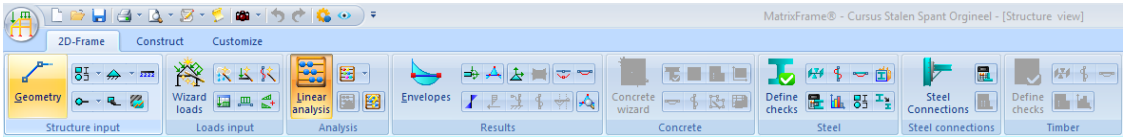
MatrixFrame version 5.0 - Release notes

Processed in version 5.0 (March 2012):

New:

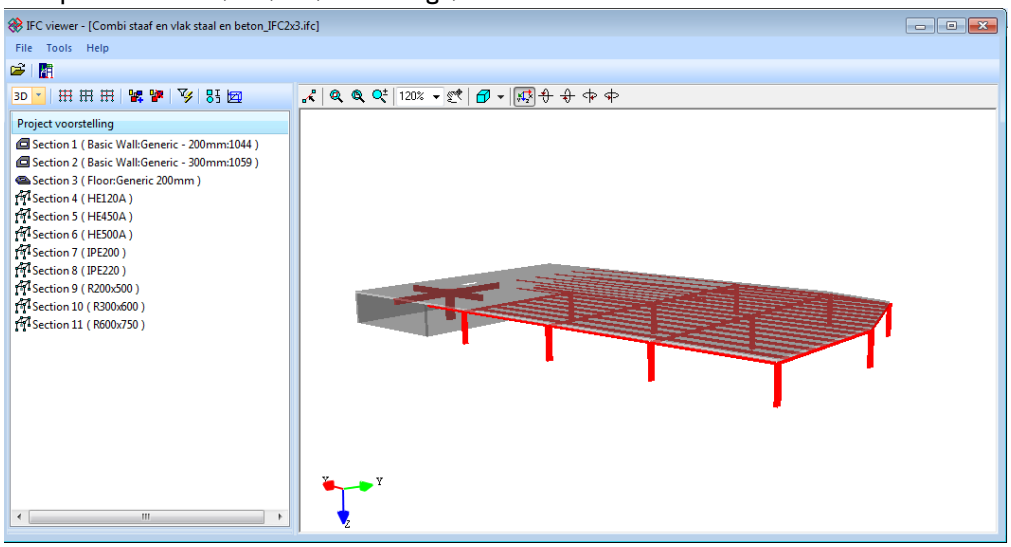
MatrixFrame® General:

1. New lay-out with ribbon bars.



2. Shortcuts can be defined by user in the Quick Access Toolbar.

3. Help system is redesigned based on functional specifications in combination with instruction movies.
4. New system for calculation of member forces is implemented. Calculation of large models (LE) and advanced GNL and/or FNL calculations are 35 to 45 percent faster.
5. New system for "Dynamic Analysis" is implemented.
6. BIM: IFC import/export (extension module)
    a. Selections of beams or plates can be made with the Matrix IFC Browser. These selections can be imported into 1D, 2D, 3D, 2D Grillage, 2D Plate of 2D Wall.



    b. Association tables are added for IFC to support several modeling programs.
    Problem of not opening in Tekla from a MatrixFrame exported IFC is solved with that.

7.  With the Spy function it is possible to show the details of the member forces and deflections at every possible position.

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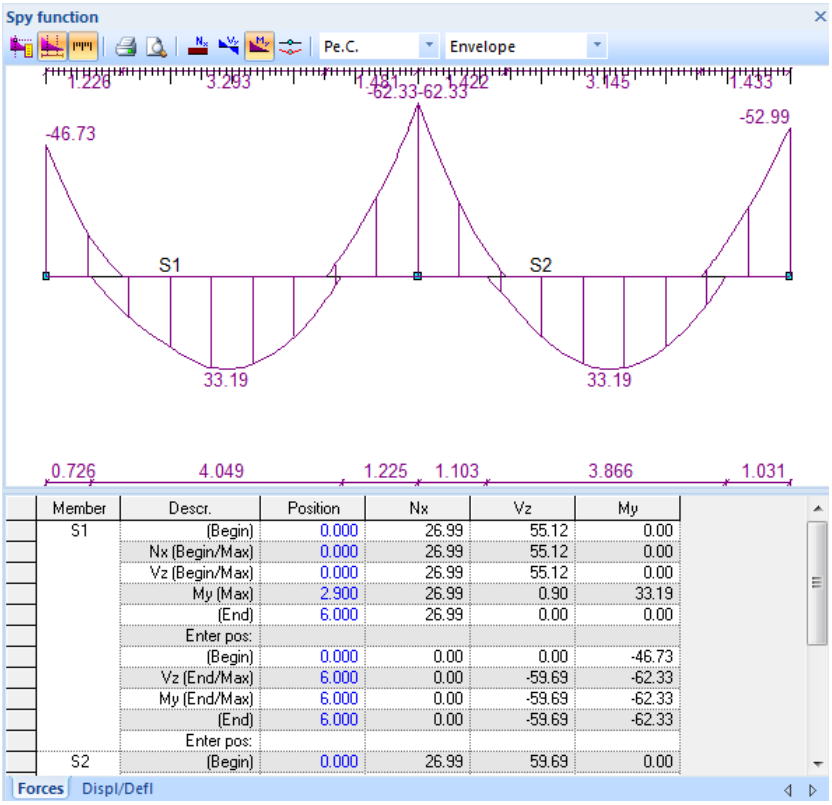
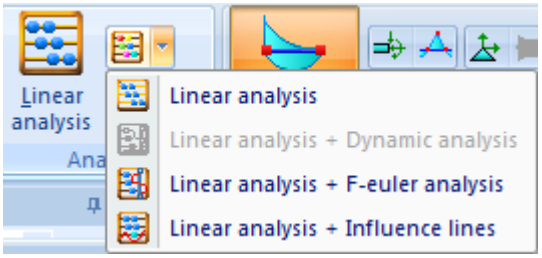
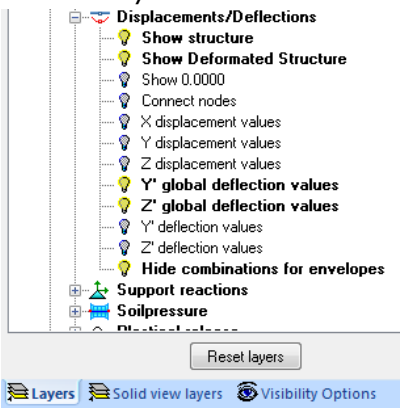


8.  A smart selection function is added. This function selects members as well as nodes and depending on the chosen action on the selection it is applied on the members or the nodes.
9. Analysis option for Influence Lines is added. (extension module).



10. 3D Visualization of the model, beside the existing schematic view.
11. An extra layer "Hide combinations for envelopes" is added for displacements/deflections. When activated only the extremes will be displayed.



