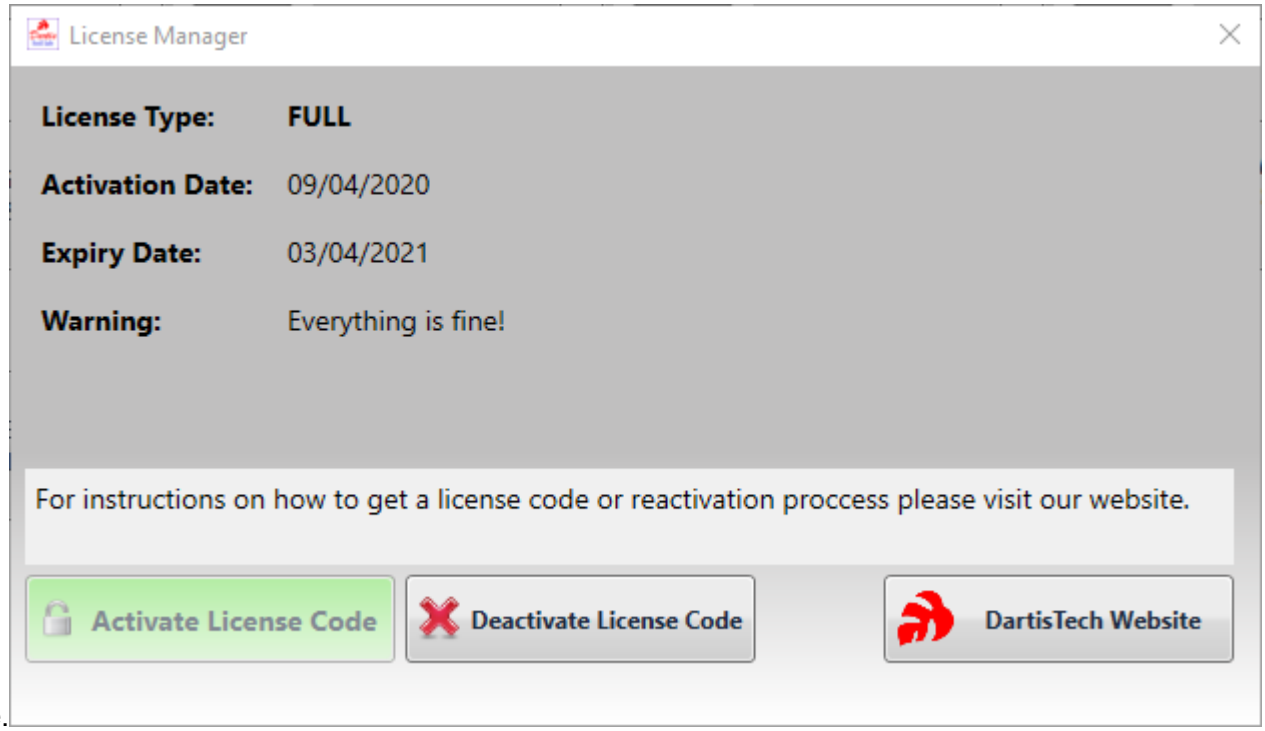
Trial: is limited and for evaluation purpose only. You may activate 14 days trial on first application startup (if you have a license code please paste it in license code textbox and click activate license code to get Full version).



In trial version you can create a project and check all capabilities of program in action.
You may always check your license status from license manager tab. In case of a trial license; by purchasing and recieving a license code, you can activate Full version in this tab.



Full: is full featured version of this product. With free updates and support while you have a valid license code.



Important Note 1 : for each purchased license code, two computers can be activated with full license (the same license code); and for each computer device two reactivations are allowed in 30 days (in case of deactivation). Two computer devices can be activated with full license at a same time.
"Reactivation amount is number of times that a license code is used successfully"

Important Note 2: in case of mandatory license check, Warning message will show you a period of time (5 days) in which you need to get online for validation purpose.

1.3. How to get license code

After the purchase process fullfilment, You will recieve an email in few minutes including your license code.

2. Unit System

This version of Dartis Soil Lab supports the following unit systems:

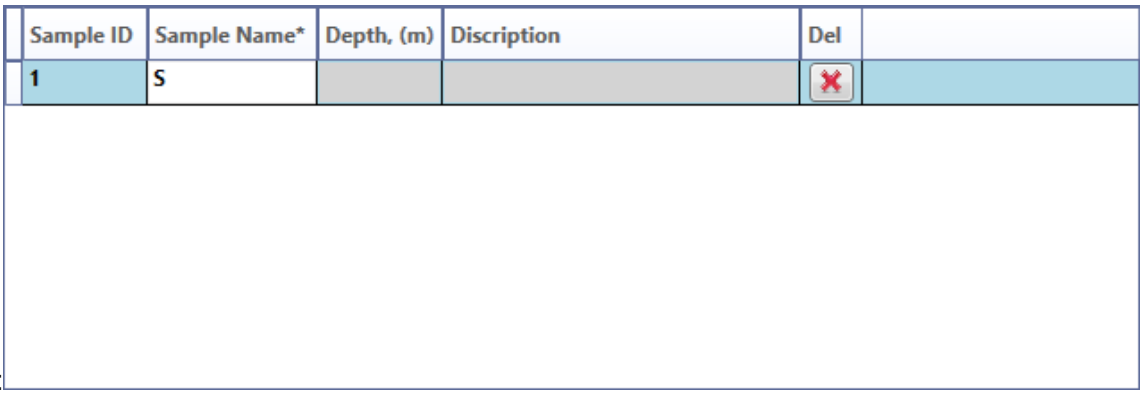
- Metric units (kg, m, cm)
- US Customary units (lb, ft, in) available for some tests.

3. Contents

3.1. Entering data

3.1.1. Useful tips on entering data manually

Most of test data are entered in table's. Here are some tips on how to work with table's efficiently:



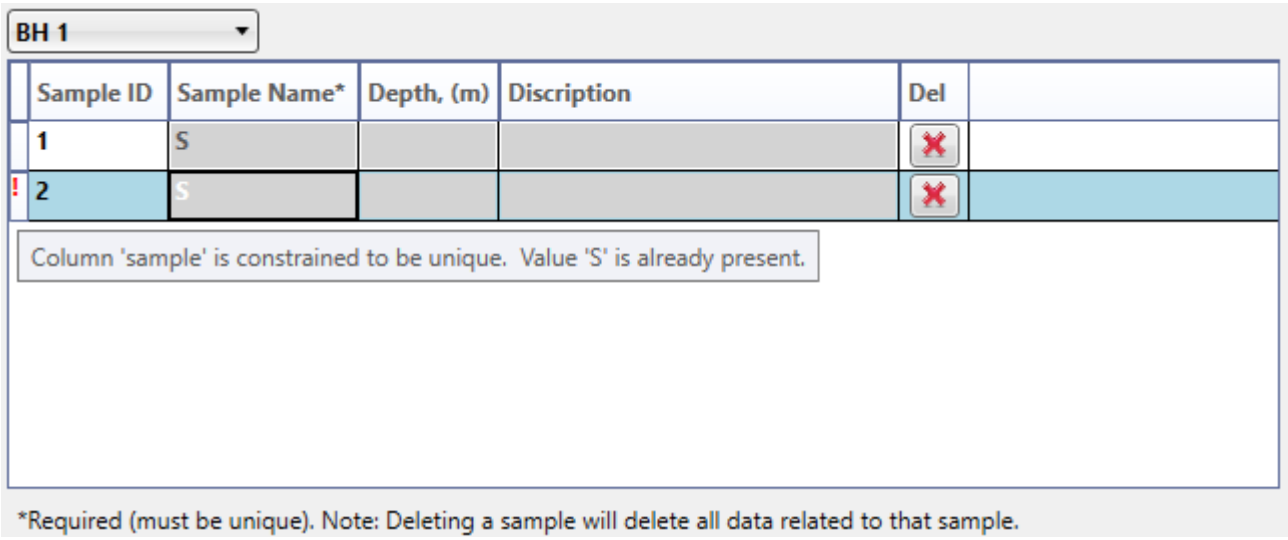
Tip 1: color of column's in which you may enter data is gray.

Tip 2: if a table row is for example representing a sample's data and there is a delete button defined, you may use this button to remove all related data of that sample (including all test data).
Note: if you want to edit a row data, simply click on any cell and change data

Tip 3: for navigation in table cells you can just click on desired cell. To move to next cell in a row you can press **Tab key** on your keyboard.

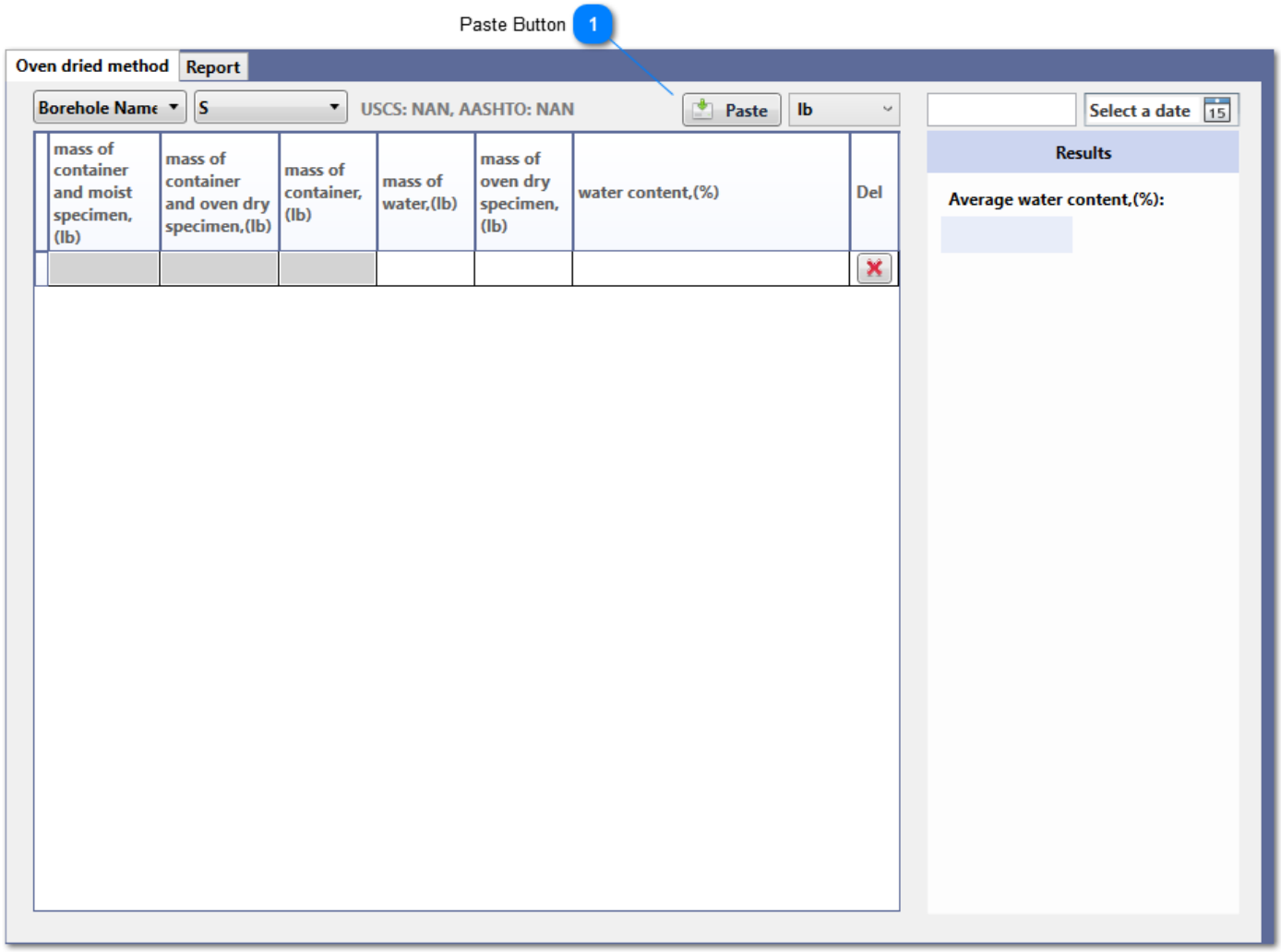
Tip 4: when you are finished entering a row's data press **ENTER** on your keyboard. This will check if entered data is correct (in format and if required in logic) and adds a new empty row for entering data.

Tip 5: in case of format or logic error an icon " ! " appears. By moving mouse curser on it an error message is shown which helps you correct it.

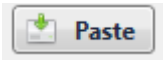


Tip 6: You can use keyboard arrows to move between datatable cells.

3.1.2. Importing from Excel



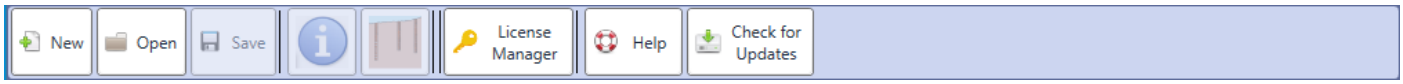
1 Paste Button



Use paste button to import copied data columns from Excel to a table. Number of copied columns from Excel should match number of columns in datatable.

