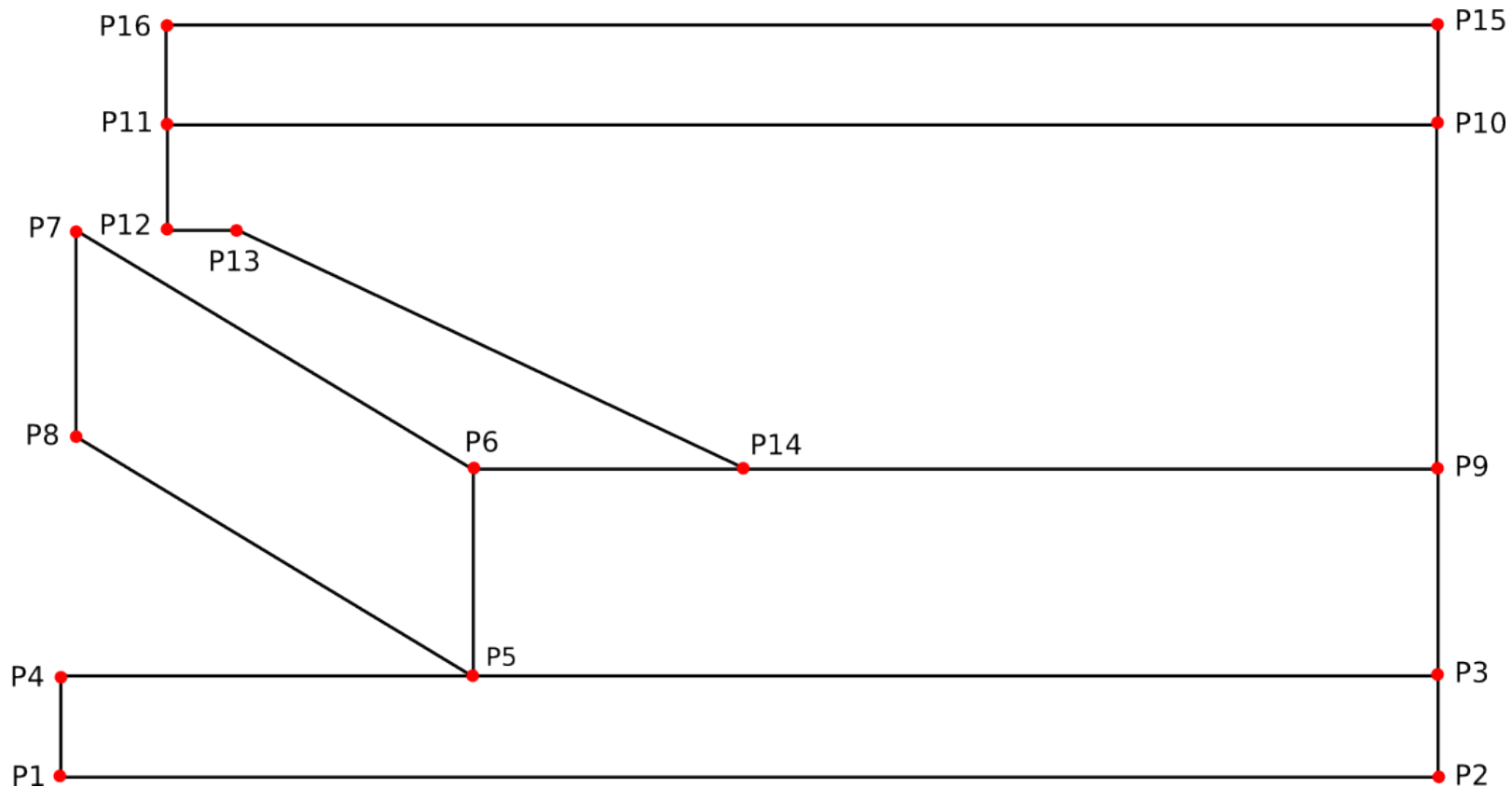


Direct Current 2D

El proyecto CloudPYME (id: 0682_CLOUDPYME2_1_E) está cofinanciado por la Comisión Europea a través de el Fondo Europeo de Desarrollo Regional (FEDER), dentro de la tercera convocatoria de proyectos del Programa Operativo de Cooperación Transfronteriza España-Portugal 2007-2013 (POCTEP).