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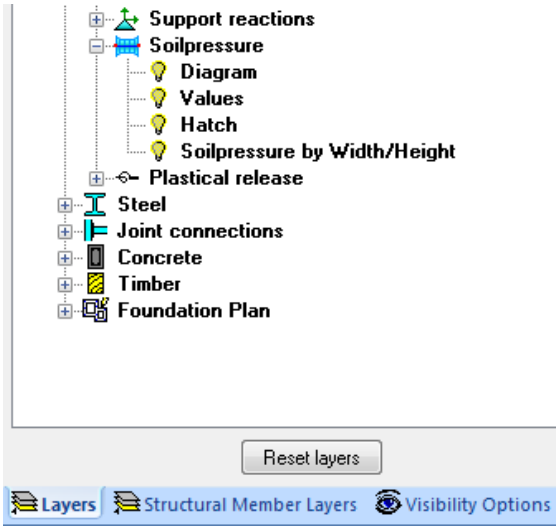
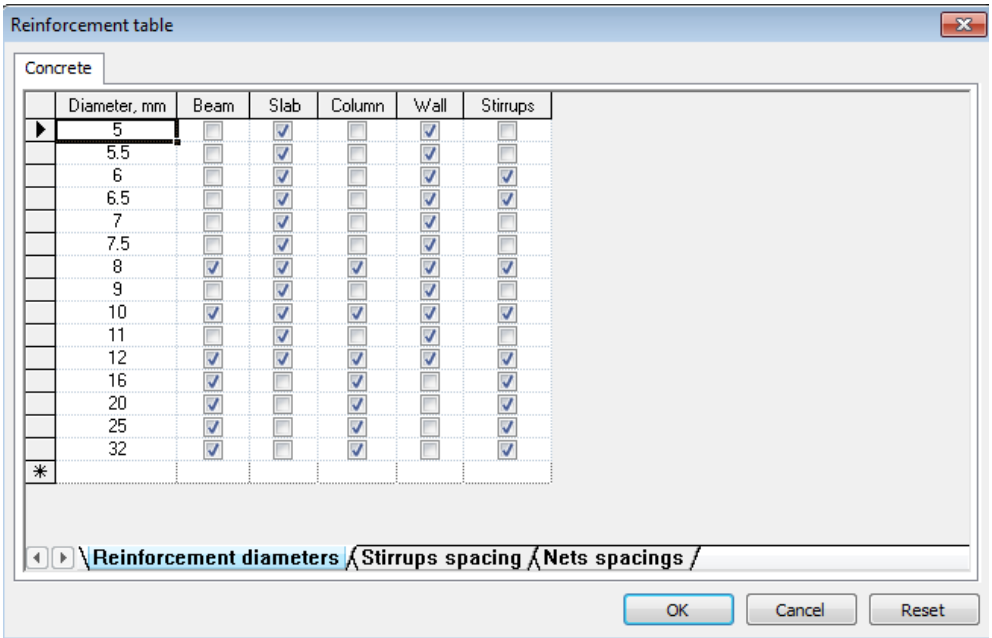
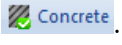
12. The size of the arrow from the support reaction can be set in the visibility options.
13.  It is possible to visualize the sum of the loads on a member.
14. Soil pressure can be shown, in tables and graphics, based on the width in kN/m2 in the results.



15. Concrete check:
    a. The Concrete wizard has been renewed.
    b. In ribbon "Customize" in "Reinforcement table"  the diameters and spacing , that are used for the dropdown list from basic and additional reinforcement, can be set.



    c. In the Reinforcement table can be set which nets spacing should be used for basic and additional.
    d. In the Reinforcement table can be set which stirrups spacing should be used for basic and total.
    e. With an elastic foundation is in the calculation klambda = 1 the default setting for Tau1.This can be changed in customize/concrete  .
    f. The tooltips in column calculations is giving the eccentricities (e0,e1,et) now in mm.

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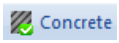
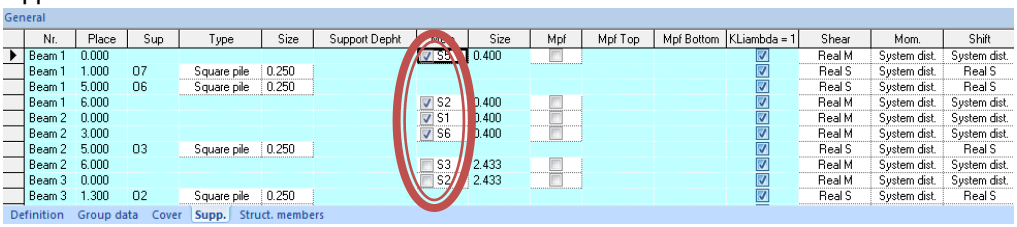
g. In extra/concrete 

can be chosen if the normal force (compression) should be taken into account in the reinforcement calculation.
h. The width of all the concrete tables is saved.
i. A new advanced calculation module is now used for determination of "z" This has replaced the common used rule z=0.9*d. Because of this a more accurate calculation is done.
j. The order of the columns "Shear, Moment and Shift" has been made more logic.
k. With double click on header "Mpf" in the "Concrete settings" tab "Supp."the Mpf for all beams can be turned on or.
l. In Concrete settings a setting is now possible to define if the crossing member should act as a support or as a load.



m. Check on cover is implemented for columns.
n. For basic reinforcement is it possible to fill in double nets.(example: R8-150+R6-150)
o. Additional reinforcement bars can now be used in combination with basic reinforcement nets..(example. R8-150+2R10)
p. Setting for Lov detection in deep beams has been added. "Ignore deep beams if lov is less than".
q. In the graphics the reinforcement is automatically selected when a cell in grid from concrete tables is activated.
r. For EN and NEN-EN higher concrete qualities then C50/60 are possible according EN and NEN-EN 1992-1-1 table 3.1.

16. Timber check:
    a. Calculation speed is increased.
    b. Input from Reference period is synchronized with the tables from NEN, NEN-EN en EN.
    c. Round sections are now supported.
    d. Optimize buttons are added in UC-chart. 

    e. The UC's are shown in color. UC < 0.9 is green; 0.9 < UC < 1.0 is orange; UC > 1.0 is red.

17. Steel check:
    a. With a F-euler analysis on the background the Alfa critical for NEN-EN en EN is calculated.
    b. The recognition of upper or lower flange for placing of the lateral buckling supports according NEN6770 art.12.2.4.2 is implemented. This means that only the correct placed supports are taken into account for the calculation for field and support moments.
    c. The UC's are shown in color. UC < 0.9 is green; 0.9 < UC < 1.0 is orange; UC > 1.0 is red.

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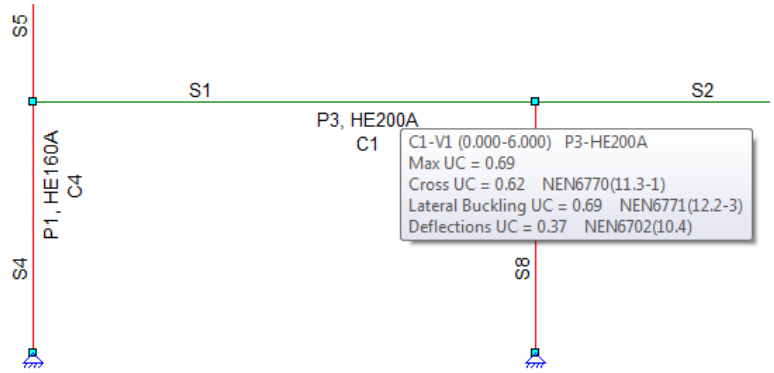
d. After steel check is done, you can see in the tooltip in structure view, the details off the checks for each member.



e. Round and square tubes that are is section class de 4 in the EN and NEN-EN will be reduced to class 3 if possible.

f. Lateral buckling and buckling check can now be don independent from each other.

