

Resistivity stratification up to 4 layers

[X] Plus
[X] Pro
[X] LE (2 layers)

up to 20 spacings

up to 8 lines of measurements

Resistivity - Measurements

Formula: complete ☐ exclude if > % of mean

Model: Wenner Depth (h): 0,25 m

Data in: Resistance

a	A	B	C	D	E	F	G	H	mean
[m]	[Ohm]	[Ohm]	[Ohm]	[Ohm]	[Ohm]	[Ohm]	[Ohm]	[Ohm]	Ω
2	33								425,7584
4	12								303,6419
8	4,5								226,5806
X 16	1,3								130,7460

Diagram: A green rectangle representing a measurement area with points A, B, C, D, E, F. Arrows indicate the measurement setup.

Instructions:

1. must enter, at least, 3 spacings data
2. after entering all data, click on "Validate"
3. if data is not shown, you forgot to click on Open (at Projects tab)

TecAt 6 - Edit Measure

OK Cancel

Spacing: Valores de Resistência

a	A	B	C	D	E	F	G	H
16	1,3	0,00	0,00	0,00	0,00	0,00	0,00	0,00

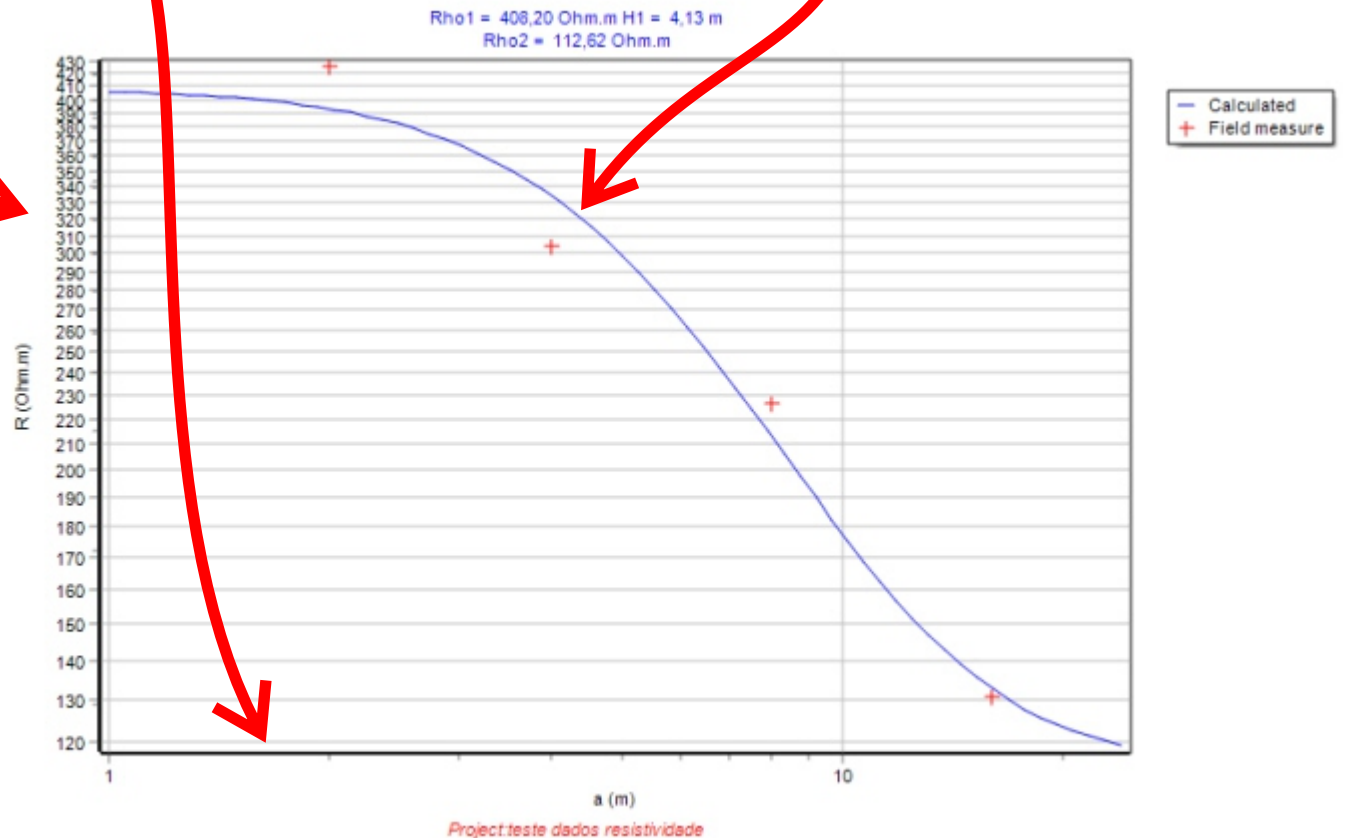
Data as:

