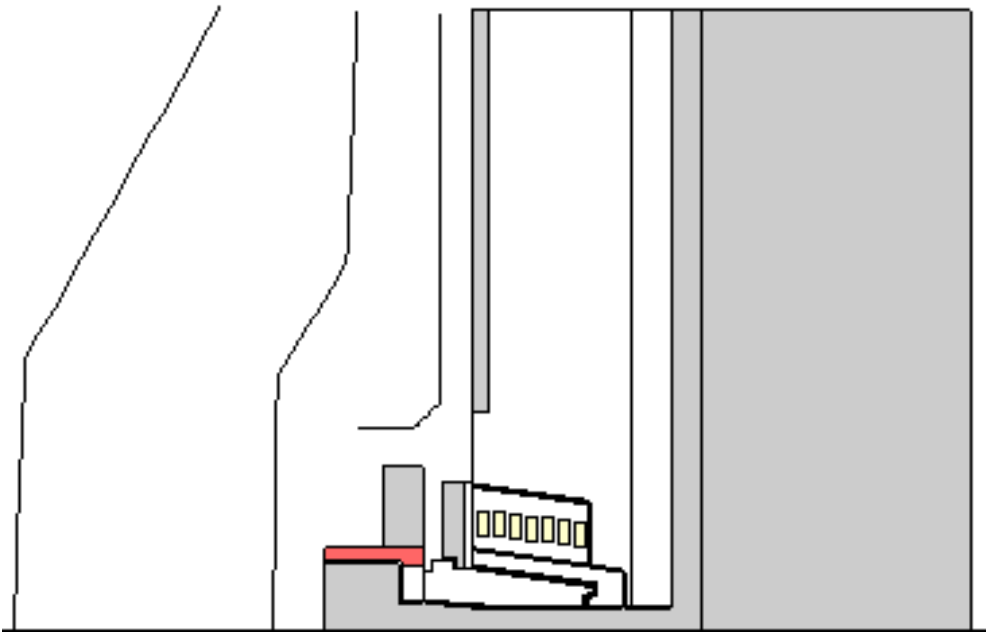# QuickField simulation report

Inductively Heated Ceramic

Calculation of the impedances and spatial heat source distribution in the inductively heated ceramic

This automatically generated document consists of several sections, which specify the problem setup and finite element analysis simulation results. Navigation links in the top of each page lead to corresponding sections of this report.

Problem description and QuickField simulation files:
https://quickfield.com/advanced/inductively_heated_ceramic.htm

Problem info

Problem type: AC Magnetics , frequency: 10000 Hz,
Geometry model class: Axisymmetric
Problem database file names:

- Problem: *BGHEL.PBM*
- Geometry: *Bgh.mod*
- Material Data: *Bgh.dhe*
- Material Data 2 (library): *none*
- Electric circuit: *none*

Results taken from other problems:
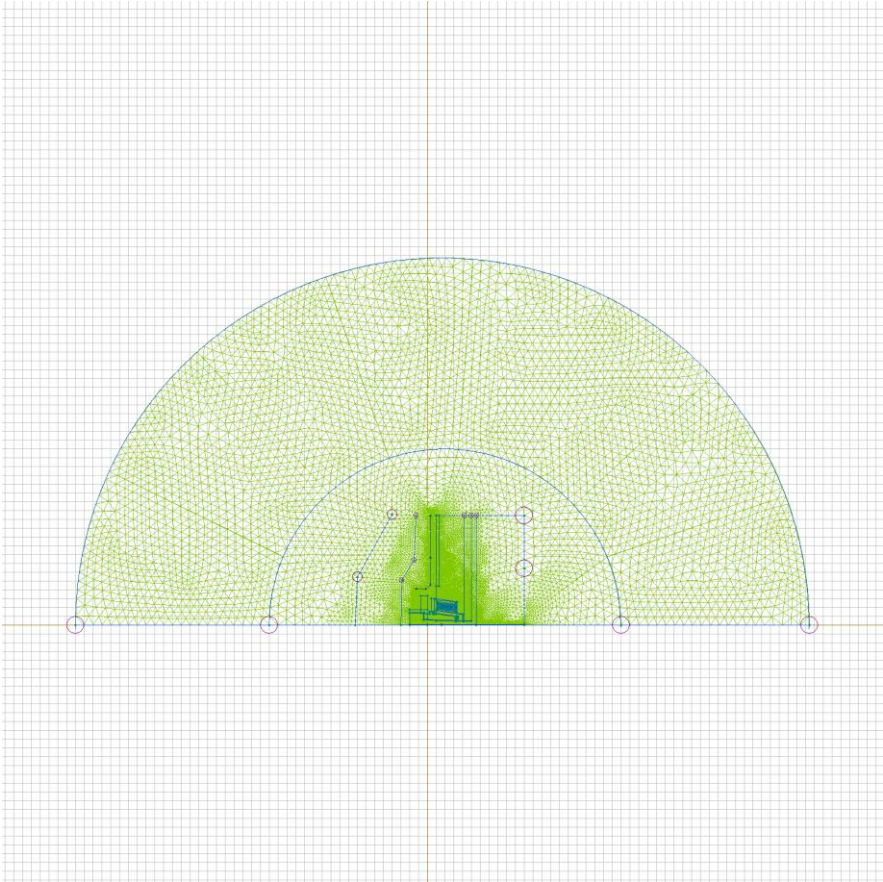
- *none*

Geometry model

Table 1. Geometry model statistics

	With Label	Total
Blocks	22	33
Edges	22	191
Vertices	0	186

Number of nodes: 80326.

Labelled objects

There are following labelled objects in the geometry model (Material Data file could contain more labels, but only those labels that assigned to geometric objects are listed)

Blocks:

- BN
- coilturn1
- Aircool
- coilturn2
- coilturn3
- coilturn4
- coilturn5
- coilturn6
- coilturn7
- mould
- liqsteel
- blanket
- gap
- steelring
- legrit
- steelwall
- didurit
- CGA
- mortar
- rubinit
- steel
- Air
-

Edges:

- alpha1
- alpha2
- alpha3
- alpha4
- alpha5
- alpha6
- alpha7
- zeroT
- zero
- konvection
- Tliqsteel
- Twater
- T50
- T200
- T100
- Taircool7
- Taircool4
- Taircool5
- Taircool6
- Taircool1
- Taircool2
- Taircool3
-

Vertices:

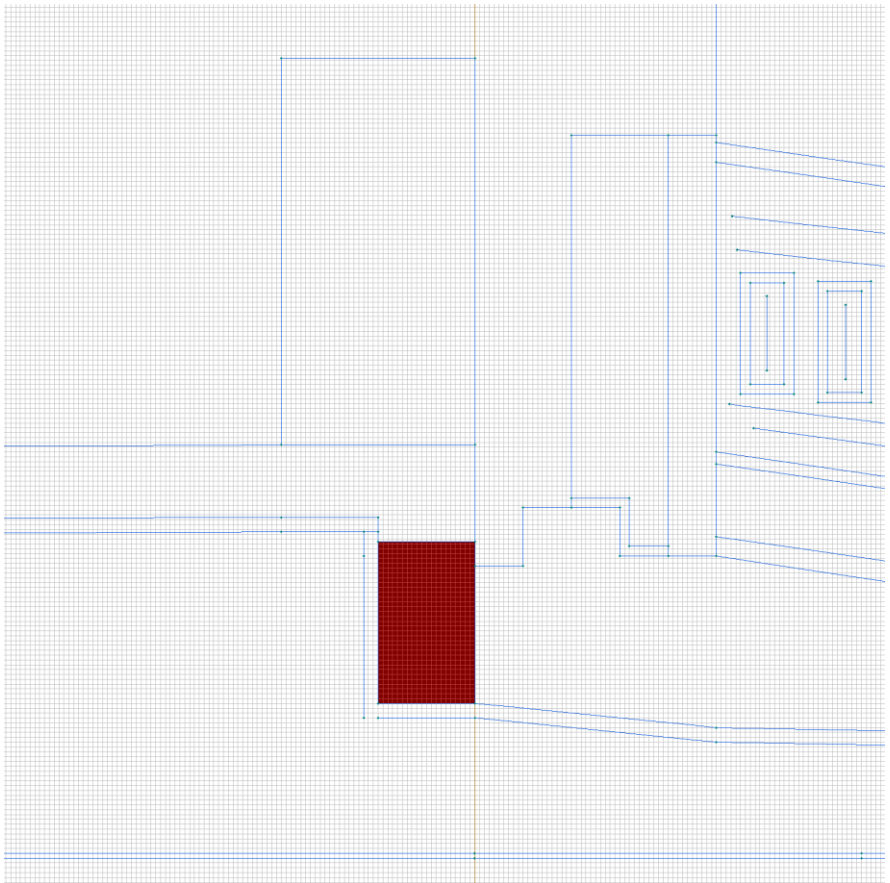Detailed information about each label is listed below.

Labelled objects: block "BN"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
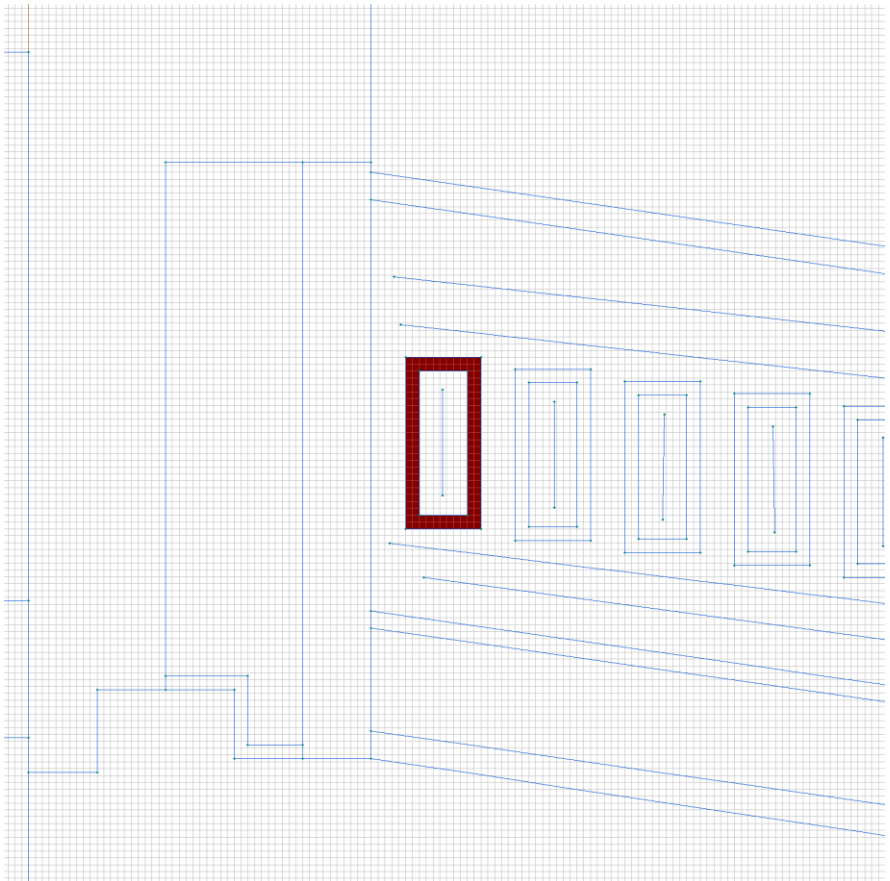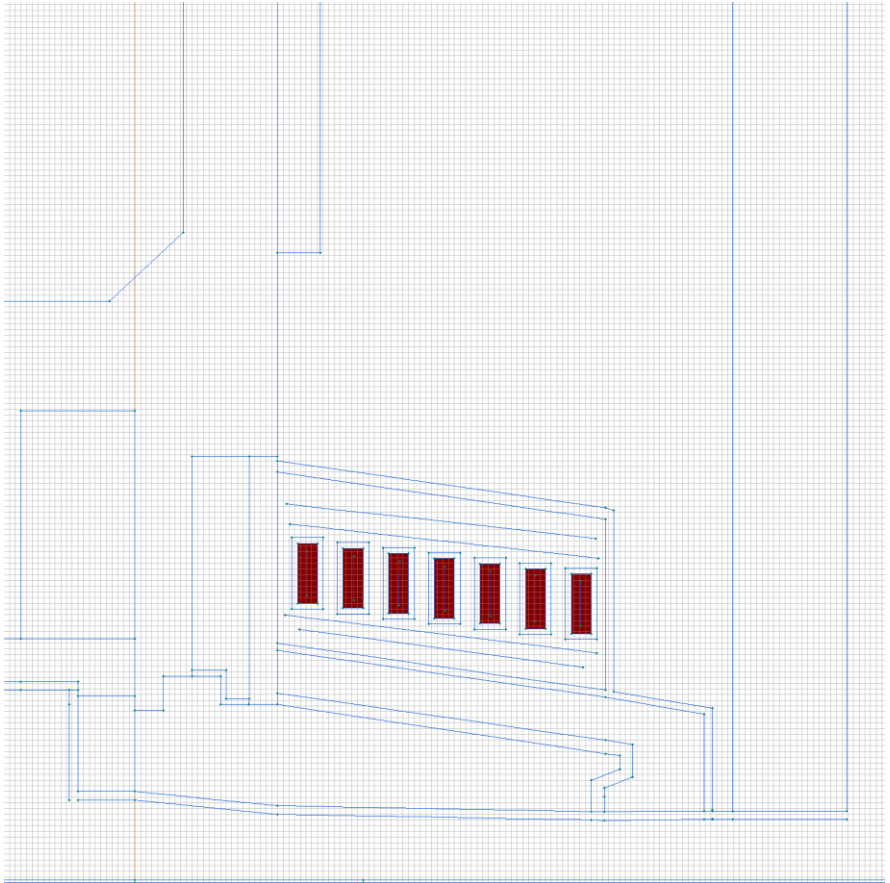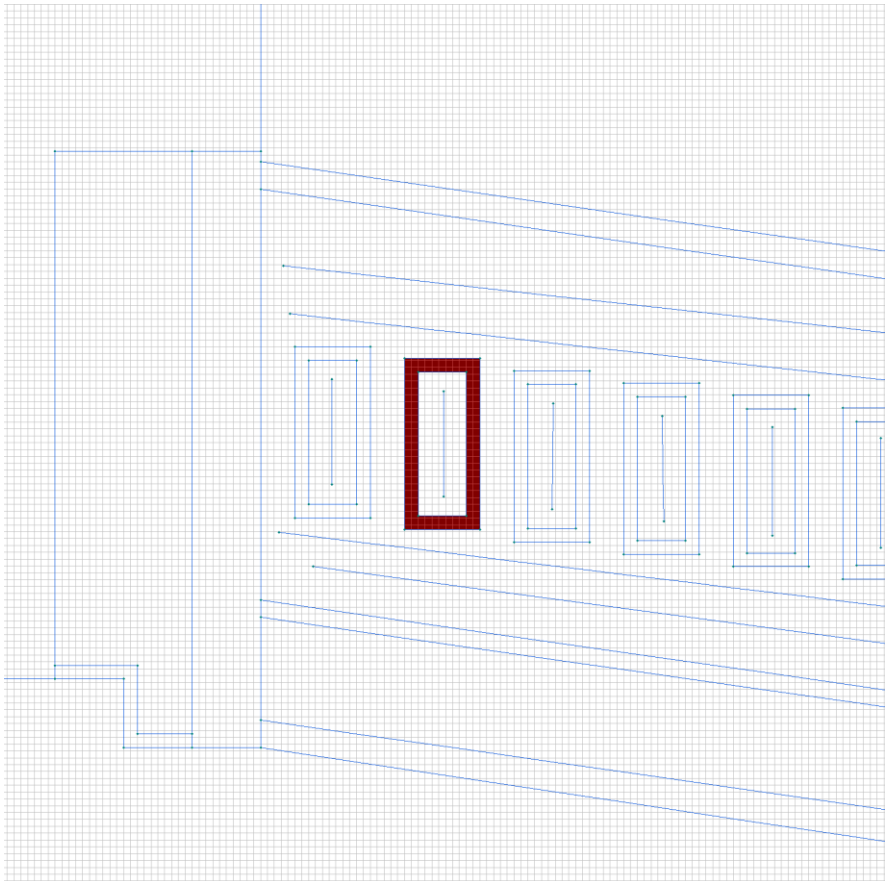Conductor's connection: in parallel

