

MatrixFrame version 5.4 SP4 - Release notes

Processed in version 5.4 (February 2019):

Bug fixes:

MatrixFrame[®] General:

- Incidentally, MatrixFrame did not want to start after closing. This was caused by a corrupted "user.mxp" file. This file is always saved in "C: \ Users \ user \ AppData \ Roaming \ Matrix \ MatrixFrame \ 5.40 \ Ini" when exiting MatrixFrame. Now the default "Easy to learn, easy to use.mxp" file will be read when a corrupt file is found.
- When starting a new project, the filled in "Part description" was not remembered for the project.

Loads generator NEN-EN:

• Problem with the incorrect generation of vertical wind loads on flat roofs has been solved.

Timber check:

• After opening an existing structure and adjusting the geometry, the structural parts were not regenerated. As a result, for example, chicken supports could be drawn outside the model

Steel Joint connections:

- In the drawing, the weld of the flange was not shown in the case of a compression- or tension plate and the value of the flange was shown at the web.
- In case of a tube connection type KN, the overlap was wrongly tested for both brace members.
- In a 2D model, with a column on a concrete slab with elastic foundation, and only a support in X, the normal force and the moment were not included in the calculation of the base plate".

End release note

MatrixFrame version 5.4 SP3 - Release notes

Processed in version 5.4 (January 2019):



New:

MatrixFrame[®] General:

• With the visibility options it is now possible to set the number of digits for length, strength and deflection in the "Global font's options". By pressing "Apply All", these are then set for all options simultaneously.

isibility properti	es
🕀 📲 Proper	ties
🚊 📶 Glo	bal fonts' options
	Rotate fonts: <yes></yes>
	Use background color: <no></no>
	Background color: < >
	Font: <arial></arial>
	Size: <45>
	Length digits: <3>
	Force digits: <2>
	Deflection digits: <4>
	_

Reports:

- In report management, the option to save the file as * .ini is added.
- The German translation for columns has been changed to "Stütze" and "Stützen.

FEM:

• If a print preview was made for the "Spy function", the results and the plate geometry were printed next to each other.

Now these images are printed under each other.

Steel check:

• In large models, the "UC histograms" no longer fit in the image. An adjustment has now been added for the maximum number of bars. This ensures that the UC histograms are automatically displayed in multiple images.

Steel Joint connections:

- Calculation of a "Column-Beam" connection with a short end plate is now possible if only shear force is present.
- Because the check for the minimum weld thickness according to "NEN-EN 1993-1-8 # 4.9 (4) and (5)" does not always have to be done, if a check of the weld is done through calculation, there is now added a setting where this check can be disabled.

Steel Joint Connections	– 🗆 X
Assumptions	Corrections O Auto (e) User
-Validations and suggestions ✓ Enable validations ✓ Stop calculations on error ✓ Show suggestions	Miscellaneous
	OK Cancel



Bug fixes:

MatrixFrame[®] General:

- Files with steel sections became too large when saved. Occasionally, a message could then appear: "Out of memory".
- When renumbering, the "Check concrete data after renumbering" warning was shown incorrectly for a timber construction.

Reports:

- With images in 3D, the global coordinate system is now displayed
- When printing a picture of the stresses HH, the stresses bar above the image was not displayed smoothly.
- Incidentally, empty tables were printed in 2D Grillage for "Concrete bar (compr.)" and "Concrete bar (detailed)".
- When the pictures of the moments, shear forces and normal forces of a very small construction were printed, these results were not scaled correctly.

Loads generator NEN-EN:

- Incidentally, a defined "Non-structural element" could no longer be removed or changed.
- Incidentally, when generating rainwater, after removing the load case rainwater and the tab in spreadsheet loads, no convergence was found when a LE calculation was first made. This was caused by the 1st iteration where not all values were reset.
- In a model where the columns are below ground level, so with a positive "z" value, the wind was generated incorrectly. Wind is only generated for structures that are above ground level.

2D Frame:

• Incidentally, a 2D model in which a bolted-splice joint connection with 2 different sections could no longer be opened.

2D Grillage:

• When generating the pile reactions for the table in the dxf drawing, the reactions of the load cases were also wrongly taken into account.

3D Frame:

• Occasionally, the "Distributed area load" was incorrectly determined in the case of several bars in line with each other.

FEM:

• Incidentally, MatrixFrame crashed when placing a node load on an already existing vertex.



Steel check:

- If a setting for a structural member was changed in the steel inspection, the checks of the other members were incorrectly not shown.
 Now only the modified check is adjusted and the others remain intact as it also worked in the previous versions.
- The automatic recognition of the "Construction type" no longer worked at the deflection. This was now set to "Floor" for all beams as standard.
 In the case of new constructions and modified constructions, "Column", "Floor" and "Roof" will again be recognized as before.
- Incidentally, a negative C2 was wrongly handled in the case of a cantilever for the lateral buckling, while the load was applied to the tension flange (upper flange).
- When testing the fire resistance, it can occur that the calculated limit temperature complies with a UC> 1.0 in the "UC Fire".

This is caused by checking N;b,fi,t,Rd or Mu at the temperature to be tested. Now an extra column "Mu; Fire" has been added where the UC is shown and in the tool tip there is more information.

Steel Joint connections:

- With a "Bolted -splice" connection of 2 unequal sections, the program crashed incidentally when a section was changed.
- In case of a KN connection with a distance between the beam bars, only one beam bar was wrongly tested for failure.
- Incidentally, the tension value was not taken into account for a "Bolted-splice" connection when checking shear and tensile force. In the report, Ft; Ed the value 0.00 kN was printed
- The M-phi diagram was incidentally incorrectly drawn when, in the case of a "Column-Beam" connection, a tension plate, compression plate and an inclined compression or inclined tension plate were applied.
- Incidentally, the program crashed when filling in several bolt rows in combination with a haunch with a flange.
- For a "Column Base plate connection", with a single anchor row, the value for "F;t,ep,Rd " was incorrectly determined. This was based on 2 anchor rows.
- In the case of a "Column Base plate connection", with a single anchor row, the value for "cd" for anchor length calculation was incorrectly determined.
- Calculation of a beam column connection, with asymmetrical bolt placement and only shear force, was wrongly not done with a message "Tension bolts must be placed symmetrically".

MatrixTools[®]:

- In the module "Column + fire", for a rectangular cross-section, a warning was always wrongly displayed that a combination was not Ok.
- The project info, company info and logo were no longer shown when printing the drawing, for example a point-supported plate.
- In the "Brawesta" module it was not possible to check a shielded side if "None" was selected for insulation.
- In the "Section properties" module, incorrect coordinates and properties were calculated for a parametric "I-Shape".



End release note

MatrixFrame version 5.4 SP2 - Release notes

Processed in version 5.4 (November 2018):

New:

MatrixFrame[®] General:

• In case of rainwater accumulation "Dead load on roof" is a load, for example from roof plates, is only entered in "2D System" if, for example, there is no load case for permanent load. Also, load is entered here if "3D System" is used.

Steel Joint connections:

• Checking for minimum weld thickness has been added according to NEN-EN 1993-1-8 # 4.9 (4) and (5). A setting for "Analysis type" has been added for this.

Frame	Horizontal stiffness
Static determined	Braced frame
Static indetermined	Sway frame
Environment Non corrosive Corrosive	Analysis type Plastic Elastic

MatrixTools[®]:

• In the "Column calculation + fire" module, the results shows the decisive combination based on MEd and As; req. Checks on detailing that gave "Not OK" were not noticed. They did appear in the report and also in the relevant results screen. Now a warning is shown in the decisive dialogue if a check is not satisfactory.



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MEd				192.51	kNr	n		MEd					kNm	n	
Nc;Ed	d			-5606.40	kN			Nc;Ed					kN		
As;pro	DV			2011	mmi			As;prov					mm²		
As;rec	9			0	mmi			As;req					mm²		
w0				0.80	%			w0					%		
Xu				506	mm			Xu					mm		
d				544	mm			d				mm			
Mu				547.16	kNr	n		Mu					kNn	n	
Check	k Reinf.							Check F	leinf.						
Check	k My/Mz							Check I	4y/Mz						
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Bug fixes:

MatrixFrame[®] General:

- Incidental the zoom percentage was jumping from "Zoom everything" back to 100% when switching between, for example, loads and results.
- If the interface was set to German, the "Non-structual elements" and groups were not available.
- The graphical representation of a moment Yr 'was incorrectly displayed.
- After installation of 5.4 SP1 it appeared that in "Control Panel\Programs\Programs and Features" both MatrixFrame 5.4 and MatrixFrame 5.4 SP1 were displayed. After installation of SP2, only MatrixFrame 5.4 SP2 is displayed.

Reports:

- When printing the report item "Concrete cross section (compr.) + pictures" Occasionally, if there were releases in the model, the correct tables were not shown below the pictures. For example, below the pictures of "Beam 3", the table of "Beam 5" was printed.
- When printing the deflection of a concrete structure on a elastic foundation, an error message appeared "This field name is not known".
- When printing a selection set in 2D-Grillage, more information was displayed than just the selection set.
- A narrow high construction (column) was displayed very small when editing in Word in the rtf file. Problem is in the export of Chrystal Reports with "* .jpg" pictures. By setting the pictures to "* .wmf" this can be corrected.

Loads generator NEN-EN:

- Incidentally, the saving or opening of a moving loads system caused a crash in MatrixFrame.
- Occasionally MatrixFrame reported "Out of memory" if a canopy was defined on the left and right of a flat roof.