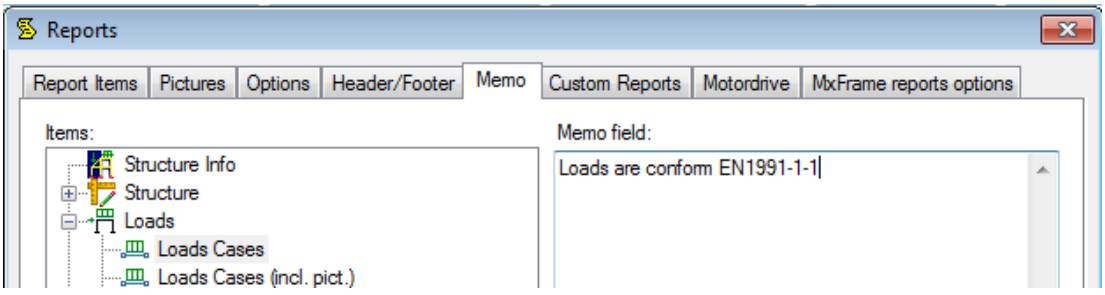
Reports:

1. Table with support reactions detailed in load cases is added.

Pe.C. Support Reactions with L.Cases

LComb	Support	Node	Reaction	
Pe.C.1	O1	K1	X	2.50 = 0.38[B.G.1] * 1.20 + 2.06[B.G.2] * 1.30 - 0.49[B.G.3] * 1.30
			Z	-84.45 = -55.97[B.G.1] * 1.20 - 14.15[B.G.2] * 1.30 + 0.85[B.G.3] * 1.30
	O2	K2	X	-0.00 = -0.00[B.G.1] * 1.20 - 2.55[B.G.2] * 1.30 + 2.55[B.G.3] * 1.30
			Z	-120.66 = -64.36[B.G.1] * 1.20 - 16.71[B.G.2] * 1.30 - 16.71[B.G.3] * 1.30
	O3	K3	X	-2.50 = -0.38[B.G.1] * 1.20 + 0.49[B.G.2] * 1.30 - 2.06[B.G.3] * 1.30
			Z	-84.45 = -55.97[B.G.1] * 1.20 + 0.85[B.G.2] * 1.30 - 14.15[B.G.3] * 1.30

2. Several changes have been made to speed up the report generation.
3. View point of self made pictures with camera is now saved in the model. This means that reports will always have correct updated pictures after changes because of these dynamic pictures.
4. Memo field is added for users to add notes to report items.



5. Pictures of UC chart are added.
6. Extreme nodal displacements are added to the report items.

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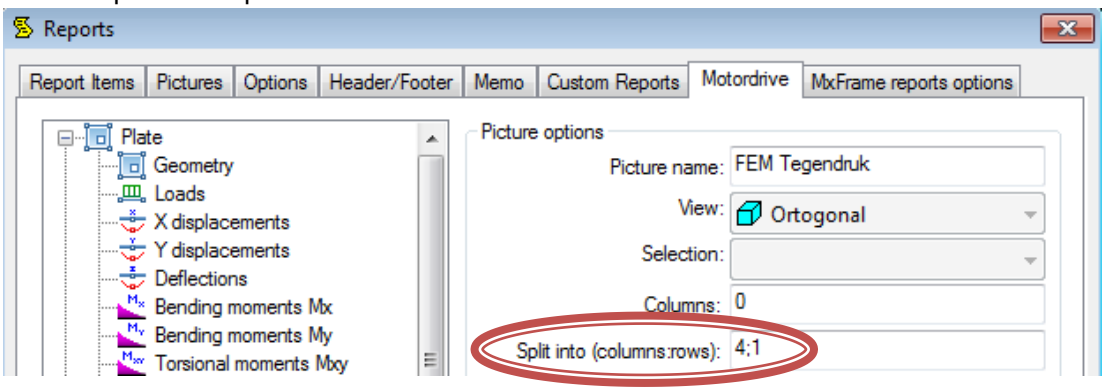
7. The possibility to split a large picture in columns and rows is added. In example below the picture is horizontal printed in 4 parts and vertical in 1.

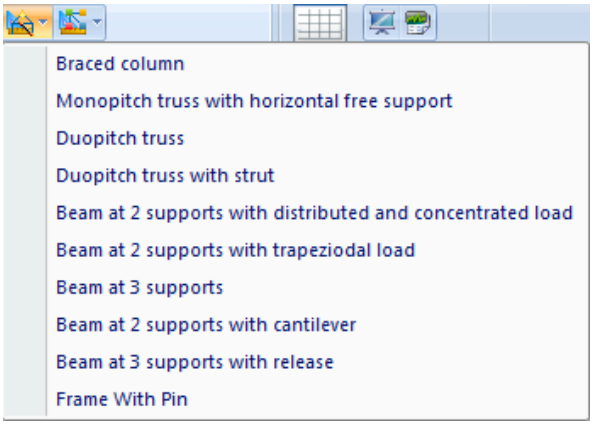


1D Beam:

1. It's now possible to choose between compressed output in reports from "Loads Cases (compr. incl. pict.)" And a detailed output from "Loads Cases (detailed. incl. pict.)"

2D Frame:

1. New models are added to the Structure Generator (extension module).



3D Frame:

1. The thickness and offset from support reactions can be set..

FEM:

1. The reinforcement calculation according NEN6720 art. 8.2.6 for walls is added to the concrete part.
2. In FEM walls the As,total is shown (As bending + As shear) with the dropdown buttons the separate reinforcement from As bending and As shear can be activated .
3. Extra table added in report "Concrete. Cross section (detailed)"In are the design moments printed..