Labelled objects: block "coilturn1"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Total current: I=1880 [A], phase 0 [deg]
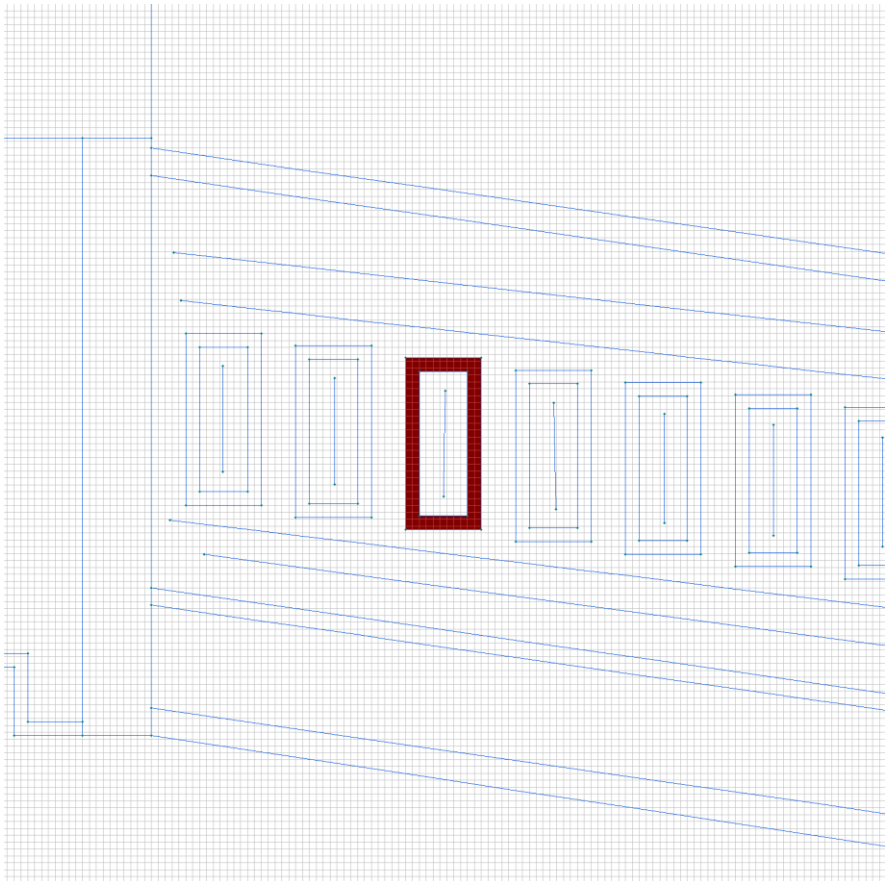Conductor's connection: in parallel

Labelled objects: block "Aircool"
There are (7) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
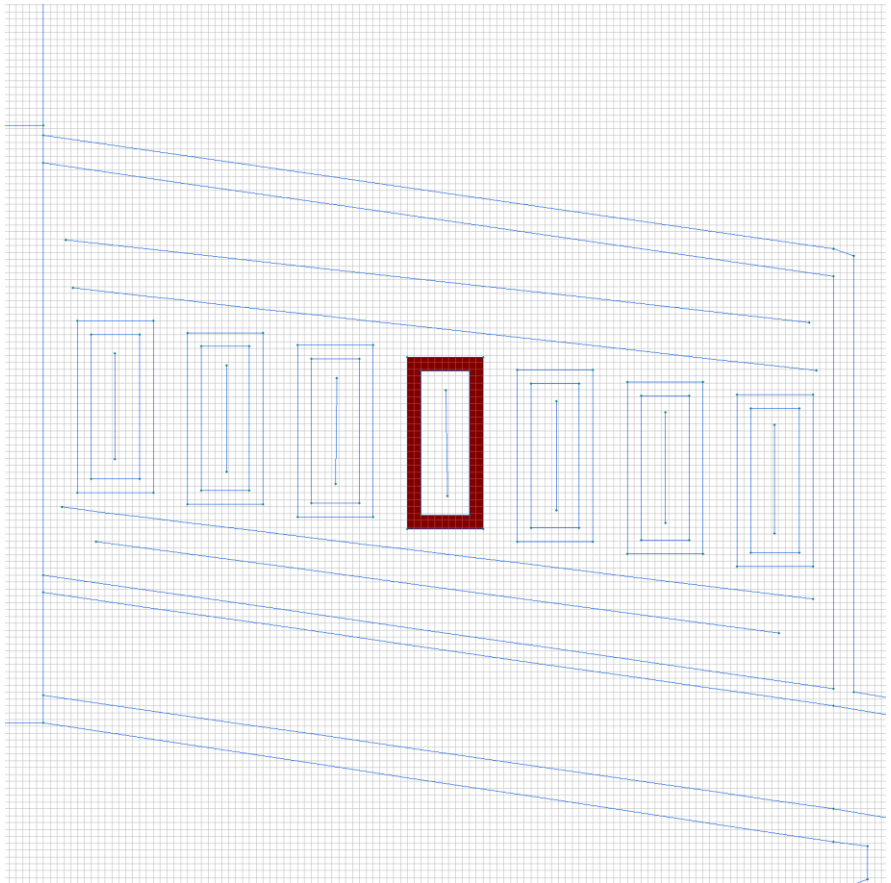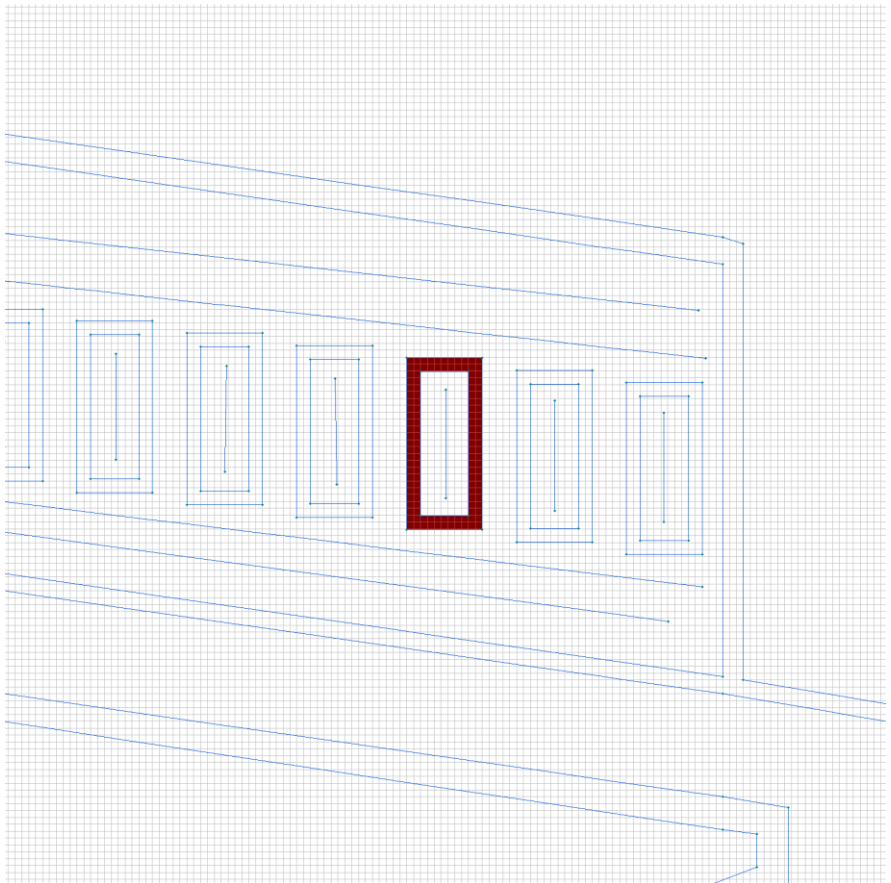Conductor's connection: in parallel

Labelled objects: block "coilturn2"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Total current: I=1880 [A], phase 0 [deg]
Conductor's connection: in parallel

Labelled objects: block "coilturn3"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Total current: I=1880 [A], phase 0 [deg]
Conductor's connection: in parallel

Labelled objects: block "coilturn4"
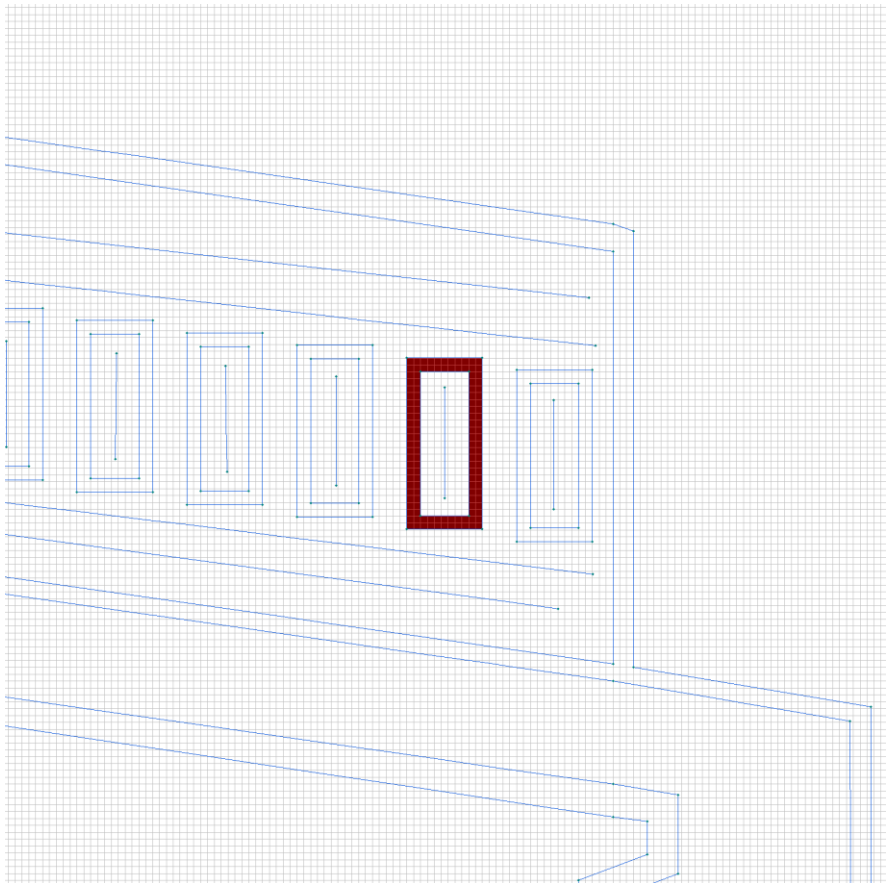There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Total current: I=1880 [A], phase 0 [deg]
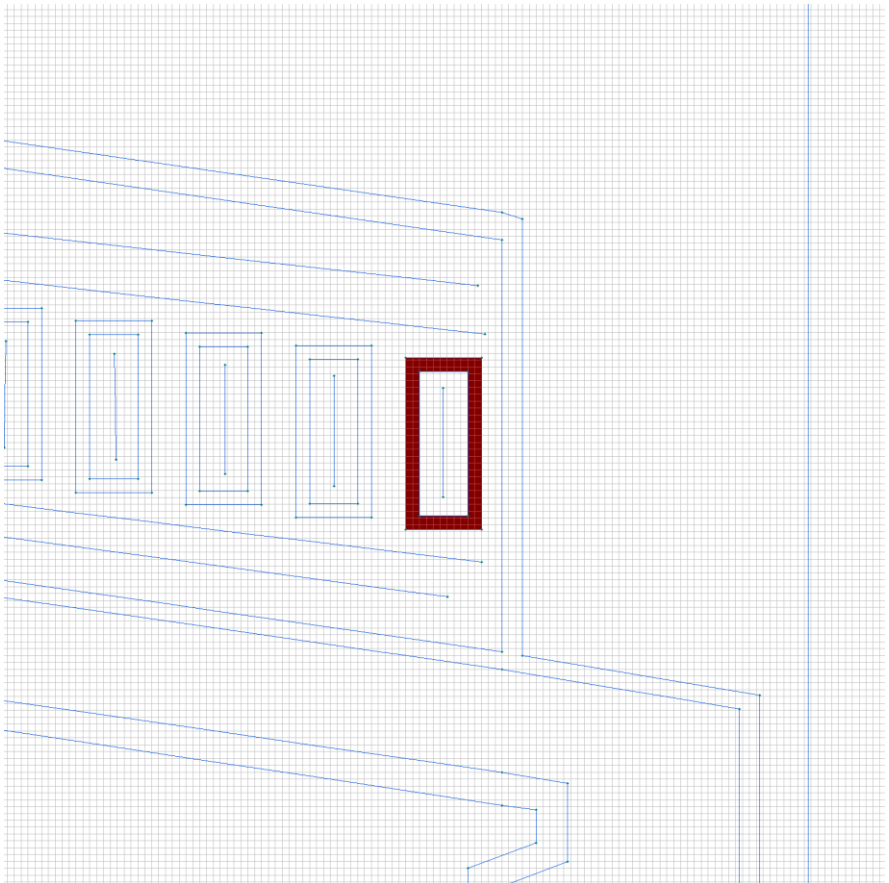Conductor's connection: in parallel

