Import DXF File Tutorial

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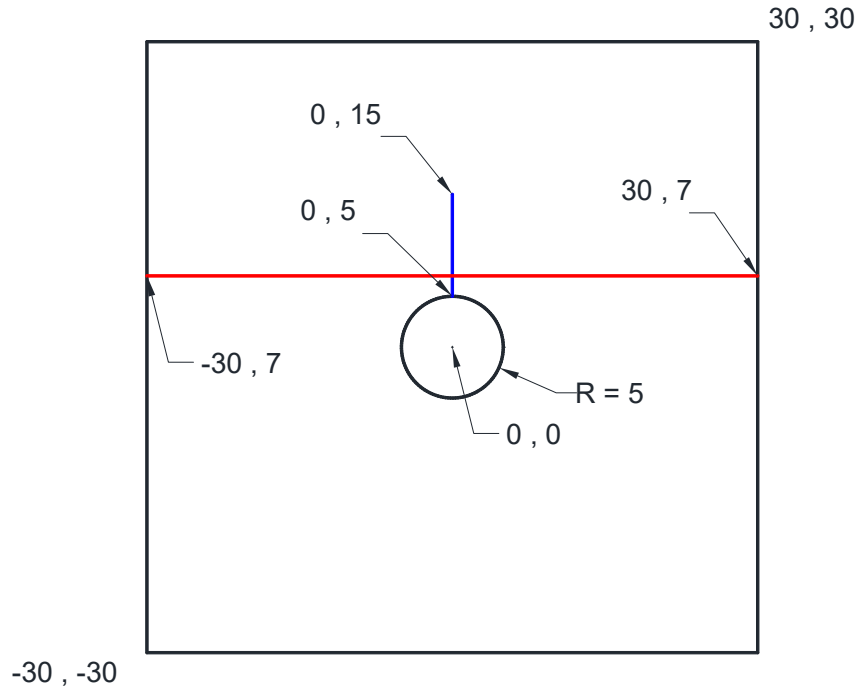
This tutorial will demonstrate how to import DXF file into ***ADONIS*** using the Import DXF wizard tool. In this tutorial ***LibreCAD***, a free Open Source CAD application is used for DXF generation but please note that ADONIS is compatible with ***AUTOCAD*** as well. ***LibreCAD*** can be downloaded from https://librecad.org/

Create DXF File

First let's create the DXF file. In order to create a simple geometry using ***LibreCAD*** let's follow the sequences below:

1- Before start drawing let's specify some layer names. From menu select ***Layer List->Add a Layer*** and then specify ***GEOMETRY*** as a layer name. Please note that ***ADONIS*** will read the geometry objects (i.e. line, arc, circle etc.) regardless of layer name but it's recommended to use ***GEOMETRY*** as a layer name for objects for more clarifications. Please repeat the same steps and create two more layers and name them ***JOINT*** and CABLE for joint and cable elements. You can optionally specify the color, width or line type for each layer for better presentation. Table 1 shows the conventions for layering while creating objects.

2- To draw the outside boundary, select ***Tools->Line->Rectangle*** and specify first point -30,-30 and second point 30,30. Now select the Rectangle and select ***Tools->Modify-***

>**Attributes** in the attributes dialog, drop down the layer selection box and choose **GEOMETRY**. Right click or press ESC key to terminate the drawing.
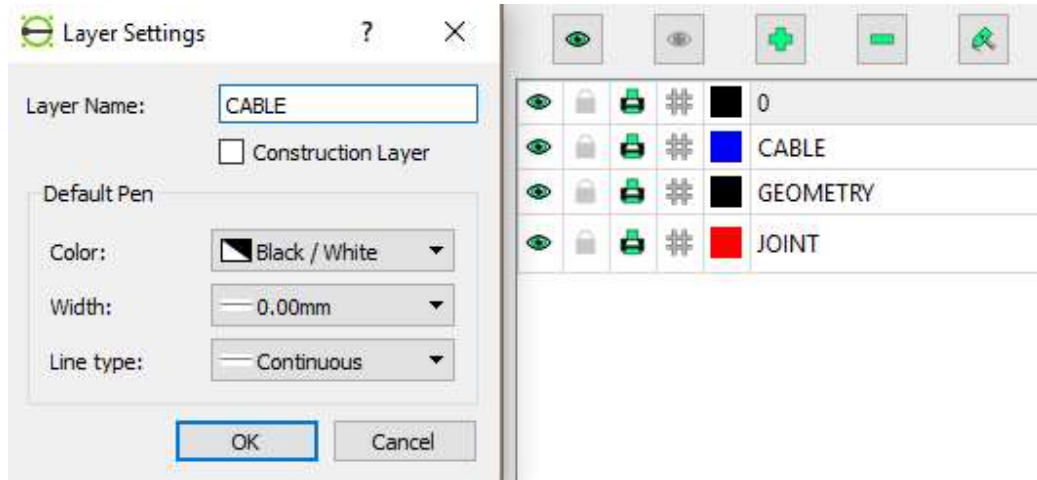