Resistivity stratification up to 4 layers

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log-log scales

visualize adjustment of curve to data

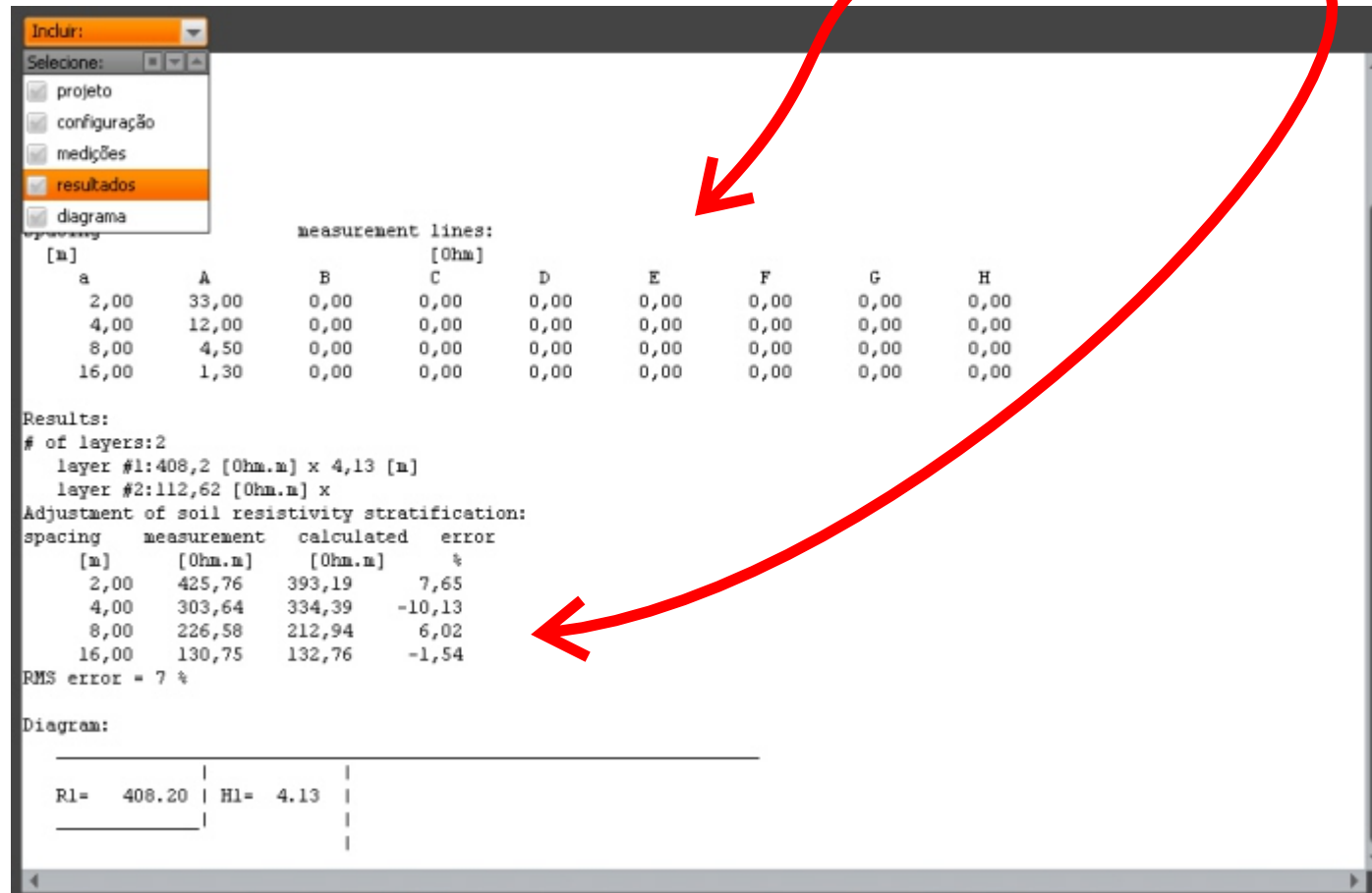


Resistivity stratification up to 4 layers

[X] Plus
[X] Pro
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select report contents

% adjust of each measure



Grid 1 - pre-defined grids in 2-layer soil

[X] Plus
[X] Pro
[X] LE

project data

materials: rods, cable, connections

Grid 1 - Configuration

Layer	Resistivity [Ohm.m]	Thickness [m]
1	408,2	4,13
2	112,62	

Project specs:

Design resistivity: 10
Maximum cost: 500
Maximum time: 50 h

Default electrodes:

- Rod 1: aço cobreado 2.0 m x 5/8"
- Rod 2: aço cobreado 2.4 m x 5/8
- Rod 3: aço cobreado 3 m x 5/8

Depth of rod [m]: 0,5

Cable:
Depth of cables [m]: 0,5

Default connections:

- in "X": weld, molde solda X 50x50 mm²
- in "T": weld, molde solda T 50x50 mm²
- cable-rod: weld, molde solda CH 50 mm² x 5/8
- rod-rod: threaded union, Luva roscada 5/8
- cable-cable: weld, molde solda CC 50x50 mm²

Update
Save default Load default

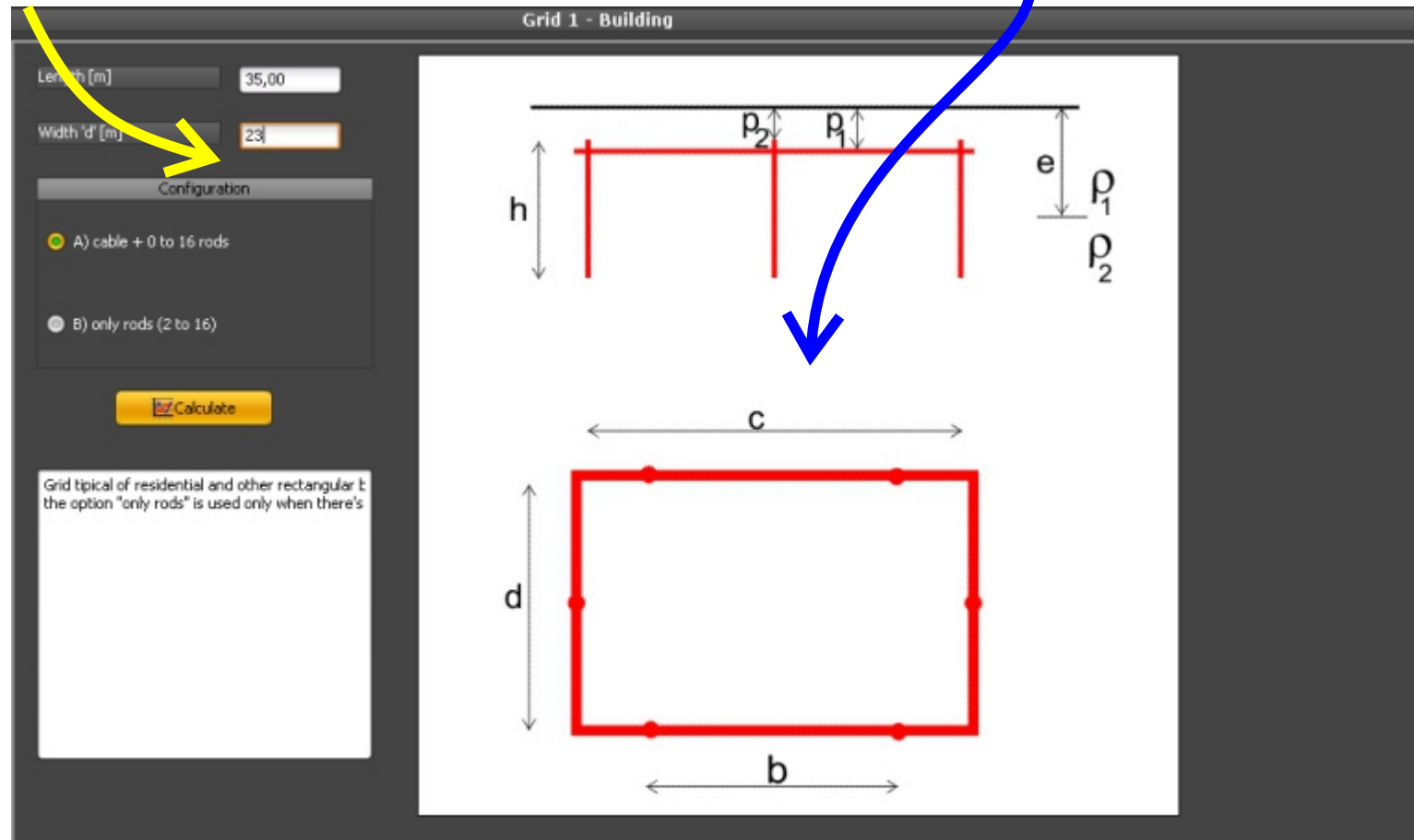
This Module - Grid 1 - gives quick and comparative resistance for several pre-defined grids, using a ;
For 3- and 4-layer soils and for better precision, use the module Grid 2, available
on TecAt Pro and TecAt Plus;

