"Uso das Geotecnologias para projetos de estudos iniciais de pequenas Barragens de Terra"

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Especialista em Georreferenciamento e geoprocessamento

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CEULP/ULBRA
CENTRO UNIVERSITÁRIO LUTERANO DE PALMAS

Palmas 25 de abril de 2018

MC ENGENHARIA
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Introdução

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O objetivo inicial é passar as informações básicas sobre a execução das práticas deste curso e sobre os ambientes utilizados.

Estrutura da Apresentação

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Cada uma das etapas práticas contém um tópico “Introdução”, onde é discriminado seu contexto e finalidade. Logo depois temos o tópico “Procedimentos”, que contém enumerados cada passo da etapa.

Dentro de cada passo existem itens, cada item é a execução de uma etapa do passo da aula prática.

Base de Dados - SEPLAN/TO
Zoneamento Ecológico-Econômico - ZEE

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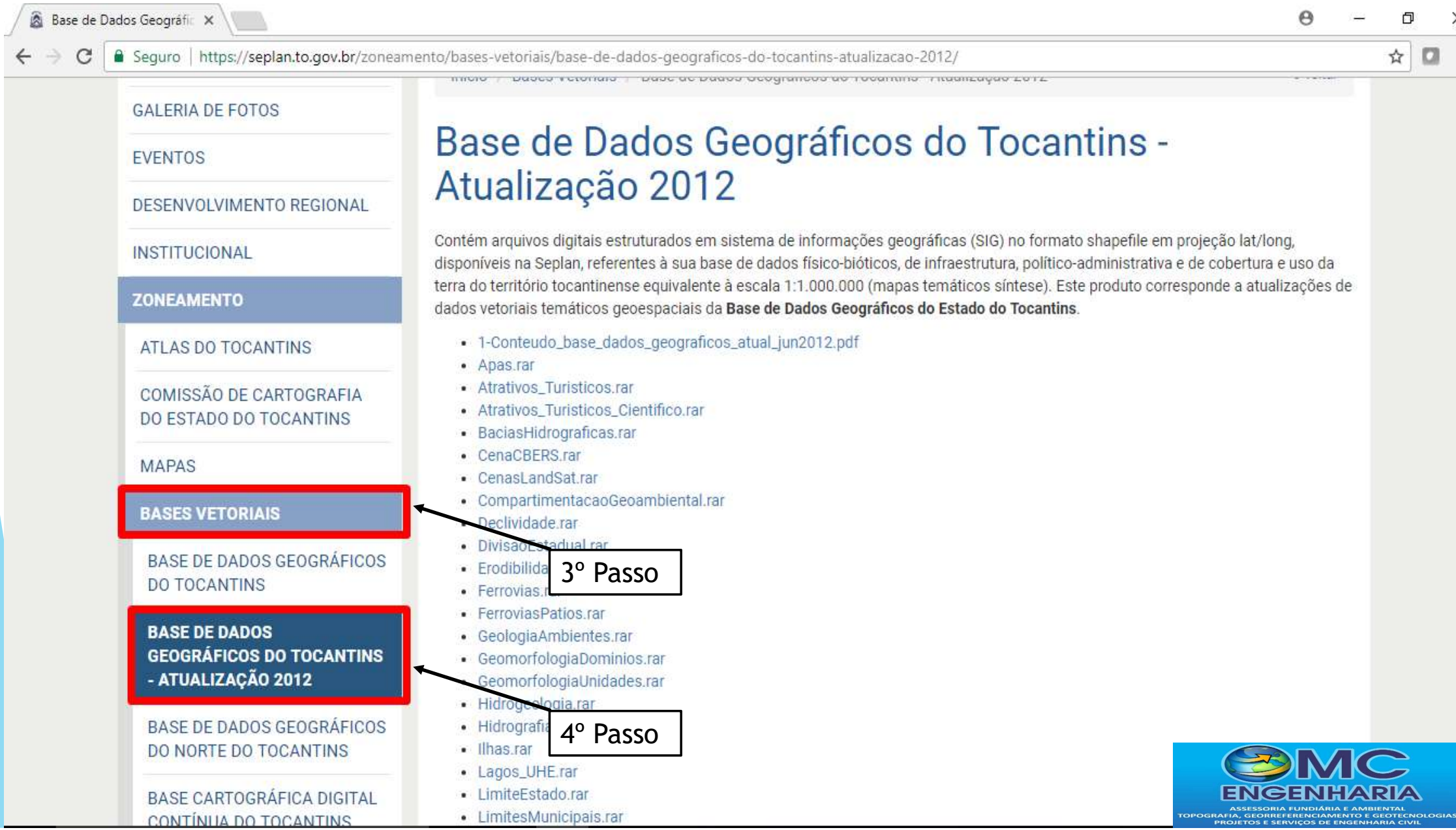
Base de Dados Geográfic
Seguro | https://seplan.to.gov.br/zoneamento/bases-vetoriais/base-de-dados-geograficos-do-tocantins-atualizacao-2012/
GALERIA DE FOTOS
EVENTOS
DESENVOLVIMENTO REGIONAL
INSTITUCIONAL
ZONEAMENTO
ATLAS DO TOCANTINS
COMISSÃO DE CARTOGRAFIA DO ESTADO DO TOCANTINS
MAPAS
BASES VETORIAIS
BASE DE DADOS GEOGRÁFICOS DO TOCANTINS
BASE DE DADOS GEOGRÁFICOS DO TOCANTINS - ATUALIZAÇÃO 2012
BASE DE DADOS GEOGRÁFICOS DO NORTE DO TOCANTINS
BASE CARTOGRÁFICA DIGITAL CONTÍNUA DO TOCANTINS
Base de Dados Geográficos do Tocantins - Atualização 2012
Contém arquivos digitais estruturados em sistema de informações geográficas (SIG) no formato shapefile em projeção lat/long, disponíveis na Seplan, referentes à sua base de dados físico-bióticos, de infraestrutura, político-administrativa e de cobertura e uso da terra do território tocantinense equivalente à escala 1:1.000.000 (mapas temáticos síntese). Este produto corresponde a atualizações de dados vetoriais temáticos geoespaciais da Base de Dados Geográficos do Estado do Tocantins.
1-Conteudo_base_dados_geograficos_atual_jun2012.pdf
Apas.rar
Atrativos_Turisticos.rar
Atrativos_Turisticos_Cientifico.rar
BaciasHidrograficas.rar
CenaCBERS.rar
CenasLandSat.rar
CompartimentacaoGeoambiental.rar
Declividade.rar
Erodibilida
Ferrovias.r
FerroviasPatios.rar
GeologiaAmbientes.rar
GeomorfologiaDominios.rar
GeomorfologiaUnidades.rar
Hidrogeologia.rar
Hidrografia
Ilhas.rar
Lagos_UHE.rar
LimiteEstado.rar
LimitesMunicipais.rar
3º Passo
4º Passo
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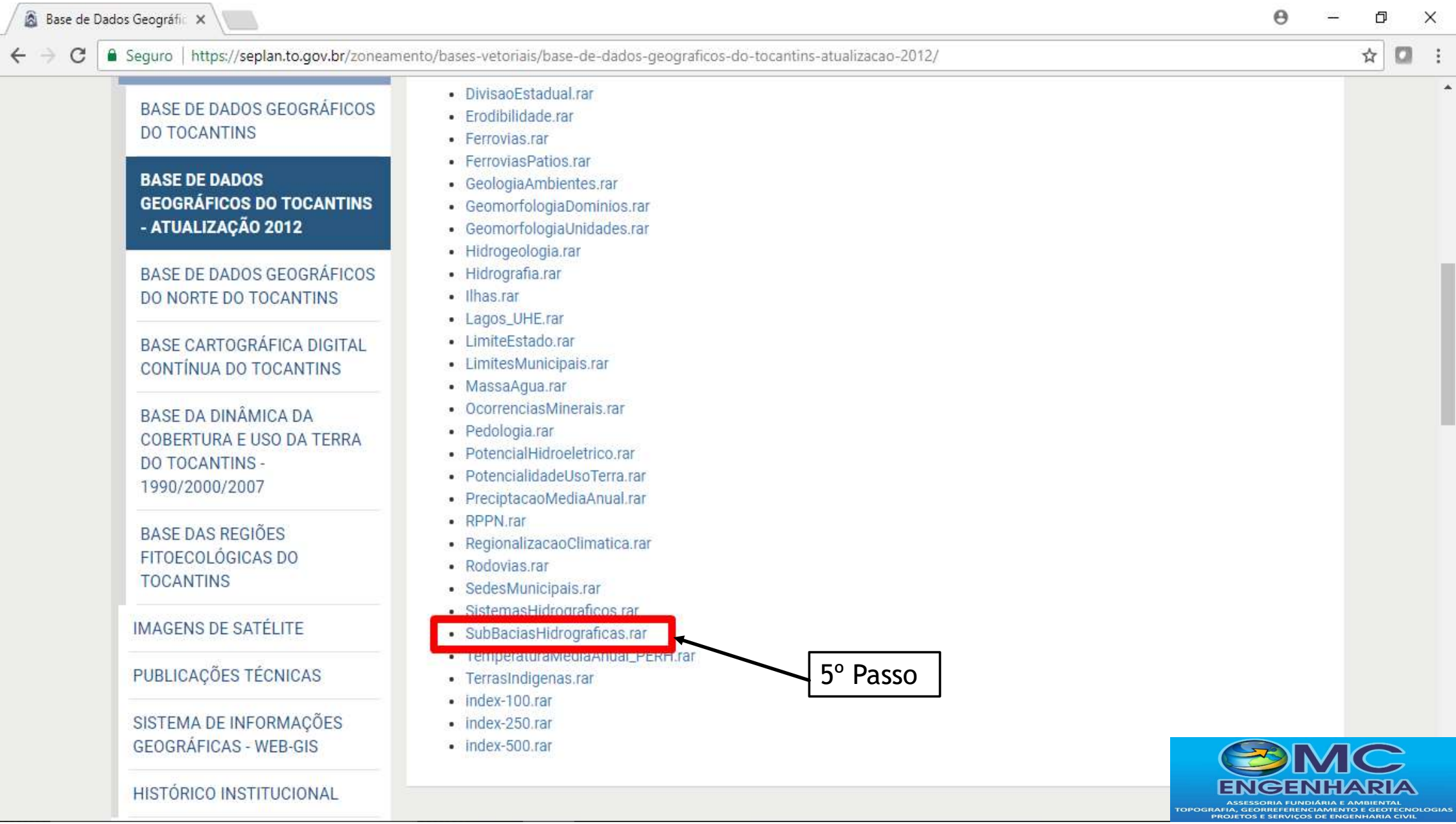
Base de Dados Geográfi
Seguro | https://seplan.to.gov.br/zoneamento/bases-vetoriais/base-de-dados-geograficos-do-tocantins-atualizacao-2012/
BASE DE DADOS GEOGRÁFICOS DO TOCANTINS
BASE DE DADOS GEOGRÁFICOS DO TOCANTINS - ATUALIZAÇÃO 2012
BASE DE DADOS GEOGRÁFICOS DO NORTE DO TOCANTINS
BASE CARTOGRÁFICA DIGITAL CONTÍNUA DO TOCANTINS
BASE DA DINÂMICA DA COBERTURA E USO DA TERRA DO TOCANTINS - 1990/2000/2007
BASE DAS REGIÕES FITOECOLÓGICAS DO TOCANTINS
IMAGENS DE SATÉLITE
PUBLICAÇÕES TÉCNICAS
SISTEMA DE INFORMAÇÕES GEOGRÁFICAS - WEB-GIS
HISTÓRICO INSTITUCIONAL
DivisaoEstadual.rar
Erodibilidade.rar
Ferrovias.rar
FerroviasPatios.rar
GeologiaAmbientes.rar
GeomorfologiaDominios.rar
GeomorfologiaUnidades.rar
Hidrogeologia.rar
Hidrografia.rar
Ilhas.rar
Lagos_UHE.rar
LimiteEstado.rar
LimitesMunicipais.rar
MassaAgua.rar
OcorrenciasMinerais.rar
Pedologia.rar
PotencialHidroeletrico.rar
PotencialidadeUsoTerra.rar
PreciptacaoMediaAnual.rar
RPPN.rar
RegionalizacaoClimatica.rar
Rodovias.rar
SedesMunicipais.rar
SistemasHidrograficos.rar
SubBaciasHidrograficas.rar
TemperaturaMediaAnual_PERH.rar
TerrasIndigenas.rar
index-100.rar
index-250.rar
index-500.rar
5º Passo

O ambiente utilizado

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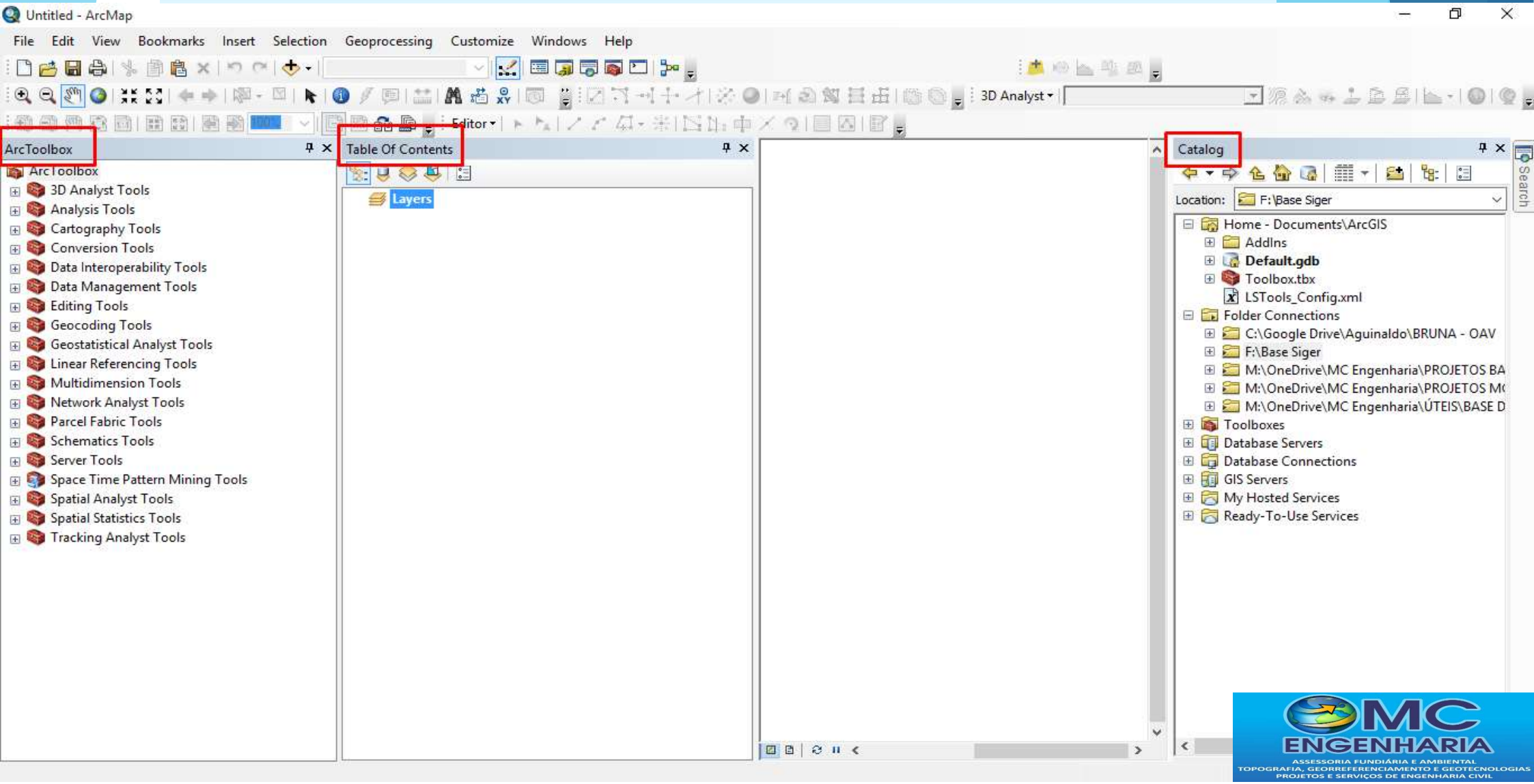
O ambiente de aprendizado das ferramentas de Sistemas de Informações Geográficas (SIG) é o *ArcGIS for Desktop 10.3*, desenvolvido pela empresa *ESRI* (http://www.esri.com). Este é o SIG mais utilizado do mercado atualmente em linhas gerais.

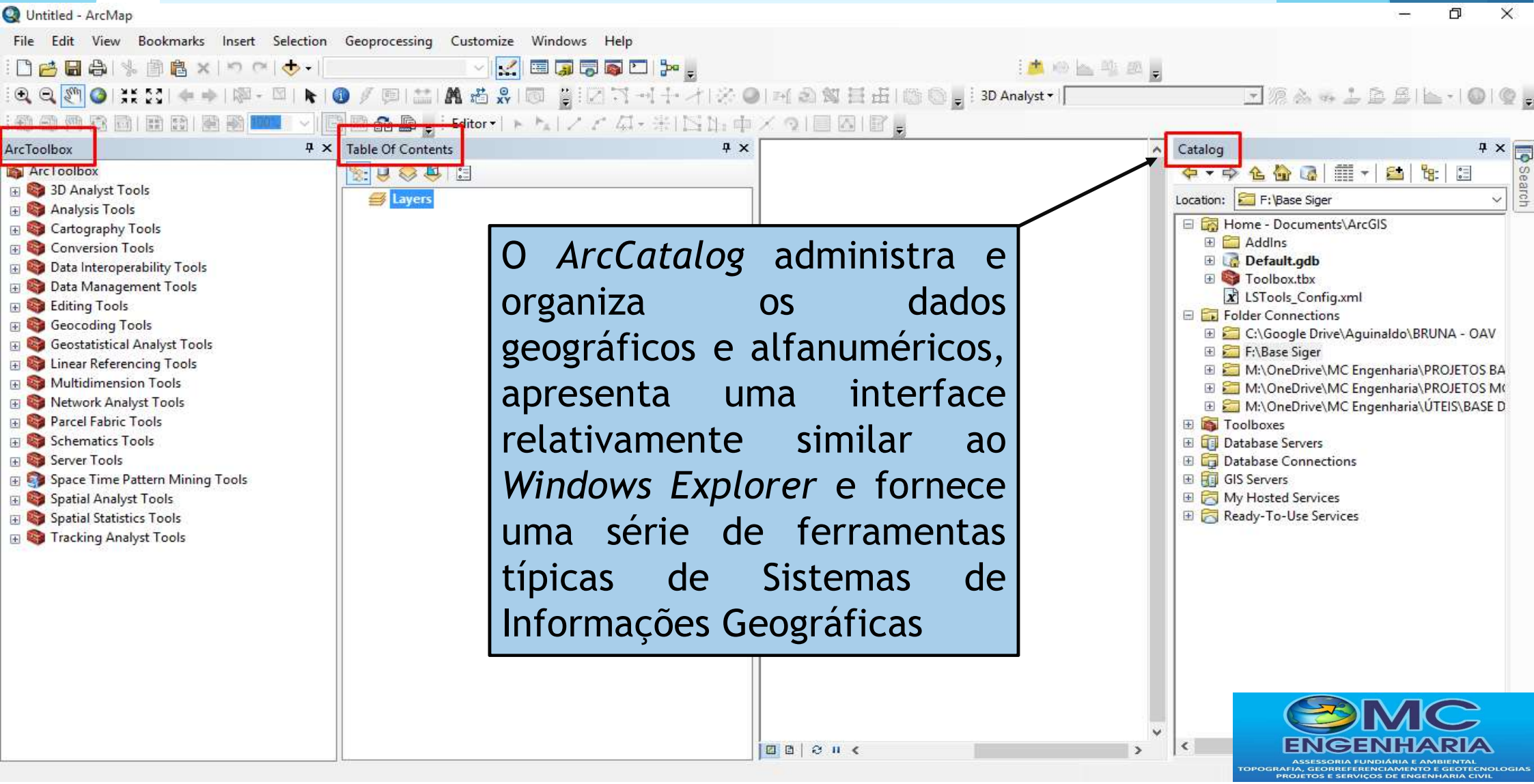
O ambiente do *ArcGIS for Desktop* é composto por diversas aplicações e extensões. Este ambiente opera sobre três licenças: *Basic*, *Standard* e *Advanced*. Os aplicativos que utilizaremos durante as práticas serão: o *ArcMap*, o *ArcCatalog* e o *ArcToolbox*, estes estarão sobre a licença *Advanced*.

Apesar do ambiente escolhido, estimula-se a exploração e o uso de outros aplicativos de Sistemas de Informações Geográficas como, por exemplo, *Spring*, *QuantumGIS*, *TerraView*, *GRASS*, *GeoMedia*, *MapInfo* e etc. Os quatro primeiros da lista são *softwares* livres.

Interface do ArcMap



Interface do ArcMap



O *ArcCatalog* administra e organiza os dados geográficos e alfanuméricos, apresenta uma interface relativamente similar ao *Windows Explorer* e fornece uma série de ferramentas típicas de Sistemas de Informações Geográficas

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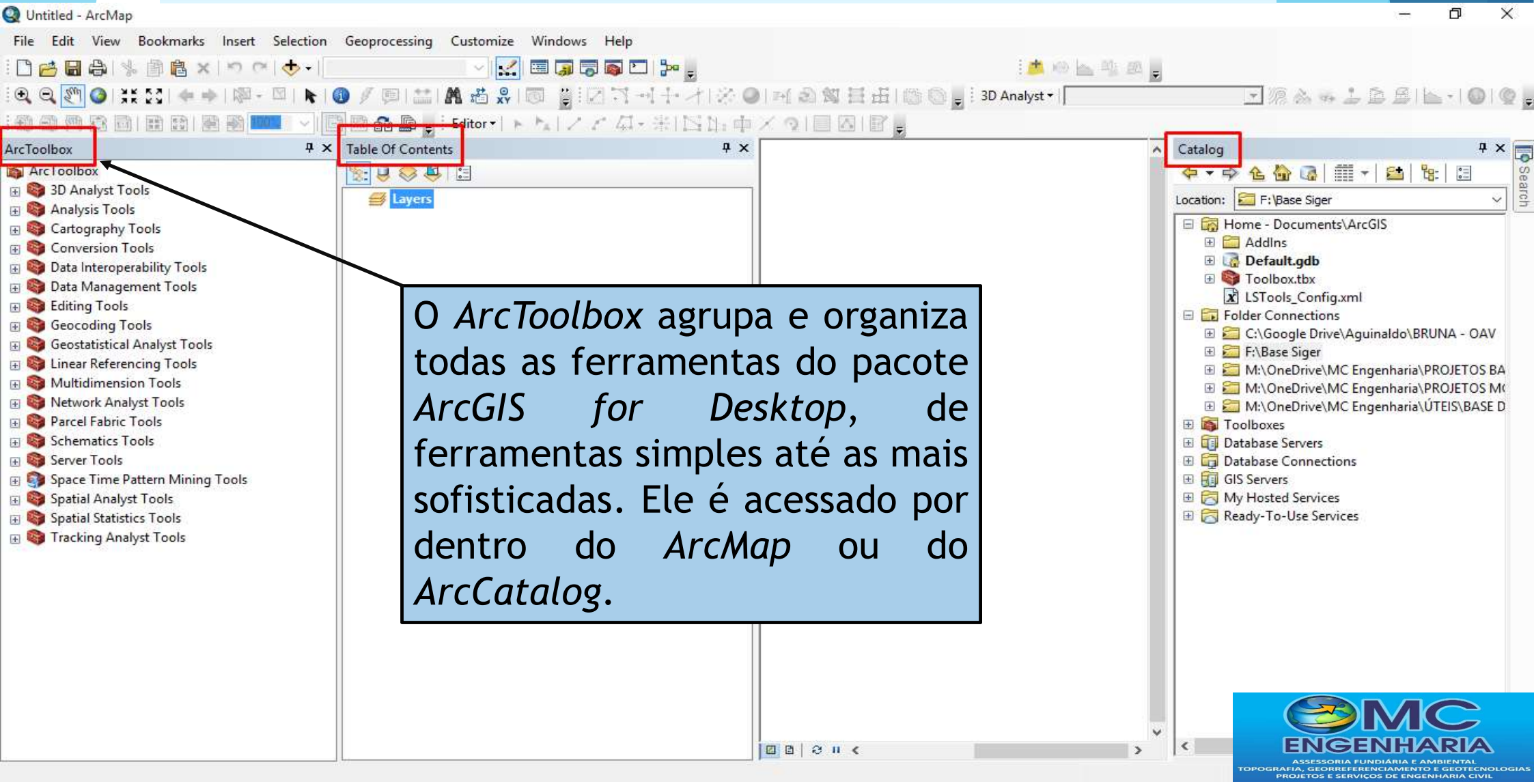
Interface do ArcMap

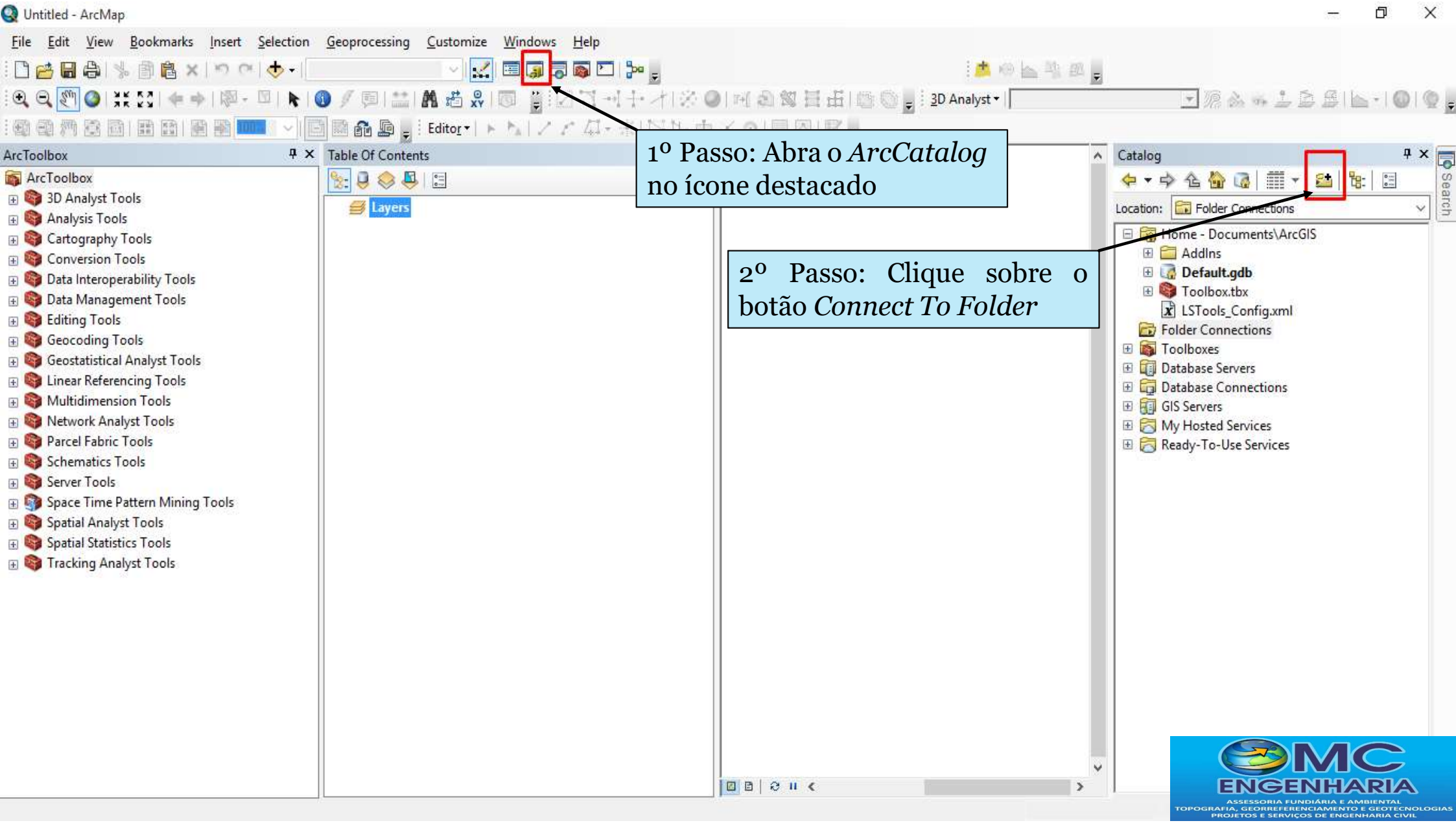


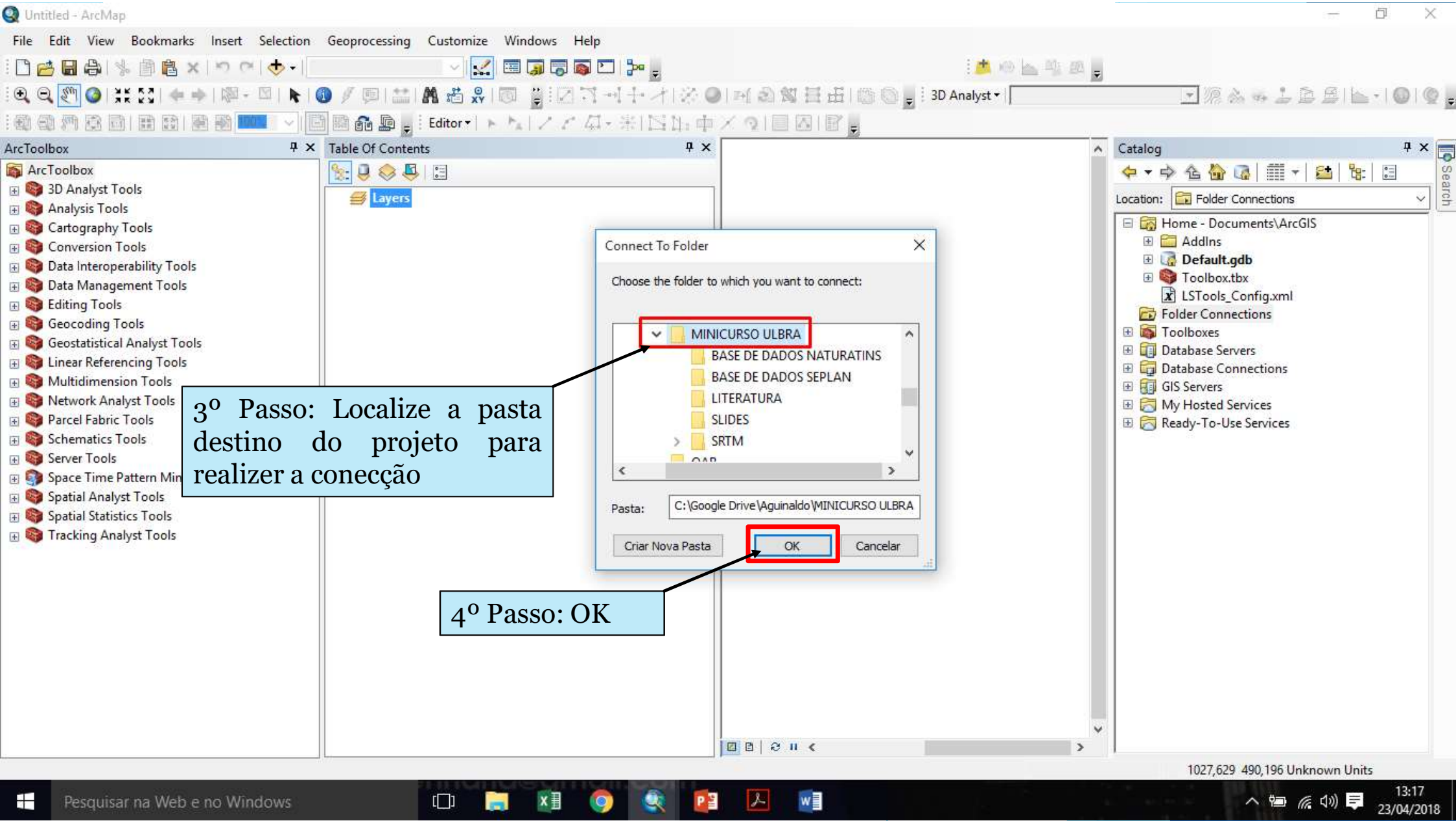
O *ArcToolbox* agrupa e organiza todas as ferramentas do pacote *ArcGIS for Desktop*, de ferramentas simples até as mais sofisticadas. Ele é acessado por dentro do *ArcMap* ou do *ArcCatalog*.

