SOLPLAN

FOUNDATION ANALYSIS SOFTWARE

PILE GROUP ANALYSIS · THREE-DIMENSIONAL, NONLINEAR

Solgroup

Release Notes

Scope, requirements and known limitations of release 1.0.10.

Release **1.0.10** · Document **SPL-SG-004** · Revision **A**

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Solgroup documentation set

No.	Title	Content
SPL-SG-001	Solgroup — End-User Licence Agreement	Terms under which Solgroup is licensed to its users.
SPL-SG-002	Solgroup — User Manual	Building, running and reporting three-dimensional pile group analyses with Solgroup.
SPL-SG-003	Solgroup — Technical Reference	Pile-group mechanics, soil-response curves, cap models, numerical solution and verification.
SPL-SG-004	Solgroup — Release Notes	Scope, requirements and known limitations of release 1.0.10.
SPL-SG-005	Solgroup — Third-Party Software Notices	Open-source components distributed with Solgroup and their licences.

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1 About this release

Product	Solgroup — three-dimensional analysis of pile groups under lateral and axial load
Release	1.0.10
Release date	2026-11-15
Release type	Update of release 1.0.0
Publisher	Solplan
Licence terms	End-User Licence Agreement SPL-SG-001

Solgroup computes the response of a group of piles joined by a pile cap to forces and moments in three dimensions. Each pile is modelled as a beam-column supported by nonlinear soil springs: lateral p-y curves, axial load–settlement curves along the shaft and at the tip, and torsional curves. The cap is either rigid or flexible; a flexible cap is represented by plate elements connected to the pile heads. The program solves the equilibrium of the cap and of every pile together and reports the movement of the cap, the forces at each pile head and the deflection, forces and soil reaction along each pile. This document summarises what the release contains, what it needs to run, and the limits that users should know before relying on its results.

2 Capabilities

Table 2.1 — Capabilities of release 1.0.10

Area	Content
Analysis	Nonlinear three-dimensional analysis of a pile group under forces and moments on the cap, loads on joints and along piles, distributed loads on a flexible cap, and free-field soil movement. Rigid or flexible cap. Load patterns, load cases and load combinations (linear add, analysed again with the factored loads, and envelope); a choice of the cases to run. Batch analysis of several project files.
Special analyses	Pushover of the group under increasing load, and the stiffness of the foundation (the cap force–displacement relation for each degree of freedom), with result plots.
Piles	Vertical and battered piles of any position, length and orientation; driven piles and drilled shafts; sections that change along the length; elastic sections and nonlinear sections of reinforced concrete, steel and prestressed concrete with moment–curvature relations; head connections from fixed to pinned; local axes; segmentation; a sloping ground surface, or a ground surface elevation for an individual pile; axial load reduction and lateral reduction factors.
Soil	Layers with lateral p-y models for clay (soft clay, soft clay with a user constant J, modified soft clay with an initial modulus, stiff clay with and without free water, stiff clay with a user modulus), sand (Reese, API), liquefied sand (with a hybrid model), silt and cemented sand, weak, strong and massive rock, residual soil of the Piedmont region, loess, an elastic subgrade and user-defined p-y curves. Axial load–settlement curves generated from the soil or entered by the user; torsional curves derived from the axial curves or entered by the user; lateral group effects by p-multipliers; correction for layered soil.
Cap	Rigid cap with six degrees of freedom; flexible cap of plate elements, generated in the program from the cap outline or imported with the model; cap sections of given thickness and material; soil resistance of an embedded cap.
Modelling	Templates for rectangular, staggered, triangular, line, circular (one or several rings), radial batter and trestle groups, and a group read from a table; drawing and editing tools, grids and coordinate systems; plan, elevation and 3D views in up to four panes; a model explorer, a property panel and a workflow panel; a model check before each run.

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Area	Content
Results and reports	Deformed shape, force diagrams and contours on the model; forces, moments, deflection and soil reaction along each pile; cap response; special plots; printed p-y curves; result tables. Text reports (input echo, output, summary); a report builder that writes Word, PDF and Excel reports from selected sections, tables and charts; model and result tables to CSV and Excel; graphs to Excel; images of the views.
Data exchange	Import of model tables from CSV or Excel, and of a single-pile model of Solpile (.lpx) for its sections and soil.
Units	Six unit systems for input and output (kN, m; kgf, m; tonf, m; N, mm; kip, in; kip, ft), with conversion of a complete project.

