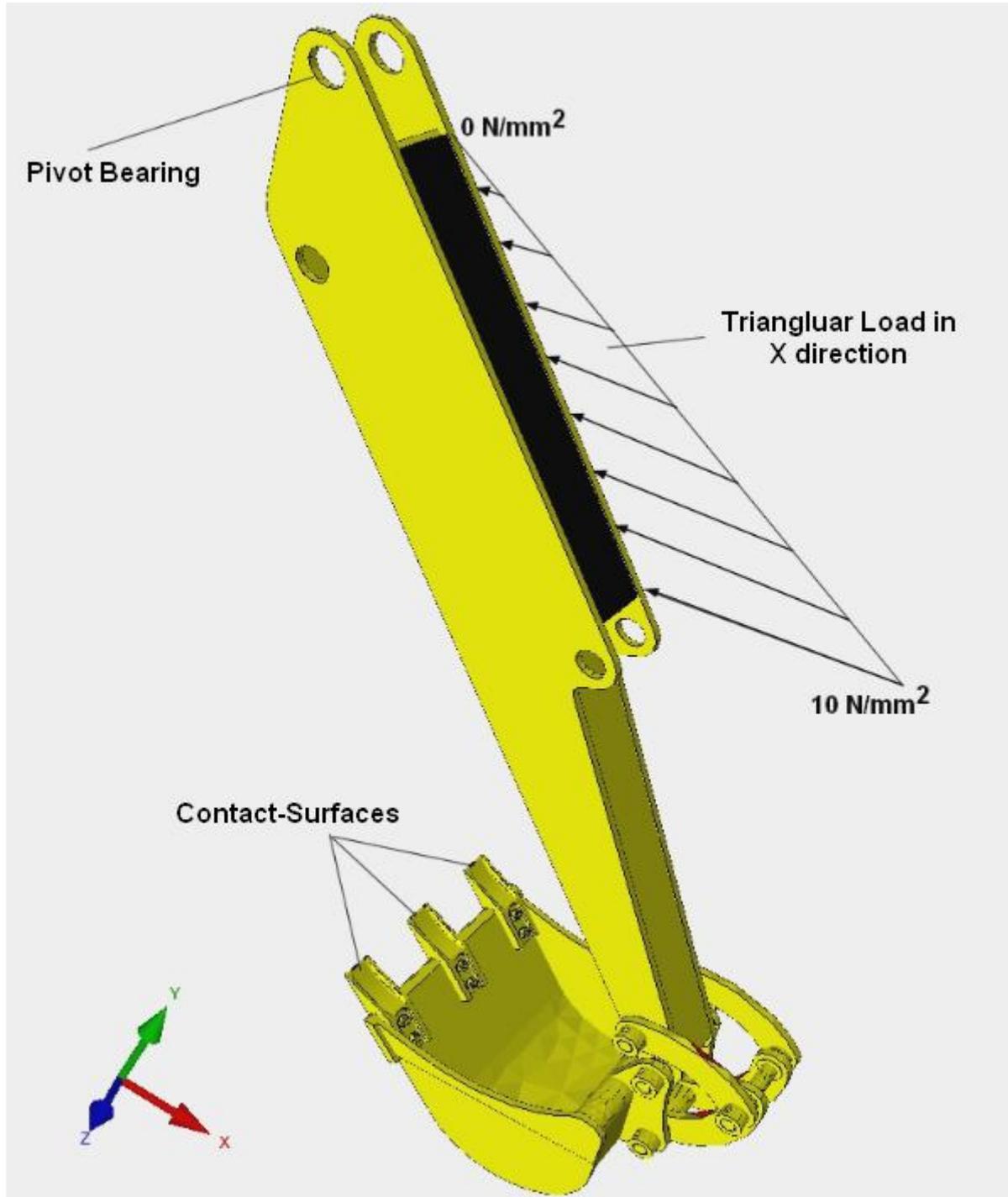


Part 20: Excavator bucket with a pivot bearing and a triangular load

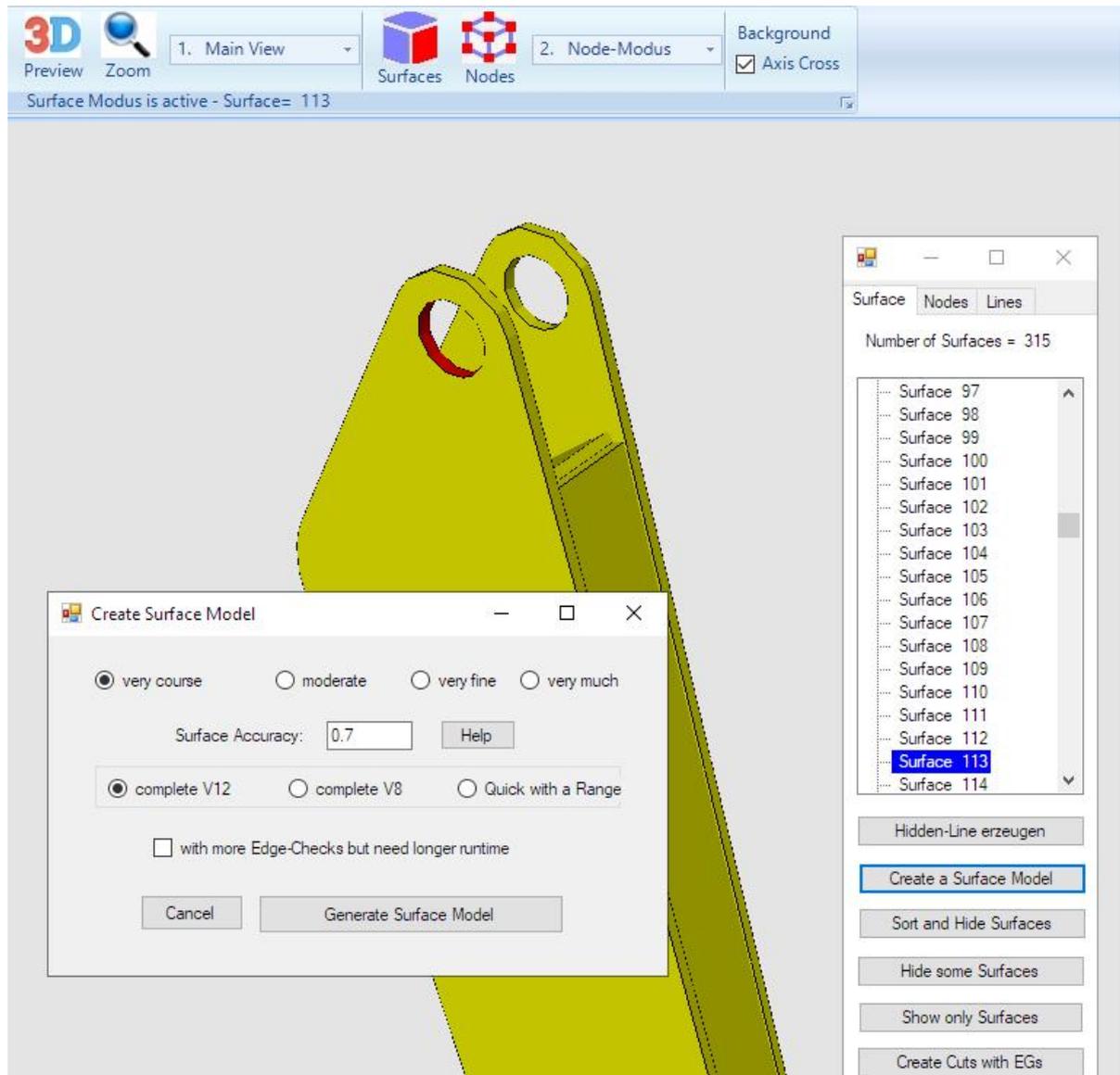
A excavator bucket is pressed against a wall with a pivot bearing and a triangular load in the X direction.



Create a Pivot Bearing



Select register "View" and  to create a surface model with "very course" so that each hole can be selected with only one surface.