Criando a conexão à pasta

O *ArcGIS for Desktop 10.3* trabalha sobre a ótica de conexões às pastas, partições de disco, *drives* de DVD, locais na rede ou qualquer outro local acessível pelo computador. Se desejarmos acessar dados de um desses locais, precisamos realizar a operação *Connect To Folder*. Esta operação pode ser executada tanto por dentro do *ArcCatalog*ou *ArcMap* na janela *Catalog Window*, esta janela será abordada na próxima prática.

Vejamos neste passo como criar uma conexão a pasta pelo *ArcCatalog* onde estão os dados utilizados durante todo o mini-curso.




Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
ArcToolbox
ArcToolbox
3D Analyst Tools
Analysis Tools
Cartography Tools
Conversion Tools
Data Interoperability Tools
Data Management Tools
Editing Tools
Geocoding Tools
Geostatistical Analyst Tools
Linear Referencing Tools
Multidimension Tools
Network Analyst Tools
Parcel Fabric Tools
Schematics Tools
Server Tools
Space Time Pattern Min
Spatial Analyst Tools
Spatial Statistics Tools
Tracking Analyst Tools
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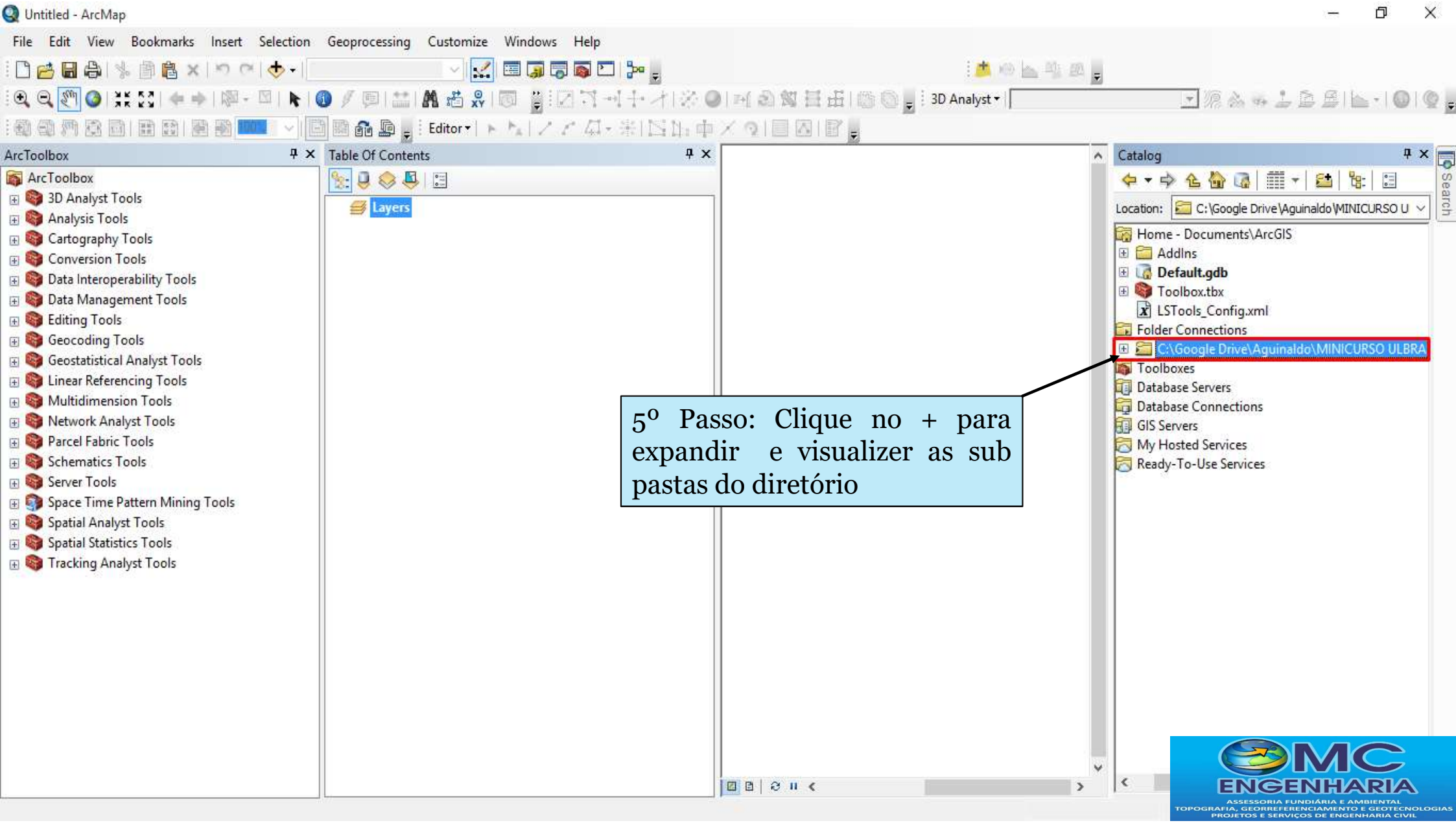
Layers
Connect To Folder
Choose the folder to which you want to connect:
MINICURSO ULBRA
BASE DE DADOS NATURATINS
BASE DE DADOS SEPLAN
LITERATURA
SLIDES
SRTM
Pasta:
C:\Google Drive\Aguinaldo\MINICURSO ULBRA
Criar Nova Pasta
OK
Cancelar
3º Passo: Localize a pasta destino do projeto para realizer a conecção
4º Passo: OK
Catalog
Location:
Folder Connections
Home - Documents\ArcGIS
AddIns
Default.gdb
Toolbox.tbx
LSTools_Config.xml
Folder Connections
Toolboxes
Database Servers
Database Connections
GIS Servers
My Hosted Services
Ready-To-Use Services
1027,629 490,196 Unknown Units
Pesquisar na Web e no Windows
13:17
23/04/2018


Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
3D Analyst
Editor
ArcToolbox
ArcToolbox
3D Analyst Tools
Analysis Tools
Cartography Tools
Conversion Tools
Data Interoperability Tools
Data Management Tools
Editing Tools
Geocoding Tools
Geostatistical Analyst Tools
Linear Referencing Tools
Multidimension Tools
Network Analyst Tools
Parcel Fabric Tools
Schematics Tools
Server Tools
Space Time Pattern Mining Tools
Spatial Analyst Tools
Spatial Statistics Tools
Tracking Analyst Tools
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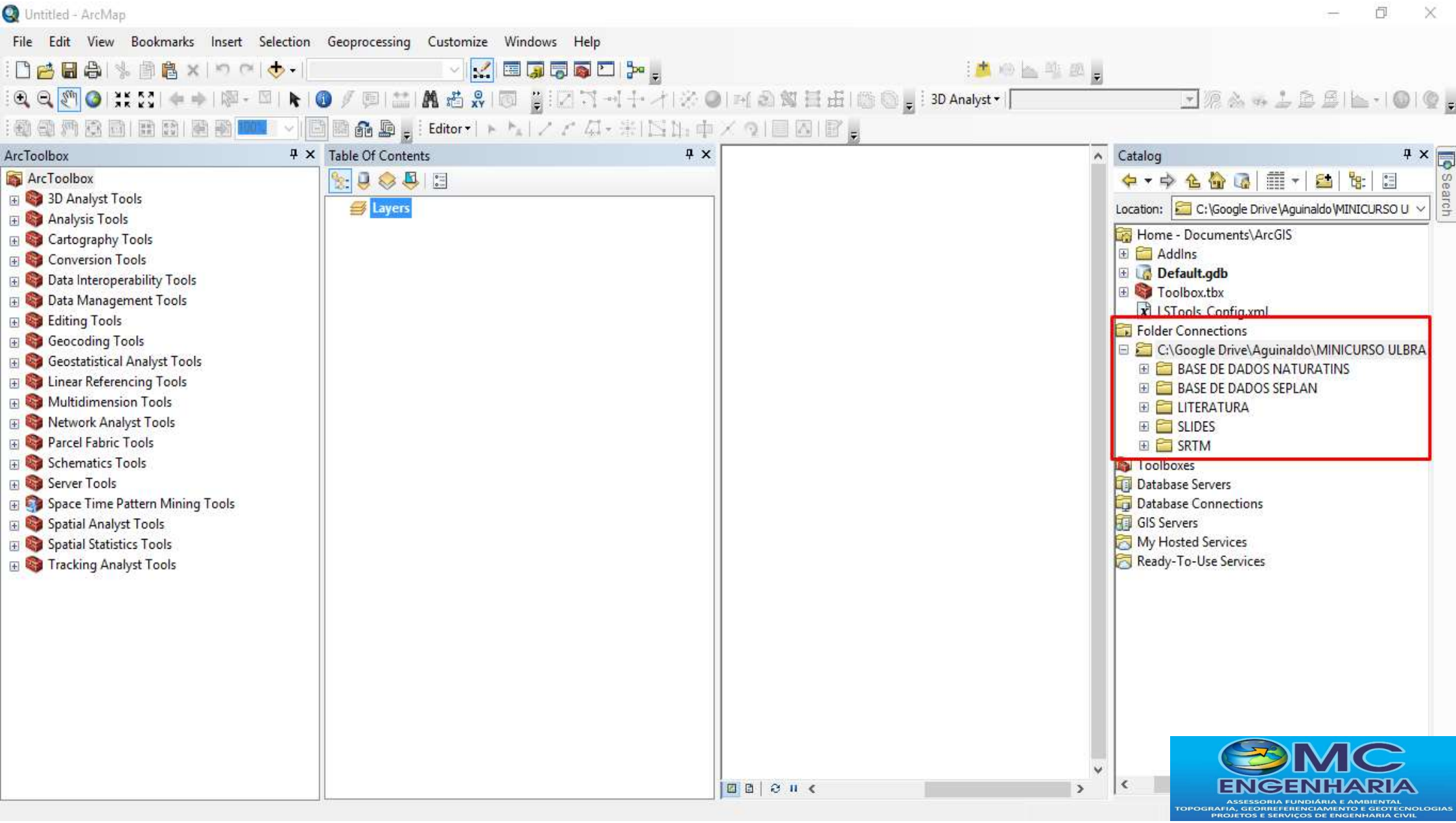
Catalog
Location: C:\Google Drive\Aguinaldo\MINICURSO U
Home - Documents\ArcGIS
AddIns
Default.gdb
Toolbox.tbx
LSTools_Config.xml
Folder Connections
C:\Google Drive\Aguinaldo\MINICURSO ULBRA
Toolboxes
Database Servers
Database Connections
GIS Servers
My Hosted Services
Ready-To-Use Services
Search
5º Passo: Clique no + para expandir e visualizer as sub pastas do diretório



Adicionar e remover dados

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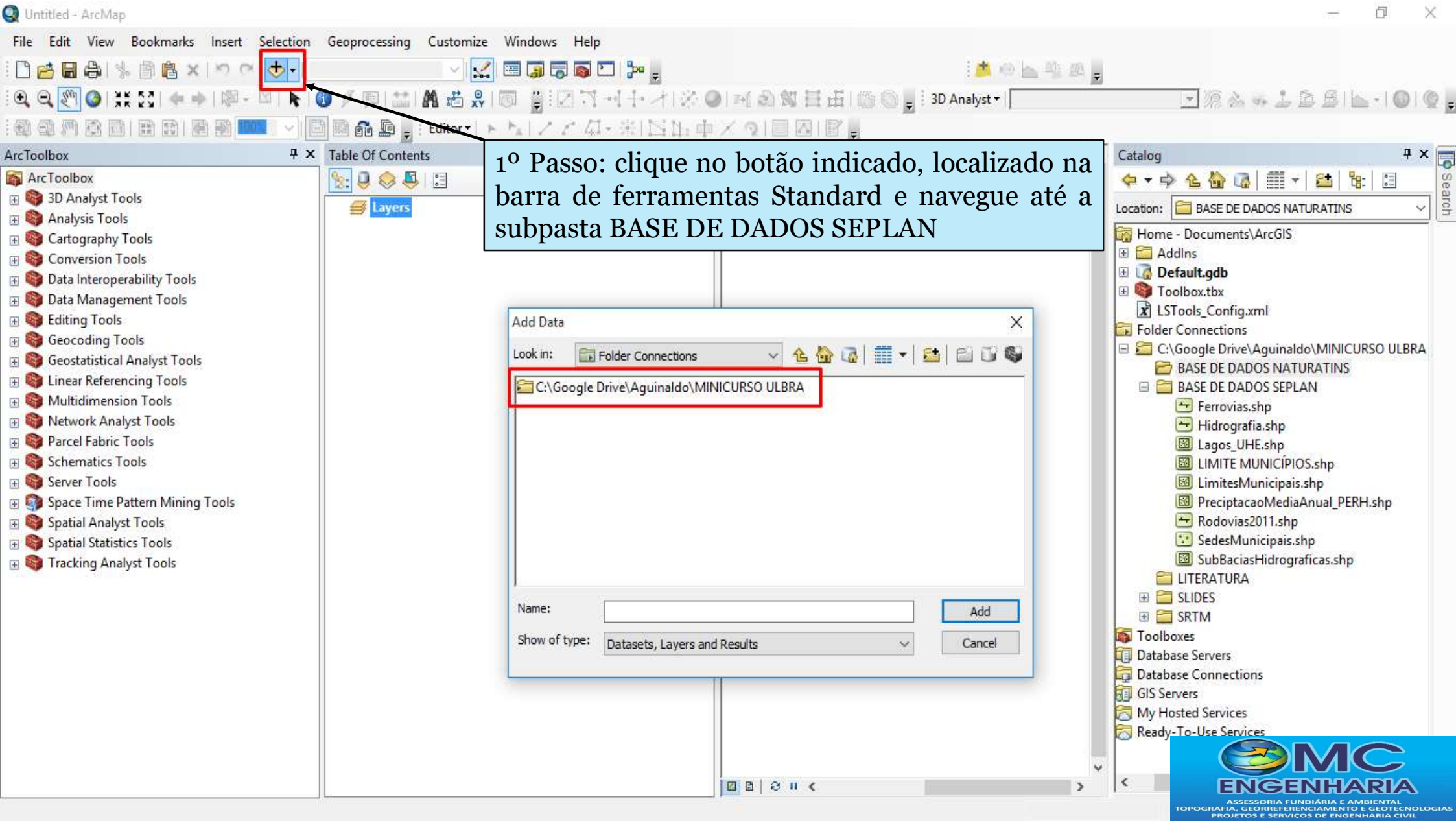

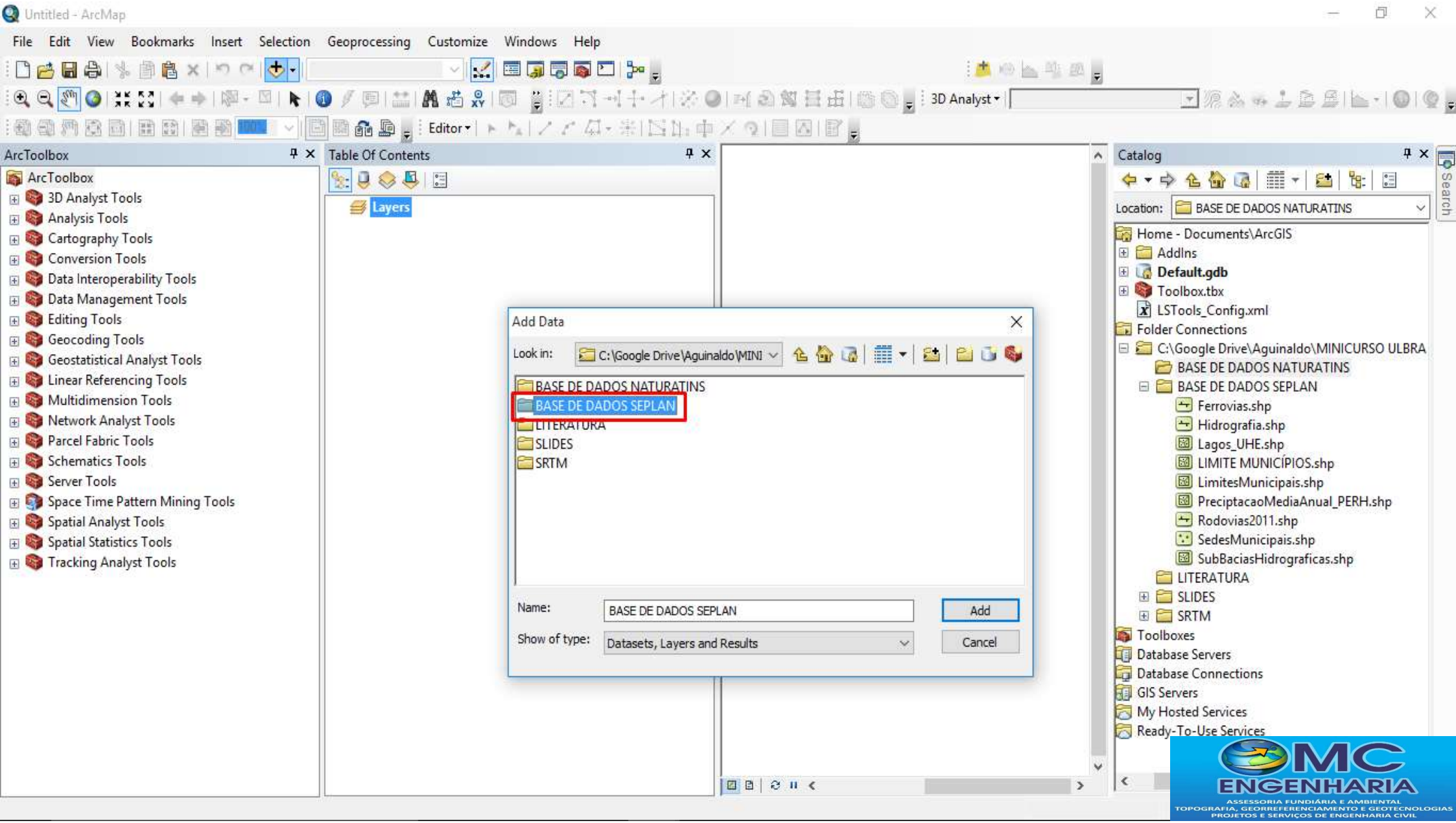

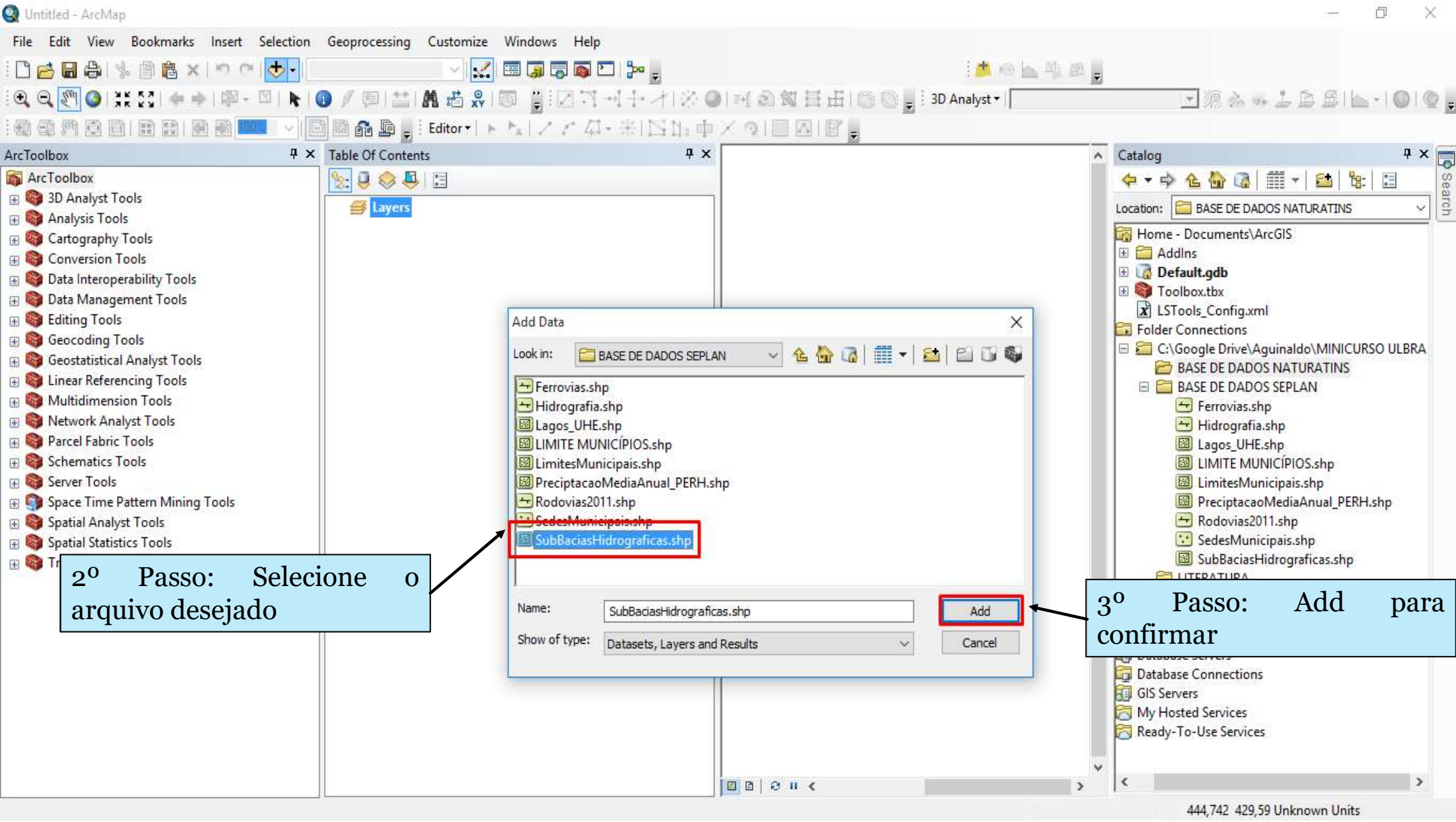
Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
ArcToolbox
ArcToolbox
3D Analyst Tools
Analysis Tools
Cartography Tools
Conversion Tools
Data Interoperability Tools
Data Management Tools
Editing Tools
Geocoding Tools
Geostatistical Analyst Tools
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Spatial Statistics Tools
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Layers
Add Data
Look in: BASE DE DADOS SEPLAN
Ferrovias.shp
Hidrografia.shp
Lagos_UHE.shp
LIMITE MUNICÍPIOS.shp
LimitesMunicipais.shp
PreciptacaoMediaAnual_PERH.shp
Rodovias2011.shp
SedesMunicipais.shp
SubBaciasHidrograficas.shp
Name: SubBaciasHidrograficas.shp
Show of type: Datasets, Layers and Results
Add
Cancel
Catalog
Location: BASE DE DADOS NATURATINS
Home - Documents\ArcGIS
AddIns
Default.gdb
Toolbox.tbx
LSTools_Config.xml
Folder Connections
C:\Google Drive\Aguinaldo\MINICURSO ULBRA
BASE DE DADOS NATURATINS
BASE DE DADOS SEPLAN
Database Connections
GIS Servers
My Hosted Services
Ready-To-Use Services
2º Passo: Selecione o arquivo desejado
3º Passo: Add para confirmar
444,742 429,59 Unknown Units

Untitled - ArcMap

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:6.837.993

3D Analyst

Editor

ArcToolbox

- ArcToolbox
  - 3D Analyst Tools
  - Analysis Tools
  - Cartography Tools
  - Conversion Tools
  - Data Interoperability Tools
  - Data Management Tools
  - Editing Tools
  - Geocoding Tools
  - Geostatistical Analyst Tools
  - Linear Referencing Tools
  - Multidimension Tools
  - Network Analyst Tools
  - Parcel Fabric Tools
  - Schematics Tools
  - Server Tools
  - Space Time Pattern Mining Tools
  - Spatial Analyst Tools
  - Spatial Statistics Tools
  - Tracking Analyst Tools