Labelled objects: block "coilturn5"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Total current: I=1880 [A], phase 0 [deg]
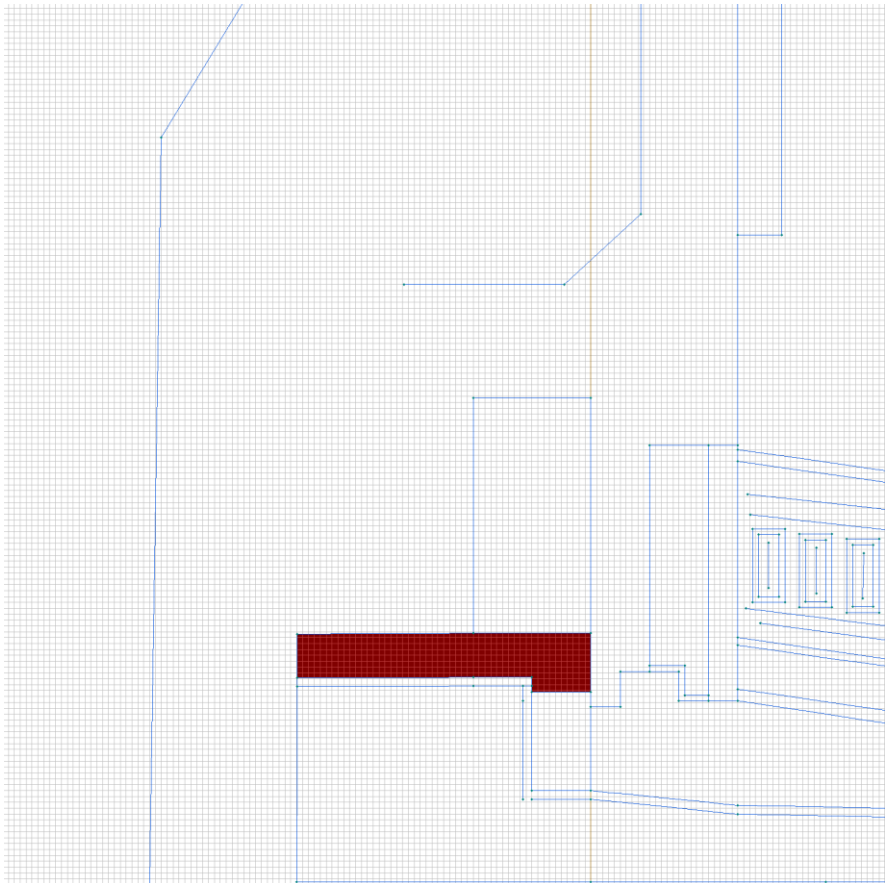Conductor's connection: in parallel

Labelled objects: block "coilturn6"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Total current: I=1880 [A], phase 0 [deg]
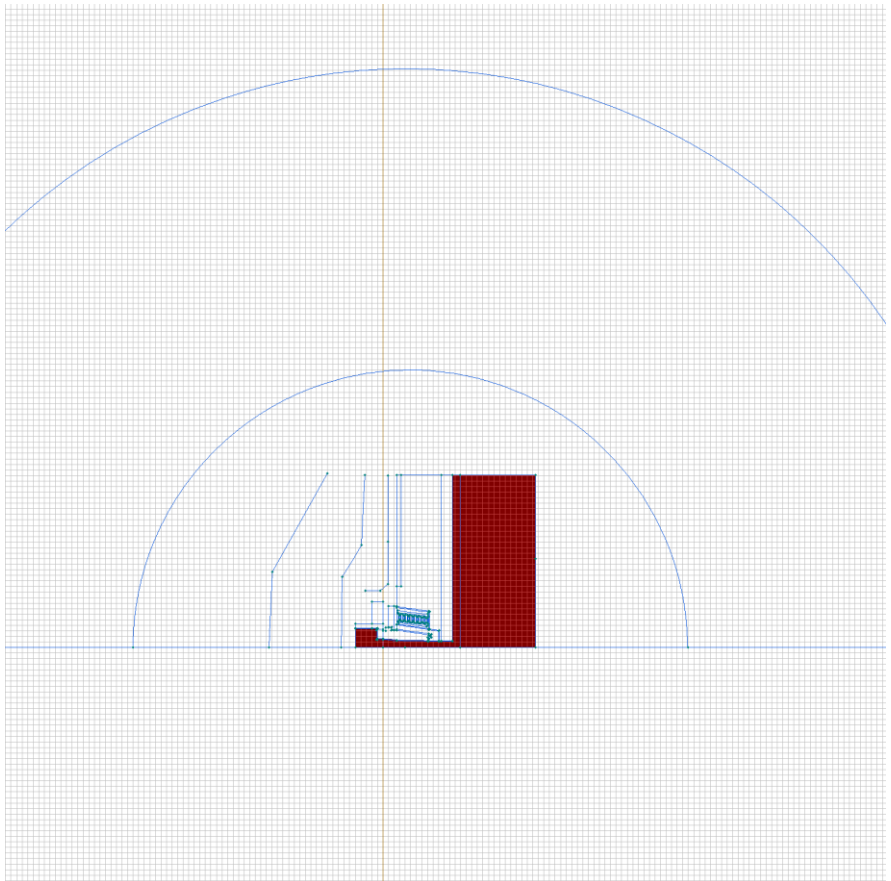Conductor's connection: in parallel

Labelled objects: block "coilturn7"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Total current: I=1880 [A], phase 0 [deg]
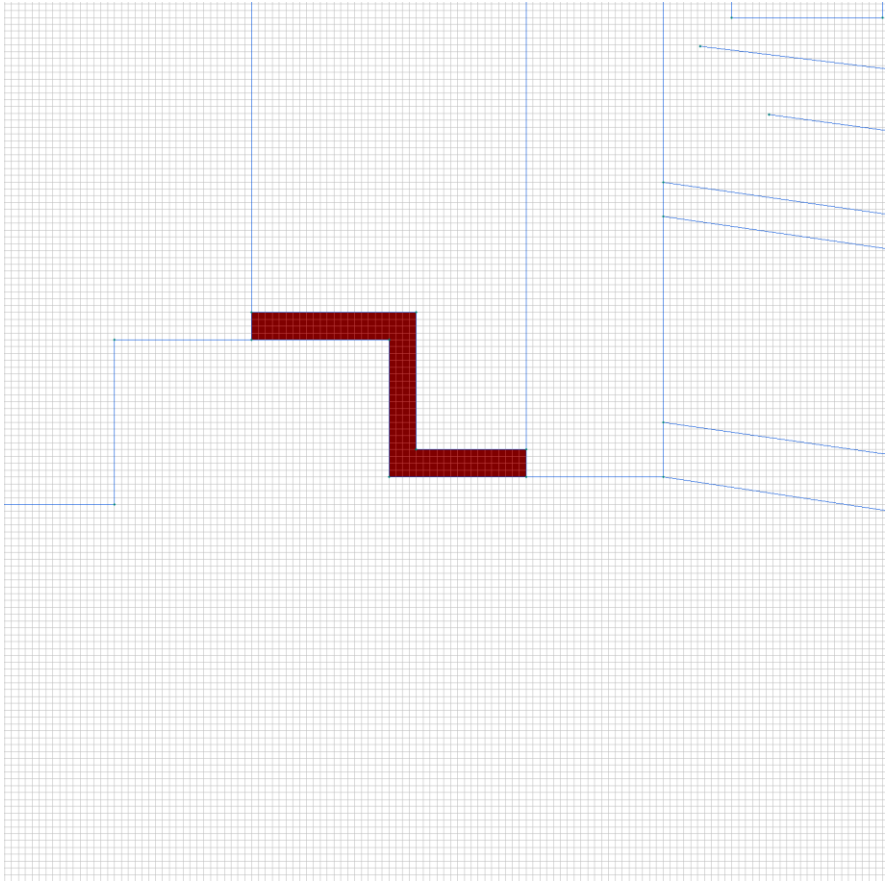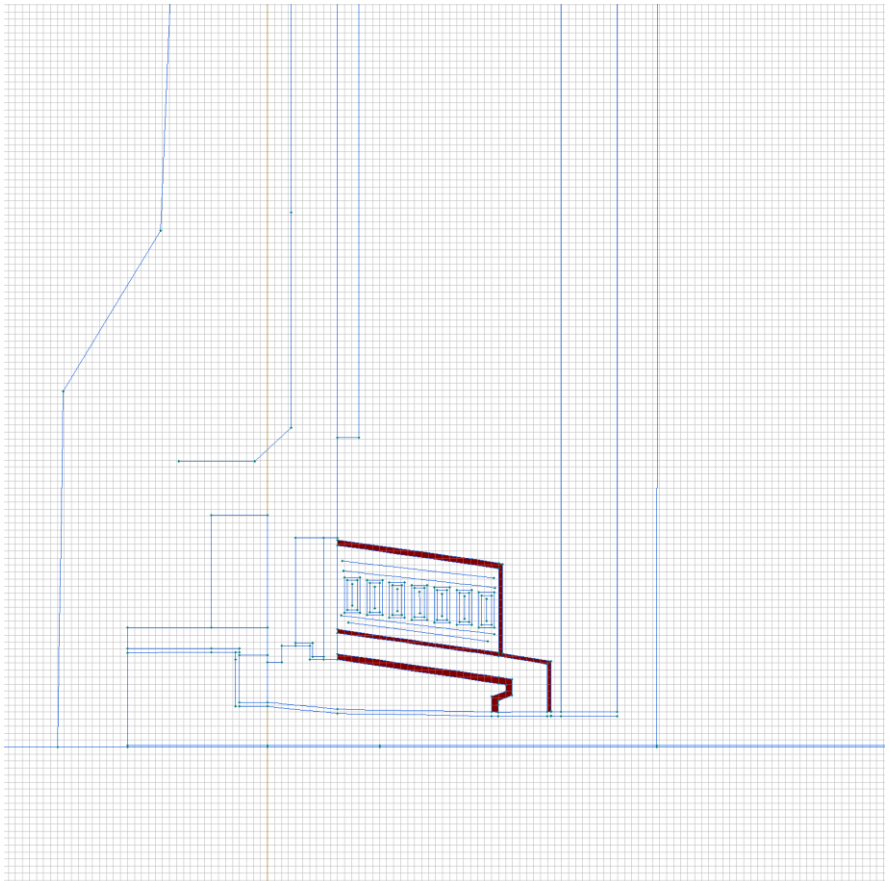Conductor's connection: in parallel

Labelled objects: block "mould"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=56000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
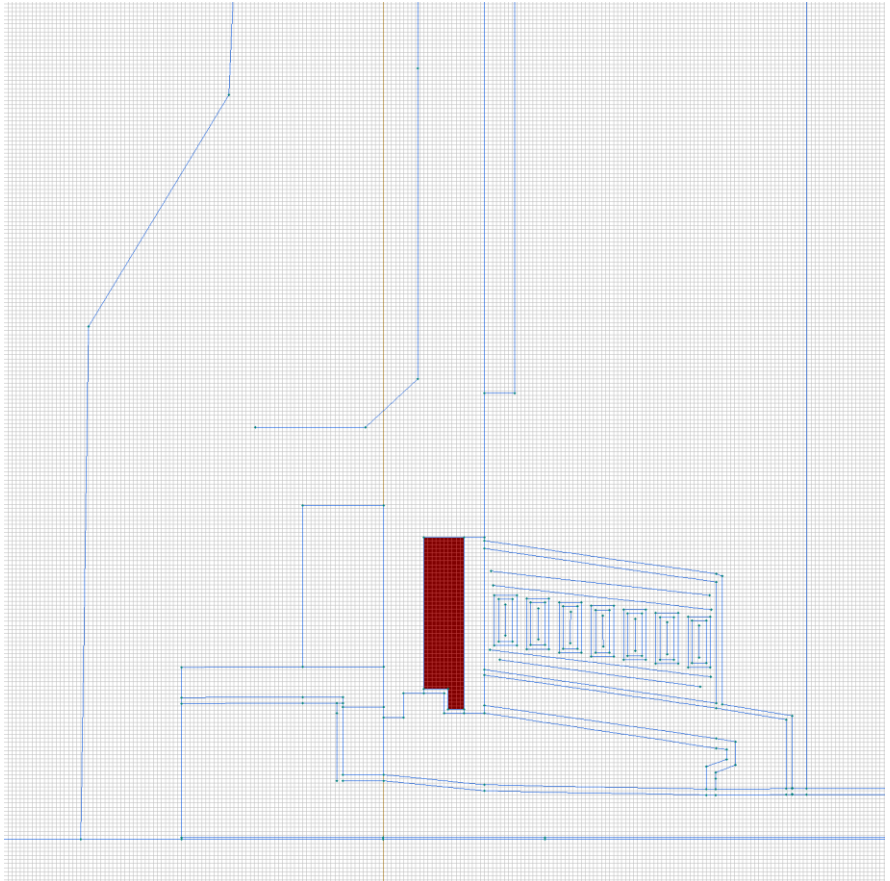Conductor's connection: in parallel

Labelled objects: block "liqsteel"
There are (3) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=1000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
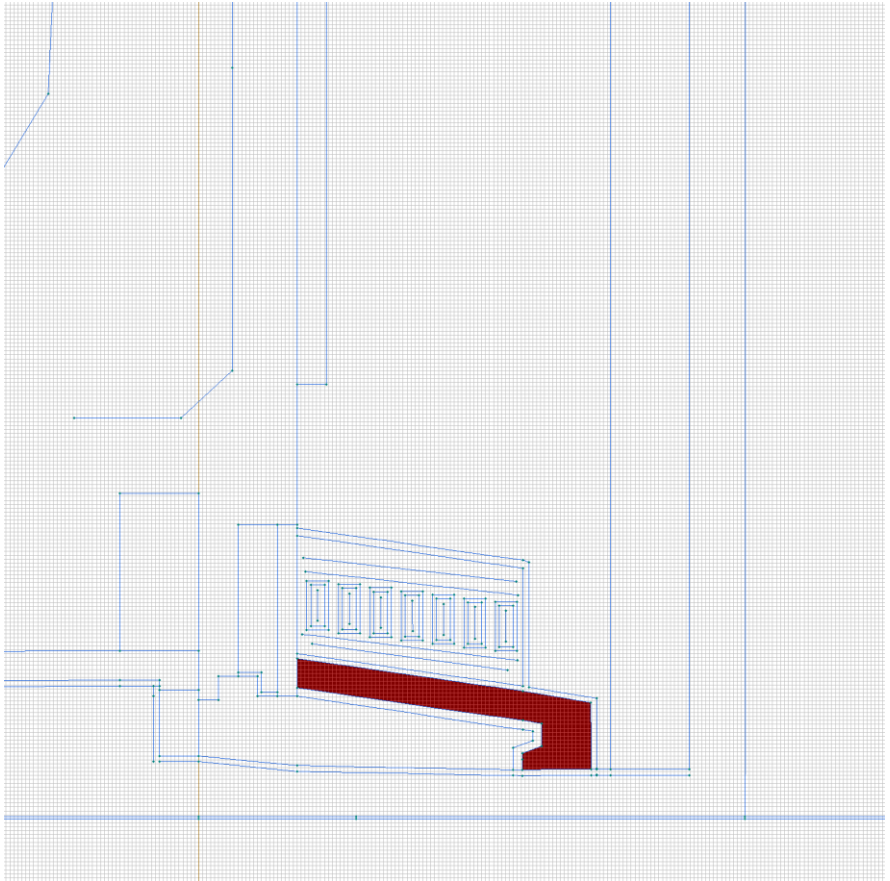Conductor's connection: in parallel

Labelled objects: block "blanket"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel

Labelled objects: block "gap"
There are (2) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
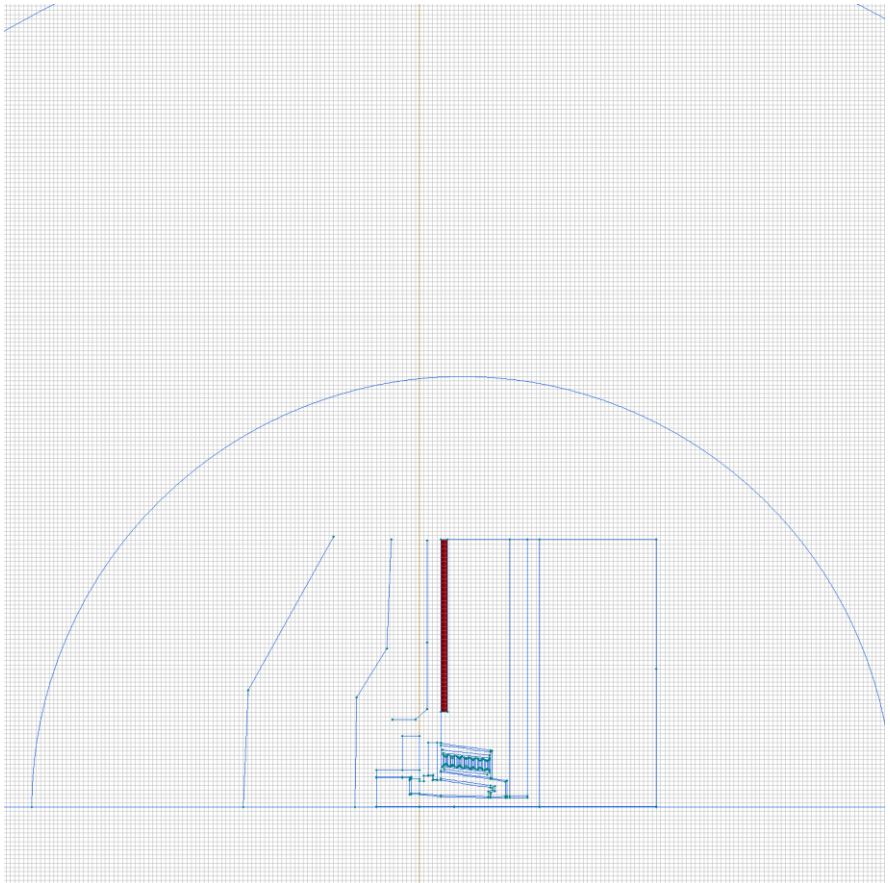Conductor's connection: in parallel

Labelled objects: block "steelring"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=55000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
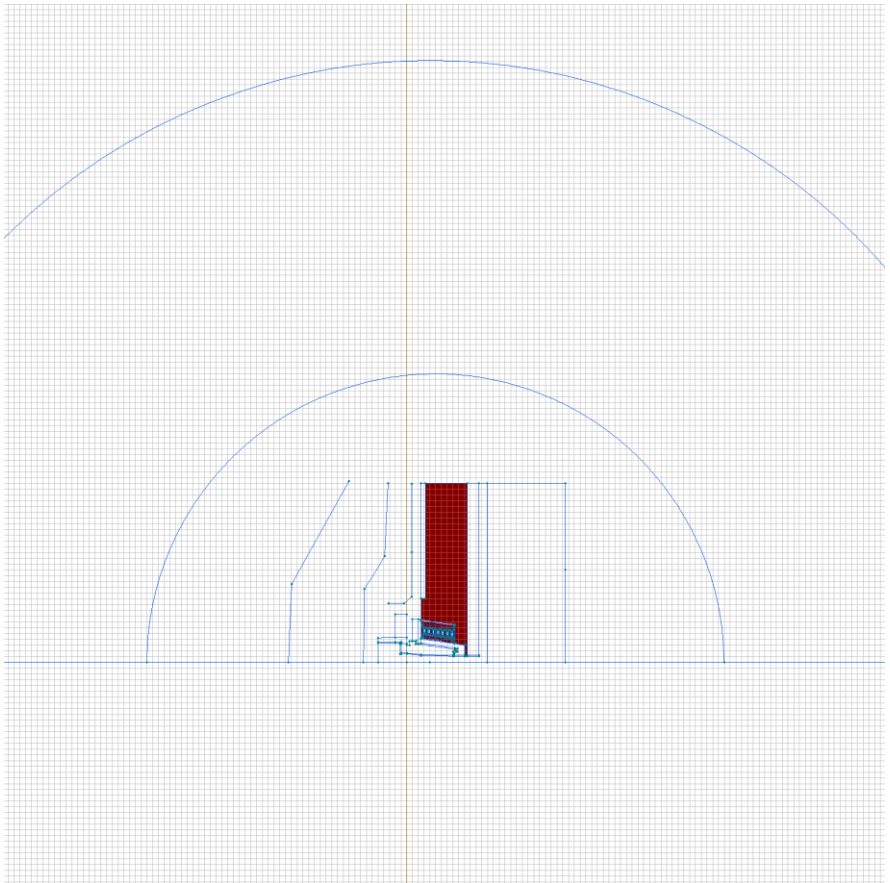Conductor's connection: in parallel

Labelled objects: block "legrit"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
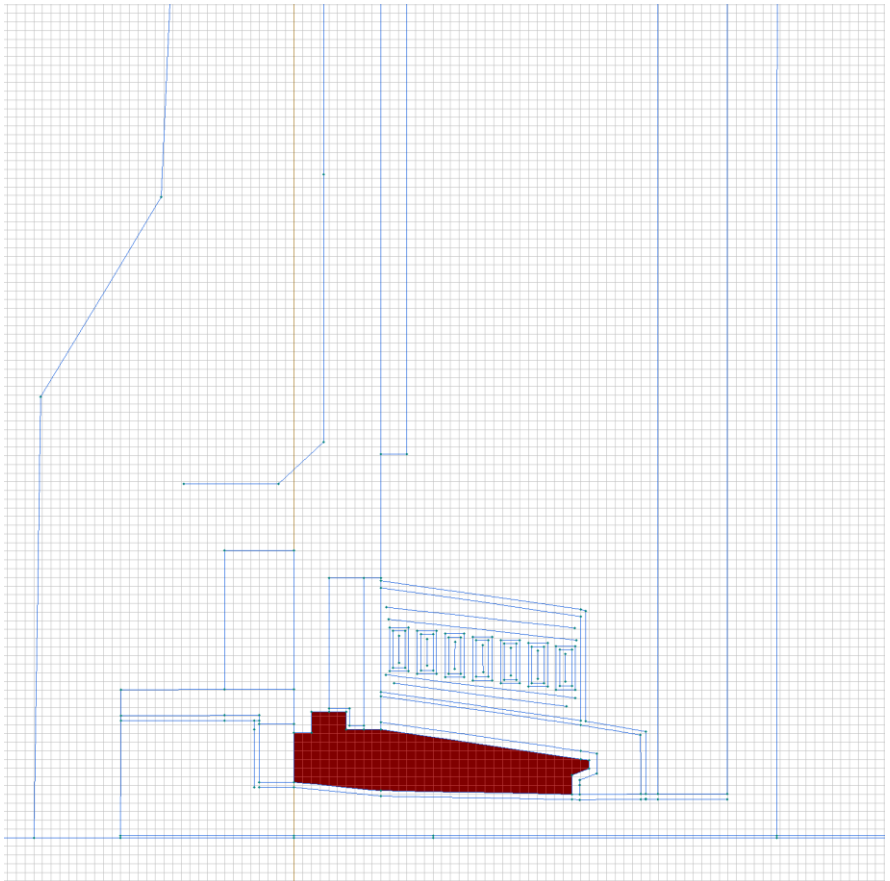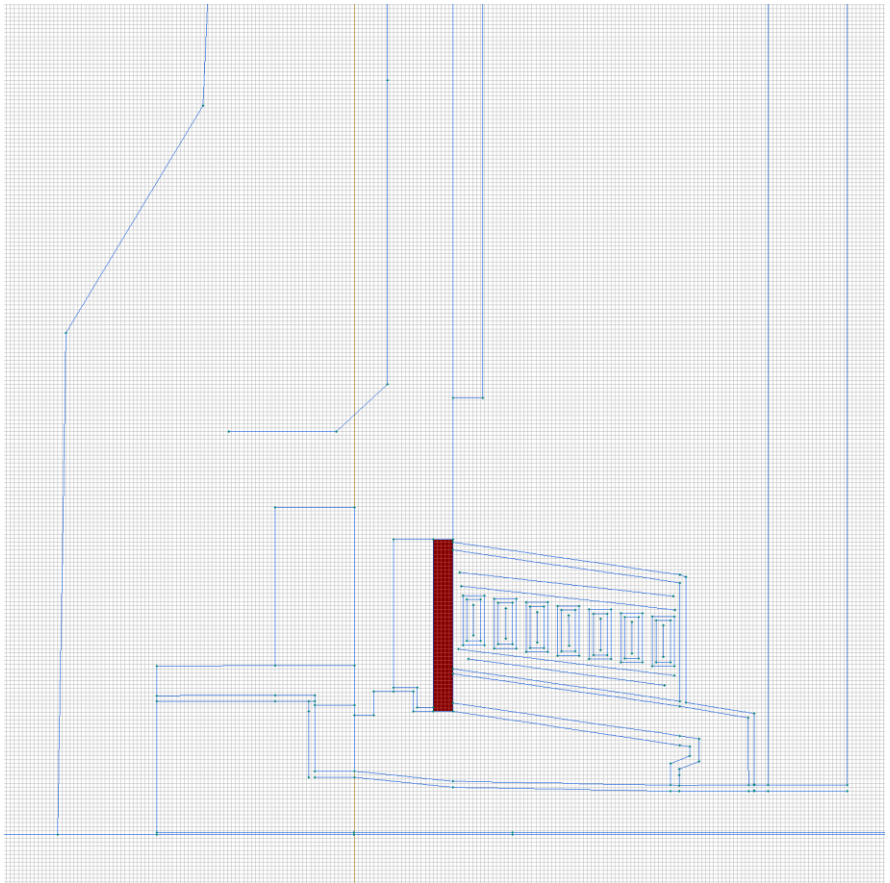Conductor's connection: in parallel

Labelled objects: block "steelwall"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=55000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel

Labelled objects: block "didurit"
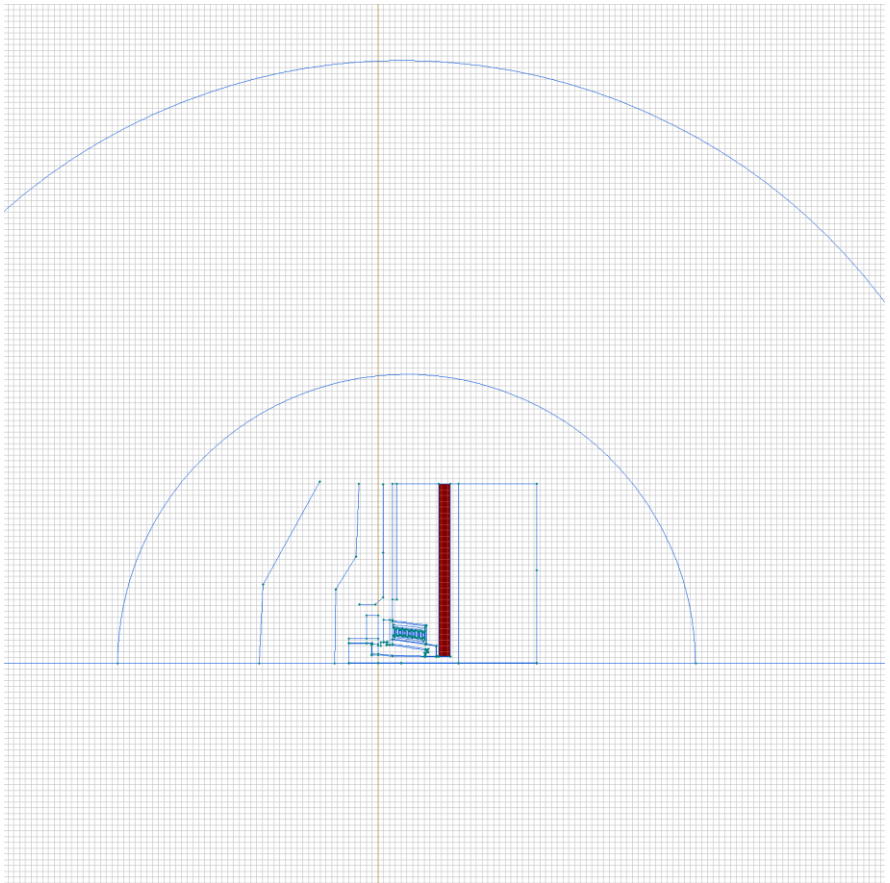There are (2) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
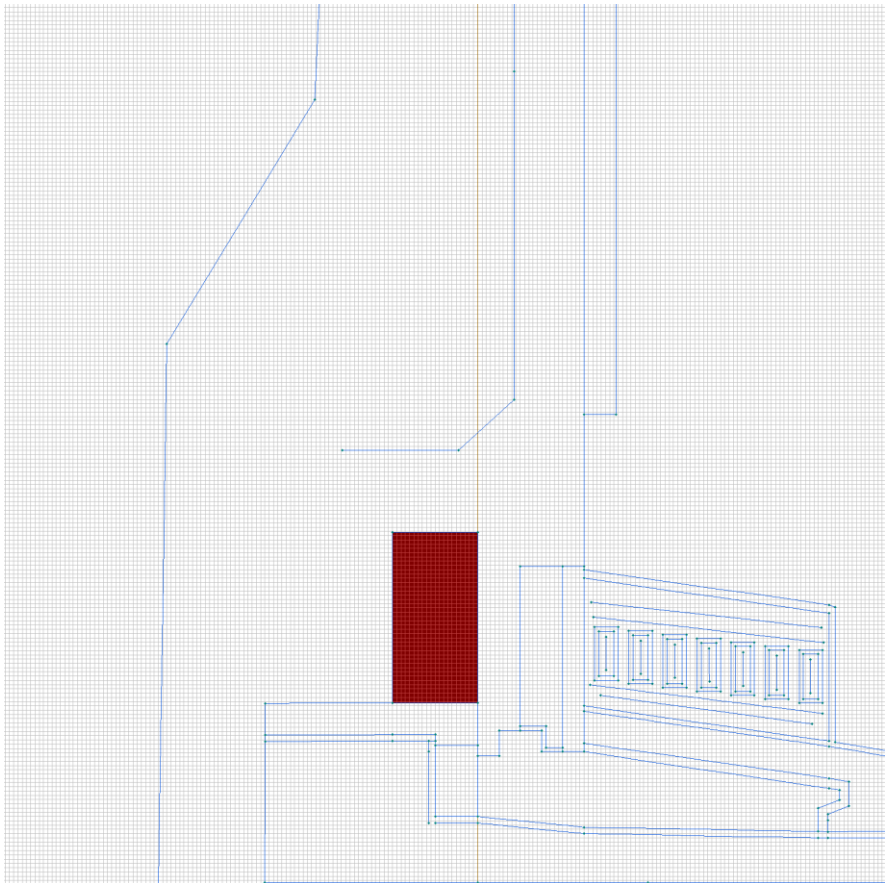Conductor's connection: in parallel

Labelled objects: block "CGA"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=33330 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel

Labelled objects: block "mortar"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel

Labelled objects: block "rubinit"
There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel

Labelled objects: block "steel"
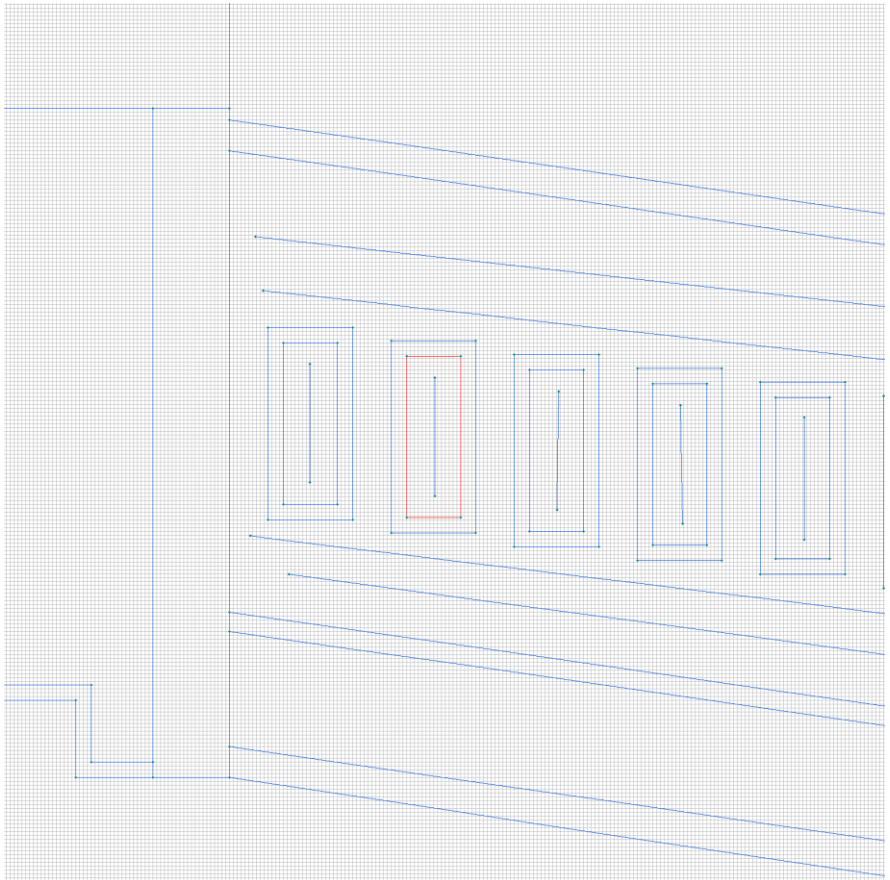There are (1) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=55000000 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel

Labelled objects: block "Air"
There are (2) objects with this label

Relative magnetic permeability: mu_x=1, mu_y=1
Electric conductivity: sigma=0 [S/m]
Current density: j=0 [A/m2], phase 0 [deg]
Conductor's connection: in parallel
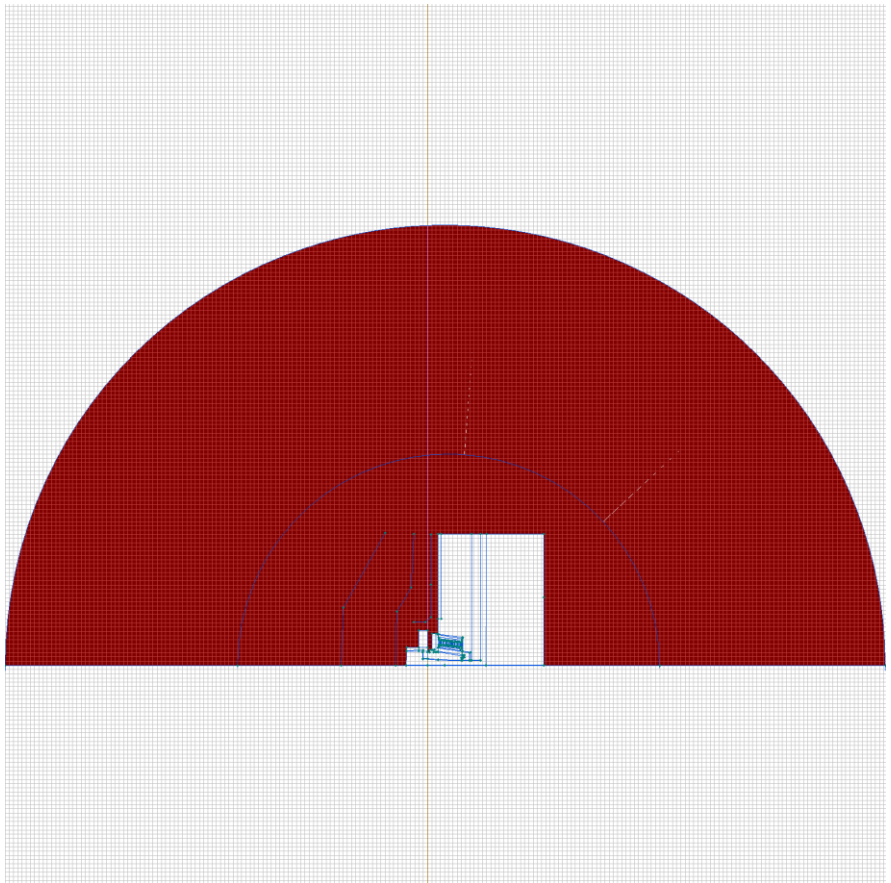
Labelled objects: edge "alpha1"
There are (4) objects with this label

No material data (boundary conditions) are specified
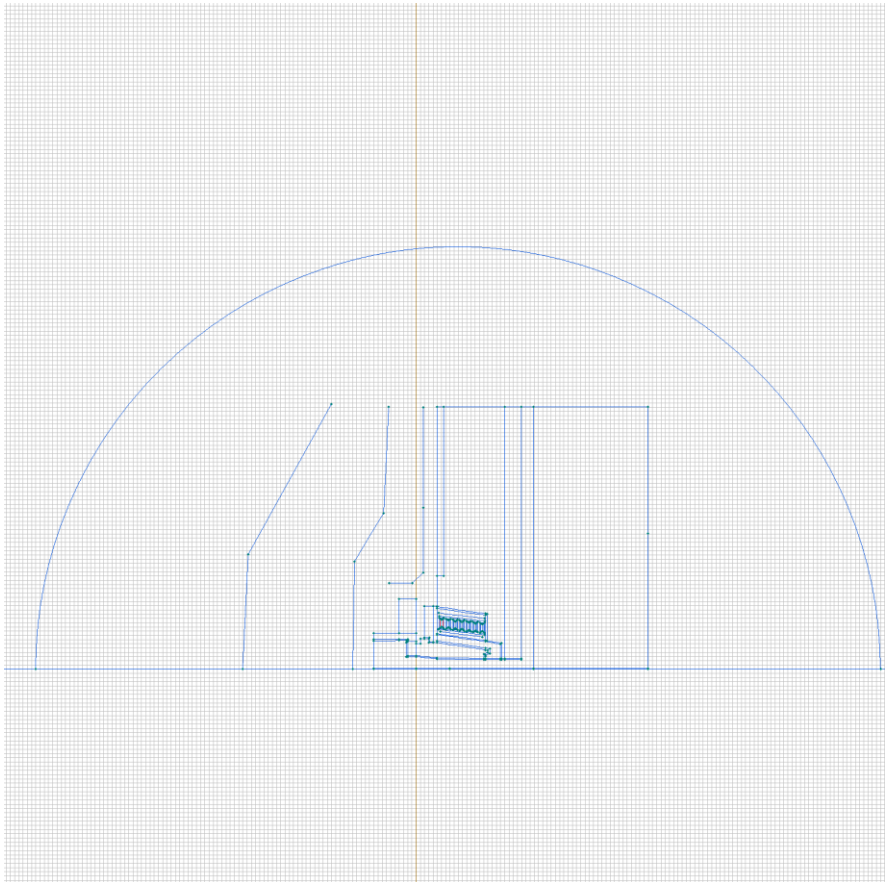
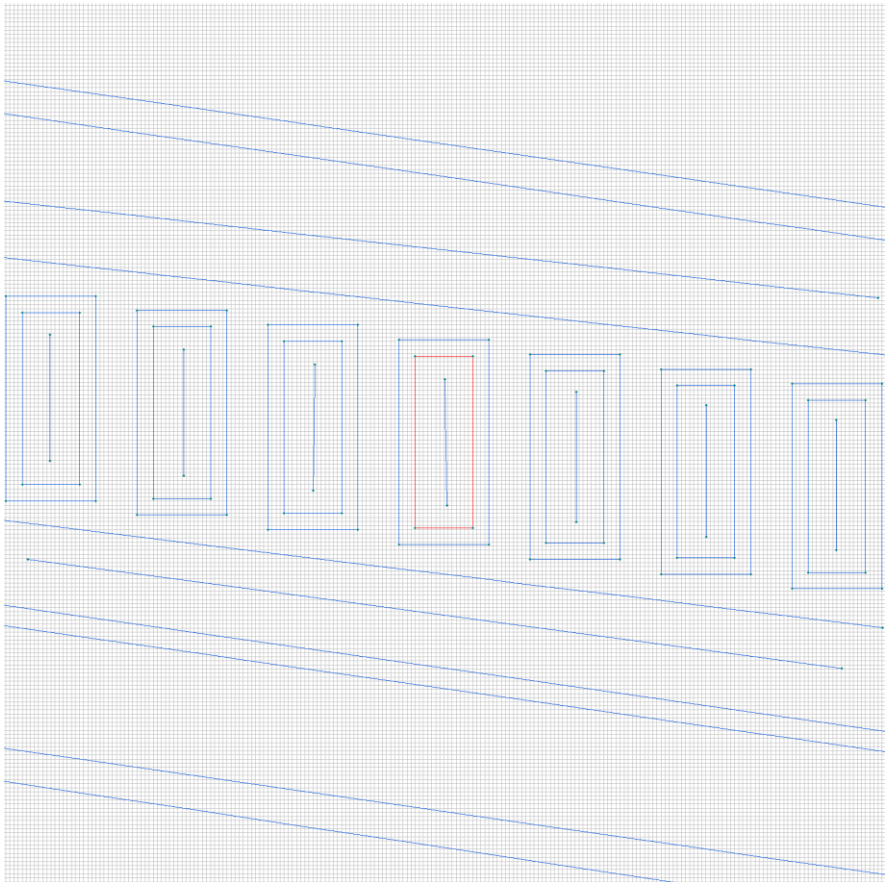# Labelled objects: edge "alpha2"
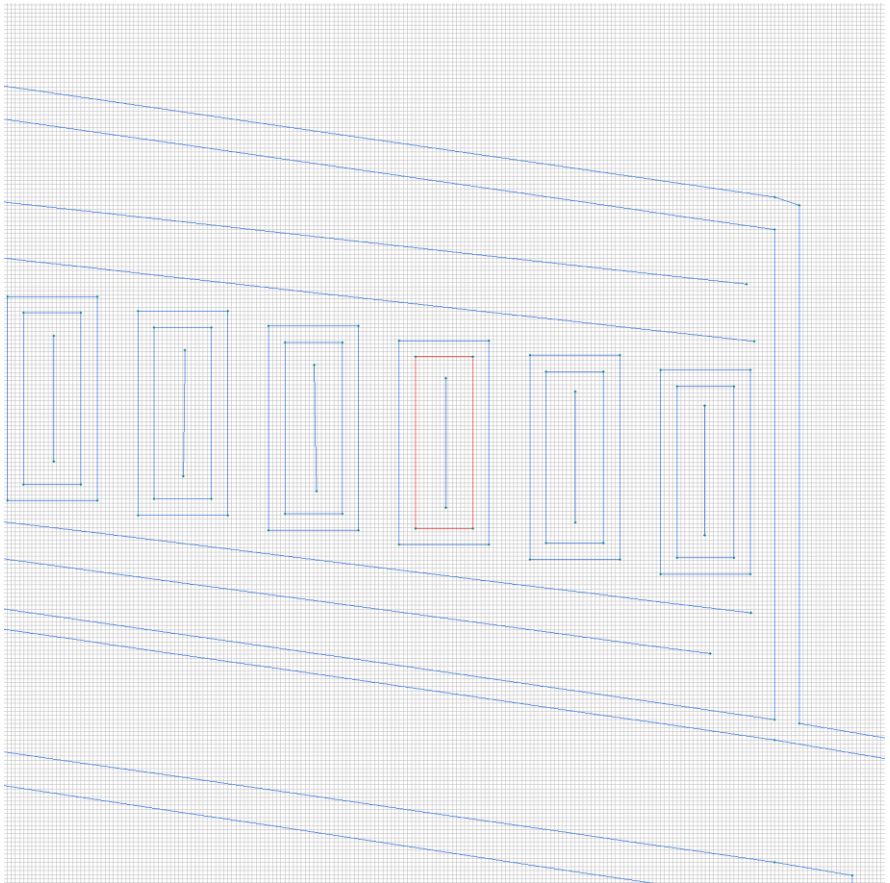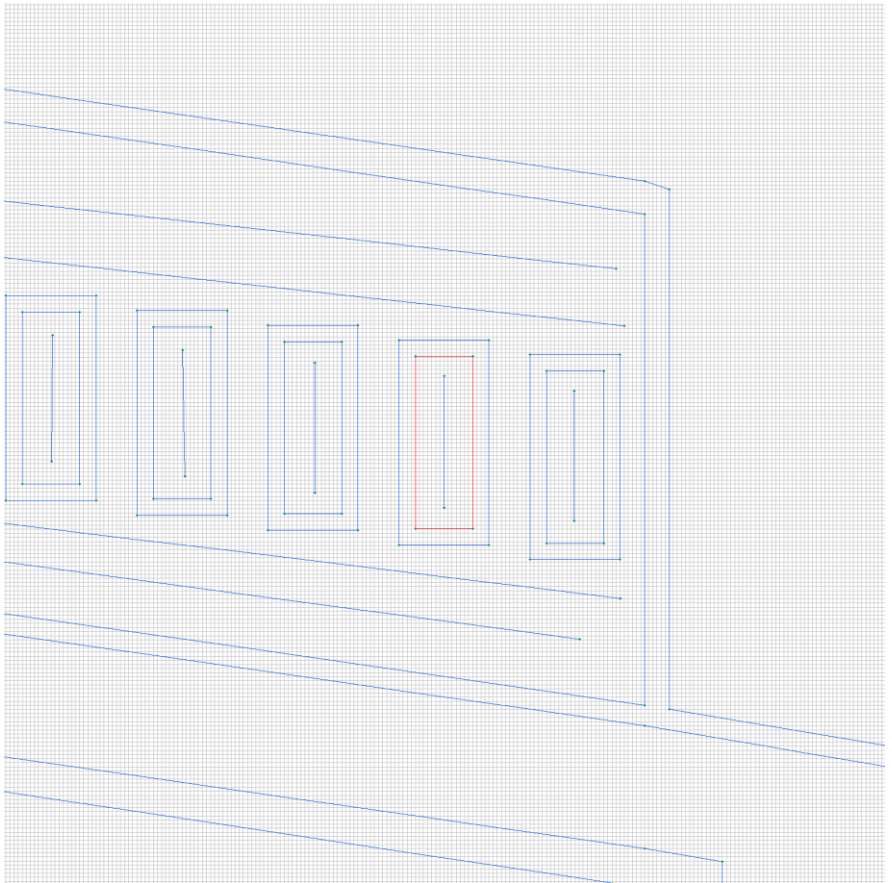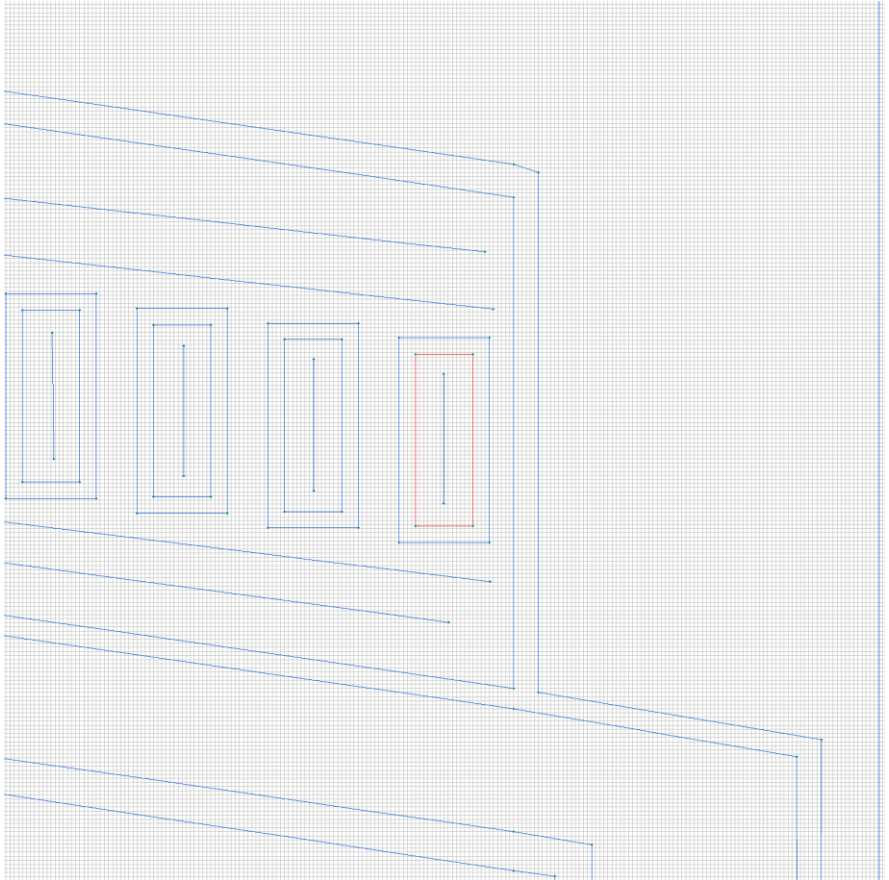There are (4) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "alpha3"
There are (4) objects with this label

