



# User Manual

CIVILAB 2023

V5.3.0

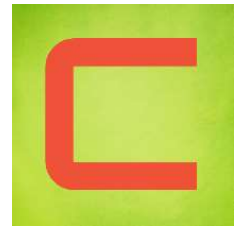
DIRECT SHEAR TEST

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BAKHTI SOFTWARE

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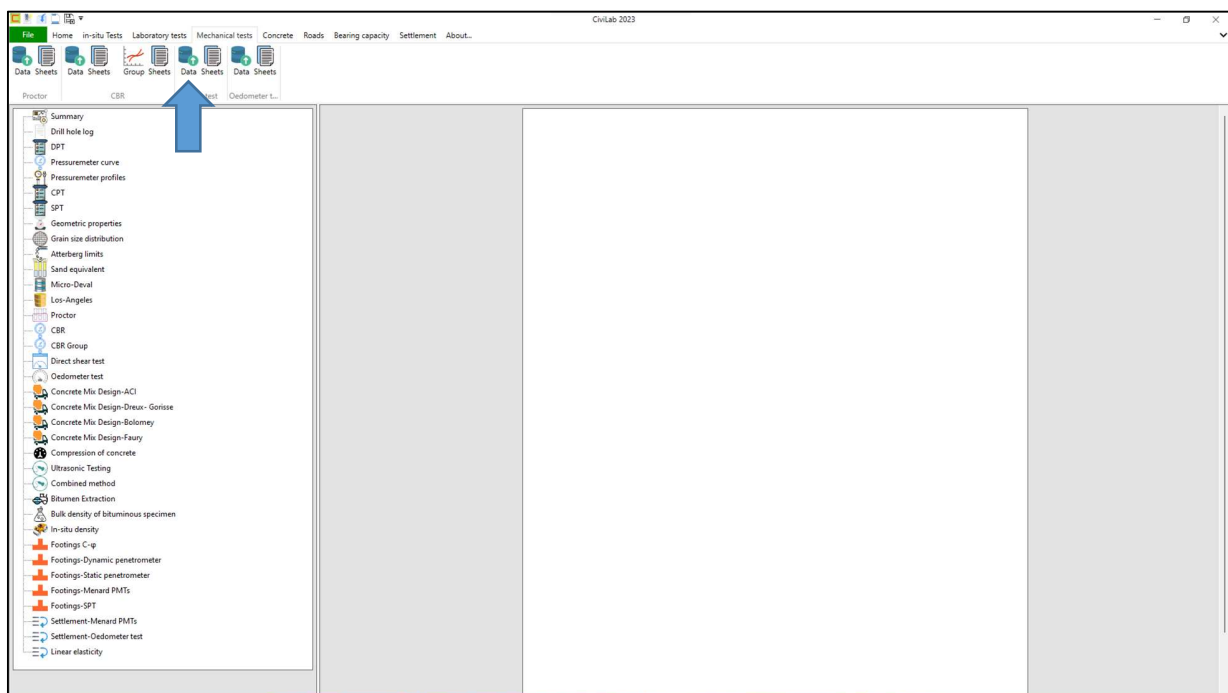
## How to use CiviLab to perform the direct shear test?

### I. Test Data Entry Instructions:

To input test data for shear tests, follow these steps:

**Step 1:** Navigate to the "Mechanical Tests" tab.

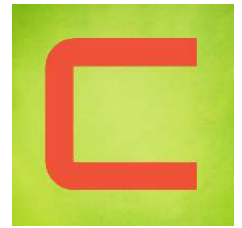
**Step 2:** Within the "Shear Test" panel, click on the "Data" button (Fig1).



**Fig1:** Screenshot of CiviLab 2023

**Step 3:** Enter the required data in the window displayed as follows (Fig2):

**1. Test Name Selection:** Utilize this Combobox to either input a new test name or select an existing one.



**2. Test Information Window:** Click this button to access the Test Information window (Fig3). In this window, you'll find seven text fields to input the necessary information for it to be displayed on the test sheet.

**3. Layer Selection:** Employ this Combobox to choose the appropriate layer for use in the drawing process.

**4. Layer Editor:** Click this button to open the Layer Editor, where you can either create a new layer or modify an existing one.