- If "Windward" or "Leeward" was assigned during the step wind, the wall or roof was incidentally incorrectly recognized. As a result, no wind was generated on the beam. By selecting everything and putting it on "Undefined" and then putting the correct definitions again, this could be restored.
- Occasionally, the q-load was not calculated for the roof in "Wind from the front" and "Wind from the rear".

1D Beam:

• In the case of a wooden beam, with several supports, not all the lateral buckling supports were shown.

2D Frame:

• Occasionally, MatrixFrame crashed when a file was opened containing steel connections with tapered sections.

2D Grillage:

- When generating dxf drawings, the value for the reinforcement symbol set in the register, for example %% 184, was not processed.
- If the supports were renumbered, the concrete data was deleted. Now the concrete data remains intact but a warning is shown: "Check concrete data after renumbering".
- When awarding a "Even surface load" on beams, which lie within a construction but do not have a connection with surrounding beams, surrounding beams were incidentally also generated as support.
- Changing supports no longer worked with "Apply to All". Now not all the supports have been modified but they have been put under all the nodes.

FEM:

• Occasionally MatrixFrame was closed without warning if the mesh was done during the calculation.

Concrete check:

- With bundles, the equivalent diameter was incorrectly not taken into account for determining the anchorage length.
- Incidentally, an incorrect "M0-b" or "M0-e" was calculated for the additional reinforcement and the anchoring length was not determined from the shifted moment line.
- For a beam where pressure reinforcement was needed, the As;req for stirrups showed instead of a value "-nan (ind) e".
- In the deflection check, the cantilever was not correctly recognized if it was a composite framework. Now a cantilever is always defined by the chosen "Structure type".
- Increasing the concrete quality caused higher deflections instead of lower ones.
- Deflections check "w2 + w3" was incorrectly determined and was therefore too unfavorable.

Steel check:

 A solid bar, round bar or square steel was incorrectly classified in cross-section class 3. Now for round bar always cross section class 1 is used and for square or rectangular, for "h / b and b / h> 3" class 3 is used and otherwise class 1.



- When fire resistance was checked, an Mb, fi, t, Rd for lateral buckling was still determined when the lambda was < 0.4 ". As a result, the K2 factor (0.85), for a static determined situation, had no effect on the Unity Check in formula 4.10.
- If the beam length was adjusted for a 1D beam, the limit for the deflection was not always updated.

Timber check:

- If structural members are combined, and a load or load combination has been changed, a message appears or the structural members should be kept.
- When printing the deflection of a beam with several fields, only the first field was printed.

Steel Joint connections:

- In the case of a "Beam-Column" connection, where the column (box profile) hangs on the beam with tension only, the bolt capacities for the endplate in bending NEN-EN1993-1-8 # 6.2.6.5 were not correctly calculated.
- In a "Beam Column" connection, for the Rotational stiffness according to NEN-EN1993-1-8 # 6.3, the K3 was incorrectly not calculated if more than 1 bolt row was subjected to tension.
- For a "Beam Column" connection, the Rotation stiffness according to NEN-EN1993-1-8 # 6.3 was incorrectly counted with a K1 = ∞ if a web plate was used. Now K1 = ∞ is only used if an inclined tension and / or compression plate is used.
- In a "Beam-Column" connection, where the column was a tube, it was not shown in the drawing.
- When creating a report for a K-N connection with tubes, MatrixTools was closed without warning.

MatrixTools[®]:

• MatrixTools was spontaneously closed when in the "Point- supported plate" in the tab "Drawing" the print button was activated.

MatrixTools Geo:

- The surface of the pile foot was not always printed with the pile data.
- An incorrect Wmax was displayed in the module "Bending moment pile".

End release note

MatrixFrame version 5.4 SP1 - Release notes

Processed in version 5.4 (July 2018):

New:

MatrixFrame[®] Toolbox:

• In the module "Column calculation + fire", the check according NEN-EN1992-1-1 # 9.5.3 (3) is no longer performed for the special combinations.



Bug fixes:

MatrixFrame[®] General:

- All project data was deleted when a new project or model was started. Now, just like in the previous version, only the "Part description" is deleted.
- An error message of "MxFTrData" occasionally appeared during the installation. This was related to the transfer of user data from 5.3 to 5.4. The procedures have been adjusted and a log file is now also created in which any errors can be found.
- If the "Member color by section" layer was on, selecting a half bar did not work correctly when adding releases or rigid links.

Reports:

- In case of a report of the deflection of a wooden beam, the camber was not printed.
- When using the report items "Pe.C. Support reactions with L.Cases "and "Ch.C. Support reactions with L.Cases "it could happen that MatrixFrame crashed.
- Incidentally, the MatrixFrame does not start up anymore after it has been closed. Problem was caused by the use of characters such as "(" or ")" or "&", in the Header or in a user-defined memo.

Loads generator NEN-EN:

- If more permanent loads were defined on an element, the corresponding q load was not calculated.
- When generating the permanent load, where multiple beams have the same load, a separate "q" was erroneously calculated for each bar.
- It was possible to enter a value of 0.00 for Delta in the CdCd calculation. This is not correct and caused an error in the formula, making the CsCd value 0.00, and so the wind loads were also 0.00. Now there is a notification where you can then choose a default value. See also NEN-EN1991-1-4 # Annex F.5 for the determination of Delta.
- The wind loads for a porch and monopitch or duopitch canopy are now treated in the same way as wind with the combination generator. Because of this they cannot all be present at the same time.
- In the case of snow, an incorrect angle for the roof was occasionally calculated.

2D Frame:

• The button to graphically select a load or "Edit loads behavior" Z for a "Distributed area load" was not visible.

2D Grillage:

- It was not possible to graphically move a support under a beam parallel to the Y axis in "Top view".
- If a support at a T intersection of beams was placed underneath the continuous beam, exactly on the node of the connecting beam, it was not seen as a support.
- When changing the geometry, the load combinations were incorrectly regenerated, while the "Generate Fields" option was not on.
- The layers were not filled in when generating DXF drawings. The problem was that they were not imported correctly from the user profile.
- Incidentally, not all images of the load cases were shown when making a report.



• Incidentally, if a number of concentrated loads were selected to be copied from a load case, they were not correctly pasted into another load case.

Concrete check:

- On a Windows 7 system, it was not possible to change in "Concrete settings/Group data" the "Str.mem." Type.
- Incidentally, a support was not shown in the "Concrete settings / Support" and thus could not be capped.
- When checking fire resistance, erroneous values were generated for the brackets. As a result, the control could wrongly give "Not OK" for a model that was "OK" in MatrixFrame 5.3 SP6.
- Incidentally, in 2D Grillage, the topping of the moment with "Reduced dMed" did not work.
- Incidentally, in the reinforcement bar positioning, an incorrect length that was too long and outside the beam was calculated for an additional reinforcement in the 2nd layer.

Steel check:

- Incidentally, a cross-section class 4 was reported incorrectly.
- Occasionally the steel control continued to hang.

Timber check:

• In the histogram of the checks, the tooltip with results was no longer shown.

Steel Joint connections:

- Occasionally MatrixFrame crashed if you wanted to open the steel connections that were in the model.
- Incidentally, the drawing of an asymmetrical column beam connection was incorrectly displayed when printing.
- In accordance with NEN-EN 1993-1-8 # 6.2.6.12 (4) and (5) an anchor plate must always be used with a tension anchor with fydb > 300 N / mm2.

MatrixFrame[®] Toolbox:

- Incidentally, the module "Column calculation + Fire" crashed. The cause was that there were fewer Accidental combinations than Persistent combinations.
- In the module "Reinforcement calculation M + V + T" the reinforcement ratio for the stirrups was incorrectly calculated. In MatrixFrame it was correct.
- If you opened a model from Windows Explorer by double-clicking, the path for "Save project as ..." was not set correctly.

End release note



MatrixFrame version 5.4 - Release notes

Processed in version 5.4 (June 2018):

New:

MatrixFrame® General:

• A new load type "Distributed area load" has been added for 2.5-Frame, 2.5-Grillage, 3D-Frame and 2D-Plate (FEM). In this way, a area load can be placed on a plate or on several members situated in the same plane, which is then distributed over the load-bearing members. This means that the area load

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Load case	By Distribu	Ł .±. ≏ _▲ 🙆 👄 uted area load distributed area loa	n n ht actions	8
	membe	r or region	End	
Generate F	membe		LIIG	
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• In "P-load decomposition" the distribution over the load-bearing member is shown.



• In Tab "Supporting" it is defined which member are contributing to the level load.

Member	Dist Begin	Dist End	9
S1	0.000	6.000	\sim
S2	6.000	0.000	\checkmark
S3	4.000	0.000	\checkmark
S4	0.000	4.000	\checkmark



- This can also be done with the additional button under "Edit loads behavior" . By clicking on the member under an area load, these are or will not be load-bearing.
- New import function MXML with which MatrixFrame can be controlled from an external modeling package. The model with loads and combinations is read. After this, a calculation with concrete check is done. Finally, a * .mxfo output file is generated.



