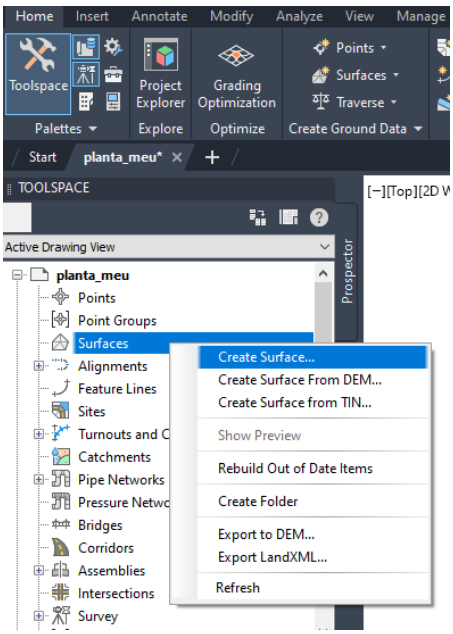
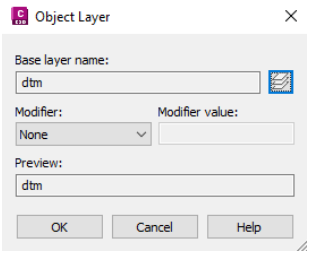
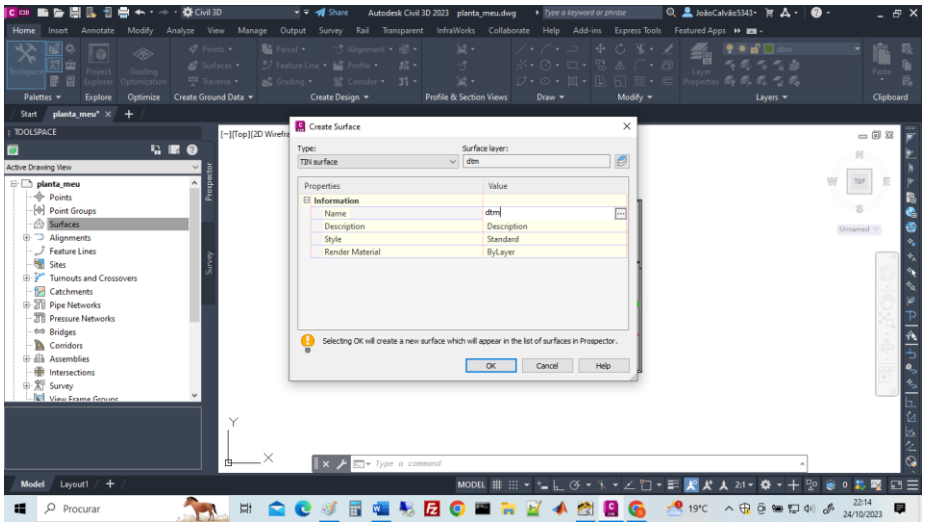
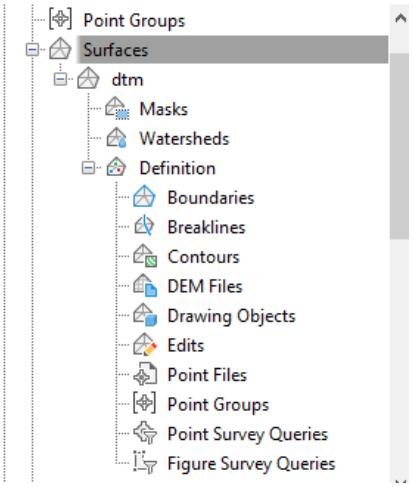
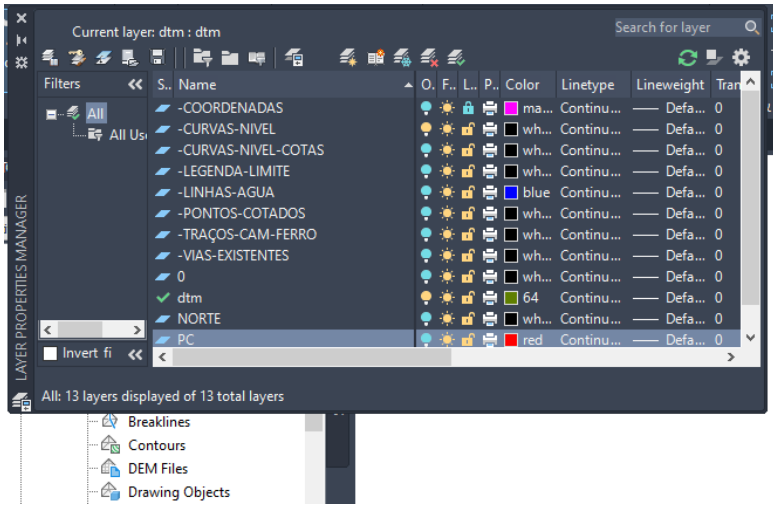
1. Gerar o modelo digital do terreno com a informação gráfica disponível

