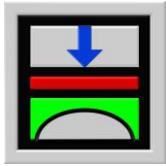


Part H

User's Guide for the program ELPLA-Boring



Determining
contact pressures, settlements, moments
and shear forces of slab foundations by the
method of finite elements

Version 9.2

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1 An overview of ELPLA-Boring

ELPLA-Boring is used to edit and display graphically the boring logs (boring layers, soil material, foundation level and water table). The drawing of the boring logs can be displayed first on the screen, and then can be sent to the printer or plotter. The program draws the soil layers by different symbols according to the German Standard DIN 4023.

ELPLA-Boring can also display the stress in soil under a specified point on the foundation with effective stress beside the corresponding boring log. The stress in soil is used to determine the limit depth of the soil layers.

The drawings, if desired, can be saved as WMF-format files, in which they can be exported to other Windows applications to prepare reports, slide presentations, or add further information.

2 Description of ELPLA-Boring

ELPLA-Boring is a 32-bit, graphical software product that operates under Microsoft Windows 9x/ NT/ ME/ XP. The common "what you see is what you get" of Windows applications makes it easy to learn how to use ELPLA-Boring, especially if you are already familiar with the Windows environment.

The program package ELPLA consists of 7 separate programs. These can be run independently. Name and short description of the seven separate programs are given in Table H-1.

The usage of the program is typically such that first data files are created describing a certain problem by ELPLA-Data, then the project problem is analyzed using ELPLA-Solver. Finally, results can be presented as graphical drawings, graphs and tables using the five separate programs ELPLA-Graphic, ELPLA-Section, ELPLA-List, ELPLA-Boring and GEOTEC-Editor.

Table H-1 Names and descriptions of the seven separate programs

Program name	Description of the program
ELPLA-Data	Editing project data
ELPLA-Solver	Analyzing the project problem
ELPLA-Graphic	Displaying data and results graphically
ELPLA-List	Listing project data and calculated results
ELPLA-Section	Displaying results graphically at specified sections
ELPLA-Boring	Editing and Displaying boring logs graphically
GEOTEC-Editor	A simple text editor program

In order to use ELPLA-Boring, first the user must define the project data by ELPLA-Data, and then must analyze by ELPLA-Solver. Table H-2 gives a list of files, which are read or created by ELPLA-Boring. The files can be classified in four groups.

Table H-2 Names of file groups

Group	Saved from the program
A Main data files	ELPLA-Data
B Boring files (*.BOR)	ELPLA-Boring
C Project data files	ELPLA-Data
D Final result files	ELPLA-Solver

Further more, Table H-3 shows filenames, contents and groups of all files that may be read or created by ELPLA-Boring.

Table H-3 Names and contents of files

A Main data files

Filename	Contents
FIRMA	Firm header
STEU	Default directory for files that are saved by ELPLA
NOFORMAT	Number formats
UNITS	System of units

B Boring files

Filename	Contents
LINEFORM. BOR	Line formats
FONT. BOR	Font data
LEGENDE. BOR	Legend data
PAINT. BOR	Fill color data
PLOTPAR. BOR	Plot parameters
NODISPLA. BOR	Data of display values
ORDINATE. BOR	Max. width data

C Project data files

Filename	Contents
*. AUF	3 lines text to identify the project
*. P21	Data of slab properties/ levels/ coordinates
*. BAU	Soil properties
*. LDH	Data of the limit depth

D Final result files

Filename	Contents
*. LD1	Results of the limit depth

The asterisk (*) matches any filename with the specified extension.

3 Starting ELPLA-Boring

Start ELPLA-Boring by clicking on the program icon. The introduction screen (Figure H-1) appears.

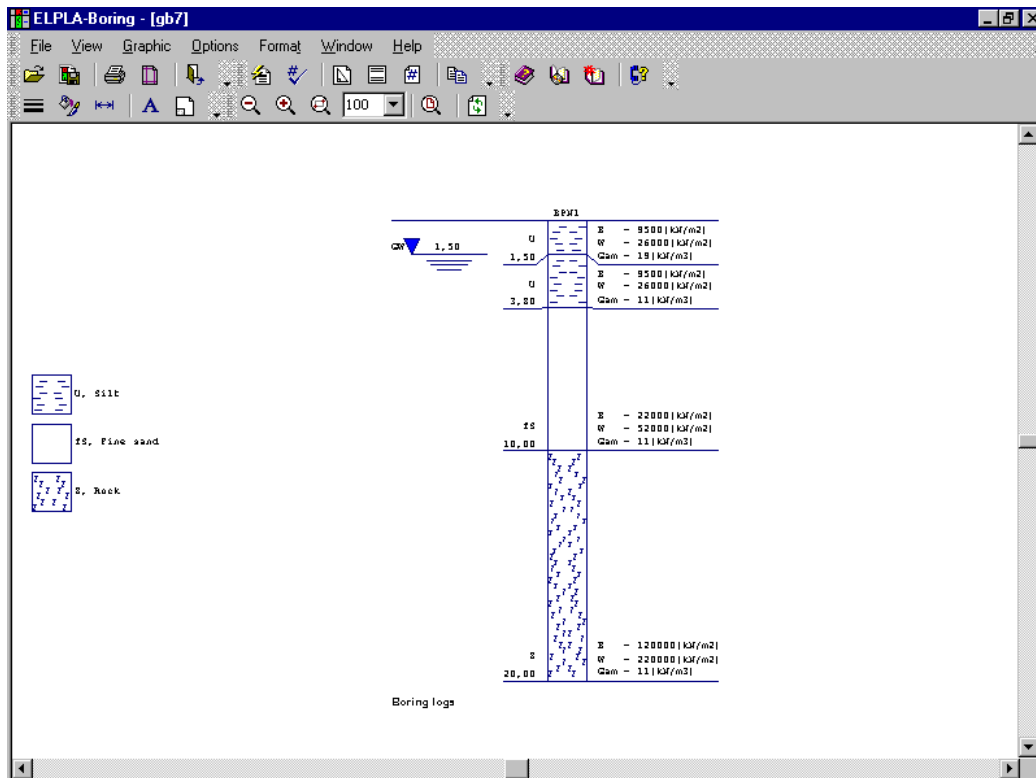


Figure H-1 Introduction screen of ELPLA-Boring

The menu head of Figure H-1 contains the following 7 commands:

- File
- View
- Graphic
- Options
- Format
- Window
- Help

After clicking one of the seven menu commands, other sub-commands or options become available. The seven menu commands and their sub-commands are presented and described in the following paragraphs 4 to 11.