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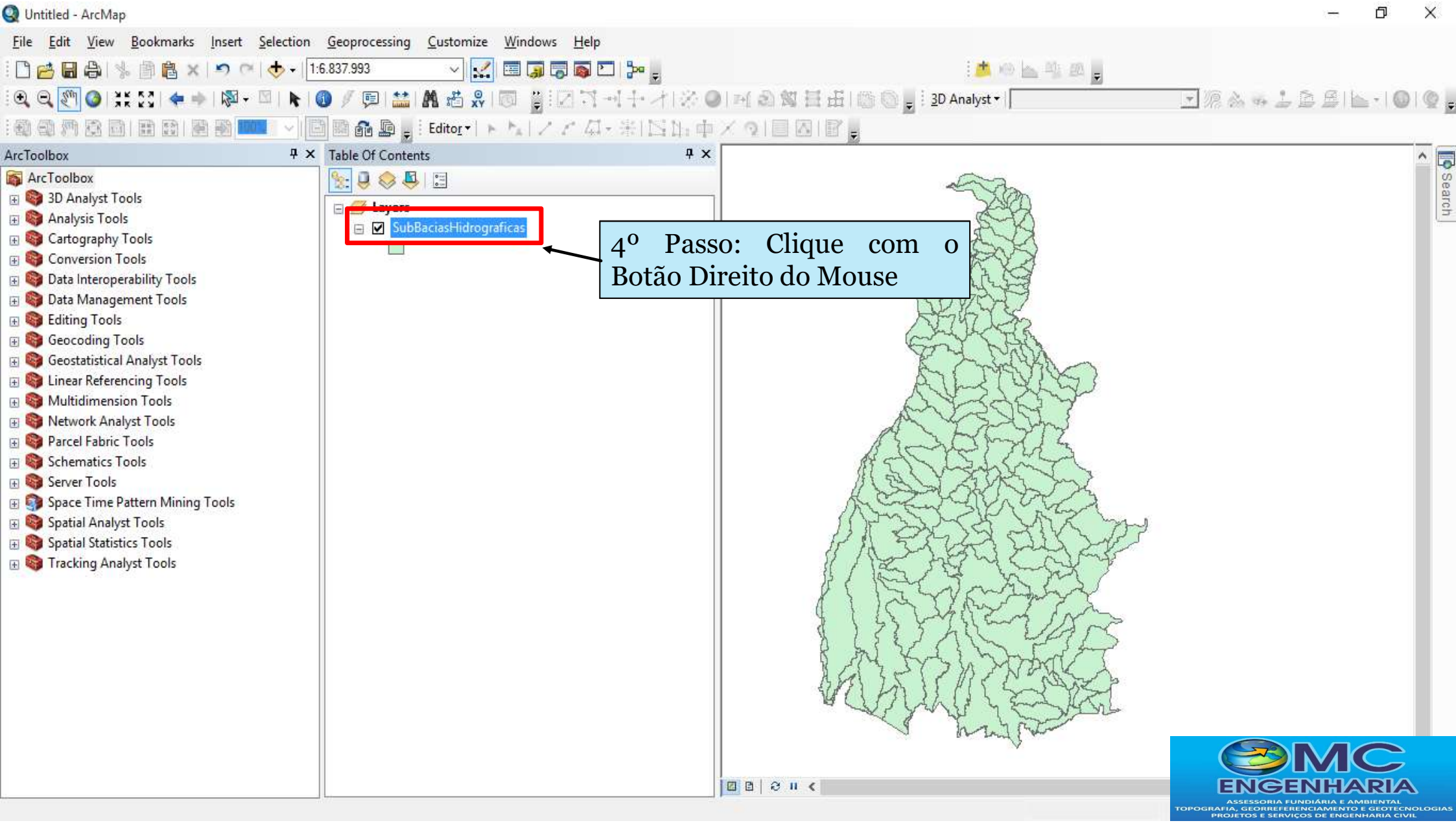
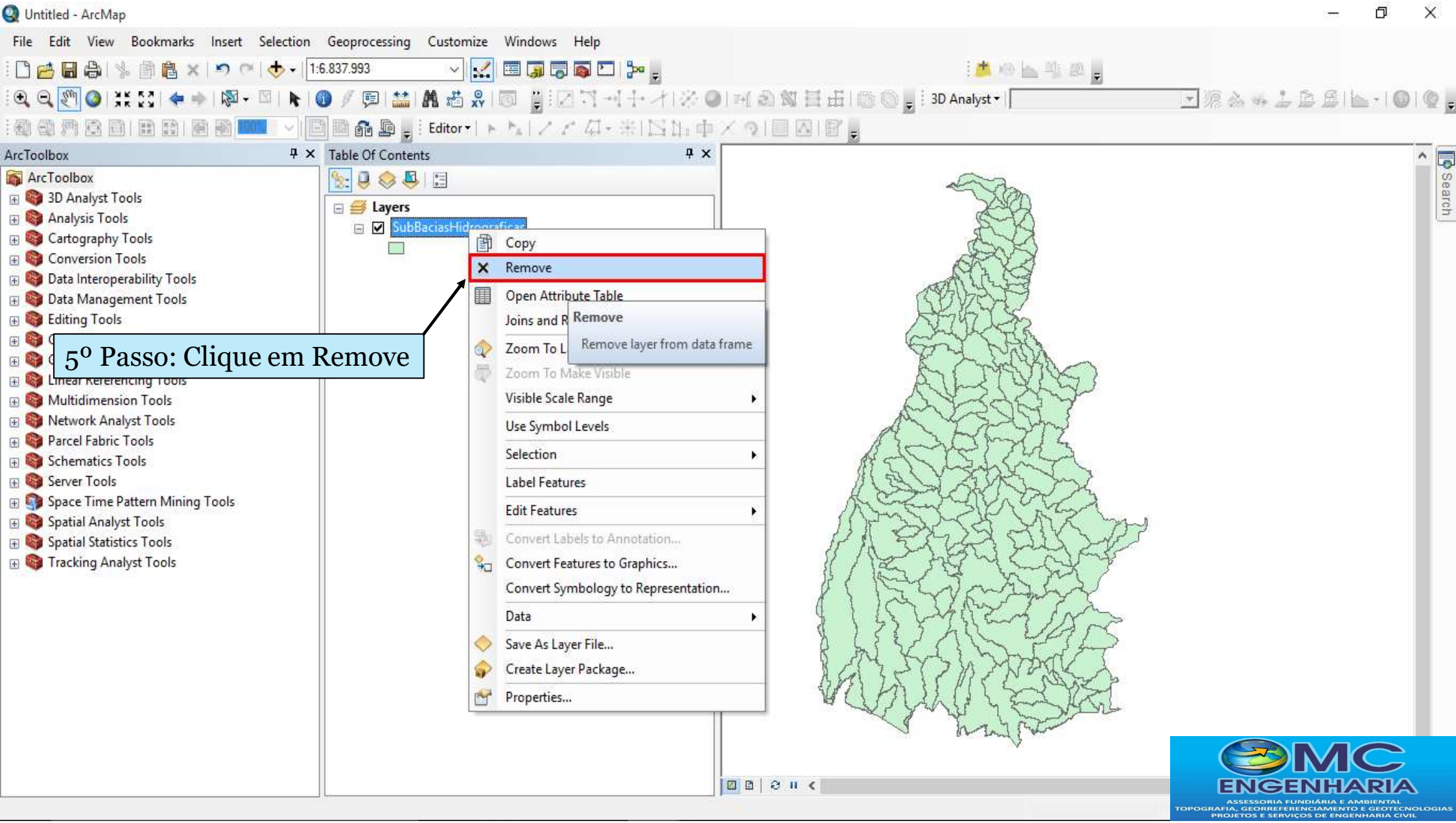
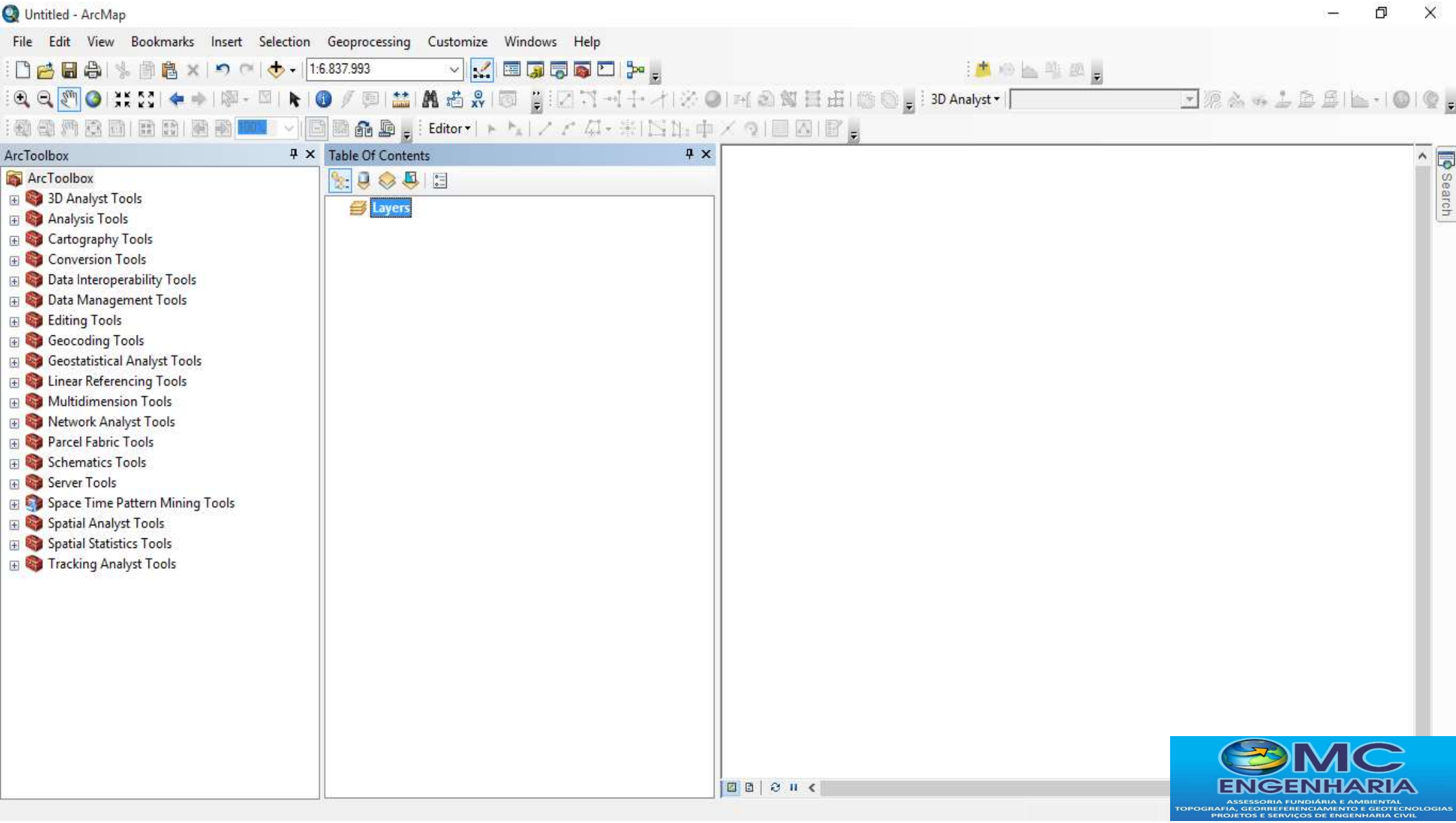
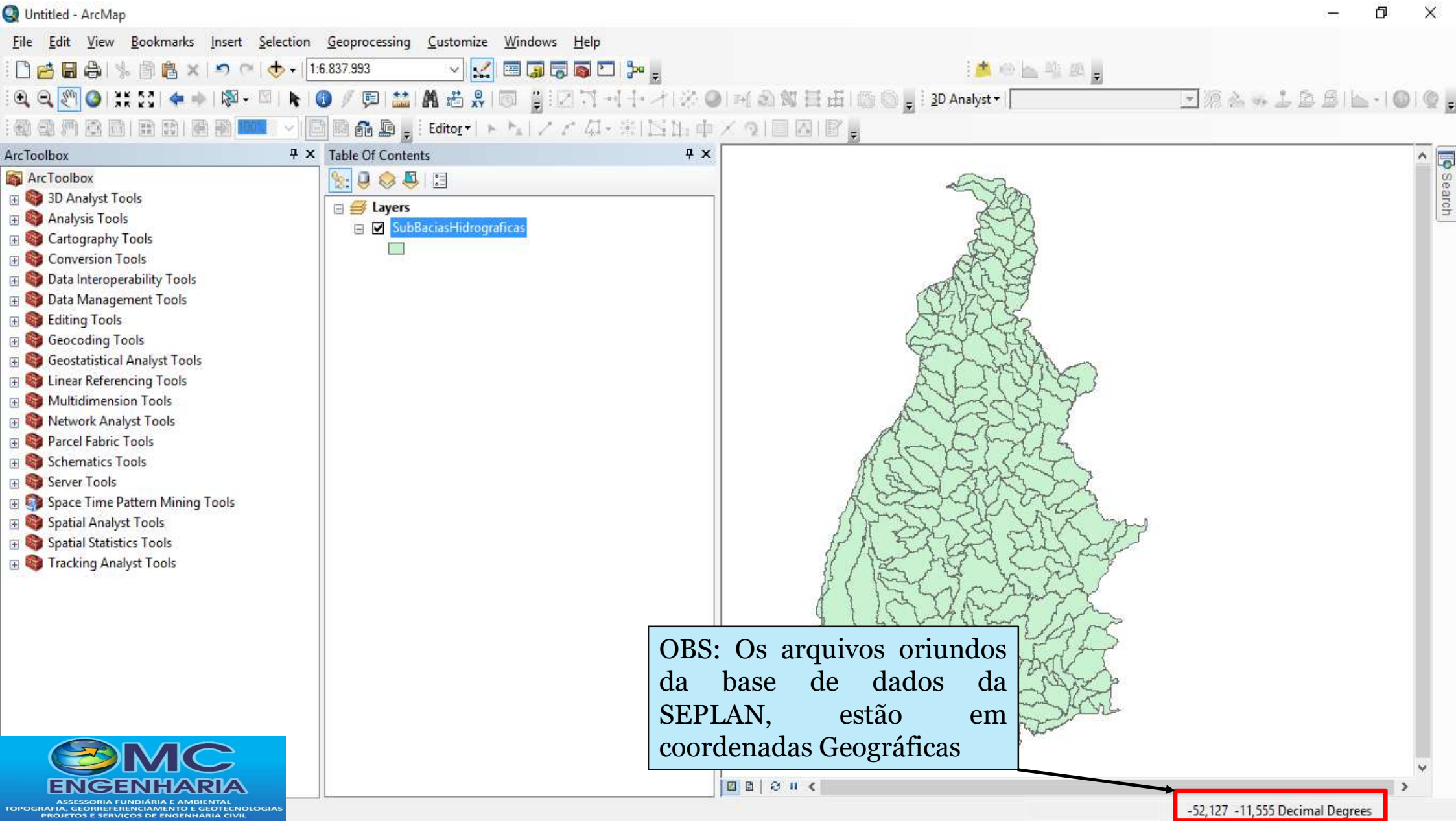
- Layers
  - SubBaciasHidrograficas

Search









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Conversão de Dados de Coordenadas Geográficas para UTM

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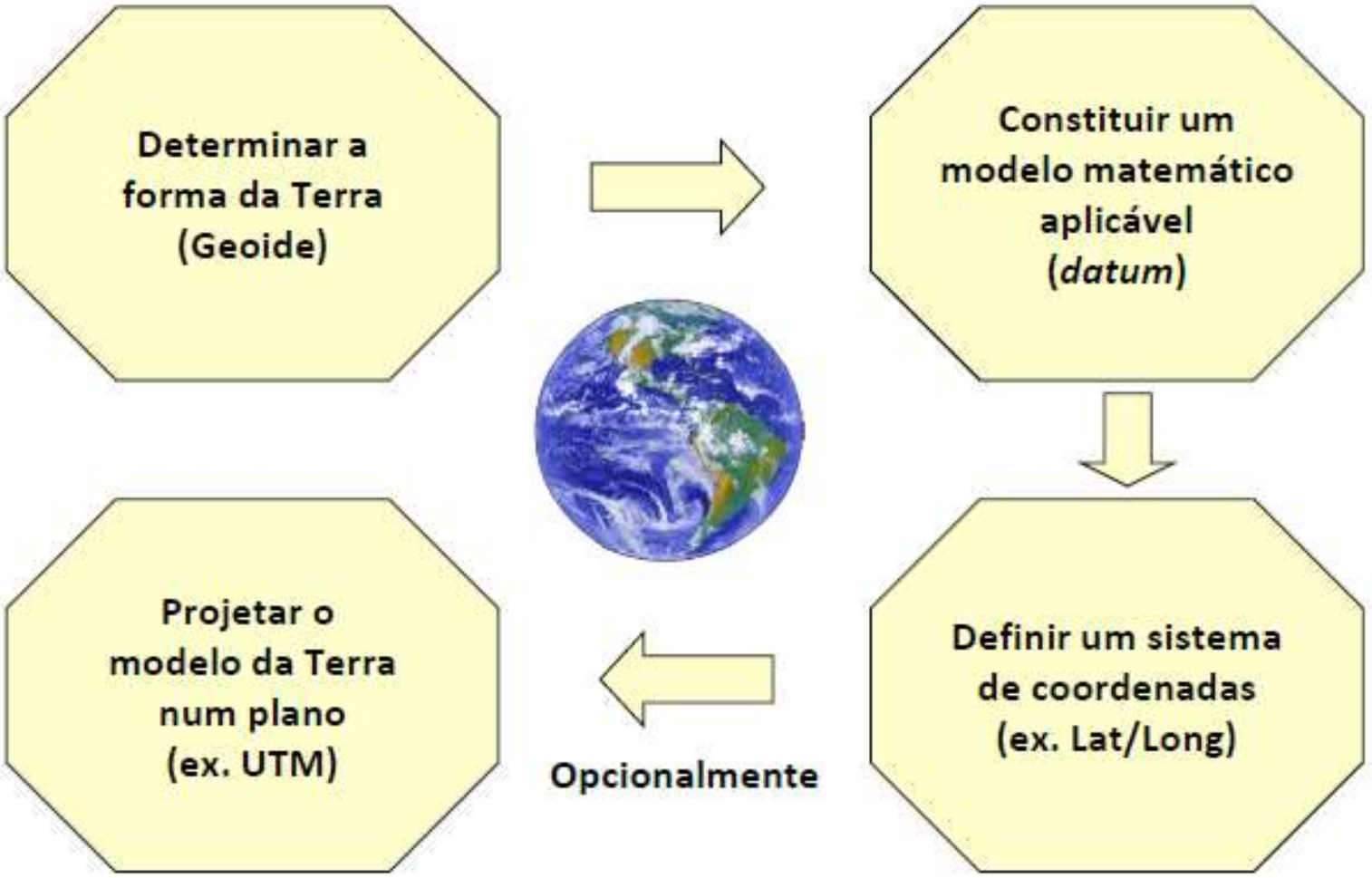
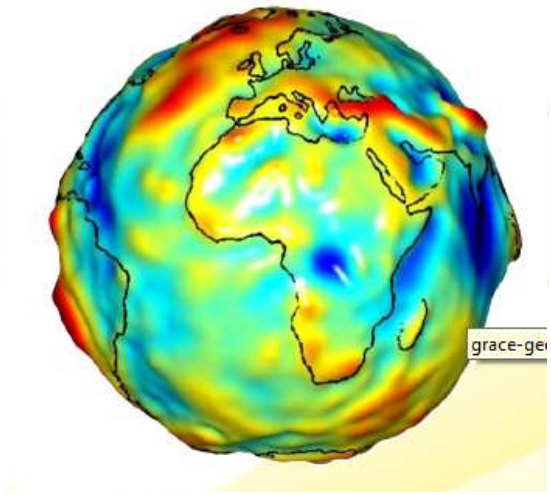




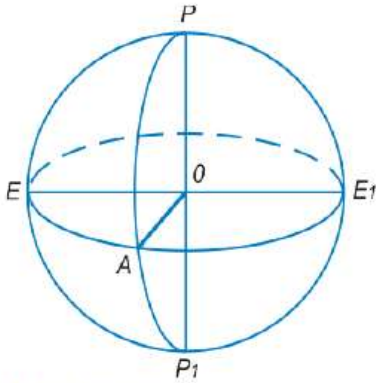
Constituir um modelo matemático aplicável (*datum*)

Definir um sistema de coordenadas (ex. Lat/Long)

Opcionalmente

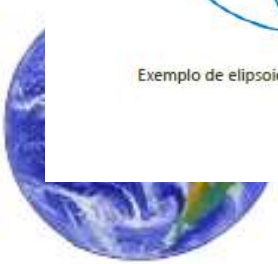
Projetar o modelo da Terra num plano (ex. UTM)

Determinar a forma da Terra (Geoide)



Exemplo de elipsoide

- Geoide é matematicamente intrincado - distância do uso prático;
- Gera-se então uma aproximação do geoide, uma forma elipsoidal;
- O elipsoide contém essencialmente dois parâmetros:
  - Raio equatorial;
  - Grau de achatamento dos polos;



Definir um sistema de coordenadas (ex. Lat/Long)

Opcionalmente

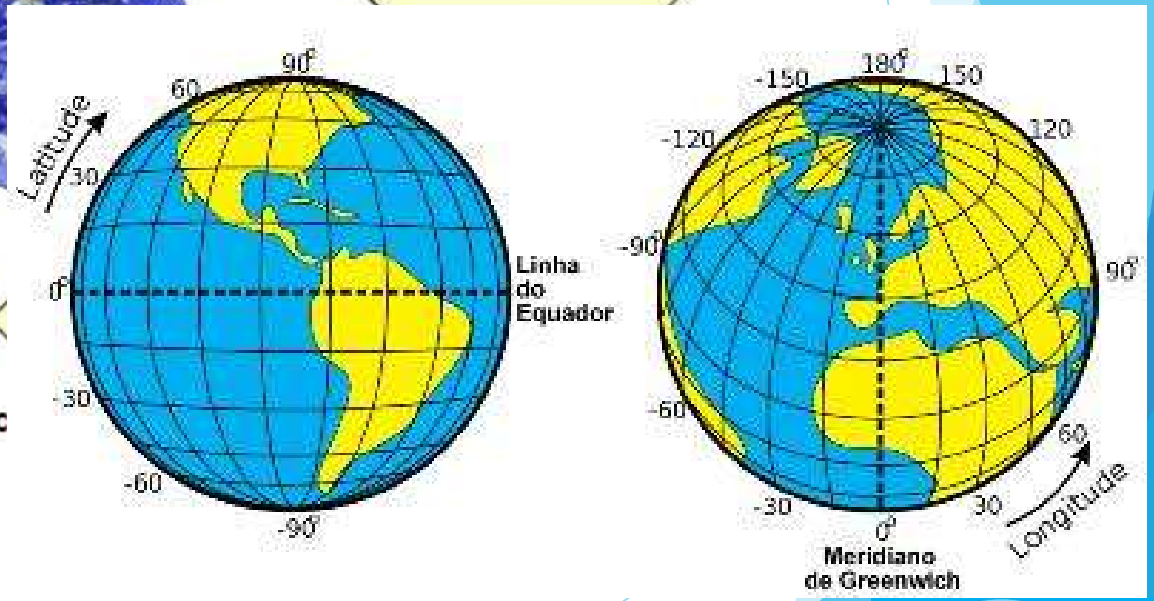
Projetar o modelo da Terra num plano (ex. UTM)

Determinar a forma da Terra (Geoide)

Constituir um modelo matemático aplicável (*datum*)

Projetar o modelo da Terra num plano (ex. UTM)

Opc



Determinar a forma da Terra (Geoide)

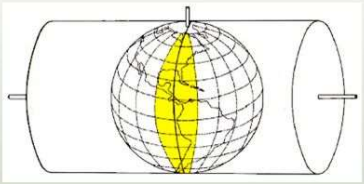
Constituir um modelo matemático aplicável (*datum*)

Definir um sistema de coordenadas (ex. Lat/Long)

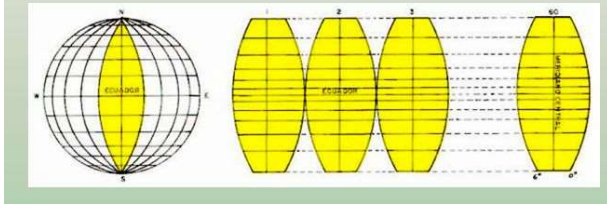
almente

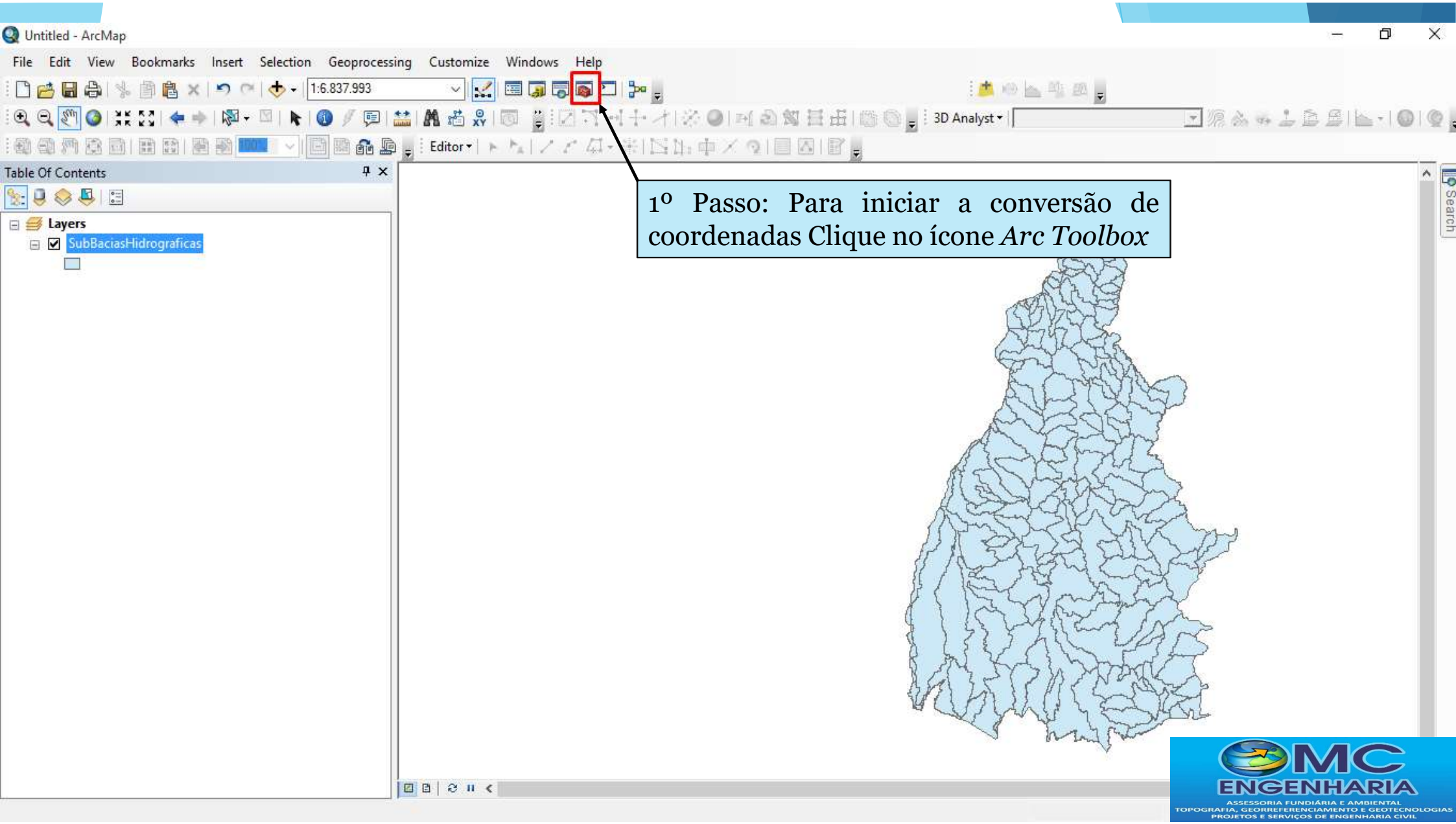
Sistema UTM

Superfície de Projeção são 60 cilindros transversos, cada um com uma amplitude de 6 graus em longitude → 60 fusos



Cada fuso possui um meridiano central, com 3 graus para cada lado





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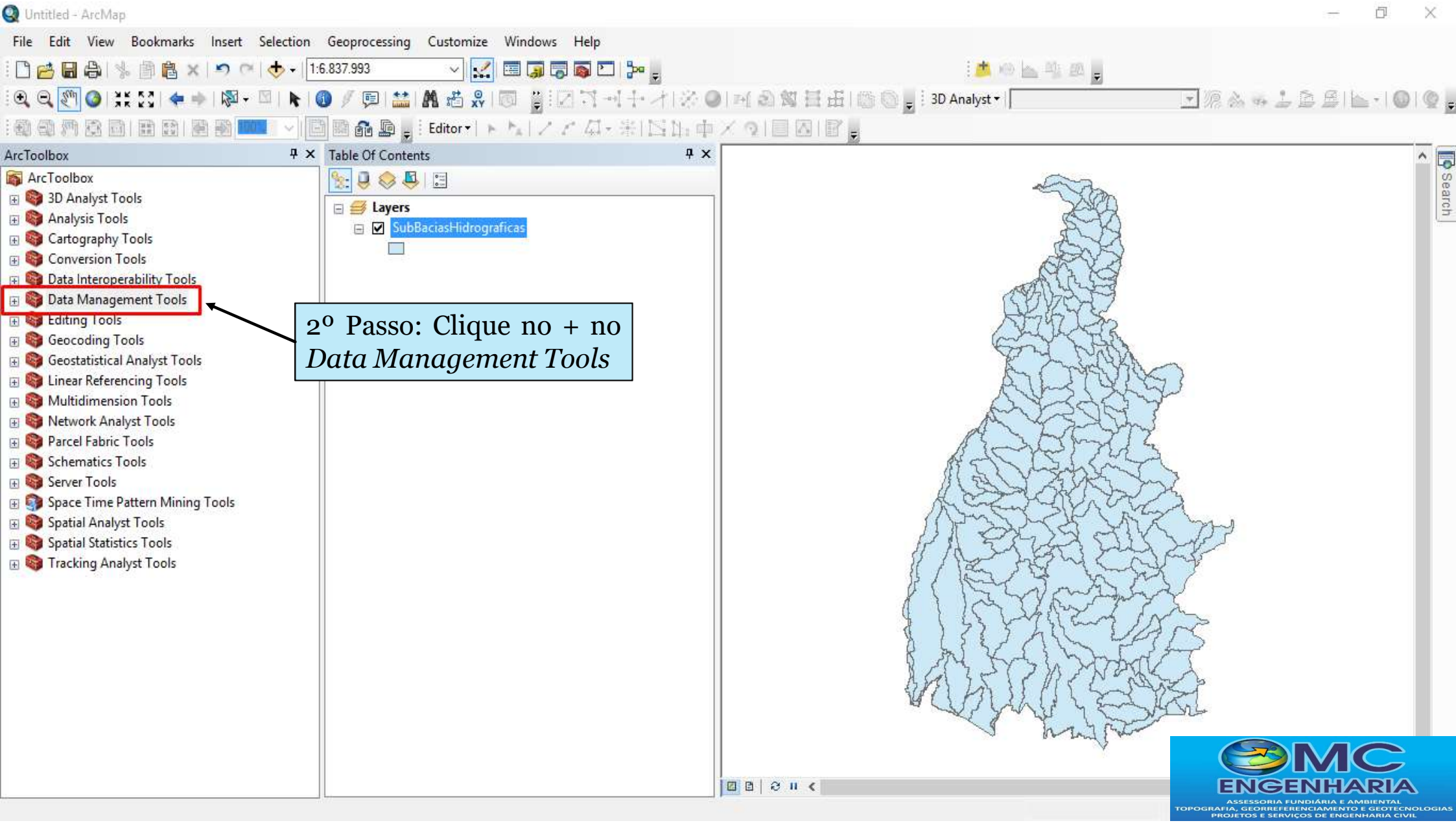
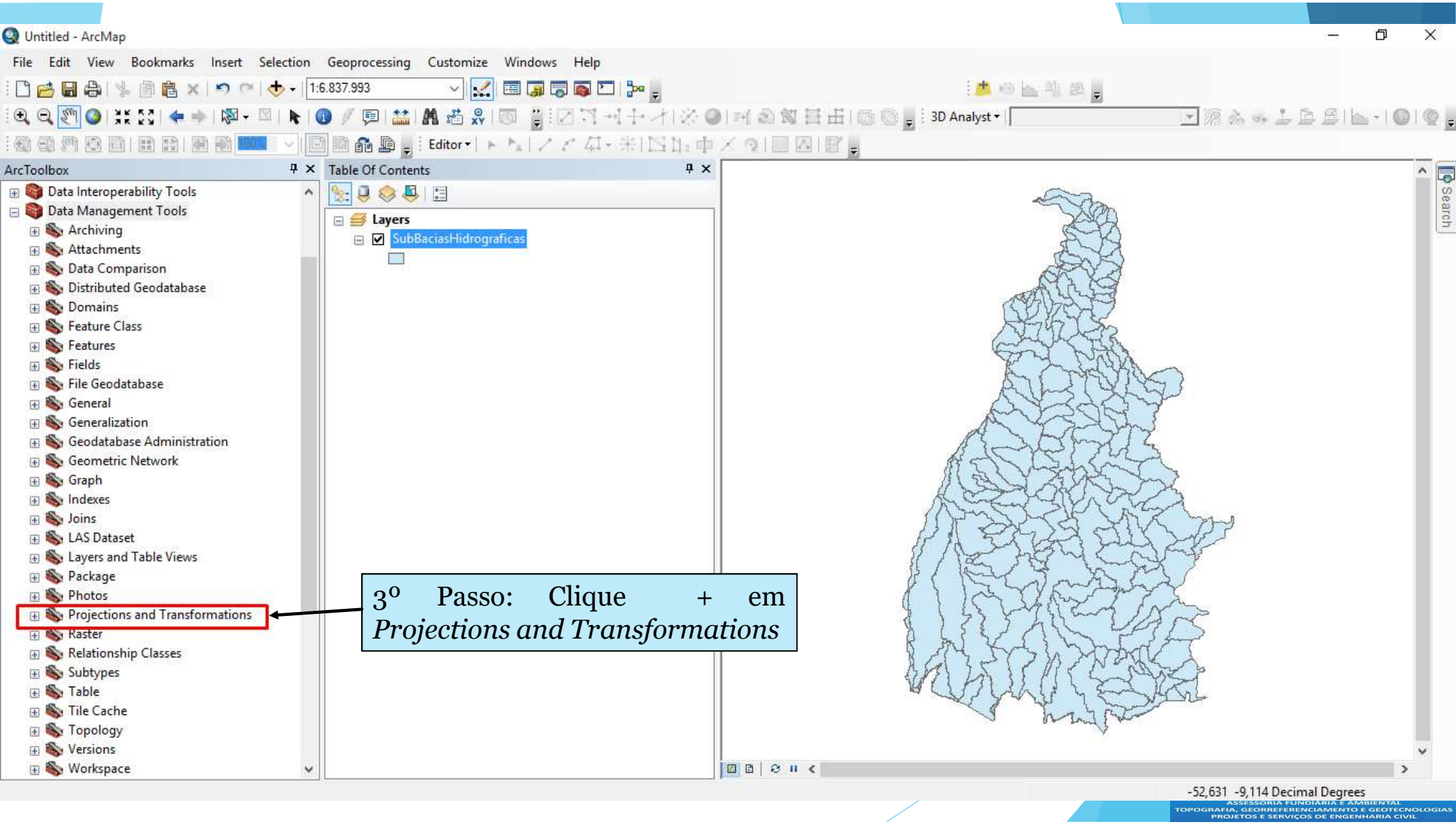
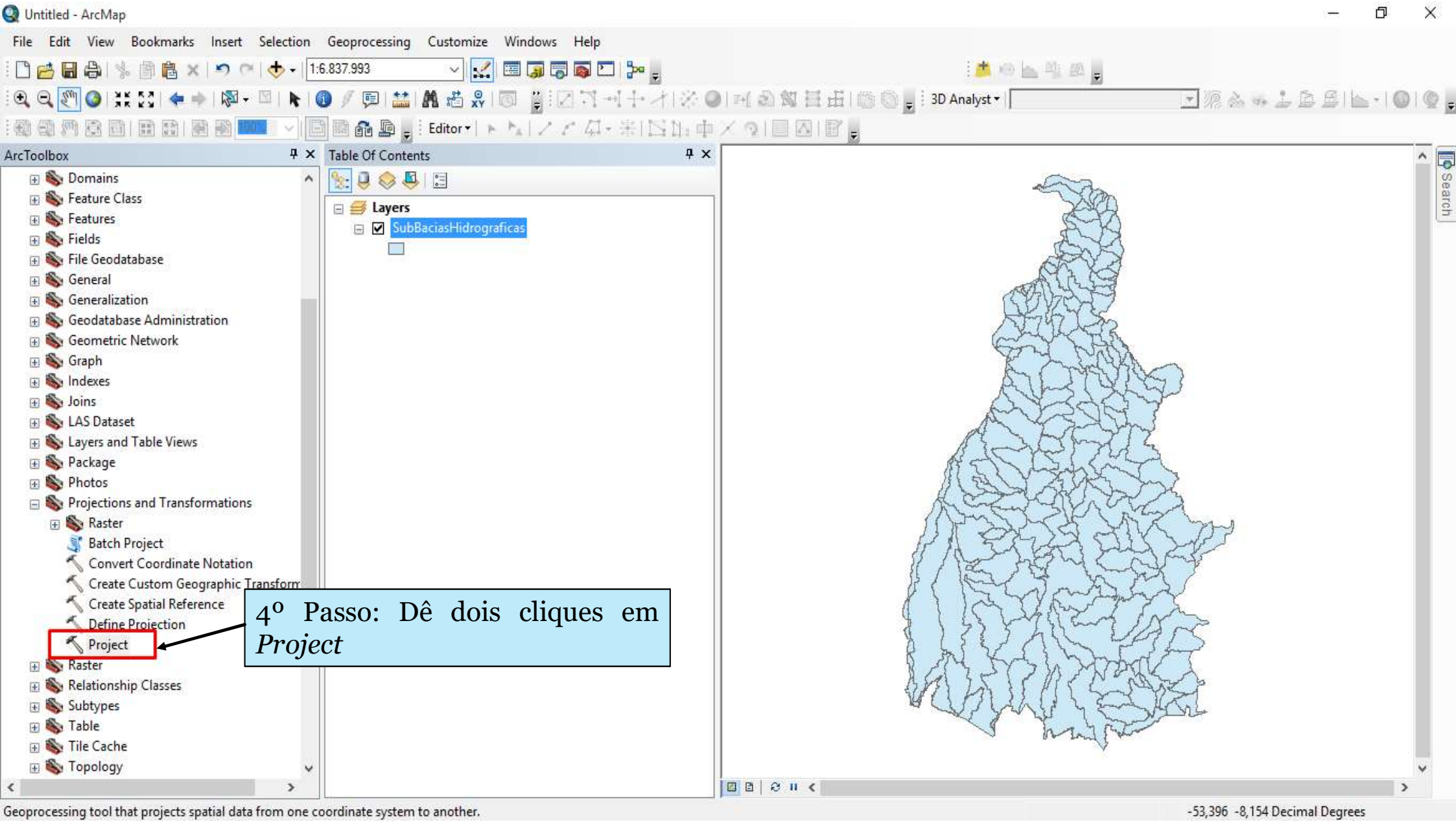