3.2. Tabs and Tests

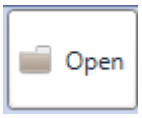
3.2.1. Toolbar



1 **New button**

Creates a new project: by clicking on 'New' button, a dialogue will open. Choose the location where you want the project to be saved. Files are saved with *.DLab extension.

2 **Open button**



Opens a previously created project file: by clicking on Open button, an open dialogue will show up. Choose the save file on your local hard. Files are stored with *.DLab extension.

3 **Save button**

Saves currently open project: saves current project's information on currently open save file.

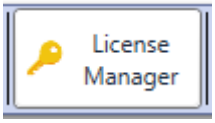
4 **button**

Opens project information tab. More information is provided here.

5 **button**

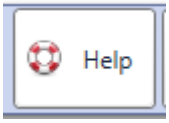
Opens Borehole and sample Manager tab. More information is provided here.

6 **License Manager button**



Opens License Manager window.

7 **Help button**

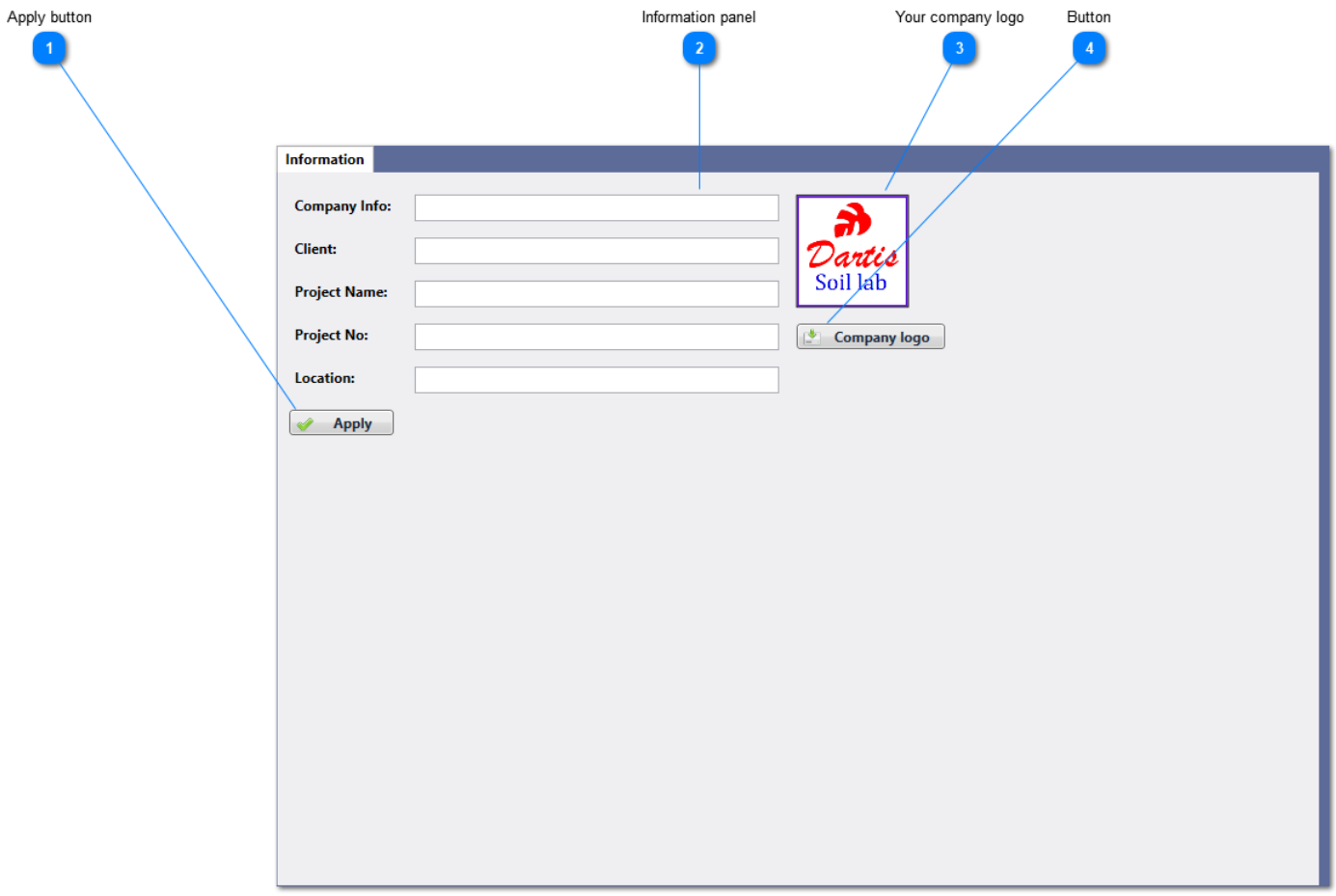


Opens current help manual.

8 **Check for Updates button**

Checks for available updates.

3.2.2. Project information



1 Apply button

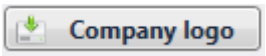
Applies entered information

2 Information panel

You may enter project's information here

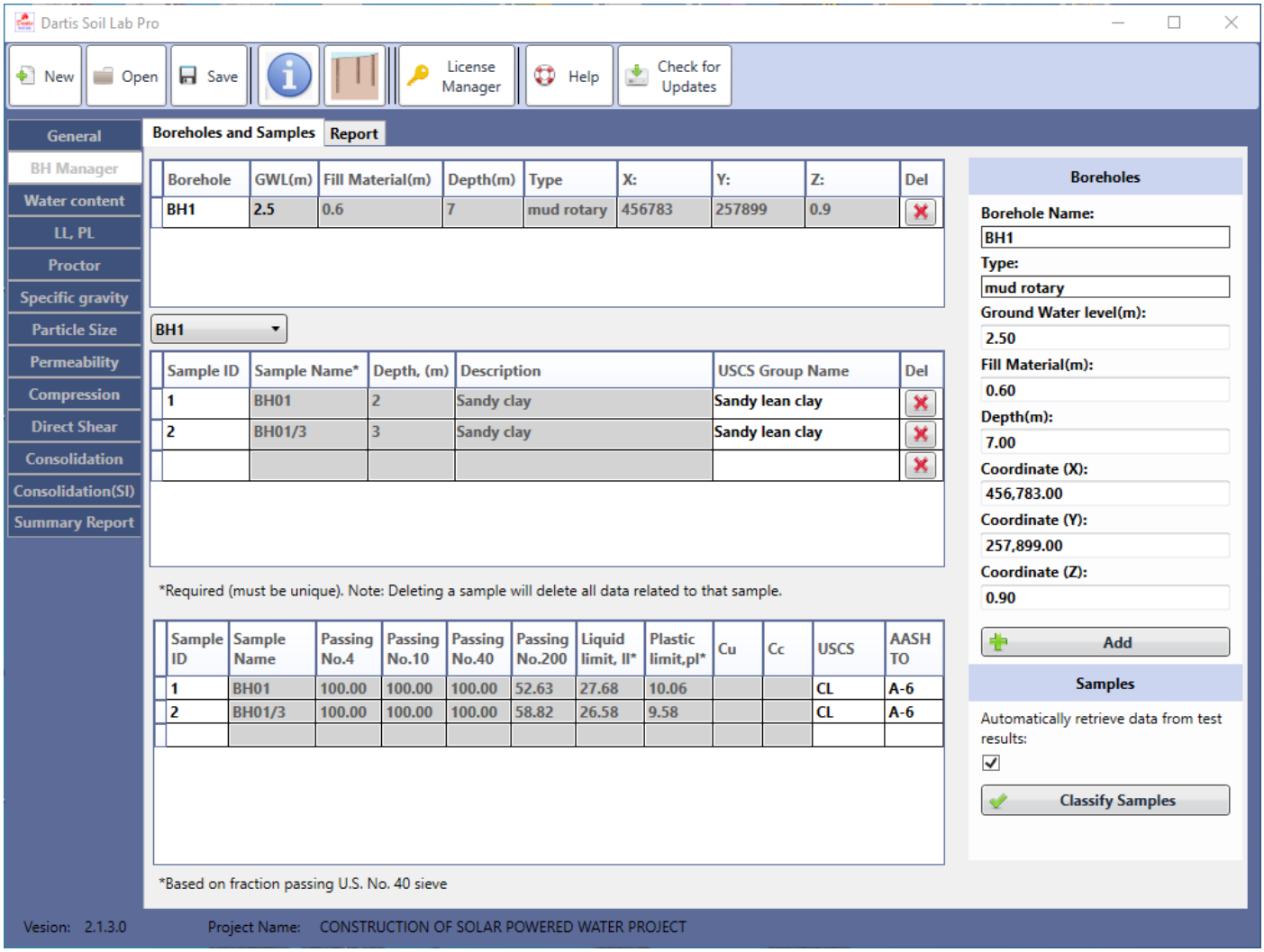
3 Your company logo

4 **Button**



Opens a selection dialogue. You may choose your company logo image path whitin dialogue.

3.2.3. Borehole and sample Manager



1. enter borehole name and properties and click add
2. select required borehole from combobox
3. complete a table row to assign new sample to that borehole and press ENTER to create a new row (you can use TAB KEY to go to next cell).

classification table

data in this table is automatically retrieved from particle size and index tests results while checkbox is checked.

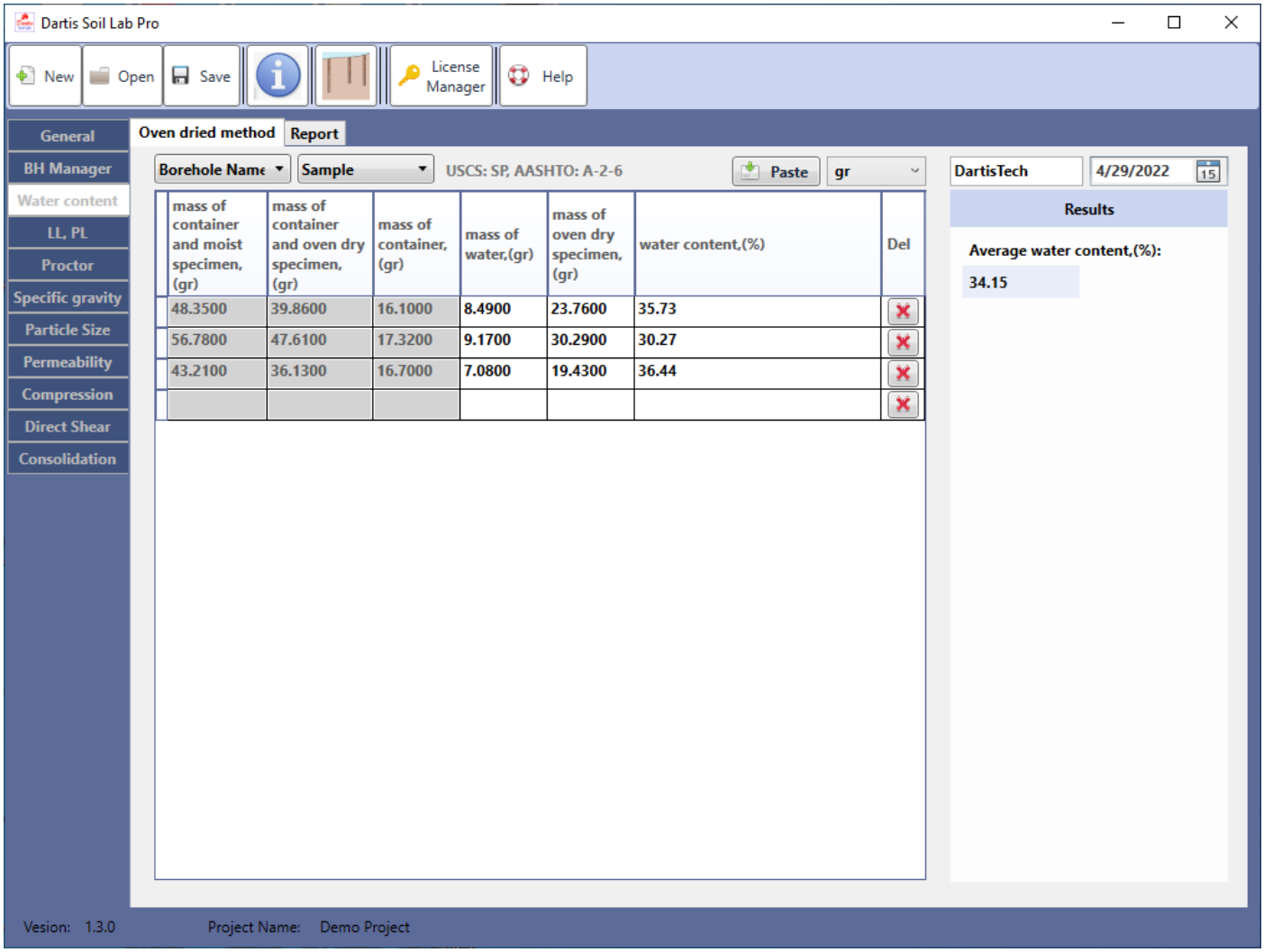
also you can complete this table manually and click on classify samples.