4 File Menu

The File Menu commands are:

- Open
- Make WMF-File
- Print
- Page setup
- Files 1, 2, 3, 4
- Exit

4.1 File Menu—"Open" command

By "Open" command the current project is closed, if one is loaded, and an existing project is opened. Figure H-2 shows "Open" Dialog box used to open a specified project.

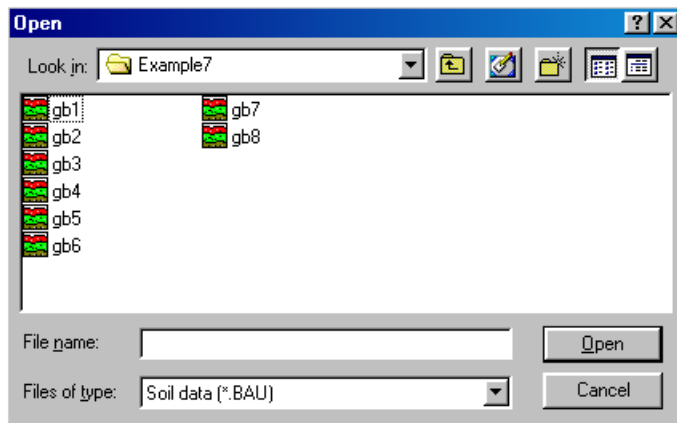


Figure H-2 "Open project" Dialog box

4.2 File Menu—"Make WMF-File" command

By "Make WMF-File" command the drawing can be saved in a format that can be read by other programs. This feature allows you to include your drawing in reports and presentations and to enhance the drawing using other drawing or CAD software packages. The drawing can be exported in the Windows Metafile (WMF) format.

Figure H-3 shows the "Save as" Dialog box used to export the drawing with the filename you wish to give the exported file, including extension and the directory in which to save the file. If the file name already exists, you may select to overwrite the existing file.

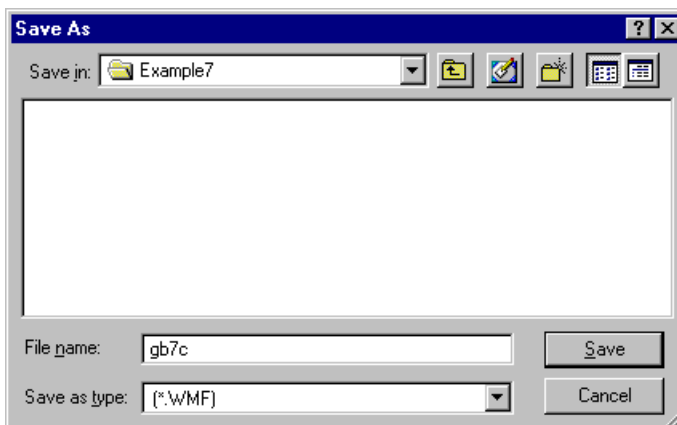


Figure H-3 "Save as" Dialog box

4.3 File Menu—"Print" command

By "Print" command data and results can be graphically plotted or printed. Only the objects currently displayed on the drawing are printed. Figure H-4 shows "Print" Dialog box. The printer group box contains controls for selecting the printer and changing its properties. Use "Name" Combo box to select the printer and use "Properties" Button to set printer settings. The number of printing copies can be defined in "Copies" Input box.

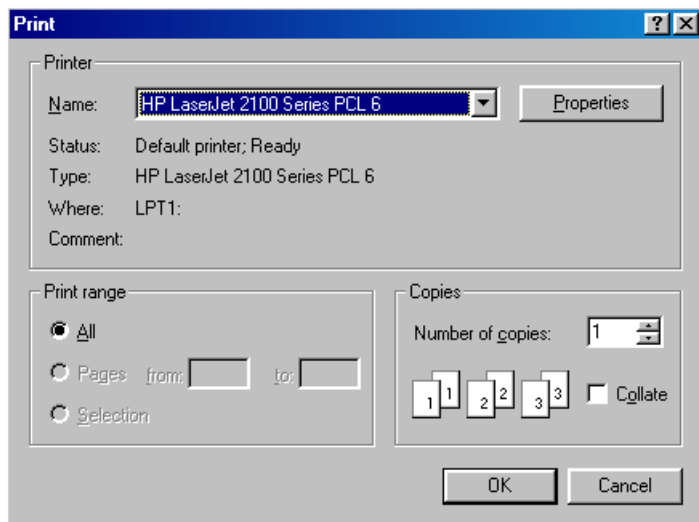


Figure H-4 "Print" Input box

4.4 File Menu—"Page setup" command

By "Page setup" command the standard "Page setup" Dialog box can be displayed with options to specify the printer, page orientation, paper size, and paper source, as well as other printing options (Figure H-5).