[X] Plus
[X] Pro
[X] LE

Grid 1 - pre-defined grids in 2-layer soil

dimensions

lay-out of grid and layers

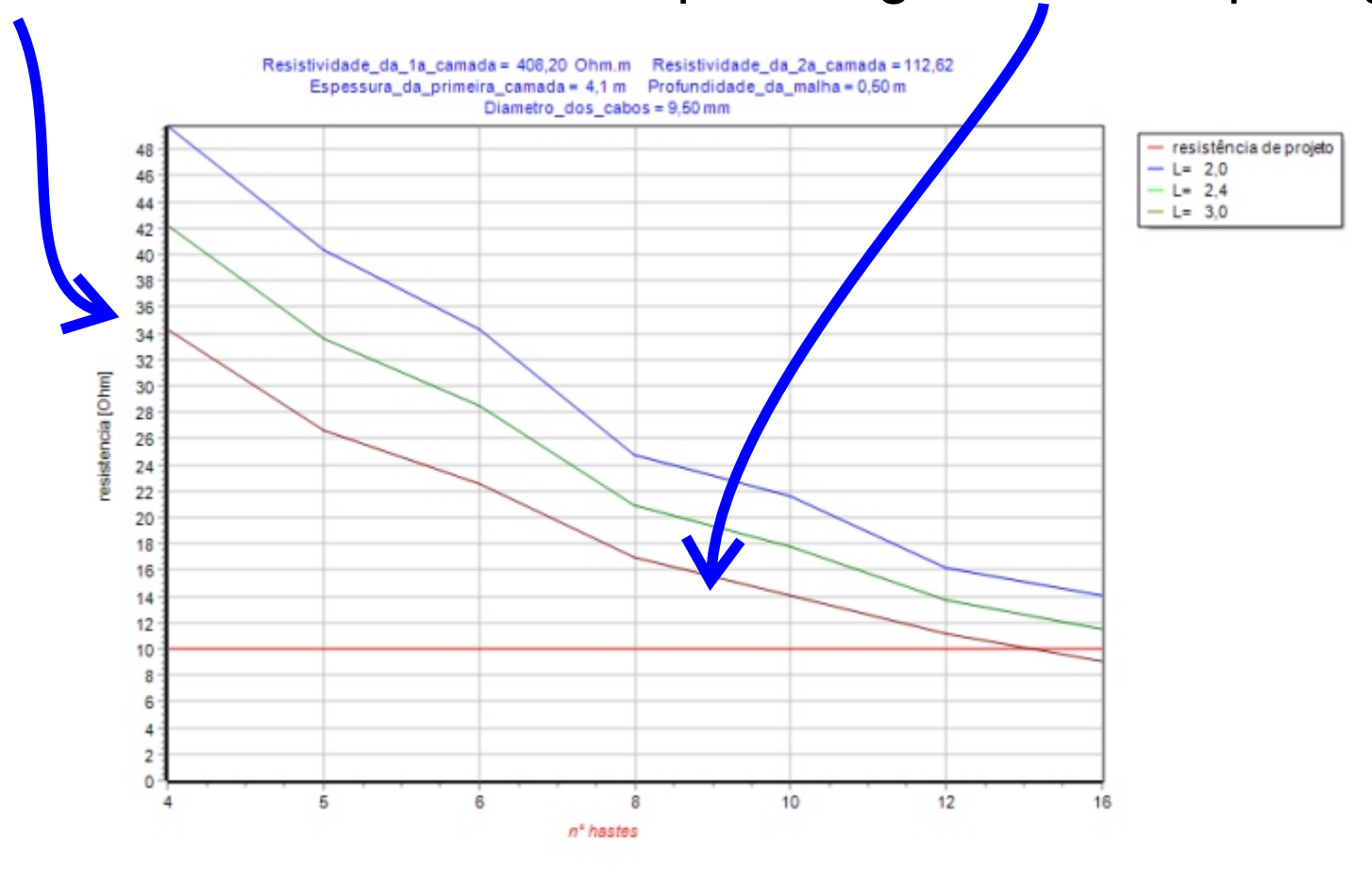


Grid 1 - pre-defined grids in 2-layer soil

[X] Plus
[X] Pro
[X] LE

resistances

up to 21 grids for comparing

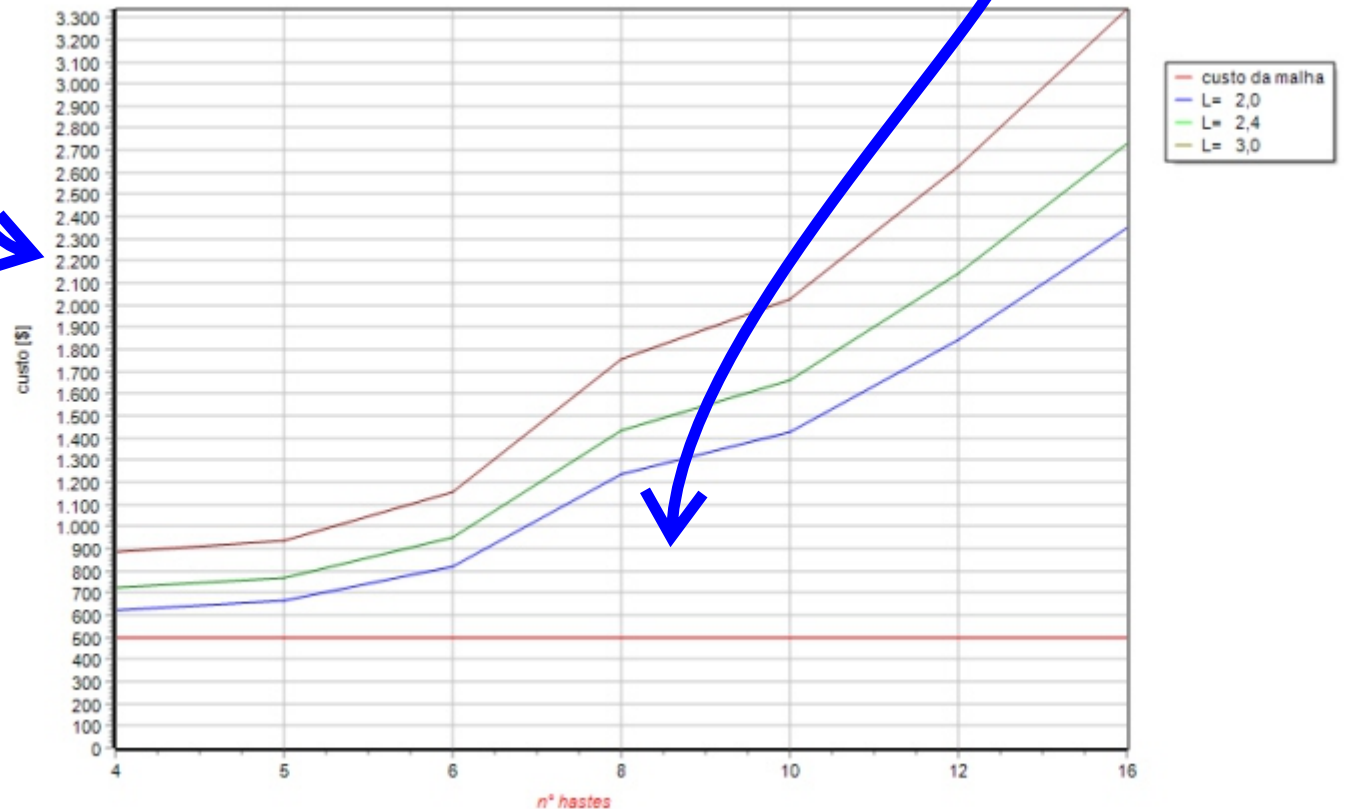


Grid 1 - pre-defined grids in 2-layer soil

[X] Plus
[X] Pro
[X] LE

costs

up to 21 grids for comparing

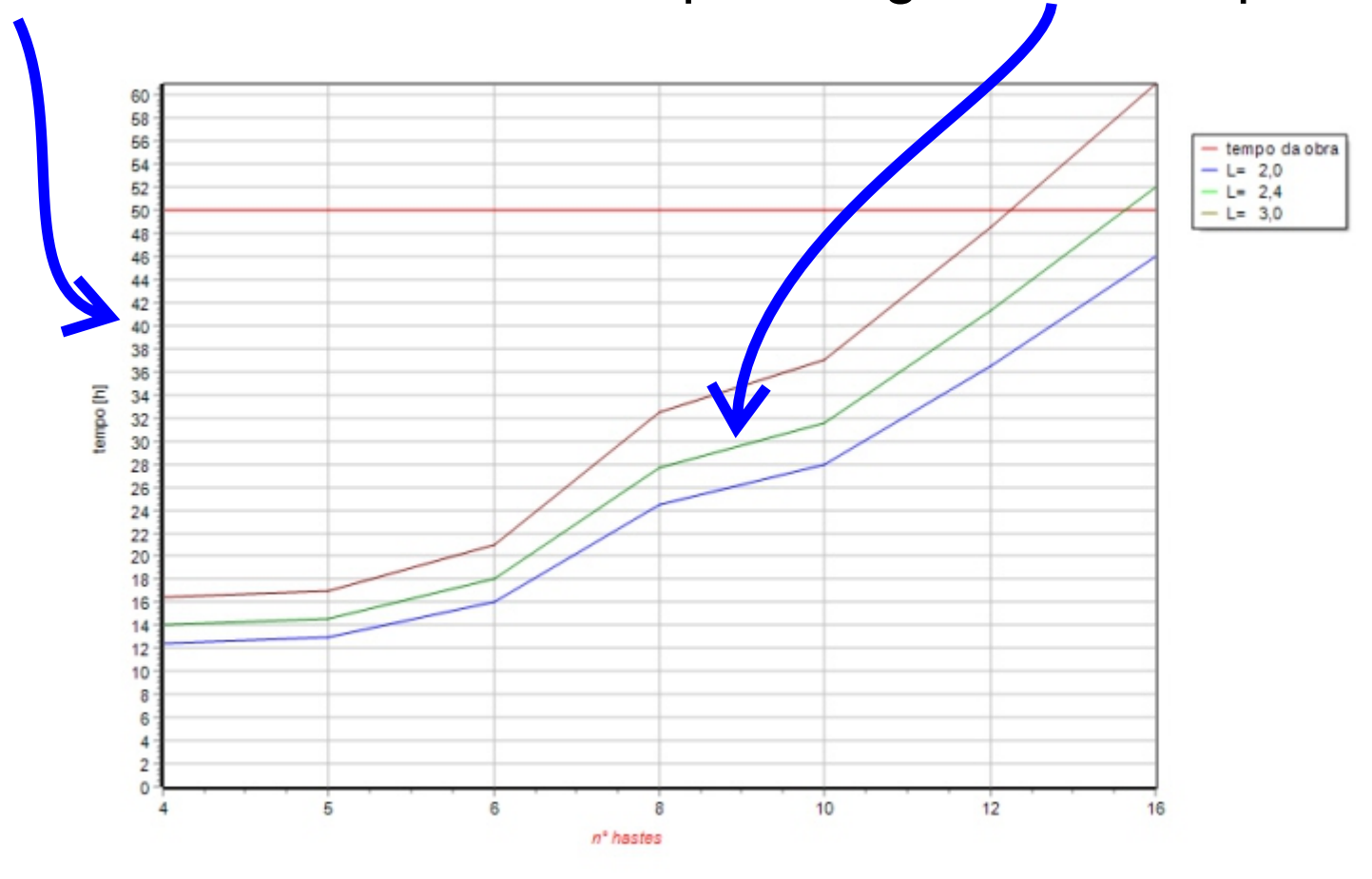


Grid 1 - pre-defined grids in 2-layer soil

[X] Plus
[X] Pro
[X] LE

hours to build

up to 21 grids for comparing

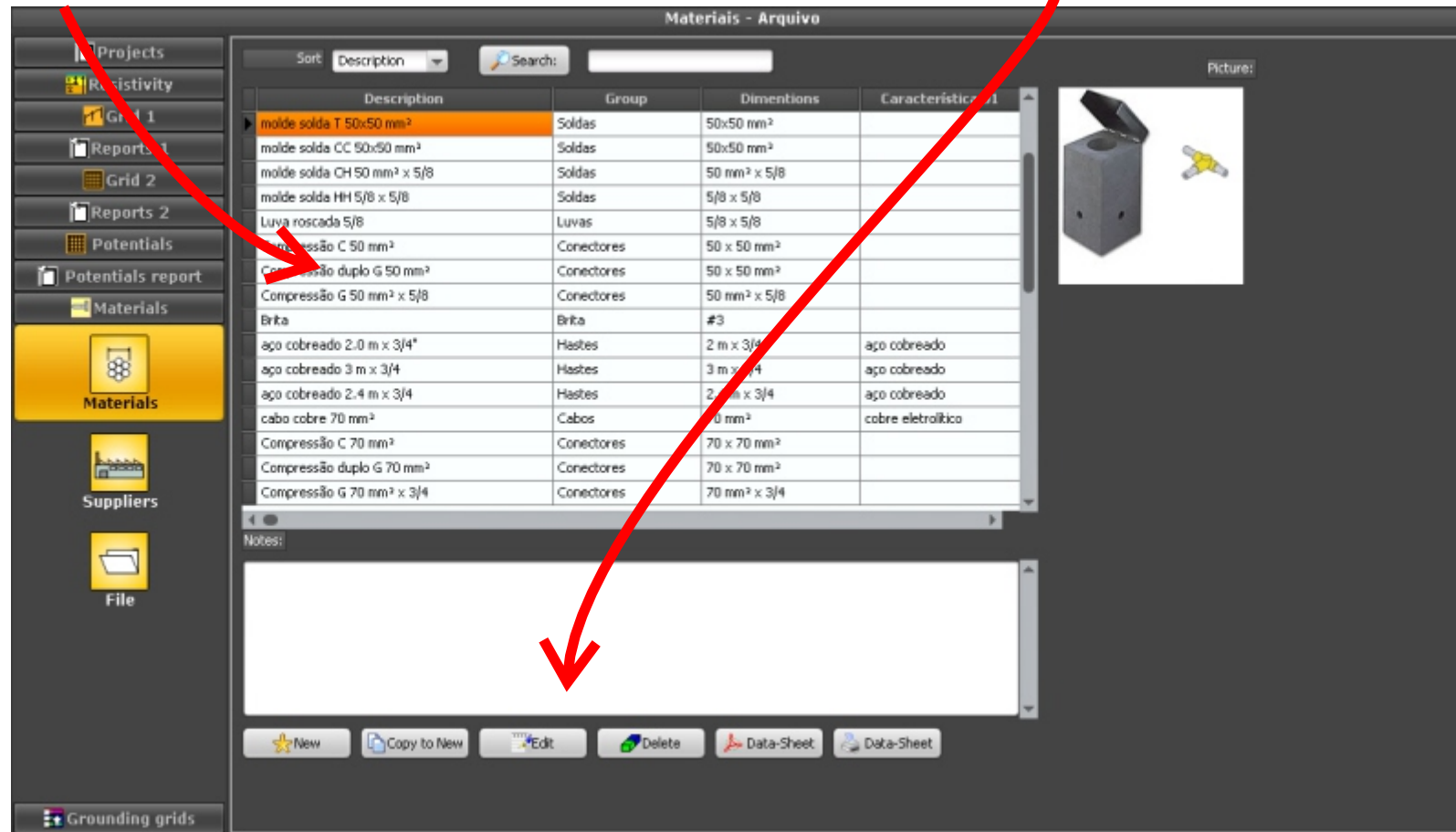


[X] Plus
[X] Pro
[X] LE

Materials database

table of materials

add, edit, delete, data-sheet



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Grid 2 - any grid, up to 4-layers

[X] Plus
[X] Pro
[] LE