Sample ID	Sample Name	Passing No.4	Passing No.10	Passing No.40	Passing No.200	Liquid limit, ll*	Plastic limit,pl*	Cu	Cc	USCS	AASHTO
2	Sample	100.00	91.93	56.85	1.75	35.28	17.93	5.11	0.87	SP	A-2-6

3.2.4. Water content

This page is used for data entry of moisture content determination test and to view / print the results

1. select the borehole and then sample
2. complete the table. data may be entered manually or by importing from Excel using paste button.



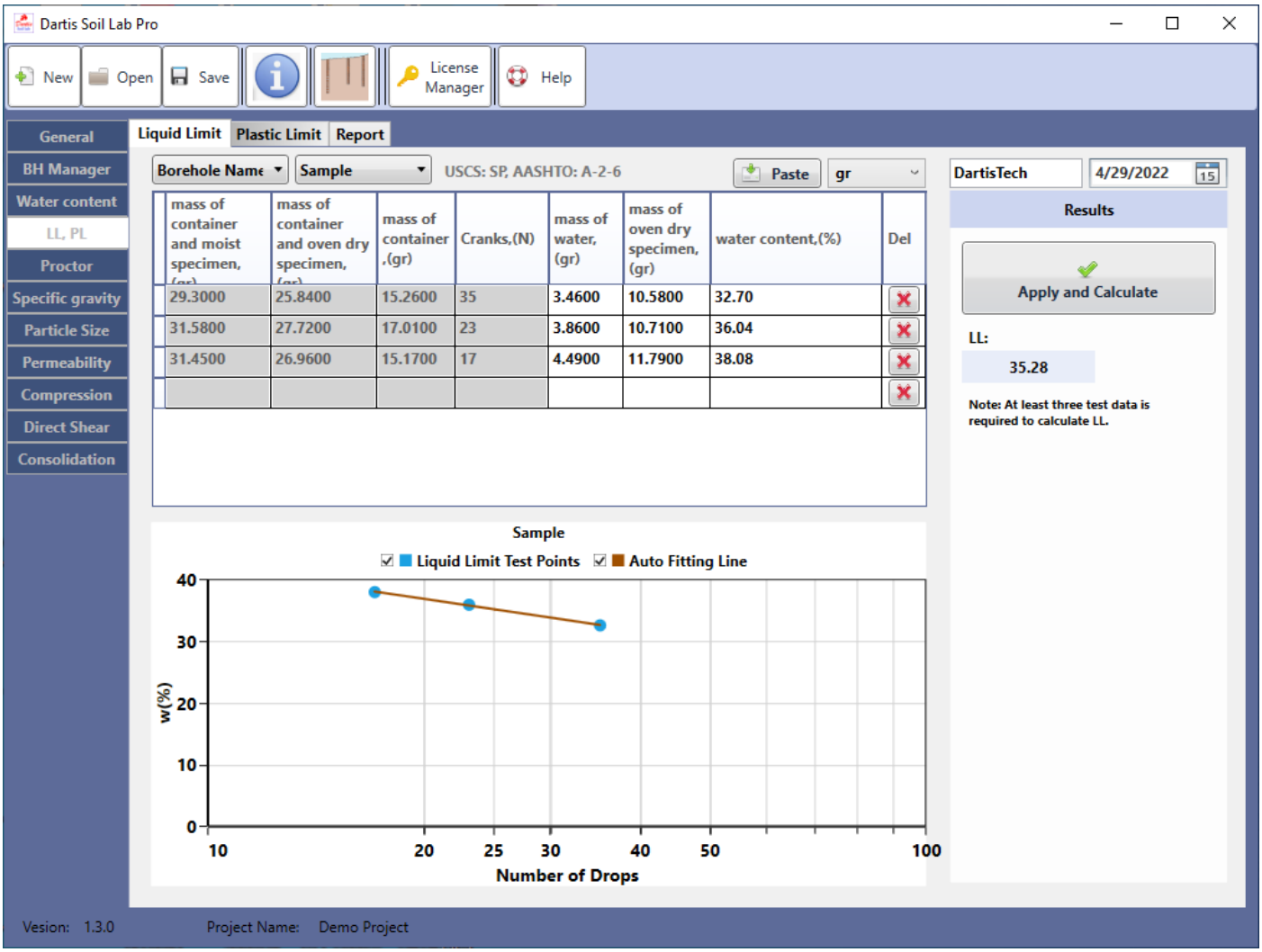
3.2.5. Liquid and plastic limit

This page is used for data entry of Liquid an Plastic limit tests and to view / print the results

Liquid Limit

1. Select a borehole and then sample
2. complete the table. data may be entered manually or by importing from Excel using paste button.
3. click on apply and calculate

Note: at least three test data is required to plot graph and calculate LL value;



Plastic Limit

1. Select a borehole and then sample
2. complete the table. data may be entered manually or by importing from Excel using paste button.
3. click on apply and calculate

Dartis Soil Lab Pro

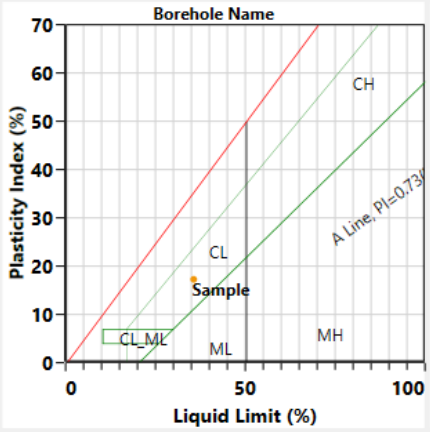
New | Open | Save | License Manager | Help

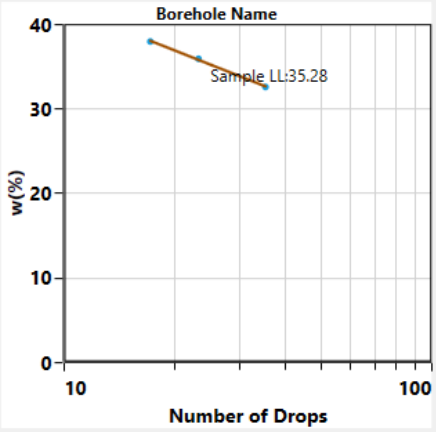
General
BH Manager
Water content
LL, PL
Proctor
Specific gravity
Particle Size
Permeability
Compression
Direct Shear
Consolidation

Liquid Limit | Plastic Limit | Report

Borehole Name | Sample | USCS: SP, AASHTO: A-2-6 | Paste | gr

mass of container and moist specimen, (gr)	mass of container and oven dry specimen, (gr)	mass of container, (gr)	mass of water, (gr)	mass of oven dry specimen, (gr)	water content,(%)	Del
23.8600	22.2700	13.3300	1.5900	8.9400	17.79	
24.8100	23.1900	14.2300	1.6200	8.9600	18.08	





DartisTech | 4/29/2022

Results

Apply and Calculate

PL:	PI:
17.93	17.35
Activity:	**LI:**
18.09	0.93

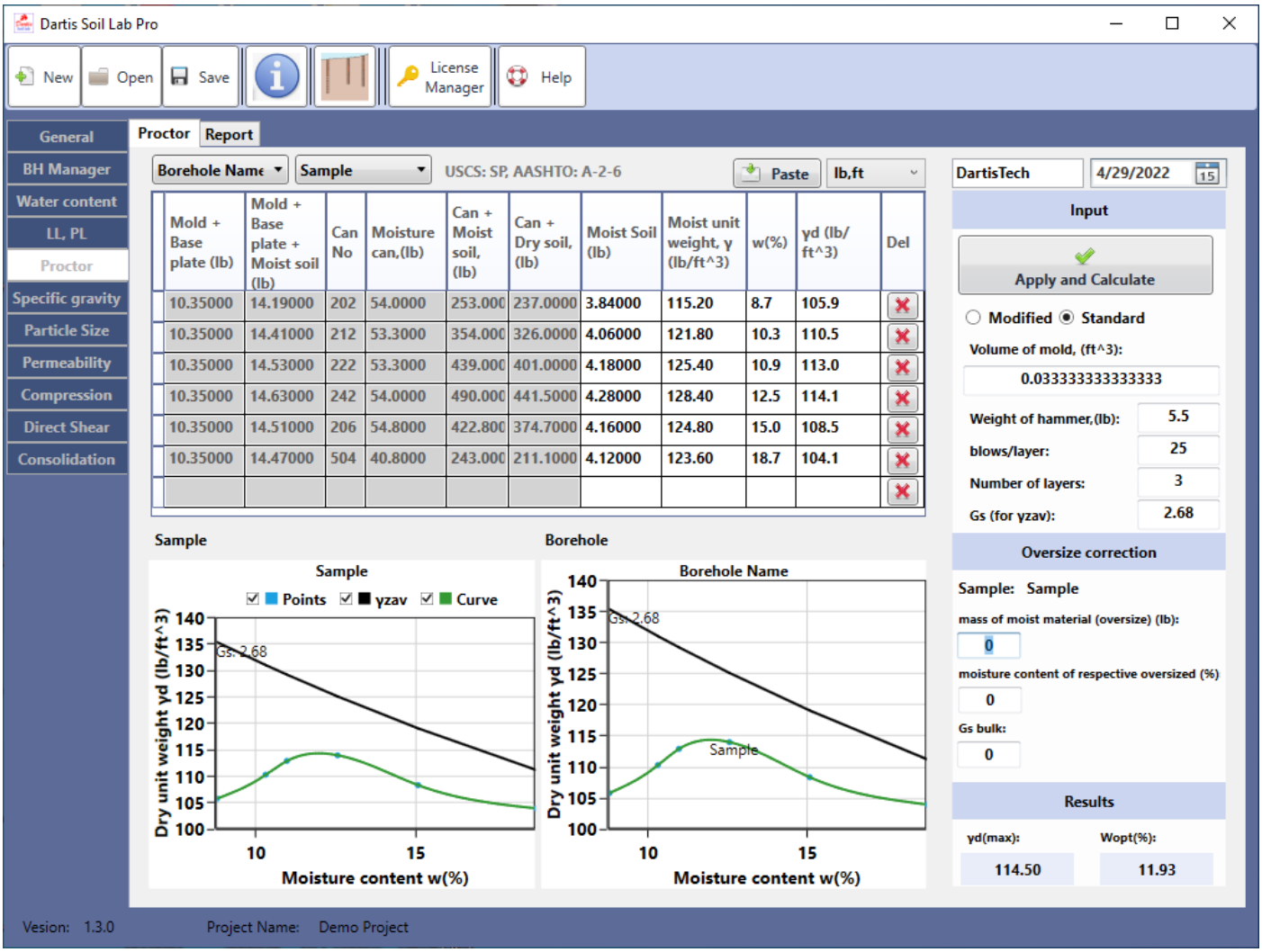
Note: Activity calculation needs sieve and hydrometer test results and LI calculation needs water content test result.