3º Passo: Clique + em *Projections and Transformations*


Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:6.837.993
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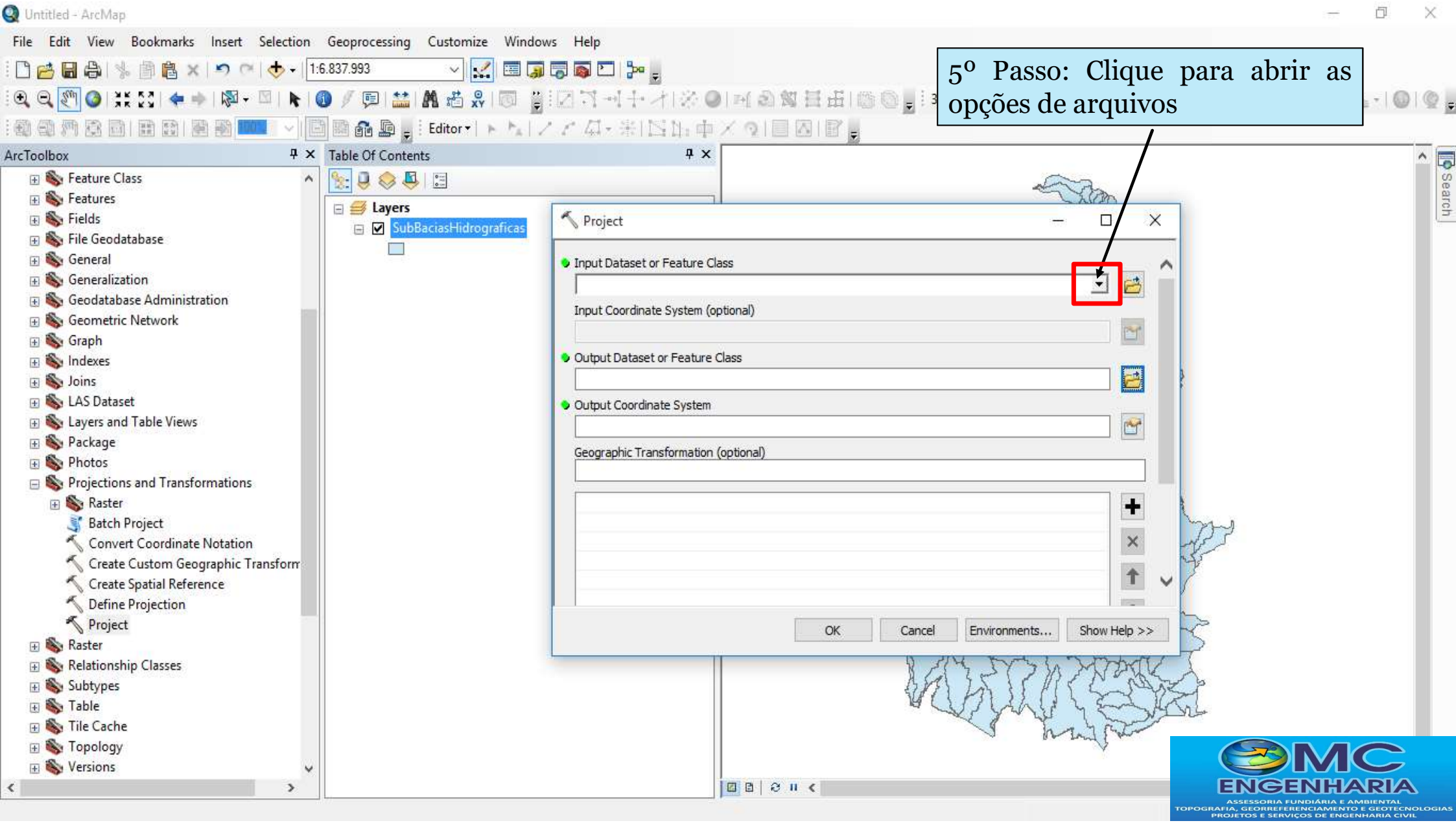
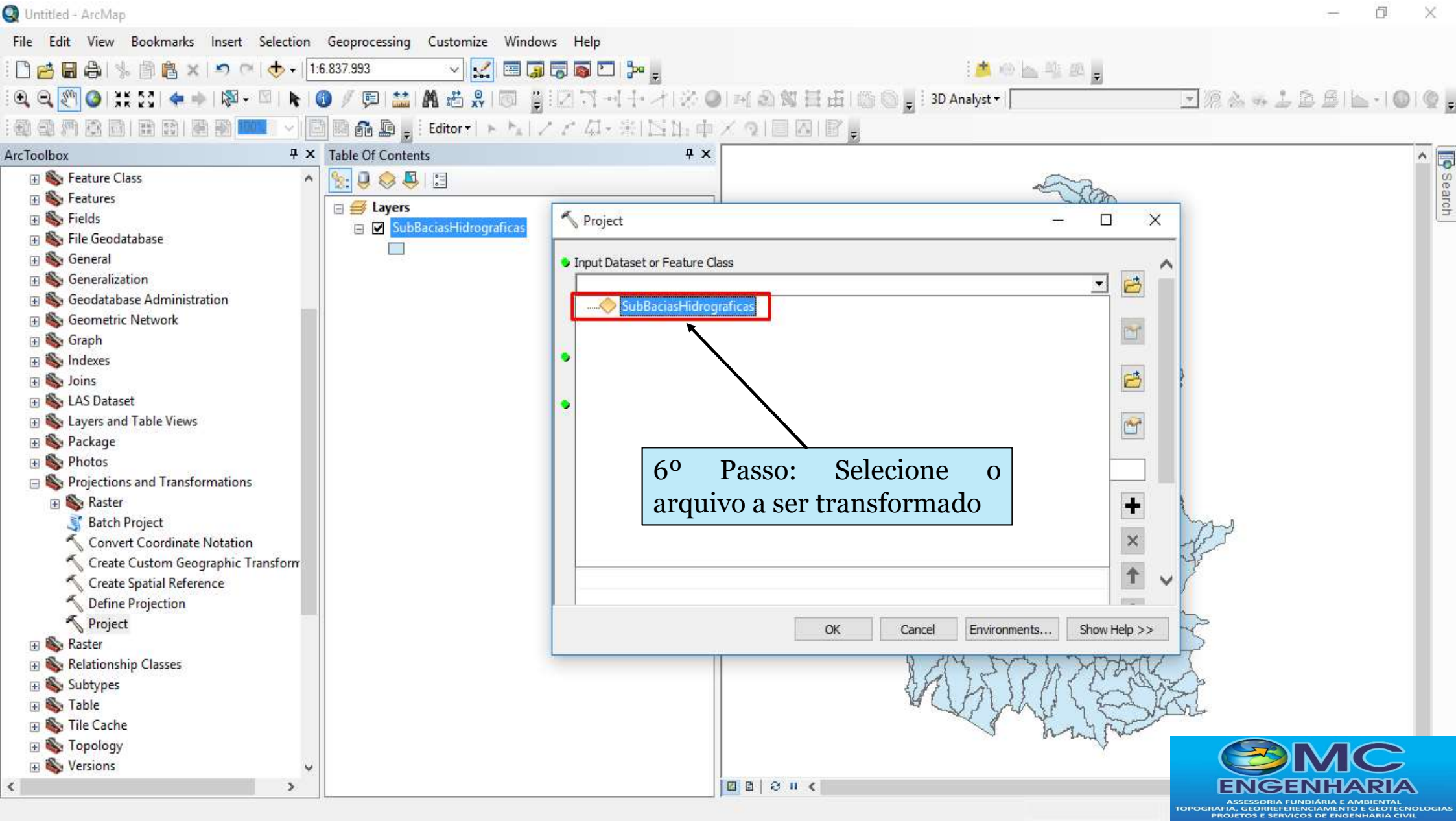
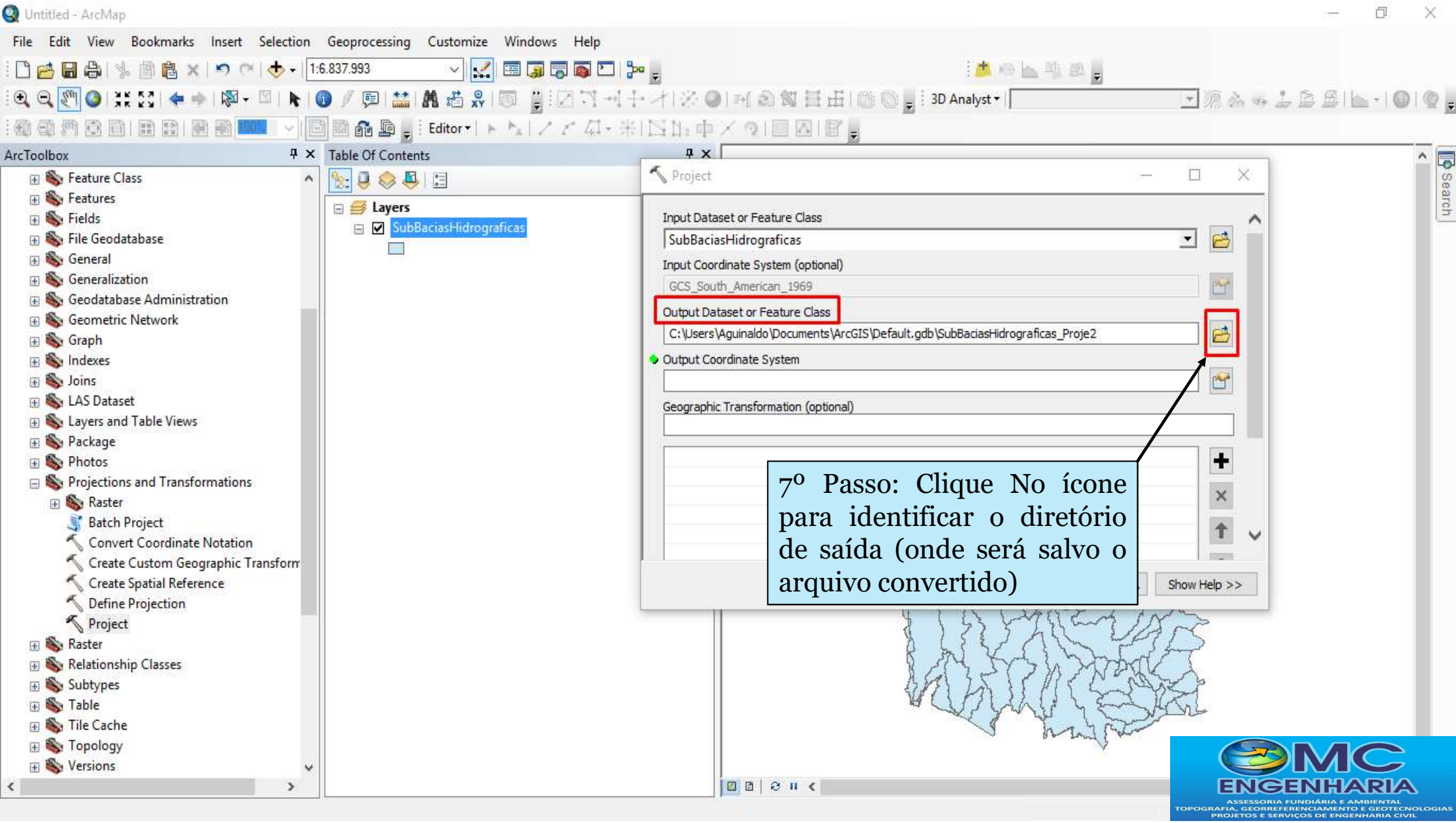
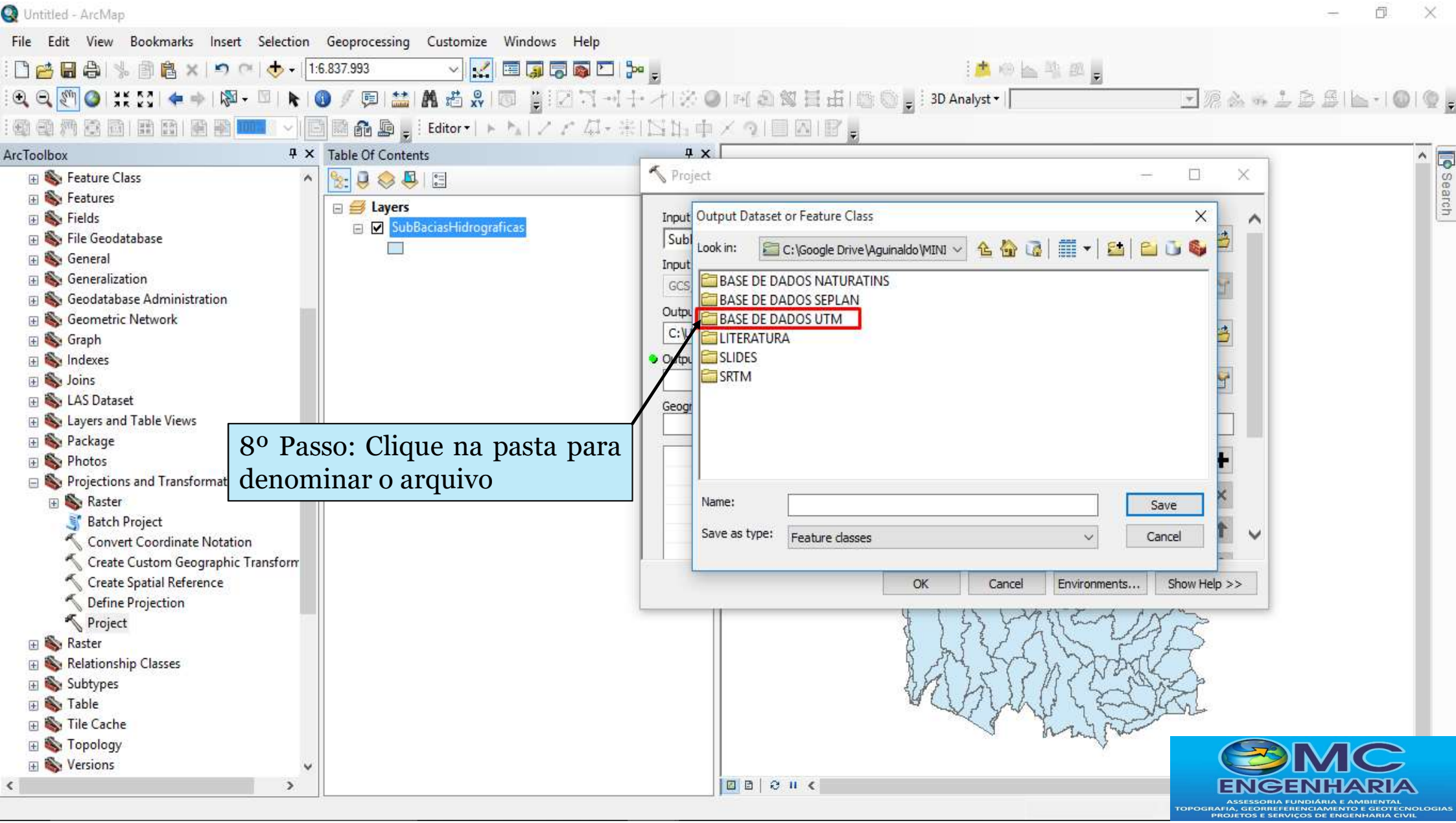
4º Passo: Dê dois cliques em *Project*
Search
Geoprocessing tool that projects spatial data from one coordinate system to another.
-53,396 -8,154 Decimal Degrees

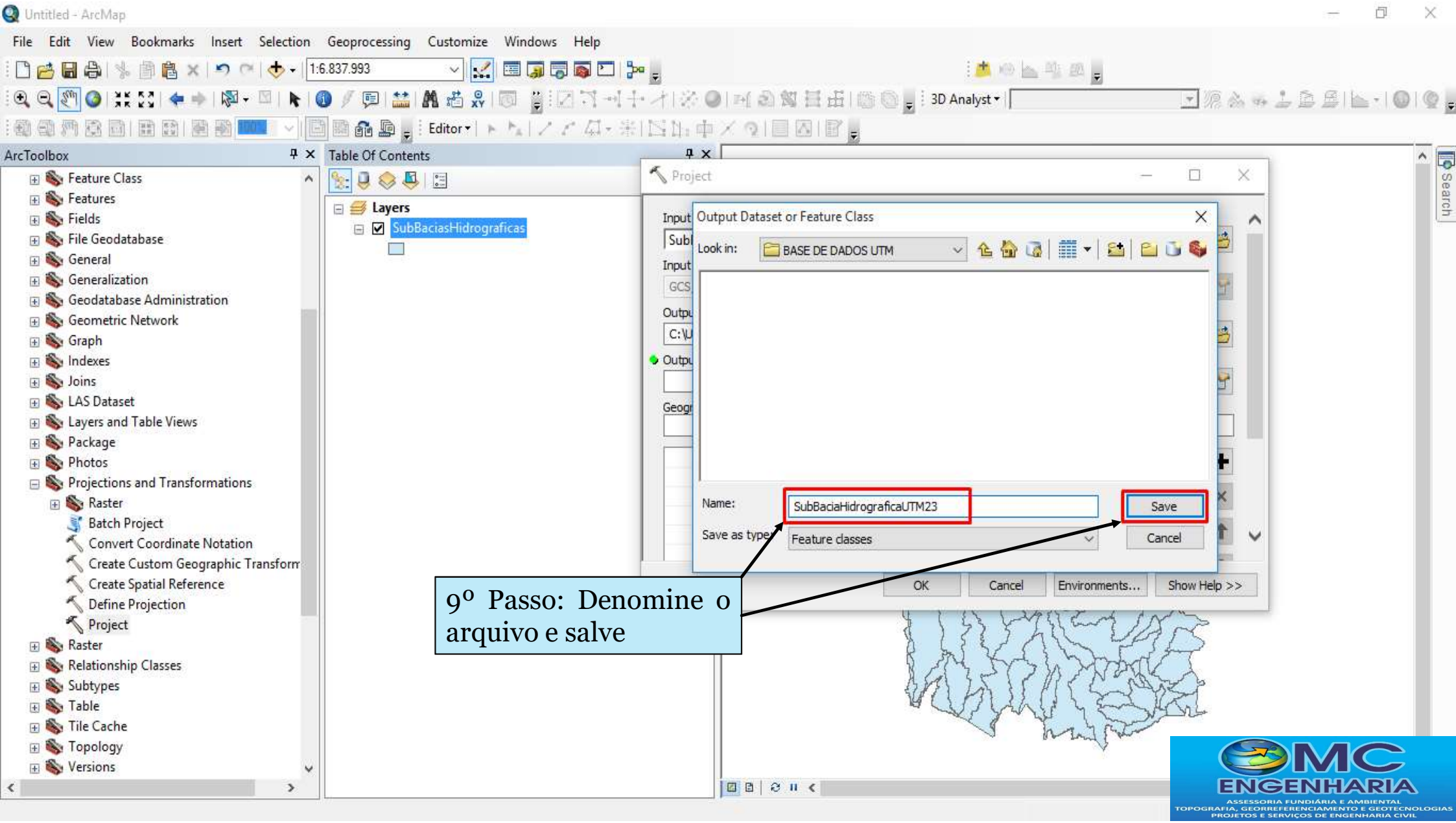








8º Passo: Clique na pasta para denominar o arquivo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Output Dataset or Feature Class
Look in:
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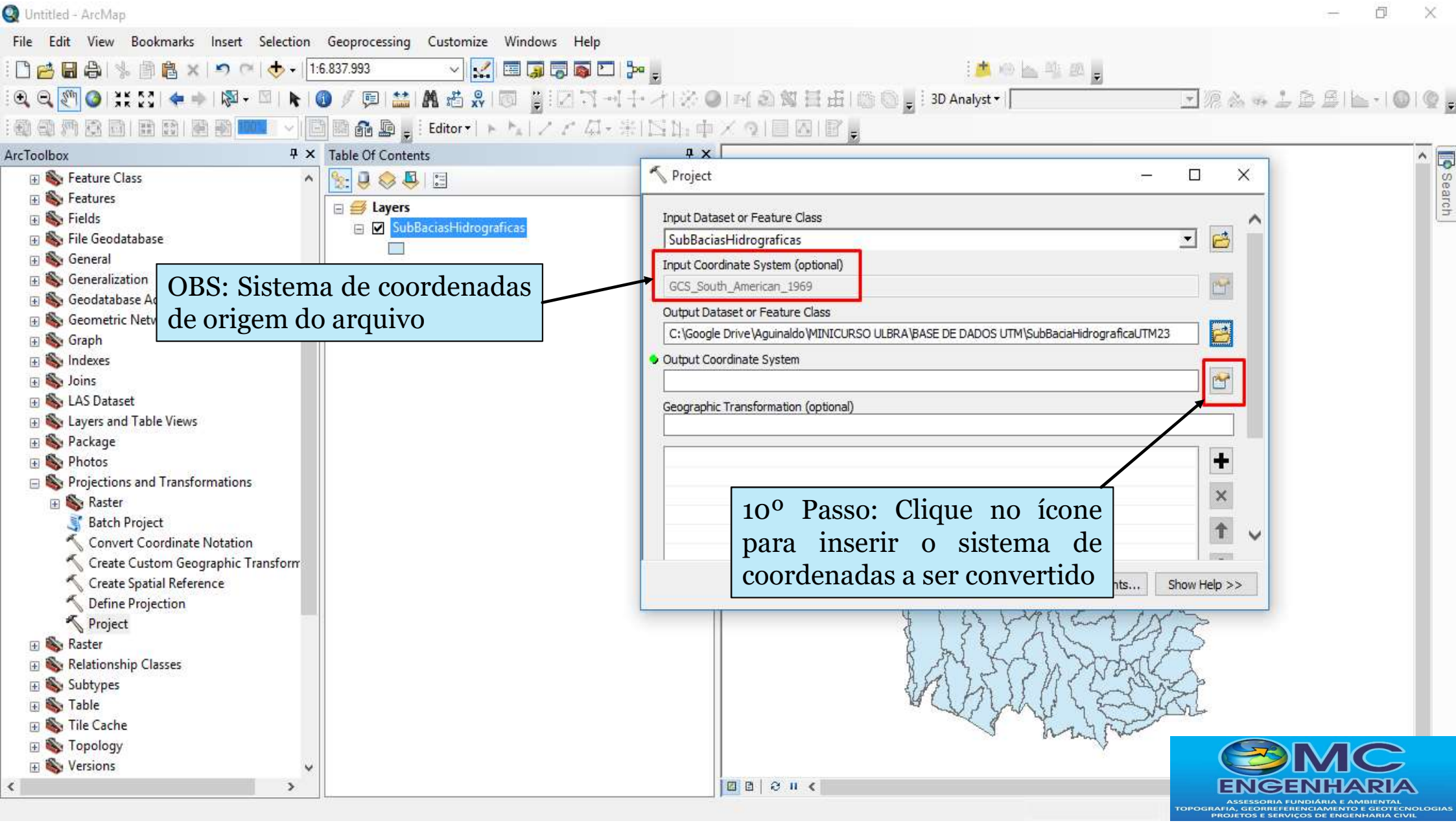
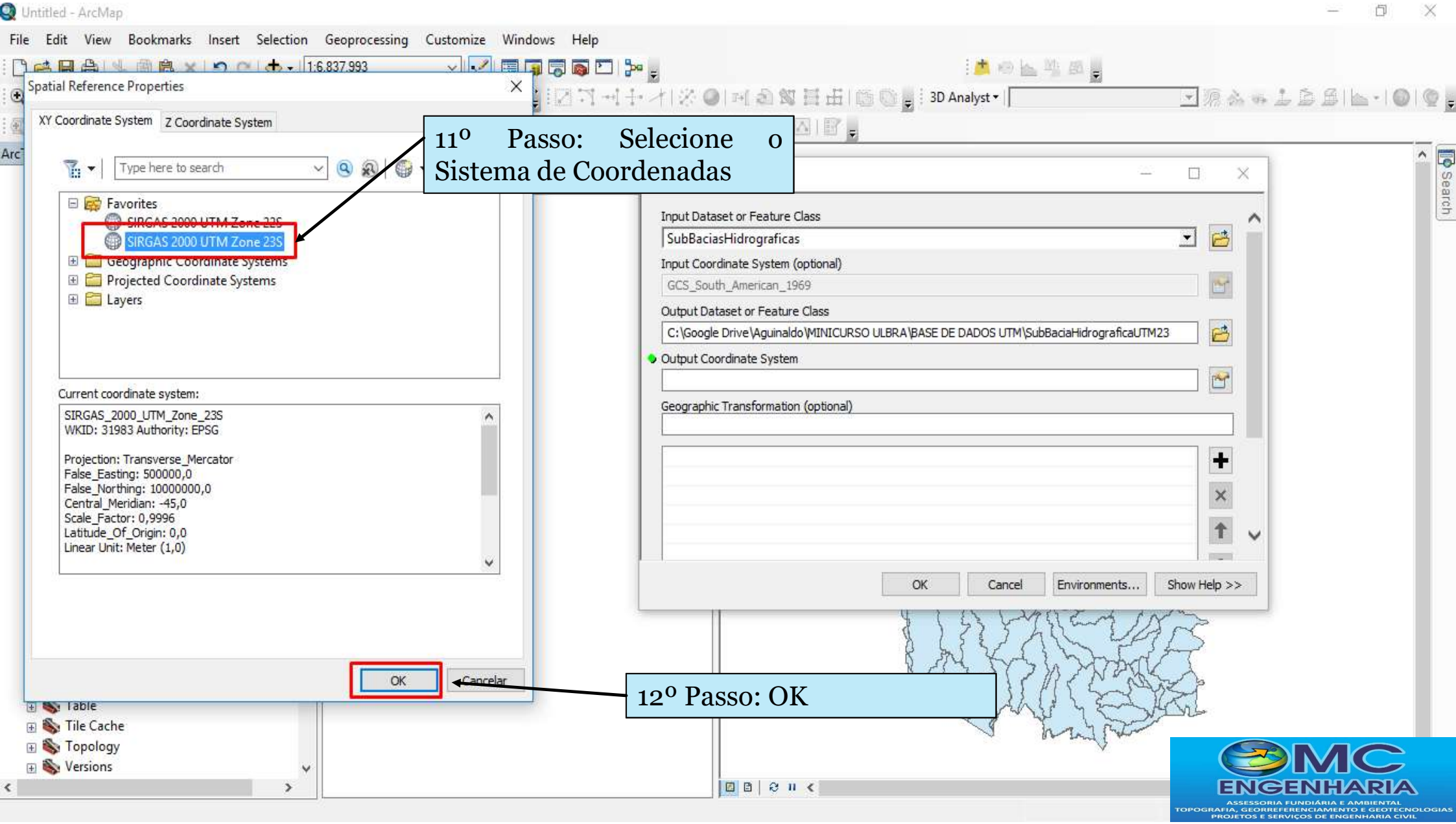
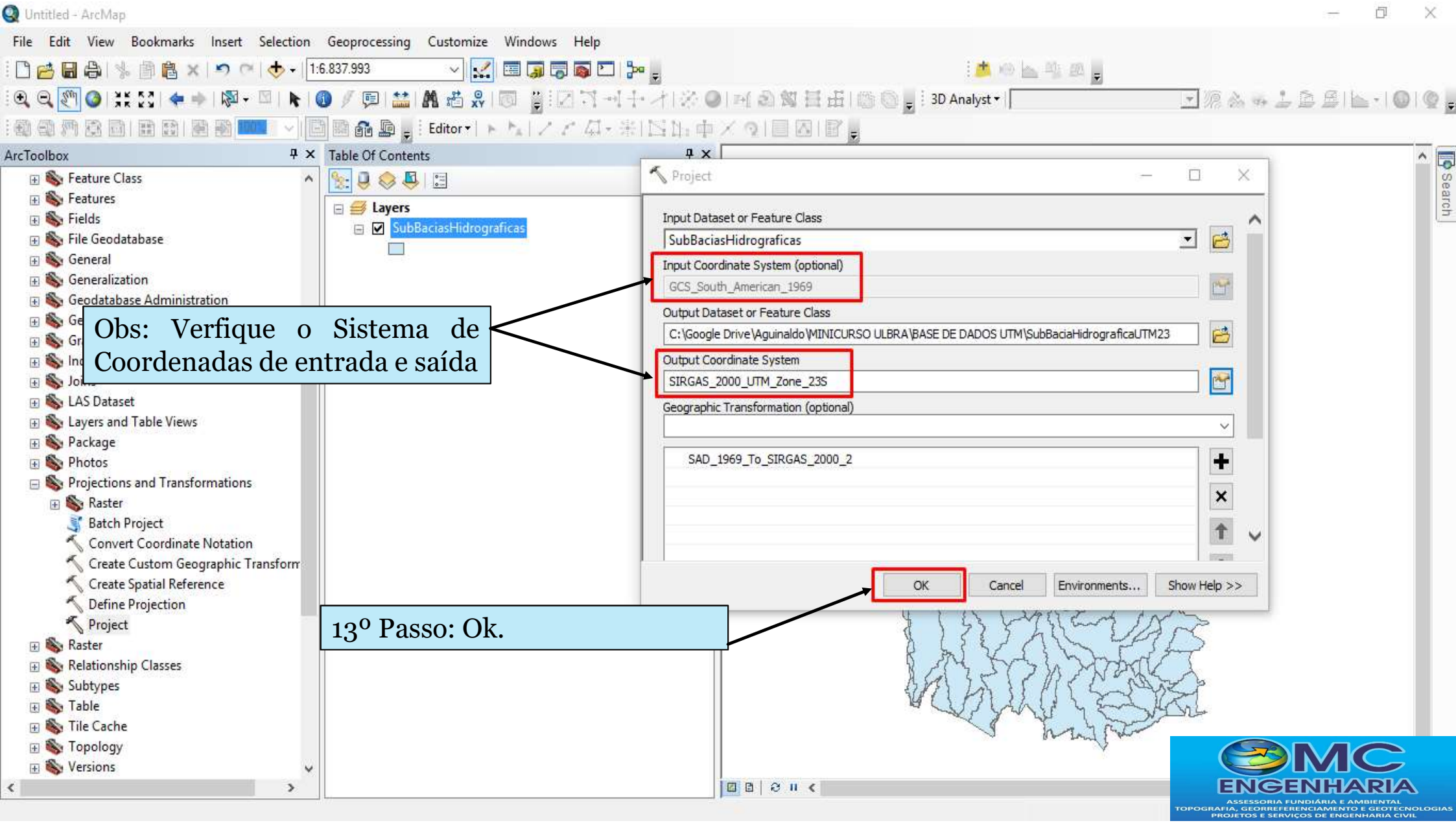
Name:
SubBaciaHidrograficaUTM23
Save as type:
Feature classes
Save
Cancel
OK
Cancel
Environments...
Show Help >>
9º Passo: Denomine o arquivo e salve
Search