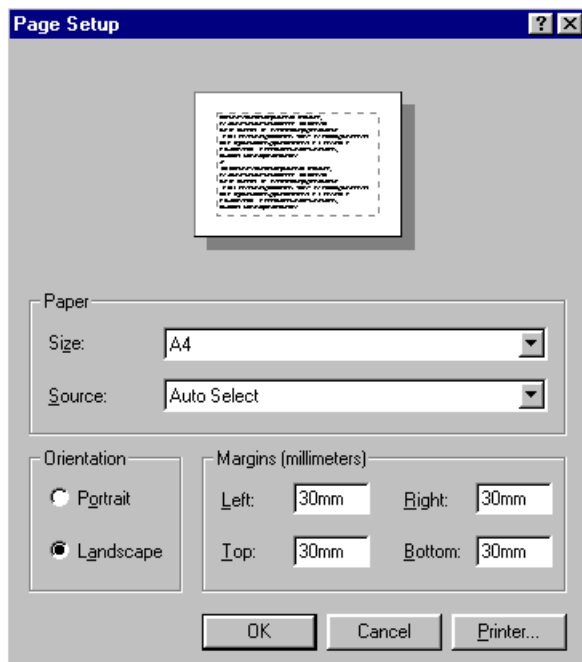


Figure H-5 "Page setup" Dialog box

4.5 File Menu—"Files 1, 2, 3, 4" command

By "Files 1, 2, 3, 4" command the user can open one of the last four loaded projects.

4.6 File Menu—"Exit" command

By "Exit" command the current project is closed and ELPLA-Boring is quitted, Figure H-6.

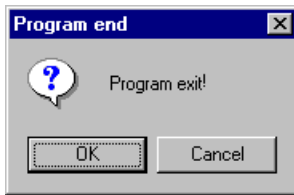


Figure H-6 "Exit" Message box

5 View Menu

The View Menu commands are:

- Status bar
- Tool bars

5.1 View Menu—"Status bar" command

"Status bar" command displays a status bar on the screen down. The status bar displays information about the progress of the current operation.

5.2 View Menu—"Tool bars" command

"Tool bars" command displays tool bars located just below the menu head. Tool bars contain icons of program menus.

6 Graphic Menu

The graphic menu is the main menu, used to display the specified drawing. The Graphic Menu command is:

- Drawing boring logs/ Limit depth

6.1 Graphic Menu—"Boring logs/ Limit depth" command

By this command the boring logs (boring layers, soil material, foundation level and water table) can be displayed. The stress in soil under the foundation with effective stress can be displayed beside the corresponding boring log. The stress in soil is used to determine the limit depth of the soil layers.

When "Drawing boring logs/ Limit depth" command is chosen, the selection Dialog box shown in Figure H-7 appears. In this Dialog box select the boring logs or the limit depths to draw, then click "OK" Button. Figure H-8 shows boring logs, while Figure H-9 shows a limit depth of soil layers.