Vesion: 1.3.0 Project Name: Demo Project

3.2.6. Proctor

This page is used for data entry of compaction test and to view / print the results

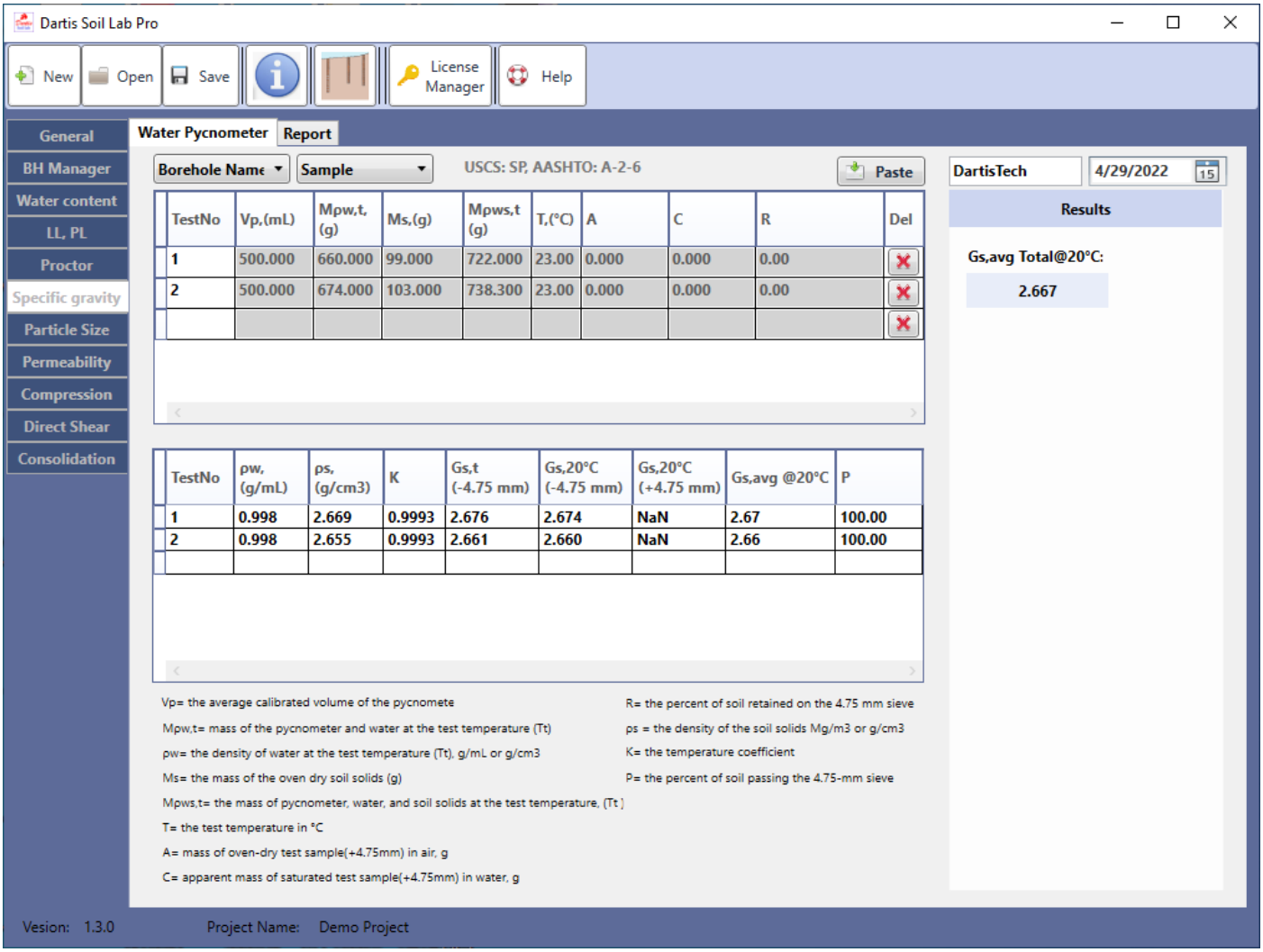
1. Select a borehole and then sample
2. enter input data
3. complete the table. data may be entered manually or by importing from Excel using paste button.
4. if oversize correction is needed enter required data for the selected sample
5. click on apply and calculate



3.2.7. Specific gravity

This page is used for data entry of specific gravity test and to view / print the results

1. Select a borehole and then sample
2. complete the table. data may be entered manually or by importing from Excel using paste button.

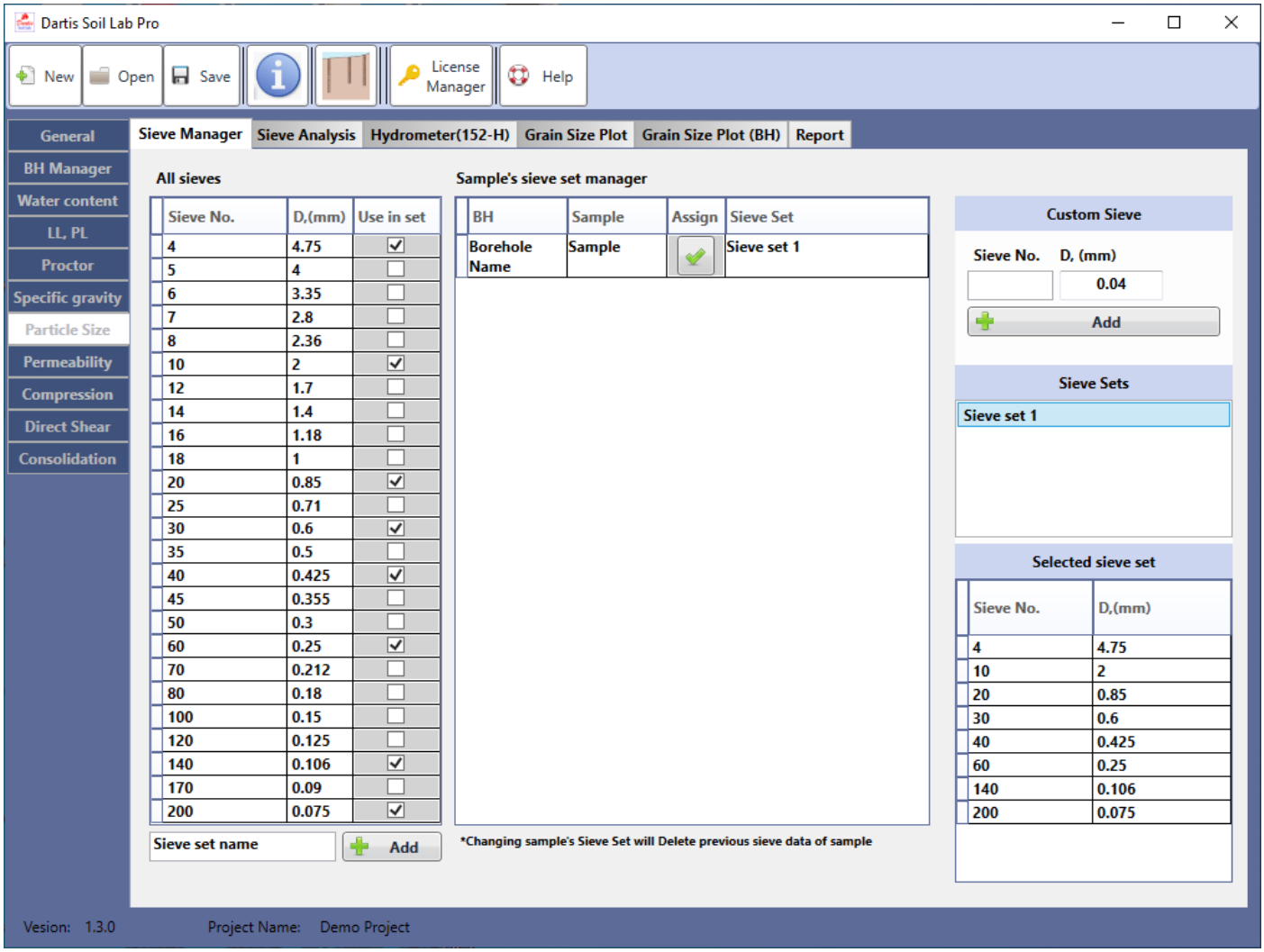


3.2.8. Particle size

This page is used for data entry of particle size test and to view / print the results

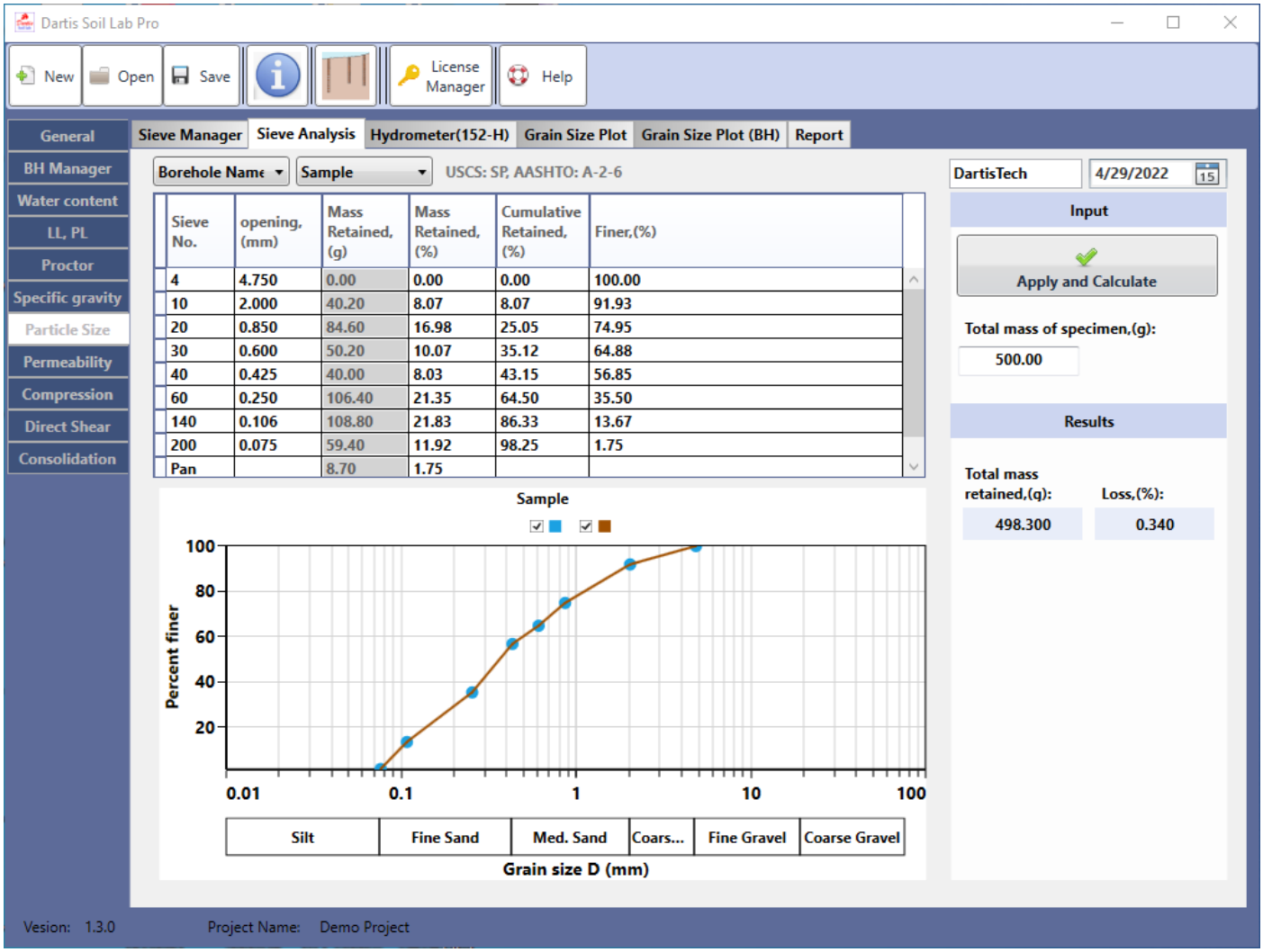
sieve manager

1. select required sieves from all sieves table, enter sieve set name and press add
2. select a previously created sieve set from sieve sets table
3. in sample's sieve set manager click assign. this will assign selected sieve set to that sample



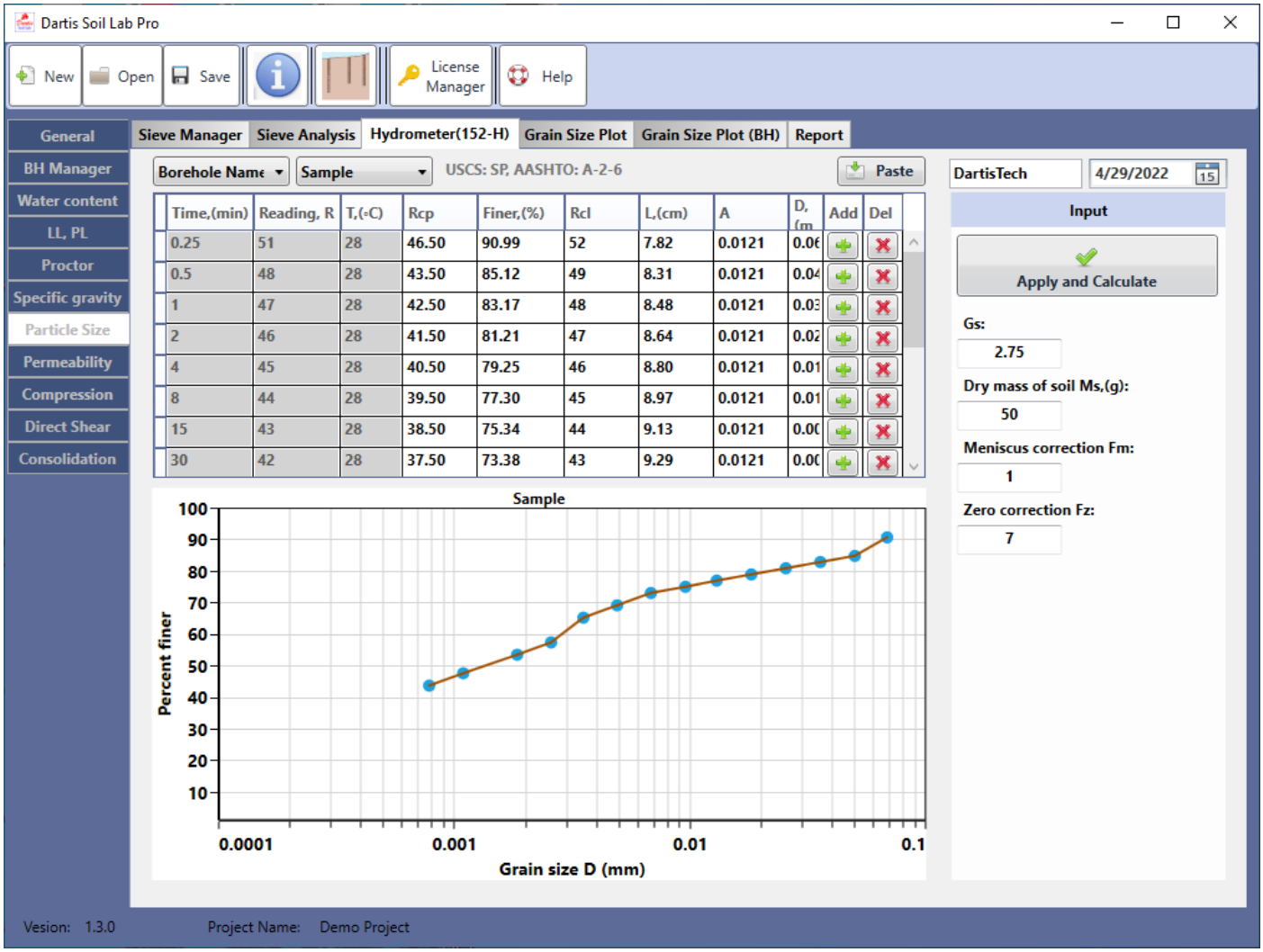
sieve analysis

1. Select a borehole and then sample
2. enter input data
3. complete the mass retaind on each sieve row by row.
4. click on apply and calculate