No material data (boundary conditions) are specified
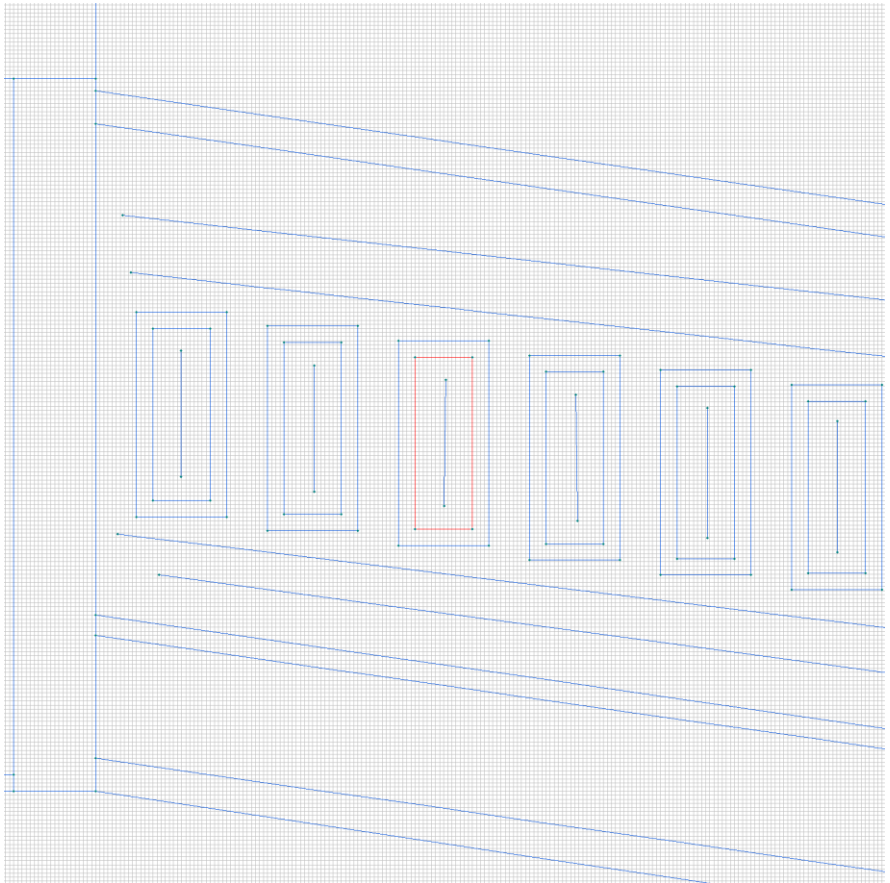
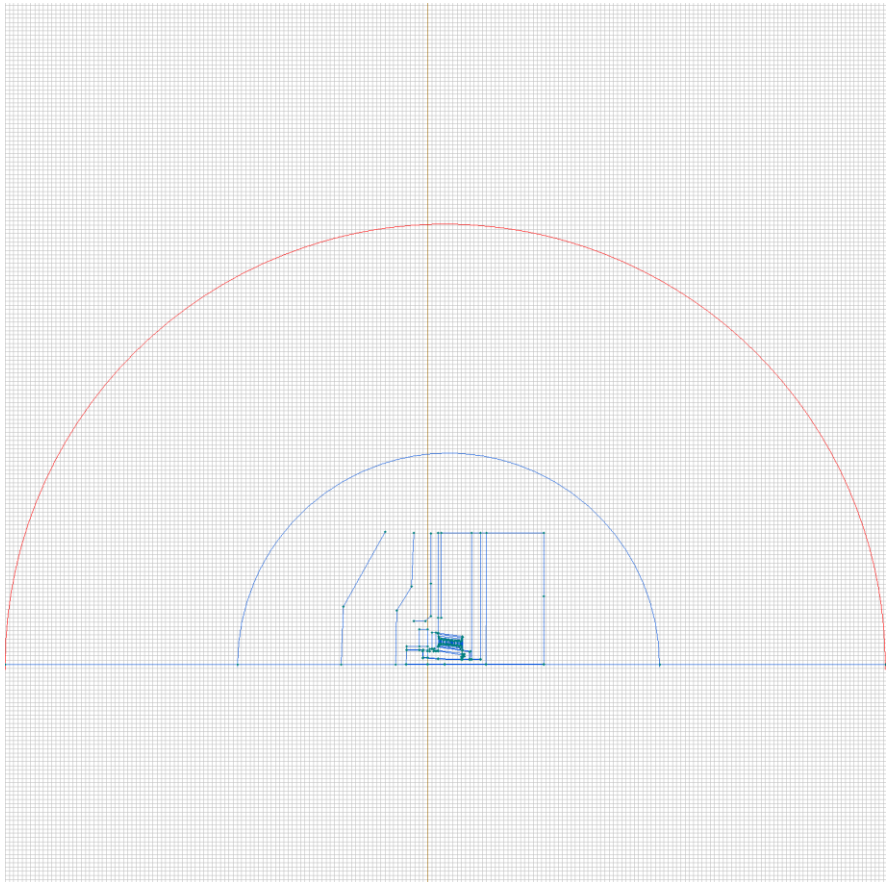# Labelled objects: edge "alpha4"
There are (4) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "alpha5"
There are (4) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "alpha6"
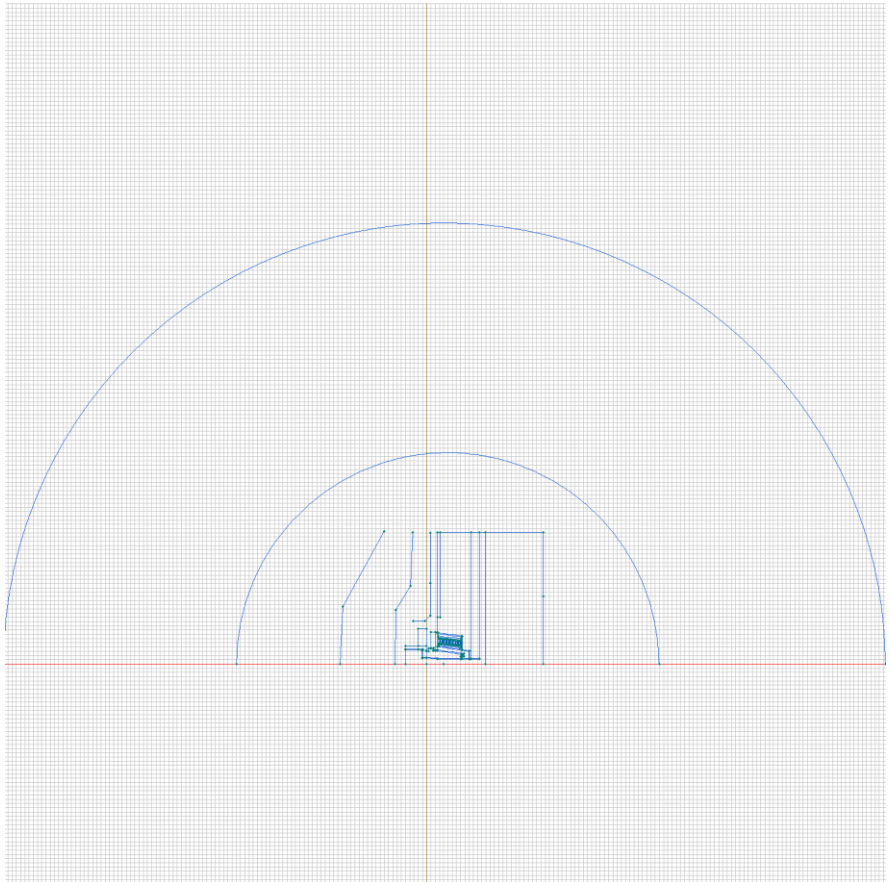There are (4) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "alpha7"
There are (4) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "zeroT"
There are (1) objects with this label

Magnetic potential: A=0 [Wb/m], phase 0 [deg]

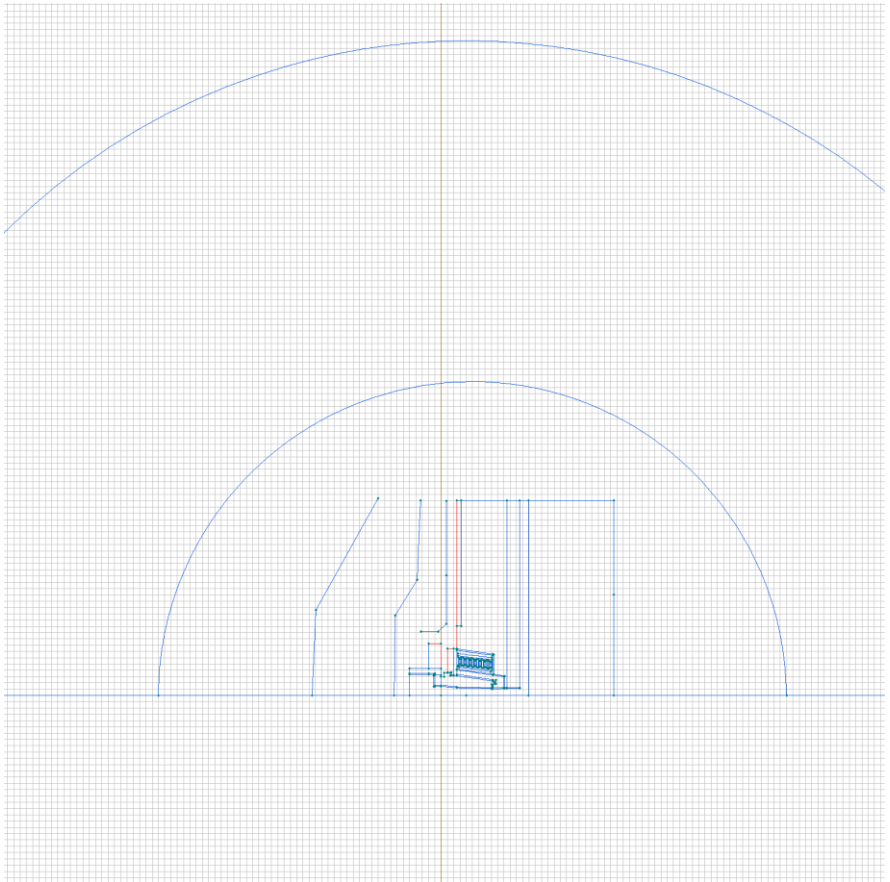# Labelled objects: edge "zero"
There are (10) objects with this label

Magnetic potential: A=0 [Wb/m], phase 0 [deg]