**5. Test Date Input:** Utilize the date picker to enter the test date.

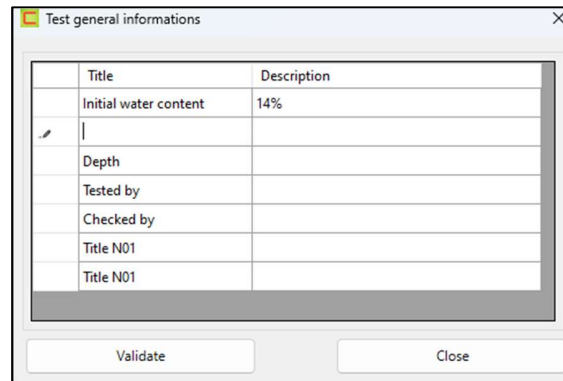
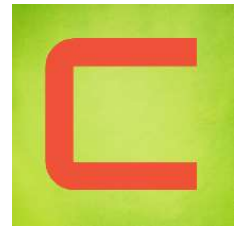
**6. Unit Selection:** Use this Combobox to select the desired unit. For the metric system, you can choose between mm/bars and mm/kPa. For the imperial unit system, only in-lbf/in<sup>2</sup> is available.

The screenshot shows a software window titled "Direct shear test" with a close button (X) in the top right corner. The window contains several input fields and a data table. Numbered callouts (1-19) point to specific elements:

- 1: Test No. dropdown menu
- 2: Plus button for Test No.
- 3: Layer dropdown menu
- 4: Plus button for Layer
- 5: Test date date picker
- 6: Unit dropdown menu (set to in/lbf/in<sup>2</sup>)
- 7: Standard dropdown menu (set to ASTM D3080-04)
- 8: Curve dropdown menu (set to Linear)
- 9: Device Name text field
- 10: Shear rate text field (set to 1)
- 11: Normal stress dropdown menu (set to 1)
- 12: Settlement text field
- 13: Layer dropdown menu (set to Graphs)
- 14: Plus button for Layer
- 15: Data table
- 16: Add/Modify button
- 17: Remove button
- 18: Add/Modify button
- 19: Remove button

	$\Delta L$ (%)	Area (in <sup>2</sup> )	T (lbf)	$\tau$ (lbf/in <sup>2</sup> )
▶	0.01817...	0	0	0
	0.03533...	0	0	0.314814815
	0.06212...	0	0	0.481481481
	0.14311...	0	0	0.796296296
	0.29660...	0	0	1.240740741
	0.52349...	0	0	1.555555556
	0.68686	0	0	1.777777778

**Fig2:** Screenshot of direct shear test data window



**Fig3:** Screenshot of test information window

**7. Standard Selection:** Utilize this dropdown menu to choose the applicable standard from three options (ASTM D 3080-4, NF P 94-071-1, and NA 16218).

**8. Curve Type Selection:** In this dropdown menu, the user can specify the desired curve type for drawing the displacement-shear test curve. Options include linear, cubic spline, cubic spline (Akima), cubic spline (Pchip), and b-spline.

**9. Device Name Input:** Enter the device name in this text field.

**10. Displacement Rate:** In this text field, input the rate of displacement. According to ASTM 3080-4, this value should fall within the range of 0.0001 to 0.04 in/min (0.0025 to 1.0 mm/min).

**11. Settlement Window:** Click this button to access the Settlement window and plot the settlement-time curves (refer to Section II for more details).

**Step 4:** For each normal stress value, do the following:

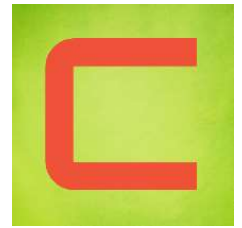
**12. Normal Stress Input:** Utilize this Combobox to either input a new normal stress value or select an existing one. For each normal stress value, follow these steps:

**13. Layer Selection:** Employ this Combobox to select the appropriate layer for use in drawing the shear stress-displacement curve related to the chosen normal stress value.

**14. Layer Editor:** Click this button to access the Layer Editor, allowing you to create a new layer or modify an existing one.

**15. Data Input Table:** In this table, input the following data:

- Displacement (for ASTM D 3080-4, input the relative displacement %).
- Shear stress value (two options available: input the values in the shear stress column or auto-estimate it by adding the specimen's area and shear force).