MatrixFrame & model exchange Revit, Tekla and IC-Prefab:

Models within Autodesk Revit and Tekla can be represented as a geometric model, where all structural components can be visualized in their true form. Less well known is that all structural elements also have an analytical representation within Revit and Tekla. Relevant data for system lines, connections, eccentricities, boundary conditions, support and even loads, load cases and load combinations can be entered in the model and can be managed. Matrix Software has developed a new interface for opening the analytical model directly within MatrixFrame structural analysis software. This can be both for the complete model, as for a part of the model. The structural engineer can decide if models will be designed in 1D beams, 2D grillage, 2D & 3D portal frames or in FEM plates.

In Revit extra columns are added to the Project browser:

- Checked
- Main structure
- Maximum Unity Check



🚦 Matrix Project Manager Projector.: Opdrachto Projects Opdrachtgever: Project ingenieur: Omschrijving Туре Auteur Geschatte uren Bestede uren Status Start Exporteren Rapport N/B 1. Staaldoorsnede Doorsnedeberekening 0 0 0% N/B 1 2. Staaldoorsnede 1 3. Staaldoorsnede Doorsnedeberekening 0% 0 0 N/B 0 0% 0 Doorsnedeberekening I. Staalkolom N/B 0% 0 0 Kolomberekening N/B Doorsnedeberekening 0 0 0% 1. Houtdoorsnede ¥ 2D-Raa 0 0% N/B Spant as 2 0 erk Projects 0 0 0% N/B Volledig project Sluiten

• Renumbering has been extended with "Supports" which has 2 different options. Based on member or global position. Re-numbering, e.g. member results in consecutive numbers per member. Re-numbering, e.g. globally, consecutive numbers result based on the X and Y coordinates. The option has also been added to "Support manually" as is also possible with nodes and members.

Renumber ×	Renumber ×
Renumber Whole structure Selection Supports Node manual Member manual Support manual	Renumber O Whole structure Selection Supports Node manual Member manual Support manual Starting label: 12
Supports renumber mode Renumber by member Renumber by global position Renumber Cancel	Supports renumber mode Renumber by member Renumber by global position Renumber Cancel



• In the "Preview pane" from Windows Explorer and the "Open dialog" from MatrixFrame the geometry is now shown for the selected model.

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Videos		🏭 Compression Pile.mxft	11/18/2015 3:22 PM	MatrixTools	26 KB	
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		Woorbeeld venster.mxf	9/29/2017 11:15 AM	MatrixFrame Project	343 KB	A A

- 19 items
 1 item selected
 342 KB
- For manually entered sections, in which the form and dimensions are entered in the "Shape" tab, the stresses are now also calculated.

 Laber	Shape	Tapered	hB	hE	tf	\mathbf{t}_{w}	tf2	ЬΒ	bE	b⊾	b,	b ₂	hT	hB	Castellated	hŧ	h ₁	h ₂	r
P1	Square Tube		0.100	0.100	0.0100	0.0100	0.0000	0.100	0.100	0.000	0.000	0.000				0.000	0.000	0.000	0.000
P4	Square Tube 🗸		0.260	0.260	0.0080	0.0230	0.0000	0.170	0.170	0.000	-0.012	-0.012				0.000	0.000	0.000	0.000
P5 .	Square Tube		0.260	0.260	0.0080	0.0080	0.0000	0.140	0.140	0.000	0.000	0.000				0.000	0.000	0.000	0.000
P2	0		0.300	0.300	0.0100	0.0100	0.0100	0.300	0.300	0.000	0.000	0.000				0.000	0.000	0.000	0.015
P3	Square Tube		0.280	0.280	0.0250	0.0100	0.0250	0.240	0.240	0.000	-0.005	-0.005				0.000	0.000	0.000	0.000

Sections Properties Loads Advanced Shape

• On stacking the loads the "qg" wil always be shown on the bottom.





• A "Clear" button has been added to the Job info to delete all Job info in one go.

Job info

Create new project 1D-Beam 1.5D-Be. 2D-Frame 2.5D-Fra 2D-Grillage 2.5D-Grill 3D-Frame 3D-Truss 2D-Plate (FEM) 2D-Vall (FEM) 2D-Plate (FEM) 0 Dene existing project	am ame illage	General File CE Job name: Comments Ivance Steel Detailed Model Job number: Student number:	^
Open existing MXML projects		Part description:	
Create new project		Structural engineer: Unknown	
		Clear	>
User profiles:	<keep current="" properties=""></keep>	OK Cancel	

• In the "Spy function" the soil pressure has been added.

spy function						~
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		32.77				
Member	Descr.	32.77 Position	Soilpressure Z	Width	Soilpressure Z / Width	
Member	Descr. (Begin)	32.77 Position 0.000	Soilpressure Z -9.13	Width 1.000	Soilpressure Z / Width -9.13	
Member	Descr. (Begin) Uz (Max)	32.77 Position 0.000 2.500	Soilpressure Z 9.13 -32.77	Width 1.000 1.000	Soilpressure Z / Width -9.13 -32.77	
Member	Descr. (Begin) Uz (Max) Def/Z (Max)	32.77 Position 0.000 2.500 2.550	Soilpressure Z -9.13 -32.77 -32.76	Width 1.000 1.000 1.000	Soilpressure Z / Width -9.13 -32.77 -32.76	
Member	Descr. (Begin) Uz (Max) Def[Z (Max) (End)	32.77 Position 0.000 2.500 2.550 7.700	Soilpressure Z -9.13 -32.77 -32.76 -6.93	Width 1.000 1.000 1.000 1.000	Sollpressure Z / Width -9.13 -32.77 -32.76 -6.93	
Member	Descr. (Begin) Uz (Max) (End) Enter pos:	32.77 Position 0.000 2.500 2.550 7.700	Soilpressure Z -9.13 -32.77 -32.76 -6.93	Width 1.000 1.000 1.000 1.000	Soilpressure Z / Width -913 -32.77 -32.76 -6.93	
Member	Descr. (Begin) Uz (Max) Def/Z (Max) (End) Enter pos: (Begin)	Position 0.000 2.500 2.550 7.700 0.000	Soilpressure Z -9.13 -32.77 -32.76 -6.93 -0.00	Width 1.000 1.000 1.000 1.000	Soilpressure Z / Width -913 -32.77 -32.76 -6.93 -0.00	
Member	Descr. (Begin) Uz (Max) Def/Z (Max) (End) Enter pos: (Begin) Def/Z (Max)	32.77 Position 0.000 2.500 2.550 7.700 0.000 5.283	Soilpressure Z -9.13 -32.77 -32.76 -6.93 -0.00 -0.00	Width 1.000 1.000 1.000 1.000 1.000 1.000	Solpressure Z / Width -9.13 -32.77 -32.76 -6.93 -0.00 -0.00	
Member	Descr. (Begin) Uz (Max) Def(Z (Max)) (End) Enter pos: (Begin) Def(Z (Max) (End)	32.77 Position 0.000 2.500 2.550 7.700 0.000 5.283 7.700	Soilpressure Z -9.13 -32.77 -32.76 -6.33 -0.00 -0.00 -0.00 -0.00	Width 1.000 1.000 1.000 1.000 1.000 1.000	Sollpressure Z / Width -9.13 -32.77 -32.76 -6.93 -0.00 -0.00 -0.00	
Member	Descr. (Begin) Uz (Max) (End) Enter pos: (Begin) DeftZ (Max) (End) Enter pos:	Position 0.000 2.500 2.550 7.700 0.000 5.283 7.700	Soilpressure Z -9.13 -32.77 -32.76 -6.93 -0.00 -0.00 -0.00 -0.00	Width 1.000 1.000 1.000 1.000 1.000 1.000	Soilpressure Z / Width -9 13 -32.77 -32.76 -6.93 -0.00 -0.00 -0.00	
Member	Descr. (Begin) Uz (Max) DefZ (Max) (End) Enter pos: (Begin) DefZ (Max) (End) Enter pos:	Position 0.000 2.500 7.700 0.000 5.283 7.700	Soilpressure Z 9.13 -32.77 -32.76 -6.93 -0.00 -0.00 -0.00	Width 1.000 1.000 1.000 1.000 1.000 1.000	Soilpressure Z / Width -9.13 -32.77 -32.76 -6.93 -0.00 -0.00 -0.00	1 0

- If a steel- or wooden column of the MatrixTools was activated from MatrixFrame, a q load in A and B was not always filled. This was caused if a uniform q load was not defined. Now an equivalent uniform q load is calculated on the basis of the shear force in A and B.
- If there was a node on a member that was not connected, the calculation of the geometry did not carry out the calculation. Now if possible the calculation will be done when the "Close" button is clicked.
- It is now possible to generate combinations with more than 250 load cases.



• It is now possible to enter different reference times for the "Ultimate Limit State" (ULS) and "Serviceability Limit State" (SLS) at the "Combination Generator".



• It is now possible to set the background color of the fonts. By setting this color to "white", texts no longer coincide with other drawn parts.



• It is now possible to select a load in the graphical screen. This is then also automatically selected in the table.





• The user profiles (mxp) are saved from 5.4 in "MXML" format. This in connection with the exchange of data between other applications such as Revit. It is advisable to re-export the user profiles that have been taken over from 5.3 so that all new layers and settings are saved.



• The loads in the table are now also filtered on the selected selection.



• A layer has been added whereby the color of the support reactions can be linked to the direction.





• When generating a DXF drawing of, for example a pile plan, if a path has not been entered for the folder settings, it is saved in the last selected folder.