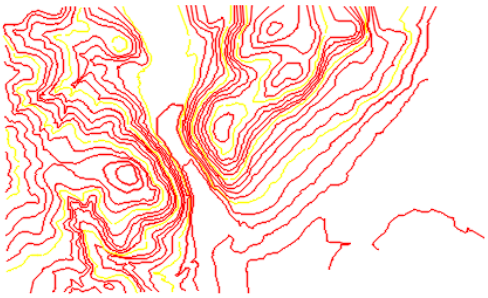


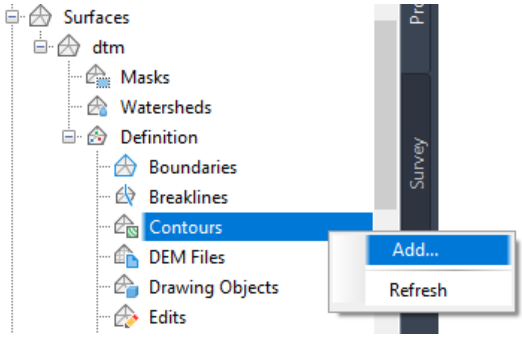


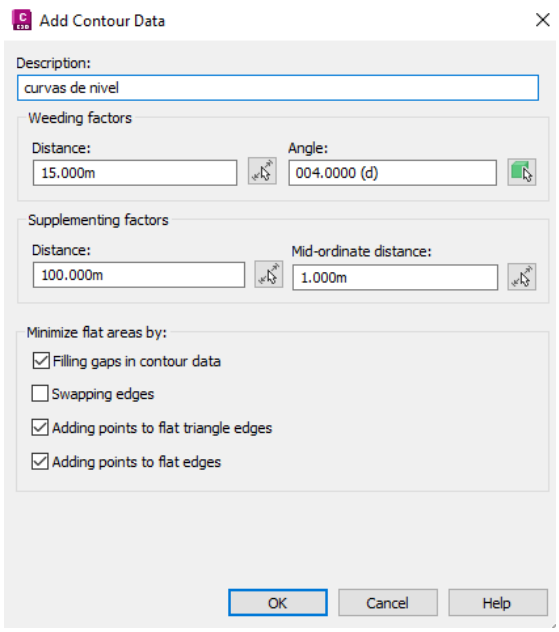


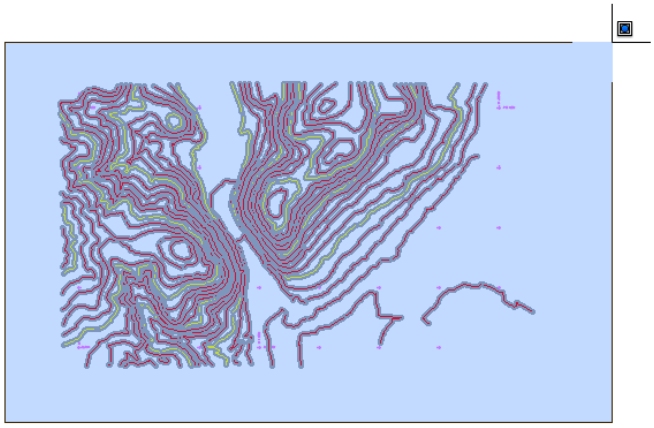


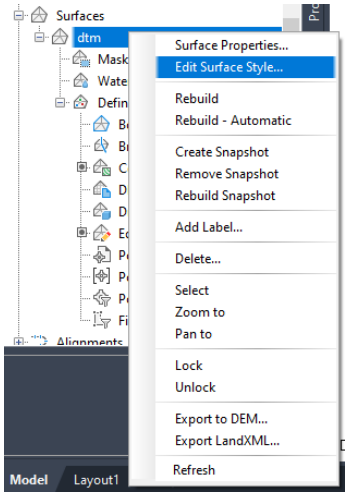


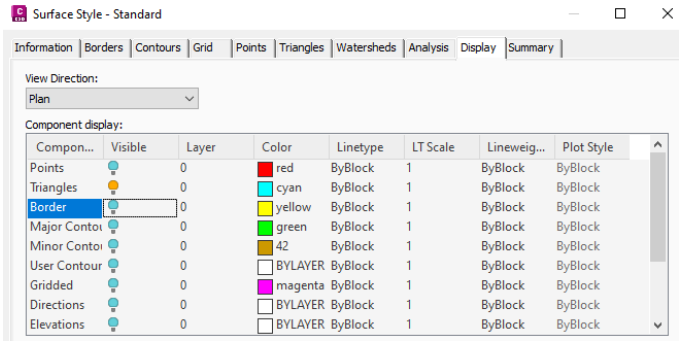


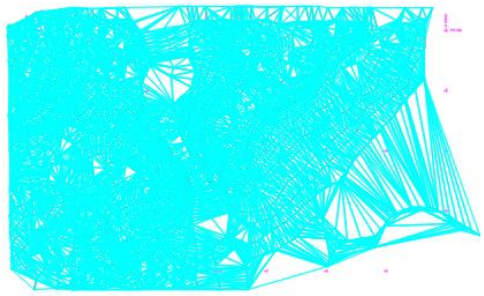

Surfaces
dtm
Masks
Watersheds
Definition
Boundaries
Breaklines
Contours
DEM Files
Drawing Objects
Edits
Add...
Refresh
Survey

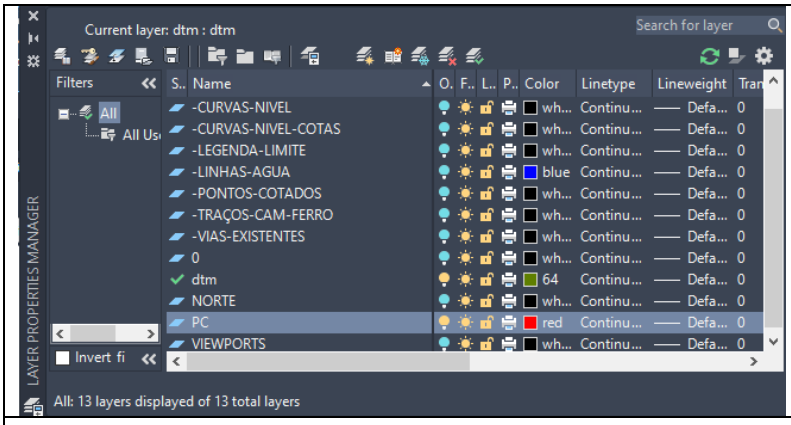

Add Contour Data
Description:
curvas de nivel
Weeding factors
Distance:
15.000m
Angle:
004.0000 (d)
Supplementing factors
Distance:
100.000m
Mid-ordinate distance:
1.000m
Minimize flat areas by:
Filling gaps in contour data
Swapping edges
Adding points to flat triangle edges
Adding points to flat edges
OK
Cancel
Help




Surfaces
dtm
Surface Properties...
Edit Surface Style...
Rebuild
Rebuild - Automatic
Create Snapshot
Remove Snapshot
Rebuild Snapshot
Add Label...
Delete...
Select
Zoom to
Pan to
Lock
Unlock
Export to DEM...
Export LandXML...
Refresh
Model
Layout1


Surface Style - Standard
Information
Borders
Contours
Grid
Points
Triangles
Watersheds
Analysis
Display
Summary
View Direction:
Plan
Component display:
Compon...
Visible
Layer
Color
Linetype
LT Scale
Lineweig...
Plot Style
Points 0 red ByBlock 1 ByBlock ByBlock
Triangles 0 cyan ByBlock 1 ByBlock ByBlock
Border 0 yellow ByBlock 1 ByBlock ByBlock
Major Contou 0 green ByBlock 1 ByBlock ByBlock
Minor Contou 0 42 ByBlock 1 ByBlock ByBlock
User Contour 0 BYLAYER ByBlock 1 ByBlock ByBlock
Gridded 0 magenta ByBlock 1 ByBlock ByBlock
Directions 0 BYLAYER ByBlock 1 ByBlock ByBlock
Elevations 0 BYLAYER ByBlock 1 ByBlock ByBlock