**16. Save/Modify Data:** Click this button to save or modify all data associated with the selected normal stress.

**17. Delete Normal Stress:** Use this button to delete the chosen normal stress entry.

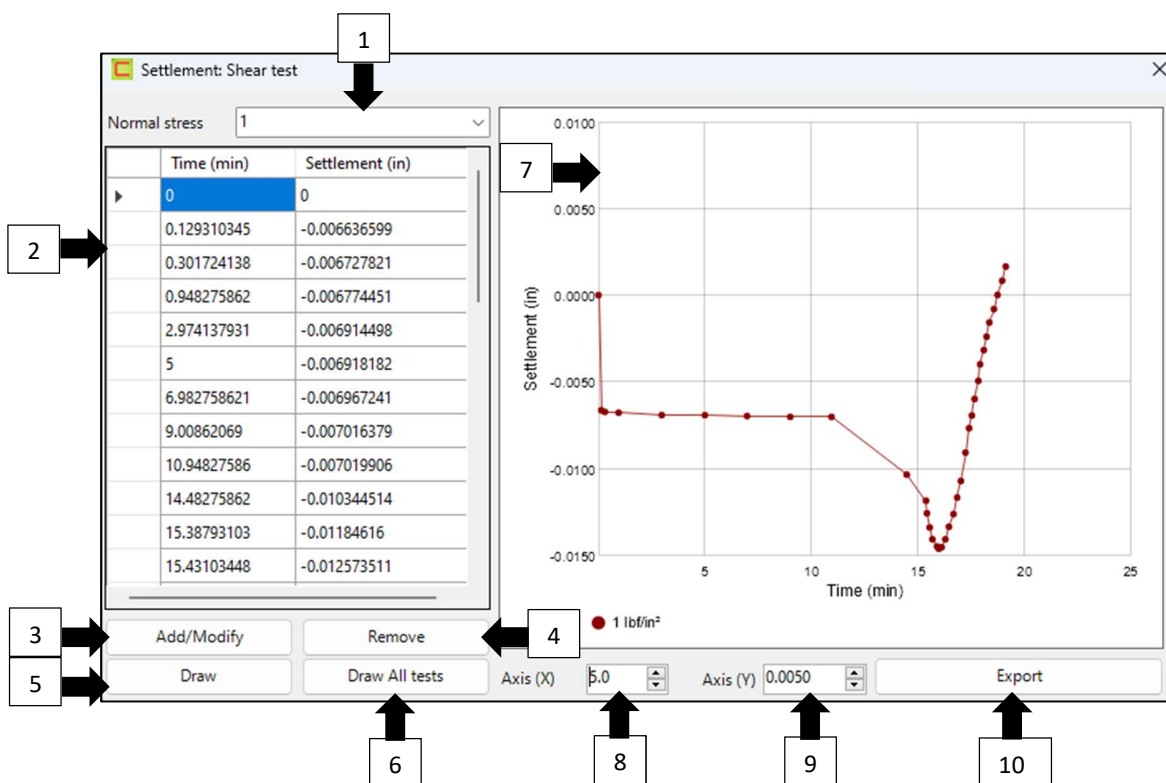
**Step 5:** Finally, click the "Add/Modify" button to save your input.

**18. Save/Modify test:** Click this button to save or modify all data associated with the selected test.

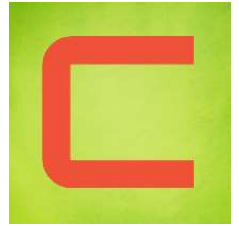
**19. Delete test:** Use this buttons to delete the chosen test.

This sequence of steps will enable you to effectively record the required test data for shear tests.

## II. Settlement Window



**Fig4:** Screenshot of test settlement window



This window (Fig 4) enables the user to create the settlement-time curve. To achieve this, the user should follow the following steps:

- 1. Normal Stress Input:** Utilize this Combobox to either input a new normal stress value or select an existing one. For each normal stress value, follow these steps:
- 2. Data Input Table:** In this table, input the settlement – time data
- 3. Save/Modify Data:** Click this button to save or modify all data associated with the selected normal stress.
- 4. Delete Normal Stress:** Use this button to delete the chosen normal stress entry.
- 5. Draw Curve:** Click this button to create the settlement curve for the selected normal stress.
- 6. Draw All Curves:** Click this button to generate settlement curves for all normal stresses in the list.
- 7. Drawing Zone:** This is where the settlement curve will be visually represented.
- 8. X-Axis Step Adjustment:** Modify the X-axis step or intervals in this section to refine the graphical representation.
- 9. Y-Axis Step Adjustment:** Adjust the Y-axis step or intervals in this section for improved graphical representation.
- 10. Export Graph:** Use this button to export the generated graph for external use or documentation.