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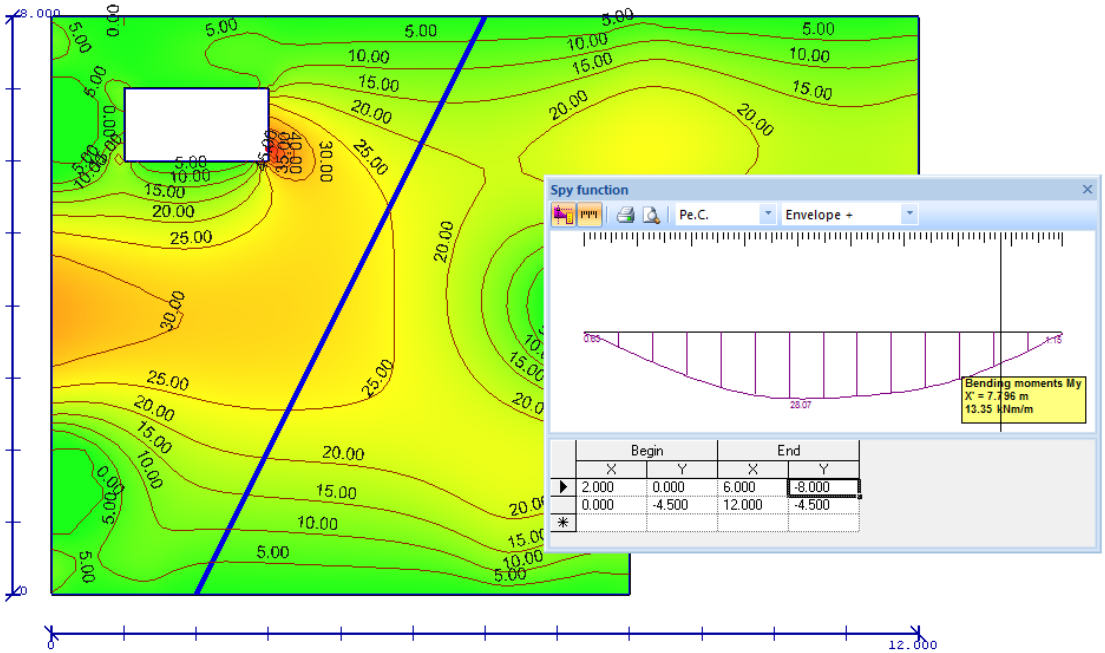
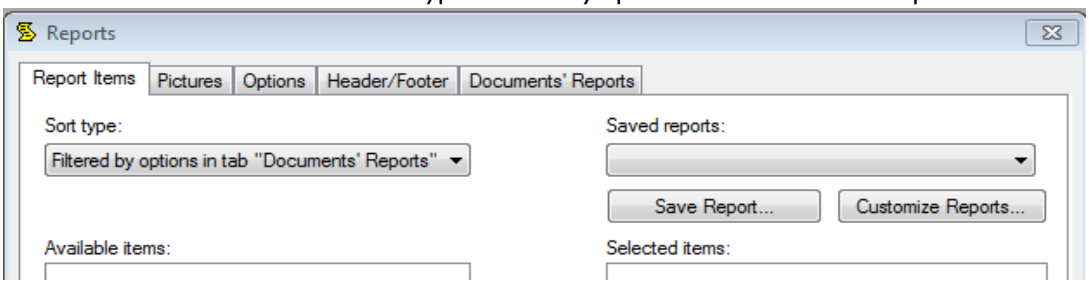
4.  With the Spy function the plate forces and deflections on a user defined cut can be shown.



5. Function added to reduce number of vertices in irregular objects. (circle)

MatrixFrame® Toolbox:

1. It's now possible to choose for "Check" or "design" in all timber and steel modules.
2. Lay-out from reports has been synchronized.
3. It's now possible to choose the same lay out for printing of multiple documents as is set for a single document. This can be done with Sort type "Filtered by option in tab "Documents Reports"".



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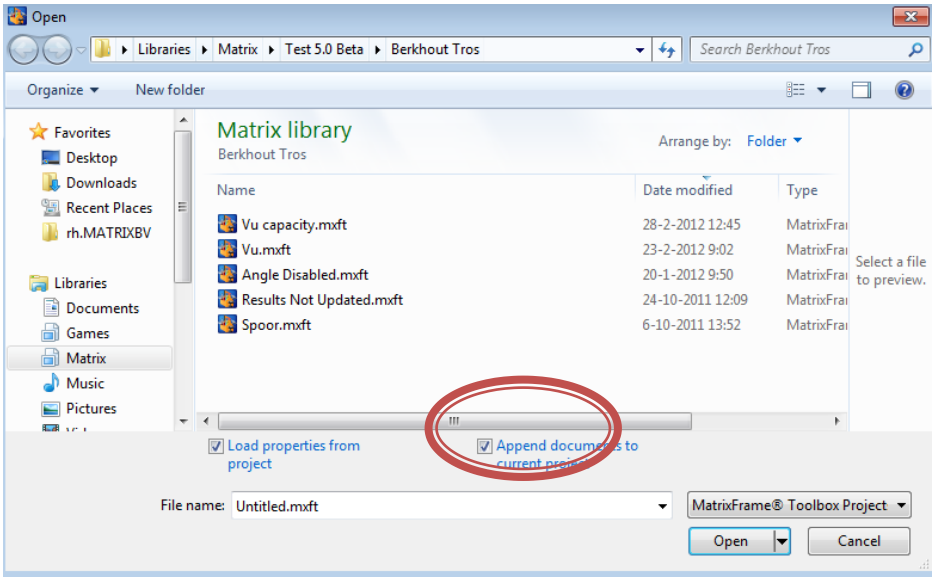
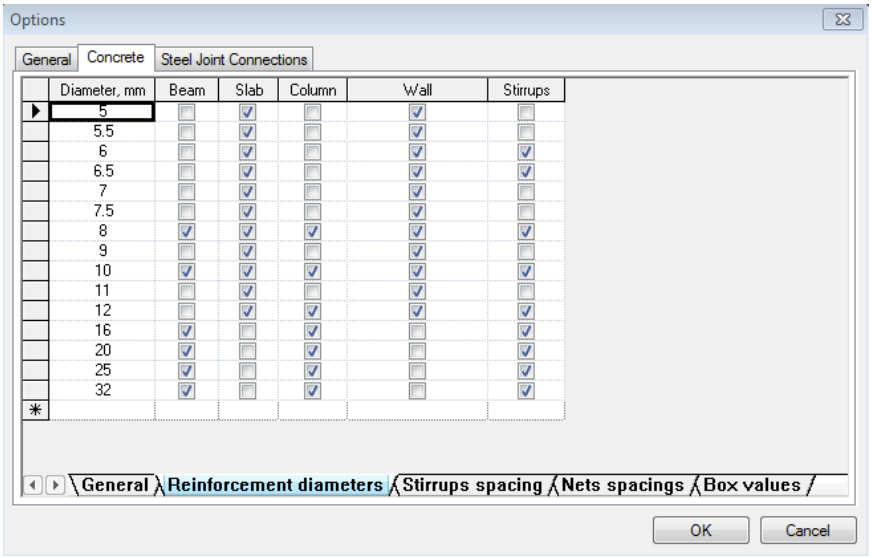
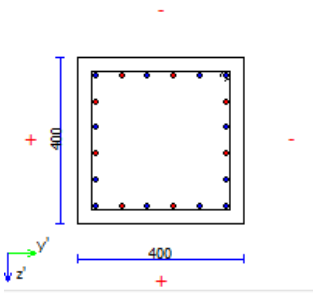
4. Appending a document to current project from another project is now possible.



5. Concrete check:
   a. In "Tools/Options/Concrete" the diameters and spacing can be set. These values will be used in reinforcement proposals.



   b. Punching calculations for EN and NEN-EN has been extended.
   c. In the module "Column calculation + fire" is with + and – sign the tension side shown for positive and negative moments. It's now easier to see on what side the steel stress is corrected with fire calculation.