Options		×
Code	Project path:	
Language	Use last saved path	
Concrete	Reload last project at startup	
Steel	Library path:	
Timber	Properties path:	
Steel Joint Connections	C:\ProgramData\Matrix\MatrixFrame\5.4\Properties\	
Folders	Dxf drawing paths	
Miscallenous	Dxf drawing templates path:	
Customize	L: \ProgramData\Matrix\MatrixHame\5.4\Templates	
<u>A</u> bout MatrixFrame®		
	Dxf prototype file:	
	C:\ProgramData\Matrix\MatrixErame\5.4\Templates\Mxt0.dvf	
	Set Default Paths	
	OK Cancel	Apply Reset

• Because the table of the profiles has many more columns than the table of the members, these have been exchanged into the "Easy to learn, easy to use" layout.

N	lembers					Д	×	Se	ctions							
Т	Memb	er	Sections				^		Label	Na	ame	Туре	Material	BiMaterial	MaterialB	Angle
	S1	P4		~					P1	400 x 60	0	Database	C20/25			0.0°
	S2	P3					_		P2	500 x 60	0	Database	C20/25			0.0°
	S3	P3							P3	500 x 60	0	Database	C20/25			0.0*
	S4	P3							P4	600 x 60	0	Database	C20/25			0.0*
	S5	P4						*								
	S6	P4														
	S8	P1														
	S9	P2														
	C10	00	2				Y									
	Members	Sections	Elast. found.	Releases	Rigid links	4	⊳	S	ections	Properties	Loads	Advanced	Shape			

- If no code was selected, it was not possible to make a mass combination. Now this is possible if the module "Dynamic analysis" (Eigenvalue analysis) is activated.
- It is now possible to enter an angle in 2D for all types of supports. This can be done under the "Advanced" tab.



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It is now possible to define a spring value in "Z" in 2D with an support at an angle.



• The visualization of the loads has been completely renewed. This also clearly shows the moments Xr ', Yr' and Zr '.







• It is now possible for wind load cases, of the same type, to change the Cprob in one time in the load combinations in tab "L.C.Type". This can be done by selecting the load cases and then clicking with the right mouse.

Loa	ds combi	inations												
	Lab	pel	Description	L.C. Type	Fav./Unfav.	Category	Level	Field	Connected fields	Ψ.	Ψ	Ψ2	Cprob (ULS)	Cprob (SLS)
	B.G.1	Permane	ent	Permanent actions	•		None	None						
	B.G.2	Windbel	asting van Links + Overdru	Wind load			None	None		0.00	0.20	0.00	0.92	0.92
	B.G.3	Windbel	asting van Links + Overdru	Wind load			None	None		0.00	0.20	0.00	0.92	0.92
			g van Links + Overdru	Wind load			None	None		0.00	0.20	0.00	0.92	0.92
	no up	DIOD (ULS)	g van Links + Overdru	Wind load			None	None		0.00	0.20	0.00	0.92	0.92
	Ср	orob (SLS)	g van Links + Onderdr	Wind load			None	None		0.00	0.20	0.00	0.92	0.92
	D.Q.7	WINUUS	asun <mark>g van Links + Onderdr</mark>	Wind load			None	None		0.00	0.20	0.00	0.92	0.92
	B.G.8	Windbel	asting van Links + Onderdr	Wind load			None	None		0.00	0.20	0.00	0.92	0.92
	0.0.0	100000000	outine rear Lieko - Dodevski	11 find load			Mono	Massa		0.00	0.20	0.00	0.02	0.02
L.C	. Type	Persistent	Accidental Characteristi	c Frequent Quasi-p	ermanent Bucklii	ng Mass								
2D	-Frame	* [NEN-EN] Length [m] Forces [k]	l] x= 16.866 y= -3	3.165 z= 0.000									

Reports:

• For concrete, 5 reports have been added, with the image of the capacity and the image of the reduction between the tables being printed.



• The extensive output of concrete deflection is fully adapted to the new M-N-Kappa calculation.

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Loads generator NEN-EN:

• The use of the correlation factor according to NEN-EN 1991-1-4 # 7.2.2 (4) can now be switched off.



- The Cprob calculation of wind has been adjusted because with short reference time it did not give the correct results. At T = 1 the formula derailed.
- With the defined roof type, the user can now adjust the direction of "Windward (+)" or "Leeward (-)".
- The definitions and settings in the load generator are now kept and also saved in the model.



• The "Rainwater Accumulation Wizard" has been completely renewed. As a result, the most recently entered values are always remembered.

nwater accumulation				
ain settings		Structure settings		
Add rainwater on:		Slope		
52	Select		~	
Permanent loads detected.		Value:		[%]
Dead load on roof:	0.350	(N/m²]		
Reference points distance:	1.000 [r	n] Function:	Middle \sim]
Min reference points on member:	2	Maximum height:	100	[mm]
Minimal water level:	0.040 [r	n]	5.000	1
Reference period:	15	/ears]	5.000][m]
Model factor Gamma M:	1.300	Main structure position:	2D system \sim	
Discharge settings		Girders		
Rectangular Width:	0.150 [1	n] Amount:	0	
O Circular Diameter:	[n] Section:		
Number:	1	Parabolic camber:		[mm]
		Left girder supported:		
nternal results		Right girder supported:		
Keep generated 3D structure		Roof plates		
Diagnostic mode (consultants on	y)	EI;		[kNm
		Width:		[m]

• Control of the size of a circular drain for rainwater has been added in accordance with NEN-EN 1991-1-3 # 7.3 (3).

1D Beam:

• New project type added "1.5D-Beam".

Job info

Create new project 1D-Beam	🗹 1.5D-Beam			
2D-Frame	2.5D-Frame			
2D-Truss				1.5D
🔘 2D-Grillage	2.5D-Grillage			
O 3D-Frame				
🔘 3D-Truss		-		
🔘 2D-Plate (FEM)				
🔘 2D-Wall (FEM)				
Open existing project	ct			
Open existing MXM	L projects			

• This is a project with 3D possibilities, whereby, for example, loads can also be set in the local and global Y-directions. It is also possible to give up a normal force or to work with pre-stress.



Loads definition		×	🖞 💶 🖓 🕀 🕀 💠 🗇 🖪 😹
프.프. 스. 스. 스. 🚣 📥			the
Load case L.C. Type	> Description		10.000
B.G.1 V Permanent a	actions V Permanent		
Gienerate Fields	Begin En	000	10,000
Value	-10.000 V ###	.000 🗸	10.000
Distance	U.UUU m L	m	
Direction			
Proj. OX OY OZ	⊖Xr ⊖Yr ⊖Zr ⊖Angk		
	OXr' OYr' OZr' OAngk		
Global OX" OY" OZ"	⊖Xr" ⊖Yr" ⊖Zr" ⊖Angk		
‡ 			10.000
	4	pply	B400500 5.000
o o			
			5.000
			5.000
			10 000
			0.000
			7
			D 0.doo

• So, as a matter of fact, supports must be defined as in 3D.



2D Frame:

• New project type added "2.5D-Frame".

Job info

Create new project 1D-Beam 2D-Frame 2D-Truss	☐ 1.5D-Beam		2.5D
2D-Grillage 3D-Frame 3D-Truss 2D-Plate (FEM) 2D-Wall (FEM)	2.5D-Grillage		
 Open existing project Open existing MXM 	et L projects		L

• This is a project with 3D possibilities, whereby, for example, loads can also be set in the local and global Y-directions.



Loads definition	$^{\pm}$ ×	📲 * 🔏 * 🛛 L.C.	B.G.1: Permanent	- & & Q [±] Q [±]	123% *	· 📲 🖅 :	📭 🕂 🕈 💠 🔶	
프 프 프 프 프 프 프 프								
Load case L.C. Type Description B.G.1 Permanent actions Permanent Value 10000 m Distance 0000 m Proj X @Y Z % Yr Zr Angle Local X* Yr Zr %' Yr' Zr' Angle' Global X* Yr Zr' %' Yr' Zr' Angle' Apply to A		↓ ₹₹					52	

• So, as a matter of fact, supports must be defined as in 3D.



2D Grillage:

• New project type added "2.5D-Grillage".

Job info

Create new project 1D-Beam 2D-Frame 2D-Truss 2D-Grillage 3D-Frame 3D-Truss 2D-Plate (FEM) 2D-Wall (FEM)	 1.5D-Beam 2.5D-Frame 2.5D-Grillage 	2.5
 Open existing project Open existing MXML p 	projects	

• This is a project with 3D possibilities, whereby, for example, loads can also be set in the local and global Y-directions. It is also possible to give up a normal force or to work with pre-stress.



	-	
Load case LC. Type Permanent actions Permanent actions Distance Distance Distance Company of the second sec	프 프 프 프 프 프 프 프 프 프	
Image: Construction of the segment	Load case L.C. Type 🕟 Description	
Begin End Distance 0.000 Distance 0.000 Proi 2 Cacel X Y Z Apply to All	LC1 V Permanent actions V Permanent	
Value 10000 m m m Dietono Pros V V Z V VY Z Angle Global X* VY Z Angle Apply to Al	Generate Fields Begin End	N/ Mc
Distance 0000 m m Proceton Proceto	Value -10.000 V -10.000 V	
Direction Processor X @ Y @ Z @ XY @ Y @ Z @ Angle Global X @ Y @ Z @ XY @ Y @ Z @ Angle Apply to Al	Distance 0.000 m L m	
	Direction Proj. OX OY OZ OXr OYr OZr OAngle	N6 N0
	Local OX' OY' OZ' OXr' OYr' OZr' OAngle'	10.00 Mas
	Global OX'' OY'' OZ'' OX'' OY'' OZ'' O Angle'' *	NG TO THE TOTAL OF TOTALO OF TOTAL OF TO
	1 Complexity to All	
		Mu Andrew
		M1 250.00
<		z
		C
Structure view Solid view		Structure view Solid view

So, as a matter of fact, supports must be defined as in 3D.