wizards to generate grids rectangular, circle, line, triangle

The screenshot displays the 'Configuration' wizard for generating grids. The 'Rectangular' tab is selected. The 'Generate' section has three radio buttons: 'only cables', 'only rods', and 'cable + rods' (selected). The 'Rods' section has two radio buttons: 'all the nodes' and 'only at the perimeter' (selected). The 'Electrodes type' section has three radio buttons: 'active' (selected), 'passive', and 'return'. The 'Distribution' section has two radio buttons: 'linear' and 'geometric' (selected), with a value of '1,30' next to it. A 'delete existing grid' checkbox is checked. The 'Default materials' section shows settings for 'Rods' (aço cobreado 3 m x 5/8), 'Rod depth [m]' (0,5), 'Cables' (cabo cobre 50 mm²), and 'Cables depth' (0,5). The 'Connections' section includes options for 'in 'X'', 'in 'T'', 'cable-rod', 'rod-rod', and 'cable-cable' connections, each with a dropdown menu and a material selection field. At the bottom, there are 'Save default', 'Load default', and 'Update' buttons.

Typical use of wizards:

Select to generate cables and/or rods; for rectangular grids, select if you want rods on every node or only at the perimeter.
On the Circles wizard, select the number of sides of the polygon and how many rod on each side.
On the Lines wizard, select the number of rods you want.
For all of them indicate if you want active (almost always), passive or return electrodes.
For each wizard run, its used only one cable type and one rod type, selectable amongst the registered materials.
Confirma Iso if you want to delete the current grid ro add the new one to it.
Finally, on the desired wizard screen, enter the corners of the grid to be generated.