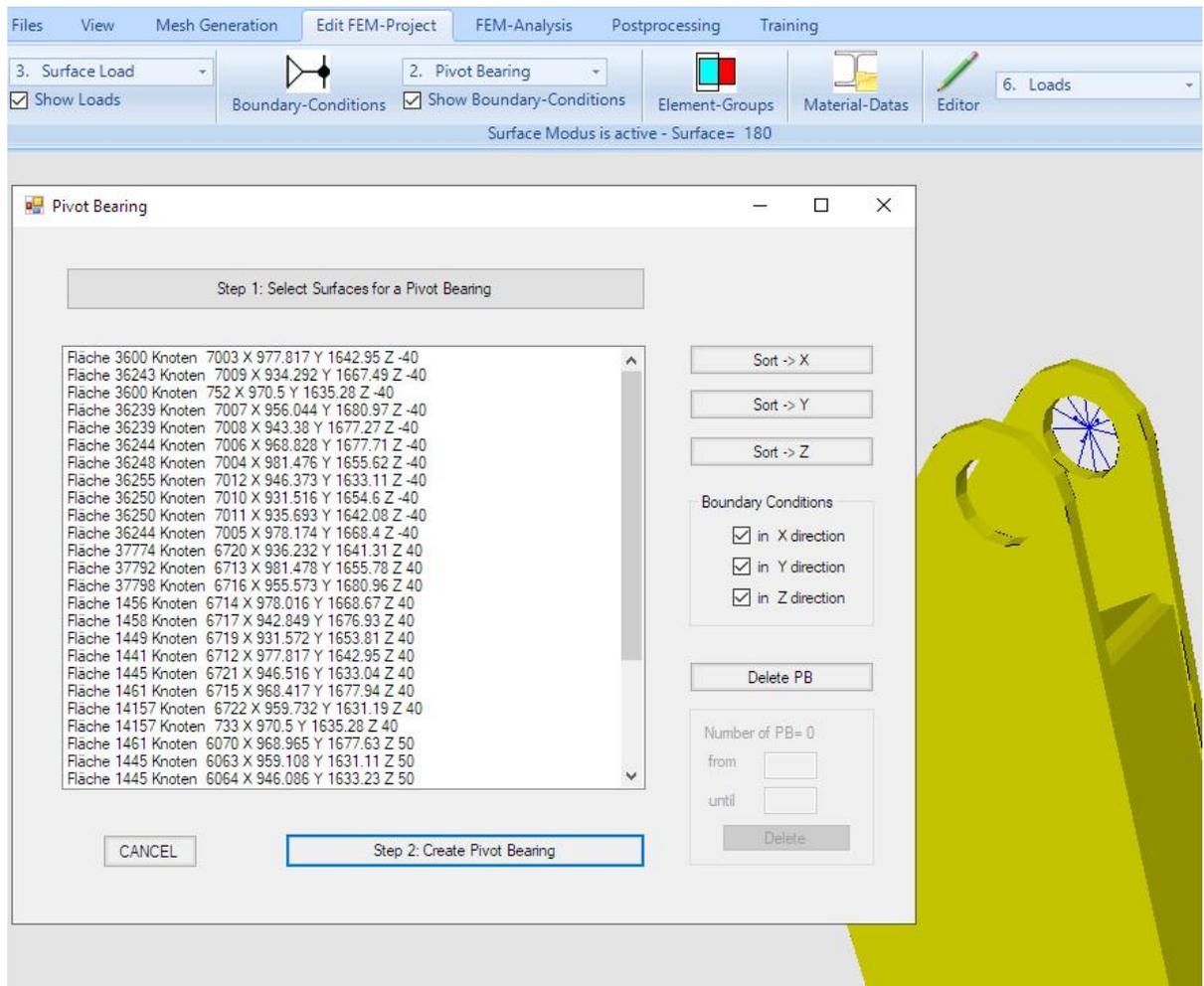
Show Pivot Bearing dialog box

Select register "Edit FEM Project" and menu "Pivot Bearing" to display the Pivot Bearing dialog box.

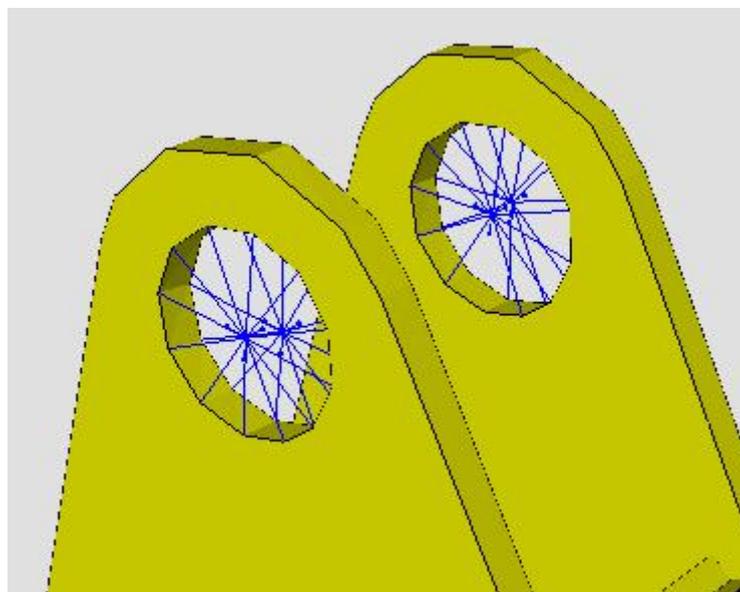
Select the menu "Step 1: Select Surfaces for a Pivot Bearing".

and click on the two upper drilling surfaces. These are displayed in the select box, select "Create" there to display the selected surface nodes in the pivot bearing dialog box with the node coordinates.

Select menu "Sort->Z" to sort all nodes in Z-direction from -50mm to 50mm.