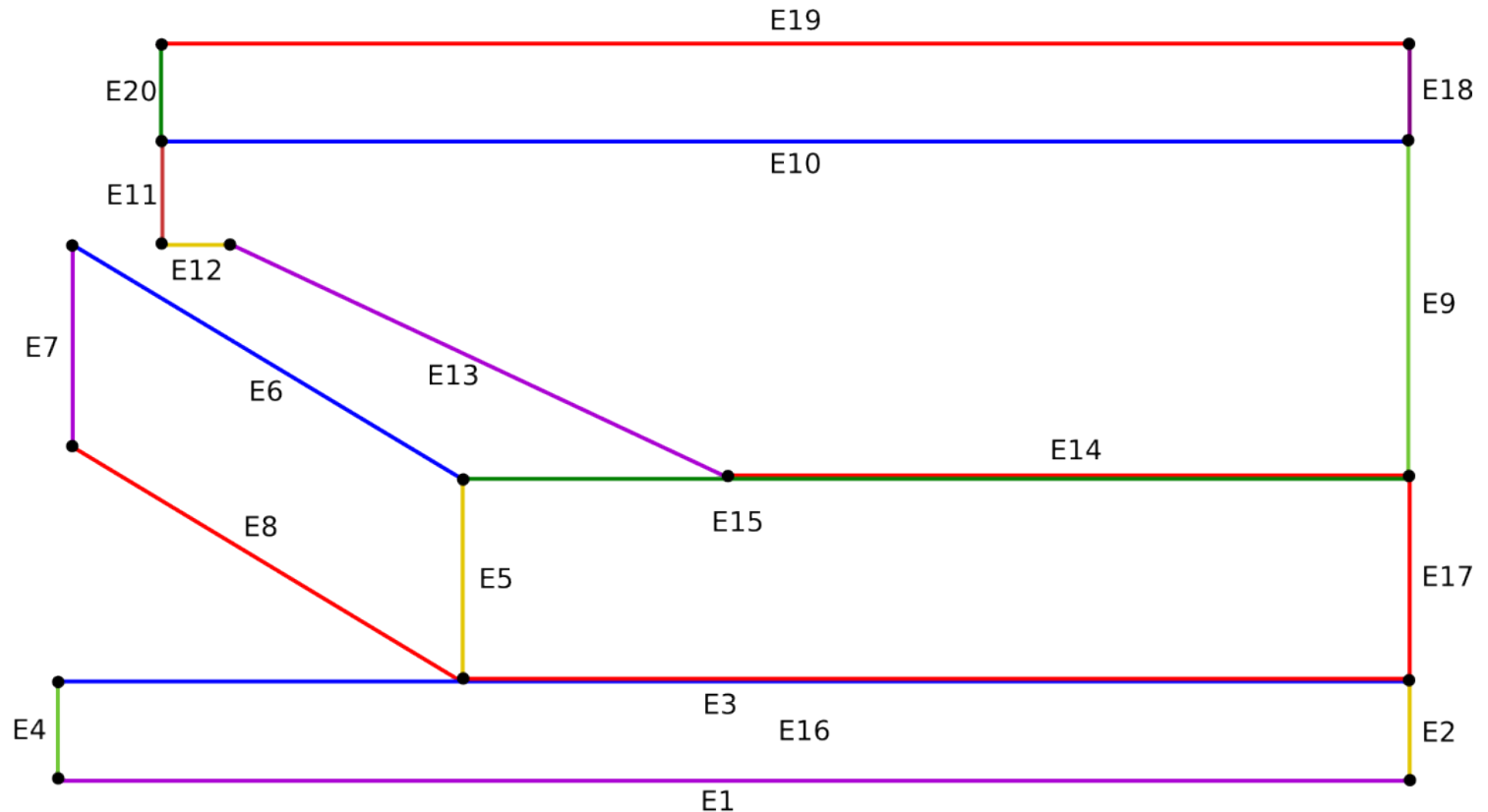
Direct Current 2D: Geometry

$P1 = (0, 0)$
 $P2 = (2, 0)$
 $P3 = (2, 0.15)$
 $P4 = (0, 0.15)$
 $P5 = (0.6, 0.15)$
 $P6 = (0.6, 0.45)$
 $P7 = (0.02, 0.8)$
 $P8 = (0.02, 0.5)$
 $P9 = (2, 0.45)$
 $P10 = (2, 0.95)$
 $P11 = (0.15, 0.95)$
 $P12 = (0.15, 0.8)$
 $P13 = (0.25, 0.8)$
 $P14 = (1, 0.45)$
 $P15 = (2, 1.1)$
 $P16 = (0.15, 1.1)$



Direct Current 2D: Geometry

E1 = LINE(P1 , P2)
 E2 = LINE(P2 , P3)
 E3 = LINE(P3 , P4)
 E4 = LINE(P4 , P1)
 E5 = LINE(P5 , P6)
 E6 = LINE(P6 , P7)
 E7 = LINE(P7 , P8)
 E8 = LINE(P8 , P5)
 E9 = LINE(P9 , P10)
 E10 = LINE(P10 , P11)
 E11 = LINE(P11 , P12)
 E12 = LINE(P12 , P13)
 E13 = LINE(P13 , P14)
 E14 = LINE(P14 , P9)
 E15 = LINE(P9 , P6)
 E16 = LINE(P5 , P3)
 E17 = LINE(P3 , P9)
 E18 = LINE(P10 , P15)
 E19 = LINE(P15 , P16)
 E20 = LINE(P16 , P11)