Current layer: dtm : dtm
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-CURVAS-NIVEL
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-LEGENDA-LIMITE
-LINHAS-AGUA
-PONTOS-COTADOS
-TRAÇOS-CAM-FERRO
-VIAS-EXISTENTES
0
dtm
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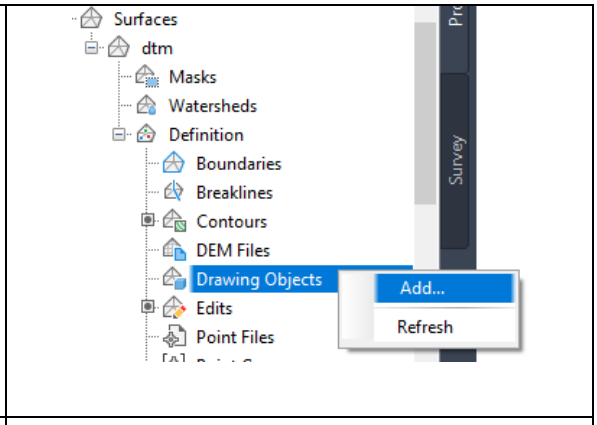
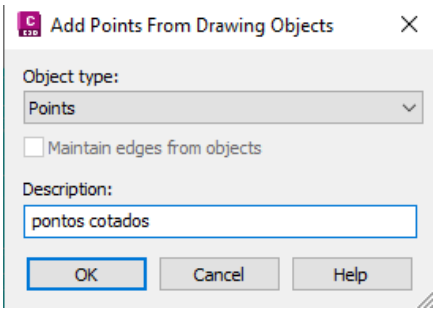
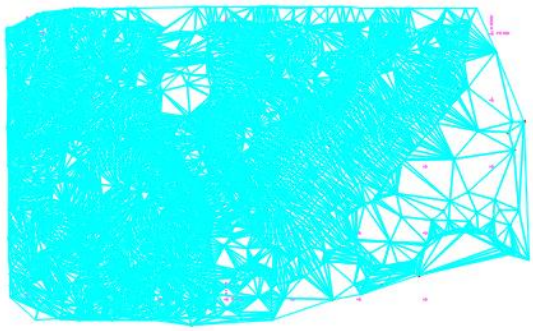
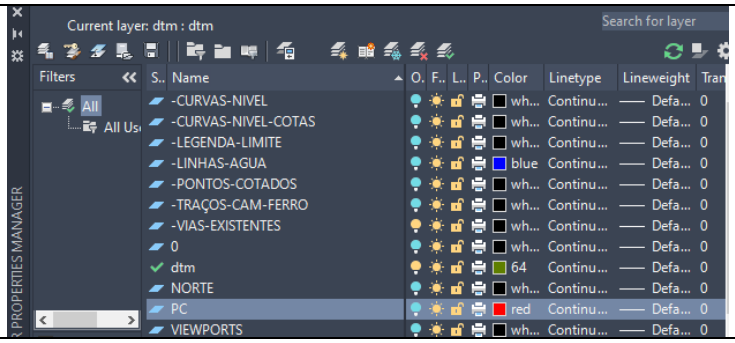
VIEWPORTS
All: 13 layers displayed of 13 total layers
LAYER PROPERTIES MANAGER


Surfaces
dtm
Masks
Watersheds
Definition
Boundaries
Breaklines
Contours
DEM Files
Drawing Objects
Edits
Point Files
Add...
Refresh
Survey


Add Points From Drawing Objects
Object type:
Points
Maintain edges from objects
Description:
pontos cotados
OK
Cancel
Help




Current layer: dtm : dtm
Search for layer
Filters
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O.. F.. L.. P.. Color Linetype Lineweight Tran
-CURVAS-NIVEL
-CURVAS-NIVEL-COTAS
-LEGENDA-LIMITE
-LINHAS-AGUA
-PONTOS-COTADOS
-TRAÇOS-CAM-FERRO
-VIAS-EXISTENTES
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dtm
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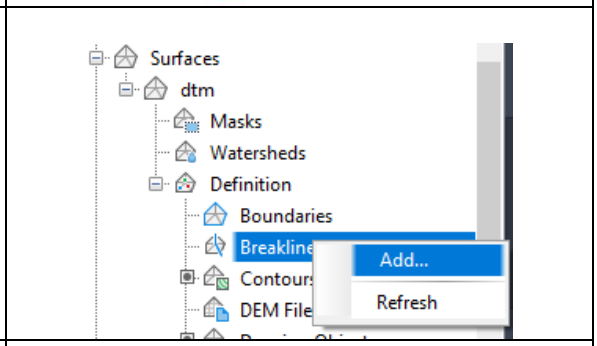
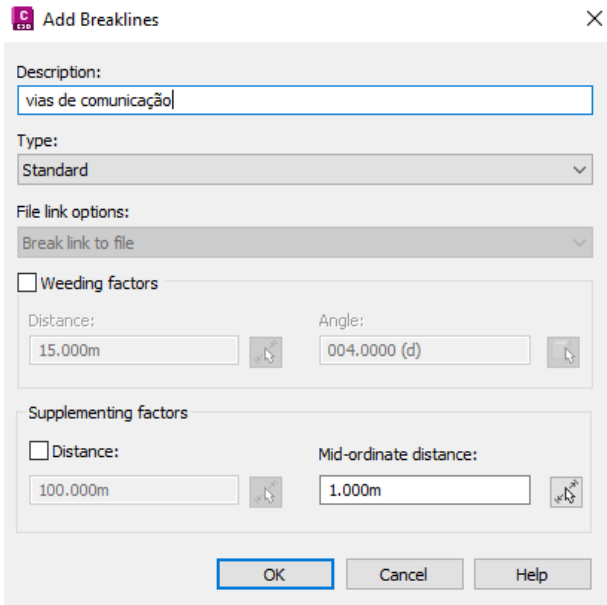
VIEWPORTS
PROPERTIES MANAGER


Surfaces
dtm
Masks
Watersheds
Definition
Boundaries
Breaklines
Contours
DEM Files
Add...
Refresh