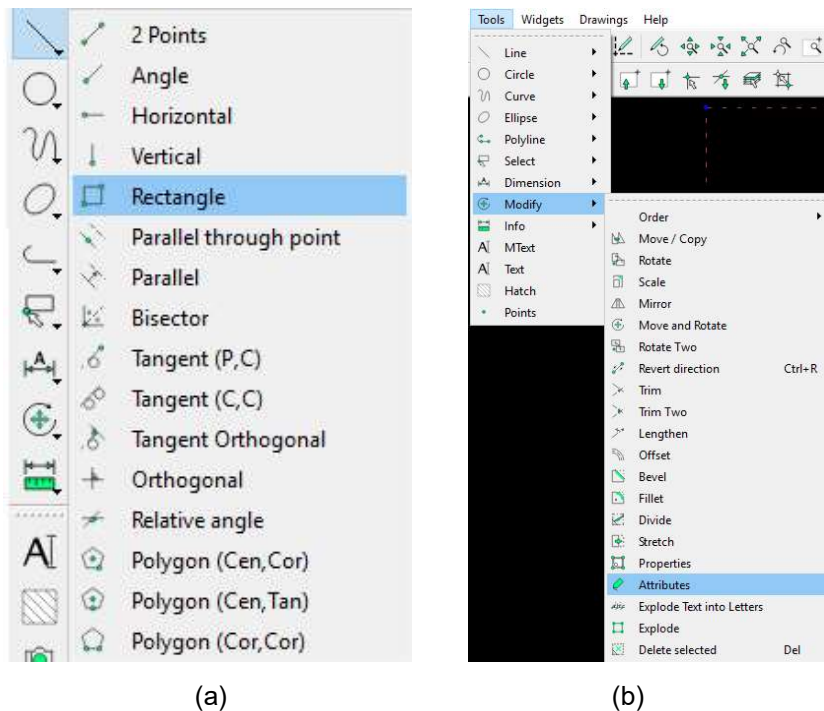Figure 1- Layers Settings dialog to specify new layers.

(a)   (b)

Figure 2- (a) draw rectangle (b) Change rectangle's layers name (attributes).

3- To draw the circular tunnel, select **Tools->Circle->Center, Point** and specify center point 0,0 and second point 5,0. Now select the Circle and select **Tools->Modify->Attributes** in the attributes dialog, drop down the layer selection box and choose **GEOMETRY**. Right click or press ESC key to terminate the drawing.

4- To draw the joint above the tunnel, select **Tools->Line->2 Points** and specify center point -30,7 and second point 30,7. Now select the Line and select **Tools->Modify->Attributes** in the attributes dialog, drop down the layer selection box and choose **JOINT**. Right click or press ESC key to terminate the drawing.

5- In the final step to draw the Cable element, select **Tools->Line->2 Points** and specify center point 0,5 and second point 0,15. Now select the Line and select **Tools->Modify->Attributes** in the attributes dialog, drop down the layer selection box and choose **CABLE**. Right click or press ESC key to terminate the drawing.

6- Save the file in the desired directory and name it "tut02_dxf.dxf"
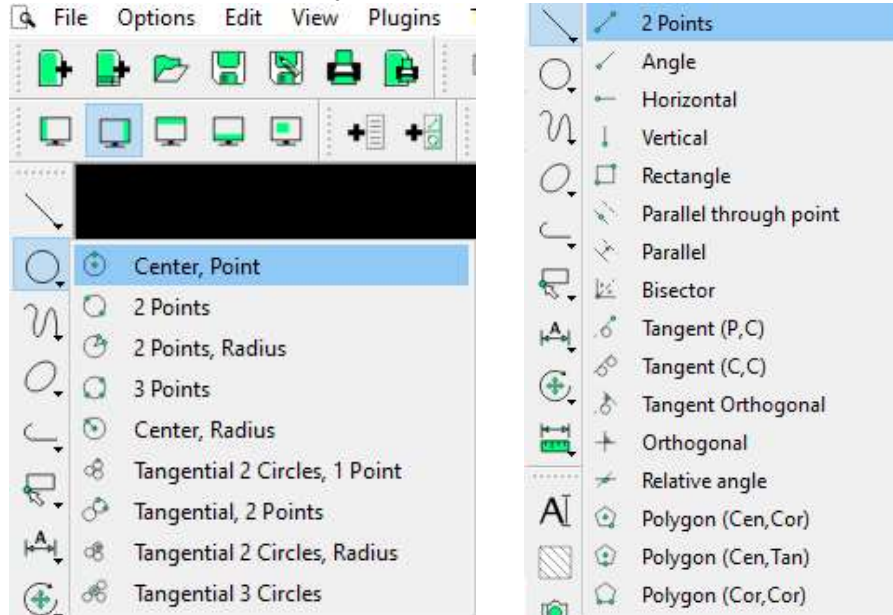
(a)   (b)