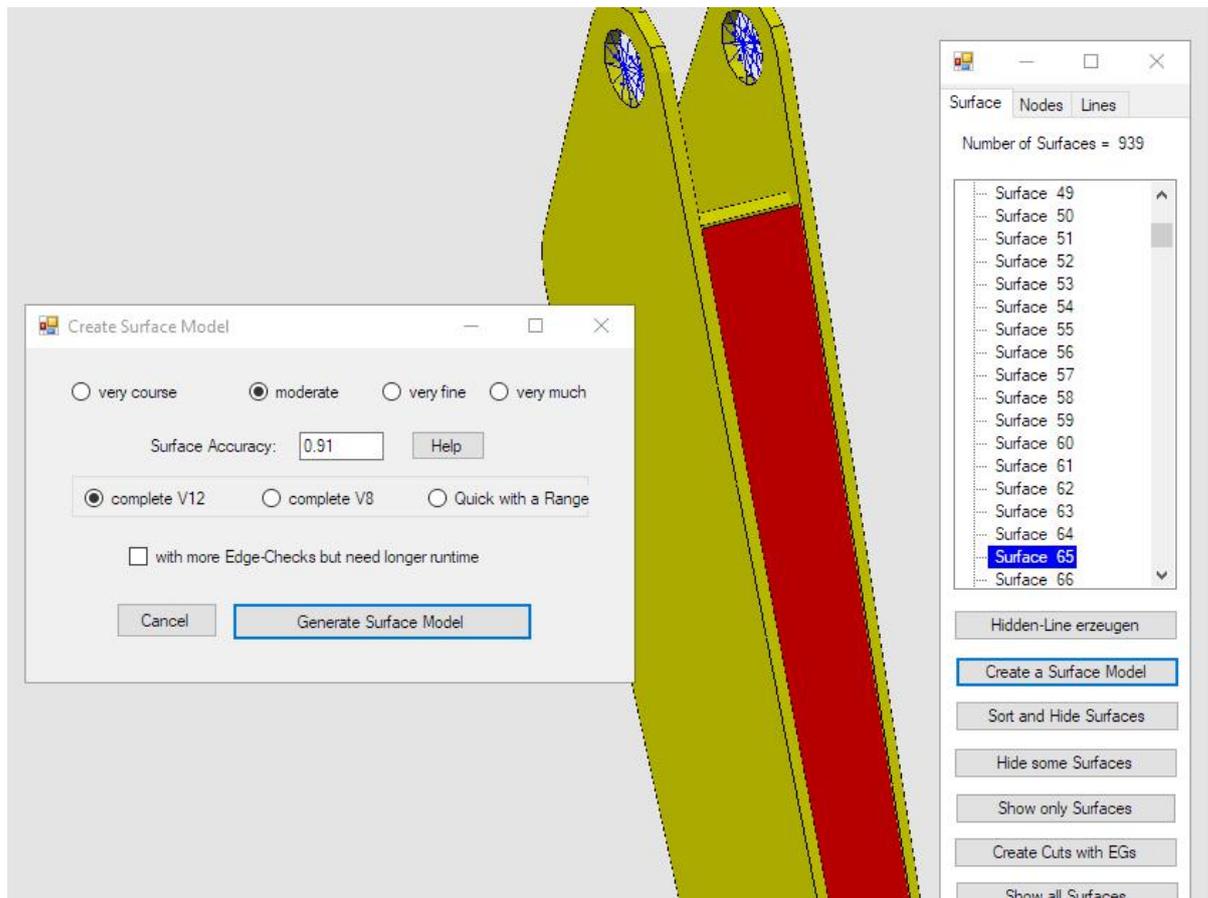


Now mark the first 11 surface nodes with the Z coordinate -50 mm and create the first pivot bearing with menu "Step 2 Create Pivot Bearing". Then repeat the marking and Step 2 for Z= - 40, 40 and 50 and create a total of 4 pivot bearings.



Generate a triangular surface load

