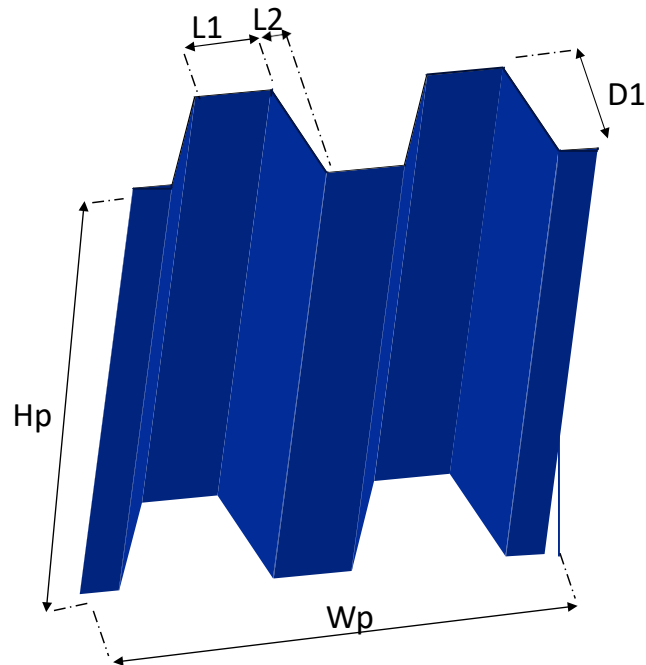


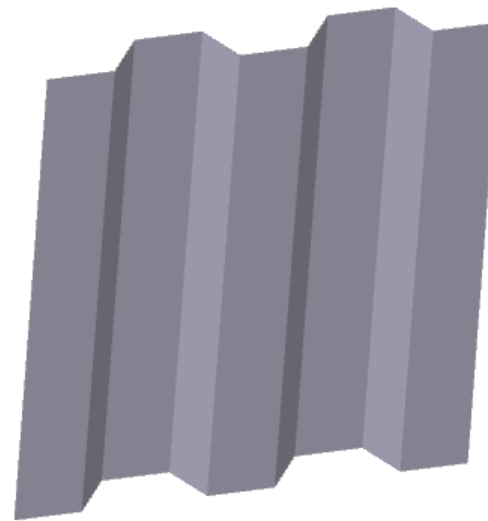
Sesam example: Parametric Modelling of Corrugated Plates

Introduction

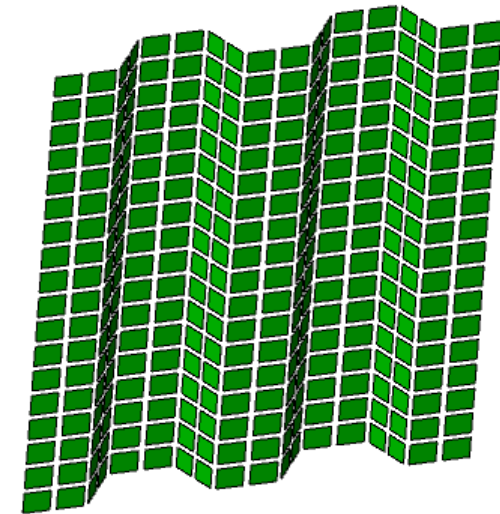
- For corrugated bulkhead, can be modelled using parametric model.
- Refer script example. Each step will be explained in this example.