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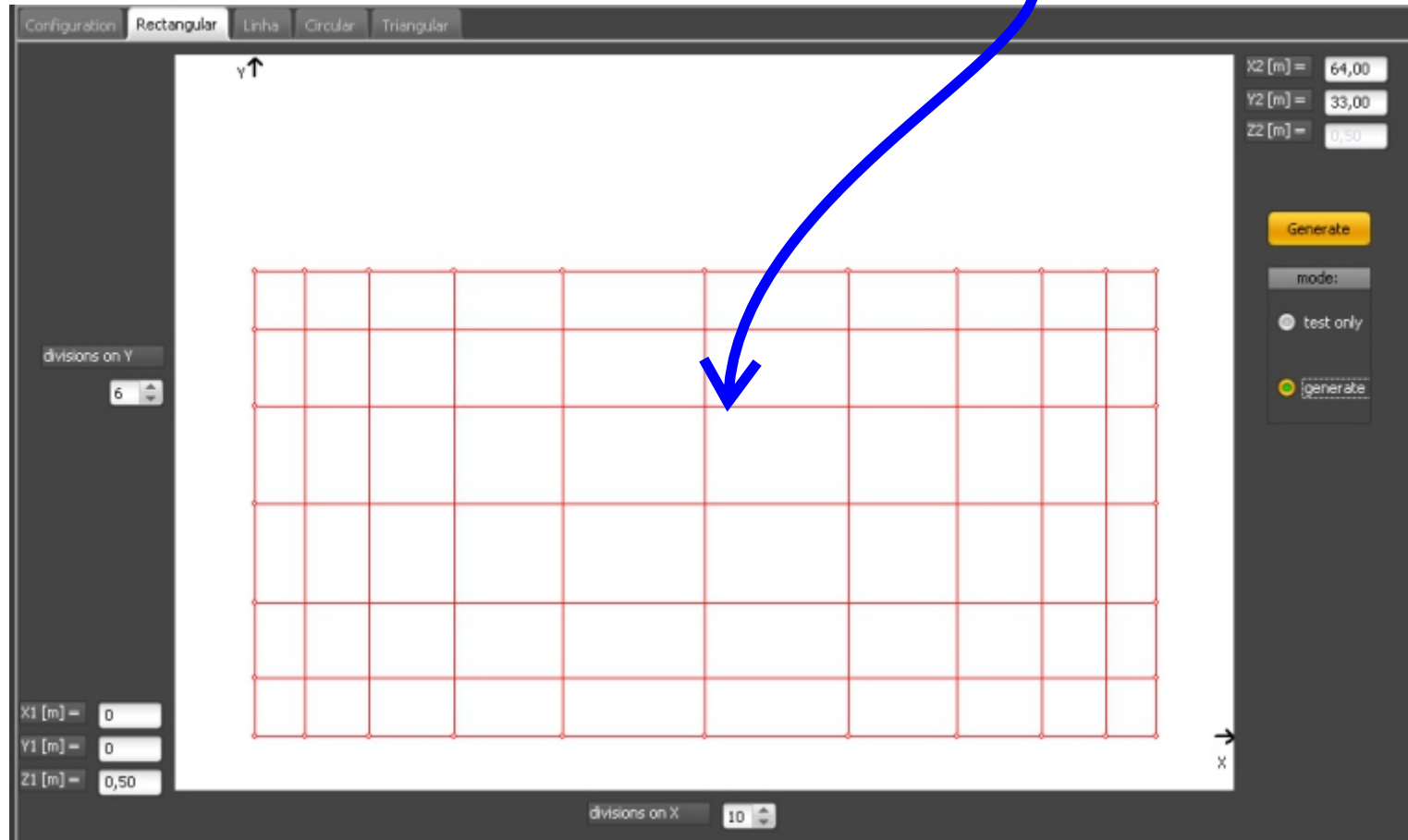
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Grid 2 - any grid, up to 4-layers

[X] Plus
[X] Pro
[] LE

or enter coordinates

build grids with any geometry



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Grid 2 - any grid, up to 4-layers

[X] Plus
[X] Pro
[] LE

cable section calculation auto-generates list of connections

Project: [] Material: []

Short circuit Amp: 2,00 [kA]

Protection: 0,40 [s]

Thermal dimensioning of the minimal section at the connection with.
Select one from the list or enter your own data.

defaults: copper mlt, weld

T min: copper mlt, weld

T amb: copper half temper

T ref: half-temper, no softening

G 0: steel-copper 40%

G 20: steel-copper 30%

G 20: steel cobreado 254

p 20: aluminum

ρ 20: aluminum 5005

ρ 20: []

ε: [] [cal/g/°C]

density: [] [g/cm³]

use TCAP: []

TCAP: []

Connection	X	Y	Z	Cond 1	Cond 2	Dim 1	Dim 2	Shape	Type	Description
n°	[m]			n°		[mm] ou [mm²]		obs:	obs:	material
203	0	0	0,5	1	8	8	0	4	1	molde solda CC 50x50 mm²
204	3,54	0	0,5	1	9	8	0	1	1	molde solda T 50x50 mm²
205	8,14	0	0,5	1	10	8	0	1	1	molde solda T 50x50 mm²
206	14,12	0	0,5	1	11	8	0	1	1	molde solda T 50x50 mm²
207	21,89	0	0,5	1	12	8	0	1	1	molde solda T 50x50 mm²
208	32	0	0,5	1	13	8	0	1	1	molde solda T 50x50 mm²
209	42,11	0	0,5	1	14	8	0	1	1	molde solda T 50x50 mm²
210	49,88	0	0,5	1	15	8	0	1	1	molde solda T 50x50 mm²
211	55,86	0	0,5	1	16	8	0	1	1	molde solda T 50x50 mm²
212	60,46	0	0,5	1	17	8	0	1	1	molde solda T 50x50 mm²
213	64	0	0,5	1	18	8	0	4	1	molde solda CC 50x50 mm²
214	0	0	0,5	1	19	8	0	2	1	molde solda CH 50 mm² x 5/
215	64	0	0,5	1	20	8	0	2	1	molde solda CH 50 mm² x 5/
216	3,54	0	0,5	1	33	8	0	2	1	molde solda CH 50 mm² x 5/

CSV

XLS

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Grid 2 - any grid, up to 4-layers

[X] Plus
[X] Pro
[] LE

resistance report

consolidated list of materials

Grid resistance [Ohm] Fault current [kA] Maximum potential rise [V] ☐ Include sub-divisions

Printing:

Export:

Project data:
Project: teste dados resistividade
Customer:
Date: 23/02/2016
Location:
of layers: 2
layer #1: 399,24 [Ohm.m] x 4,57 [m]
layer #2: 97,45 [Ohm.m] x
Tempo de processamento: 0,016 s
Resistance [Ohm] = 1,63
Ground potential rise [V] = 1627,12

condutores:
Nr. X1(m) Y1(m) Z1(m) X2(m) Y2(m) Z2(m) Ralo(mm) NSub Tipo

quantity	description	unit	\$ mat	hours	\$ hour	\$ unit	\$ total
32 rods	aço cobreado 3 m x 5/8	un	55	0,5	5	57,5	1840
811 cable	cabo cobre 50 mm²	m	30	1	5	35	28385
4 connection	molde solda CC 50x50 mm²	un	8	0,5	5	10,5	42
28	molde solda T 50x50 mm²	un	8	0,5	5	10,5	294
32	molde solda CH 50 mm² x 5/8	un	8	0,5	5	10,5	336
45	molde solda X 50x50 mm²	un	8	0,5	5	10,5	472,5

Printing:

Export:

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Grid 2 - Potentials

[X] Plus
[] Pro
[] LE

admissible potentials

potentials for full grid or small area

Gravel layer

☒ Use gravel -> Gravel resistivity: 3000 Layer thickness [m]: 0,1

Select

Operator weight

☒ 50 kgf ☐ 70 kgf

Protection:

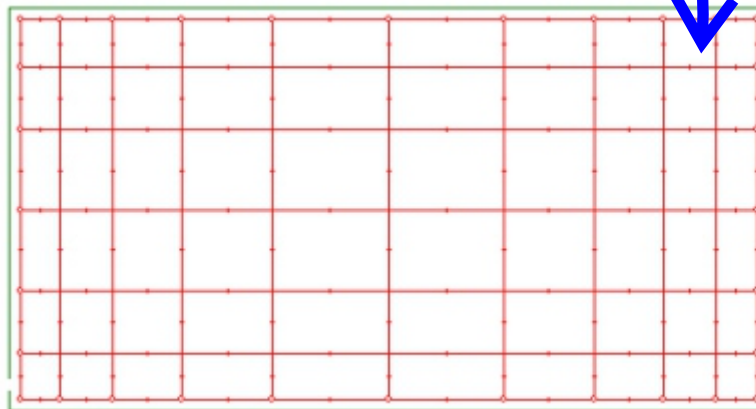
Fault time: 0,40 s Fault current: 2,00 kA

Update

Calculate:

Admissible touch potential [V]: 1069,37

Admissible step potential [V]: 3532,77

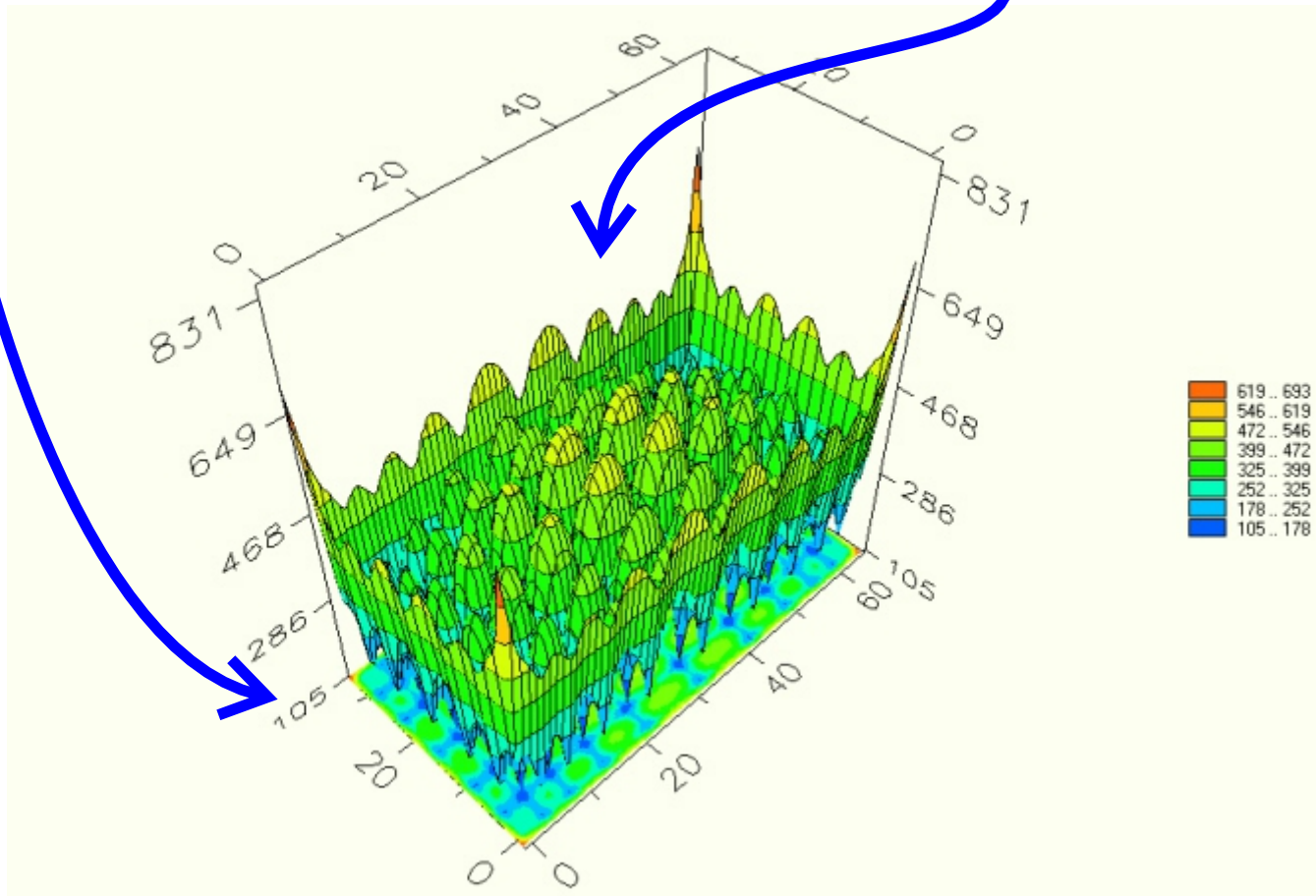


Grid 2 - Potentials

[X] Plus
[] Pro
[] LE

3D view (or projection)