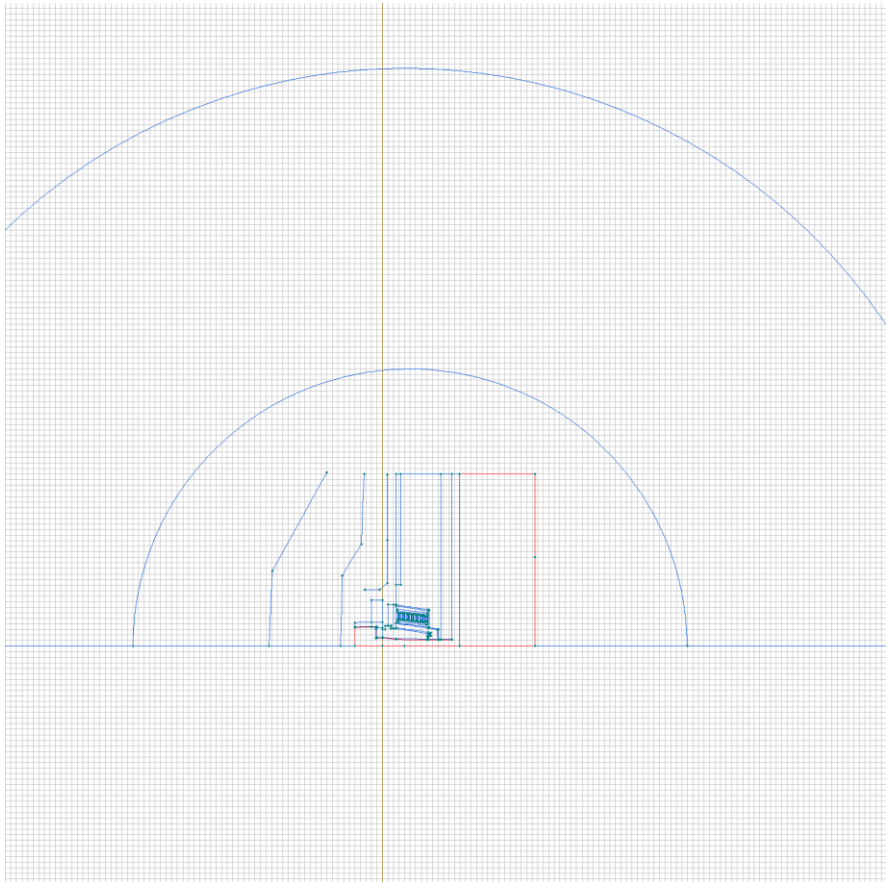# Labelled objects: edge "konvection"
There are (7) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "Tliqsteel"
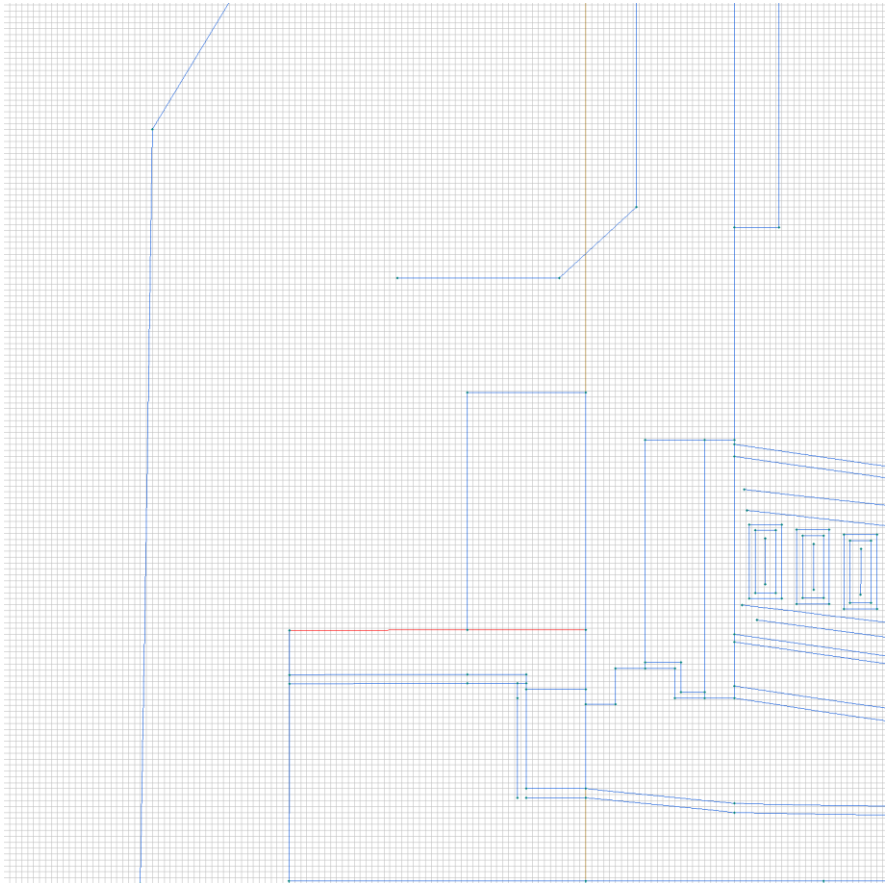There are (21) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "Twater"
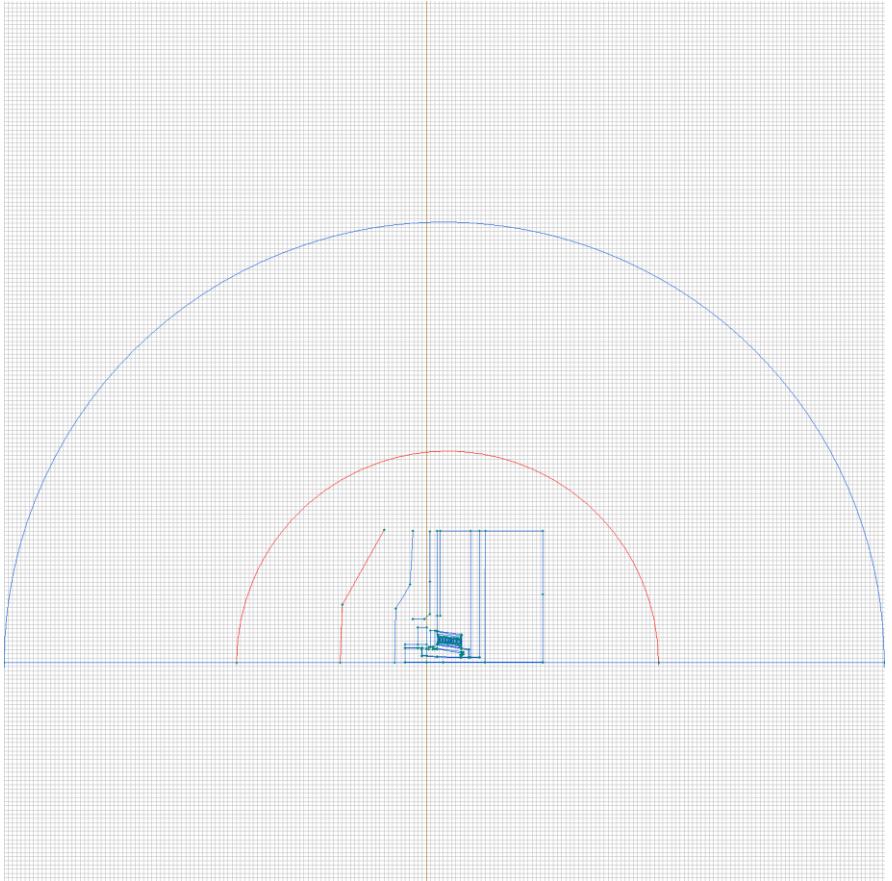There are (2) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "T50"
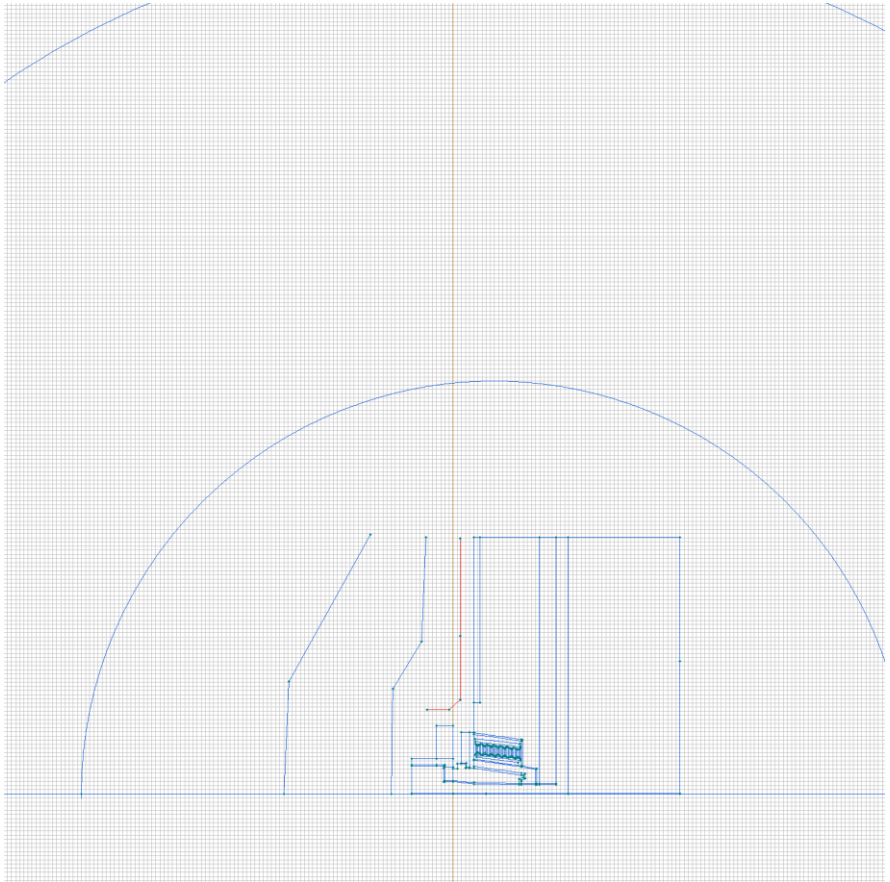There are (3) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "T200"
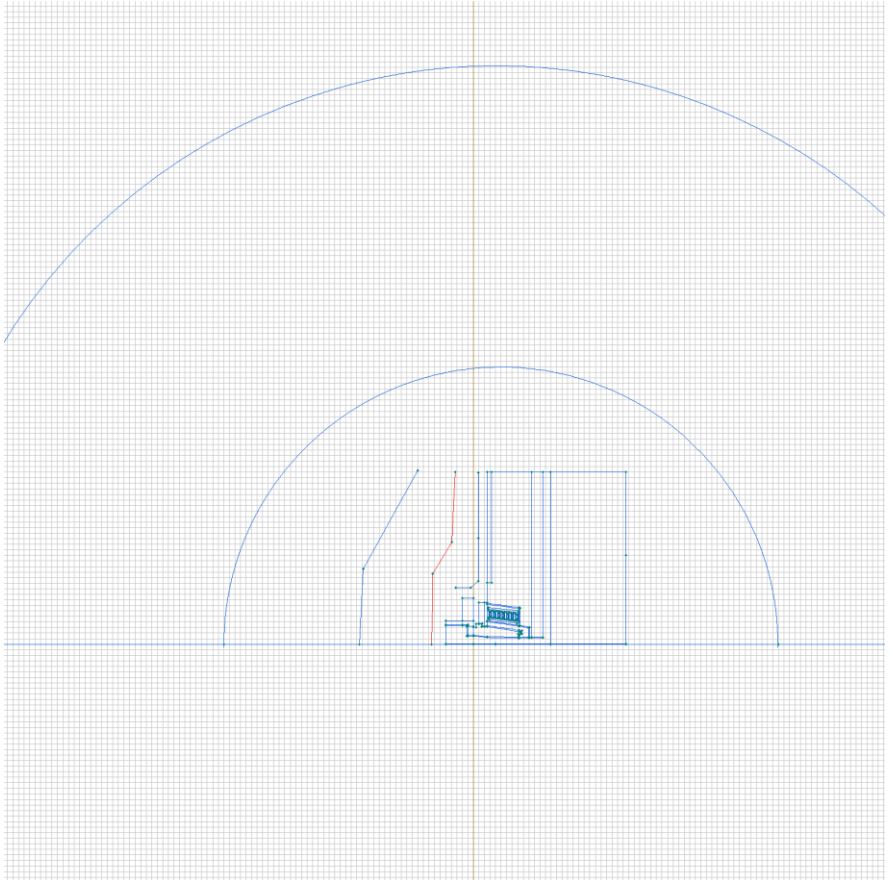There are (4) objects with this label