Dimensions → Parameters



Concept model



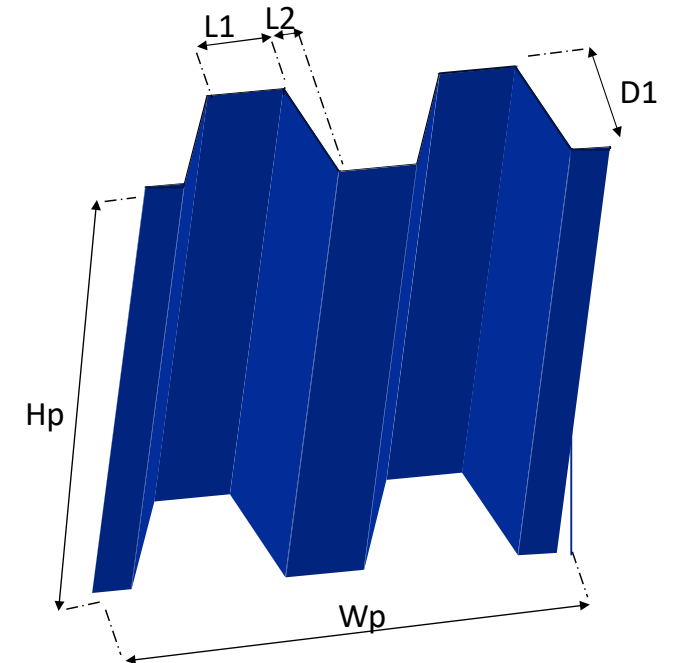
Mesh

Script Example – Input

- Input : Plate Dimensions, Material & thickness

```
// Dimensions of corrugated plates
Hp = 6.23 m;           //Hp = Height of plate
Wp = 12.32 m;         //Wp = Total width of plate
L1 = 700 mm;          //L1 = Length of sub panel <L1><L2> ___
L2 = 300 mm;          //L2 = Length of corrugation ___ / \ D1
D1 = 400 mm;          //D1 = Depth of corrugation
PanelName = "Bulkhead_1"; //PanelName = Name of set comprising corrugated plate

// Material and thickness
Mild = Material(235 MPa, 7850 kg/m3, 210 GPa, 0.3, 1.2E-5, 0.03);
Th_10 = Thickness(10 mm);
Mild.setDefault();
Th_10.setDefault();
```



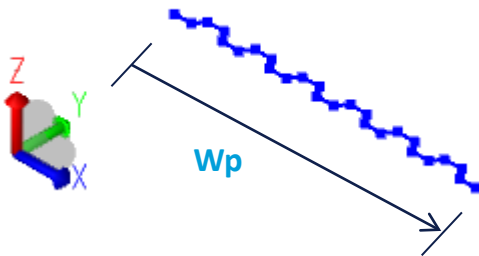
Script Example – Step 1

- Step 1 – Initialization of intermediate parameters, array

```
var Total_Length = 0.0 m;           // Total length of the plate we have created to now
var i = 0;                          // Counter for sub panels ____
var j = 0;                          // Counter for corrugations = 4 sub panels ____/ \
var PartNo = 1;                     // Sub panel part 1,2,3,4
var array_Curves = new Array();     // Guide curves at the base of the plate
```

Script Example – Step 2

- Step 2 – Create curves for sub panels until they are beyond W_p
 - “L1”, “L2”, “D1”, “ W_p ” are used.
 - Using “Do... while...” statement. Repeat this until $Total_Length < W_p$



```
do {
    var StartP = (L1+L2)*2*j; // Start (reference) point for the next corrugation
    if ( PartNo == 1) // Create curve for 1st subpanel
    {
        array_Curves[i] = CreateLineTwoPoints(Point(StartP,0,0), Point((StartP+L1),0,0));
        rename(array_Curves[i], "Line_"+i);
        Total_Length = Total_Length + L1;
        PartNo = 2;
    }
    else if ( PartNo == 2) // Create curve for 1st corrugation subpanel
    {
        array_Curves[i] = CreateLineTwoPoints(Point(StartP+L1,0,0), Point((StartP+L1+L2),D1,0));
        rename(array_Curves[i], "Line_"+i);
        Total_Length = Total_Length + L2;
        PartNo = 3;
    }
    else if ( PartNo == 3) // Create curve for 2nd subpanel
    {
        array_Curves[i] = CreateLineTwoPoints(Point(StartP+L1+L2,D1,0), Point((StartP+2*L1+L2),D1,0));
        rename(array_Curves[i], "Line_"+i);
        Total_Length = Total_Length + L1;
        PartNo = 4;
    }
    else if ( PartNo == 4) // Create curve for 2nd corrugation subpanel
    {
        array_Curves[i] = CreateLineTwoPoints(Point(StartP+2*L1+L2,D1,0),
        Point(StartP+2*(L1+L2),0,0));
        rename(array_Curves[i], "Line_"+i);
        Total_Length = Total_Length + L2;
        PartNo = 1;
        j++; // New corrugation
    }
    i++; // Next sub panel
} while (Total_Length < Wp);
```