Add Breaklines
Description:
vias de comunicação
Type:
Standard
File link options:
Break link to file
Weeding factors
Distance:
15.000m
Angle:
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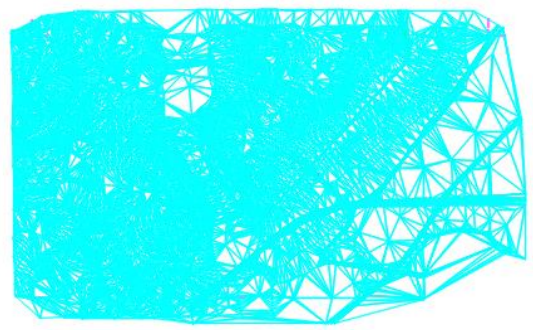
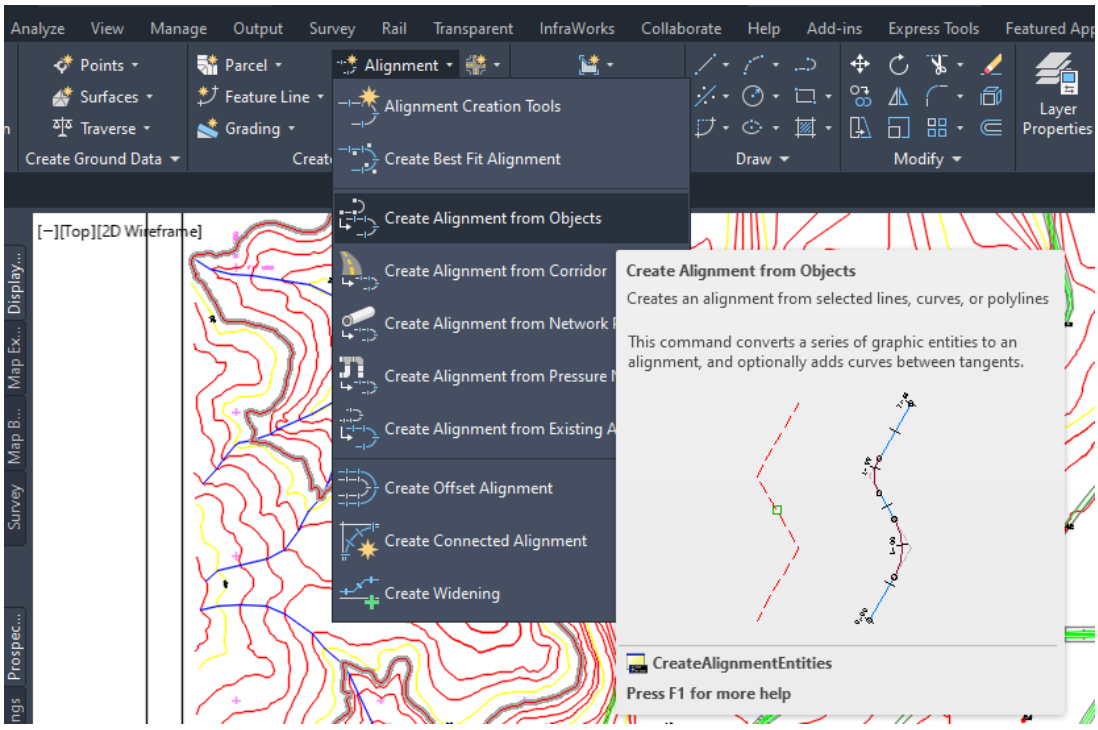
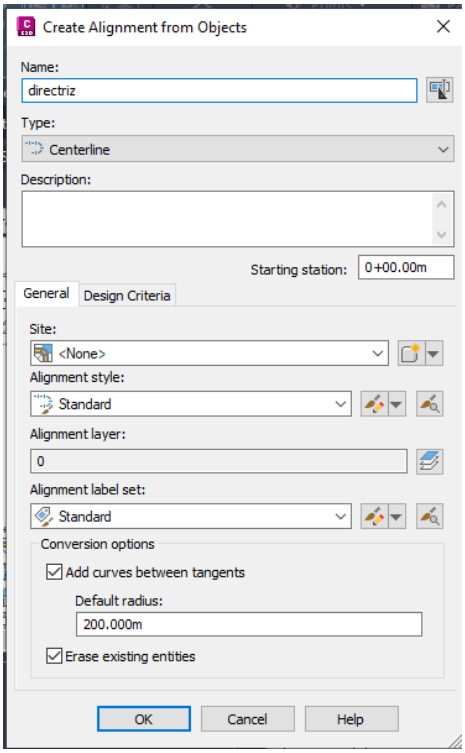
Supplementing factors
Distance:
100.000m
Mid-ordinate distance:
1.000m
OK
Cancel
Help



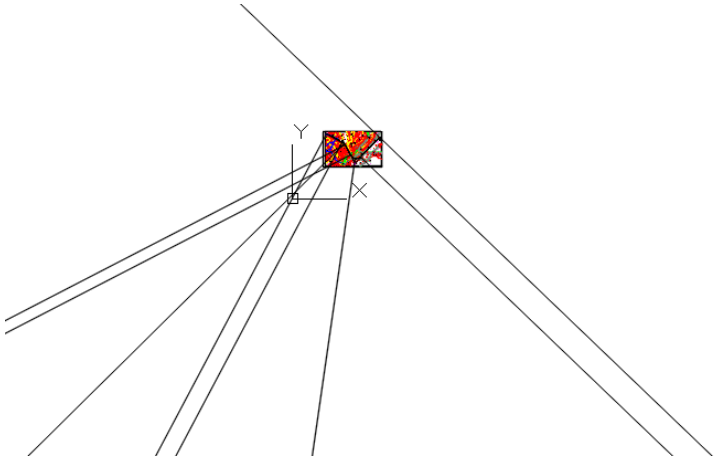
2. Definir a directriz: criar layer directriz; conforme o tipo de estrada, ligar as tangentes com arcos circulares e introduzir clotóides; unir estes elementos numa polyline única (join)