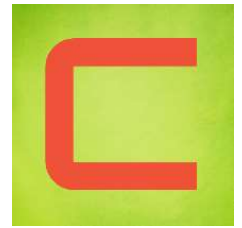
### **III. Add a sheet:**

To create a sheet in the "Shear Test" panel, follow these steps:

**Step 1:** Navigate to the "Mechanical Tests" tab.

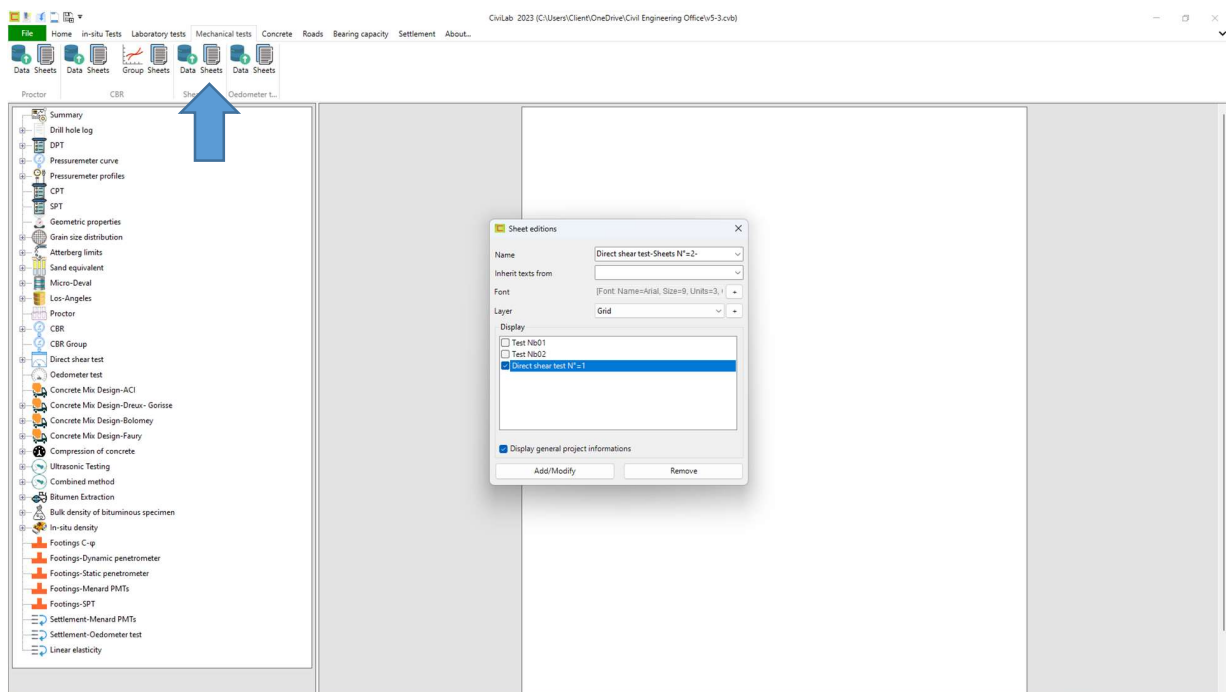
**Step 2:** Within the "Shear Test" panel, click on the "Sheets" button (Fig4).

**Step 3:** Input the following details:



- Sheet name.
- Select the desired font.
- Choose the background drawing layer.
- Select the tests to be included.
- To display general project information, check the corresponding box.
- Finally, click the "Add/Modify" button to save your sheet configuration.

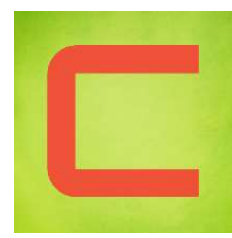
To delete the selected sheet click on remove button



**Fig4:** Screenshot of sheet window

#### **IV. Display the report**

To view the report, simply click on the sheet name within the tree view. For exporting or printing the report, navigate to the "Home" tab and then select the relevant action from the options provided in the outputs panel (either "Print" or "Export").



CivilLab 2023 (C:\Users\Client\OneDrive\Civil Engineering Office\5-3.cib)

File Home In-situ Tests Laboratory tests Mechanical tests Concrete Roads Bearing capacity Settlement About...

Data Sheets Data Sheets Group Sheets Data Sheets Data Sheets

Proctor CBR Shear test Oedometer L...