grid and surface potentials

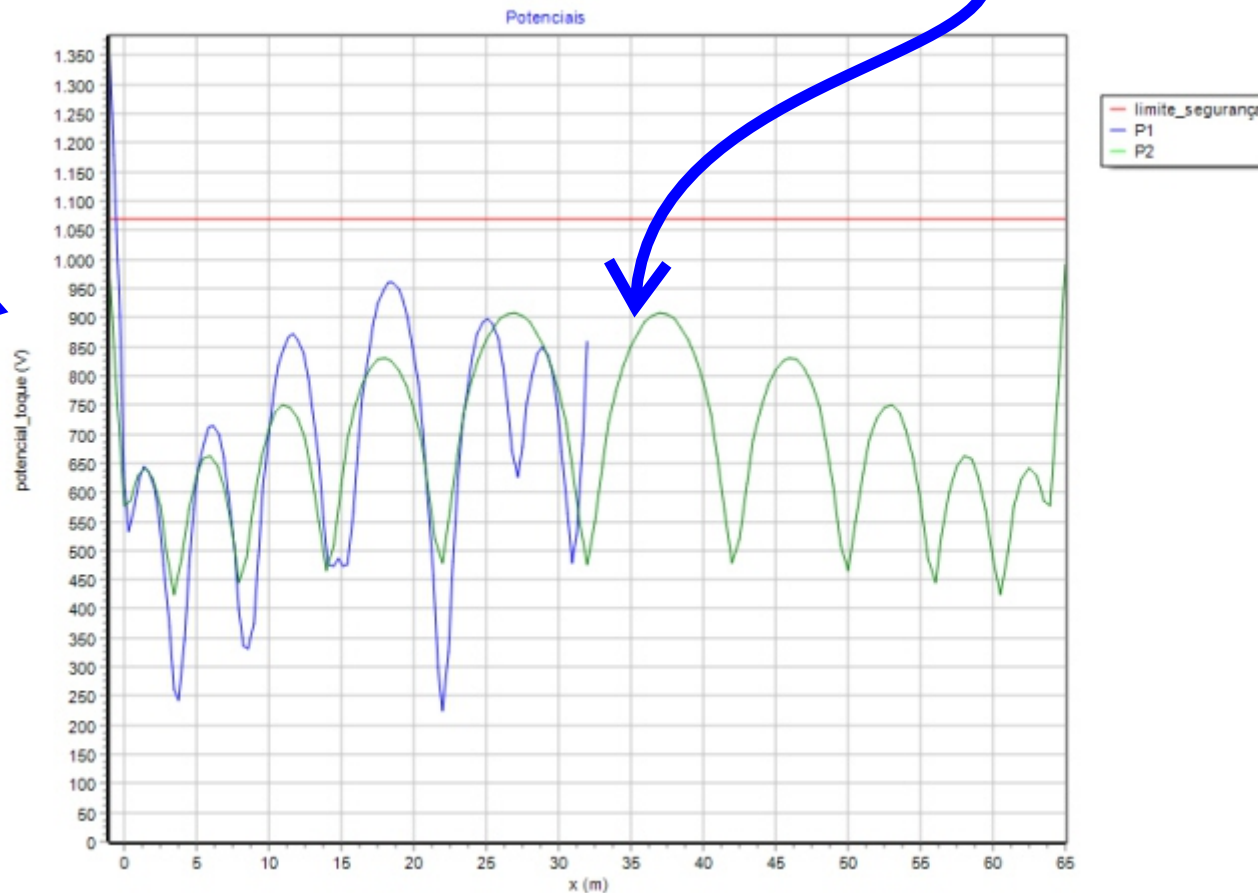


Grid 2 - Potentials

[X] Plus
[] Pro
[] LE

2D view

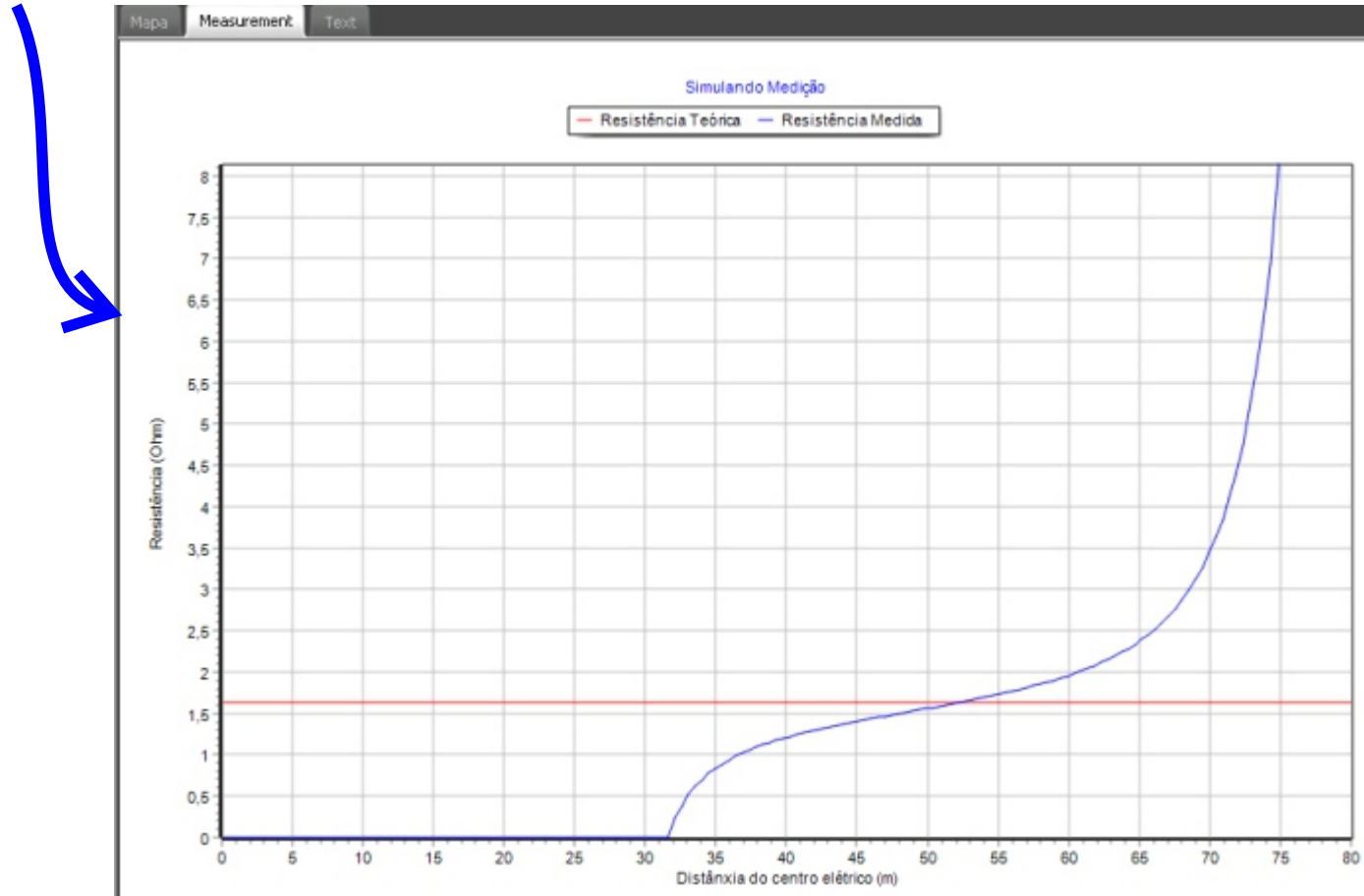
touch, step and surface potentials



Grid 2 - Potentials

[X] Plus
[] Pro
[] LE

simulation of resistance measurement



Grid 1 and 2 - Analysis

[X] Plus
[X] Pro
[X] LE (grid 1)

several charts of costs and time to build of components