Identificação da Bacia Hidrográfica

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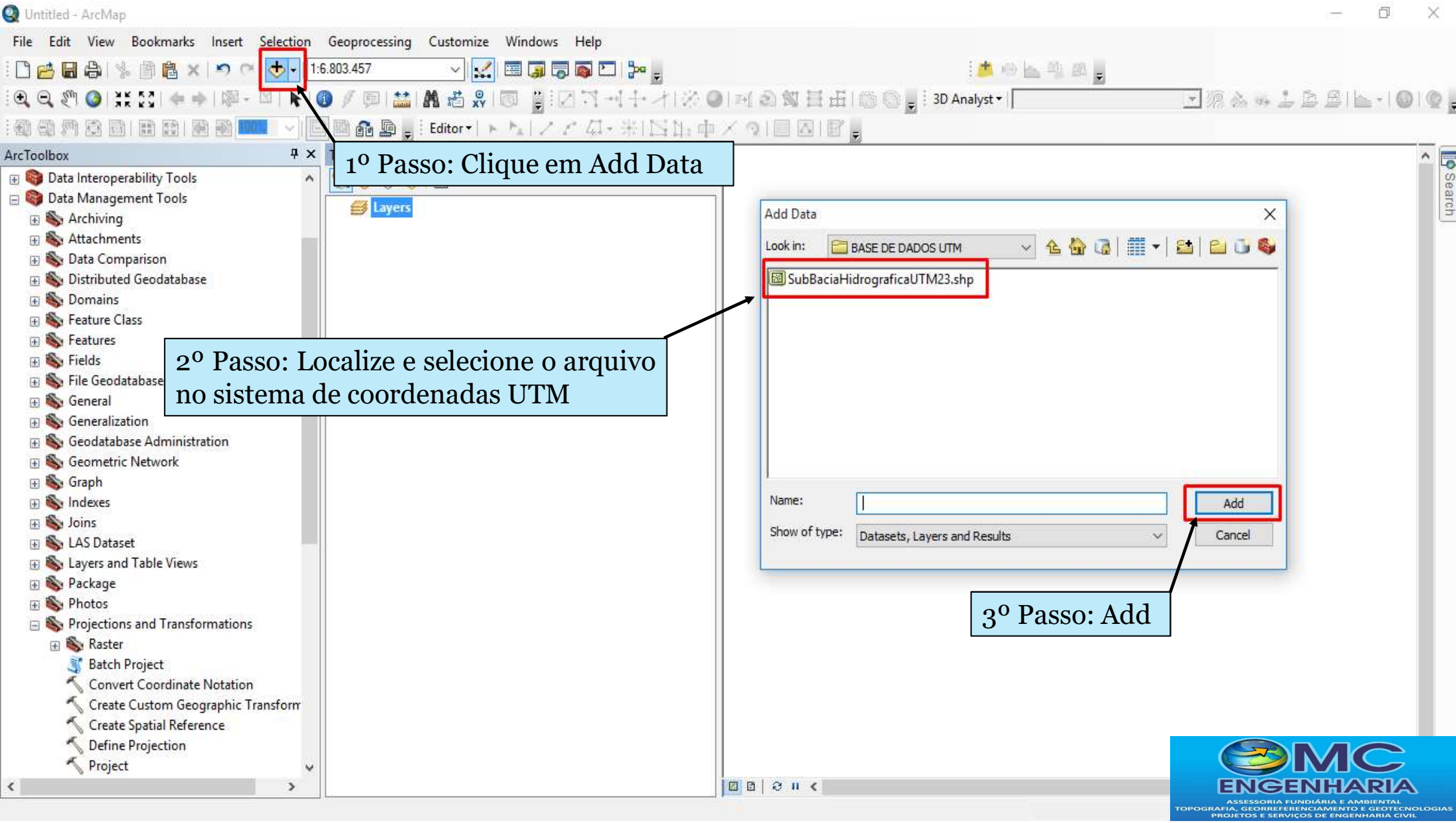
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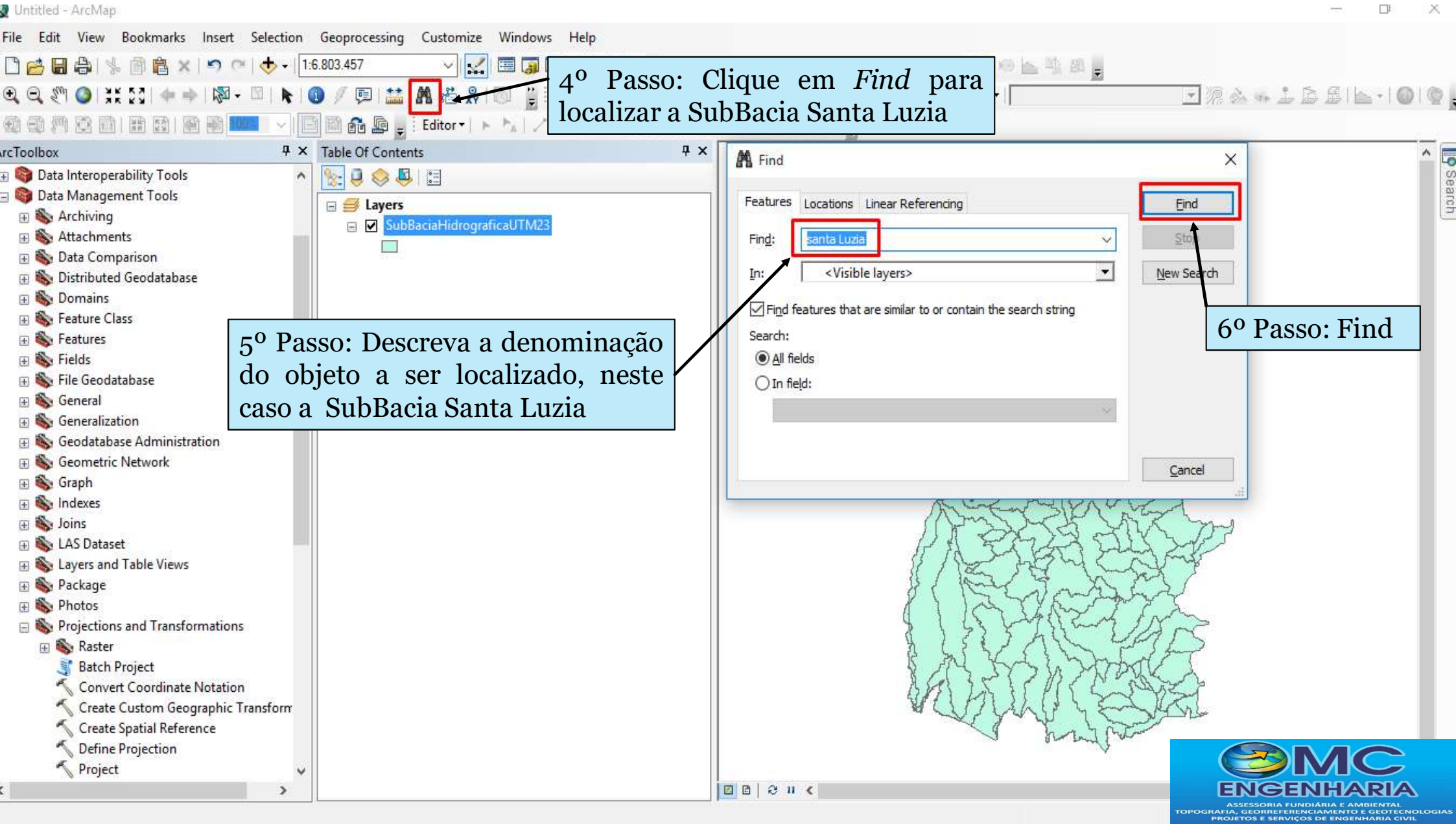
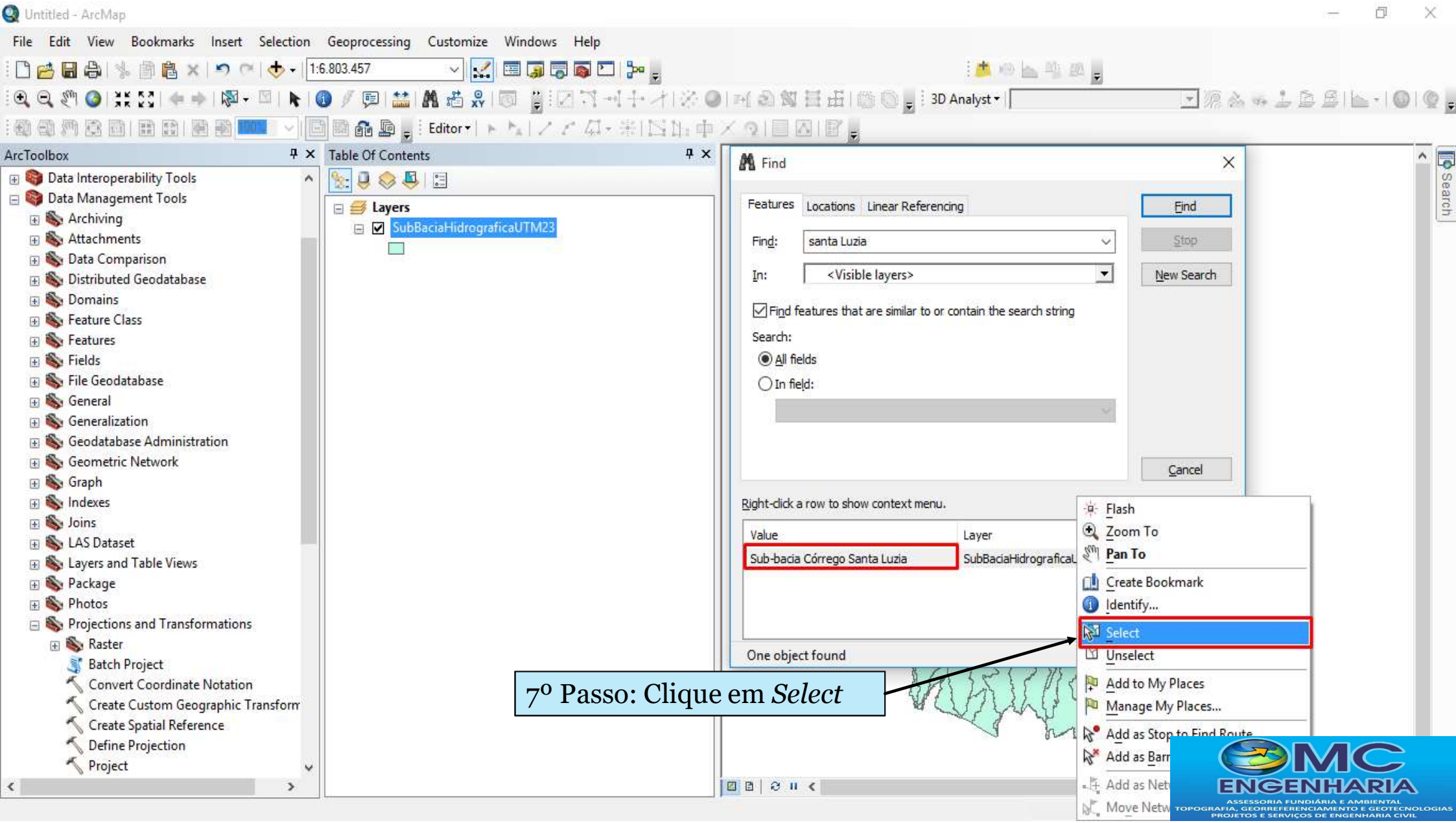
1º Passo: Clique em Add Data
2º Passo: Localize e selecione o arquivo no sistema de coordenadas UTM
Add Data
Look in: BASE DE DADOS UTM
SubBaciaHidrograficaUTM23.shp
Name:
Show of type: Datasets, Layers and Results
Add
Cancel
3º Passo: Add
Search




Untitled - ArcMap
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<Visible layers>
Find features that are similar to or contain the search string
Search:
All fields
In field:
Find
Stop
New Search
Cancel
Right-click a row to show context menu.
Value
Layer
Sub-bacia Córrego Santa Luzia
SubBaciaHidrograficaU
One object found
Flash
Zoom To
Pan To
Create Bookmark
Identify...
Select
Unselect
Add to My Places
Manage My Places...
Add as Stop to Find Route
Add as Barr
Add as Net
Move Netw
7º Passo: Clique em Select
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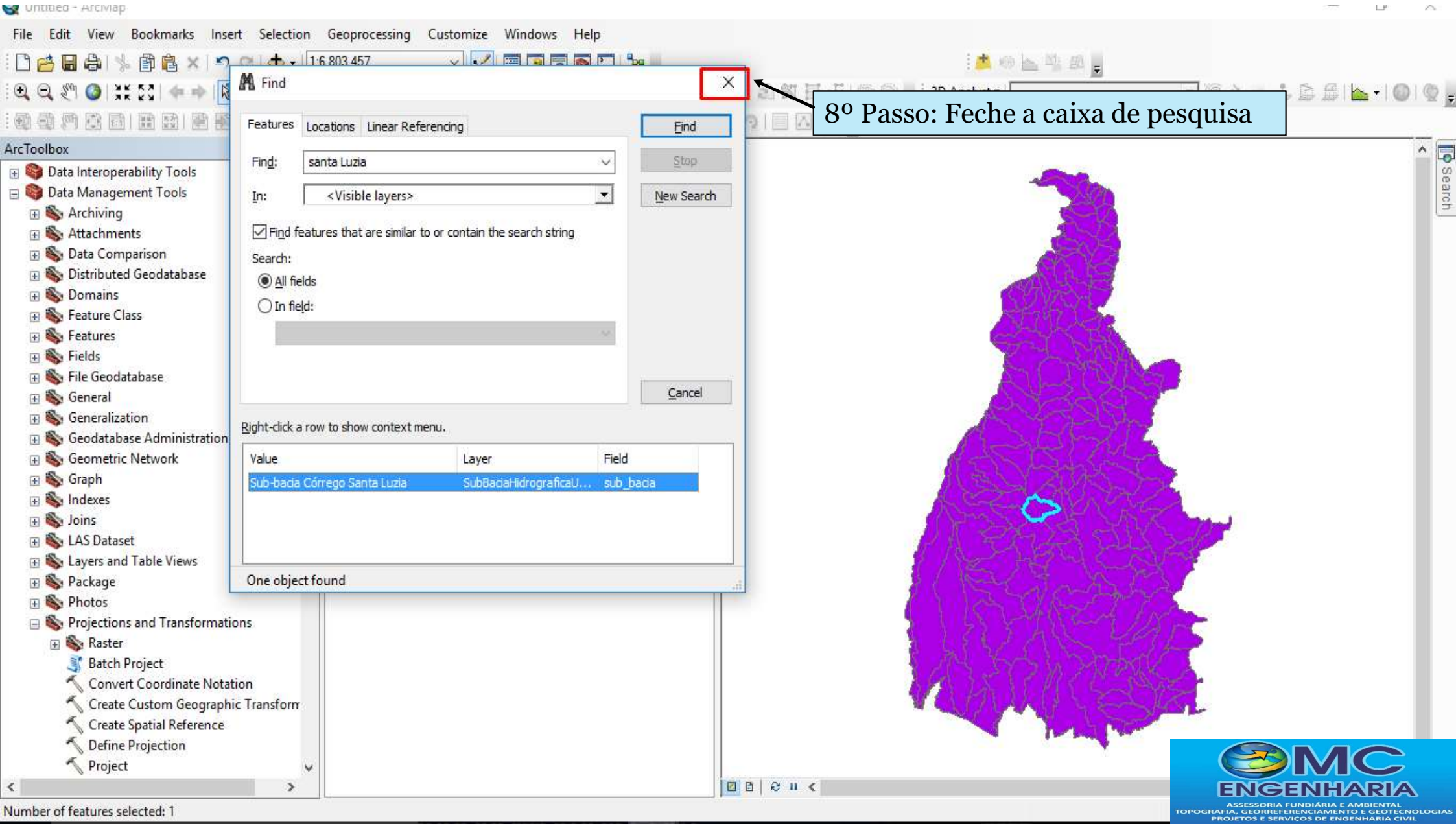

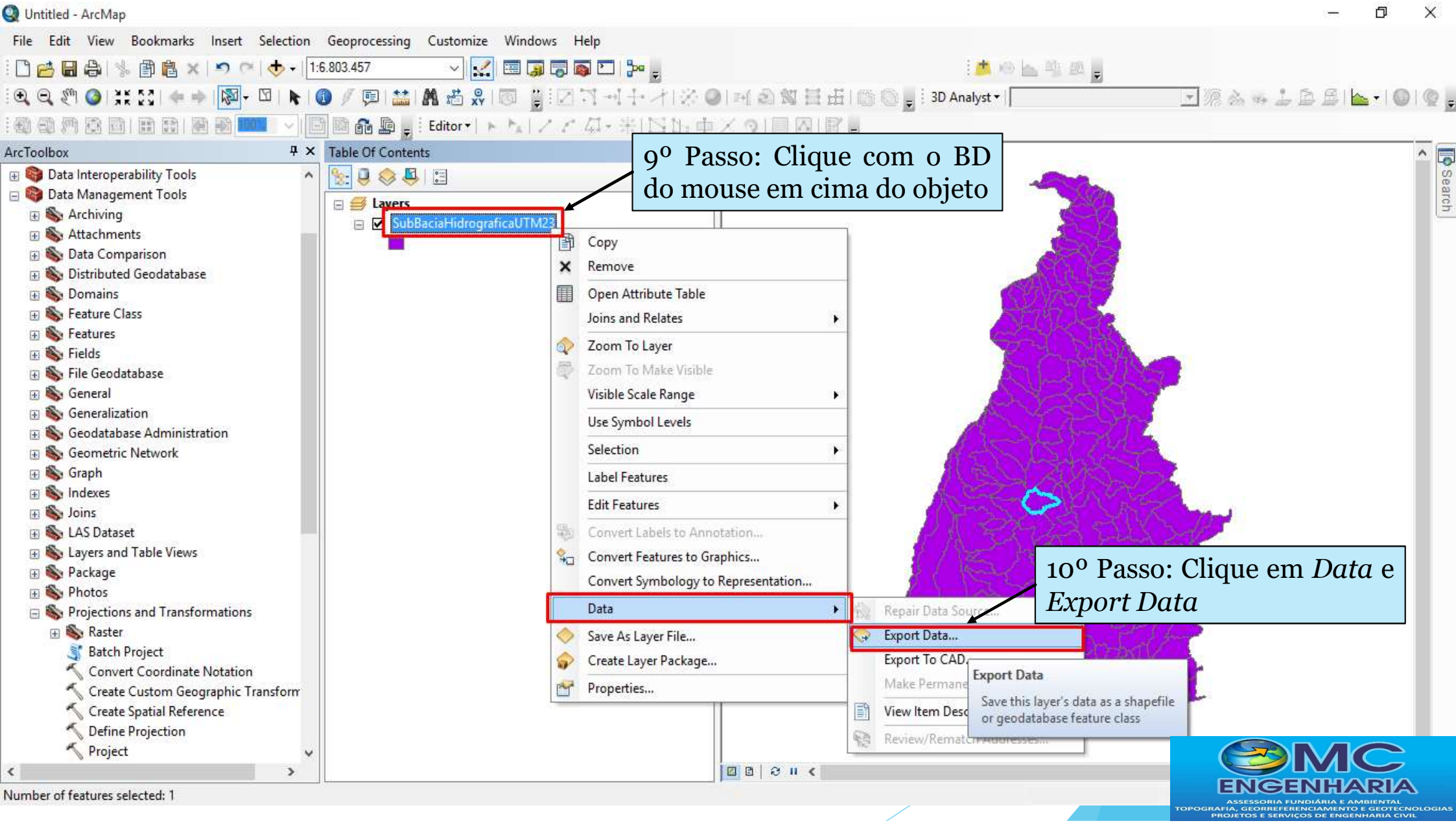

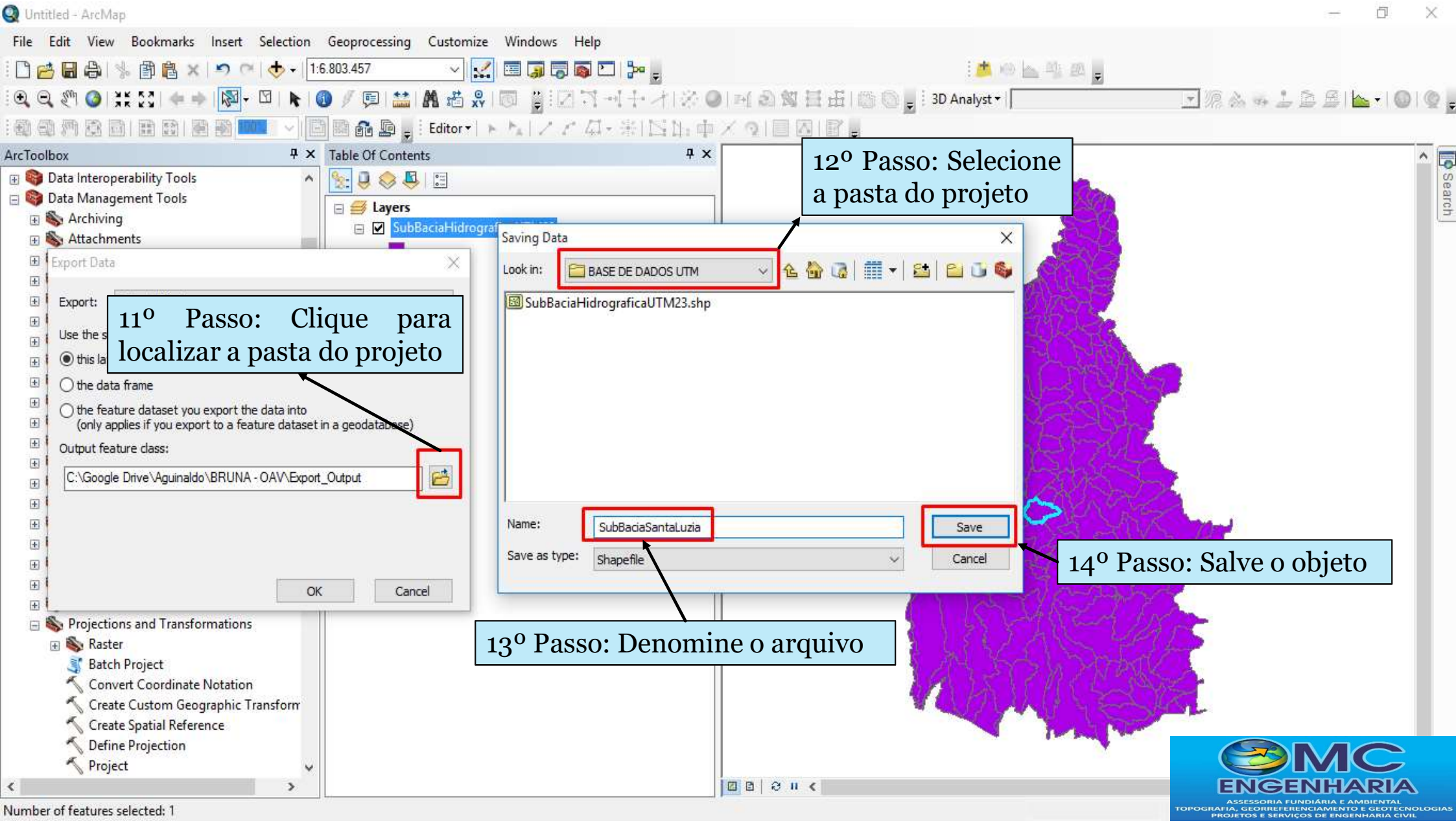
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Export:
Use the s
this la
the data frame
the feature dataset you export the data into
(only applies if you export to a feature dataset in a geodatabase)
Output feature class:
C:\Google Drive\Aguinaldo\BRUNA - OAV\Export_Output
OK
Cancel
11º Passo: Clique para localizar a pasta do projeto
Saving Data
Look in:
BASE DE DADOS UTM
SubBaciaHidrograficaUTM23.shp
Name:
SubBaciaSantaLuzia
Save as type:
Shapefile
Save
Cancel
12º Passo: Selecione a pasta do projeto
13º Passo: Denomine o arquivo
14º Passo: Salve o objeto
Search
Number of features selected: 1
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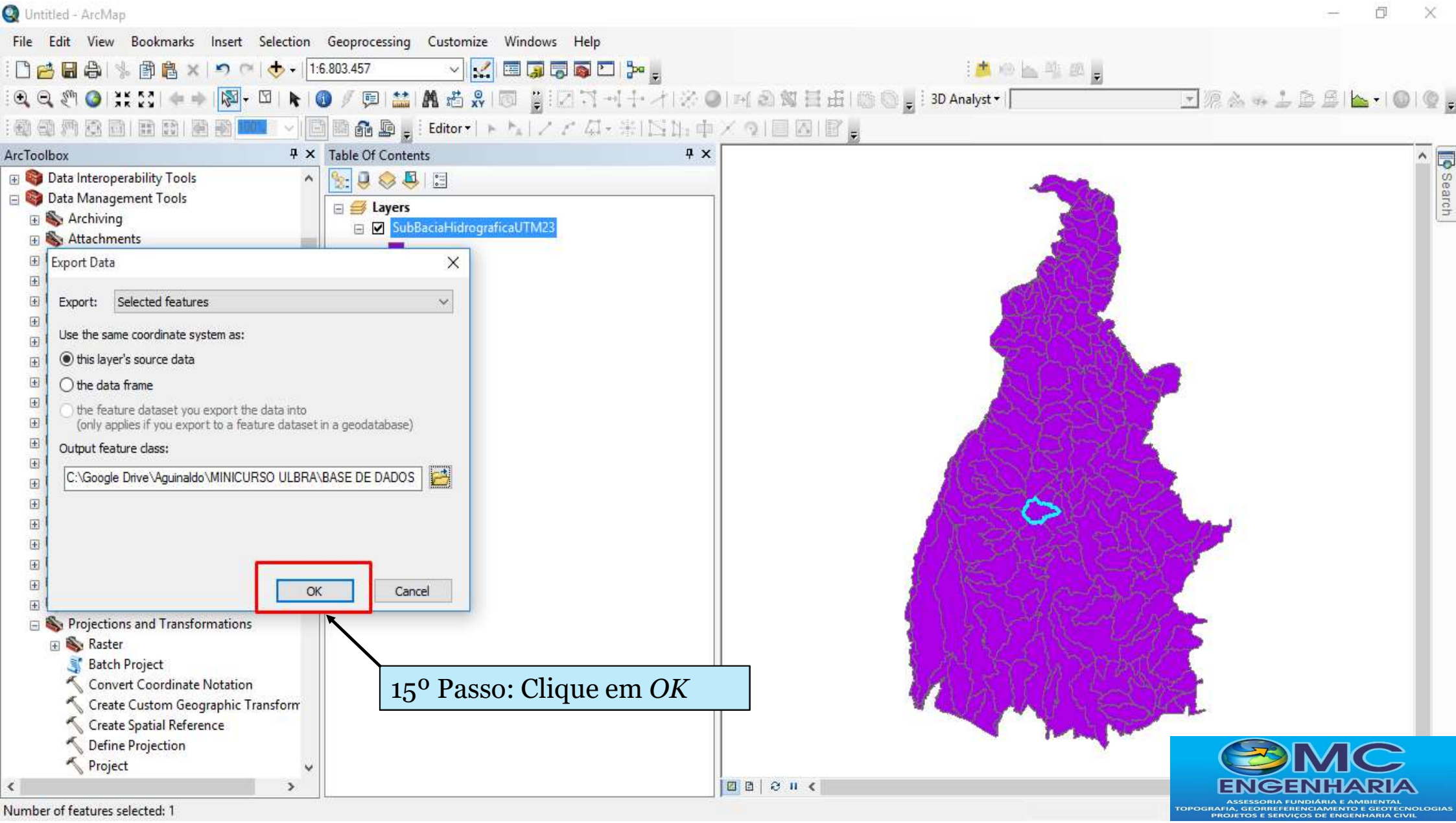