Loads definition



• The division of the concrete images into columns and rows has been renewed and made smarter. Now when filling in for example "10m: 1", the number of columns is automatically determined with a maximum beam length of 10,000m.





• It is now possible to have the fields generated in "Distributed variable load", in the same way as is possible with 1D-Beam.

Loads definition 4 ×	
扁.ㅍ.④.爾.杰.ዹ.士.士.속. 🝓 👄 🐇	
B 6 2 V Imposed loads distribute V Imposed loads distributed	
Generate Fields Begin End	
Value 15 🗸 15 🗸	
Distance 0 m L m	
Proj. OZ Xr OYr	
Local OZ' OXr' OYr'	
Loads definition 🔍 🗶 🦉 👻 🔏 💌 L.C. 💌 B.G.2.2: Im	posed k 🔻 🗟 🕸 ब्रे ब्रे 🖉 🐨 🐨 🐙 🗊 🗊 🗊 👘 👘 🥵 की की 📐
Load case L.C. Type > Description B.G.2 V Imposed loads distribute Imposed loads distributed	
Generate Fields Begin End	K2 5 86
Distance 0.000 m L m	15.00 R400x500 H4
	Raddan
	St 15.00 K6 Sto
RA	10x500 R400
	R400X- 1500 Kg
+O******O	×3 100×500
	15.00 Kere
	R400x500 H5 RAUDISTU
Label Type Value begin Value end Dist Begin Dist End Direction	Member/Node Loads style
LD17 q 15.000 15.000 4.000 5.000 2 51 LD18 q 15.000 15.000 4.000 7.400 Z 52 LD19 a 15.000 15.000 2.000 6.900 Z 53	
LD20 q 15.000 15.000 2700 6.300 Z S4	
B.G.2.1 B.G.2.2 B.G.2.3 B.G.2.4	4 4
Generated load fields	
LD11 q 15.000 15.000 L000 L Z S2 LD11 q 15.000 15.000 0.000 L Z S3 LD12 a 15.000 15.000 0.000 L Z S3	
*	
B.G.1 B.G.2 New	

3D Frame:

•

• It is now possible to specify an angle for a "User Defined" section.

Sections Definition 2 × Sections Sections User Defined Parametric - L Angle - Circle - Rectangle - Rectangle - Rectangle - Rectangle - Rectangle - Square Tube - J I-Shape - O Tube - U-Shape - O Tube - Castellated - I I-Shape - Rectangle - Recta			•			0			
 Sections User Defined Parametric Angle Circle Hollowcore plate Fib plate Square Tube T-shape Square Tube T-shape Square Tube T-shape Square Tube Angle Scatellated FiB Arcelor/Mittal Castellated FiB Glued laminated timbe Glued laminated timbe Angle 	Sections Definition							ą.	×
Image: Second secon	Sections User Defined Parametric Angle Circle Hollowcore plate Rib plate Square Tube To-shape Visual Square Tube Tube	^	Angle	•	A I I E 35	5.4e-03 2.0e-07 8.35e-0! 3.04e-03 2.1e08	m² m^4 m^4 kN/m²		
	U-Shape Waardo ArcelorMittal Castellated IFB With AVB hot rolled Castellated C	e	Roof t	eam (sectio	on Apply	to All		



FEM:

The load generator can now also be used with 2D-Plates (FEM). (This is an extension module).

 Image: The load generator can now also be used with 2D-Plates (FEM). (This is an extension module).



It is now possible to link with the M + V + T module
 It is now possible to link with the M + V + T module
 of the toolbox to make a check calculation.
 The crack width check can then also be done. ATTENTION: this requires that the user enter an Mrep value. (This is an extension module)





Activate Edit Windows		
Project Browser 0 X trixTools 1. Cross M+V+T (V1213 (X=2.000, Y=2.000) 1. Cross M+V+T (V1213 (X=2.000, Y=2.000) 1. Cross M+V+T (V1213 (X=2.000, Y=2.000) Image: Concrete image:	Not Image: Check Design Steel B500B Main reinforcement Top Basic Additional Asprov Image: Cover Basic R7.150 Additional Additional Additional Additional Additional Secondary reinforcement Top Basic R7.150 Additional Secondary reinforcement Top Bottom Trans. reinf. Top Bottom Tas.prov	

- The mesh module has been renewed and as a result the mesh will generate less error messages or problems with areas, such as a hole, that was not processed correctly.
- Mesh procedures are more refined and if necessary the mesh is restarted several times to come to a
 solution. Additional checks are also carried out on unused points. If this message appears, the problem
 can be resolved by increasing the "Mesh density factor" and possibly switching the "Optimize mesh"
 function on or off.



• The help has been extended with an explanation of how the values are displayed, in the reinforcement grid at a user-defined local direction.





Local reinforcement direction is now also shown in the image.
 P P P P





• The reinforcement grid now also shows the direction X / Y and top and bottom.



• If after import DXF is forgotten to define a material and sheet thickness, a message about this will appear after starting the calculation and the calculation will be aborted.

Concrete check:

• For the lattice girder a setting has been added "Asi reduction for lattice girders" where it is possible to specify how many percent of the lattice girder may be taken into account for the shear plane between the prefab slab and the top layer.





• Deflection calculation has been completely renewed and connected to the new M-N-Kappa module. Various settings for M-N-Kappa can be found in the settings for concrete.



- The concrete wizard now also supports the stirrup with 3 cuts. (1.5R8-300)
- Added setting to disable the check on "As; dbmin." For deep beams. This is because it causes far too high values for the required stirrup reinforcement in beams.

tions		
oncrete		
		~
	Elastic foundation K-Lambda = 1: <yes></yes>	
	Ignore axial force for reinforcement calculation: <yes></yes>	
	Advanced Z calculation: <yes></yes>	
	Check on conflict diameters: <yes></yes>	
	 Round bar count to integer for nets: <no></no> 	
	 Ignore deep beams if lov is less than: <0.100> 	
	Cracking check EN1992: <spacing+diameter(#7.3.3)></spacing+diameter(#7.3.3)>	
	 Detect zero position with tolerance My [kNm]: <0.010> 	
	Allow stirrups for thin slabs(ignore #9.3.2(1) rule): <no></no>	
	My threshold for detecting cuts [kNm]: <1.000>	
	Split cuts if axial force changes: <no></no>	
	Long <= Short term: <yes></yes>	
	Beta factor (static = 1.0, dynamic = 0.5): <1.0>	
	Check As;dbmin for deep beams: <yes>.</yes>	
÷	Concrete defaults	
÷	FNL Reinforcement	~
		_
Check As;	dbmin for deep beams Yes	~
		_
	OK Cancel Apply	Reset



Steel check:

• It is now possible to set the number of decimals for the Unity Check.



The tables of the check are now also filtered on the selected selection set.



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×

- The stresses are now also calculated for IFB profiles.
- The steel check for IFB profiles has been refined and if the UC = 999 more information will be shown in the tool tip.
- An extra layer has been added where the load attachment can be shown for lateral buckling.

Timber check:

- It is now possible to set the number of decimals for the Unity Check. (see steel check)
- The tables of the check are now also filtered on the selected selection set. (see steel check)

Steel Joint connections:

Drawing print

- The welding resistances have been added to the welding calculations in accordance with NEN-EN 1993-1-8 # 4.10 (5).
- Cross-section check of the sections has been added for all connections.
- For the stability connection, the check for "tearing of bolt groups" according to NEN-EN 1993-1-8 # 3.10.2 and 3.10.3 has been added.
- For a "Beam Cross girder" connection, where only on one side is a girder, additional controls "VRd, min" have been added for the web of the crossbeam at the location of the bolt holes and the endplate of the girder.
- In the case of a compression haunch, the weld is no longer checked between the beam and the console for the maximum capacity, but for the shear force occurring as a result of the moment.
- The scale factor is now printed when the drawing is printed.
- When printing a connection, it is now possible to have the "Description" printed on a separate page so that there is more space for the drawing.

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- For lattice girders, the control of eccentricity has been added according to NEN-EN 1993-1-8 # 5.1.5 (5). Extra moments are charged in accordance with NEN-EN 1993-1-8 # 5.1.5 (6) and NEN-EN 1993-1-8 # 5.1.5 (7).
- In the case of a "Beam Cross girder" connection on the flange, the eccentricity is now also taken into account as an extra moment.
- With the "Column-beam" connection it is now possible to calculate a rod (strut) at an angle between 20 ° and 160 °. This is possible if there is only a normal force.
- With a welded tube on a column, the shear force can now also be entered. This is included in the profile control.
- The equilibrium check is added for "Column Beam", "Beam-Cross girder" and "Tube connections". This can be switched on at the settings.

Steel Joint Connections	— 🗆 X
Assumptions Shear plane passes through the threaded portion	Corrections O Auto I User
Validations and suggestions	Miscellaneous
Enable validations	🗹 Equilibrium
Stop calculations on error	
Show suggestions	
	OK Consel

- At a compression haunch, the check is no longer carried out on the maximum console capacity but on occurring forces.
- It is now possible to switch off the control for "F; t, Rd" in the case of a foot plate connection with anchors and an anchor plate. This check is only necessary if a plastic hinge needs to be able to occur.