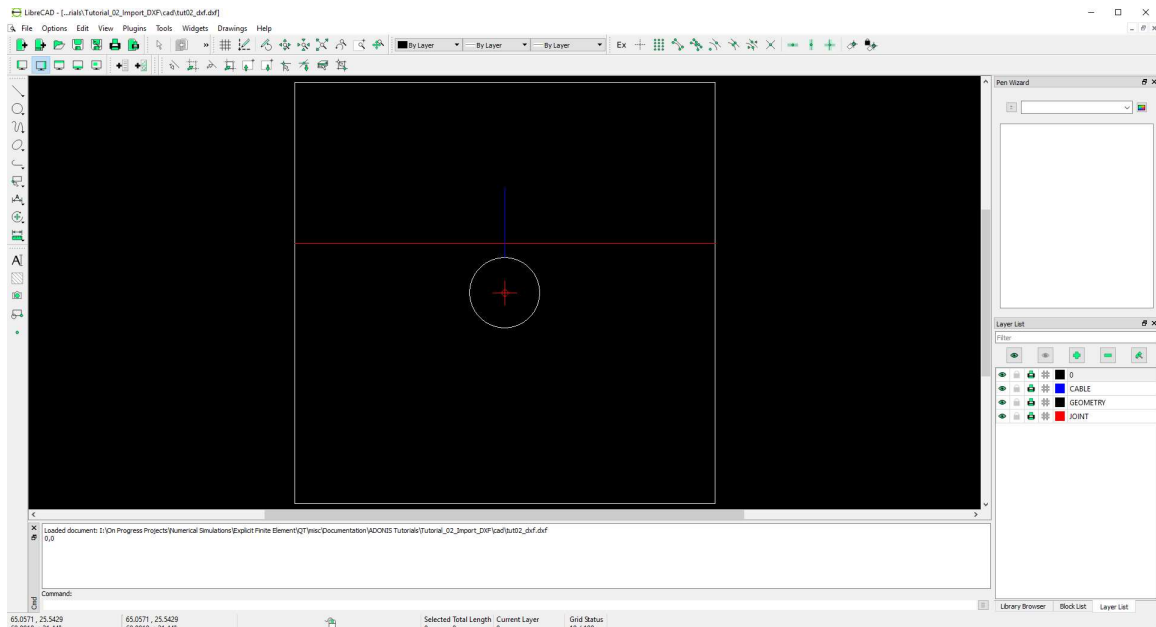Figure 3- (a) draw circle with center and point on circle (b) Draw line with two points.

Figure 4- Final result in the LibreCAD.

Table 1- conventions for layering and entity type

Object	Layer Name	CAD Entity Type
Geometry	GEOMETRY (optional)	LINE / POLYLINE / ARC / CIRCLE
Joints	JOINT	LINE
Cables	CABLE	LINE
Tiebacks	TIEBACK	LINE
Strips (i.e. Geogrids)	STRIP	LINE

Import DXF

To import dxf file into **ADONIS** using wizard dialog, select **File->Import DXF** from menu or toolbar

Select:

Then follow the steps below:

1. In the **Import DXF** dialog, click on Select DXF File button and select the required DXF file and press Open.
2. In case you want to modify the output filename click on **Output Filename** checkbox and specify output script filename. By default the output filename is identical to the input DXF filename.
3. Then select **Unit System**. Uncheck the **Load Script after Creation** if you don't want to load the created script after generation.
4. Click on **Apply** button, to generate the script file (i.e. *.ajs). Generated script corresponding to selected DXF file can be found in the same directory as input DXF file.
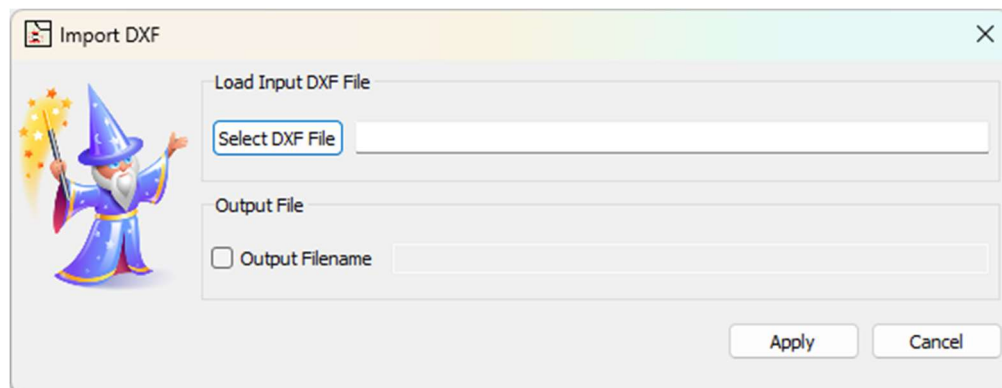

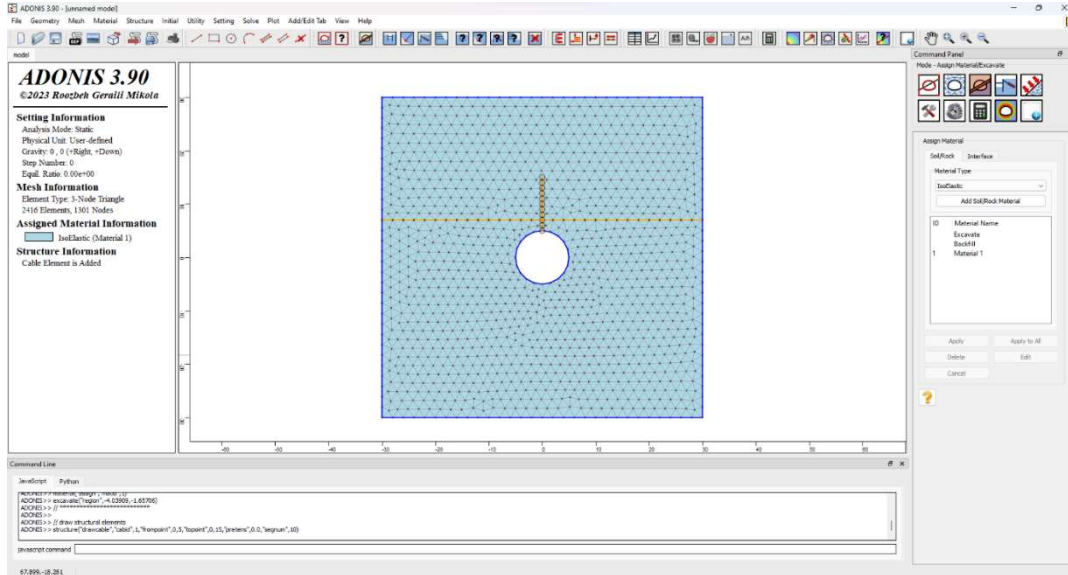Figure 5- Import DXF dialog in ADONIS.

Figure 6- Final result in ADONIS after cleaning up the script.

Script

Now you can open the script file, for instance you can create and specify the material to the solid elements then excavate the tunnel before installing the cable element. The following command lines shows the output from the wizard tool including the modifications made before cable installation:

```javascript
// ***************************
// this part is included after clean up

// create new model
newmodel()

// select system unit
set("unit","user-defined")
// ***************************

// generate geometry
line("startPoint",-30,-30,"endPoint",30,-30)
line("startPoint",30,-30,"endPoint",30,30)
line("startPoint",30,30,"endPoint",-30,30)
line("startPoint",-30,30,"endPoint",-30,-30)
circle("centerPoint",0,0,"radius",5,"numSeg",20)
joint("startPoint",-30,7,"endPoint",30,7,"id",1)

// discretize/triangulate the model
discretize("size","auto")
gmsh("size","auto","elemtype","T3","useNMD","on")

// ***************************
// this part is included after clean up
// create and specify material and then excavate the tunnel before installing the cable element
material("create","IsoElastic","matid",1,"matname","Material
1","density",2500,"shear",2.8e+09,"bulk",3.9e+09)
material("assign","matid",1)
excavate("region",-4.03909,-1.65706)
// ***************************

// draw structural elements
structure("drawcable","cabid",1,"frompoint",0,5,"topoint",0,15,"pretens",0.0,"segnum",10)
```