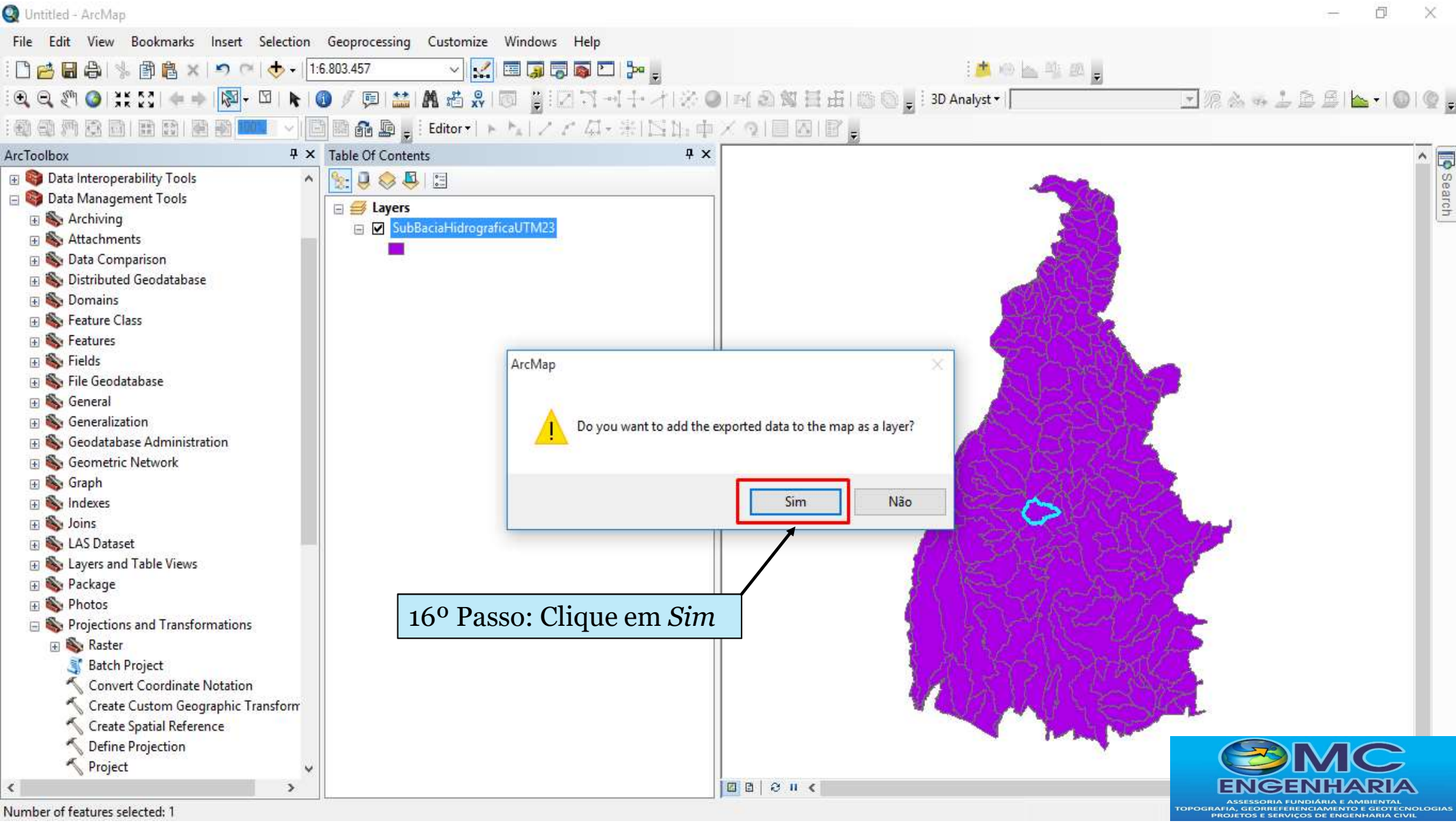
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Do you want to add the exported data to the map as a layer?
Sim
Não
16º Passo: Clique em *Sim*
Search
Number of features selected: 1
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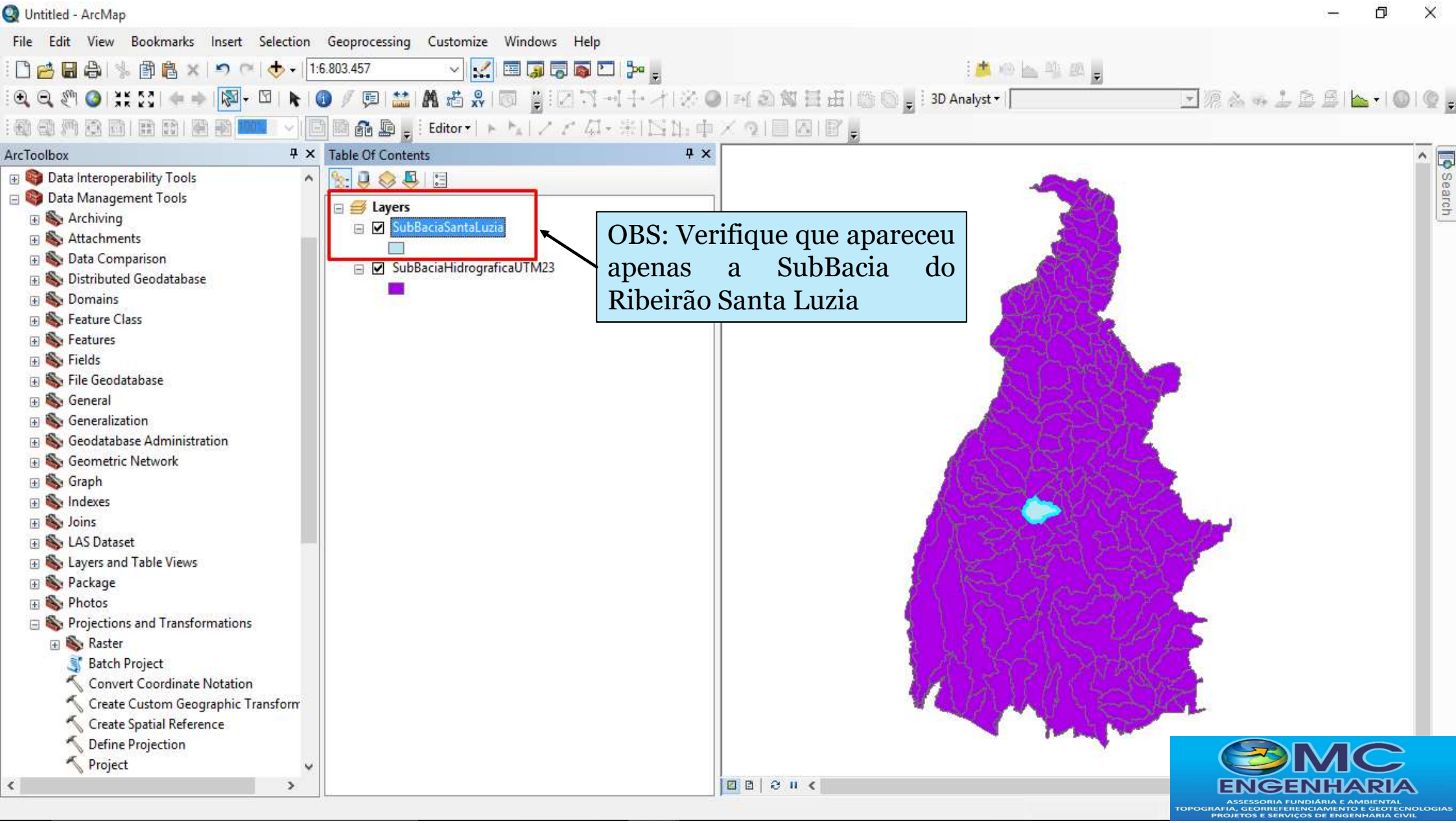

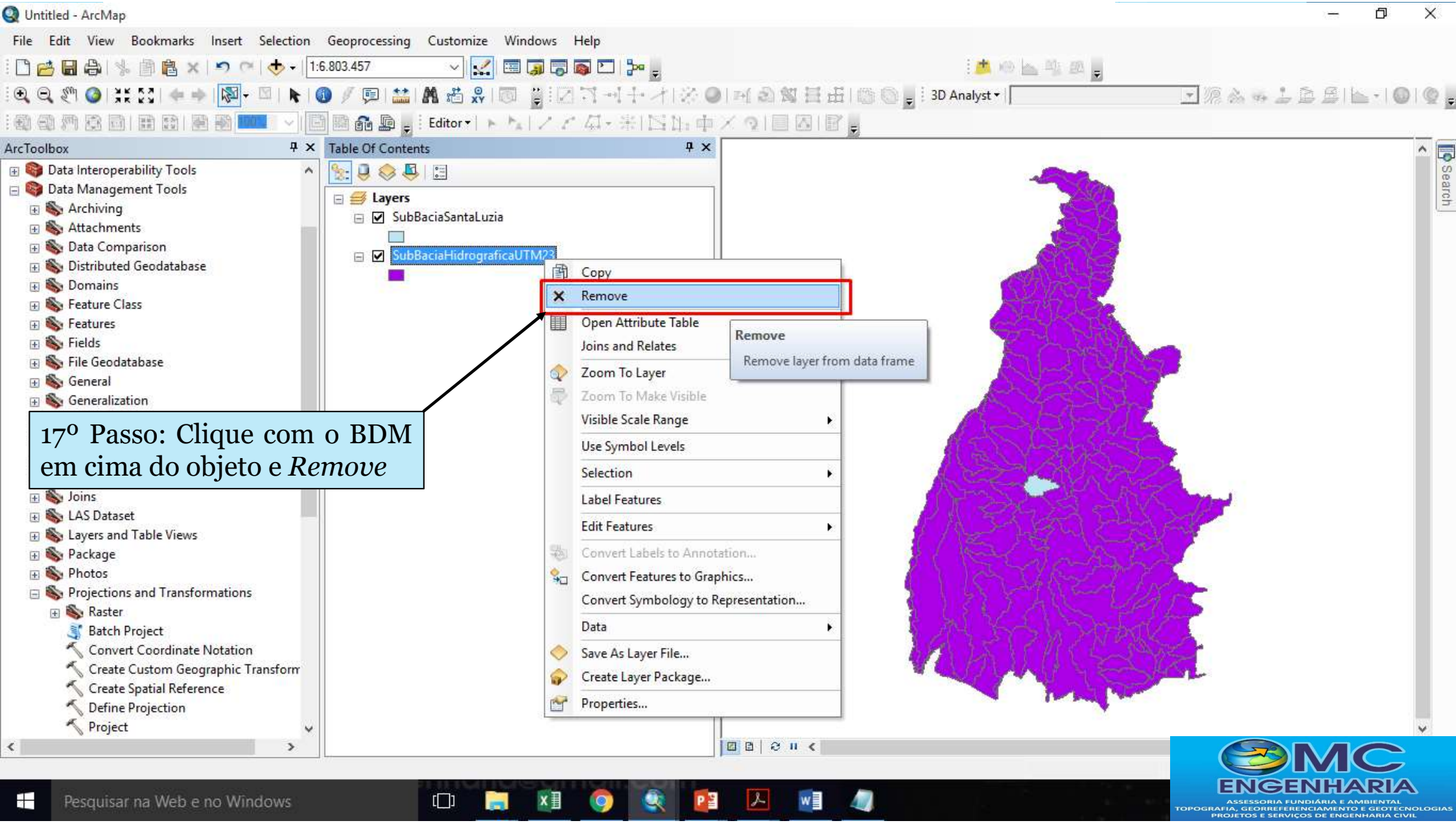
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Zoom To Make Visible
Visible Scale Range
Use Symbol Levels
Selection
Label Features
Edit Features
Convert Labels to Annotation...
Convert Features to Graphics...
Convert Symbology to Representation...
Data
Save As Layer File...
Create Layer Package...
Properties...
Remove
Remove layer from data frame
17º Passo: Clique com o BDM em cima do objeto e Remove
Search
Pesquisar na Web e no Windows
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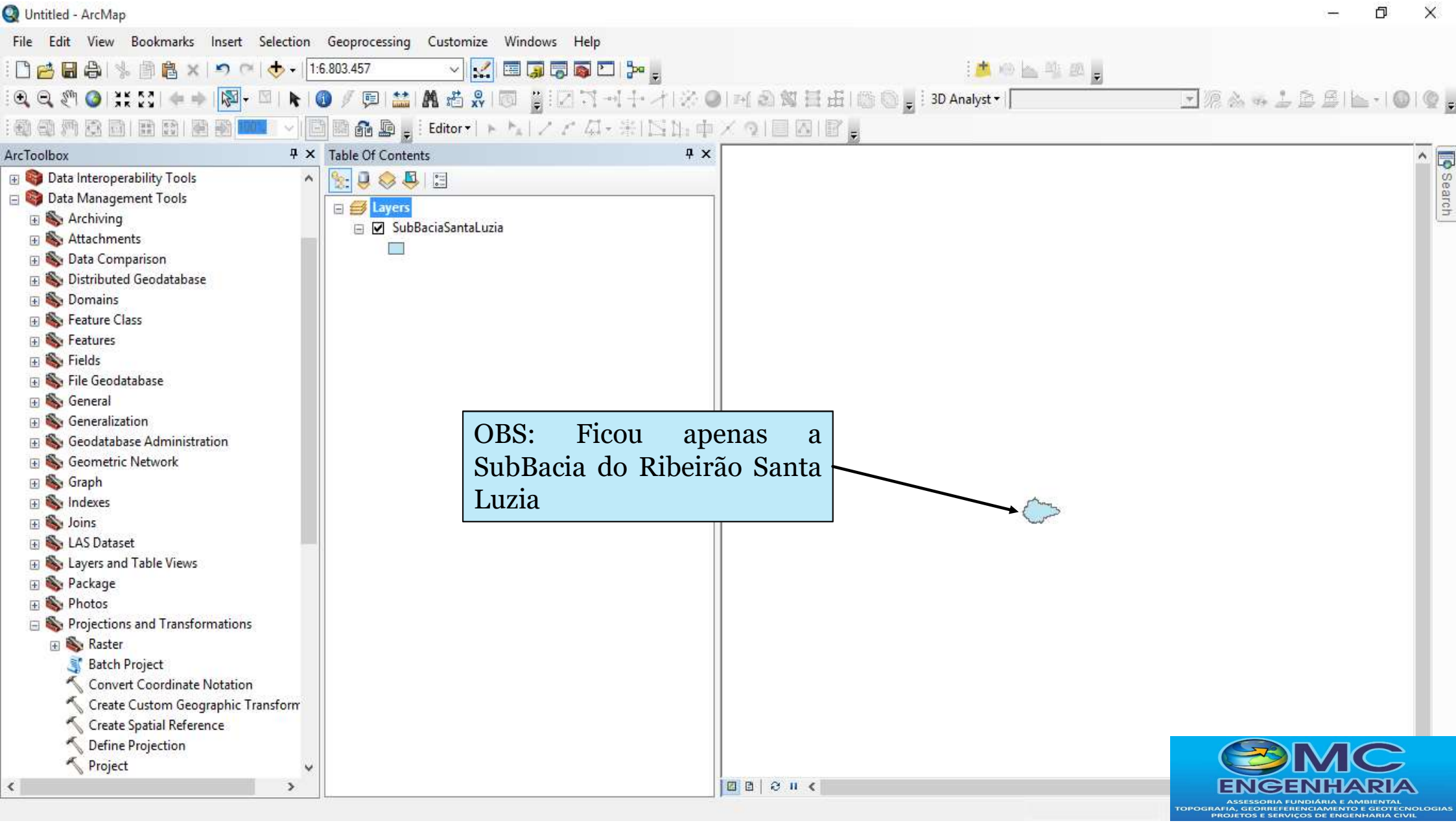

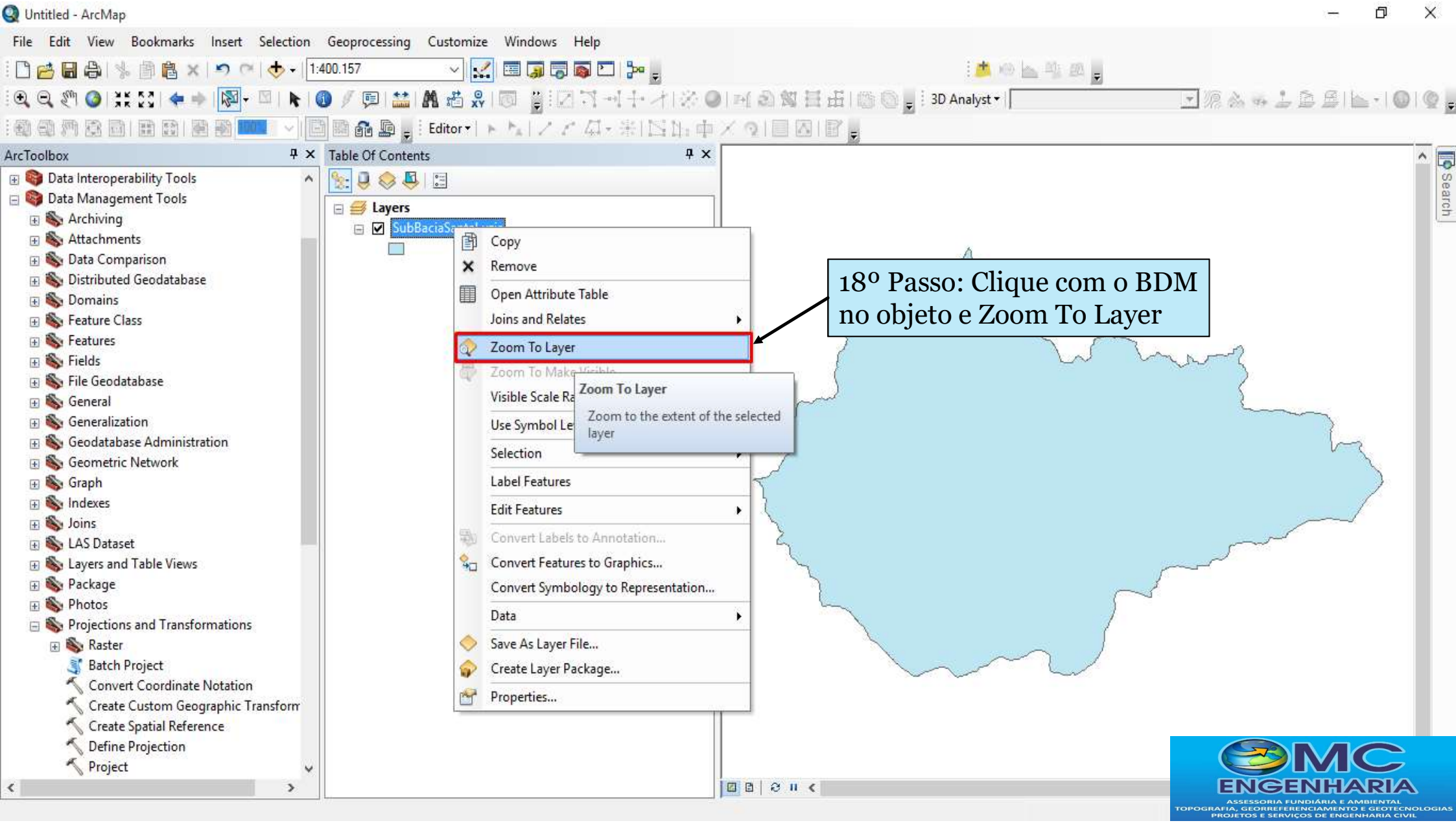

Dados SRTM

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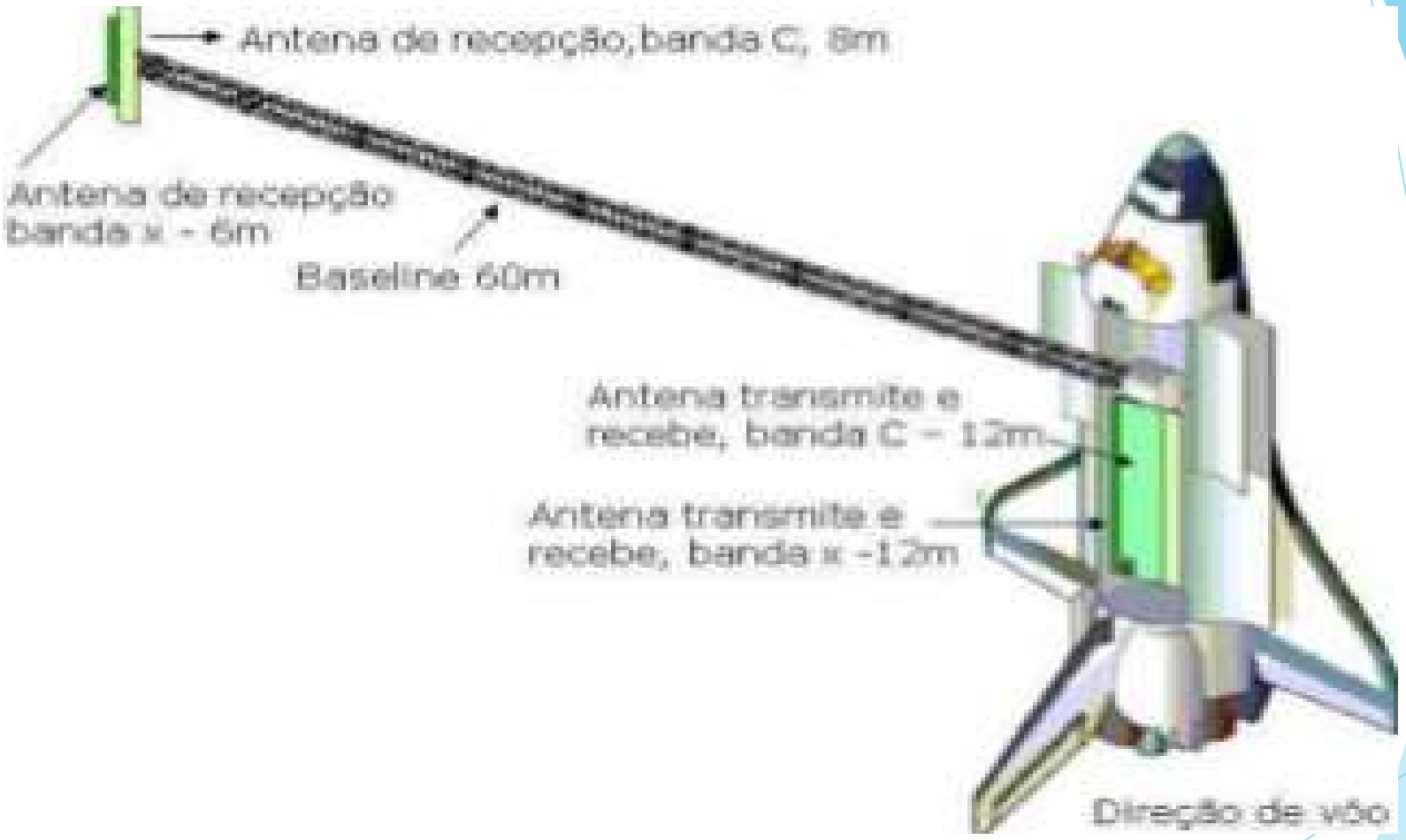
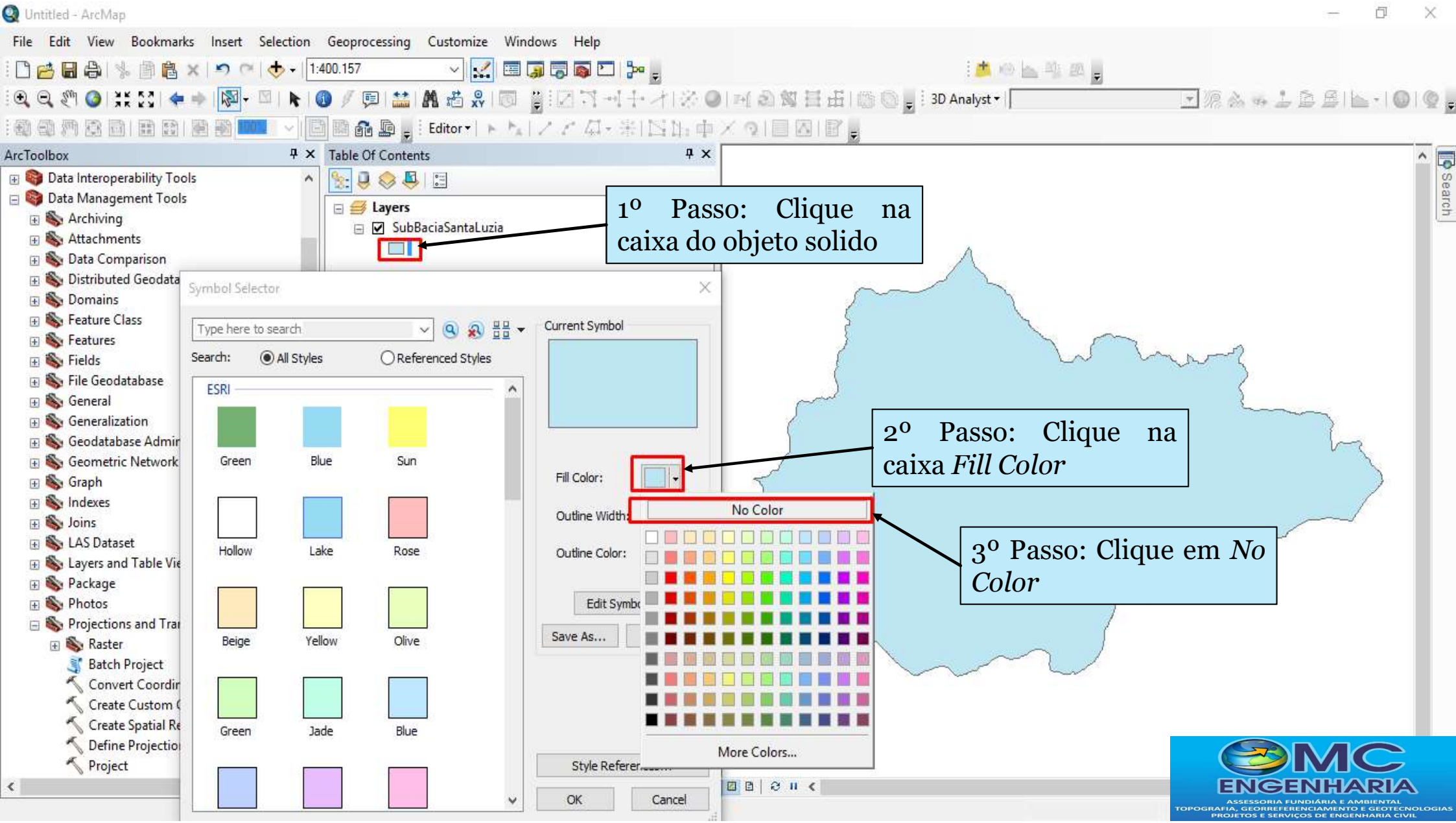
A Missão Topográfica por RADAR Interferométrico, conhecida como SRTM (*Shuttle RADAR TopographicMission*) colocou em órbita em fevereiro de 2000 a nave espacial Endeavour. Esta nave levou em seu compartimento de carga um equipamento SAR interferométrico (*InSAR*), operando nas bandas C e X. Uma haste mecânica presa à nave apresentava em sua extremidade duas antenas receptoras do SAR, bandas C e X (Figura 2).Ao longo de 11 dias, utilizando a técnica de interferometria de uma passagem, foi imageada 80% da superfície terrestre, compreendendo os paralelos 60º N e 56º S, fornecendo modelos tridimensionais com amplitude da grade de 30 metros (SRTM 1) e 90 metros (SRTM 3) (CHIEN, 2000).


Antena de recepção, banda C, 8m
Antena de recepção
banda x - 6m
Baseline 60m
Antena transmite e
recebe, banda C - 12m
Antena transmite e
recebe, banda x -12m
Direção de vôo

Através do projeto Topodata, concebido pelo INPE – Instituto Nacional de Pesquisas espaciais, onde os dados estão todos estruturados em quadrículas compatíveis com a articulação 1:250.000, o Modelo Digital de Elevação (MDE) das imagens de sensoriamento remoto oriundas do projeto SRTM foi modificado sua resolução espacial por meio de métodos geoestatísticos de krigagem dos produtos originais de 90 metros para 30 metros, onde agrupou as informações sobre o território brasileiro.