Frame	Horizontal stiffness
Static determined	● Braced frame
Static indetermined	○ Sway frame
Environment Non corrosive Corrosive	Check on F;t,Rd

- ٠
 - A setting has been added to allow the control of the welds, according to NEN EN 1993 1 8 # 6.2.3 (5), to be carried out or not. This check is only necessary if a plastic hinge needs to be able to occur.

Frame Static determined Static indetermined	Horizontal stiffness Braced frame Sway frame
Environment Non corrosive Corrosive	Check welds based on M;j;Rd



MatrixTools:

- Deep beam. 0 拱 1. Deep beam - • • 📓 🤹 🖉 🚨 🖨 109% 👻 🗟 💐 💐 🗳 General Node results Member results Reinforcement result Check type Load Check 🔿 Design 150.00 kN/m Top;q 0 mm z Top;F 405.00 kN 60.1 • Theta Bottom;q 150.00 kN/m Increase 10% Yes Bottom;F 405.00 kN Wall Concrete N1 • N2 820 Length 5400 mm Concrete C25/30 = -810.00 kN M2 = -810.00 kN M 3000 mm Reinf. 8500A \sim Heiaht N3 N4 Depth 250 mm h-d 180 mm M3 = -465.75 kN Supports = 405.00 1800 = 405.00 kN 3000 мþ WIGEVEE L Rectangle \sim Shape 2000 13 400 mm Width 250 mm Depth M7 = -010.00 kN M6 = 465.75 kN ∑MB = -810.00 kN Ň7 N10 180 N9 1 ŧ 1150 200 200 1150 2700 4 5400 + Drawing Open 4 ⊳
- New module has been added for "Strut & Tie". (This is an extension module) •

Foundation block 0



Various settings can be made under the "Customize / Settings" menu in "Strut & Tie". 0

🔳 Strut & tie			×
Increase compressive stress Hydrostatic Split nodes — Calculation assumptions —	s values by 10%		
Calculation Axial force limit	10	kN	
	ОК		Cancel



- Module M-N-Kappa has been completely renewed:
 - $\circ~$ It is now also possible to use BiMaterial, Prestress, T and L sections.
 - Calculations of the "Ultimate Limit State (ULS)" are now also possible.
 - o Various options have been added for "Concrete tensile stress diagram".
 - For Reinforcement diagram you can choose "Horizontal branch" or "Inclined branch".
 - Method Tension softening has changed completely.





1. Fire protectio	in a						
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 	3						
General							
Load				Fire temperature, f	yd related to tim	e	
Element type	EN-Firetex FX13381		\sim				
at buck length	EN-Hempacore AQ 48860			°C			N/mm²
	EN-Hempacore Une 43600			1200			
4;fi;d	EN-Hensotherm 320 KS						
Lateral buckling	EN-Hensotherm 410 KS			1000-			-250
M;1;Ed	EN-Hensotherm 420 KS	🚖 M;2;I	Ed 🛛 0.00 🖨 kNm 🚽				_
	EN Isolatek Type 300			800-			-200
Mu;U	EN-Promatect-H single	nperature d	istribution				
	EN-Promatect-200	rmined bea	m at the supports				150
Fection	EN-Promapaint-SC3	-		600-			-
section	EN-Promapaint-SC4			• /			
Section	EN-Promaspray-C450		Y-Axis 🗸	400-			-100
4.1.2.1	EN-Sika Platinum	F					
Material	NEN-Cafcote 280		60.7 N/mm2	200-			-50
	NEN-Fiproplaat						
⁻ hi	NEN-Flame Guard HCA-WL						
21.11	NEN-Mandolite CP2				15	30	45 min
Area	NEN-Multifire System S605			0	10 A	50	43 11111
dy:pl	NEN-Promatect-H				Amplent temp.	fud require	ad
	NEN-Pumica				Crit steeltemn	- Reg time	su
y	NEN-Rinoflam-S(beam)				one oroon tomp.	rtoq. uno	
√y;pl	NEN-Supalux-S	Jurface	5614e-04 m2/m				
Inculation	NEN-Supalux-V						
	NEN-Purotech-SP		1				
Section factor	NEN-Multifire Sys. S605WB 👻		166.1 m ⁻¹	Results			
nsulation	EN-Firetex FX13381	Foaming		Calculated thickness	0.208 mm	t;Theta;a	64 mir
	4		Shielded	Thetararspectmax	688 °C	Thetargetimax	842 °C
	According to EIN 13381-8:2010		Above	ara,a,opoo,man			
Entire section	Boxed Surface			Theta;a;cr	688 °C	UC	0.99
Thickness	0.776 V mm	Left		Conclusion	Fire res	istance is suffic	ient
Required fire	30 🖨 min						~
	1111						M

• New insulating materials have been added in "Fire protection" according to EN 13381-8: 2010.

• It is now possible to have the modules sorted by type.





MatrixTools Geo:

-1-1-0

• The name of the CPT diagram is now displayed in all forms.

r Begin End		Soil				Vo.	Vort	E100	Phi	C C	Cu	-	Friction		
II.	begin	LIIU	Name	Mixture	Consistence	Color	10	i sat	2100		L	cu	a	riction	ЧC
-	m	m	-	-	-	-	kN/m²	kN/m²	MPa	*	kN/m²	kN/m²	-	-	MPa
1	-1.43	-1.48	Peat	Pre-loaded	Moderate		12	12	0.5	15.0	5.0	0.0	5.0	-100%	0.20
2	-1.48	-1.68	Clay	Clean	Fixed		19	19	4.0	17.5	25.0	0.0	5.0	100%	2.00
3	-1.68	-1.83	Sand	Very salty, clayey	-		18	20	20.0	25.0	0.0	0.0	5.0	100%	2.00
4	-1.83	-1.88	Sand	Weak salty, clayey	•		18	20	25.0	27.0	0.0	0.0	5.0	100%	5.00
5	-1.88	-1.98	Sand	Very salty, clayey	-		18	20	20.0	25.0	0.0	0.0	5.0	100%	2.00
6	-1.98	-2.03	Sand	Weak salty, clayey	•		18	20	25.0	27.0	0.0	0.0	5.0	100%	5.00
7	-2.03	-2.83	Sand	Very salty, clayey	-		18	20	20.0	25.0	0.0	0.0	5.0	100%	2.00
8	-2.83	-2.88	Clay	Slightly sandy	Fixed		20	20	5.0	22.5	25.0	0.0	5.0	100%	2.50
9	-2.88	-2.93	Loam	Slightly sandy	Fixed		21	21	10.0	27.5	5.0	0.0	5.0	100%	3.00
10	-2.93	-3.03	Clay	Clean	Fixed		19	19	4.0	17.5	25.0	0.0	5.0	100%	2.00
11	-3.03	-3.13	Loam	Slightly sandy	Fixed		21	21	10.0	27.5	5.0	0.0	5.0	100%	3.00
12	-3.13	-3.18	Clay	Slightly sandy	Fixed		20	20	5.0	22.5	25.0	0.0	5.0	100%	2.50
13	-3.18	-3.63	Clay	Clean	Fixed		19	19	4.0	17.5	25.0	0.0	5.0	100%	2.00
14	-3.63	-4.33	Clay	Clean	Moderate		17	17	2.0	17.5	10.0	0.0	5.0	-100%	1.00
15	-4.33	-4.58	Clay	Organic	Moderate		15	15	1.0	15.0	0.0	0.0	5.0	-100%	0.50
16	-4.58	-4.88	Clay	Clean	Moderate		17	17	2.0	17.5	10.0	0.0	5.0	-100%	1.00
17	-4.88	-5.08	Clay	Clean	Fixed		19	19	4.0	17.5	25.0	0.0	5.0	100%	2.00
18	-5.08	-5.13	Clay	Slightly sandy	Fixed		20	20	5.0	22.5	25.0	0.0	5.0	100%	2.50
19	-5.13	-5.28	Loam	Slightly sandy	Fixed		21	21	10.0	27.5	5.0	0.0	5.0	100%	3.00
20	-5.28	-5.33	Sand	Very salty, clayey	-		18	20	20.0	25.0	0.0	0.0	5.0	100%	2.00
21	-5.33	-5.48	Loam	Slightly sandy	Fixed		21	21	10.0	27.5	5.0	0.0	5.0	100%	3.00
22	-5.48	-6.03	Sand	Very salty, clayey	-		18	20	20.0	25.0	0.0	0.0	5.0	100%	2.00
23	-6.03	-6.08	Loam	Slightly sandy	Fixed		21	21	10.0	27.5	5.0	0.0	5.0	100%	3.00
24	-6.08	-6.13	Clay	Slightly sandy	Fixed		20	20	5.0	22.5	25.0	0.0	5.0	100%	2.50
25	-6.13	-6.18	Loam	Slightly sandy	Fixed		21	21	10.0	27.5	5.0	0.0	5.0	100%	3.00
26	-6.18	-6.43	Sand	Very salty, clayey	•		18	20	20.0	25.0	0.0	0.0	5.0	100%	2.00
27	-6.43	-6.48	Loam	Slightly sandy	Fixed		21	21	10.0	27.5	5.0	0.0	5.0	100%	3.00
28	-6.48	-6.53	Clay	Clean	Fixed		19	19	4.0	17.5	25.0	0.0	5.0	100%	2.00
29	-6.53	-6.58	Loam	Slightly sandy	Fixed		21	21	10.0	27.5	5.0	0.0	5.0	100%	3.00

Edit soil layers: 24-3158_6.GEF

• In the tab results for a pile calculation an extra column has been added with "Fc; netto". This is the carrying capacity without negative adhesive (Rc; d - Fnk; rep).