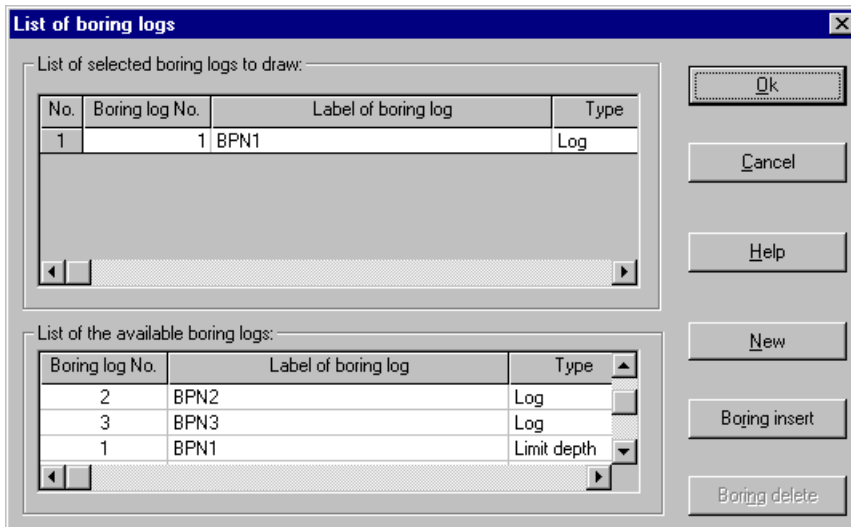


Figure H-7 "List of borings" Dialog box

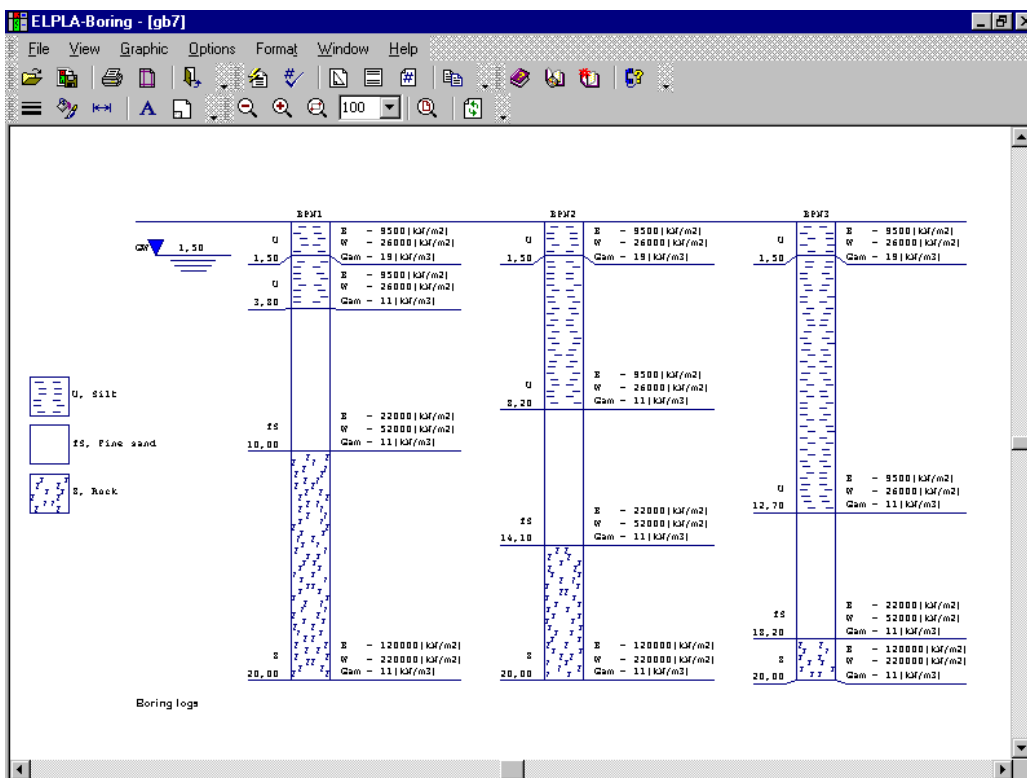


Figure H-8 Drawing of 3 borings with multi-layers and different soil material

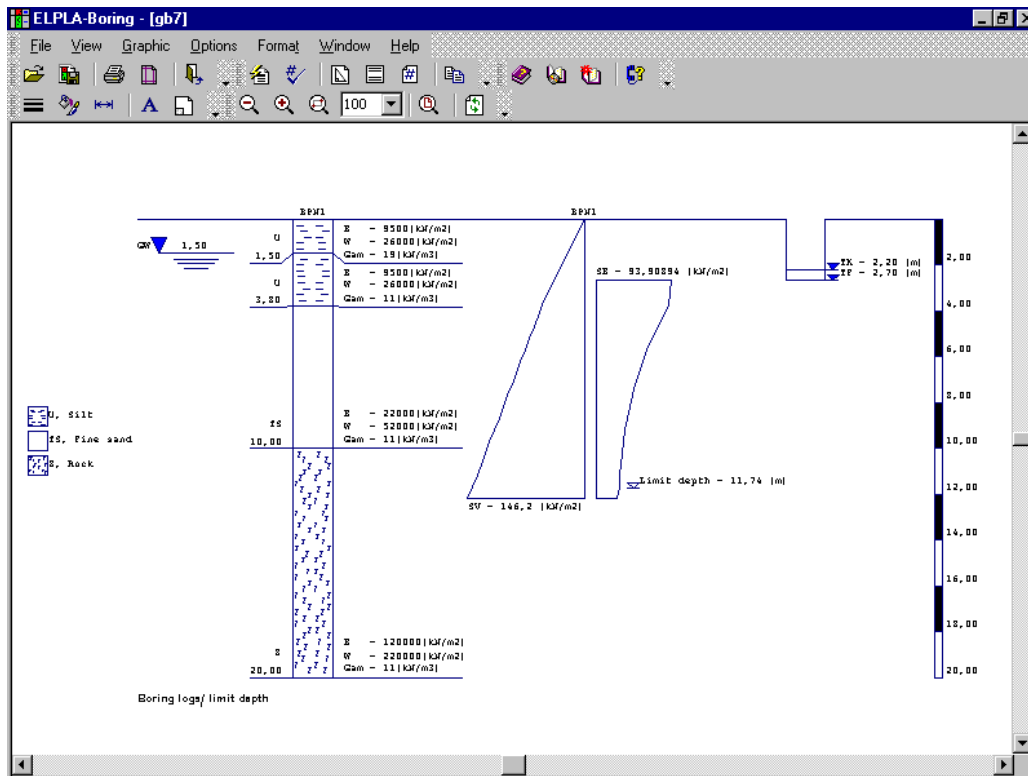


Figure H-9 Limit depth of the soil layers

7 Options Menu

The Options menu has the following commands:

- Plot parameters
- Display values
- Scale
- Title
- Page No.
- Copy

7.1 Options Menu—"Plot parameters" command

Figure H-10 shows the parameters, set as default values by the program, or specified by the user.

- Color soil layers
- Draw the water table
- Simple drawing of boring logs
- Setting soil colors according to DIN 4023
- Display soil properties C, Phi and Nue
- Color foundation
- Draw foundation
- Draw measurement bar
- Color limit depth
- Page with frame

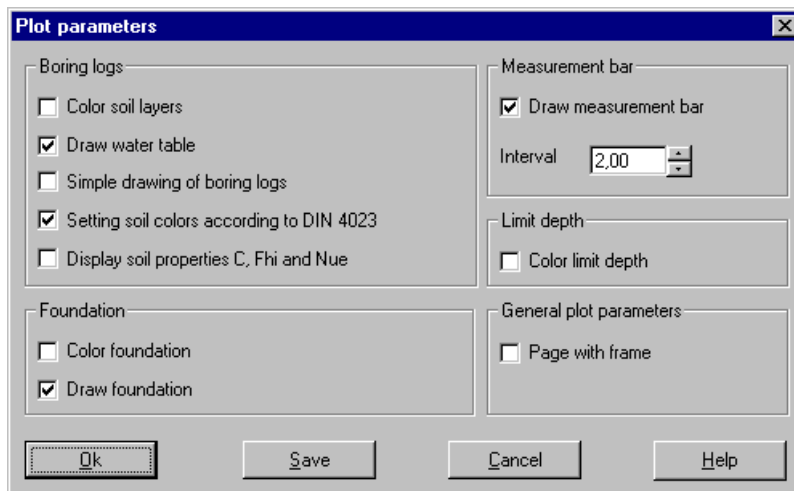


Figure H-10 "Plot parameters" Dialog box

7.2 Options Menu—"Display values" command

By "Display values" command the values of the following items can be displayed, if desired, on the drawing (Figure H-11):

- Label of the boring
- Layer description
- Layer depth
- Display text of soil symbols
- Measurement bar
- Foundation
- Water level
- Limit depth
- Stress value

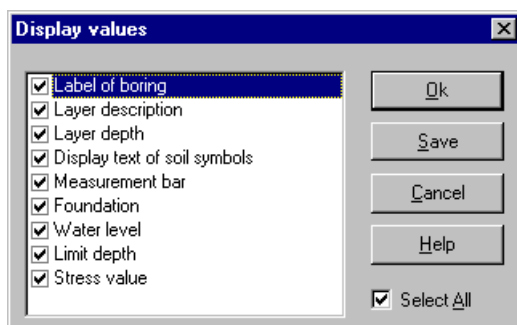


Figure H-11 "Display values" Dialog box

7.3 Options Menu—"Scale" command

By "Scale" command the scale of the drawing can be defined as shown in Figure H-12. The defaulted value for the scale factor is chosen to pass the active printer-paper format.