Importar Dados SRTM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Sun
Hollow
Lake
Rose
Beige
Yellow
Olive
Green
Jade
Blue
Current Symbol
Fill Color:
Outline Width:
Outline Color:
No Color
More Colors...
Edit Symbo
Save As...
Style Referer
OK
Cancel
2º Passo: Clique na caixa Fill Color
3º Passo: Clique em No Color
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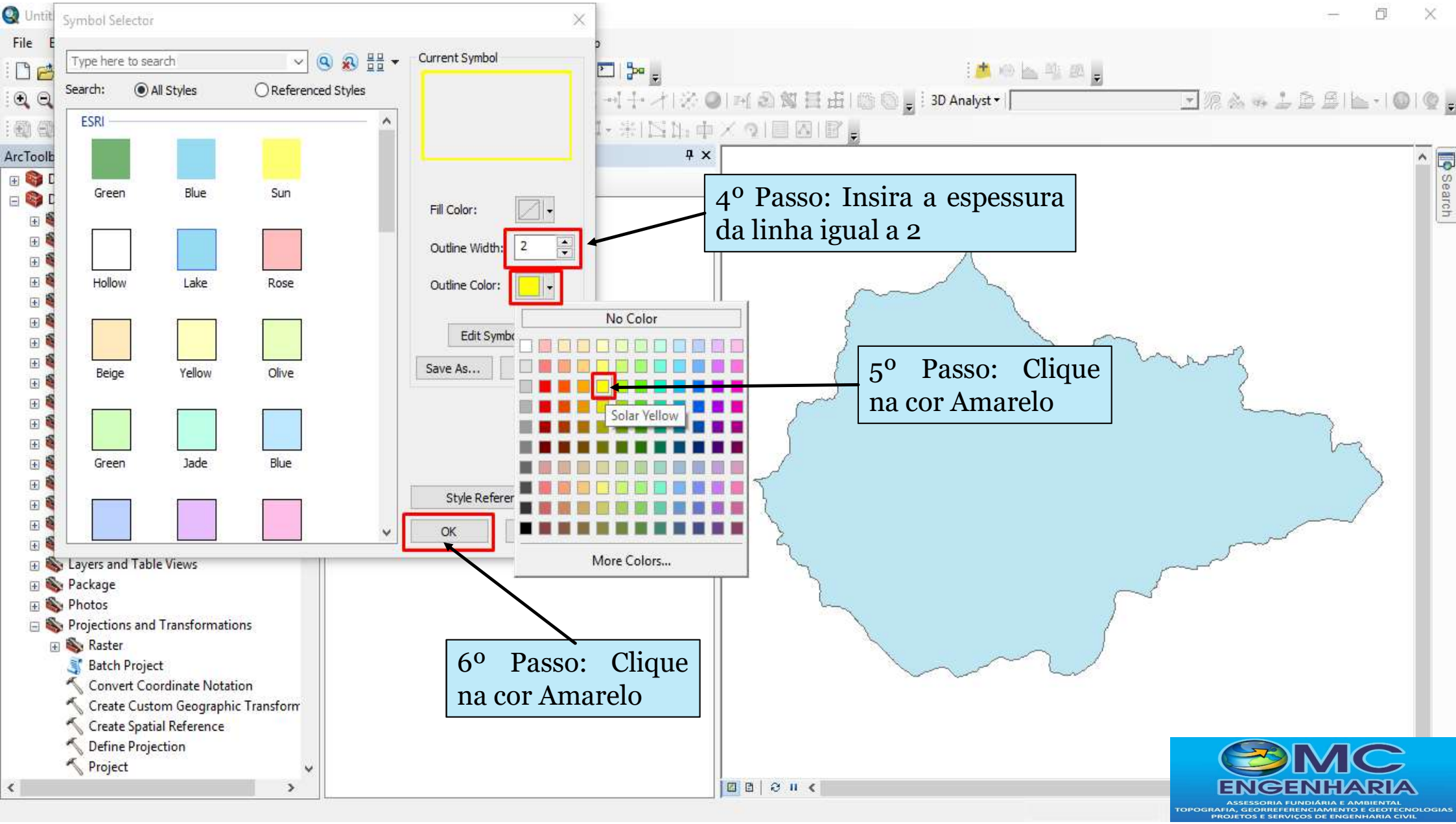

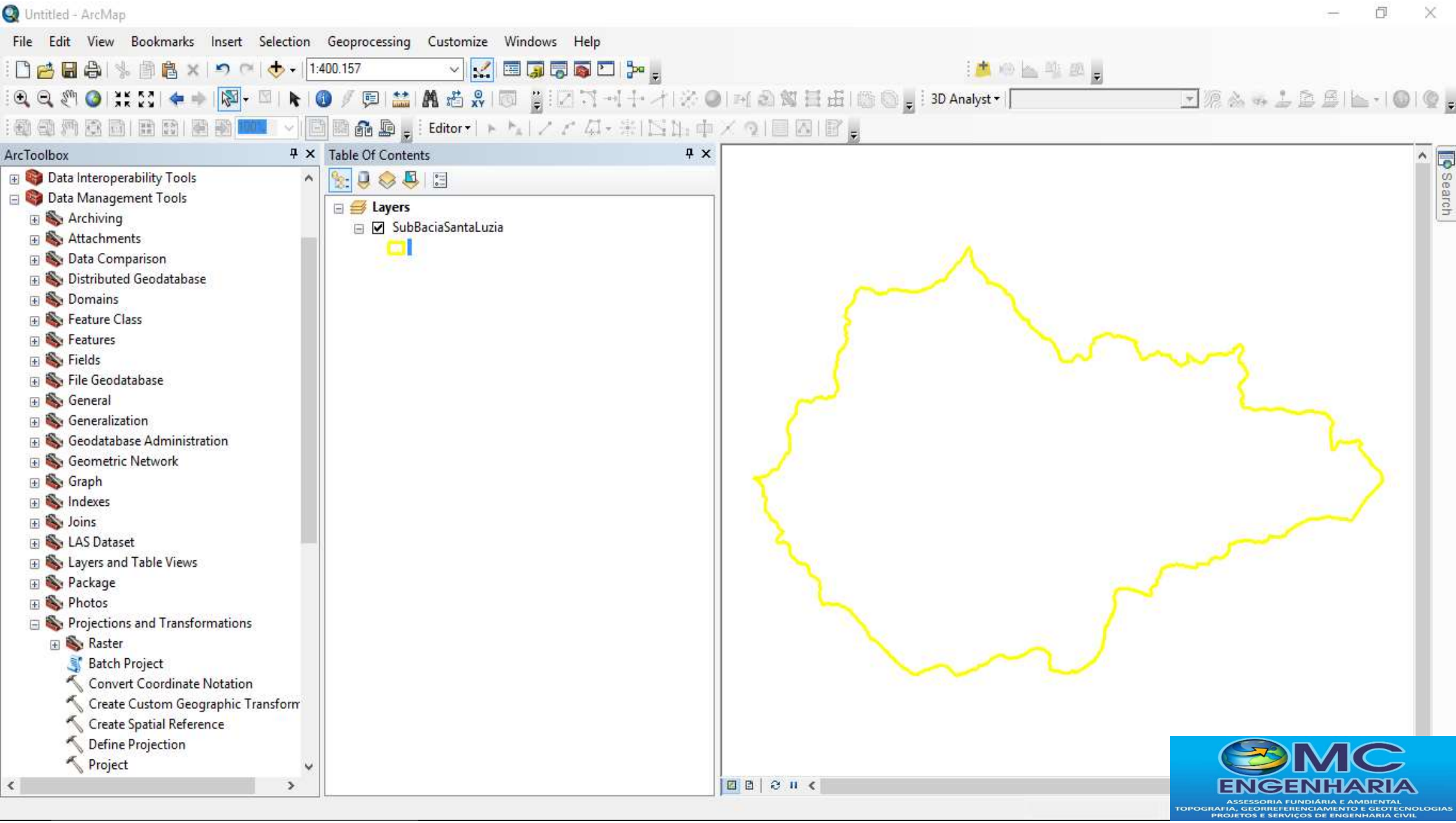
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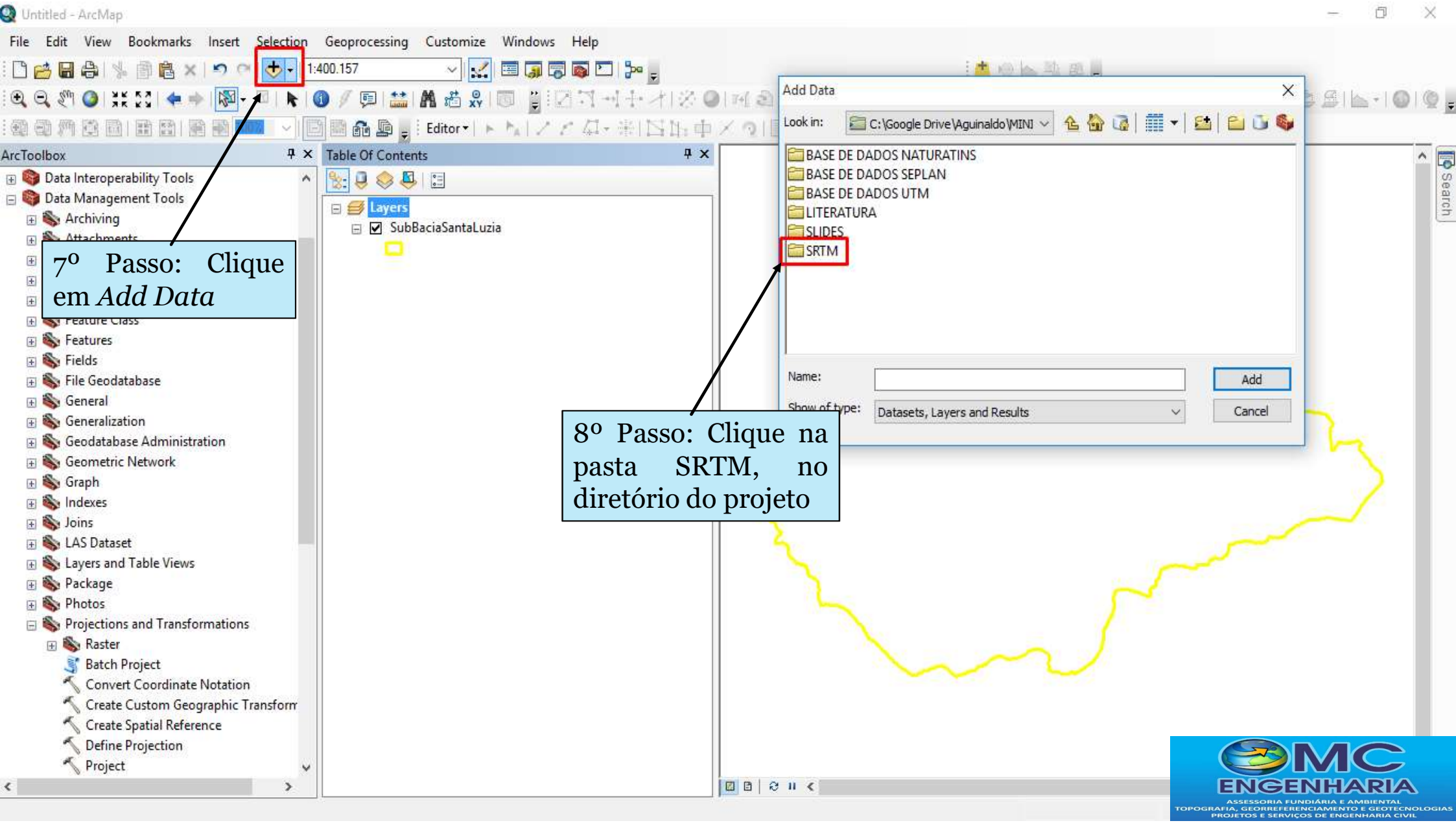