-	E I. Com	pression Pile							
ľ	😡 😘 💈	3 🛕 🖪 👘							
	<u> </u>	T	Describe	1			1		
	General	Average result	s Results	24-3158_6.GE	F 24-3158_6.GEF	Settlement chart			
	Pile f	oot level f	Fnk;rep	Fc;tot	Rb;cal;max;rep	Rs;cal;max;rep	Ro;d	Fc;netto	Check
	24-315	58_6.GEF							
		-12.000	124.60	474.60	88.38	75.35	163.73	39.13	Not Ok
		-12.250	124.60	474.60	95.27	86.50	181.77	57.17	Not Ok
		-12.500	124.60	474.60	130.40	96.38	226.78	102.18	Not Ok
		-12.750	124.60	474.60	142.81	108.75	251.56	126.96	Not Ok
		-13.000	124.60	474.60	145.37	125.78	271.15	146.55	Not Ok
		-13.250	124.60	474.60	120.87	143.76	264.63	140.03	Not Ok
		-13.500	124.60	474.60	102.09	161.34	263.43	138.83	Not Ok
		-13.750	124.60	474.60	96.49	174.30	270.79	146.19	Not Ok
		-14.000	124.60	474.60	41.93	183.41	225.34	100.74	Not Ok
		-14.250	124.60	474.60	31.07	194.57	225.64	101.04	Not Ok
		-14.500	124.60	474.60	27.16	204.93	232.09	107.50	Not Ok
		-14.750	124.60	474.60	22.16	214.02	236.17	111.58	Not Ok
		-15.000	124.60	474.60	17.48	228.00	245.48	120.88	Not Ok
		-15.250	258.91	608.91	16.89	0.00	16.89	-242.02	Not Ok
		-15.500	267.70	617.70	18.25	0.00	18.25	-249.45	Not Ok
		-15.750	276.60	626.60	18.84	0.00	18.84	-257.76	Not Ok
		-16.000	284.89	634.89	18.69	0.44	19.13	-265.76	Not Ok
		-16.250	294.74	644.74	17.85	0.00	17.85	-276.89	Not Ok
		-16.500	303.96	653.96	19.15	0.00	19.15	-284.81	Not Ok
		-16.750	313.28	663.28	19.43	0.00	19.43	-293.86	Not Ok
		-17.000	322.71	672.71	19.59	0.00	19.59	-303.12	Not Ok
		-17.250	332.25	682.25	21.70	0.00	21.70	-310.55	Not Ok
		-17.500	341.89	691.89	23.86	0.00	23.86	-318.03	Not Ok
		-17.750	351.63	701.63	24.07	0.00	24.07	-327.56	Not Ok
		-18.000	360.69	710.69	63.53	0.66	64.19	-296.50	Not Ok
		-18.250	360.69	710.69	82.21	15.98	98.19	-262.51	Not Ok
		-18.500	360.69	710.69	75.09	33.09	108.17	-252.52	Not Ok
		-18.750	360.69	710.69	69.57	48.87	118.45	-242.25	Not Ok
		-19.000	360.69	710.69	66.38	60.57	126.95	-233.75	Not Ok
		-19.250	360.69	710.69	77.43	76.28	153.71	-206.99	Not Ok
		-19.500	360.69	710.69	78.01	90.81	168.82	-191.88	Not Ok
1		.19 750	P3 039	710.69	176.47	109 50	29/ 97	.75.72	NotOk



There is also a new report item made for this "Compression Pile Fc; netto".

🗲 Reports				×
Report Items Pictures Options Header/Footer Doc	uments' Reports			
Sort type:		Saved reports:		
Split (separate item for each table)	\sim			~
		Save Report	Customize R	eports
Available items:		Selected items:		
 1. Compression Pile 1. Compression Pile Summary 1. Compression Pile Summary by CPT CPT diagram CPT diagram Compression Pile: -12.000 m Compression Pile: -12.250 m Compression Pile: -12.250 m Compression Pile: -12.750 m Compression Pile: -13.000 m Compression Pile: -13.250 m Compression Pile: -13.250 m Compression Pile: -13.750 m Compression Pile: -13.750 m Compression Pile: -14.250 m Compression Pile: -14.250 m Compression Pile: -14.500 m Compression Pile: -14.500 m Compression Pile: -15.500 m 	 ∧ >> <li< td=""><td></td><td>c;netto</td><td></td></li<>		c;netto	
	Print	Preview Editor	Export	Close

• In the settings for pile systems, a column "Limit qc; 3 gem." added. This setting is necessary for, for example, CFA piles which are limited to 2 MPa.

Pile type	Specification	Installation	Pile Typ	e Alpha;p	Alpha;s	Alpha;t	Fu line	Delta; j k	Limit qc;3 avg.	Table A	Shape	Pulled tube	Pile morta
Concrete	Prefab ; Smooth pile with square shape	Drilled	1	1.0	0.010	0.007	1	0.75	N/A	A.6	Square		
Concrete	Prefab ; Pile with footer and with square shape	Drilled	2	1.0	0.010	0.007	1	0.75	N/A	A.6	Square		
Concrete	Prefab ; Smooth pile with round shape	Drilled	1	1.0	0.010	0.007	1	0.75	N/A	A.6	Circle		
Concrete	Prefab ; Pile with footer and with round shape	Drilled	2	1.0	0.010	0.007	1	0.75	N/A	A.6	Circle		
Concrete	Shaped in soil with smooth tube pile on a drilled footer,	Drilled; tube pile is removed from the soil while	3	1.0	0.014	0.012	1	1.00	N/A	A.6	Circle	\sim	\checkmark
Concrete	Shaped in soil with smooth tube pile on a foot plate, in	Drilled; tube pile is removed from the soil while	4	1.0	0.014	0.012	1	1.00	N/A	A.6	Circle	\sim	\sim
Concrete	Shaped in soil with smooth tube pile on a drilled footer,	Drilled; tube pile is removed from the soil while	3	1.0	0.012	0.010	1	1.00	N/A	A.6	Circle	\sim	\sim
Concrete	Shaped in soil with smooth tube pile on a foot plate, in	Drilled; tube pile is removed from the soil while	4	1.0	0.012	0.010	1	1.00	N/A	A.6	Circle		\sim
Concrete	Shaped in soil with smooth tube pile on screw base, in	Screwed; While pulling the tube pile the screw	10	0.9	0.009	0.009	1	1.00	N/A	A.7	Circle	\sim	\sim
Concrete	Shaped in soil with CFA	Screwed	10	0.8	0.006	0.004	2	1.00	2	A.7	Circle		
Concrete	Shaped in soil with grout injection	Dug or drilled	10	0.5	0.006	0.004	3	1.00	N/A	A.7	Circle		
teel	Constant cross dimension; tube pile with closed base	Drilled	8	1.0	0.010	0.007	1	0.75	N/A	A.6	Circle		
teel	Constant cross dimension; section	Drilled	11	1.0	0.006	0.004	1	0.75	N/A	A.6	I-Shape		
iteel	Constant cross dimension; open pile tube	Drilled	12	1.0	0.006	0.004	1	0.75	N/A	A.6	CHS		
Steel	Shaped in soil with grout shell around section with colu	Drilled; with grout injection	7	1.0	0.014	0.012	1	1.00	N/A	A.6	Circle		
Steel	Constant cross dimension above screw base	Screwed	10	0.8	0.006	0.004	1	1.00	N/A	A.7	Circle		
Steel	Shaped in soil with grout shell around tube pile with scr	Screwed without taking the pile up and down	9	0.9	0.009	0.009	1	1.00	N/A	A.7	CHS		
Steel	Constant cross dimension	Pulsed	10	0.5	0.005	0.000	3	1.00	N/A	A.8			
Micro	Shaped in soil with double drill pile, in which grout is pr	Washing drills with grout injection, not pressed	7	0.5	0.008	0.008	2	1.00	N/A	A.7	Circle		
Micro	Shaped in soil with double drill pile, in which grout is pr	Washing drills with grout injection, pressed	7	0.5	0.011	0.011	1	1.00	N/A	A.7	Circle		
Micro	Shaped in soil with single drill pile, in which grout is pre	Washing drills surrounded from the outside wit	7	0.5	0.008	0.008	2	1.00	N/A	A.7	Circle		
Micro	Shaped in soil with single drill pile, in which grout is pre	Washing drills surrounded with grout injection,	7	0.5	0.011	0.011	1	1.00	N/A	A.7	Circle		
vlicro	Shaped in soil with anchor piles and drill head in which	Drilled automatically with grout injection	7	0.5	0.008	0.008	2	1.00	N/A	A.7	Circle		
Micro	Shaped in soil with anchor tubes and screw blades, in	Screwed; mix of soil and grout	7	0.5	0.008	0.008	2	1.00	N/A	A.7	Circle		
Micro	Shaped in soil with steel sub pile tube, in which grout is	Drilled with grout injection	7	0.5	0.006	0.006	2	1.00	N/A	A.8	Circle		
Timber	Constant cross dimension	Drilled	5	1.0	0.010	0.007	1	0.75	N/A	A.6	Circle		
Timber	Tapered	Drilled	6	1.0	0.012	0.007	1	0.75	N/A	A.6	Circle		
~													

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It is now possible to have the graph with design results printed when reporting.