- Summary
- Drill hole log
- DP
- Pressuremeter curve
- Pressuremeter profiles
- CPT
- SPT
- Geometric properties
- Grain size distribution
- Atterberg limits
- Sand equivalent
- Micro-Deval
- Los-Angeles
- Proctor
- CBR
- CBR Group
- Direct shear test
  - Direct shear test-Sheets N°=1- ←
  - Direct shear test-Sheets N°=2-
- Oedometer test
- Concrete Mix Design-ACI
- Concrete Mix Design-Drean- Garisse
- Concrete Mix Design-Solemy
- Concrete Mix Design-Faury
- Compression of concrete
- Ultrasonic Testing
- Combined method
- Bitumen Extraction
- Bulk density of bituminous specimen
- In-situ density
- Footings C-q
- Footings-Dynamic penetrometer
- Footings-Static penetrometer
- Footings-Menard PMTs
- Footings-SPT
- Settlement-Menard PMTs
- Settlement-Oedometer test

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Project: Suik RN 18 Project No: Ref 0062/2020  
Client: DTP  
Location: Meika  
Date: 2023-11-04  
Liquid Limit: 21.2%

### DIRECT SHEAR TEST

Standard: ASTM D3098-04

Direct shear test N°=1  
Device Name:  
Shear rate= 0.04 in/mm  
Type:  
σ = 1.0 kg/cm²  
σ = 3.0 kg/cm²  
σ = 5.0 kg/cm²  
σ = 1.0 kg/cm² → τ = 2.3 kg/cm²  
σ = 3.0 kg/cm² → τ = 4.8 kg/cm²  
σ = 5.0 kg/cm² → τ = 6.8 kg/cm²

Direct shear test N°=1  
Device Name:  
Shear rate= 0.04 in/mm  
Type:  
σ = 1.3 kg/cm²  
φ = 46.9 degrees

1- Test report :





## BAKHTI Software Ltd

Civil engineering software development

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1

Project: Suivi RN 18

Client: DTP

Location: Medea

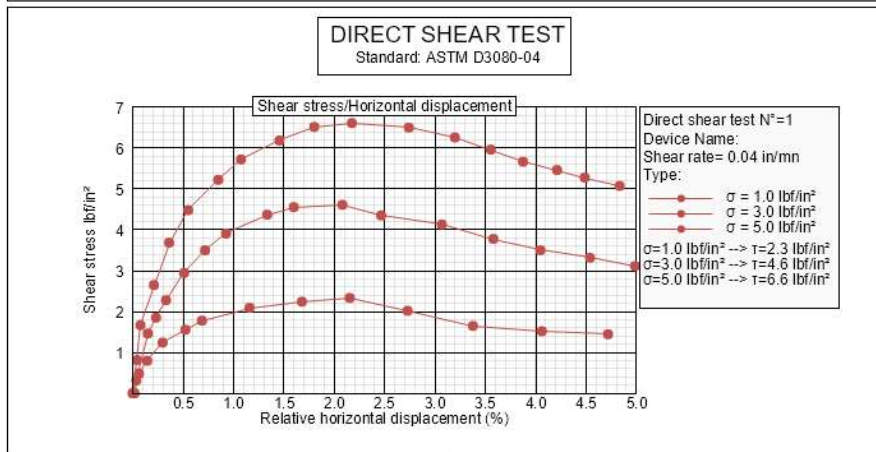
Date: 2023-11-04

Liquid Limit: 21.2%

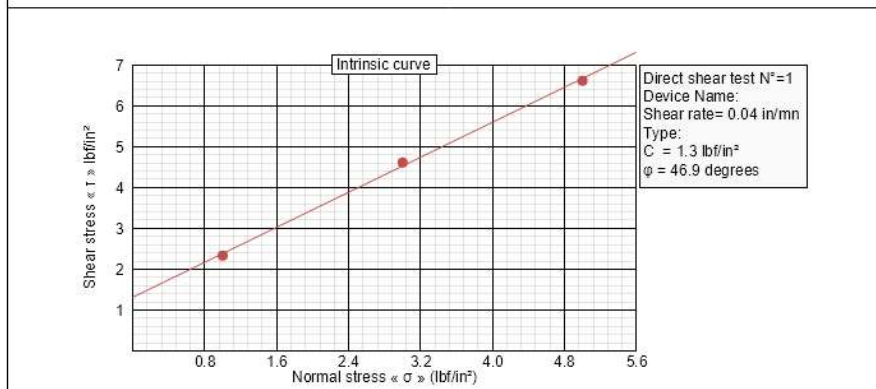
Project No.: Ref 008/2020

2

3



4



Software: CiviLab 2023

**1. Sheet Header Presentation:** To import or modify the sheet header, go to the "Home" tab and select the "Header" button.

**2. Project Name and Reference:** These details can be entered from the project's general information found in the File menu.

**3. Area for Displaying Test Information:** Test information can be input within this area from the Test Information window (Fig3) and project's general information window.

**4. Area for Plotting Curves:** this area is designated to visualize curves and the test results.