Create a new surface model with "moderate" so that surface 65 can be selected for the surface load, otherwise the surface is connected to another surface.

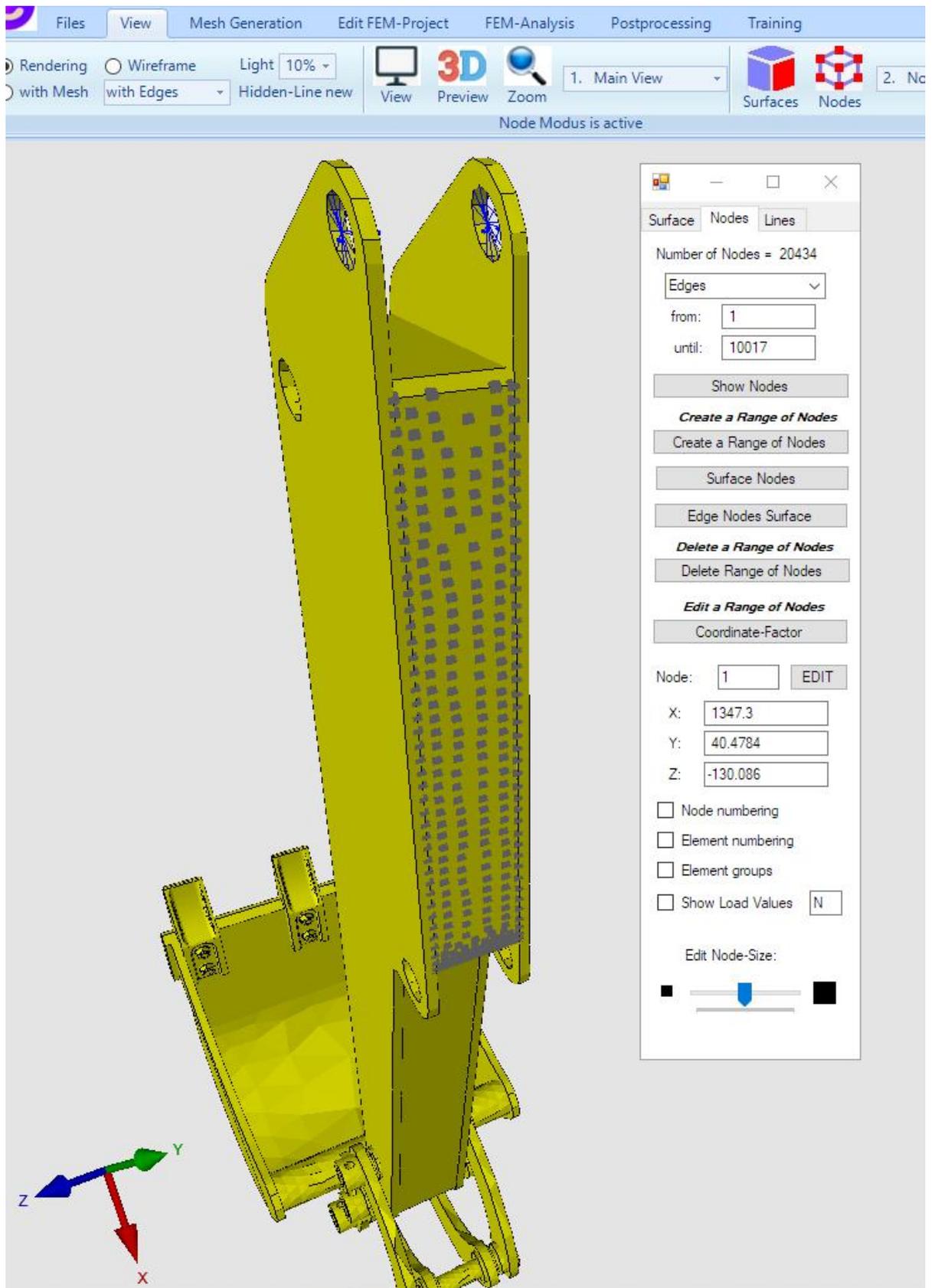


Create a range of nodes

In the case of an uniform surface load with the same load values, surface 65 can be clicked directly. In the case of an triangular surface load, however, a range of nodes of surface 65 must first be created.