3 System requirements

Table 3.1 — System requirements

Item	Minimum	Recommended
Operating system	Windows 10, 64-bit	Windows 11, 64-bit
Processor	x86-64, 2 cores	4 cores or more (the pile analyses of a group run in parallel)
Memory	4 GB	8 GB or more for groups of several hundred piles or a fine flexible-cap mesh
Disk space	1 GB for the program and its libraries	2 GB
Display	1280 × 720 pixels	1920 × 1080 pixels or more
Network	Required while Solgroup is in use, for licence validation (EULA SPL-SG-001, clause 4). A licence can be borrowed for use without a connection for up to 30 days.	
Office software	Optional; only to open exported Word and Excel reports	

4 Installation and upgrade

1. Run Solgroup-1.0.10-Setup.exe and accept the End-User Licence Agreement. Setup needs administrator rights and installs into C:\Program Files\Solplan\Solgroup. Its options are: open .ggp project files with Solgroup (on by default) and a desktop shortcut (off by default).
2. Start Solgroup from the Start menu (**Solplan ▸ Solgroup**) or by double-clicking a project file.
3. When Solgroup starts, sign in with your solplan.id account, with its e-mail address and password or with Google. Solgroup licences are listed under **Account ▸ Licences** at solplan.id, where a 7-day trial (results can be viewed but not exported) can be started, once per program. A Solgroup licence is separate from a licence of another Solplan program.

An upgrade is installed over the previous release with the new Setup; uninstall from Windows **Settings ▸ Apps** or from the Start menu. Project files (.ggp) and user settings are kept in both cases. Before relying on results of work in progress, open each project in the new release and re-run it; the section “Changes to computed results” of the release notes states whether results may differ.

5 Files and compatibility

Table 5.1 — Files used by Solgroup

File or folder	Content

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File or folder	Content
`*.ggp`	Project file: compressed JSON text. Saved atomically: a failed save does not damage the previous file. The results are not stored; they are computed again by a run.
`*.autosave.ggp`	Recovery copy written while a model is edited. When Solgroup starts after an interruption it offers to restore the copy.
`Windows registry, HKCU\Software\Geostruktur\GeoGroup`	User preferences (window layout, units of new models, recent files). The names are retained from development builds so that existing settings continue to apply.
`%APPDATA%\Geostruktur\Solgroup`	Recovery copies of unnamed models and the log folder logs.
`%LOCALAPPDATA%\GeoGroup`	Program cache, created on the first run. It can be deleted; it is created again.

6 What is new in 1.0.10

- **Layer boundaries at a pile node**: a pile node that lies exactly on a soil-layer boundary, or a pile ground surface exactly at the pile head below the top of the soil, now takes the same soil properties as the reference solutions of the method. This affects a battered pile whose head lies on a boundary, a weak rock or elastic subgrade layer above another soil, a cemented silt below a layer without lateral resistance, a weak rock layer with a single node, and a massive rock layer below a boundary node.
- **Ground surface at the bottom of the first layer**: a pile whose ground surface lies exactly at the bottom of the first soil layer is analysed as in release 1.0.8 again.

6.1 Release 1.0.9

- **Refined analysis rules**: the soil models and the iteration of the group were reviewed against reference solutions of the method, model by model. Among others: the p-y curves of loess, of residual soil of the Piedmont region and of the hybrid liquefied sand evaluated node by node; the node at the ground surface and at a layer boundary, a buried pile head and the empty layer above the first soil; the soil columns of an embedded cap; the end of a moment–curvature curve, which now holds its last moment; the axial force used for the bending stiffness of nonlinear piles; and the convergence of a pile judged on its deflection.
- **Faster analysis**: nonlinear piles, the newer soil models and the pile-head stiffness of the group iteration run in compiled code and in parallel threads, and the axial curves of a pile are built once for all load cases of a run. Most models analyse as fast as the reference solutions or faster.
- **Analyses that cannot converge stop early**: when the group iteration or a pile does not converge, the analysis reports it after the first attempt, as the method prescribes, instead of trying further strategies for a long time. A nonlinear pile that has not closed within the iterations of the file is still solved again with more iterations.