Direct Current 2D: Geometry

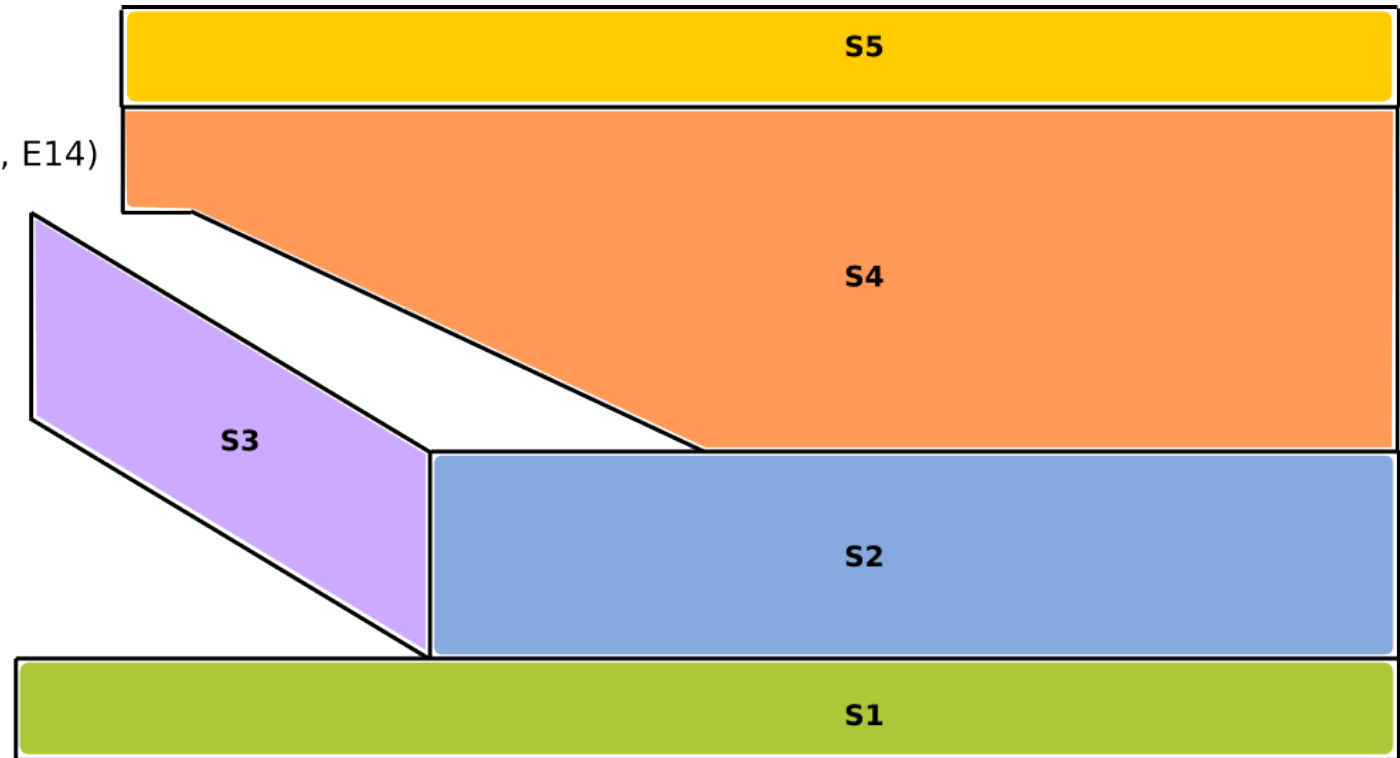
$S1 = \text{FACE}(E1, E2, E3, E4)$

$S2 = \text{FACE}(E4, E15, E16, E17)$

$S3 = \text{FACE}(E5, E6, E7, E8)$

$S4 = \text{FACE}(E9, E10, E11, E12, E13, E14)$


$S5 = \text{FACE}(E10, E18, E19, E20)$




Direct Current 2D: Geometry

Material	Electrical conductivity
Bath	1.e3
Liquid aluminium	7.69e7
Rammed paste	1.78e4
Cathodic block	2.7e4
Collector bar	1.67e6