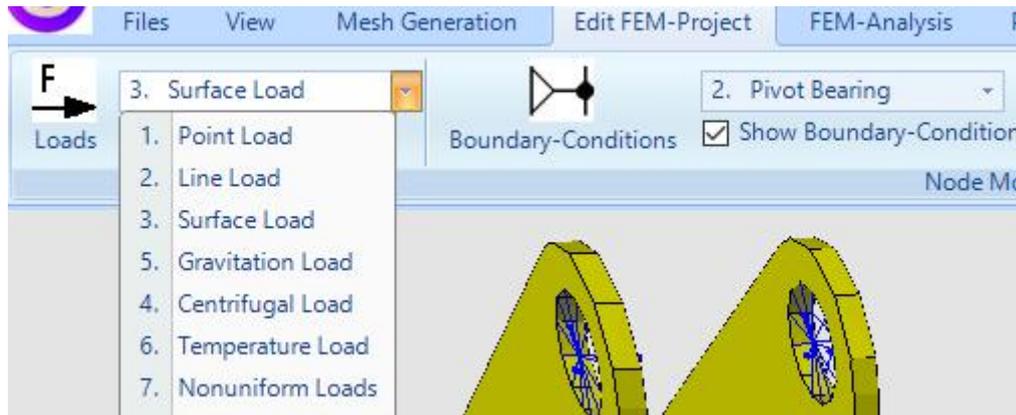


Select the "View" tab and the icon  and menu „Surface Nodes“ to display all nodes of the surface 65 in the Node Modus".

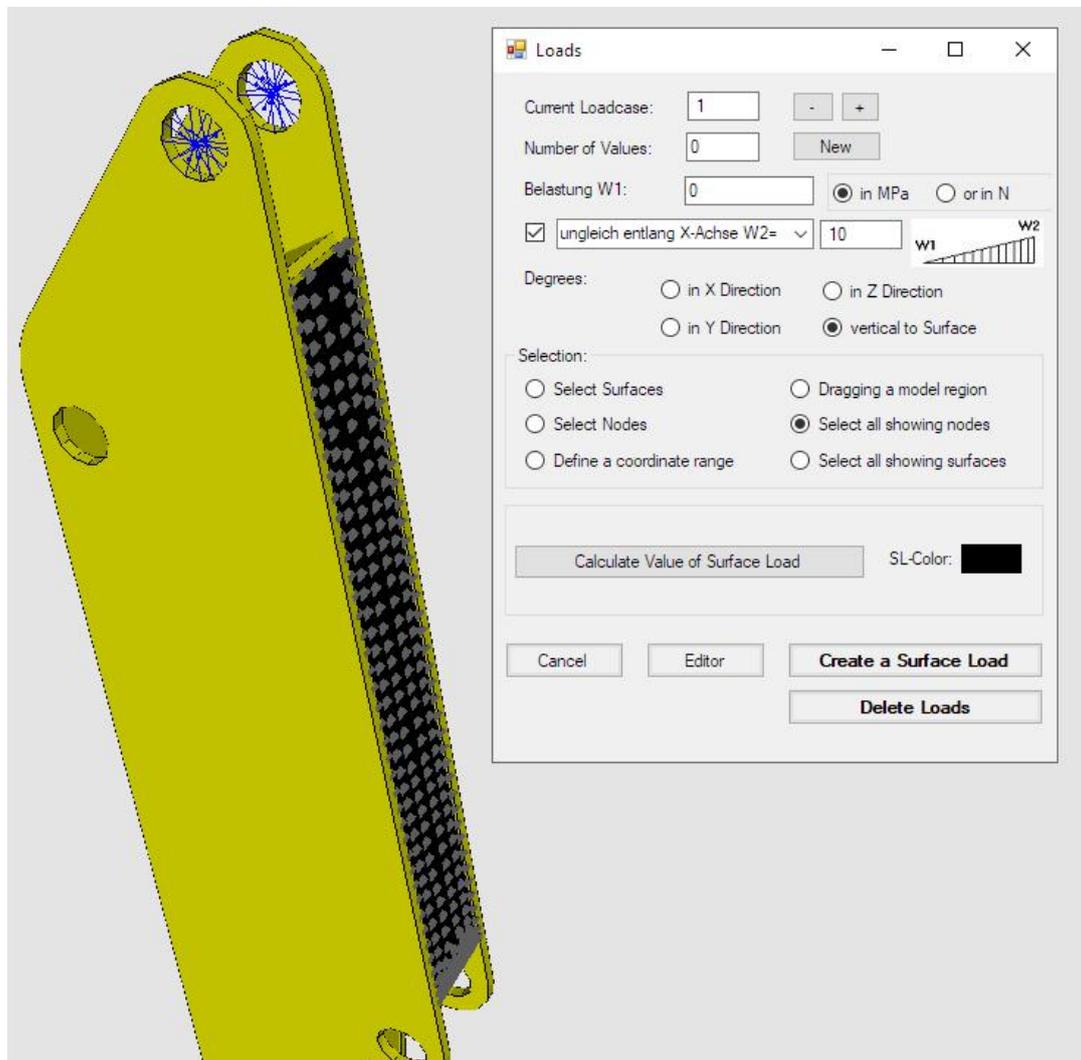


Generate surface load

Select register "Edit FEM-Project" and menu "Surface Load" to create a triangular surface load.

