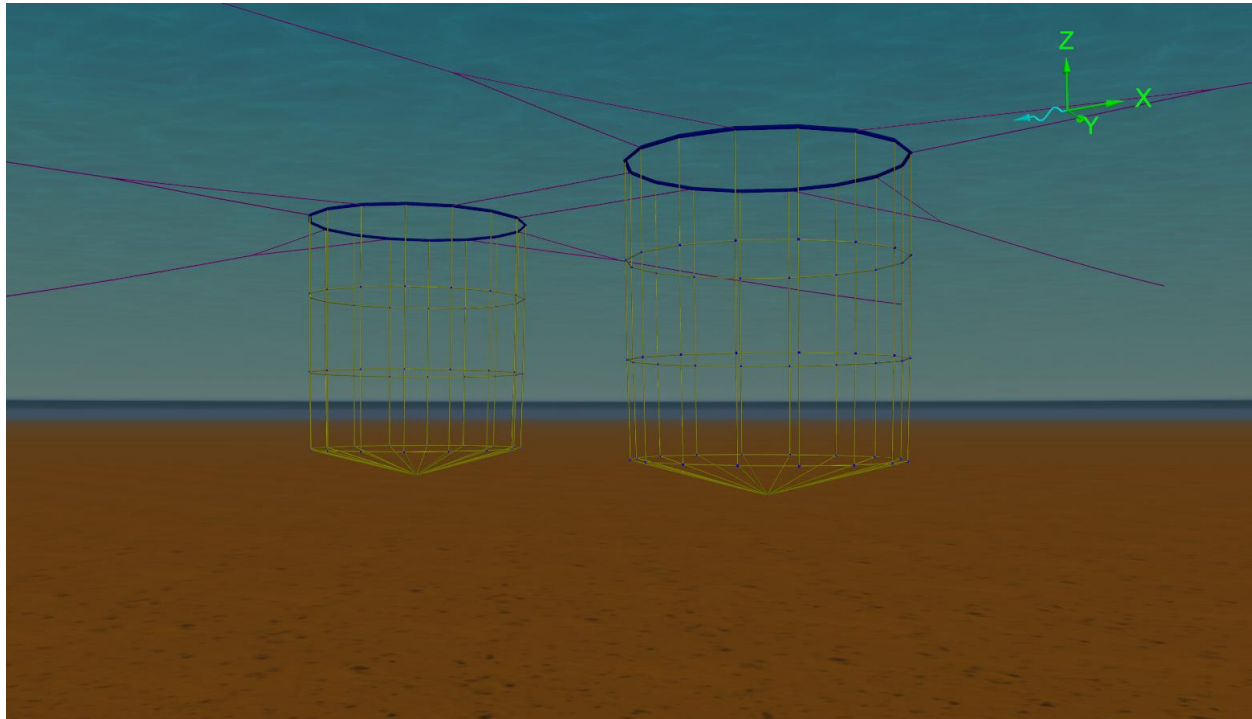# C08 Fish farm

Introduction

Two fish farm cages are modelled. They are connected to each other via moorings to give a 2 cell structure.

Building the model

In the *model browser*, right click and make sure that the *view by groups* option is ticked.

The important result for this model is the behaviour of the net as a complete entity. This allows the net model to be simplified in two ways:

- The net mesh needs to be modelled with sufficient refinement to show the distribution of loading. This means an equivalent mesh can be generated that has the same resultant loads but does not need to show each individual knot and line. This is basically the same as defining the mesh refinement on a surface for an FE model.
- Detailed motions at each knot, and the length of rope in between, are not required. Therefore, the lines can be single segment and the knots can be *3D buoys*. Pinned connections can be used because the line bending stiffness is negligible, so moment transfer would be too.

The nets are suspended below floating rings. Again single segment lines are used but the plastic rings have appreciable bending stiffness i.e. the bending moments need to be transferred. Therefore, *6D buoys* and 'built in' line end connections (*end connection stiffness* of infinity) are used for the floating rings.

The whole structure is then moored using more lines.

When building this type of structure, it can be helpful to use the *group* facility to build a basic unit then copy, paste and move within the model browser. Remember, you can right click on a *model browser* group and use the move selected objects wizard to displace or rotate all objects within it as a whole. Also, you can copy and paste objects by using the standard *Ctrl+C* and *Ctrl+V* shortcut keys.

Further options exist when building this type of structure in OrcaFlex. For example, lines can be connected directly to other lines which can, in some cases, simplify the model by reducing the number of objects used. However, it can sometimes be more convenient to use buoy objects – or even *constraints* – as connection points.

We recommend that, when building models of complex structures like this, you consider using the Python application programming interface (API) to automate the creation of objects and their connections to other objects. If you are interested in learning more about this, then please contact Orcina.

Further details about the available automation tools, provided with OrcaFlex, can be found on the Automation | Introduction page of the OrcaFlex help.

Results

Replay the animation to see the cells respond to the applied environmental loading.