FUSE =  +  +  +  + 

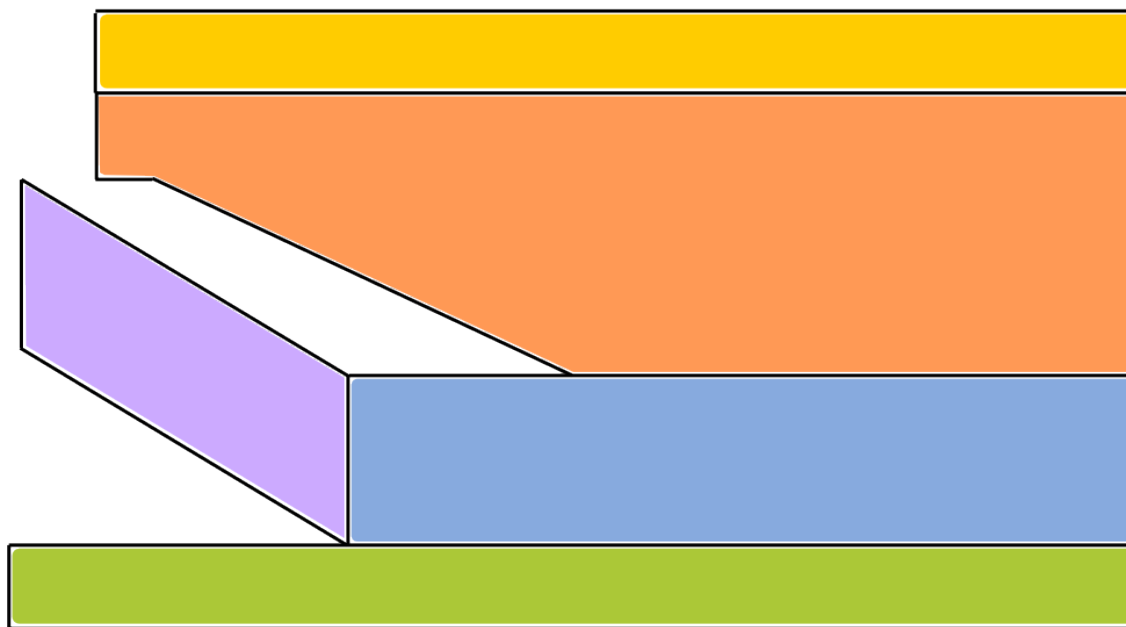
 = Bath

 = Liquid aluminium

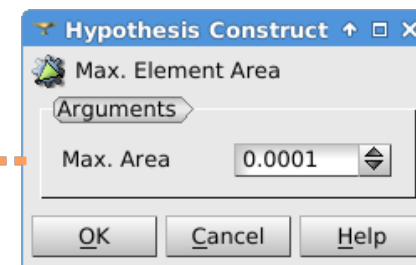