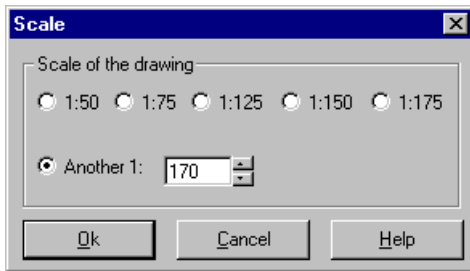


Figure H-12 "Scale" Dialog box

7.4 Options Menu—"Title" command

By "Title" command the text data (two line texts above the drawing and two line texts under the drawing) can be defined, Figure H-13.

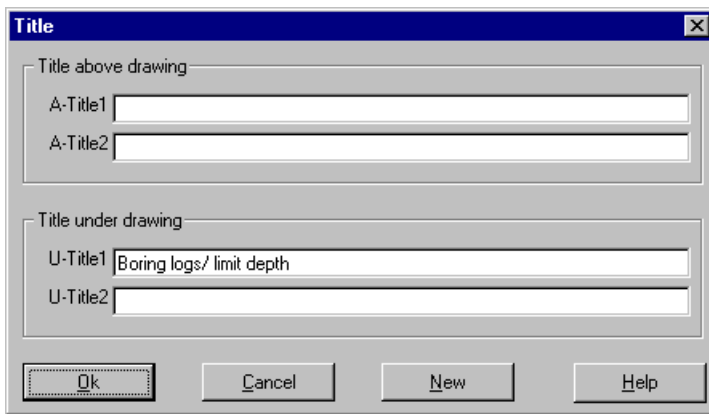


Figure H-13 "Title" Dialog box

7.5 Options Menu—"Page No." command

By "Page No." command the page No. can be defined, Figure H-14.

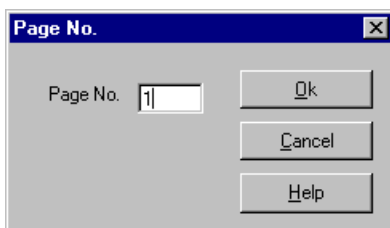


Figure H-14 "Page No. " Dialog box

7.6 Options Menu—"Copy" command

By "Copy" command the current drawing can be copied in Metafile-Format to Clipboard. Then it can be inserted directly to other Windows programs such as Word, WordPerfect and AutoCAD.

8 Format Menu

The Format menu has the following commands:

- Line formats
- Fill color
- Max. width
- Font
- Legend

8.1 Format Menu—"Line formats" command

Color, style and thickness of drawing lines can be defined (Figure H-15). The way a line is drawn depends on the setting of the color and style properties. 15 different colors and 5 styles for line formats are available. The following list shows the available lines, which can be formatted:

- Identification box
- Page boundary
- Boring boundary
- Soil layer levels
- Soil symbols
- Groundwater
- Foundation
- Measurement bar
- Limit depth

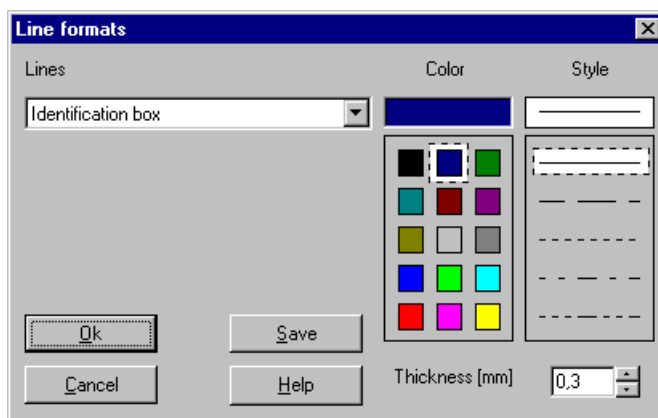


Figure H-15 "Line formats" Dialog box

8.2 Format Menu—"Fill color" command

The following list shows available items, which can be filled with a specified color, Figure H-16:

- Groundwater
- Foundation
- Measurement bar
- Stress due to foundation
- Stress from neighboring foundations
- Stress from soil weight

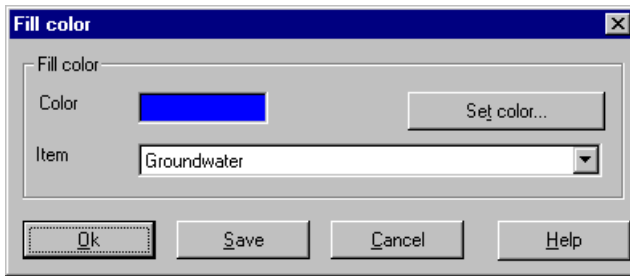


Figure H-16 "Fill color" Dialog box

8.3 Format Menu—"Max. width" command

By "Max. width" command the maximum width for the drawing can be defined, Figure H-17.

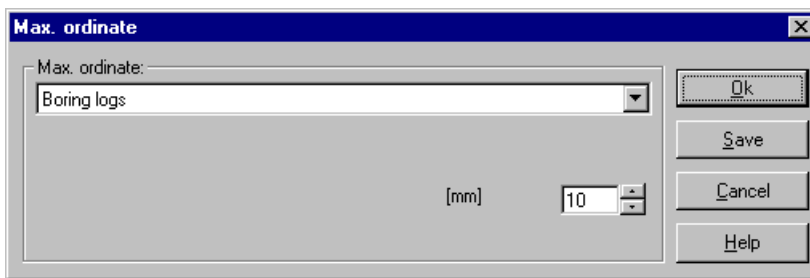


Figure H-17 "Max. width" Dialog box

8.4 Format Menu—"Font" command

By "Font" command the font size (Figure H-18) and font type (Figure H-19) for the drawing can be defined.