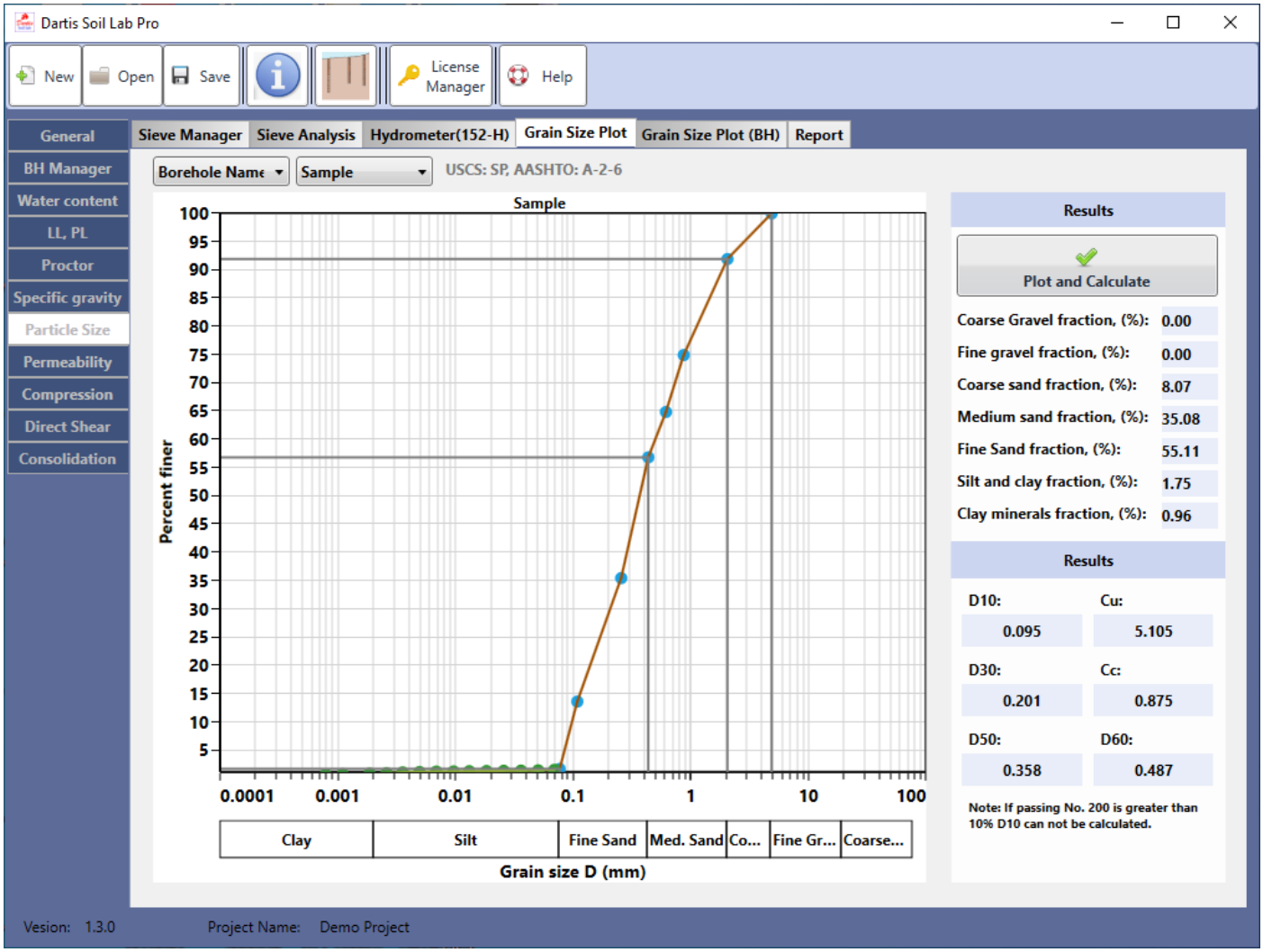
hydrometer

1. Select a borehole and then sample
2. enter input data
3. complete the table. data may be entered manually or by importing from Excel using paste button.
4. click on apply and calculate



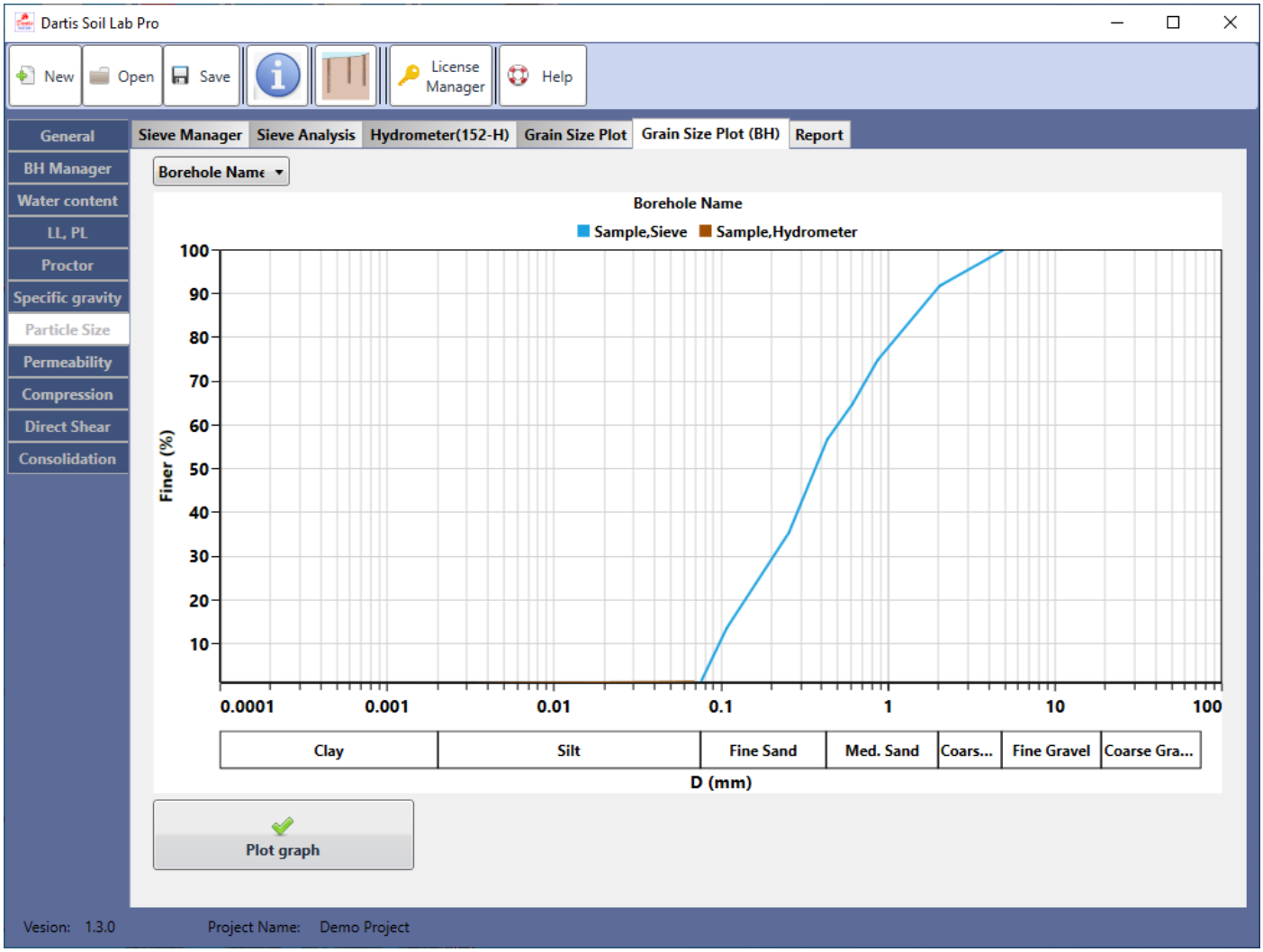
grain size plot

1. Select a borehole and then sample
2. click on plot and calculate



borehole samples grain size

1. Select a borehole
2. click on plot graph

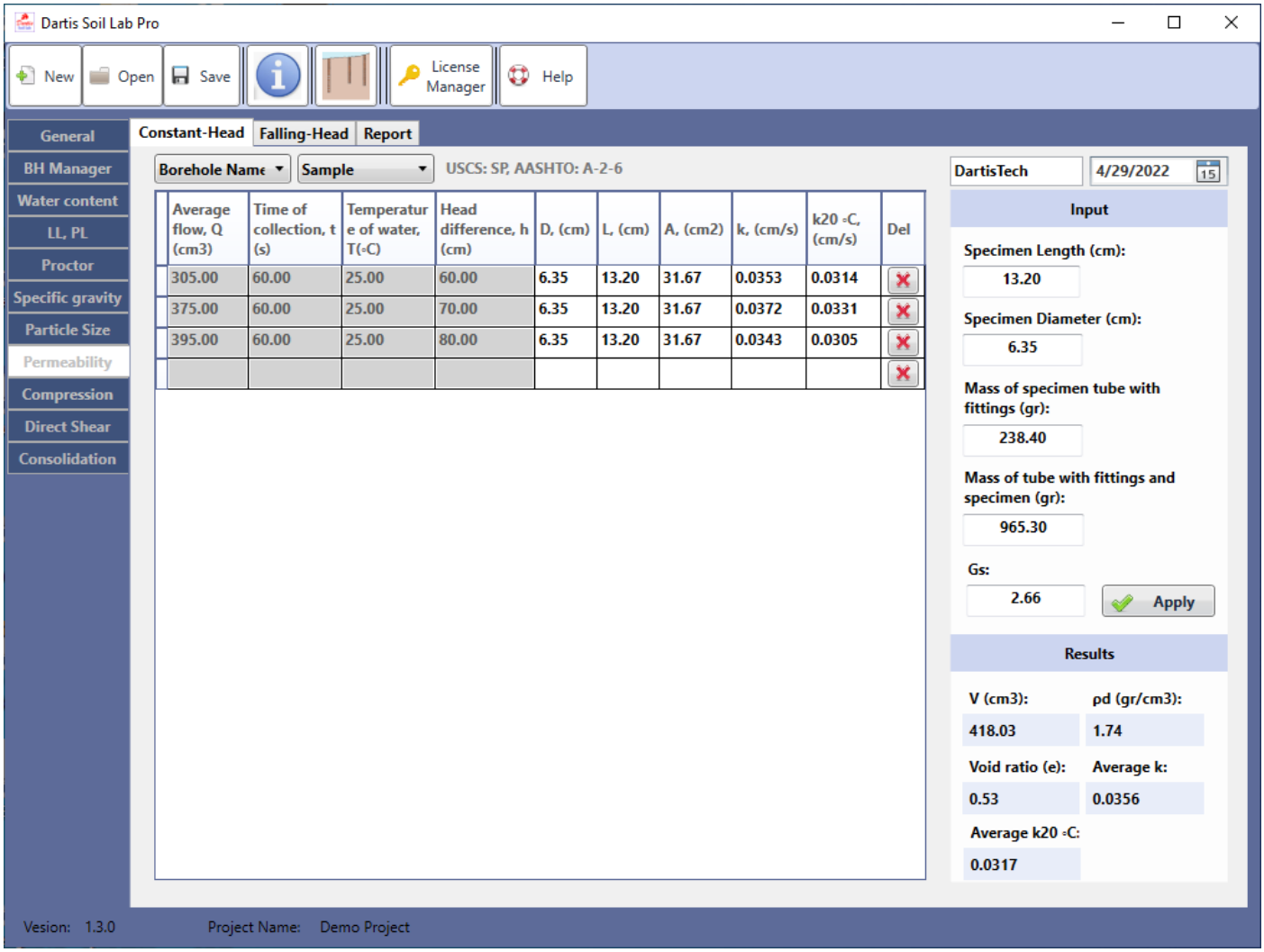

Dartis Soil Lab Pro
New
Open
Save
License Manager
Help
General
BH Manager
Water content
LL, PL
Proctor
Specific gravity
Particle Size
Permeability
Compression
Direct Shear
Consolidation
Sieve Manager
Sieve Analysis
Hydrometer(152-H)
Grain Size Plot
Grain Size Plot (BH)
Report
Borehole Name
Borehole Name
Sample,Sieve
Sample,Hydrometer
Finer (%)
100
90
80
70
60
50
40
30
20
10
0.0001
0.001
0.01
0.1
1
10
100
Clay
Silt
Fine Sand
Med. Sand
Coars...
Fine Gravel
Coarse Gra...
D (mm)
Plot graph
Vesion: 1.3.0
Project Name: Demo Project