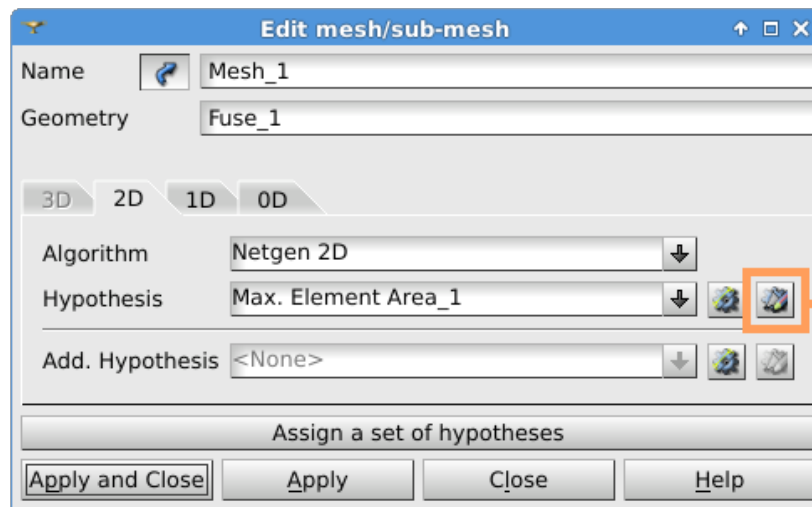
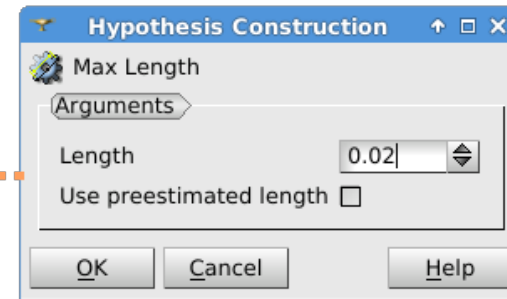
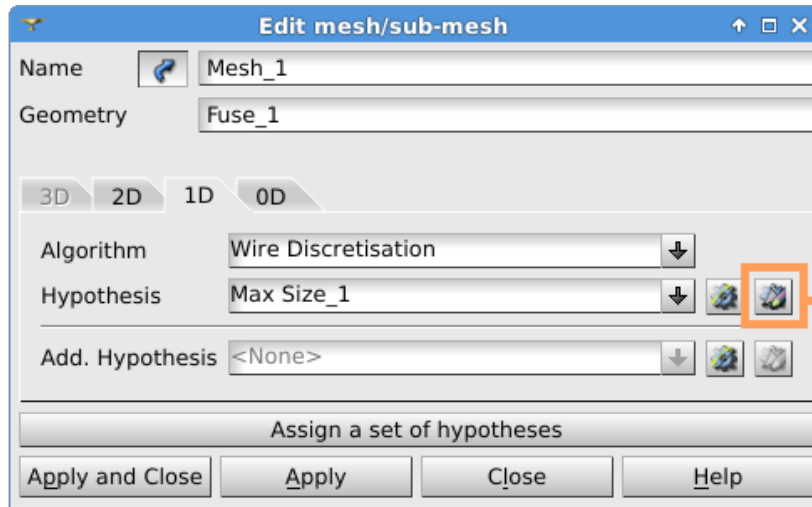
 = Rammed paste