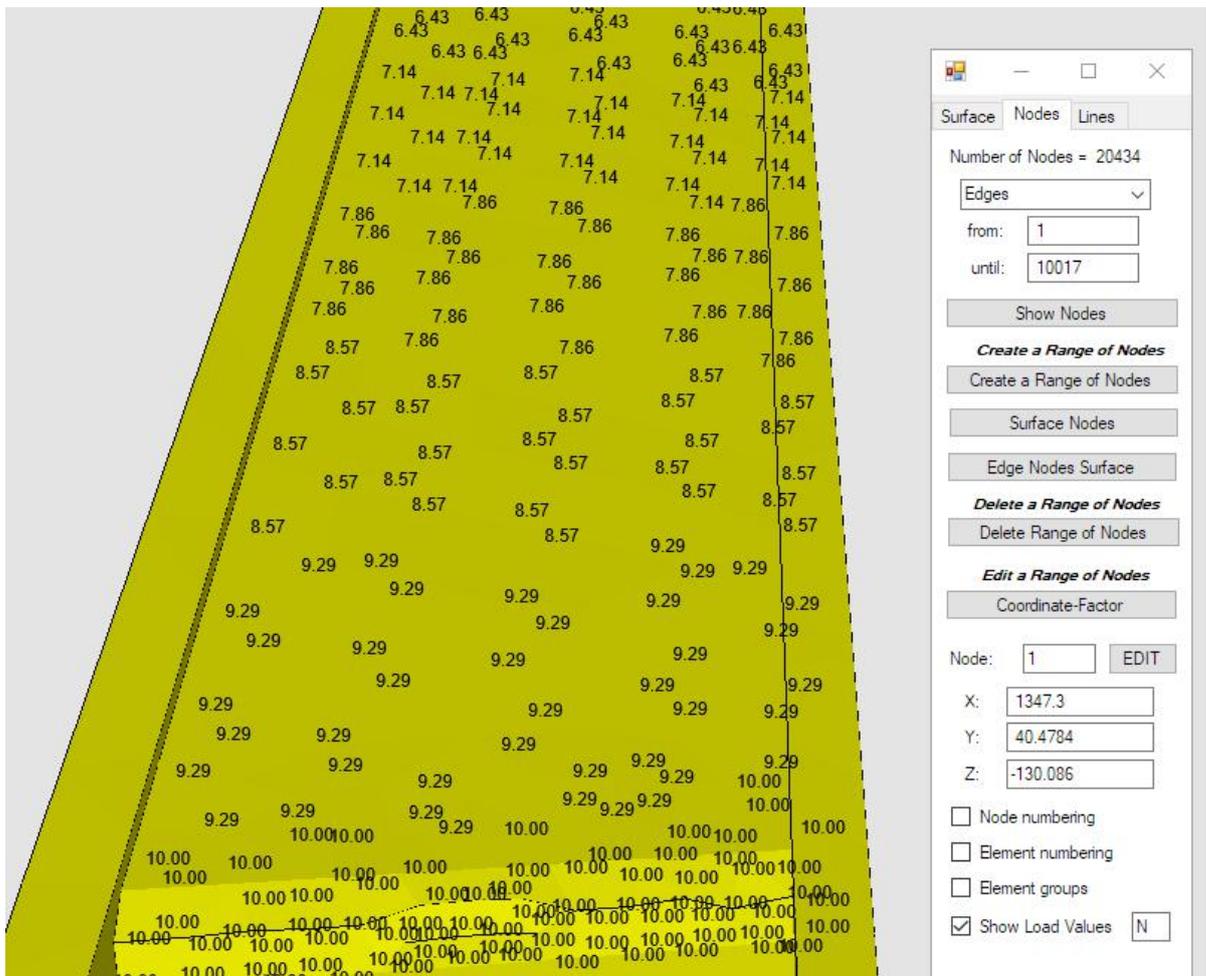


Click on "in MPa" and "unequal along X-axis W2" and enter $W1 = 0$ and $W2 = 10$ and select the options "vertical to Surface" and "Select all showing nodes" and create with menu "Create a Surface Load" the surface load.