3.2.9. Permeability

This page is used for data entry of permeability test and to view / print the results

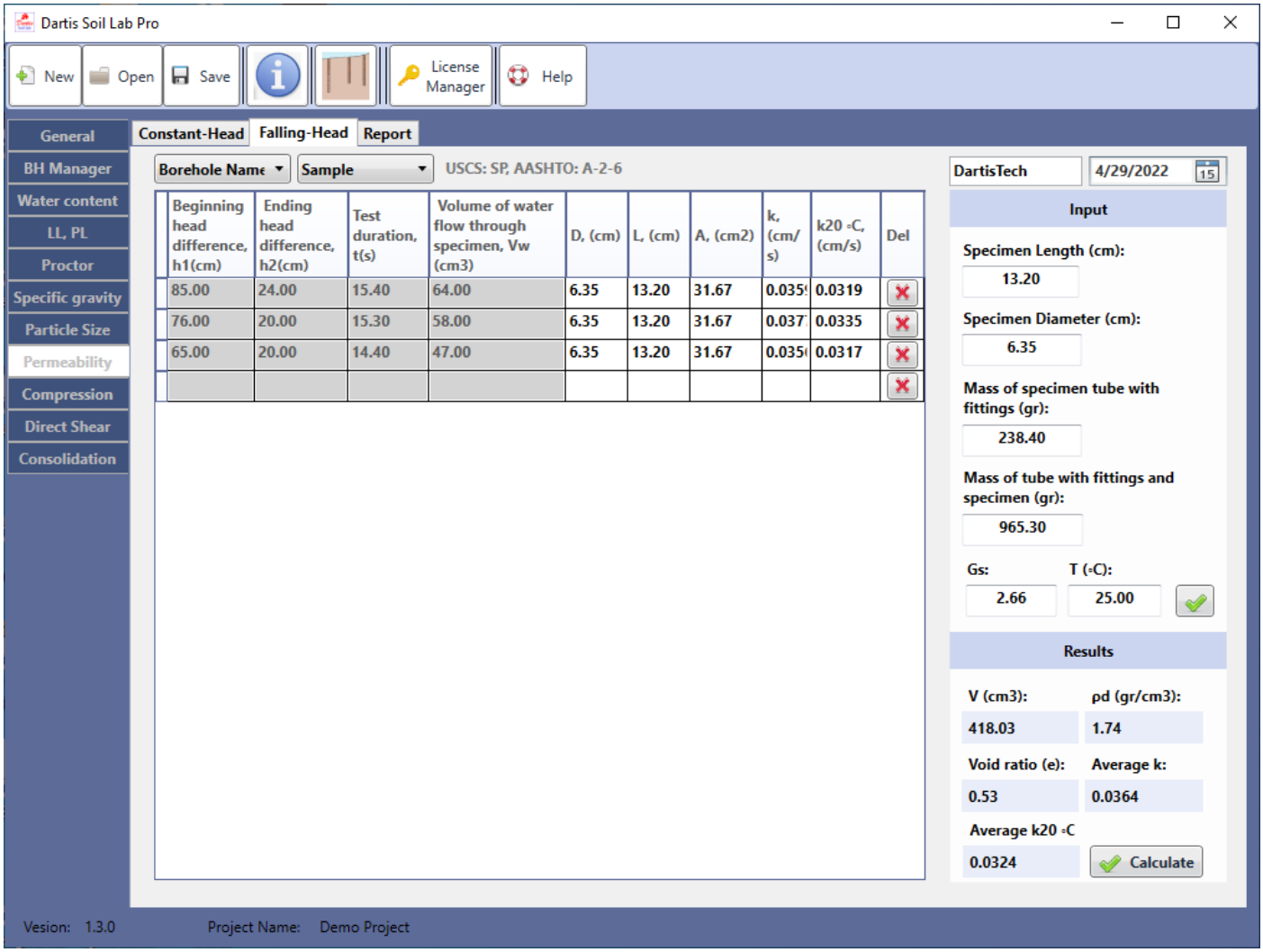
constant head

1. Select a borehole and then sample
2. enter input data and click on apply
3. complete a table row and press ENTER to create a new row (you can use TAB KEY to go to next cell)



falling head

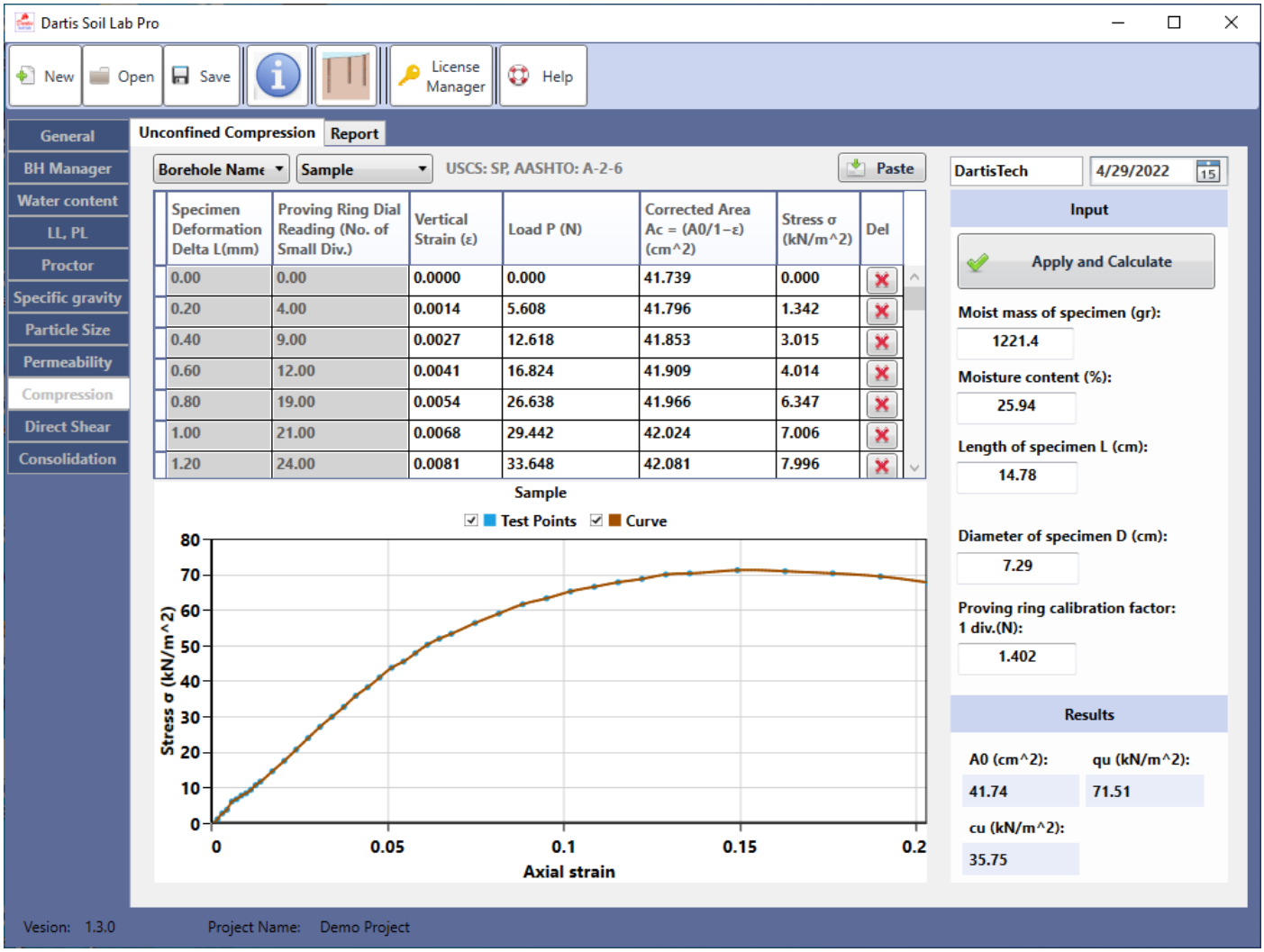
1. Select a borehole and then sample
2. enter input data and click the check button.
3. complete a table row and press ENTER to create a new row (you can use TAB KEY to go to next cell)
4. click on calculate


Dartis Soil Lab Pro
New
Open
Save
License Manager
Help
General
BH Manager
Water content
LL, PL
Proctor
Specific gravity
Particle Size
Permeability
Compression
Direct Shear
Consolidation
Constant-Head
Falling-Head
Report
Borehole Name
Sample
USCS: SP, AASHTO: A-2-6
Beginning head difference, h1(cm)
Ending head difference, h2(cm)
Test duration, t(s)
Volume of water flow through specimen, Vw (cm3)
D, (cm)
L, (cm)
A, (cm2)
k, (cm/s)
k20 -C, (cm/s)
Del
85.00 24.00 15.40 64.00 6.35 13.20 31.67 0.035 0.0319
76.00 20.00 15.30 58.00 6.35 13.20 31.67 0.037 0.0335
65.00 20.00 14.40 47.00 6.35 13.20 31.67 0.035 0.0317
DartisTech
4/29/2022
Input
Specimen Length (cm):
13.20
Specimen Diameter (cm):
6.35
Mass of specimen tube with fittings (gr):
238.40
Mass of tube with fittings and specimen (gr):
965.30
Gs:
2.66
T (-C):
25.00
Results
V (cm3):
418.03
ρd (gr/cm3):
1.74
Void ratio (e):
0.53
Average k:
0.0364
Average k20 -C
0.0324
Calculate
Vesion: 1.3.0
Project Name: Demo Project

3.2.10. Unconfined compression

This page is used for data entry of unconfined compression test and to view / print the results

1. Select a borehole and then sample
2. enter input data
3. complete the table. data may be entered manually or by importing from Excel using paste button.
4. click on apply and calculate



3.2.11. Direct shear

This page is used for data entry of direct shear test and to view / print the results

1. Select a borehole and then sample
2. Enter data of selected sample row by row in first table or just paste data from Excel.
3. Select test id form Test ID combobox.
3. Enter data of selected test id row by row in second table or just paste data from Excel.
4. Click on plot and calculate