 = Cathodic block

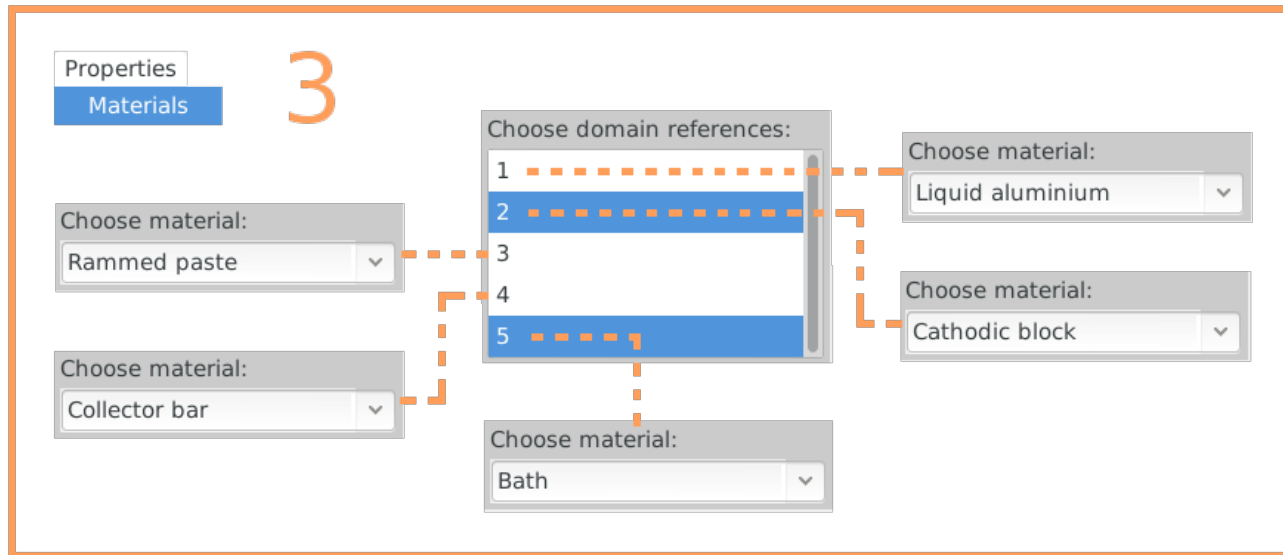
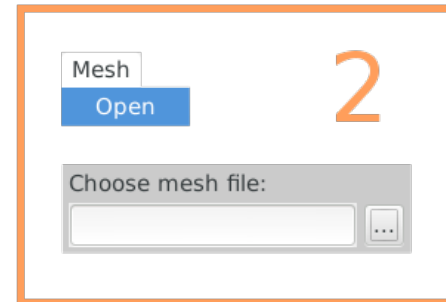
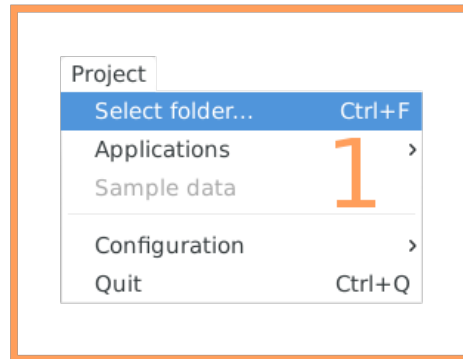
 = Collector bar