No material data (boundary conditions) are specified

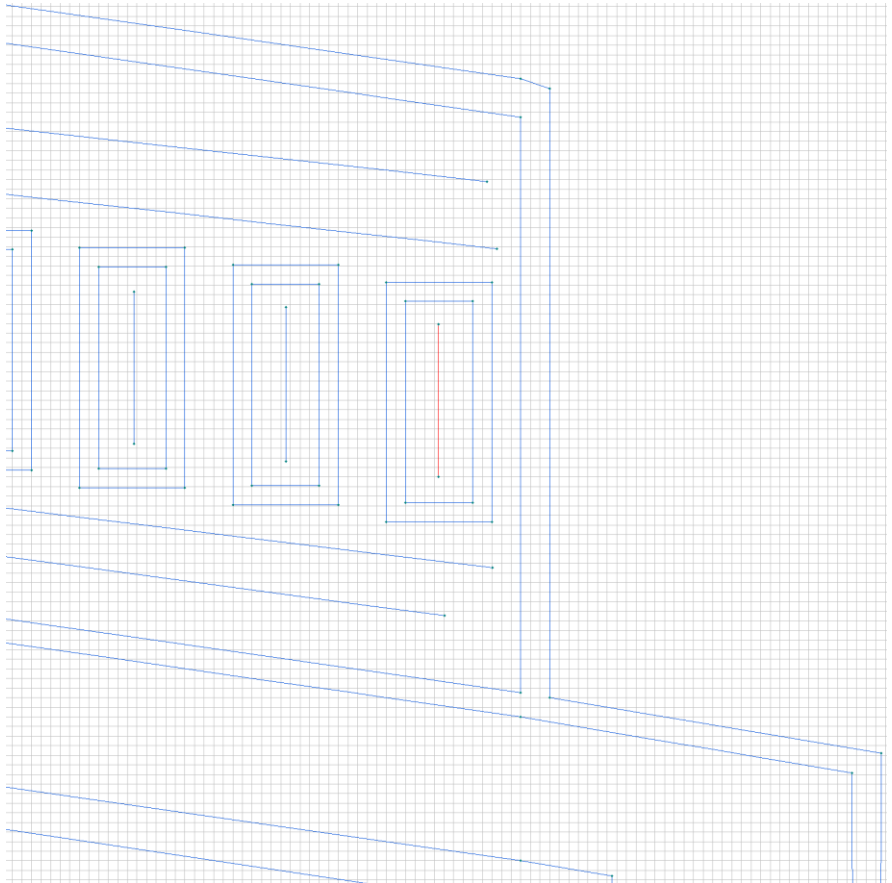# Labelled objects: edge "T100"
There are (3) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "Taircool7"
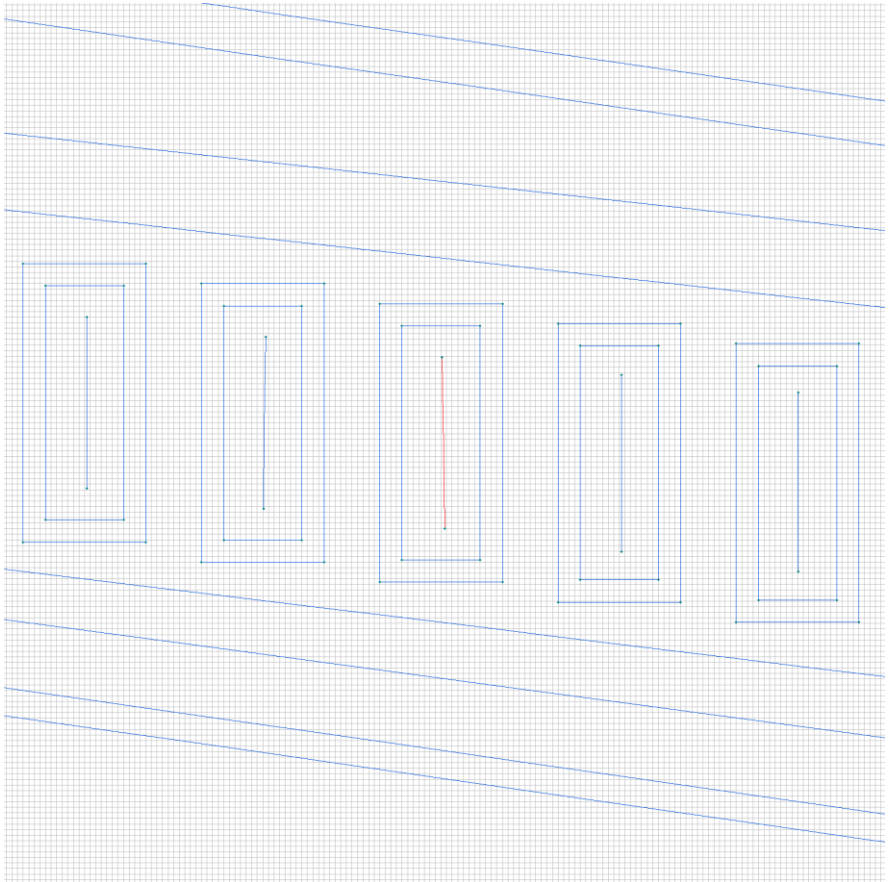There are (1) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "Taircool4"
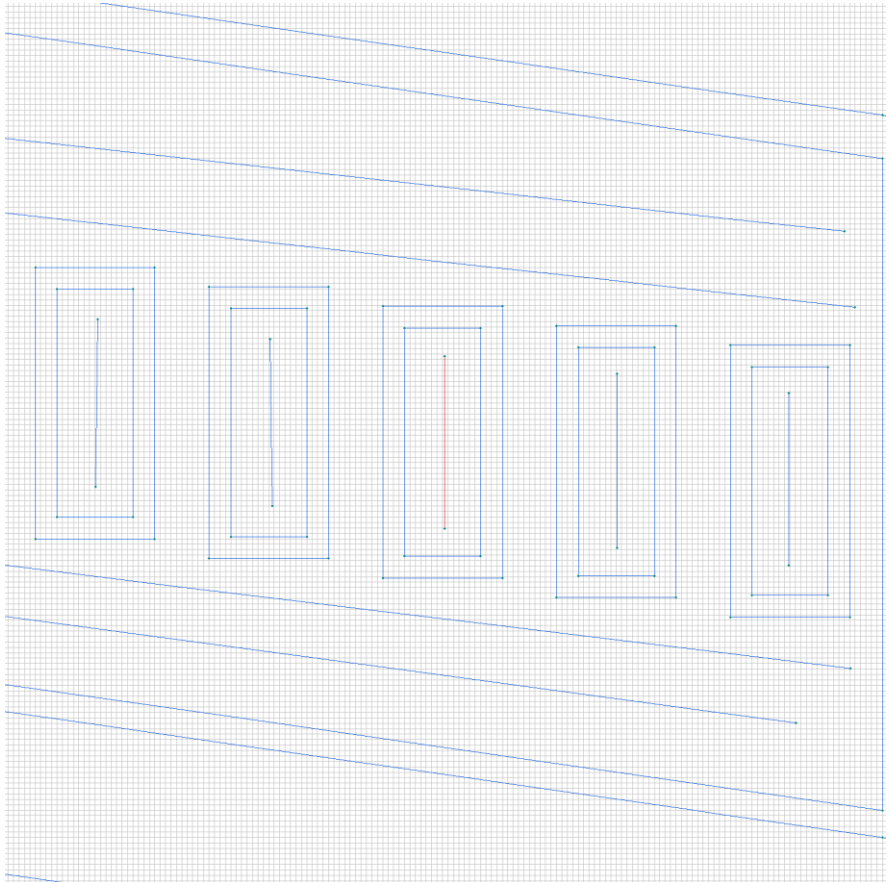There are (1) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "Taircool5"
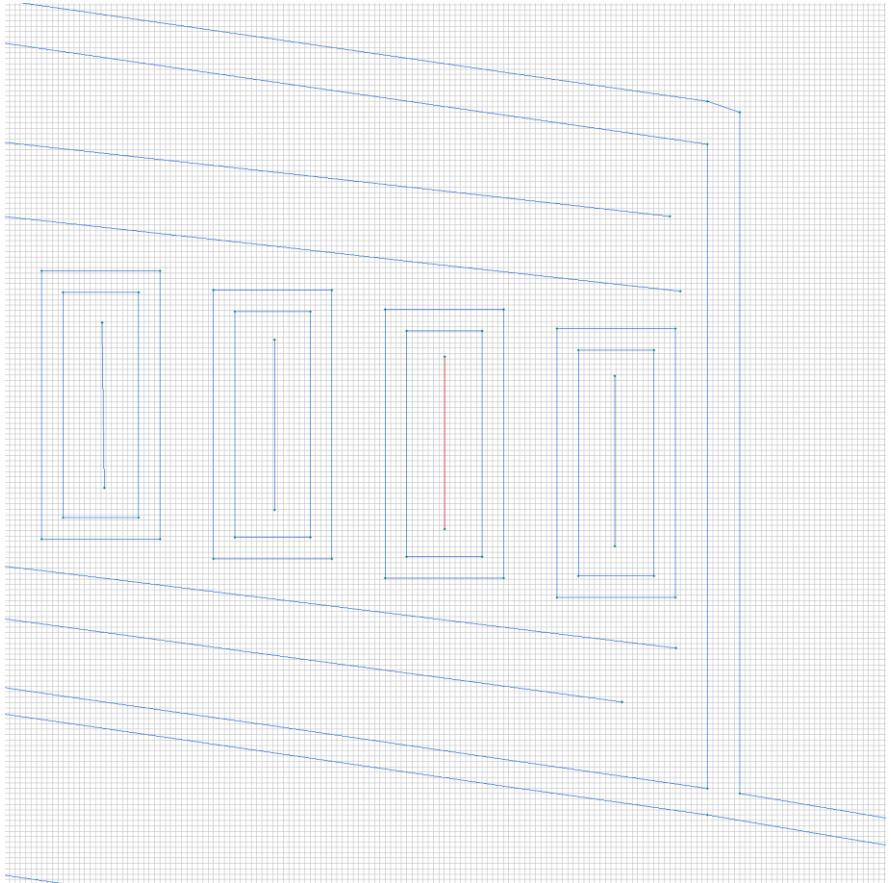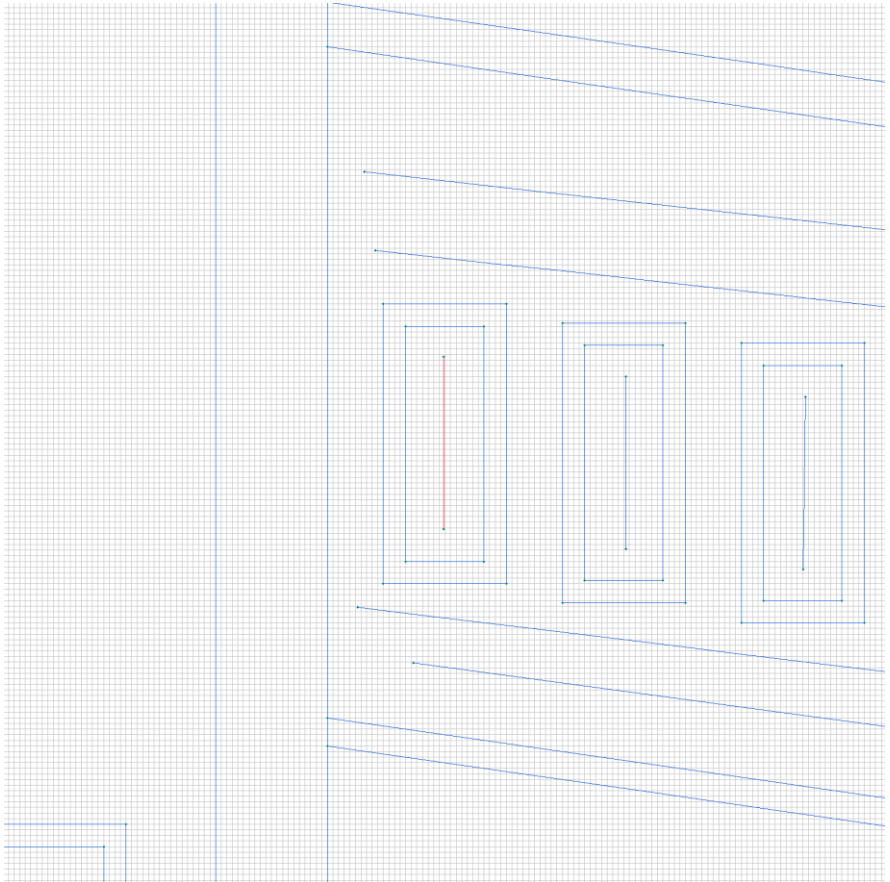There are (1) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "Taircool6"
There are (1) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "Taircool1"
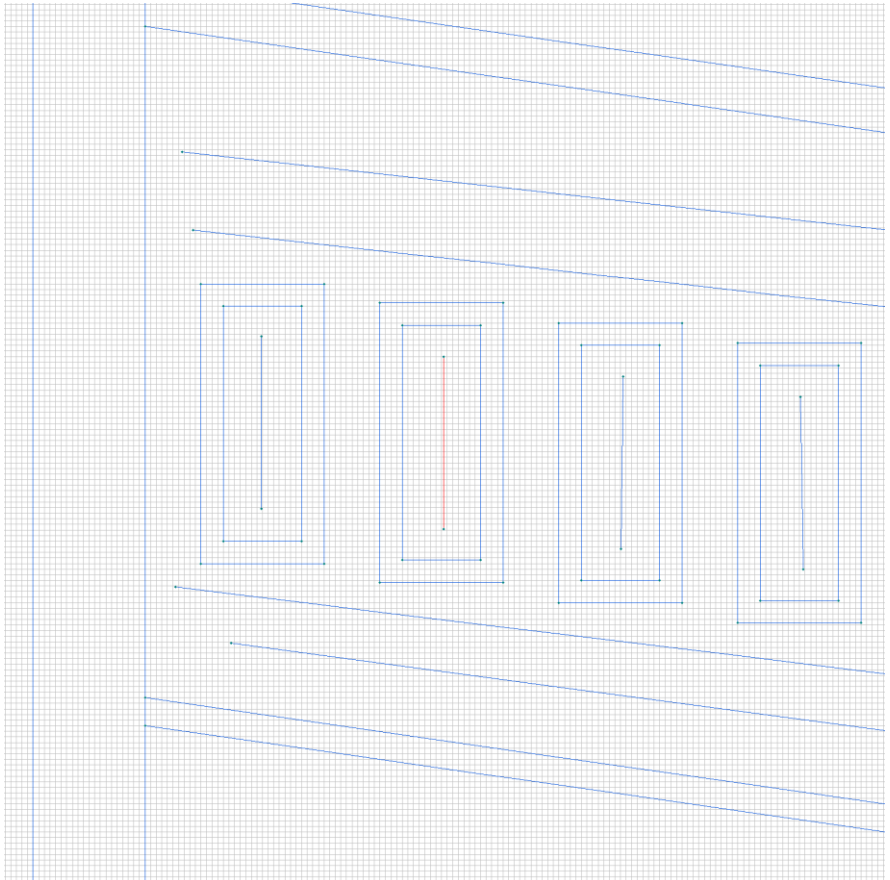There are (1) objects with this label

No material data (boundary conditions) are specified

Labelled objects: edge "Taircool2"
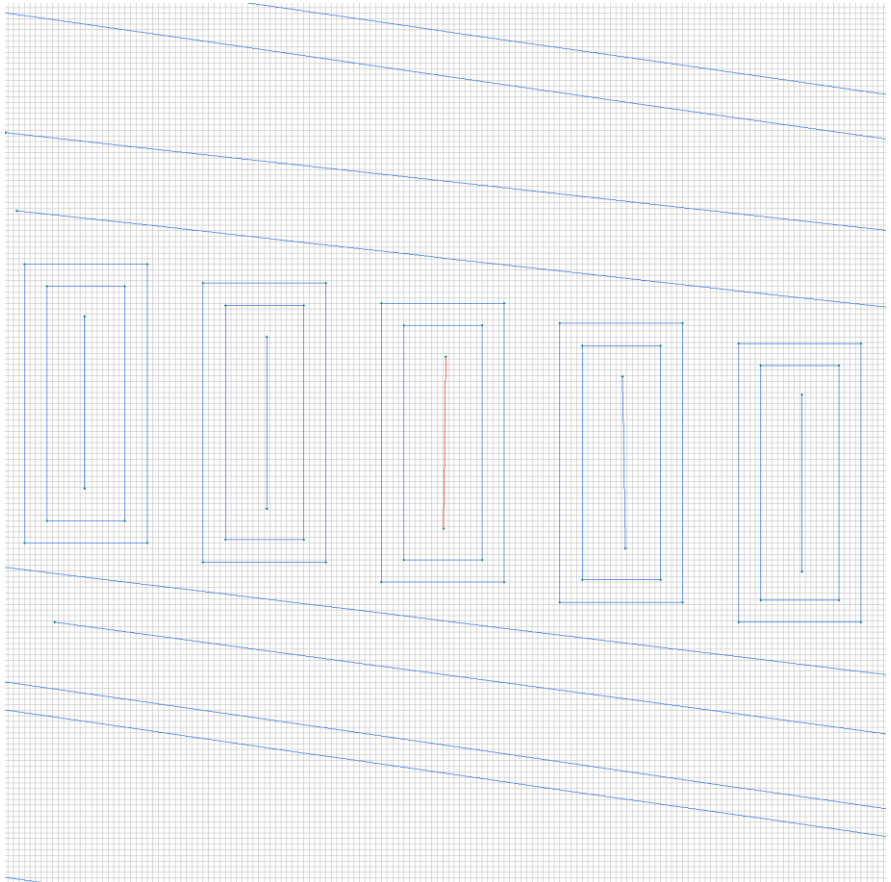There are (1) objects with this label

No material data (boundary conditions) are specified
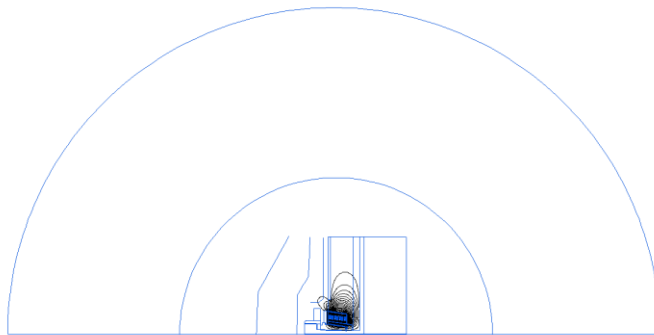
Labelled objects: edge "Taircool3"
There are (1) objects with this label

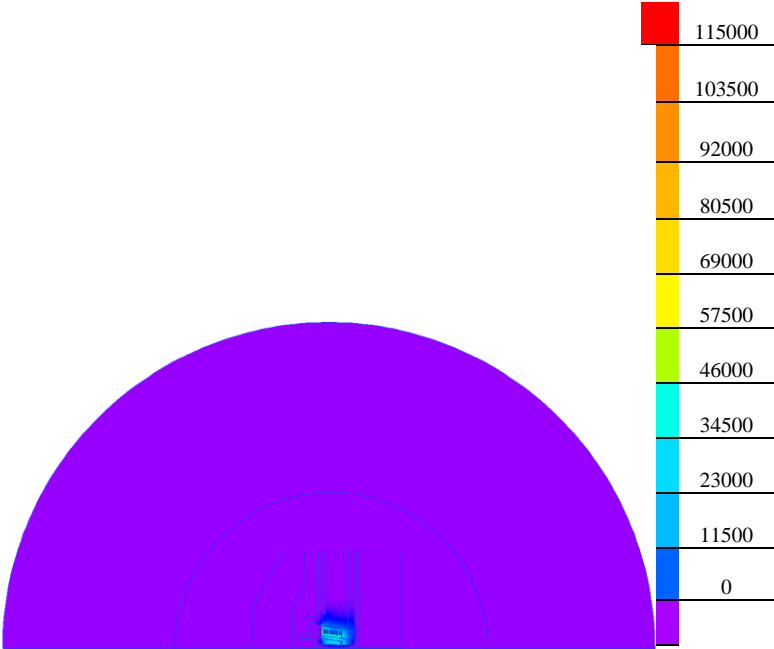No material data (boundary conditions) are specified

Results

Field lines

Results

Color map of Strength |H| [A/m]

Nonlinear dependencies

No non-linear dependencies are used in this problem data