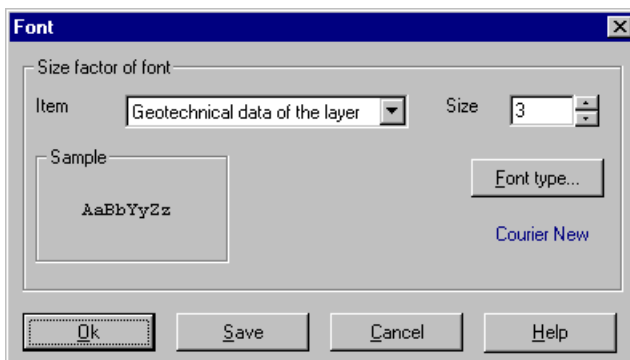


Figure H-18 "Font size" Dialog box

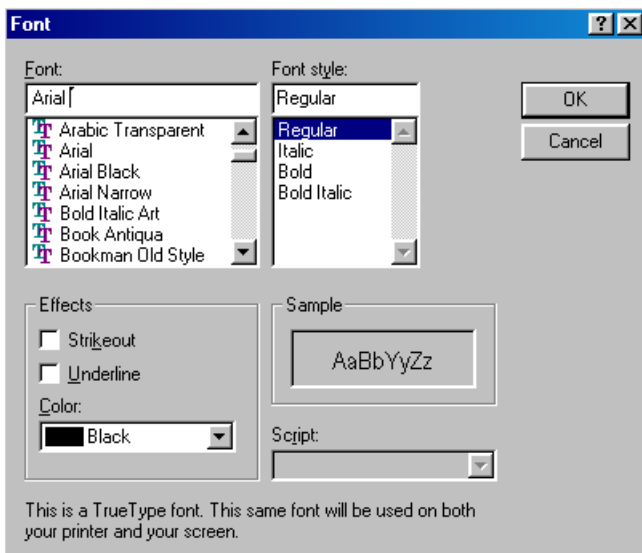


Figure H-19 "Font type" Dialog box

8.5 Format Menu—"Legend" command

By "Legend" command height and width of legends can be specified as shown in Figure H-20. Also the legend that you wish to display can be chosen.

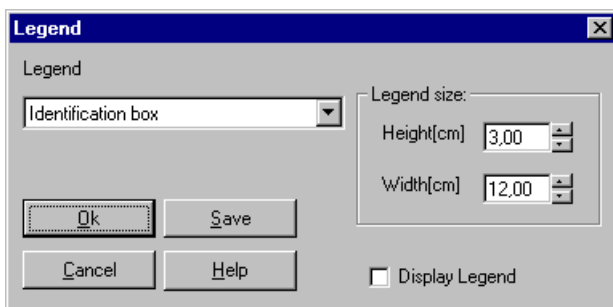


Figure H-20 "Legend" Dialog box

9 Window Menu

The Window menu has the following commands:

- Zoom in
- Zoom out
- Zoom window
- Zoom %
- Original size

9.1 Window Menu—"Zoom in" command

By "Zoom in" command the size of the drawing on the screen can be reduced.

9.2 Window Menu—"Zoom out" command

By "Zoom out" command the size of the drawing on the screen can be increased.

9.3 Window Menu—"Zoom window" command

By "Zoom window" command the size of the drawing on a specified area can be increased.

9.4 Window Menu—"Zoom %" command

By "Zoom %" command the size of drawing on the screen can be specified (Figure H-21). Choosing "Zoom %" allows you to increase or decrease the size at which the drawing is displayed. Choosing 100% displays the drawing at its original size. Clicking on the percentage, changes the drawing size to the specified percentage. The drawing can be displayed at any size by typing the desired percentage in the specified Edit box.

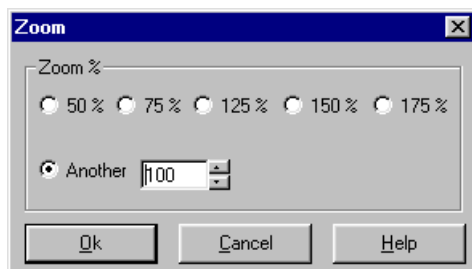


Figure H-21 "Zoom %" Dialog box

9.5 Window Menu—"Original size" command

The commands "Zoom in", "Zoom out" and "Zoom %" can change the size of drawing on the screen. The drawing can be displayed in its original size again using "Original size" command.

10 Help Menu

The Help Menu commands are:

- Contents
- Short description of ELPLA
- New in ELPLA
- About ELPLA-Boring

10.1 Help Menu—"Contents" command

"Contents" command displays a help file in HTML-Format containing the complete ELPLA User's Guide, Figure H-22.