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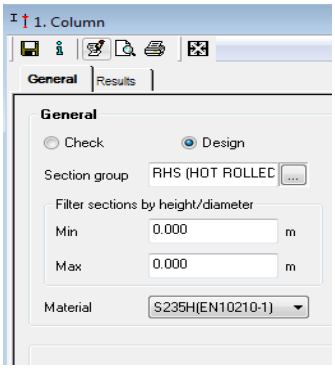
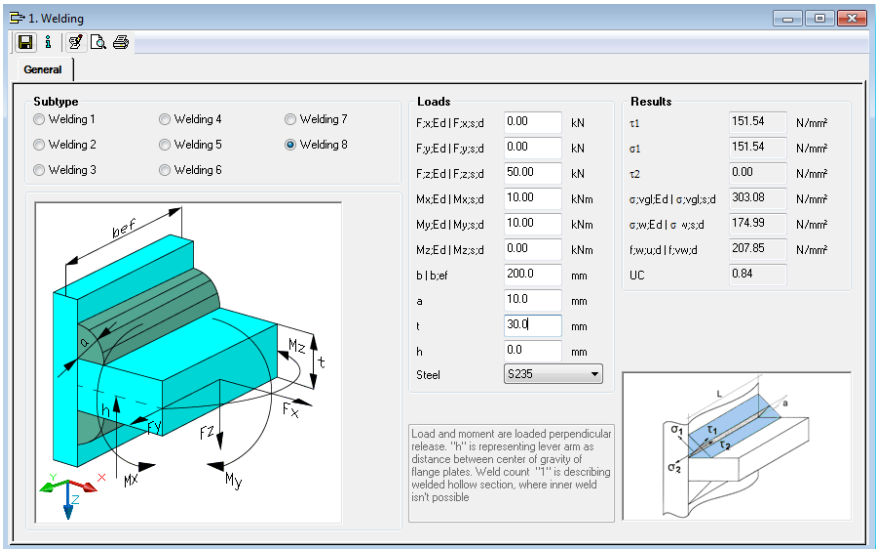
6. Steel check:
    a. In steel modules a filter can be set for minimum and maximum height or diameter for tubes and square tubes.



    b. 2 new types (Weld 7 and Weld 8) are added to weld calculations.



7. Steel Joint Connections:
    a. For column base an extra anchor row can be added for shear. This row is placed in the middle.

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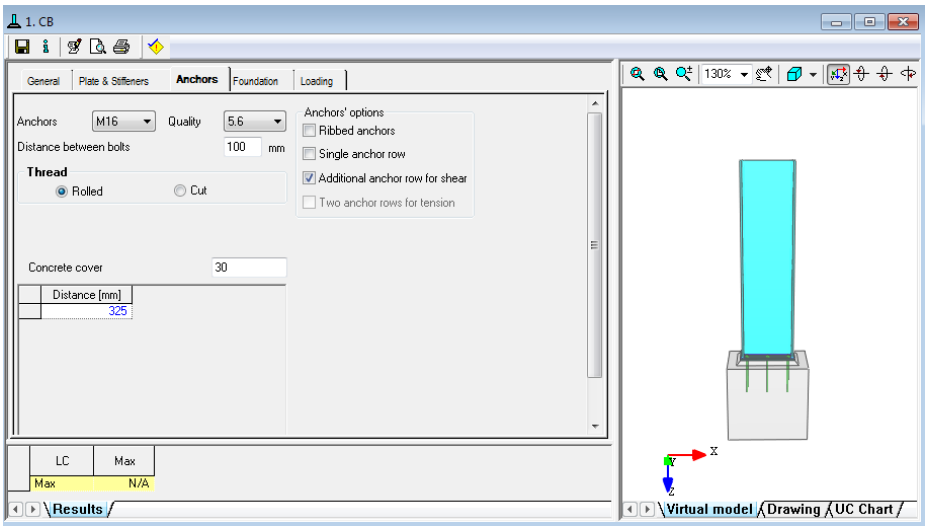
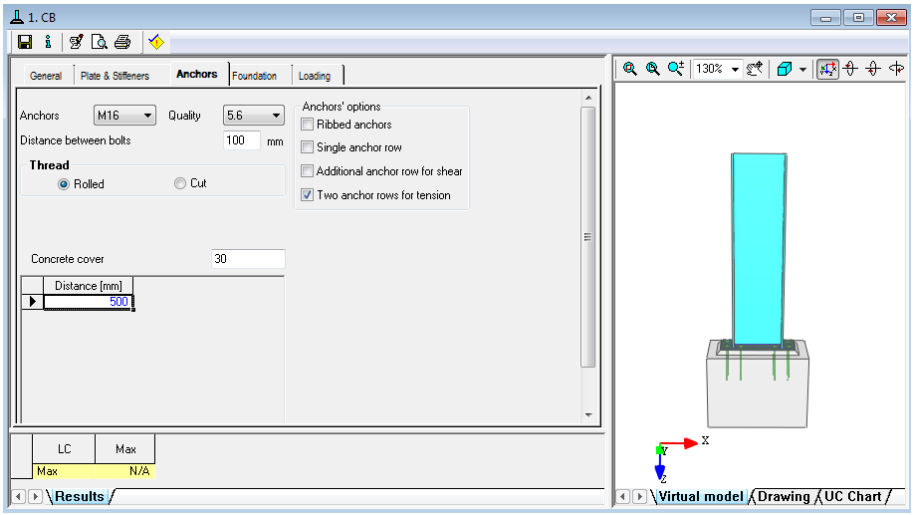
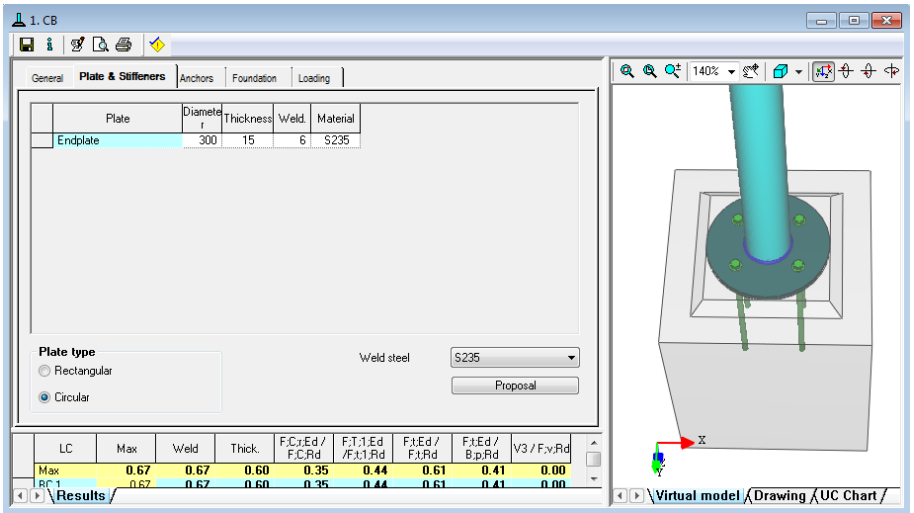


b. For column base with anchors placed outside the flanges is it possible to define 2 anchor rows for tension.



c. Column base calculations for tube and square tube are added.

d. In the NEN-EN circular endplates are possible for tubes.



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e. Hinged column base with 1 anchor row is now possible.
f. In asymmetric X joint and Y joint different beams are now possible on the left and the right.
g. The steel quality for each plate or stiffener can be set.