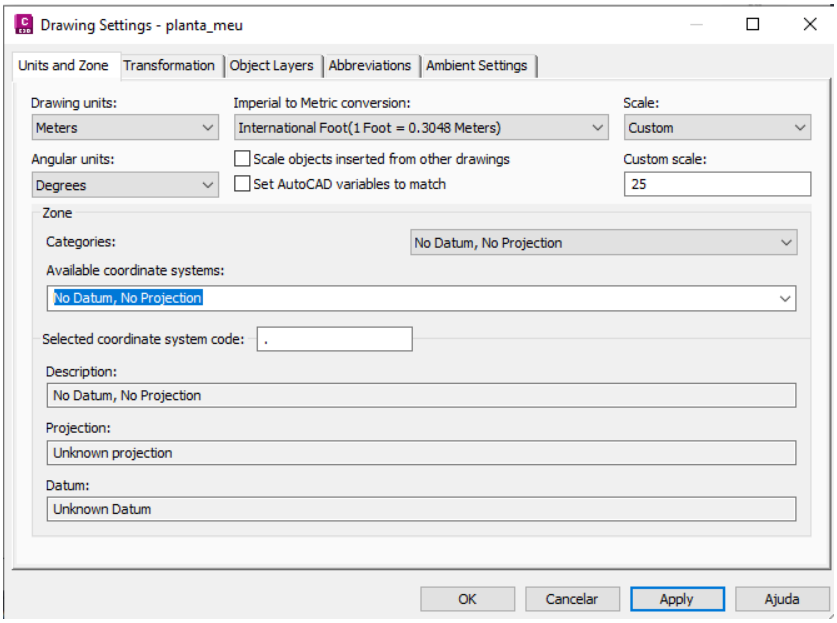
3. Gerar o alinhamento (directriz)

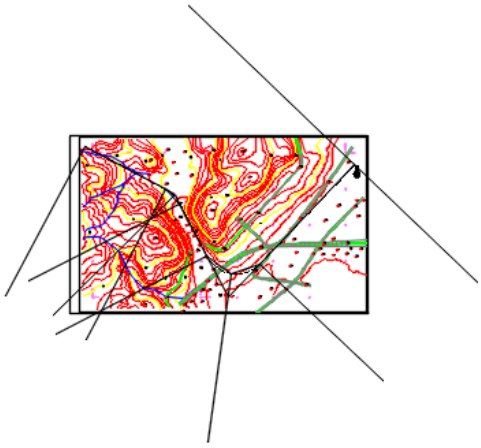




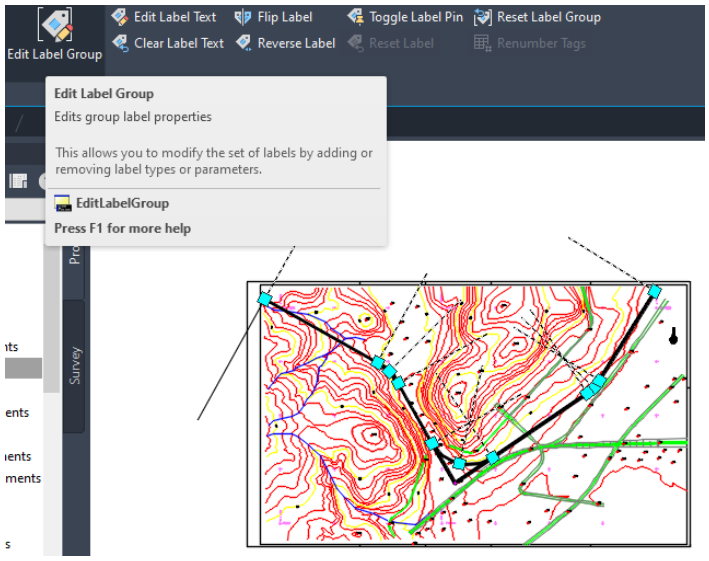
No caso de as linhas ficarem muito grandes, alterar a escala:



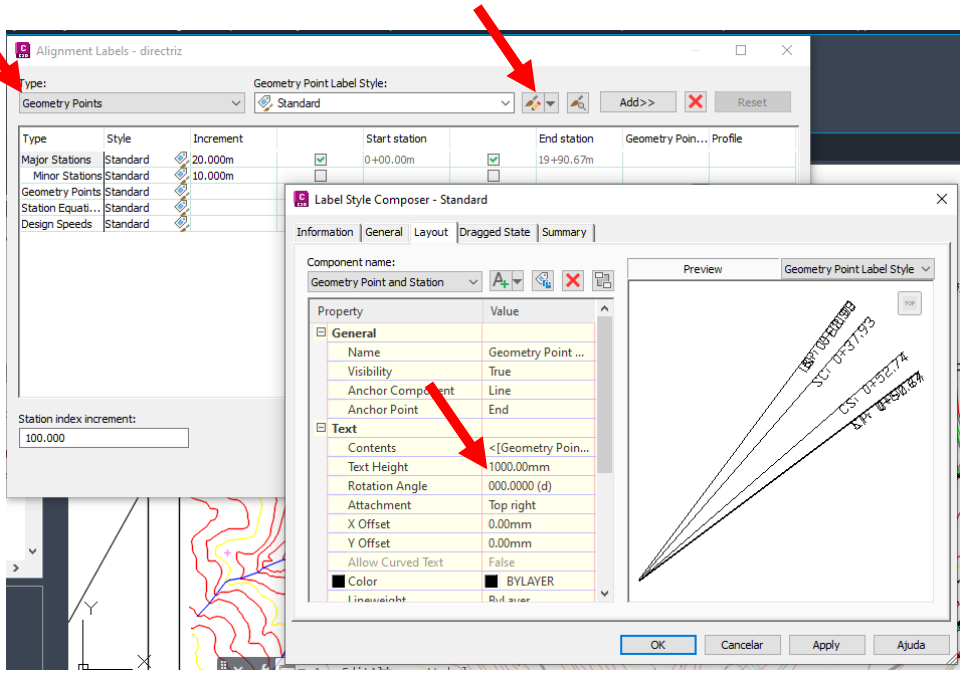


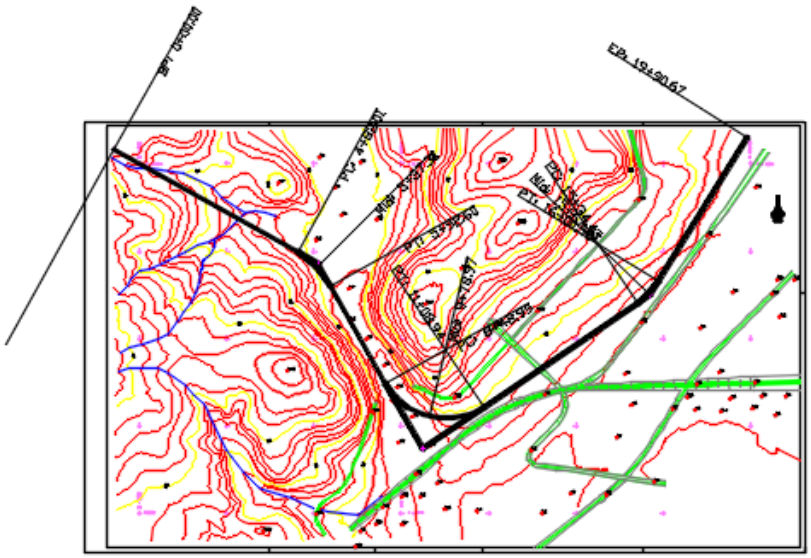


Alterar a dimensão dos textos: seleccionar o alinhamento, Edit Label Group

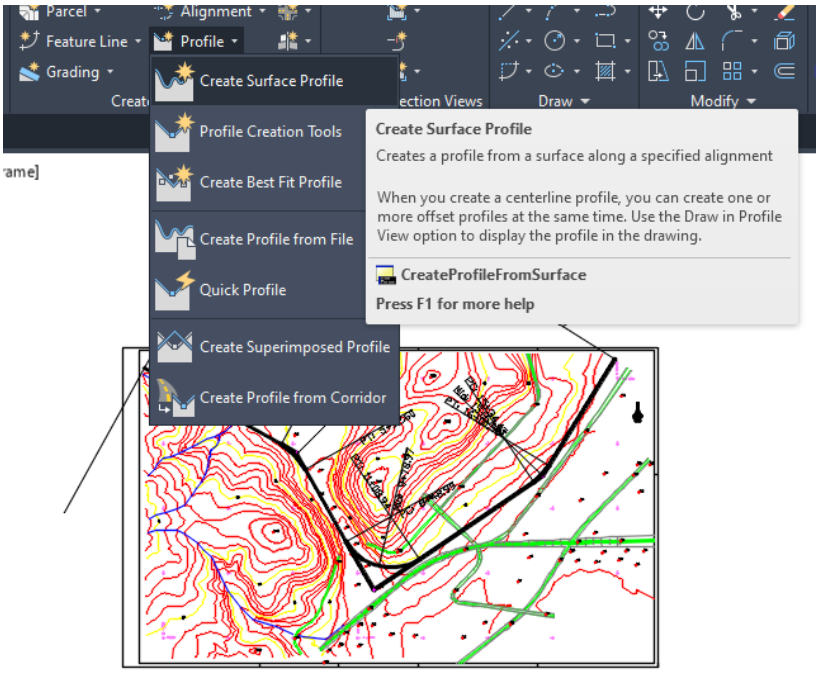


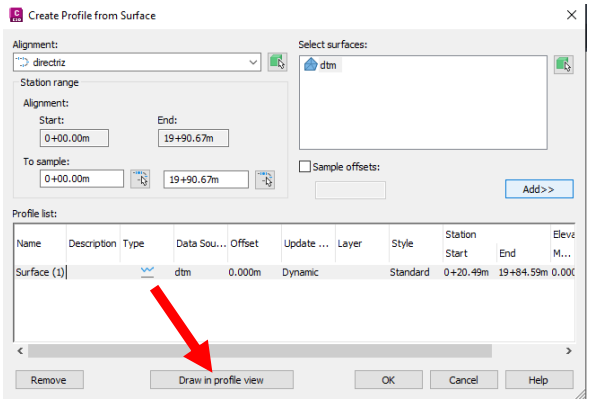
Type: Geometry Points

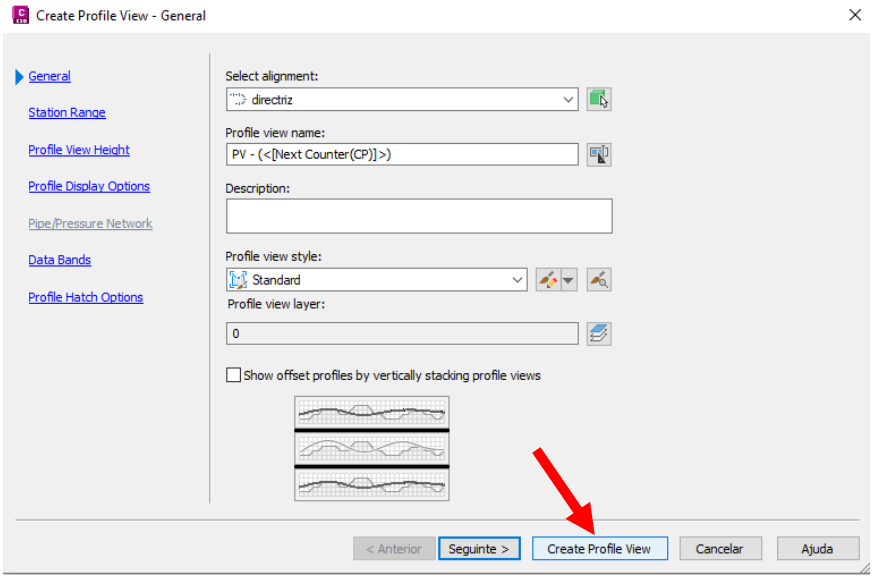


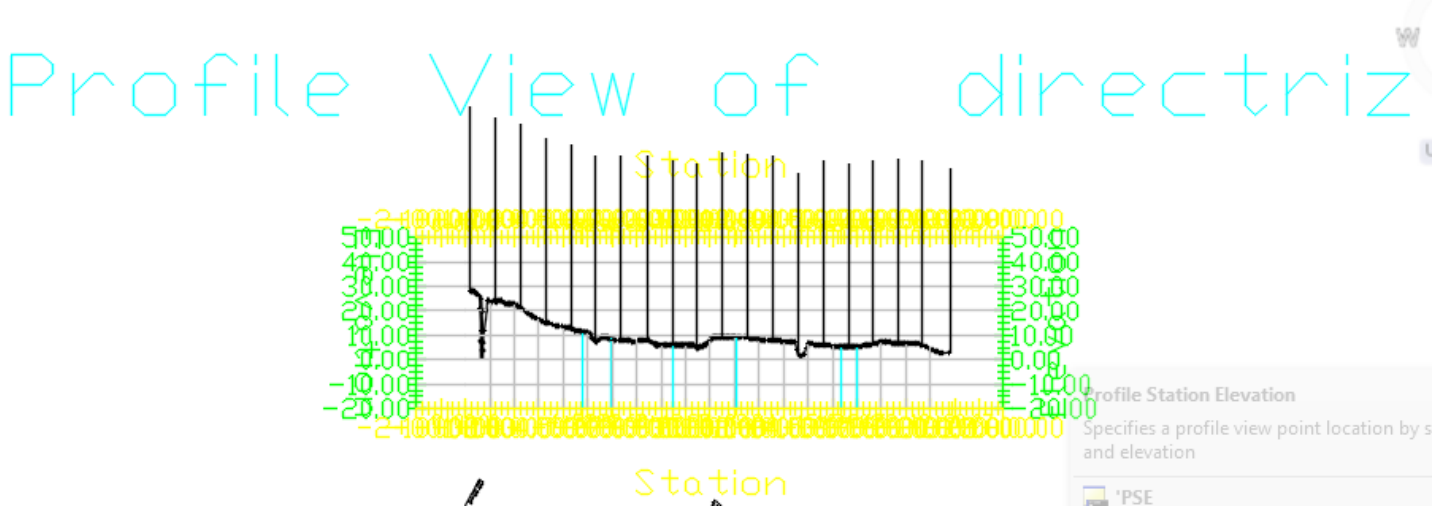


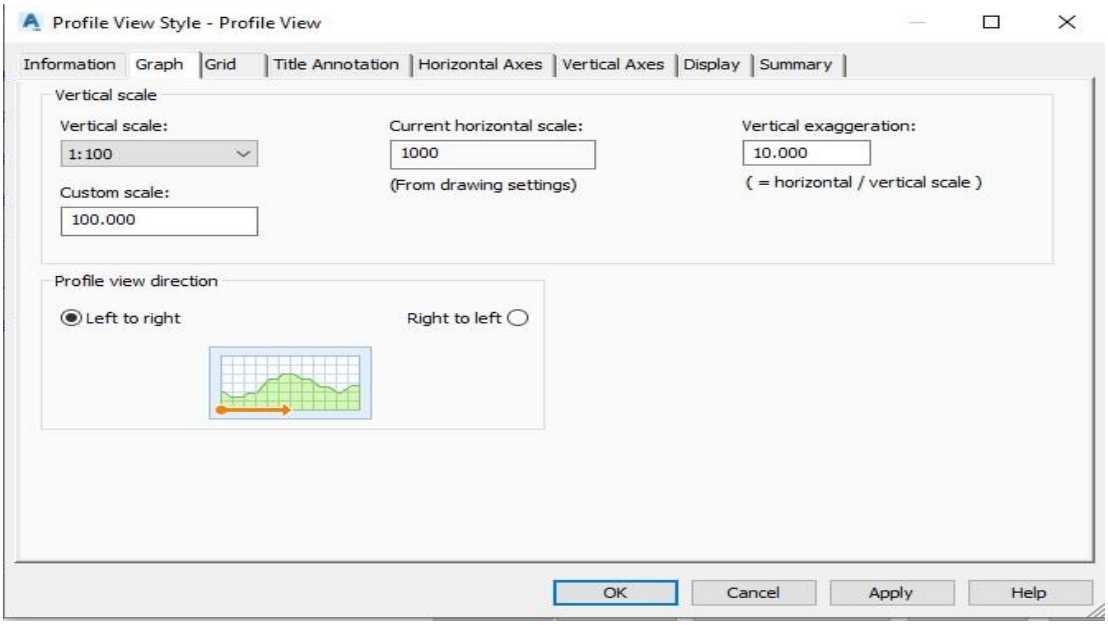
4. Gerar o perfil longitudinal do terreno ao longo do alinhamento (directriz)