Show load values

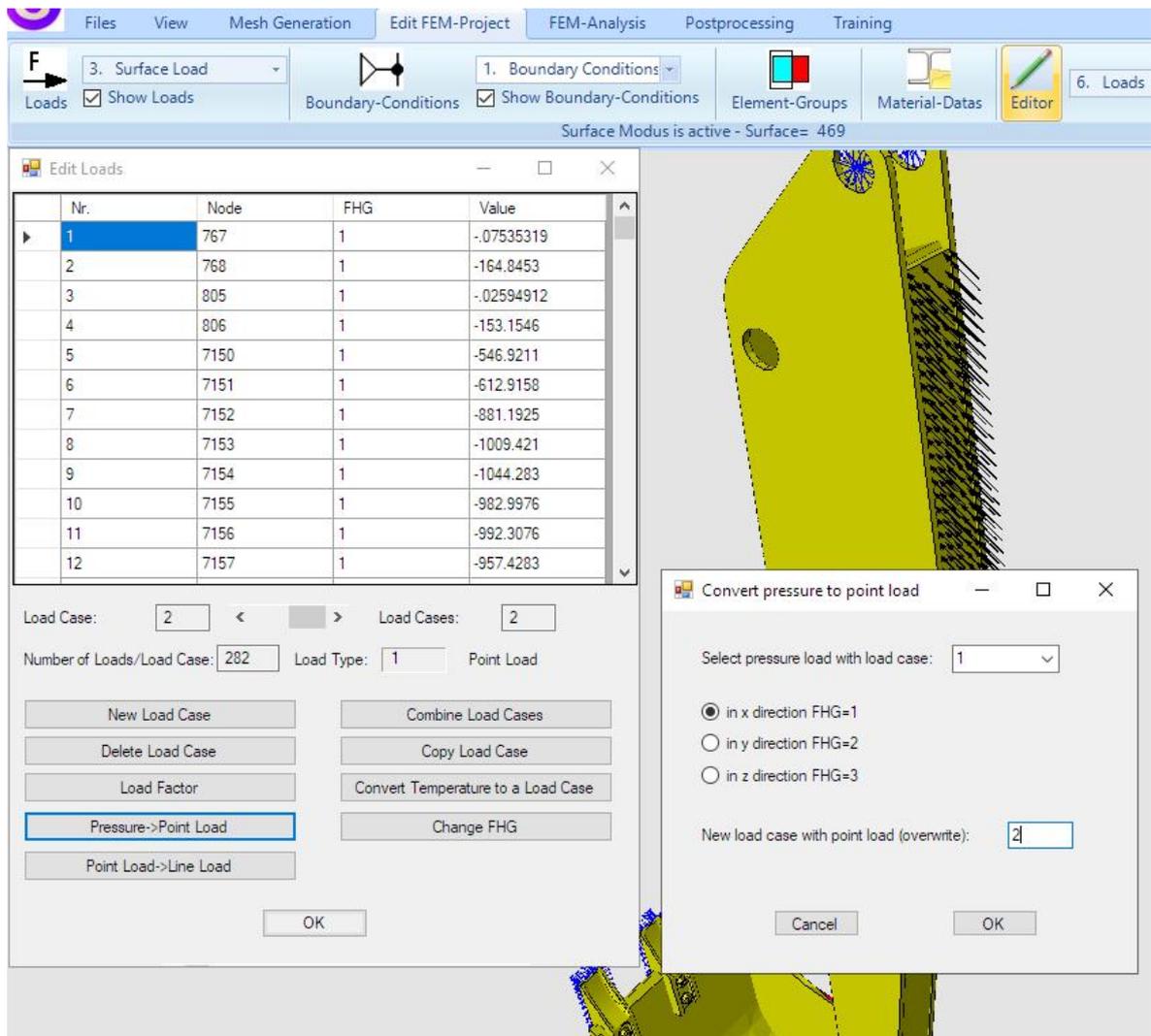
You can display and check all load values of the surface load in the Node Modus with "Show load values".