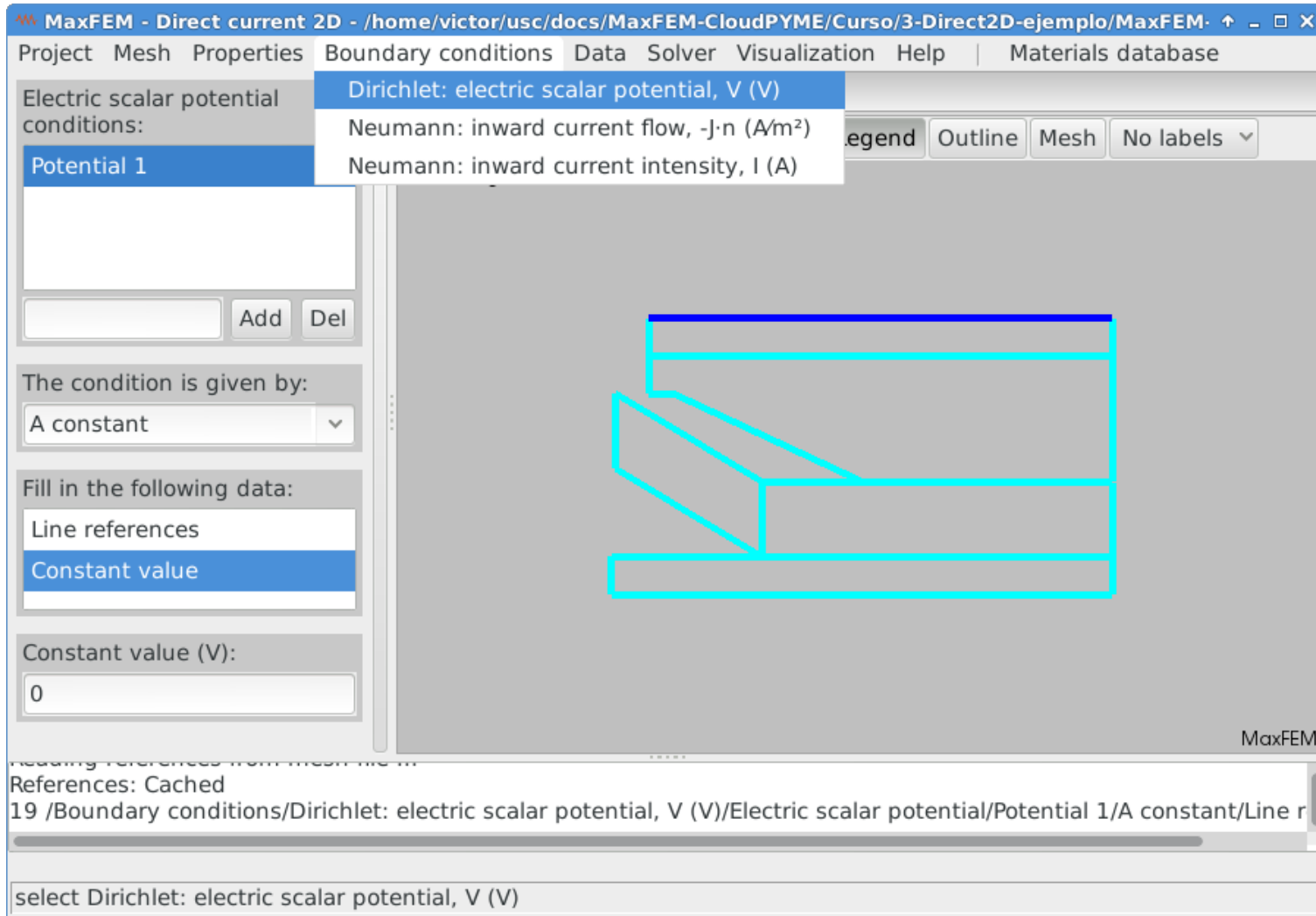
Direct Current 2D: Mesh



Direct Current 2D: MaxFEM



Direct Current 2D: MaxFEM



MaxFEM - Direct current 2D - /home/victor/usc/docs/MaxFEM-CloudPYME/Curso/3-Direct2D-ejemplo/MaxFEM

Project Mesh Properties **Boundary conditions** Data Solver Visualization Help | Materials database

Electric scalar potential conditions:

- Potential 1

Dirichlet: electric scalar potential, V (V)

Neumann: inward current flow, $-j \cdot n$ (A/m²)

Neumann: inward current intensity, I (A)

Legend Outline Mesh No labels

The condition is given by:

A constant

Fill in the following data:

Line references

Constant value

Constant value (V):