6.2 Release 1.0.8

- **Signing out without a licence**: when the account signed in has no active licence, Solgroup offers **My licences**, **Check again**, **Sign out** and **Close** instead of closing, so a different account can be used. The licence choice offers **Use another account**.

6.3 Release 1.0.7

- **Axial force along the piles in the canvas**: **Force Diagrams in Canvas** and the **Heat Map** offer the component *N · axial force along pile*, drawn on every pile from its t-z analysis. It is available when **Analyze ▸ Analysis Options** *Include axial load variation along the piles* is ticked; otherwise the dialog says how to obtain it.
- **Jetty template above the seabed**: the template *Trestle / Bent (jetty)* now places the pile heads and the deck 4 m above the seabed, with the water 1 m below the deck, so the piles stand free through the water as in a jetty.

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Before, the pile heads were at the ground surface. The template fields keep their meaning; existing projects do not change. Example 2 of the User Manual uses the new template and shows the axial force along the piles.

6.4 Release 1.0.6

- **Stronger protection of the program**: Solgroup is now built as compiled machine code, and every analysis checks the licence. A modified installation or a copy of the program files cannot run an analysis without a valid licence. Projects, results and the way the program is used do not change.

6.5 Release 1.0.5

- **Faster first run with nonlinear piles**: the first analysis after Solgroup starts, from the window, the Command Line, Batch Run or the MCP server, prepares its compiled pile solver once, where before several parallel pile solutions could each prepare it at the same time. The first run of a model with nonlinear (moment-curvature) piles no longer waits for that repeated preparation.
- **Load stepping with nonlinear piles**: when the full load does not converge at once and the analysis continues in smaller load steps, the nonlinear piles of each step are now solved in parallel, as in the full-load attempt.

6.6 Release 1.0.4

- **Faster analysis**: the lateral and axial pile solutions, the pile-head states of the group iteration and the equivalent springs run in compiled code and in parallel; typical models analyse about twice as fast as in release 1.0.3.
- **Superimposed dead load**: the load pattern type **SUPERDEAD** (finishes, utilities, wearing surface) takes the DEAD factors in the ACI 318 / ASCE 7 design combinations and the DW factors in the AASHTO LRFD combinations; it is exported to Excel as a dead load and can be set from the Command Line (`type=SUPERDEAD`).
- **Repeated runs**: running a model a second time in the same session gives the same results as the first run also for piles with user-defined p-y curves between two depths.
- **Trial licence**: results are not exported through the Command Line or MCP `export` command, `--check-run` or the Copy buttons either, as in the menus.
- **Model Explorer**: a reference point or reference line can be selected in the Model Explorer, for example to assign a cap load at a column position without clicking it in the view.

6.7 Release 1.0.3

- **Special Plots**: a quantity along the piles is drawn like the pile profile, with the distance from the pile head on the vertical axis, increasing downward.
- **Ground of a pile in Properties**: the row **Ground override** holds the ground elevation entered for one pile, and the new read-only row **Effective ground** shows the ground the analysis uses (the sloping surface or the override, less the scour).
- **Sloping ground**: the Soil Profile form, its sketch, the profile list and the cap Properties give the range of the ground where the piles meet it, not only between the two points that define the plane; Check Model reports a pile whose ground lies below the bottom of the profile.
- **Command Line and MCP server**: `add cases type=pushover factors=… hold=…` defines a pushover case with the rules of the Pushover dialog; `add sections` and `add piles section=` work again; the log returns to the left after a wide table.
- **Display**: short tables in Show Tables are no longer cut off; after a run the zoom in use is recorded, so **View ▸ Previous Zoom** returns to it; unit labels such as N·mm/mm and tonf·m/m are no longer cut off.
- **User Manual**: Getting started and the tutorials start from **File ▸ New Model** and define every section and soil layer they use; several examples state their starting model and match the numbers the program shows.

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6.8 Release 1.0.2

- **Sign-in from the console**: `solgroup-cli.exe --login` (e-mail and password, or `--google`), `--licence` and `--logout` sign in, show the licences and sign out without the window.
- **Command-line tool on PATH**: the installer offers **Add the 'solgroup' command-line tool to PATH**, so that `solgroup` starts the console tool from any folder.
- **Uninstall**: removing the last Solplan program also removes the empty Solplan folder of Program Files.