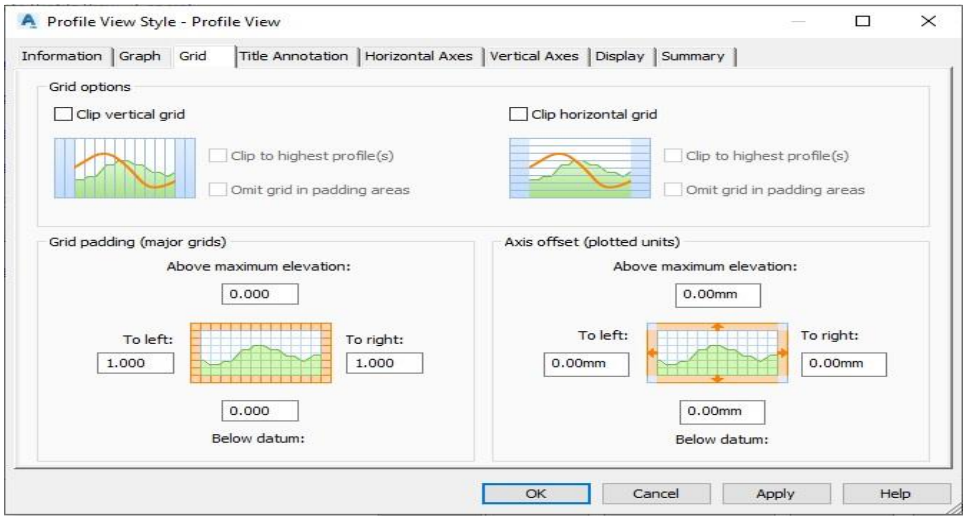


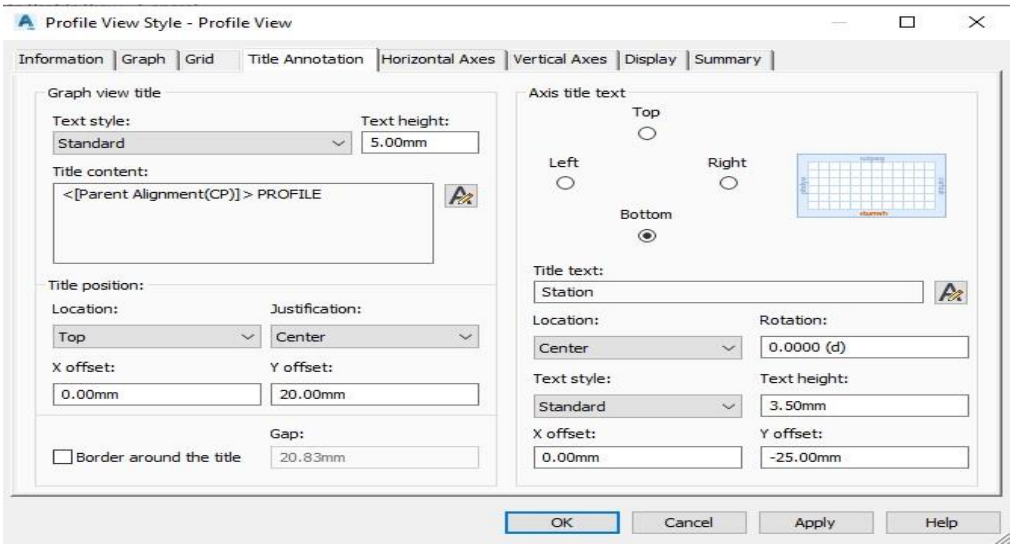







Profile View Style - Profile View
Information
Graph
Grid
Title Annotation
Horizontal Axes
Vertical Axes
Display
Summary
Vertical scale
Vertical scale:
1:100
Current horizontal scale:
1000
(From drawing settings)
Vertical exaggeration:
10.000
(= horizontal / vertical scale)
Custom scale:
100.000
Profile view direction
Left to right
Right to left
OK
Cancel
Apply
Help