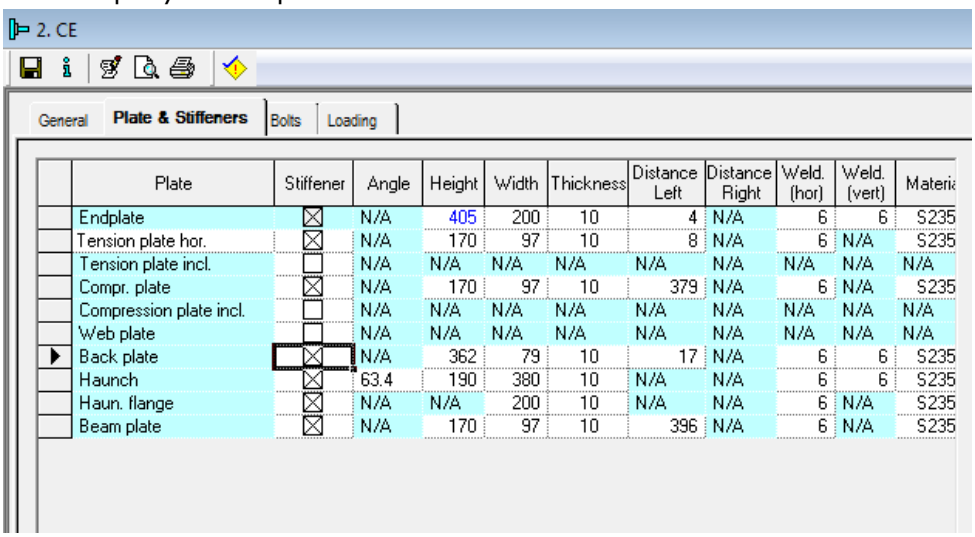
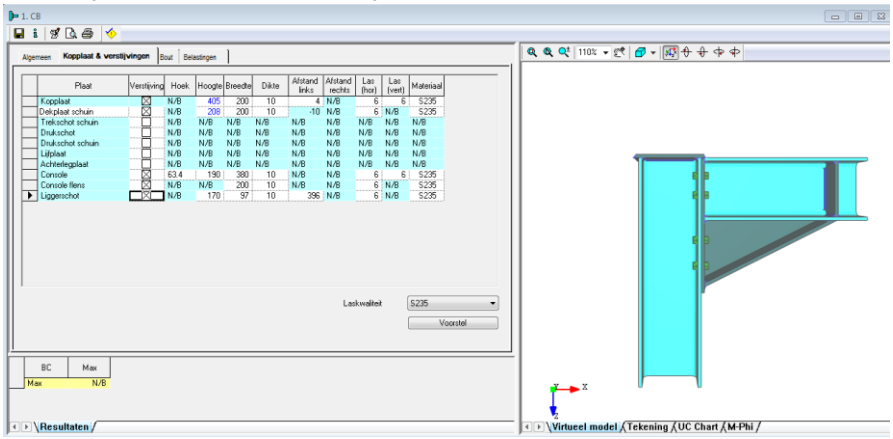
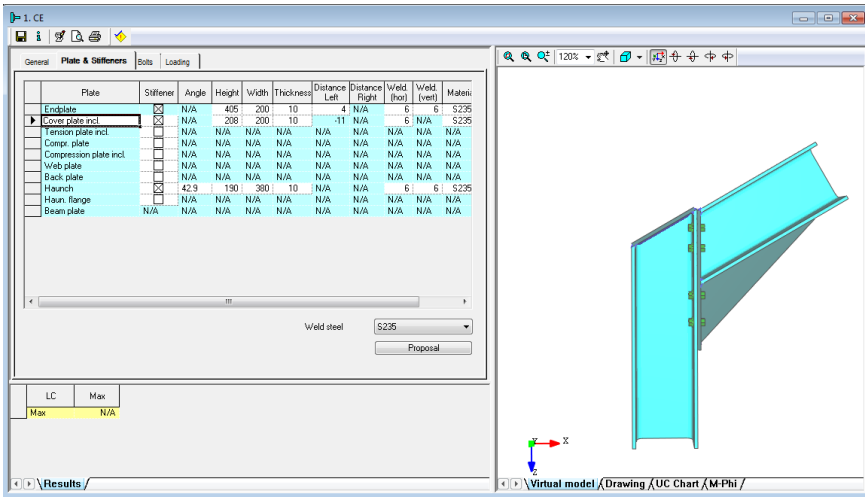


Plate	Stiffener	Angle	Height	Width	Thickness	Distance Left	Distance Right	Weld. (hor)	Weld. (vert)	Materi
Endplate	☒	N/A	405	200	10	4	N/A	6	6	S235
Tension plate hor.	☒	N/A	170	97	10	8	N/A	6	N/A	S235
Tension plate incl.	☐	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Compr. plate	☒	N/A	170	97	10	379	N/A	6	N/A	S235
Compression plate incl.	☐	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Web plate	☐	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Back plate	☒	N/A	362	79	10	17	N/A	6	6	S235
Haunch	☒	63.4	190	380	10	N/A	N/A	6	6	S235
Haun. flange	☒	N/A	N/A	200	10	N/A	N/A	6	N/A	S235
Beam plate	☒	N/A	170	97	10	396	N/A	6	N/A	S235

h. EN and NEN-EN:
   a. It's now possible to define a cover plate.



   b. For the haunch it's possible to fill in the angle.
   c. For Y connection a inclined cover plate can be defined.



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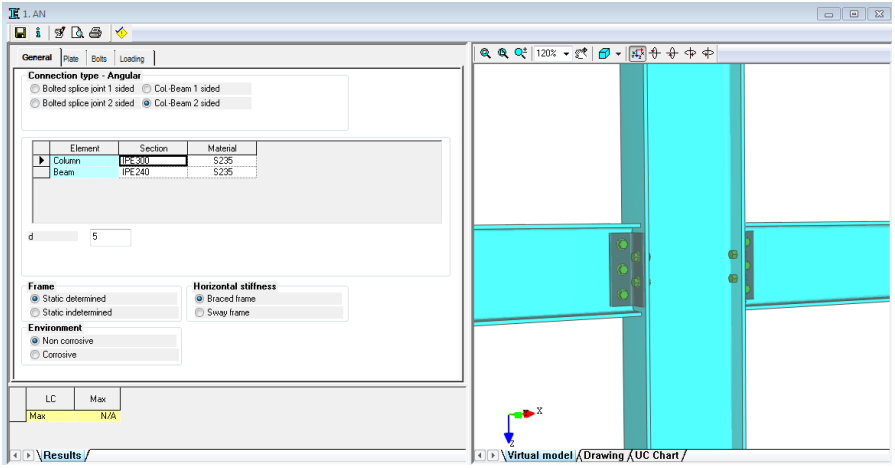
d. Asymmetric bolt placing in column and beam is now possible for angular connection.