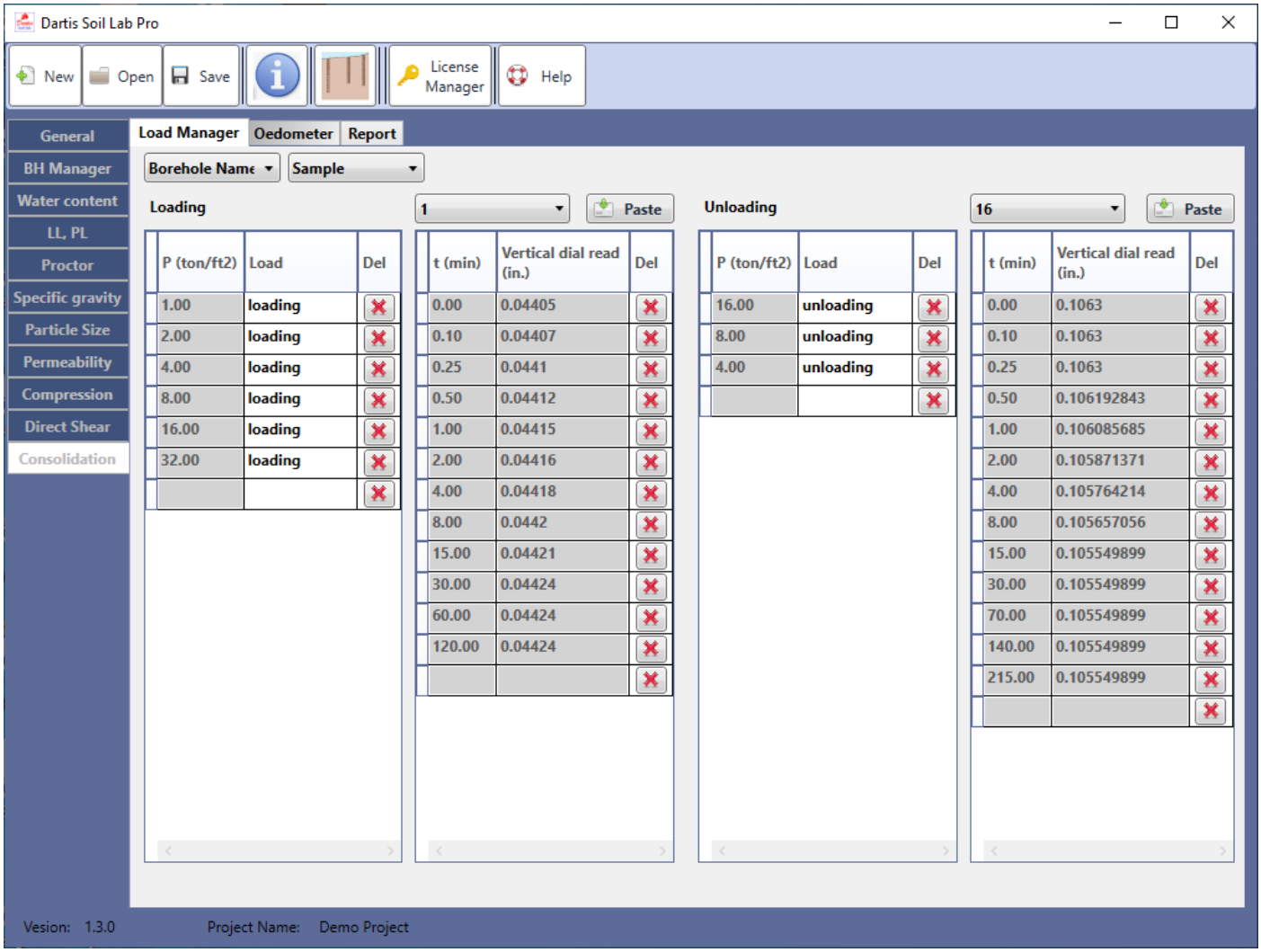
Note1: At least 3 test data is required for each sample to plot main graph

3.2.12. Consolidation

This page is used for data entry of consolidation test and to view / print the results

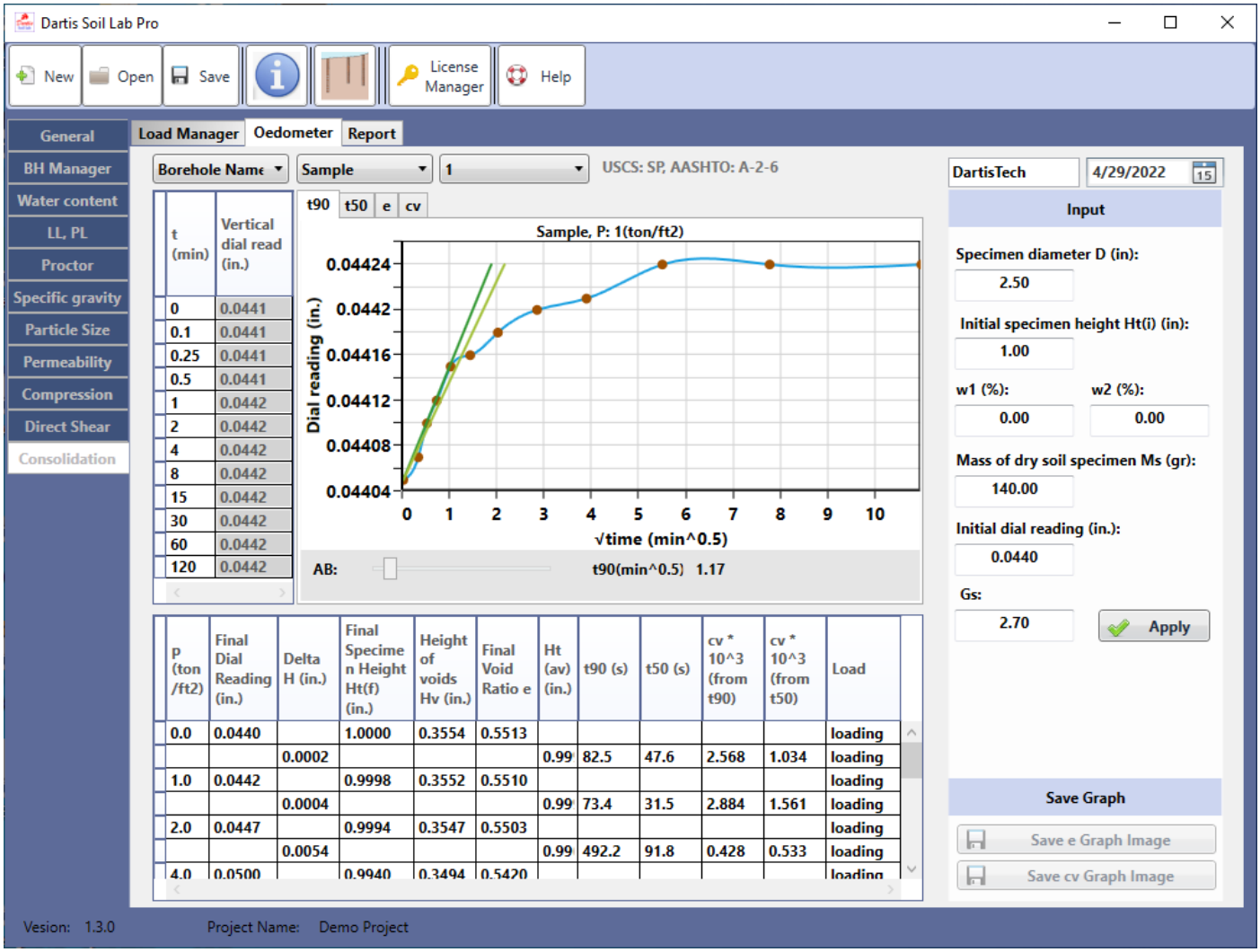
Load Manager

1. Select a borehole and then sample
2. Enter P in loading and unloading tables manually.
3. For each loading first select it from combobox then complete time and dial read table by entering data manually or by pasting data from Excel.
4. For each unloading first select it from combobox then complete time and dial read table by entering data manually or by pasting data from Excel.

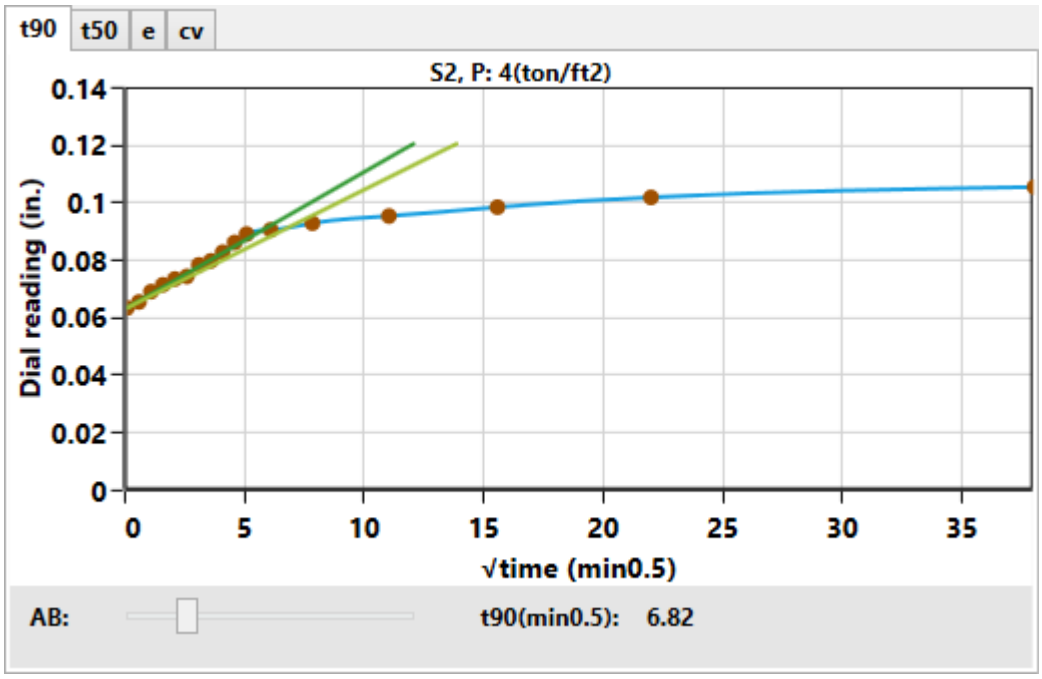


Oedometer

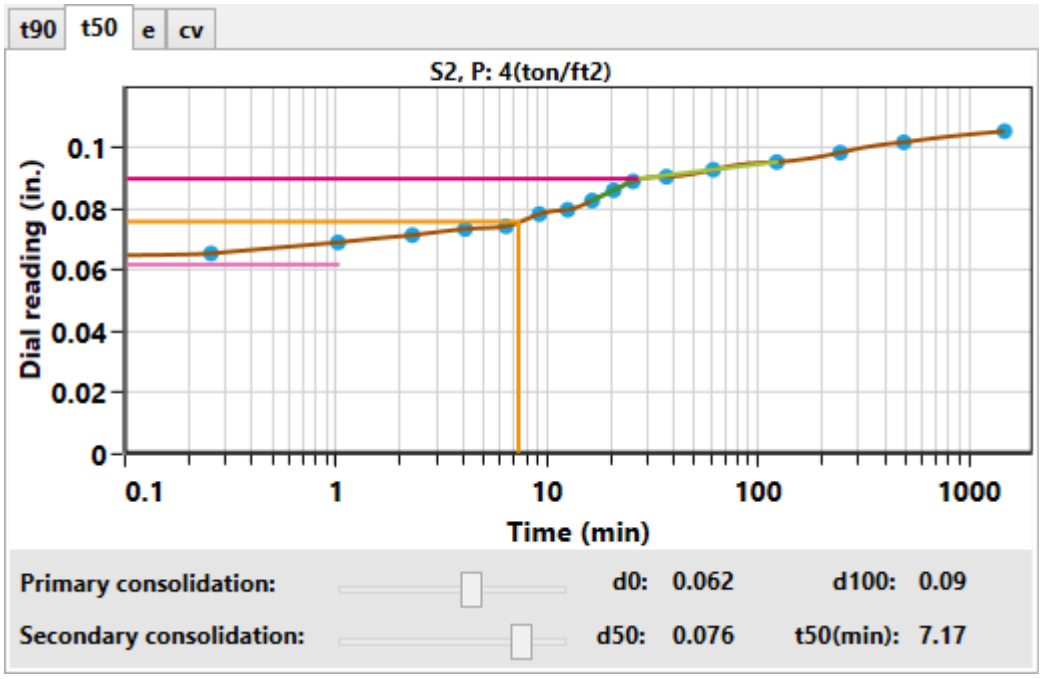
1. Select a borehole and then sample
2. enter input data
3. click on apply
3. select P from third combobox



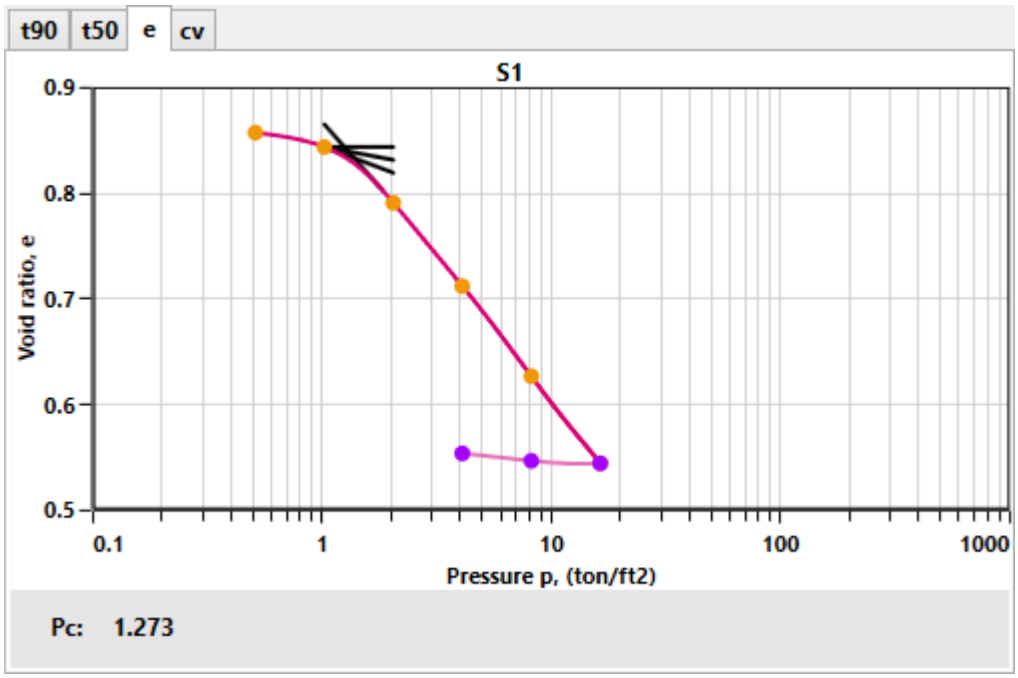
for each P use (AB) scroll bar to determine t90