6.9 Release 1.0.1

- **Command Line**: **Window ▸ Command** or the **Command** button in the status bar opens a command line beside *Messages*. Short text commands build, change, analyse and report the open model; every change is one Undo step (User Manual, Command Line and the MCP server).
- **MCP server**: `solgroup-cli.exe --mcp` lets an AI assistant that supports the Model Context Protocol build and analyse Solgroup models with the same commands, in the background.
- **Command files**: `solgroup-cli.exe --script commands.txt` runs a file of commands without the window, and `solgroup-cli.exe --shell` opens an interactive command prompt.
- **Tables fill their panel**: the columns of every table share the width of the window instead of leaving an empty area beside the last column (cap response, foundation stiffness, reduction factors, Show Tables and others).

7 Changes to computed results

Releases 1.0.1 to 1.0.3 compute the same results as release 1.0.0. In release 1.0.4 the results agree with release 1.0.3 within numerical rounding, except a second run in the same session of a model with user-defined p-y curves between two depths, which now equals the first run. Releases 1.0.5 to 1.0.8 compute the same results as release 1.0.4; a new model made from the jetty template differs because its geometry and water level differ.

Release 1.0.9 changes computed results where the refined rules apply: models with the soil types, pile heads, embedded caps or nonlinear sections listed there can differ from release 1.0.8, in some cases by tens of per cent, and agree more closely with the reference solutions. A model whose iteration does not converge now ends with the message of the first attempt; release 1.0.8 could still find an answer for some of them through further strategies, after a long run.

Release 1.0.10 changes computed results only for the boundary cases listed in What is new; all other models compute the same results as release 1.0.9.

8 Known limitations

The limitations below are inherent in the methods or in the scope of this release. They are also described in the User Manual (SPL-SG-002) and the Technical Reference (SPL-SG-003).

Table 8.1 — Known limitations

No.	Topic	Limitation
1	Group effects	The interaction of closely spaced piles through the soil is represented by p-multipliers on the lateral curves and by reduction factors entered by the user. The piles do not interact through a continuum model of the soil.
2	Empirical curves	Each p-y, load–settlement and torsional curve is an empirical relation derived from a limited set of field tests. Results outside the range of soil conditions, pile types and sizes behind a curve are extrapolations, and the choice of curve remains an engineering decision.

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No.	Topic	Limitation
3	Static loading	Loads are static or represent cyclic loading through the cyclic forms of the p-y curves. Dynamic response, time effects, consolidation and creep are not modelled.
4	Flexible cap	A flexible cap is a mesh of plate elements connected to the pile heads at the nodes of the mesh. A mesh must be generated (or imported) before the run, and it is not regenerated automatically when the cap or the piles are changed afterwards; Check Model warns when it no longer matches.
5	Model size	At most 2 500 piles; coordinates within 2×10^{7} m of the origin. A load that exceeds the capacity of the group is reported with a message and without converged results for that case.
6	Self-weight	The weight of the piles is not applied. The weight of the cap is applied through the Self weight multiplier of a load pattern (unit weight of the cap material × thickness × plan area).
7	Piles and cap	Every pile head is tied to the cap. A pile drawn outside the cap outline is still tied to a rigid cap, which ignores its outline (Check Model warns); a head outside the mesh of a flexible cap stops the run. A pile that stands on its own, without a cap, needs a separate single-pile model.
8	Interface language	The user interface and the reports are in English.

9 Documentation

Table 9.1 — Documentation of this release

No.	Title	Use
SPL-SG-001	End-User Licence Agreement	Terms of use, licence and session rules
SPL-SG-002	User Manual	How to build, run, check and report an analysis; examples
SPL-SG-003	Technical Reference	Pile and cap models, soil curves, numerical method, verification
SPL-SG-004	Release Notes	This document
SPL-SG-005	Third-Party Software Notices	Open-source components and their licences

The documents are installed in the docs folder of the installation; the User Manual is also listed in the Start menu.

10 Support

Questions and problem reports are handled by support@solplan.id. A problem report should include the release number (**Help ▸ About Solgroup**), the project file, a description of the steps that lead to the problem, and the log file from %APPDATA%\Geostruktur\Solgroup\logs.

END OF DOCUMENT

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