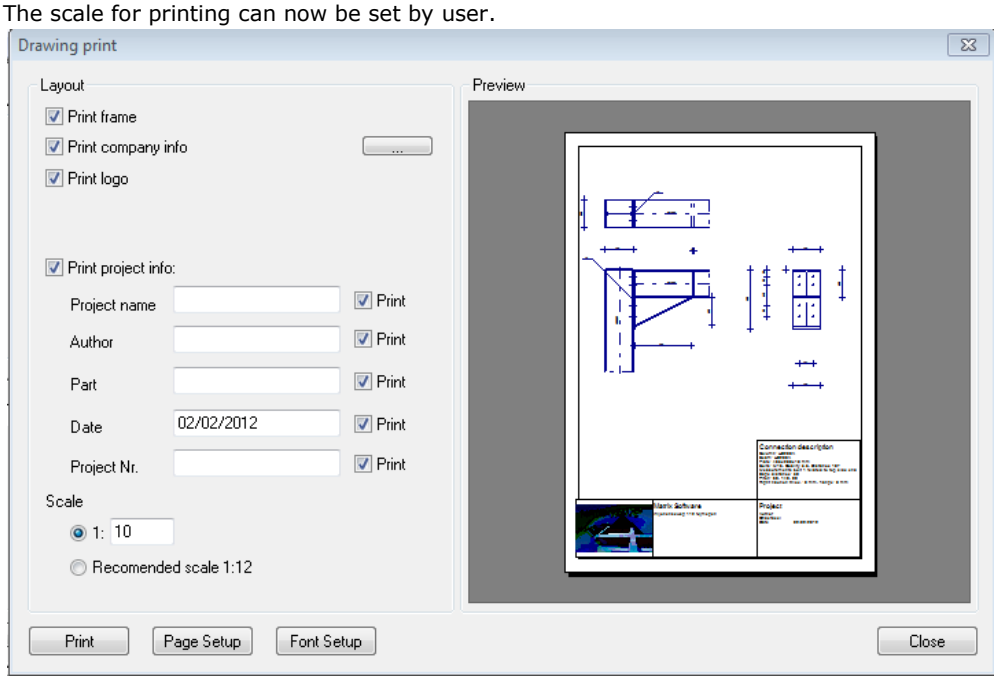
i. In MatrixFrame is the column with the equilibrium check added.

j. Steel Joint Connections is now implemented in the MatrixFrame Toolbox.

k. A steel column that is connected in line with a concrete column is now supported as a column base calculation.

l. The drawing can now be printed on any choosen paper size.

m. The scale for printing can now be set by user.



n. The results row with unity checks will be colored red if a serious error has been detected during calculation. Description of the errors can be found in the Output window.

8. Timber Beams:

a. Deflection check scan now be defined by user.

b. The used loads duration class is now shown in the tooltip in results and in reports.

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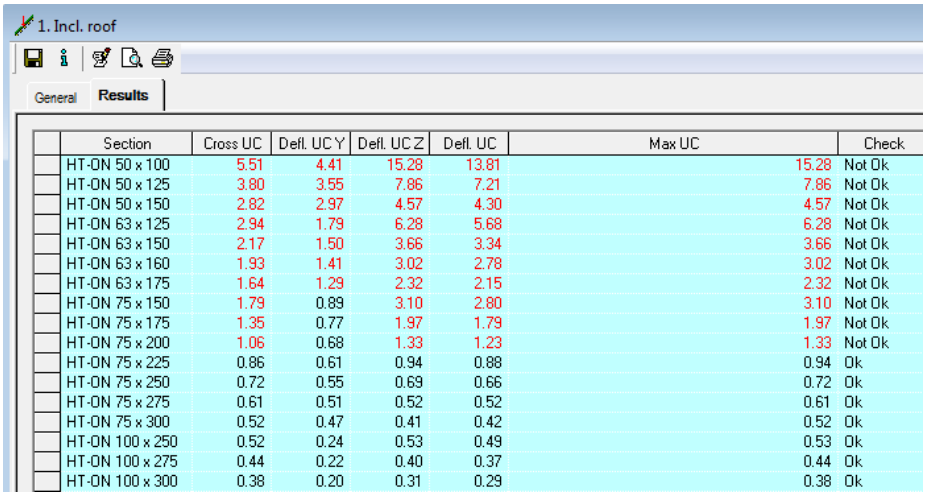
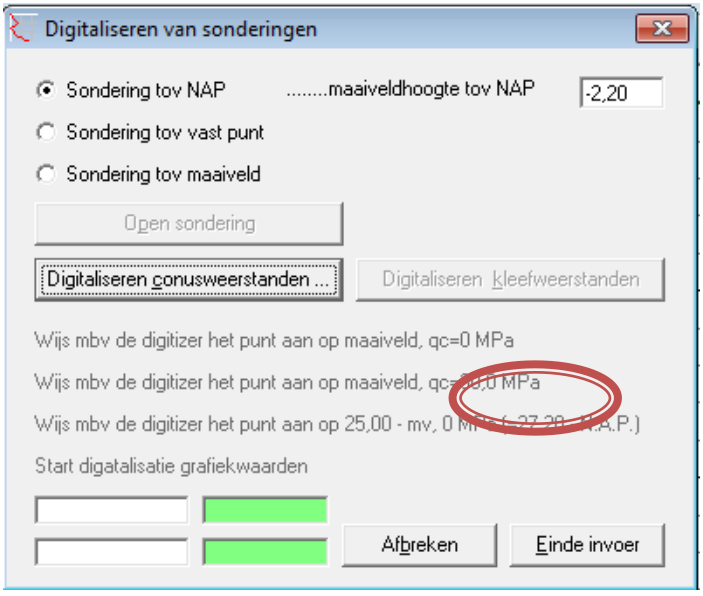
c. The check on deflection in Y direction is added the module "inclined roof".



Section	Cross UC	Defl. UC Y	Defl. UC Z	Defl. UC	Max UC	Check
HT-ON 50 x 100	5.51	4.41	15.28	13.81	15.28	Not Ok
HT-ON 50 x 125	3.80	3.55	7.86	7.21	7.86	Not Ok
HT-ON 50 x 150	2.82	2.97	4.57	4.30	4.57	Not Ok
HT-ON 63 x 125	2.94	1.79	6.28	5.68	6.28	Not Ok
HT-ON 63 x 150	2.17	1.50	3.66	3.34	3.66	Not Ok
HT-ON 63 x 160	1.93	1.41	3.02	2.78	3.02	Not Ok
HT-ON 63 x 175	1.64	1.29	2.32	2.15	2.32	Not Ok
HT-ON 75 x 150	1.79	0.89	3.10	2.80	3.10	Not Ok
HT-ON 75 x 175	1.35	0.77	1.97	1.79	1.97	Not Ok
HT-ON 75 x 200	1.06	0.68	1.33	1.23	1.33	Not Ok
HT-ON 75 x 225	0.86	0.61	0.94	0.88	0.94	Ok
HT-ON 75 x 250	0.72	0.55	0.69	0.66	0.72	Ok
HT-ON 75 x 275	0.61	0.51	0.52	0.52	0.61	Ok
HT-ON 75 x 300	0.52	0.47	0.41	0.42	0.52	Ok
HT-ON 100 x 250	0.52	0.24	0.53	0.49	0.53	Ok
HT-ON 100 x 275	0.44	0.22	0.40	0.37	0.44	Ok
HT-ON 100 x 300	0.38	0.20	0.31	0.29	0.38	Ok

MatrixGeo:

1. Depth based on reference point is added.



Bugfixes:

MatrixFrame® General:

1. Movable partitions are added to the imposed loads for the EN and NEN-EN.
2. Stresses for a parametric I section with different flanges where not correct calculated.
3. On several places the Dutch text is updated.
4. After opening a model the self made selections were not always visible.
5. Moment on a node with a support was not always correct recognized.