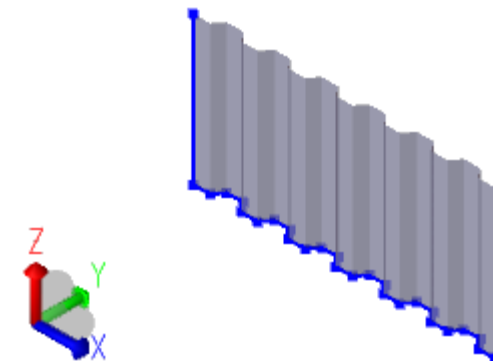
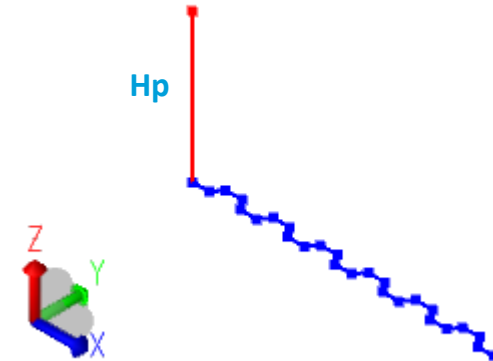
Script Example – Step 3, 4

- Step 3 – Make a curve to sweep along Using “Divide by plane”.
 - “Hp” is used.
 - “*CreateLineTwoPoints*” command is used

```
var SweepCurve1 = CreateLineTwoPoints(Point(0,0,0), Point(0,0,Hp));
```

- Step 4 – Make plates by sweeping lines and put them in a set
 - Create plate by sweeping along guide curve

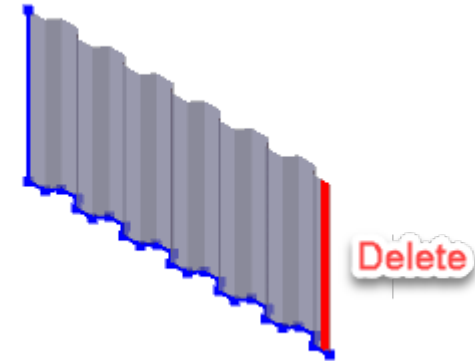
```
NewSet = Set();  
i = 0;  
for ( i = 0; i < array_Curves.length(); i++)  
{  
    temp_Panel = SweepCurve(array_Curves[i], SweepCurve1);  
    NewSet.add(temp_Panel);  
    rename(temp_Panel, "Panel_" + i);  
}
```



Script Example – Step 5, 6

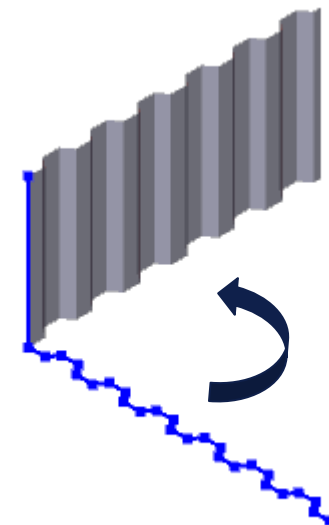
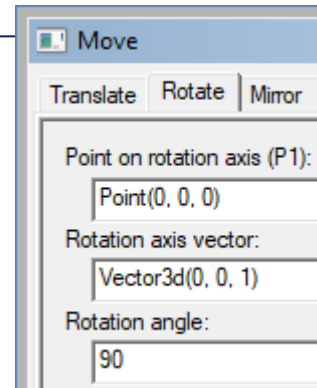
- Step 5 – Divide the last panel at Wp and delete the rest
 - Using “Divide by plane”.
 - “Wp” is used.

```
Print("Final numer of curugate plate = " + (i - 1));  
var Rest = GetNamedObject("Panel_"+(i-1)).divide(XPlane3d(Wp));  
Delete(Rest);
```



- Step 6 – May use "Move-Rotate" to move the plate to where it belongs

```
NewSet.moveRotate(Point(0, 0, 0), Vector3d(0, 0, 1), 90, geUNCONNECTED);  
NewSet.name = PanelName;
```



Script Example – Step 7

- Step 7 – Generate Mesh
 - “L1” is used for default mesh density (to have 2 meshes along width in one sub-panel)

```
Mesh_Default = MeshDensity(L1/2.0);  
Mesh_Default.setDefault();  
Analysis1 = Analysis(true);  
Analysis1.add(MeshActivity());  
Analysis1.add(LoadResultsActivity());  
Analysis1.setActive();  
Analysis1.execute();
```