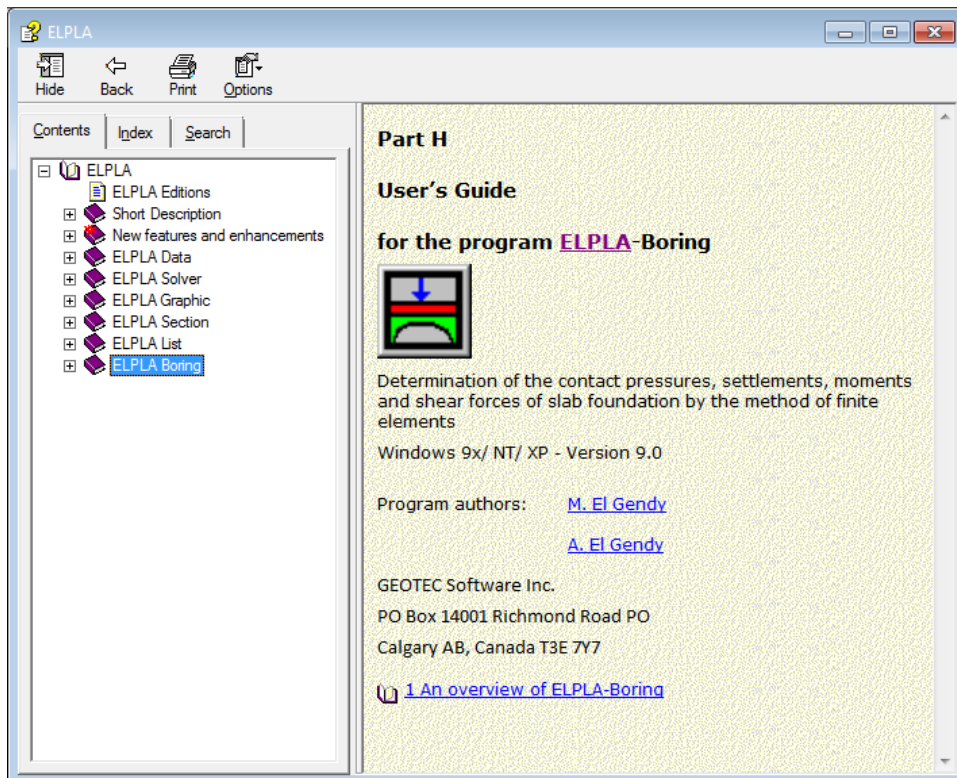


Figure H-22 Menu "Contents"

10.2 Help Menu—"Short description of ELPLA" command

"Short description of ELPLA" command gives a short description of ELPLA package.

10.3 Help Menu—"New in ELPLA" command

"New in ELPLA" command summarizes the new features and enhancements in ELPLA.

10.4 Help Menu—"About ELPLA-Boring" command

The command, as shown in Figure H-23, gives information about ELPLA-Boring.

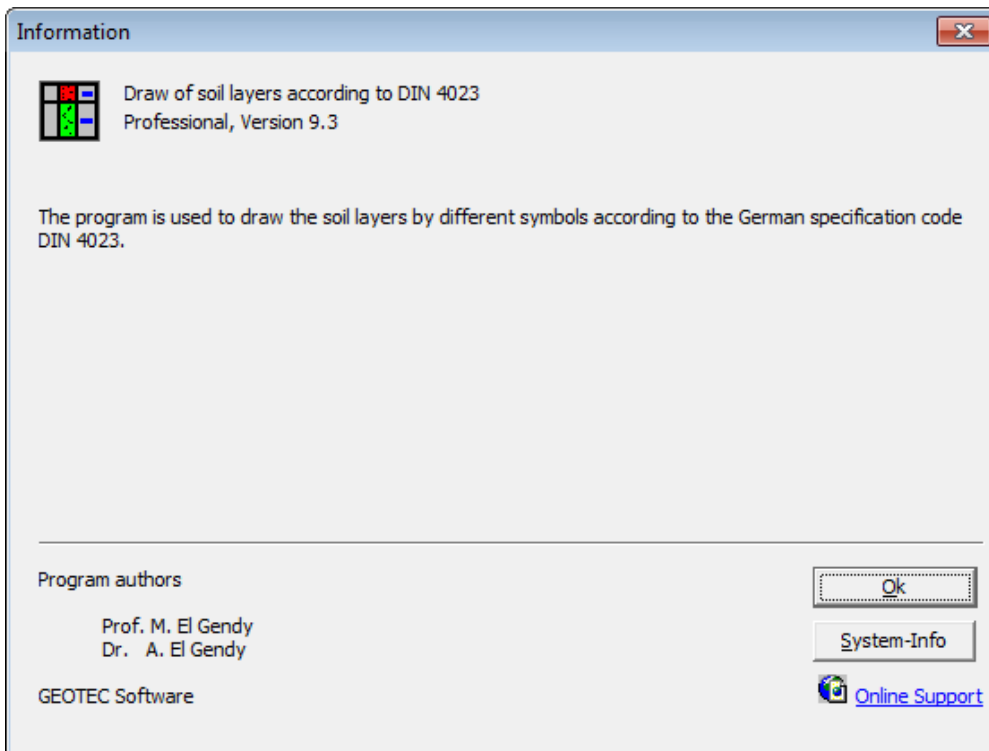


Figure H-23 Information form of ELPLA-Boring

11 Tips and Tricks

11.1 Keyboard

The user can obtain all menu titles and commands also through Shortcut keys. The action of the Shortcut keys is listed in Table H-4 to Table H-11:

Table H-4 Shortcut keys of menu head

Shortcut keys	Action
[Alt+f]	Calling menu head "File"
[Alt+v]	"View"
[Alt+g]	"Graphic"
[Alt+o]	"Options"
[Alt+t]	"Format"
[Alt+w]	"Window"
[Alt+h]	"Help"

Table H-5 Shortcut keys of File-Command

Shortcut keys	Action
[Ctrl +o] or [Alt+f] then [o]	Calling command "Open"
[Alt+f] then [w]	"Make WMF-File"
[Ctrl +p] or [Alt+f] then [p]	"Print"
[Alt+f] then [u]	"Page setup"
[Alt+f] then [1]	Calling the first project from the last four loaded projects
[Alt+f] then [2]	Calling the second project from the last four loaded projects
[Alt+f] then [3]	Calling the third project from the last four loaded projects
[Alt+f] then [4]	Calling the fourth project from the last four loaded projects
[Ctrl+q] or [Alt+f] then [x]	Calling command "Exit"

Table H-6 Shortcut keys of View-Command

Shortcut keys	Action
[Alt+v] then [b]	Calling command "Status bar"
[Alt+v] then [t]	"Tool bars"
[Alt+v] then [t], then [f]	"Tool bars-File"
[Alt+v] then [t], then [g]	"Tool bars-Graphic"
[Alt+v] then [t], then [o]	"Tool bars-Options"
[Alt+v] then [t], then [t]	"Tool bars-Format"
[Alt+v] then [t], then [w]	"Tool bars-Window"
[Alt+v] then [t], then [h]	"Tool bars-Help"
[Alt+v] then [t], then [r]	"Reset Toolbar"