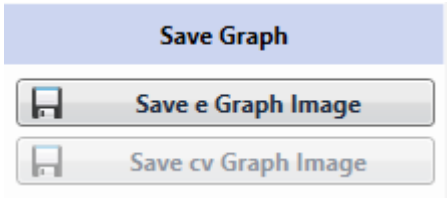


for each P use primary and secondory consolidation scroll bars to determine t50



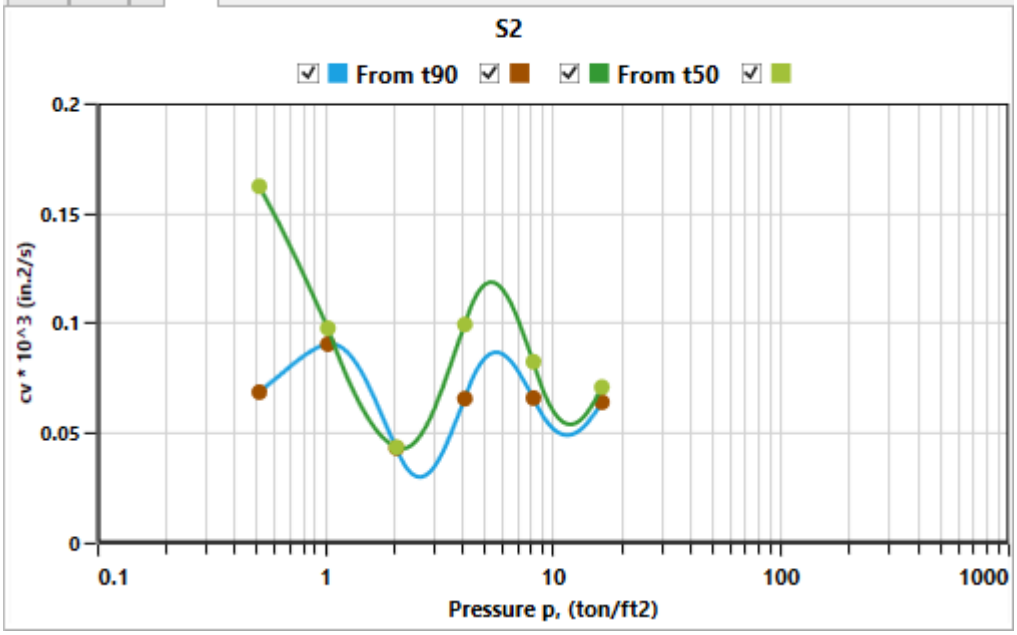
5. select (e) tab and then click save e graph image





5. select (cv) tab and then click save cv graph image

t90 | t50 | e | cv



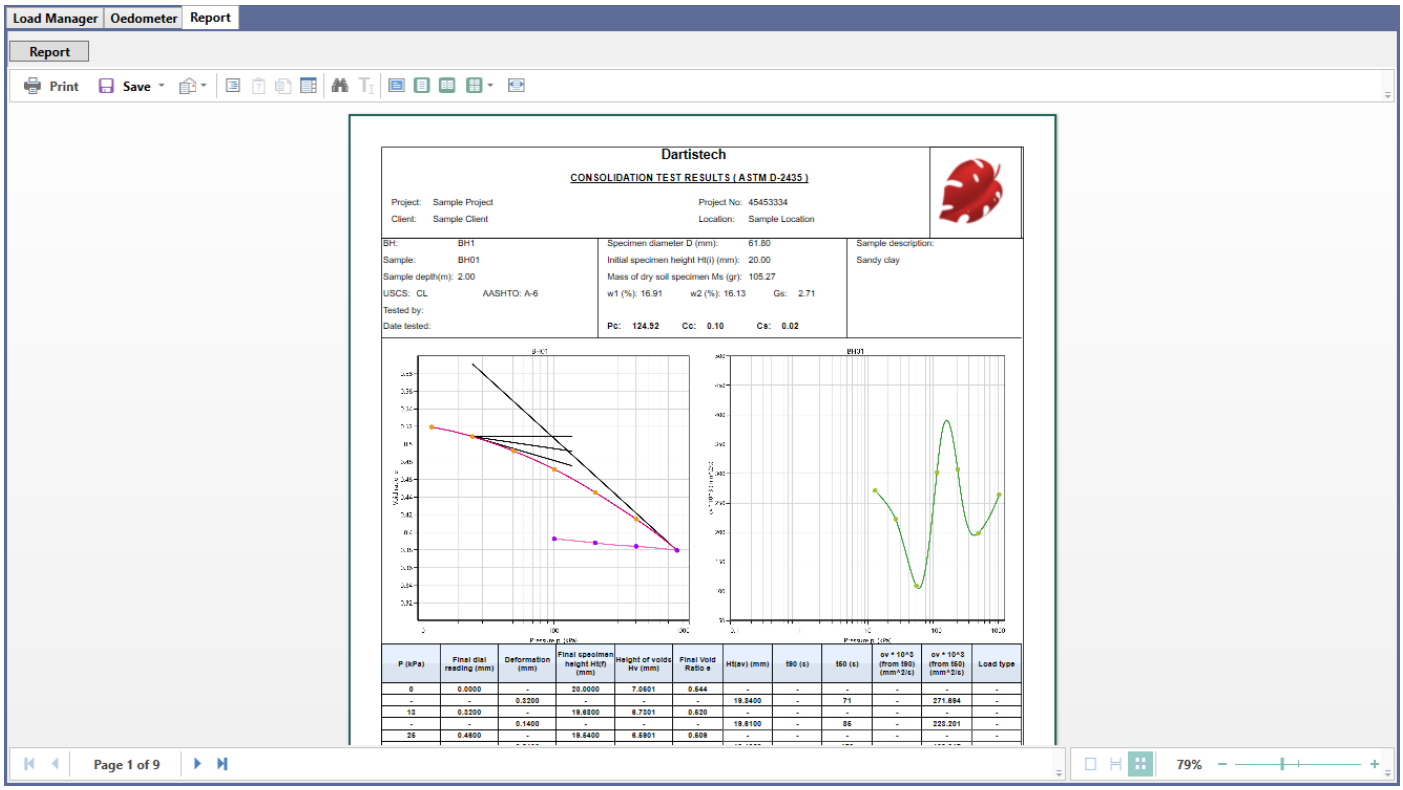
Save Graph

Save e Graph Image

Save cv Graph Image

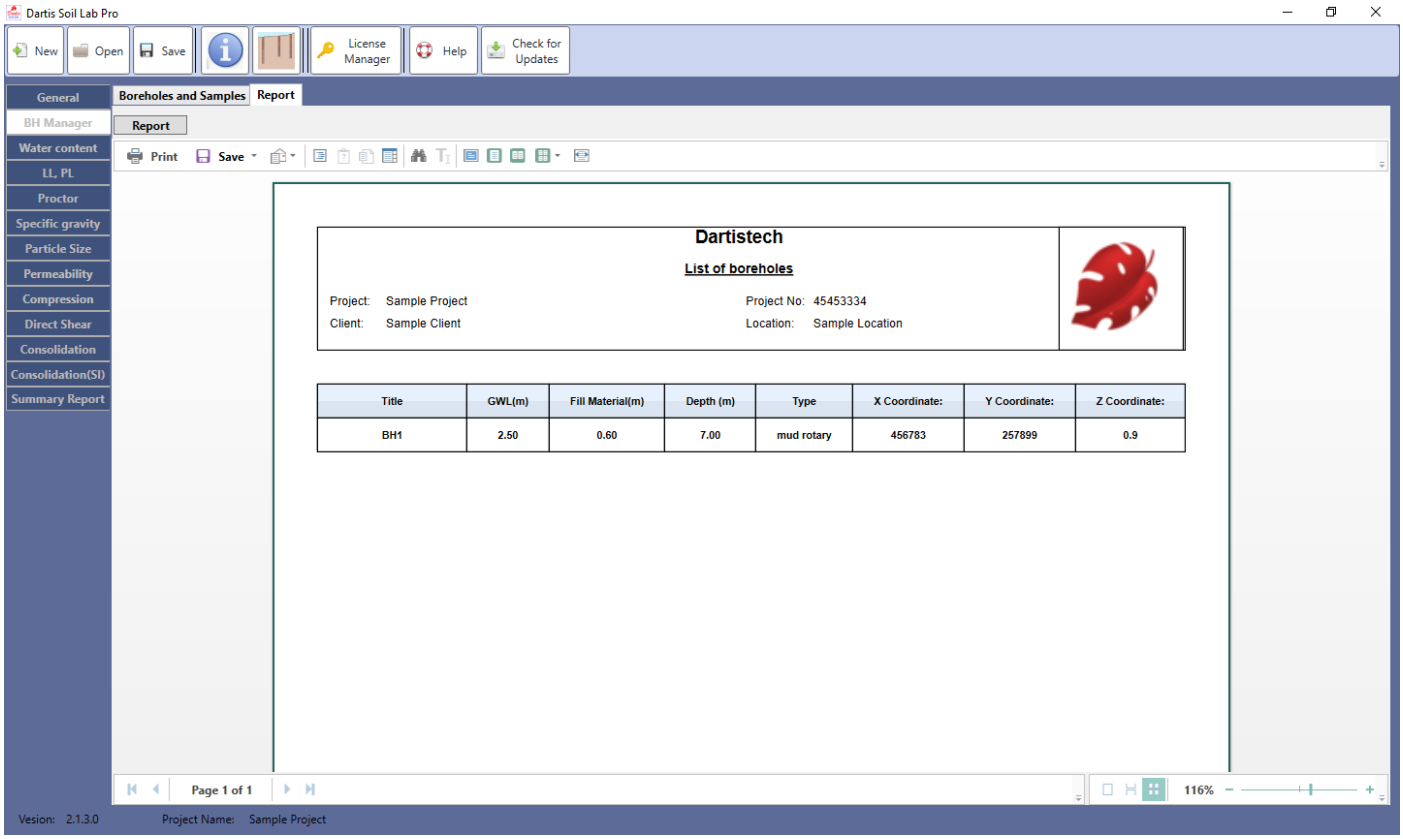
3.3. Reporting

For each test page there is a report tab defined. In report tab choose between available reports. The following shows a sample consolidation test report:



Borehole list report

In BH Manager page choose Report tab and click on report button. This will show the following report:



Summary Report

This report provides a summary of all laboratory tests in the current project. To access this report choose "Summary Report" page, and click on "Report". The following shows a similar report:

Dartistech

Tests Summary

Project: Sample Project
Client: Sample Client
Project No: 45453334
Location: Sample Location

						Atterberg Limits		Proctor		SP Gravity	Permeability		Compression		Direct Shear		Consolidation (English)			Consolidation (SI)		
Borehole	Sample	Sample Depth (m)	USCS	AASHTO	Avg Water Content (%)	Liquid Limit	Plastic Limit	γd max	Wopt (%)	Gs @ 20° C	Constant Head, Avg k20° C (cm/s)	Falling Head, Avg k20° C (cm/s)	Cu (kPa)	qu (kPa)	c' (kPa)	φ' (Degree)	Pc (ton/ft2)	Cc	Ce	Pc (kPa)	Cc	Ce
BH1	BH01	2.00	CL	A-6	17.75	27.68	10.06	-	-	2.77	-	-	67.27	134.54	218.91	-0.37	-	-	-	124.9203	0.1000	0.0154
BH1	BH01/3	3.00	CL	A-6	17.85	26.58	9.58	-	-	2.71	-	-	67.70	135.41	14.48	28.46	-	-	-	-	-	-

					Sieve & Hydrometer Analysis											
Borehole	Sample	Sample Depth (m)	USCS	AASHTO	D10	D30	D60	Cu	Cc	Clay (%)	Silt & Clay (%)	Fine Sand (%)	Medium Sand (%)	Coarse Sand (%)	Fine Gravel (%)	Coarse Gravel (%)
BH1	BH01	2.00	CL	A-6	-	0.087	0.081	-	-	11.76	52.63	47.37	0.00	0.00	0.00	0.00
BH1	BH01/3	3.00	CL	A-6	-	0.089	0.076	-	-	13.72	58.82	41.18	0.00	0.00	0.00	0.00

System Requirements

Minimal System Requirements:
• Microsoft Windows 7/8/10/Vista
• 500 MHz processor
• 512 MB RAM
• At least 100 MB free hard drive space

Contacts

Product website:
http://www.dartistech.com

Support e-mail:
support@dartistech.com