Convert Triangular Surface Load to Point Load

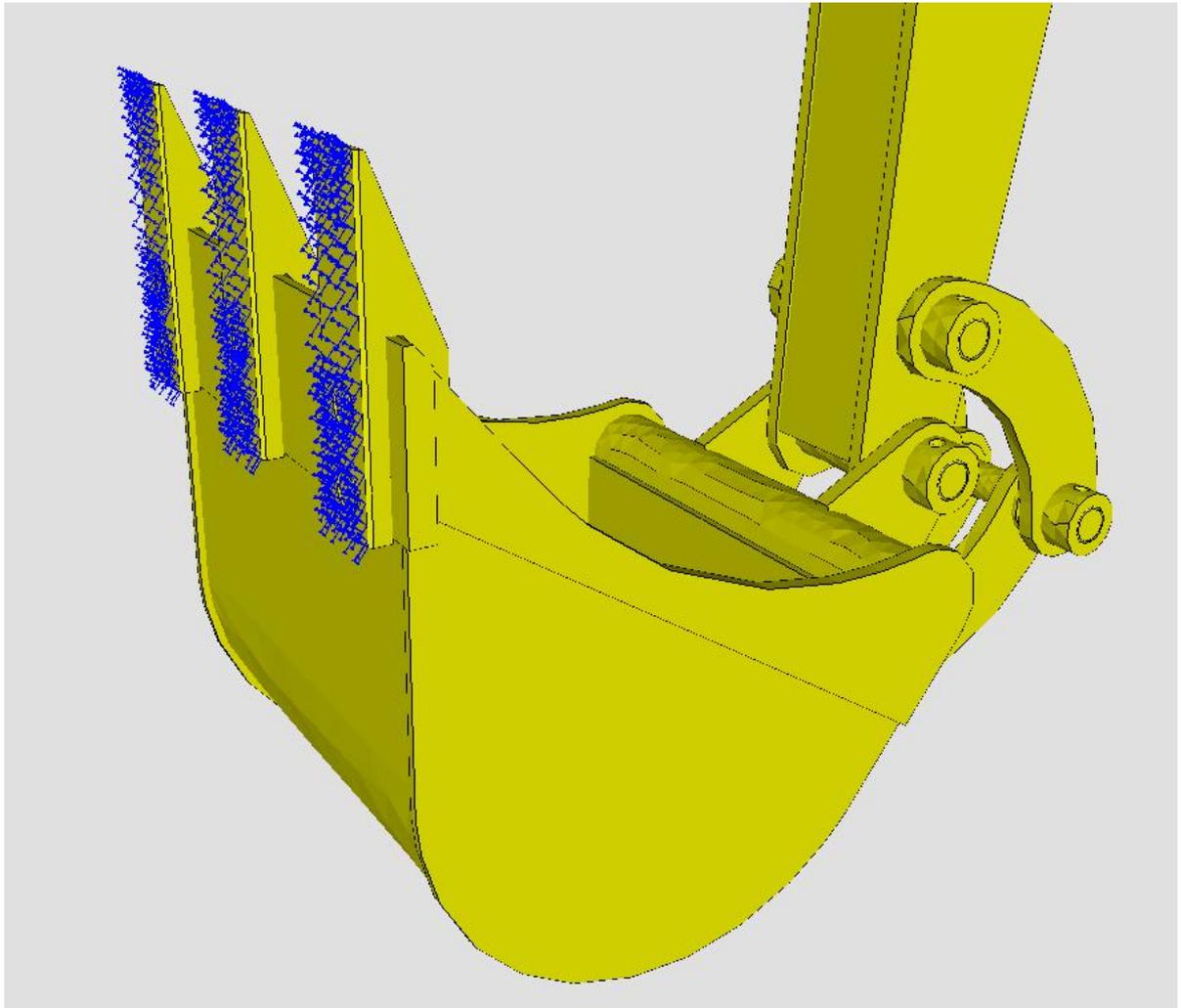
Because the quick solver can only calculate surface loads in „vertical to surface“ direction, the triangular surface load must now be converted into a Point Load in the X direction.

Select the "Edit FEM project" and "Editor" tabs to create load case 2 with a Point Load in the X direction using menu "Pressure->Point Load" menu. Finally, load case 1 with the surface load must be deleted.



Create Boundary Conditions

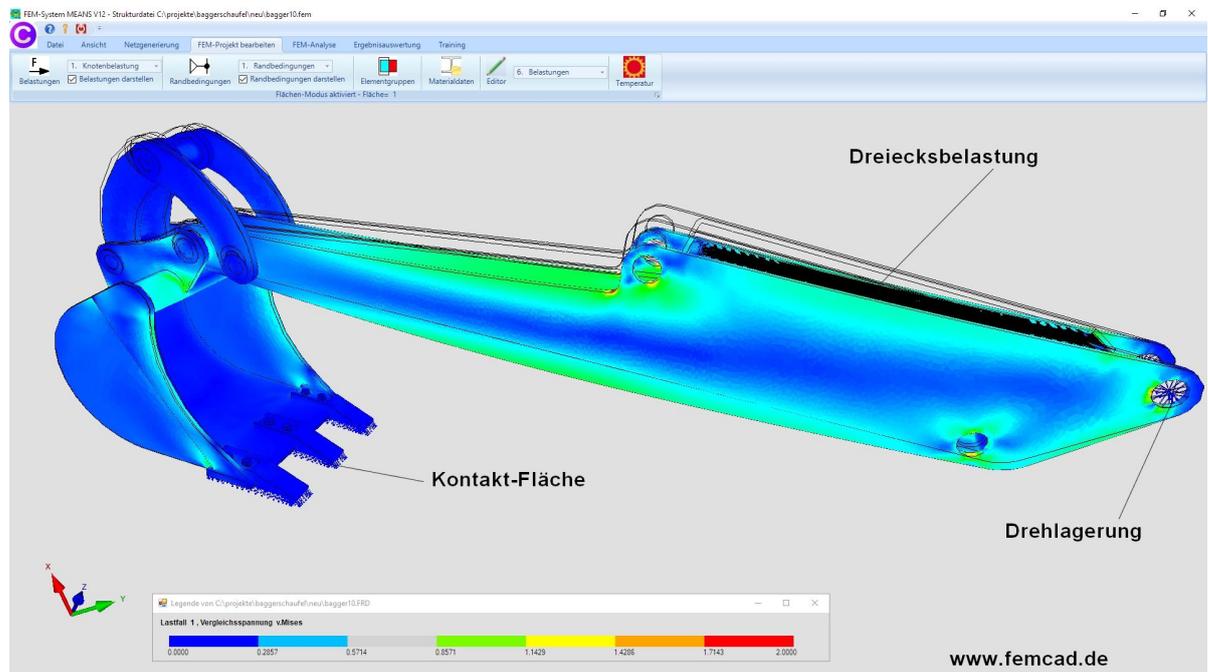
To create the contact between bucket and the wall select register „Edit FEM-Project“ and menu „Boundary Conditions to clamped fixed the three surfaces of the bucket in x, y and z direction.



Postprocessing

With register „Postprocessing“ the results such as displacements and stresses can be evaluated graphically.

v.Mises-Stress with a triangular surface load in „vertical to surface“ direction



v.Mises-Stress with a triangular surface load in x direction