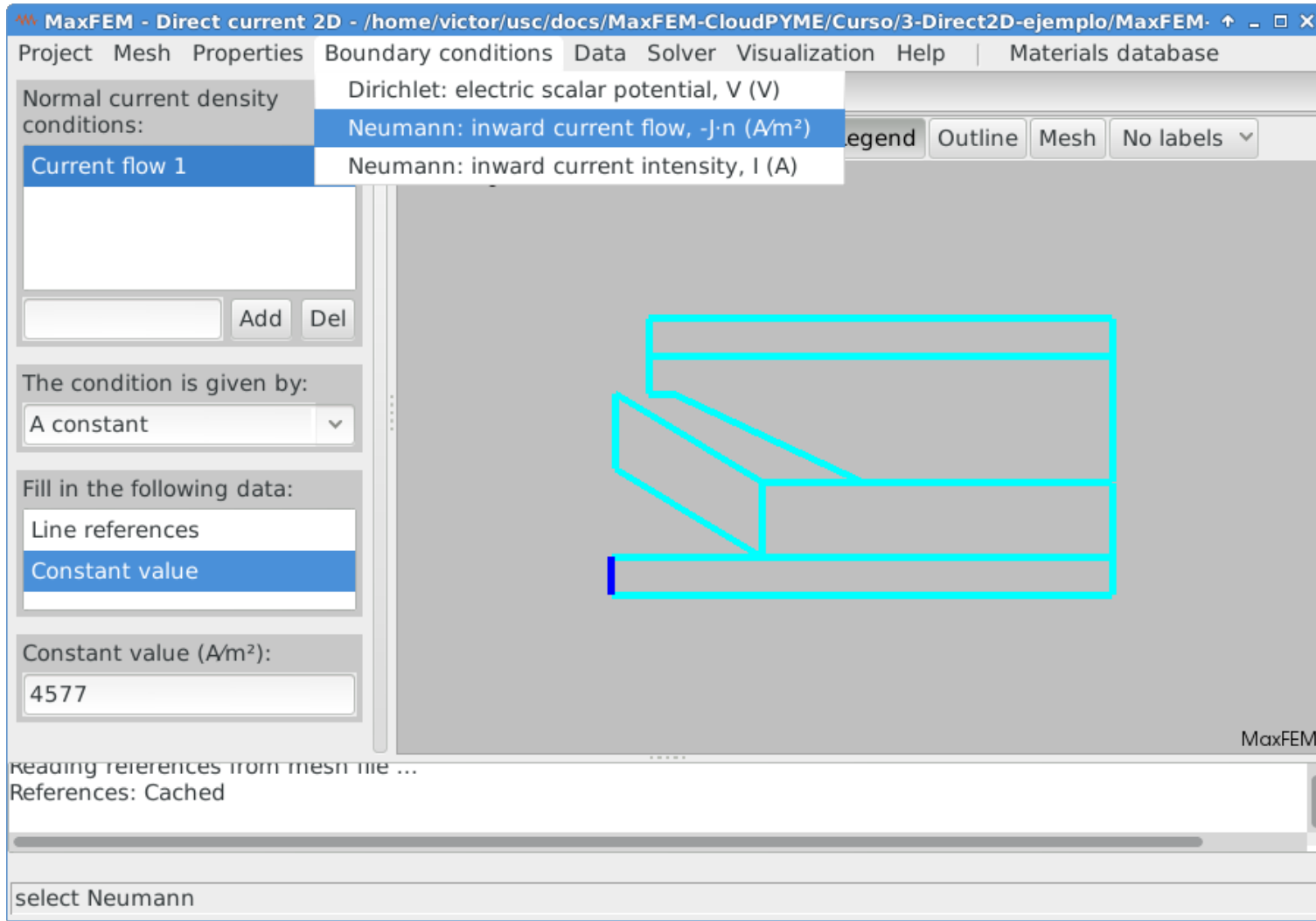
0

References: Cached

19 /Boundary conditions/Dirichlet: electric scalar potential, V (V)/Electric scalar potential/Potential 1/A constant/Line r

select Dirichlet: electric scalar potential, V (V)

Direct Current 2D: MaxFEM



The screenshot shows the MaxFEM software interface with the following configuration:

- Project:** MaxFEM - Direct current 2D - /home/victor/usc/docs/MaxFEM-CloudPYME/Curso/3-Direct2D-ejemplo/MaxFEM
- Boundary conditions:**
 - Dirichlet: electric scalar potential, V (V)
 - Neumann: inward current flow, $-j \cdot n$ (A/m^2)
 - Neumann: inward current intensity, I (A)
- Current flow 1:**
 - The condition is given by: A constant
 - Fill in the following data: Constant value
 - Constant value (A/m^2): 4577

The central visualization shows a 2D mesh of a complex geometric shape with cyan outlines. The status bar at the bottom indicates "select Neumann".