Table H-7 Shortcut keys of Graphic-Command

Shortcut keys	Action
[Alt+g] then [o]	Calling command "Drawing boring logs/ Limit depth"

Table H-8 Shortcut keys of Options-Command

Shortcut keys	Action
[Alt+o] then [l]	Calling command "Plot parameters"
[Alt+o] then [d]	"Display values"
[Alt+o] then [s]	"Scale"
[Alt+o] then [t]	"Title"
[Alt+o] then [p]	"Page No."
[Alt+o] then [c]	"Copy"

Table H-9 Shortcut keys of Format-Command

Shortcut keys	Action
[Alt+t] then [l]	Calling command "Line formats"
[Alt+t] then [i]	"Fill color"
[Alt+t] then [x]	"Max. width"
[Alt+t] then [f]	"Font"
[Alt+t] then [d]	"Legend"

Table H-10 Shortcut keys of Window-Command

Shortcut keys	Action
[Alt+w] then [i]	Calling command "Zoom in"
[Alt+w] then [o]	"Zoom out"
[Alt+w] then [w]	"Zoom window"
[Alt+w] then [z]	"Zoom %"
[Alt+w] then [r]	"Original size"

Table H-11 Shortcut keys of Help-Command

Shortcut keys	Action
[Alt+h] then [c]	Calling command "Contents"
[Alt+h] then [s]	"New in ELPLA"
[Alt+h] then [n]	"Short description of ELPLA"
[Alt+h] then [a]	"About ELPLA-Boring"

11.2 Mouse

By double-clicking the left mouse Button on a specified screen position, the user can obtain the almost menu of the program.

- By double-clicking on *legend*, *firm header*, *title* or *project identification*, the corresponding menu appears
- By double-clicking on *scale* in the identification box, "Scale"-Menu appears
- By double-clicking on *file name* in the identification box, "Open"-Menu appears
- By double-clicking on *page No.* in the identification box, "Page No."-Menu appears
- By clicking the right mouse Button at any position on the screen, the user can also obtain the "Popup-Options"-Menu, Figure H-24

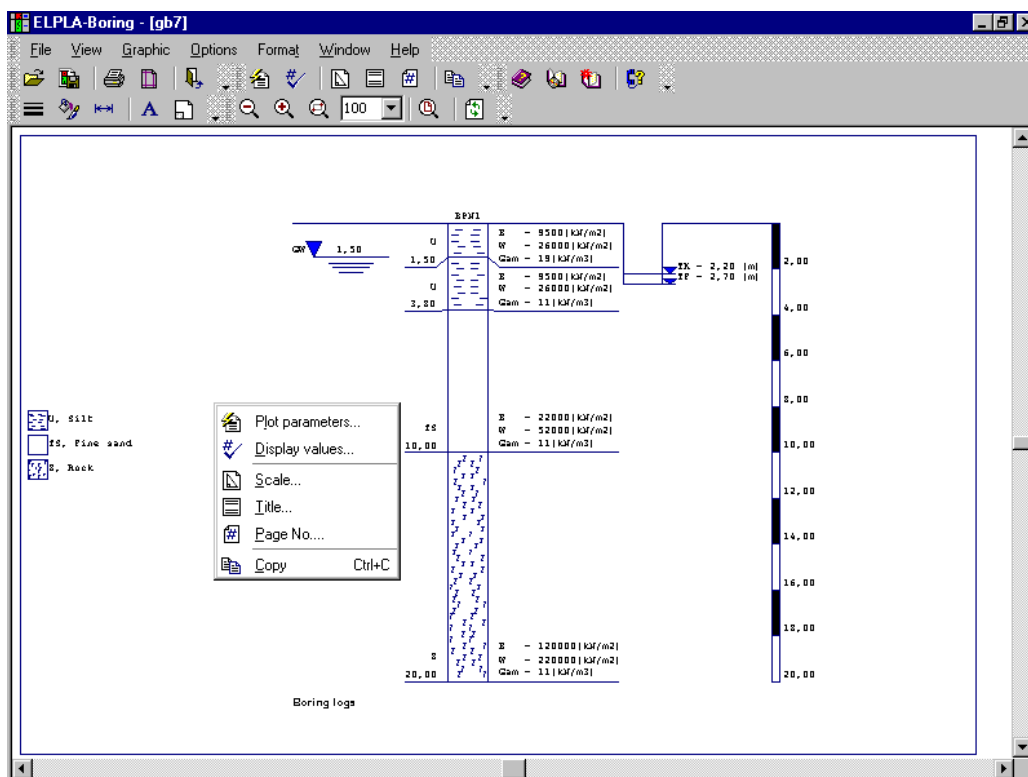


Figure H-24 Menu "Popup-Options"

12 Samples for graphical drawings using ELPLA-Boring

ELPLA-Boring draws the soil layers by different symbols, where the same layers are presented with the same symbols for easy identification. For drawing the boring logs, the main symbols of German specification code are considered in ELPLA-Boring. It is possible to draw a total number of 46 soil and rock arts in boring logs according to German Standard DIN 4023.

Samples for symbols of soil layers according to German Standard DIN 4023 are presented in page P1. The pages P2 to P3 show also some graphical presentations of boring logs and limit depth according to Table H-12 and Table H-13.

12.1 Graphical drawings of boring logs

Table H-12 Boring logs

Presentation	Page
Boring logs according to DIN 4023	P1
Simple presentation of boring logs	P2

12.2 Graphical drawings of limit depth

Table H-13 Limit depth

Presentation	Page
Limit depth	P3

13 Reference

- [1] DIN 4023. Baugrund- und Wasserbohrungen. Zeichnerische Darstellung der Ergebnisse
Beuth-Verlag, Berlin 1984

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