Profile View Style - Profile View
Information
Graph
Grid
Title Annotation
Horizontal Axes
Vertical Axes
Display
Summary
Grid options
Clip vertical grid
Clip to highest profile(s)
Omit grid in padding areas
Clip horizontal grid
Clip to highest profile(s)
Omit grid in padding areas
Grid padding (major grids)
Above maximum elevation:
0.000
To left:
1.000
To right:
1.000
0.000
Below datum:
Axis offset (plotted units)
Above maximum elevation:
0.00mm
To left:
0.00mm
To right:
0.00mm
0.00mm
Below datum:
OK
Cancel
Apply
Help


Profile View Style - Profile View
Information
Graph
Grid
Title Annotation
Horizontal Axes
Vertical Axes
Display
Summary
Graph view title
Text style:
Standard
Text height:
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Title position:
Location:
Top
Justification:
Center
X offset:
0.00mm
Y offset:
20.00mm
Gap:
20.83mm
Border around the title
Axis title text
Top
Left
Right
Bottom
Title text:
Station
Location:
Center
Rotation:
0.0000 (d)
Text style:
Standard
Text height:
3.50mm
X offset:
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Y offset:
-25.00mm
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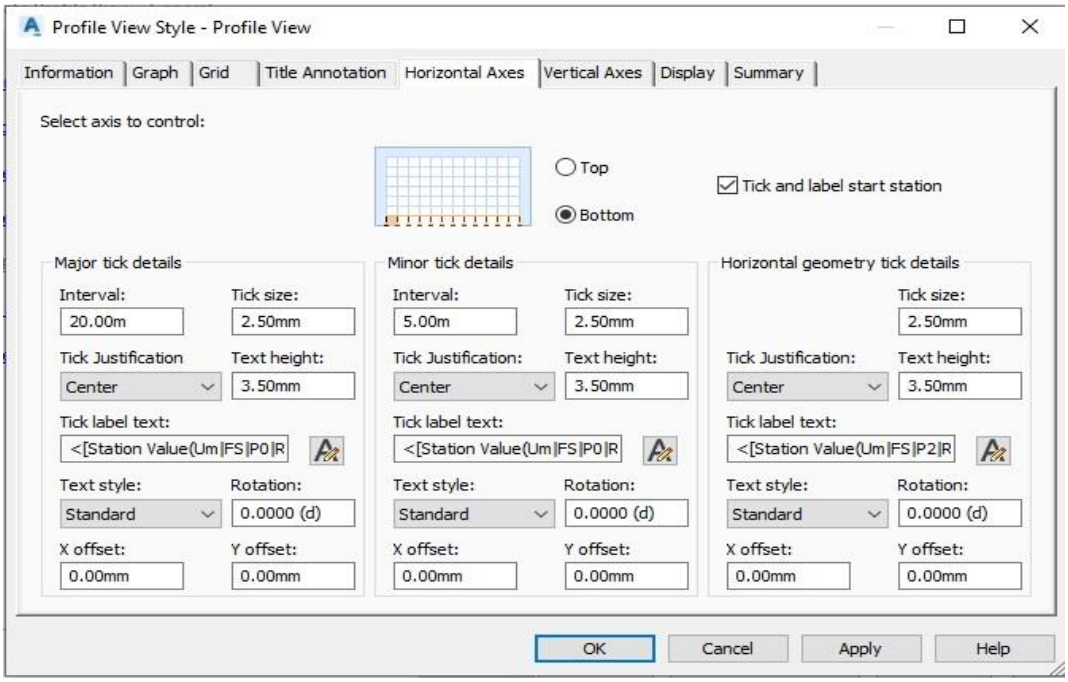
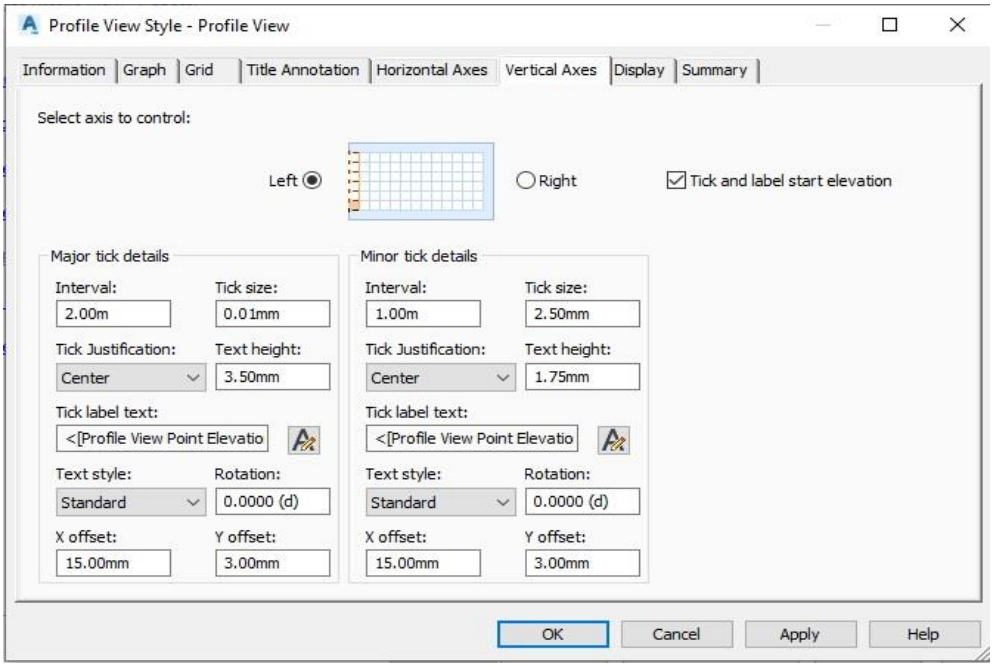
Cancel
Apply
Help





5. Introduzir trainéis; calcular os declives respectivos; definir desenvolvimentos das curvas verticais e calcular pontos sobre elas.