• It is now possible to print the graph with adhesive sections when reporting.





The spring stiffness of the pile can now also be printed.



It is now possible to select multiple cells for the cone and friction values table and then assign a value ٠ by clicking the right mouse button. Also inserting a row is now possible.

Depth	Cone value	Friction value		
-1.430	0.010	0.000		
-1.445	0.342	-0.001		
-1.460	0.396	0.002		
-1.479	0.451	0.005		
-1.498	0.470	0.009		
-1.519	0.463	0.015		
-1.548	0.476	0.024		
-1.577	0.476	0.031		
-1.606	0.488	0.036		
-1.635	0.518	0.038		
-1.791	3.189	0.048		
-1.813	3.585	0.048		
-1.835	3.756	0.04		
-1.858	3.780	0.04	Сору	
-1.881	3.750	0.04	Paste	
-1.903	3.683	0.05		
-1.926	3.658	0.05	Insert row	
-1.949	3.726	0.06		
-1.971	3.957	0.06	Set value for s	elected row(s)
-1.993	4.067	0.067	6	
-2.016	3.842	0.062	/	



• Because in soil analysis based on Qc, where several types of soil have the same value, the first value is chosen, an extra table is added "NEN-EN1997-1 Table 2.b (sand). This means that with gravel and sand, sand will be selected.

| lame Mixture
nd Clean
nd Clean
nd Clean
nd Weak salty, clayey | Consistence
Loose
Moderate
Fixed | Color
- | kN/m²
17
18 | kN/m ²
19
20 | MPa
15.0 | 30.0 | kN/m² | kN/m²
 | 9
 | rincdon
 | W C,II II. | wc,avg.
 | wc,sup.
 | qo,ini. | qc | qc,sup. | | | |
|---|--|--|--|--|--|---|--
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--|--|--|--|--|---|
| nd Clean
nd Clean
nd Clean
nd Weak salty, clayey | Loose
Moderate
Fixed |] | kN/m ³
17
18 | kN/m²
19
20 | MPa
15.0 | 30.0 | kN/m² | kN/m²
 |
 |
 | |
 |
 | | | | | | |
| nd Clean
nd Clean
nd Clean
nd Weak salty, clayey | Loose
Moderate
Fixed | | 17
18 | 19
20 | 15.0 | 30.0 | |
 | ·
 | •
 | • |
 | -
 | MPa | MPa | MPa | | | |
| nd Clean
nd Clean
nd Weak salty, clayey | Moderate
Fixed | | 18 | 20 | | 50.0 | 0.0 | 0.0
 | 5.0
 | 100%
 | 0.86 | 0.91
 | 0.95
 | 3.50 | 5.00 | 12.50 | | | |
| nd Clean
nd Weak salty, clayey | Fixed | | 10 | | 45.0 | 32.5 | 0.0 | 0.0
 | 5.0
 | 100%
 | 0.78 | 0.82
 | 0.86
 | 12.50 | 15.00 | 20.00 | | | |
| nd Weak salty, clayey | | | 15 | 21 | 75.0 | 35.0 | 0.0 | 0.0
 | 5.0
 | 100%
 | 0.70 | 0.74
 | 0.78
 | 20.00 | 25.00 | 27.50 | | | |
| | | | 18 | 20 | 35.0 | 27.0 | 0.0 | 0.0
 | 2.0
 | 100%
 | 0.95 | 1.10
 | 1.25
 | 12.50 | 12.00 | 20.00 | | | |
| nd Very saity, clayey | • | | 18 | 20 | 15.0 | 25.0 | 0.0 | 0.0
 | 2.0
 | 100%
 | 1.25 | 1.63
 | 2.00
 | 7.50 | 8.00 | 12.50 | | | |
| avel Slightly salty brackish | Loose | | 17 | 19 | 45.0 | 32.5 | 0.0 | 0.0
 | 5.0
 | 100%
 | 0.20 | 0.25
 | 0.30
 | 12.50 | 15.00 | 20.00 | | | |
| avel Slightly salty brackish | Moderate | | 18 | 20 | 75.0 | 35.0 | 0.0 | 0.0
 | 5.0
 | 100%
 | 0.10 | 0.15
 | 0.20
 | 20.00 | 25.00 | 27.50 | | | |
| avel Slightly salty brackish | Fixed | | 19 | 21 | 90.0 | 37.5 | 0.0 | 0.0
 | 5.0
 | 100%
 | 0.00 | 0.05
 | 0.10
 | 27.50 | 30.00 | 100.00 | | | |
| avel Highly salty | Loose | | 18 | 20 | 30.0 | 30.0 | 0.0 | 0.0
 | 5.0
 | 100%
 | 0.56 | 0.63
 | 0.70
 | 7.50 | 10.00 | 12.50 | | | |
| avel Highly salty | Moderate | | 19 | 21 | 45.0 | 32.5 | 0.0 | 0.0
 | 5.0
 | 100%
 | 0.43 | 0.50
 | 0.56
 | 12.50 | 15.00 | 20.00 | | | |
| avel Highly salty | Fixed | | 20 | 22 | 75.0 | 35.0 | 0.0 | 0.0
 | 5.0
 | 100%
 | 0.30 | 0.37
 | 0.43
 | 20.00 | 25.00 | 27.50 | | | |
| am Slightly sandy | Weak | | 19 | 19 | 2.0 | 27.5 | 0.0 | 50.0
 | 1.0
 | -100%
 | 2.45 | 2.48
 | 2.50
 | 0.85 | 1.00 | 1.25 | | | |
| am Slightly sandy | Moderate | | 20 | 20 | 3.0 | 27.5 | 1.0 | 100.0
 | 1.0
 | 50%
 | 2.40 | 2.43
 | 2.45
 | 1.50 | 2.00 | 1.75 | | | |
| am Slightly sandy | Fixed | | 21 | 21 | 5.0 | 27.5 | 2.5 | 200.0
 | 1.0
 | 100%
 | 2.00 | 2.20
 | 2.40
 | 2.50 | 3.00 | 3.50 | | | |
| am Highlysandy | • | | 19 | 19 | 3.0 | 27.5 | 0.0 | 50.0
 | 1.5
 | 100%
 | 2.50 | 2.60
 | 2.70
 | 1.50 | 2.00 | 1.75 | | | |
| y Clean | Weak | | 14 | 14 | 1.0 | 17.5 | 0.0 | 25.0
 | 1.0
 | -100%
 | 4.00 | 4.25
 | 4.50
 | 0.35 | 0.50 | 0.60 | | | |
| y Clean | Moderate | | 17 | 17 | 2.0 | 17.5 | 5.0 | 50.0
 | 1.0
 | -50%
 | 3.60 | 3.80
 | 4.00
 | 0.85 | 1.00 | 1.25 | | | |
| y Clean | Fixed | | 19 | 19 | 4.0 | 17.5 | 13.0 | 100.0
 | 1.0
 | 100%
 | 3.10 | 3.35
 | 3.60
 | 1.75 | 2.00 | 2.50 | | | |
| y Slightly sandy | Weak | | 15 | 15 | 1.5 | 22.5 | 0.0 | 40.0
 | 1.0
 | -100%
 | 3.00 | 3.05
 | 3.10
 | 0.60 | 0.70 | 0.85 | | | |
| y Slightly sandy | Fixed | | 18 | 18 | 3.0 | 22.5 | 5.0 | 80.0
 | 1.0
 | 50%
 | 2.90 | 2.95
 | 3.00
 | 1.25 | 1.50 | 1.75 | | | |
| y Slightly sandy | Moderate | | 20 | 20 | 5.0 | 22.5 | 13.0 | 120.0
 | 1.0
 | 100%
 | 2.80 | 2.85
 | 2.90
 | 2.50 | 2.50 | 2.75 | | | |
| y Highly sandy | • | | 18 | 18 | 2.0 | 27.5 | 0.0 | 0.0
 | 1.5
 | -100%
 | 2.70 | 2.75
 | 2.80
 | 0.85 | 1.00 | 1.25 | | | |
| y Organic | Weak | | 13 | 13 | 0.5 | 15.0 | 0.0 | 10.0
 | 1.0
 | -100%
 | 7.00 | 8.00
 | 9.00
 | 0.15 | 0.20 | 0.35 | | | |
| y Organic | Moderate | | 15 | 15 | 1.0 | 15.0 | 0.0 | 25.0
 | 1.0
 | -100%
 | 4.50 | 5.75
 | 7.00
 | 0.35 | 0.50 | 0.60 | | | |
| at Not pre-loaded | Weak | | 10 | 10 | 0.2 | 15.0 | 1.0 | 10.0
 | 0.5
 | -100%
 | 12.00 | 56.00
 | 100.00
 | 0.00 | 0.10 | 0.01 | | | |
| at Pre-loaded | Moderate | | 12 | 12 | 0.5 | 15.0 | 2.5 | 20.0
 | 0.5
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- With the "Bending moment pile" module, the check on Smax according to NEN-EN1992-1-1 # 9.5.3 (6) is no longer performed.
- At the "Bending moment pile" module, the "d, nom." Is now shown in the drawing.
- The settings for the digitizer for cone value, friction value and depth with respect to ground level can now be adjusted in the digitizer dialog.