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6. A model with NL supports and or releases gave a error when GNL, FNL or GNL+FNL calculation was started with setting for iteration method on "Automatic". Now the method is automatically changed in "Linear".
7. Arcelor library are updated and Vest library has been removed. For compatibility the sections from Vest are added to the Matrix library.
8. Concrete check:
    a. Reinforcement proposal from wizard are refined.
    b. On section changes in the field were Md was corrected with 1.25 M, was sometimes the support moment also wrongly corrected with 1.25.
    c. Occasional the s;max. was not correct calculated for beams
    d. For a beam with a constant normal force the Mu was not always the same in different cuts.
    e. The module for detection of deep beams is because of the Euro Code completely rewritten. This will give more stability in recognition of deep beams.
    f. Problem with empty Lines in concrete grid is solved.
    g. Deflection calculation has been changed to support a beam with different sections.
    h. Sorting in the concrete tables in reports has been modified.
    i. With changing of basic reinforcement in a beam the top view drawing was not always generating a extra section.
    j. With changing of side reinforcement in a beam the top view drawing was not always generating a extra section..
9. Timber check:
    a. Occasional a symmetric duo pitch roof had a asymmetric UC
    b. In the NEN-EN was the incorrect k;def used for deflections. This gave a too big deflection.
10. Steel check:
    a. Scaling of the fire protection chart is corrected.
    b. The lateral buckling check for manual filled in forces in Y direction on 90 degrees rotated section were not correct.
    c. Occasional in fire protection an IPE was wrongly set to section class 3 and could therefore not be calculated.
    d. The steel check with code NEN 6770 was sometimes not done. This was caused by Wkip that was set to 0.
    e. The “Wel” for a parametric tube was wrongly calculated. The inside diameter was used instead of the outside diameter.
    f. In symmetric 1D model the lateral buckling check was occasional not symmetric.

Reports:

1. On several places the Dutch text corrected.
2. Layer of check definitions can now be turned o nor of in pictures from steel and timber definition
3. Scaling of reinforcement pictures was not always on total page width.
4. Several problems with reports from selected selections are solved.
5. After renumbering in FEM the report with support reaction was not sorted correct.
6. In EN and NEN-EN the wrong text was printed for concrete cover. (Cmin instead of Cnom)
7. Occasional the text was printed on the picture with steel joint connections.
8. When cables were used the advanced table was not in report. Therefore the pre stress could not be found in report.

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1D beam:

1. In report with “load cases (incl. pict.)” the generated fields were not printed in the correct order.
2. Not all loads where pasted when a load case was copied with met CtrL-C and pasted in a new load case with Ctrl-V.

2D Frame:

2. Loads Generator NEN:
    a. When wind was generated on a duopitch canopy the name of the load case wind from the right was wrongly named wind from the back.
3. Loads Generator NEN-EN:
    a. Opening a model that was made with language settings in German, was giving problems in loads calculations if the language was different.
    b. For roofs in category H the maximum of 10 m2 was not implemented.
    c. For a asymmetric model the length of the different load areas on the roof was incorrect.
4. Steel Joint Connections:
    a. Occasional a joint connection was not calculated in MatrixFrame. The reason was not clear. Now the reason can be found in the log file.
    b. M-phi diagram was not always calculated for a Group.

3D Frame:

1. Occasional the user made selections were not shown after opening.
2. The tolerance to detect if beams are in 1 line so they can be seen as 1 structual member is refined.
3. The positive- and negative envelope support reactions where in top view drawn with a different offset.

Grillage:

1. The advanced option “F-Euler analysis” was always set to “checked” if a model was opened.
2. Insert a project was not working correct.

FEM:

1. Error message for As,req,Y with the use of a net in the middle is solved.
2. Import dxf gave error that no closed poly line was found. Poly line type 129 caused this problem and has been added to import module.
3. Occasional older models could not be meshed any more.

MatrixFrame® Toolbox:

1. Concrete check:
    a. Module “Cross calculation M+V+T”:
        i. Value Cmin was not correct updated when report was generated.
        ii. In a cantilever calculation occasional the value "d" was used instead of "z". This happened when checkbox “Static situation determined” was not checked.

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iii. The secondary reinforcement was wrongly displayed with setting on “Check”
iv. With the setting on “Check” the reinforcement was not colored red in results tab if the Asprov < Asreq.

b. Module “Column calculation + Fire”:
i. With double bending was the check for minimum bar distance (Smin) from the "Z-ax" calculated with the width instead of the height.
ii. The S;max. was not checked for the reinforcement.
iii. With structure type “Wall” the Ec was not correct calculated.

c. Module “Punching calculation”:
i. The check on Tau2 was not always correct done in the NEN
ii. In the table was not the correct value from Fd from the perimeter printed.
iii. The value “ay” was printed incorrect and multiple times.
iv. In the NEN-EN the number of digits in reports is made the same as input.

d. Module “Point supported plate”:
i. In the modules "Point en Line supported plate" was no warning when lx was bigger then ly. Now values wil become red and in tooltip the reason is shown.
ii. Column plate type was always set to "None" after opening.
iii. Wrong "d" was calculated if a plate was defined that was inside the reinforcement road.

e. The reinforcement proposals are extended in the module “Cross calculation Mu capacity”.
f. The check for Smin and Smax for EN and NEN-EN is modified.

2. Steel check:
a. In the module column calculations was the buckling factor with Buckling data set to “Braced” different from the buckling factor with setting on “User” with the same filled in data. This has been synchronized.
b. Speed of calculation of tubes and square tubes has been increased.

3. Steel Joint Connections:
a. Several changes has been made in the drawings.
b. Wrong input from a bolt row with a distance “0” has been blocked.
c. An 180 degrees rotated bolted splice joint connection with the same loads did not give the same UC values..
d. Filling in a 90 degrees rotated section has been blocked because the calculation rules are not supporting that kind of connection.
e. For a column-column connection what had a angle to the left for the upper part the wrong angle was taken. The angle should always be < 180 degrees.
f. The unity check for welds is added to the reports.

4. Timber beams:
a. Combinations according rules NEN-EN1990 formule 6.10, 6.10a en 6.10b where generated. This has been modified in 6.10a en 6.10b.
b. Spreading of concentrated loads according NEN-EN1995 "5.2 (5) 10.2.3 van NEN 6760 are implemented.
c. The setting “Inclined” for a inclined roof was not working always as expected.
d. The text in permanent loads “Sheeting” has been changed in “Separations” in the module “Beam calculation floor".
e. The text from building category C (shopping areas) and D (congregation areas) were switched. The subcategory was correct.
f. In reports from “Beam calculation floor" are several corrections made for the units.

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5. Masonry:
    a. Module “Support detail”:
        i. Model factor was not correct updated when a model was opened.
        ii. In the NEN the model factor was not correct saved.
        iii. In the results tab "not" in the text "The support does not meet the requirements" was occasional not shown.
    b. Calculation of ei & em based on absolute values of Mid/Nid (bug)
    c. Check "Check ei < t/2" added. In case of False, calculation of ei_red based on EN1996_Annex_C (feature)
    d. Calculation of Capacity_Reduction_Factor (Middle) based on EN1996-1-1 Annex G (feature)
    e. Calculation of Rho_n was conservative 1.0, now implemented dependend of ei < 0.25 t (Floor_Concrete is assumption, Timber floors not implemented (feature)
    f. e_init for middle is modified with imperfection (10 mm)

End release note

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