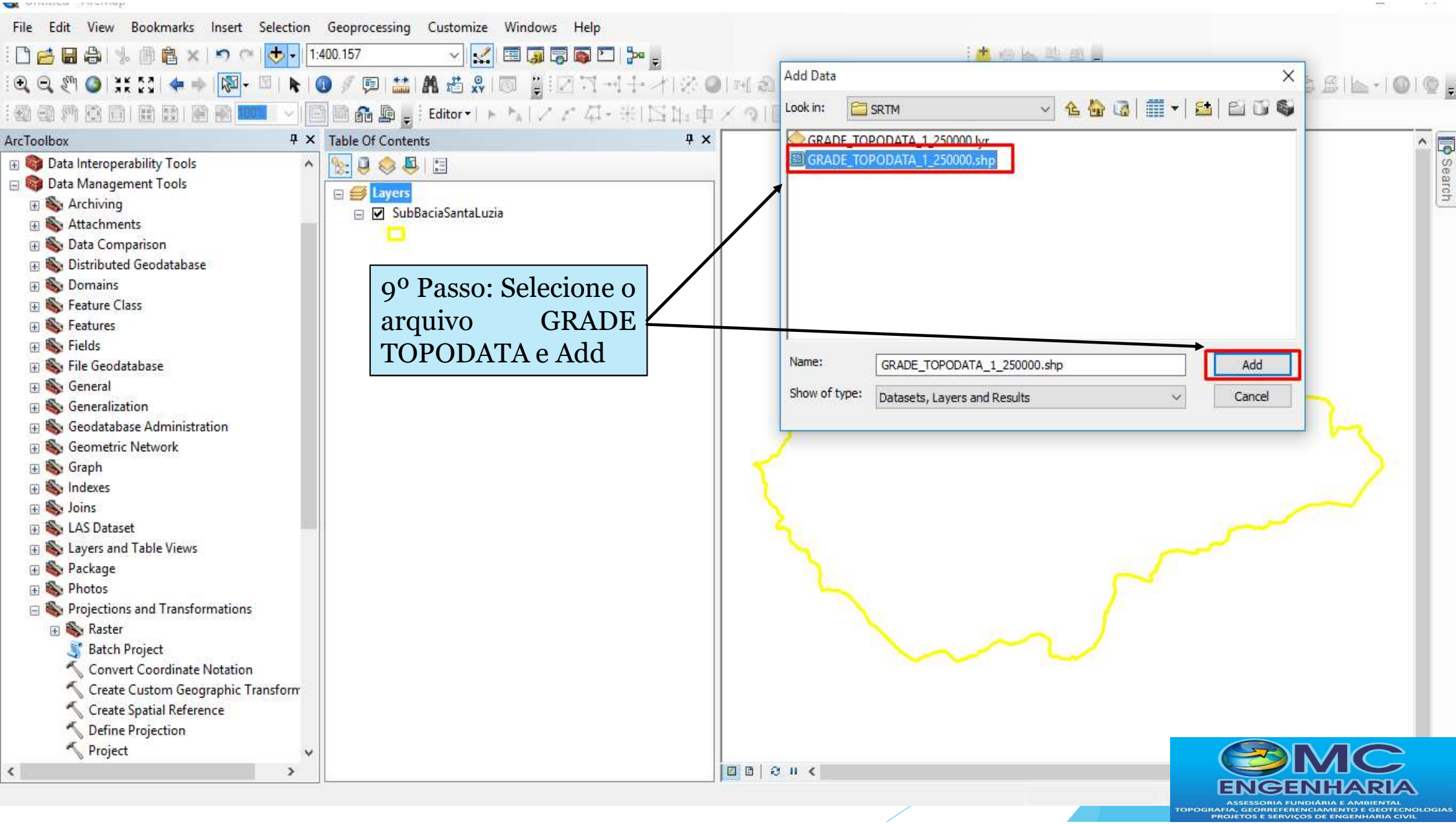

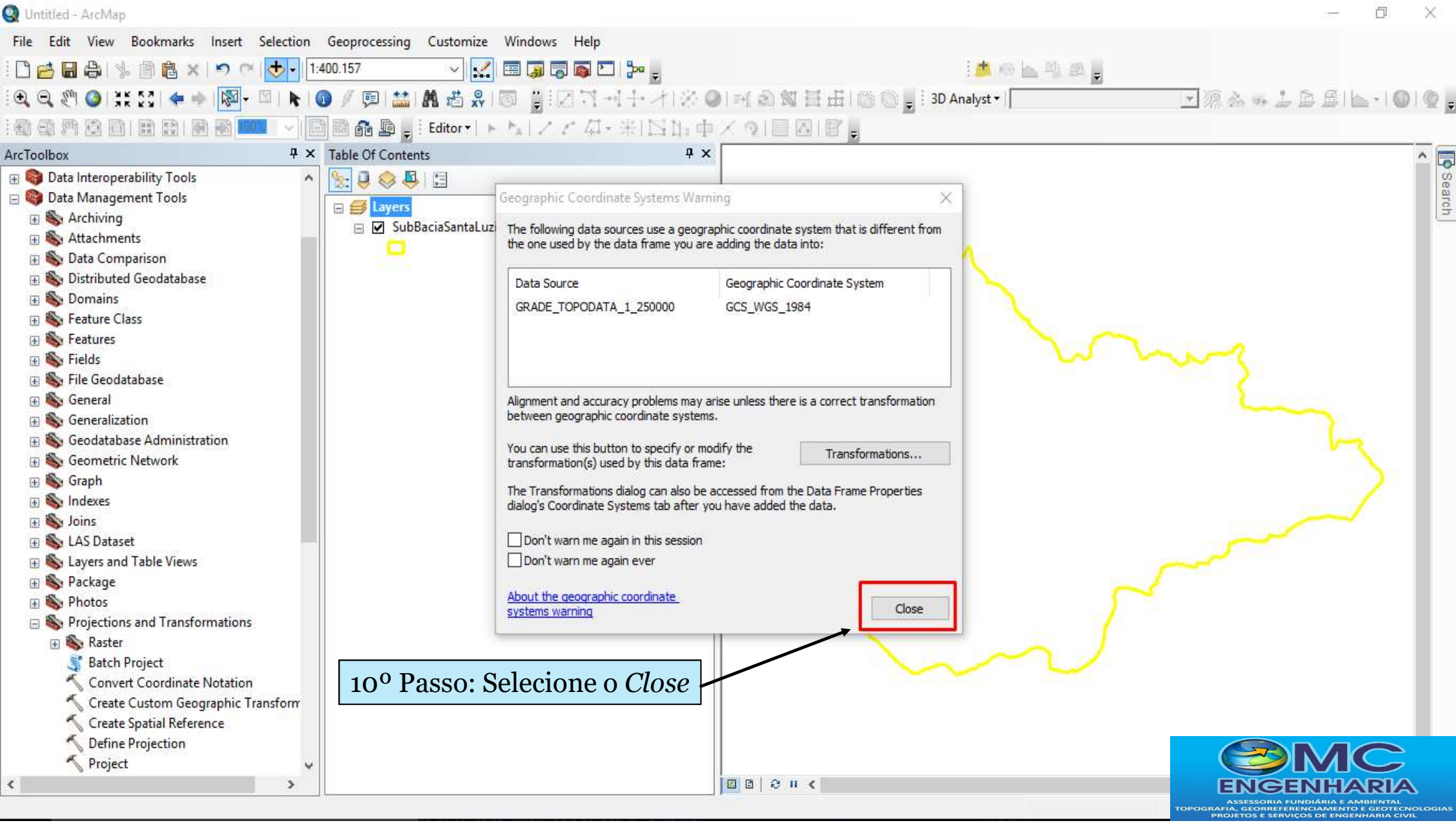

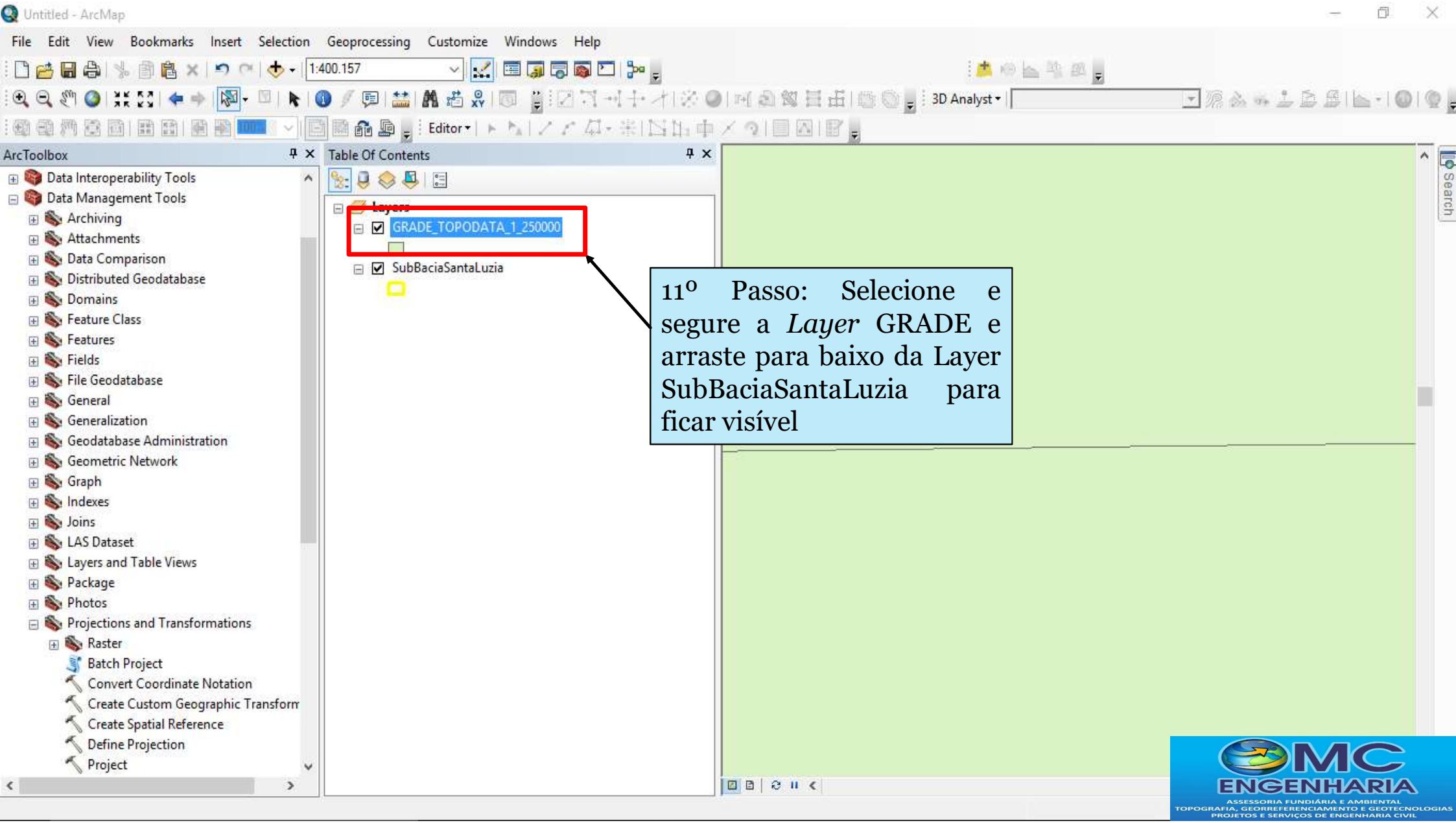

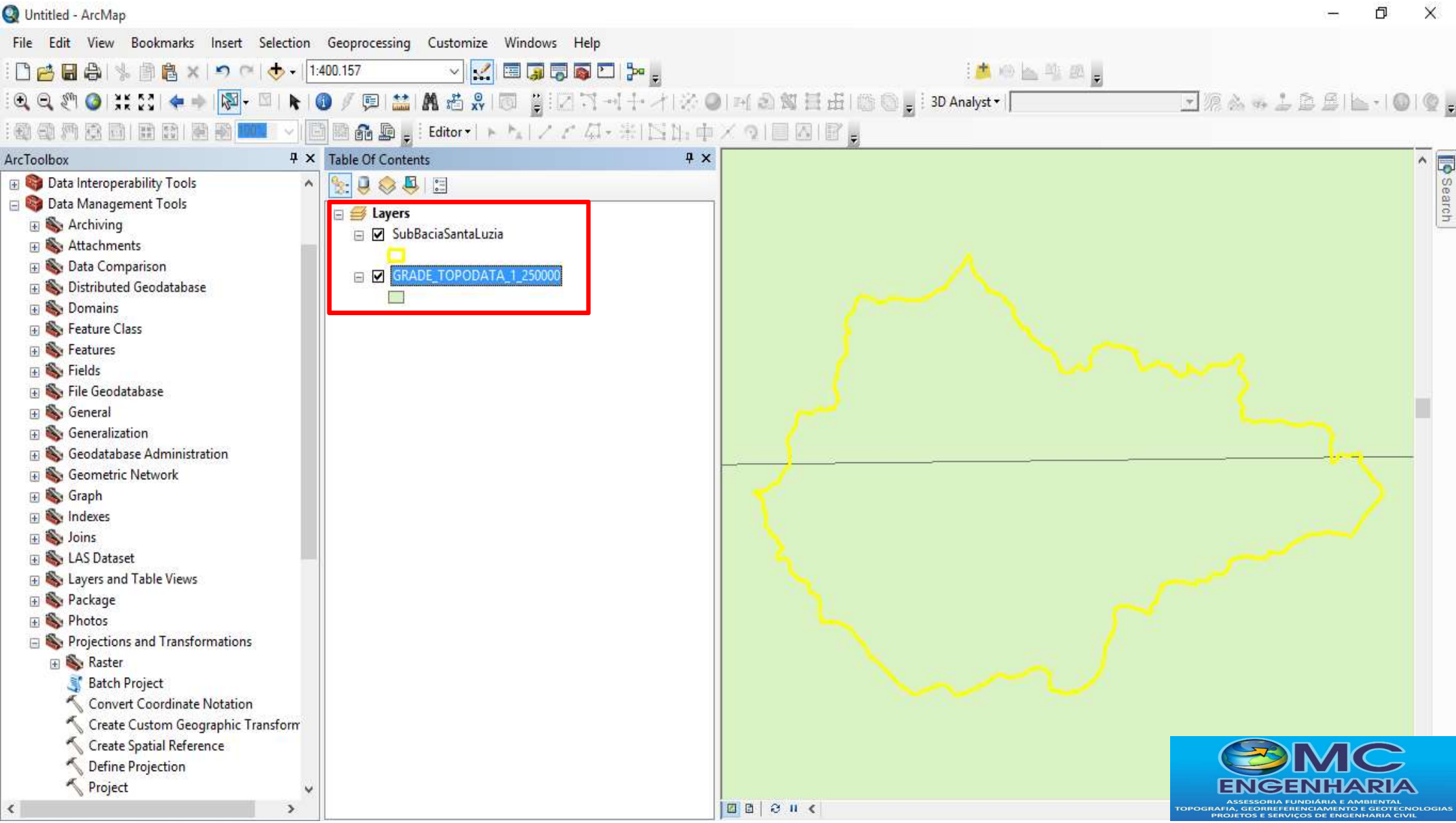
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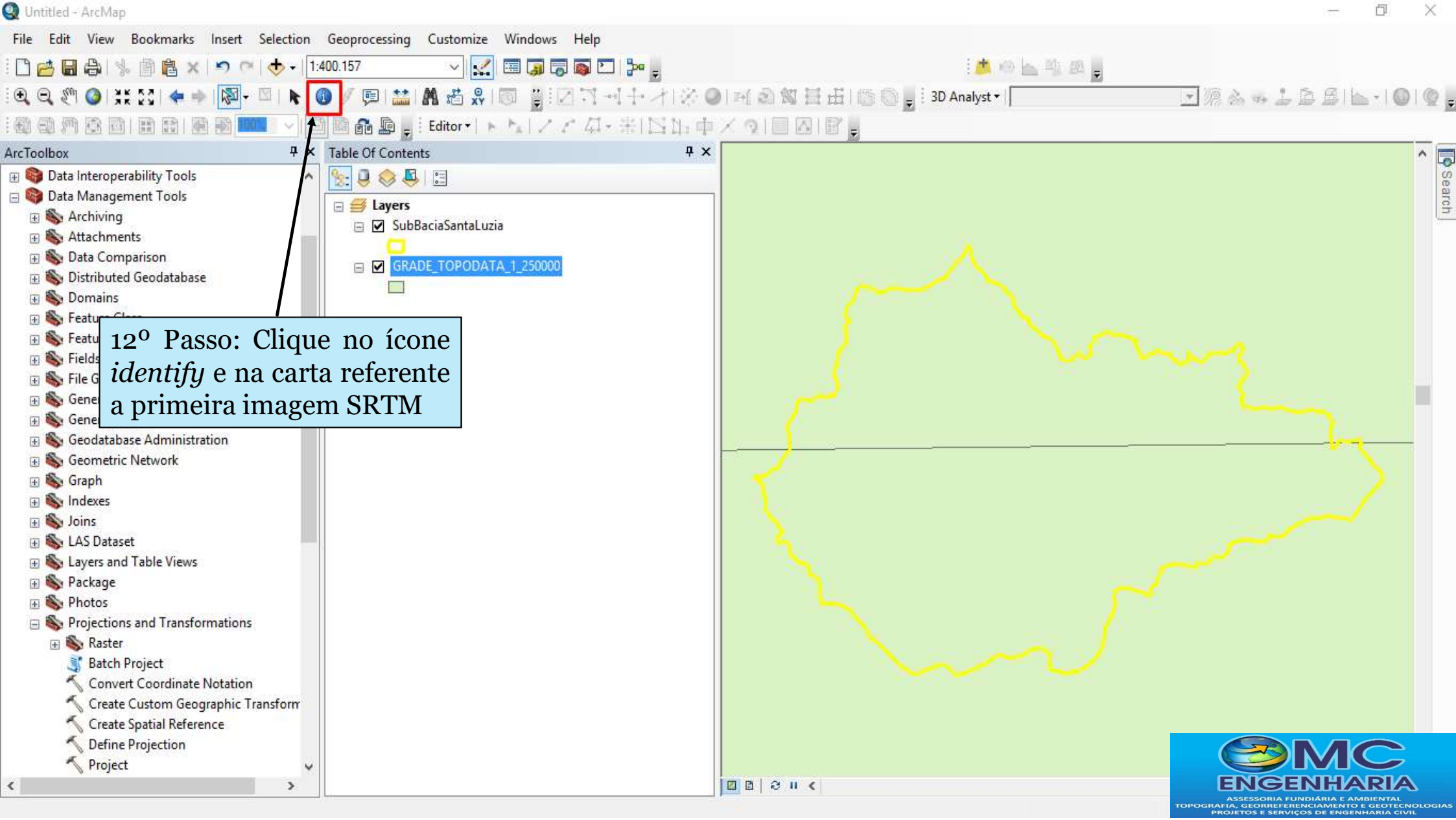
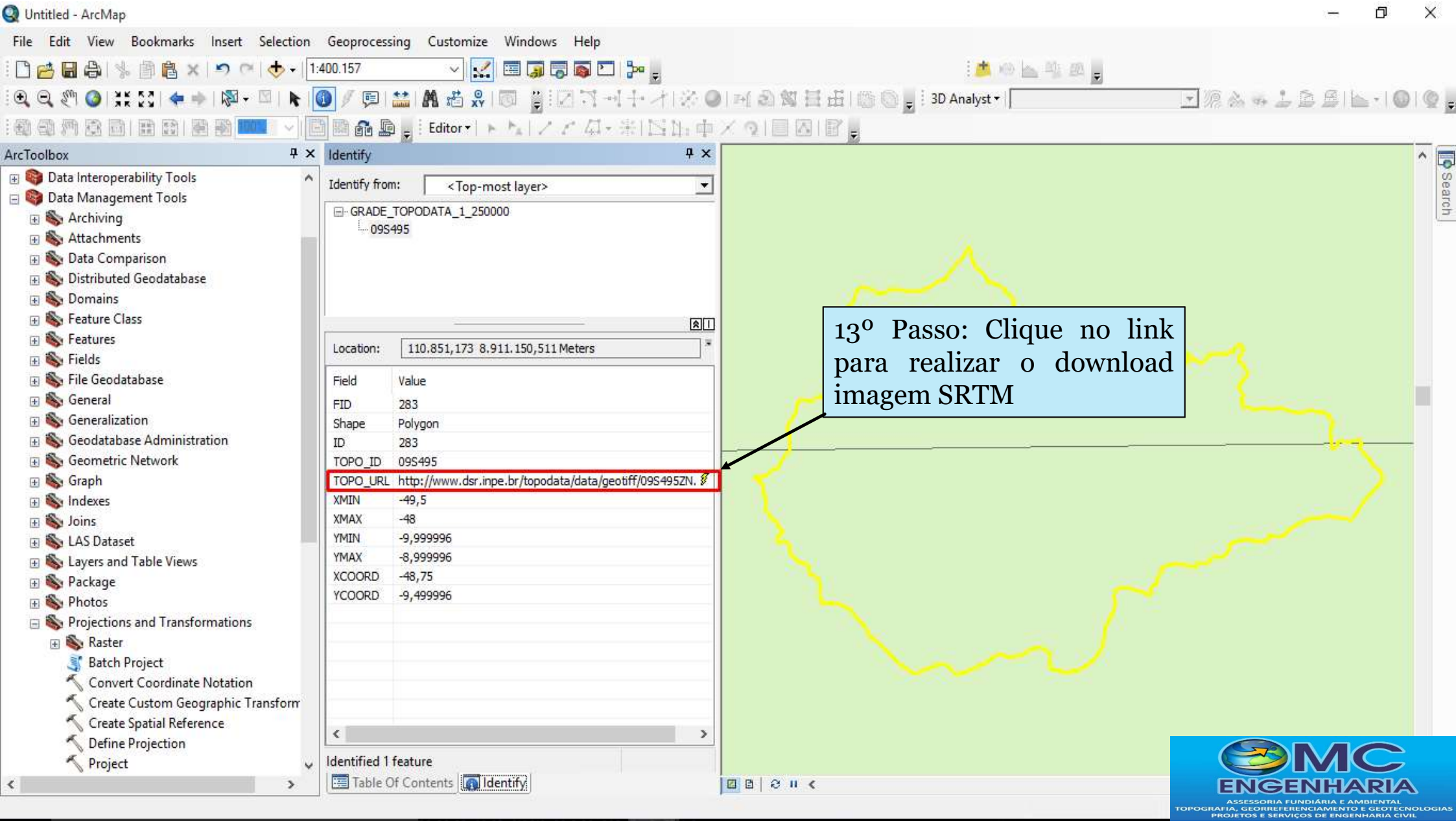
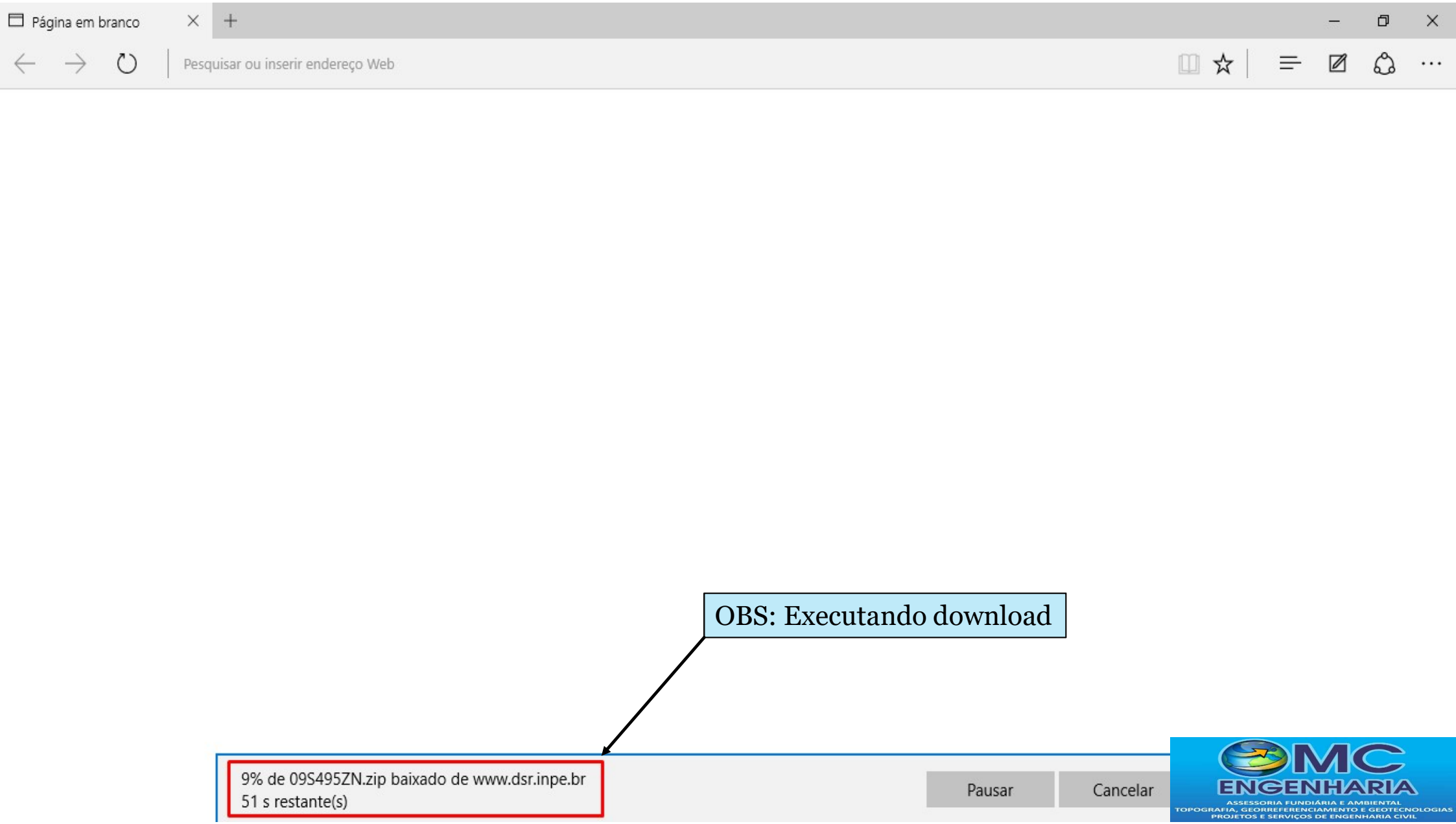
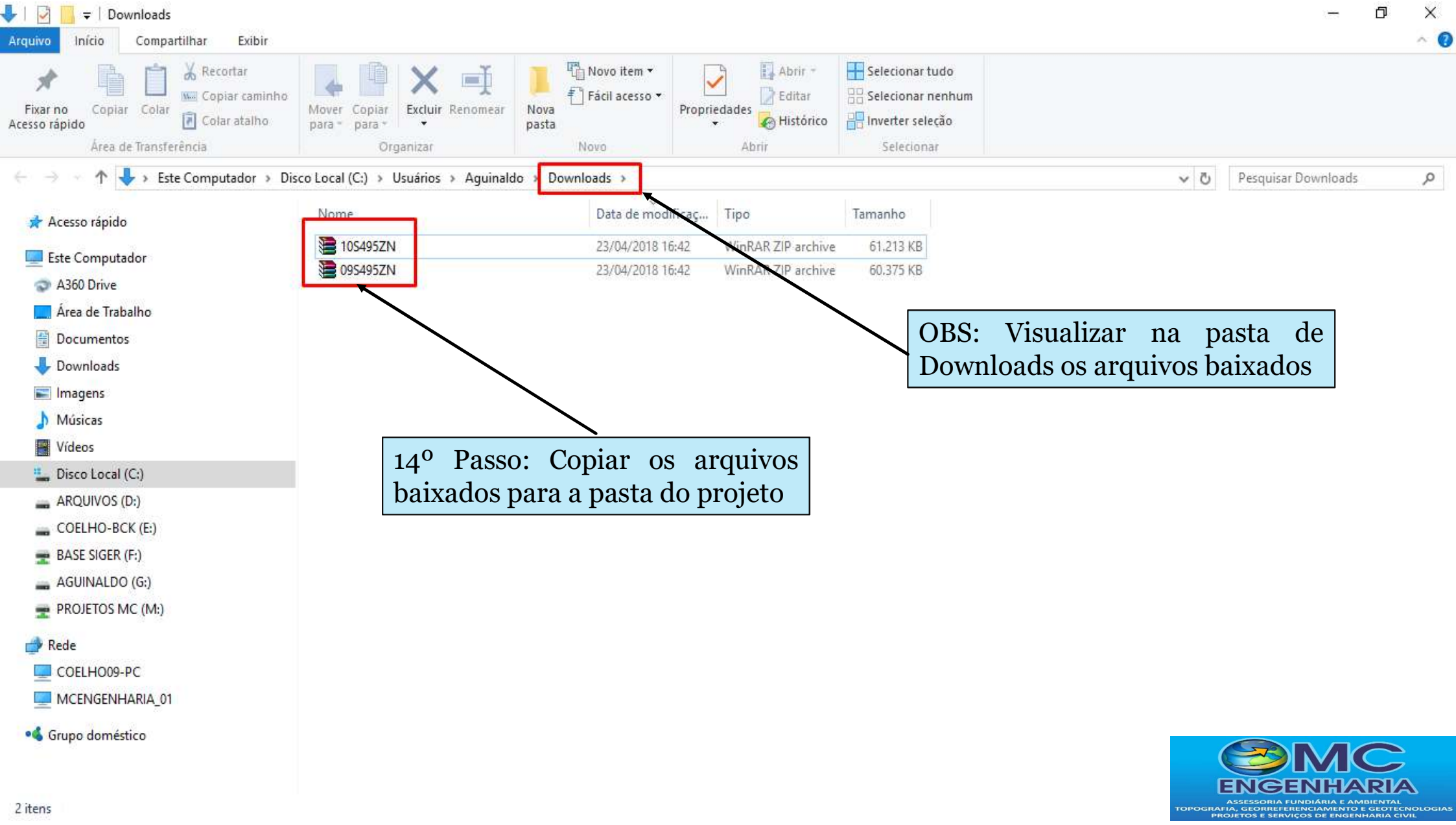
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL

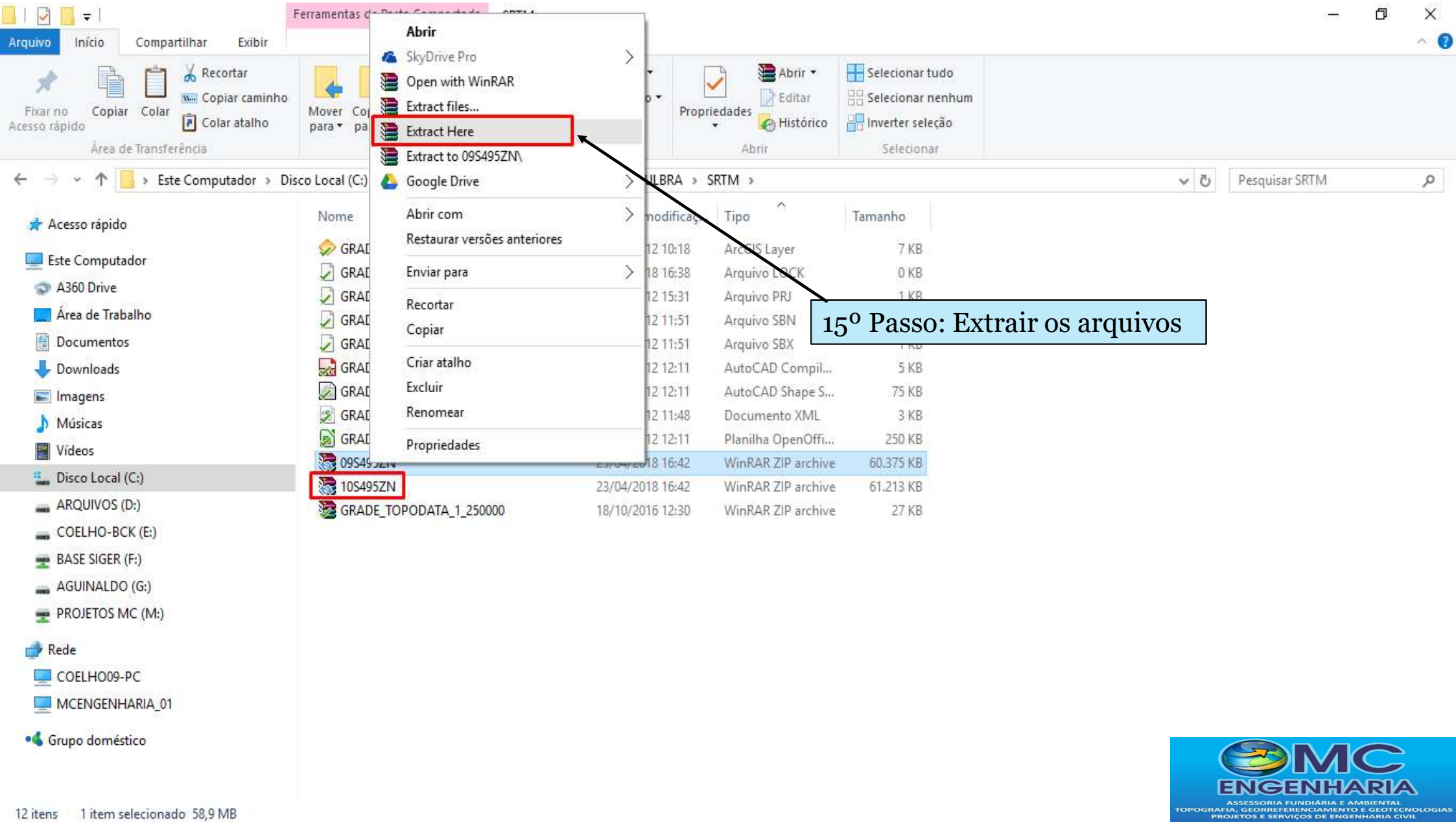


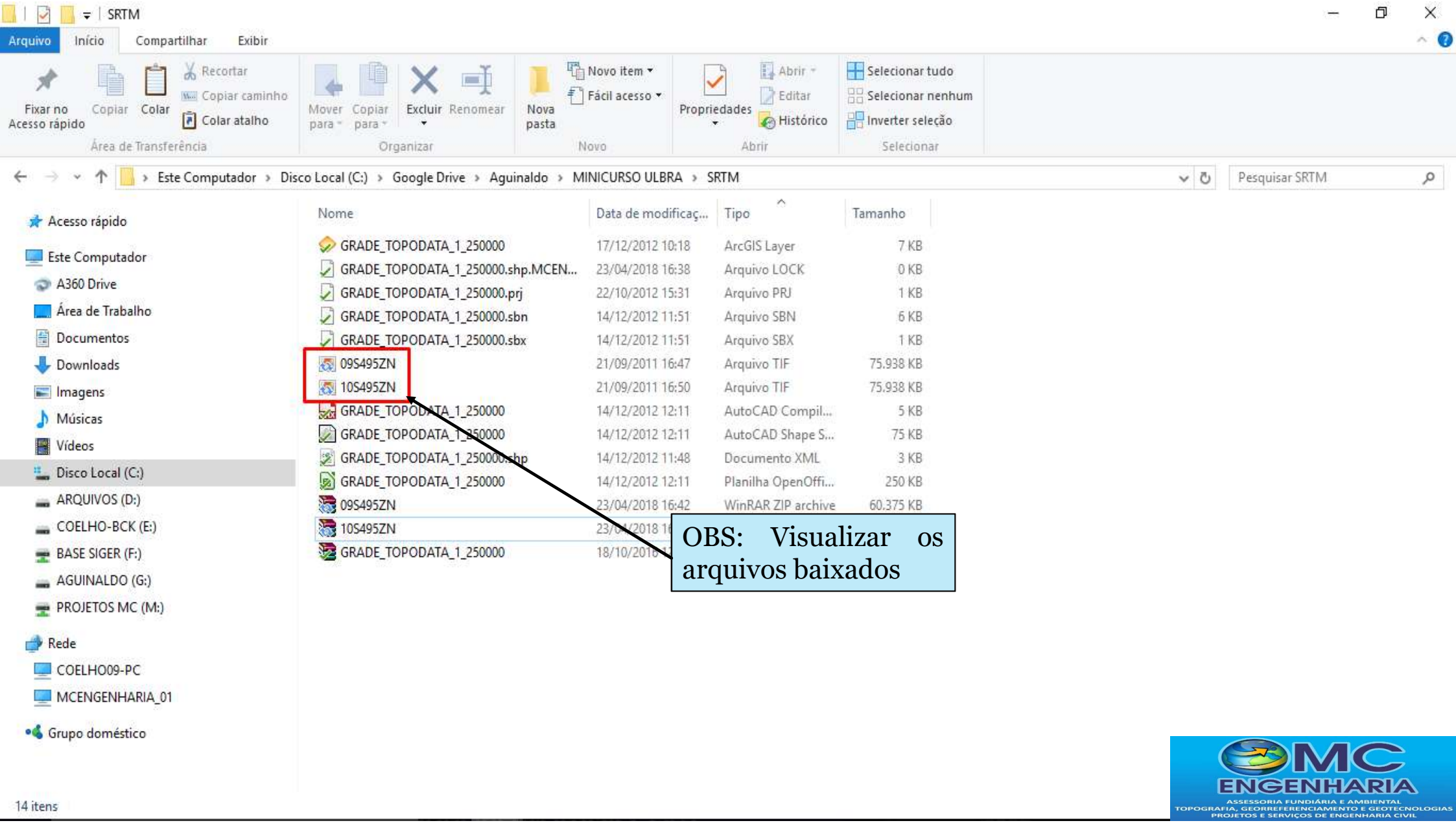


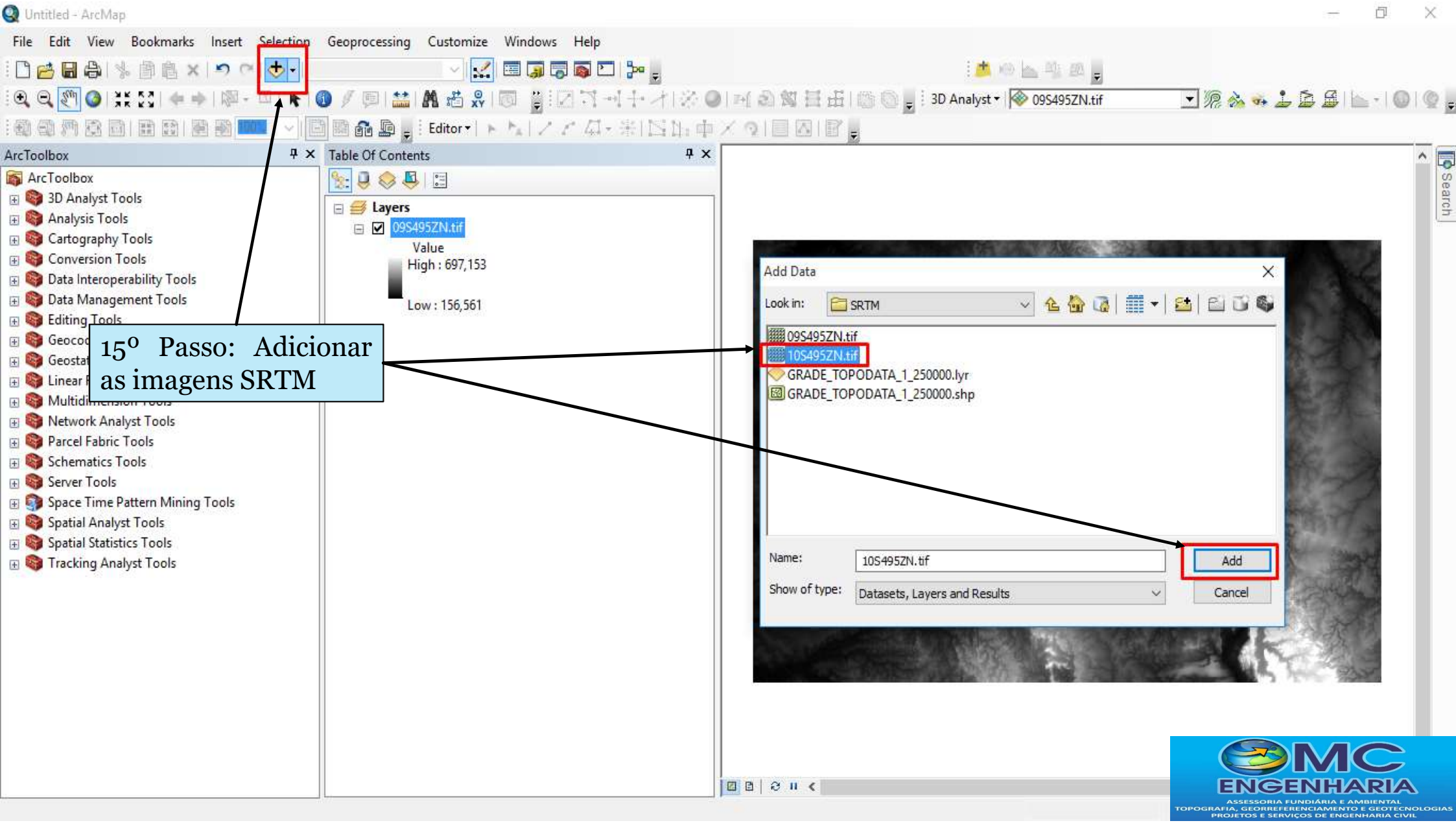

Página em branco
Pesquisar ou inserir endereço Web
OBS: Executando download
9% de 09S495ZN.zip baixado de www.dsr.inpe.br
51 s restante(s)
Pausar
Cancelar
MC
ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL

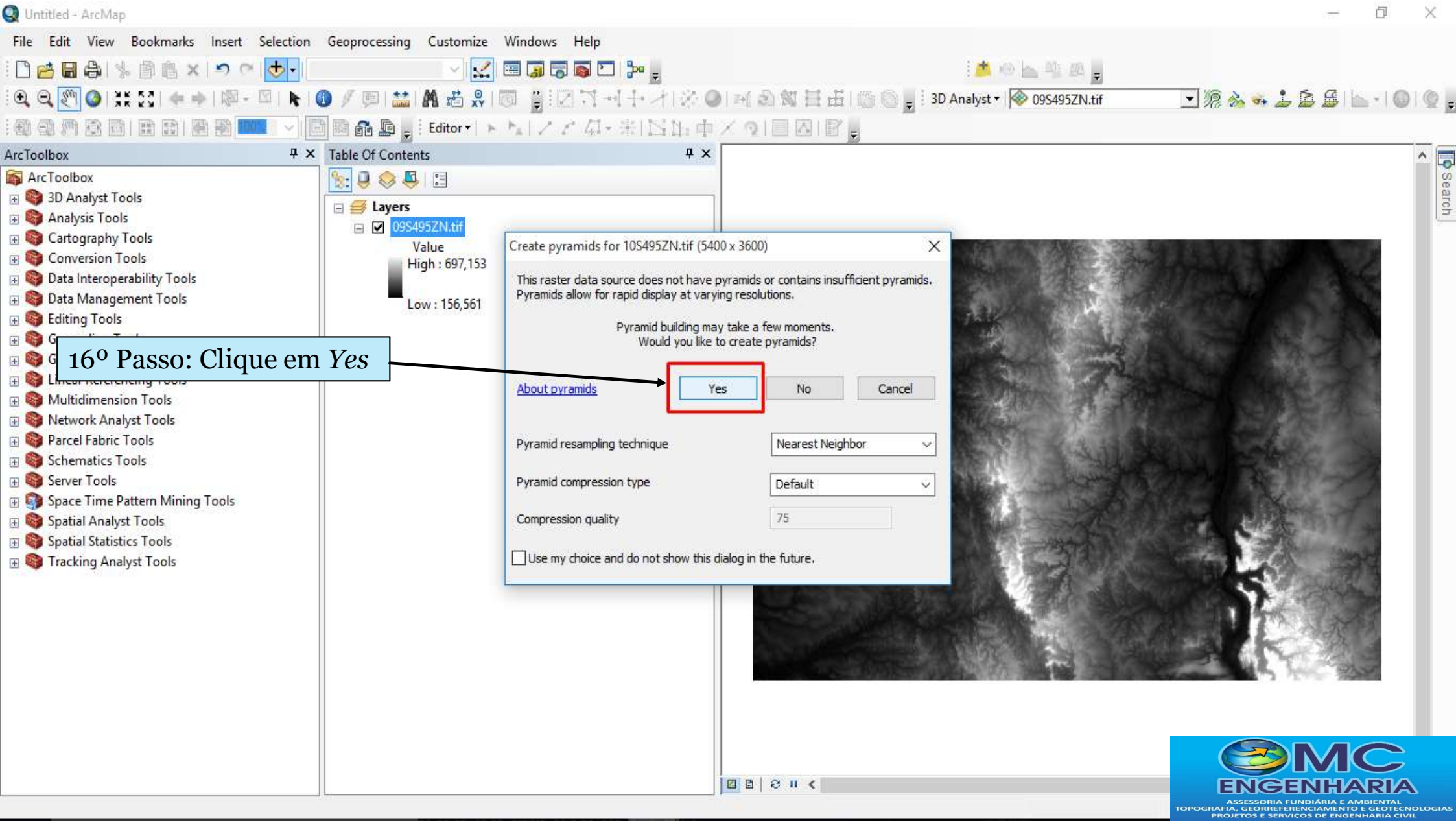


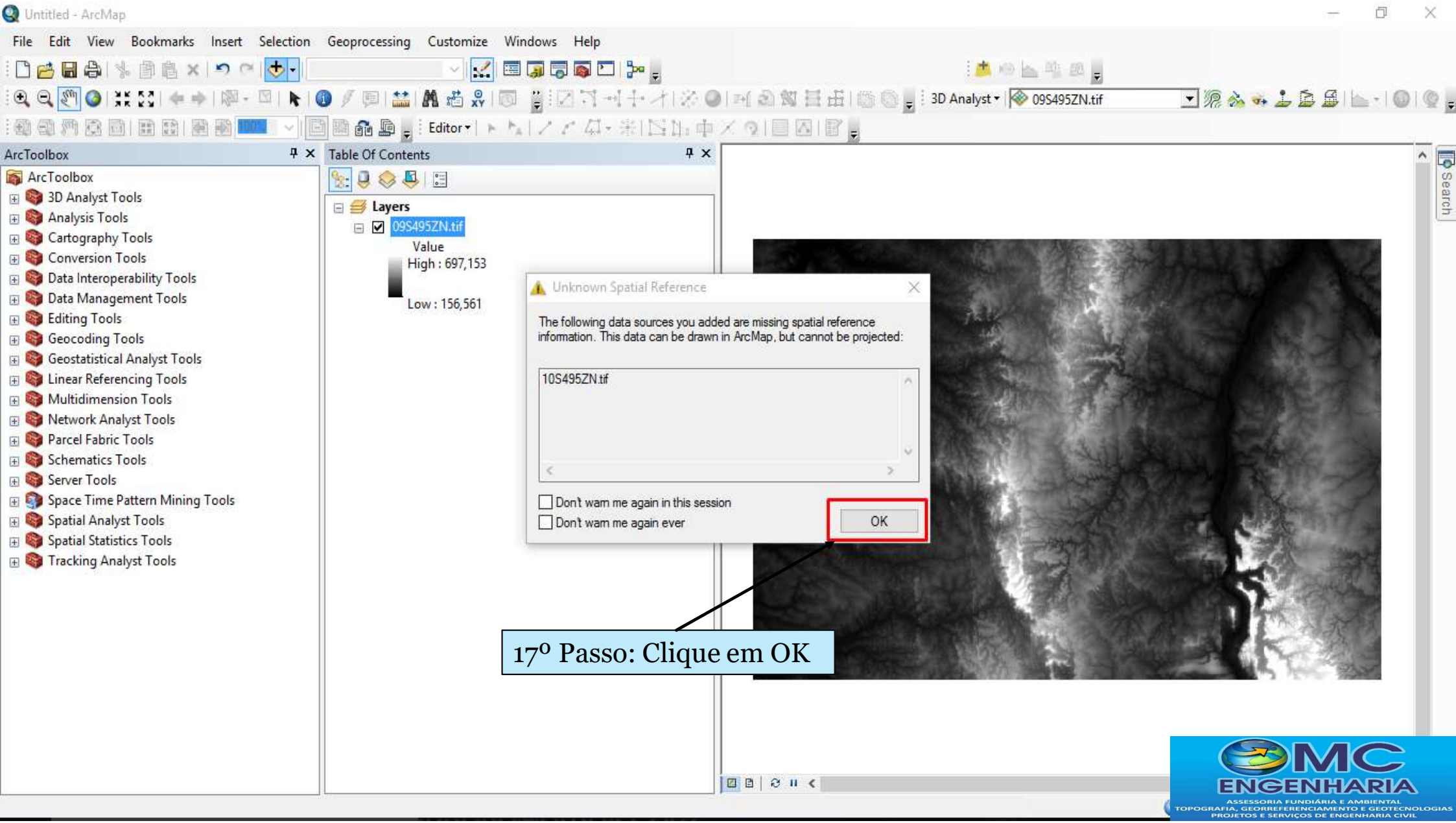
MC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL

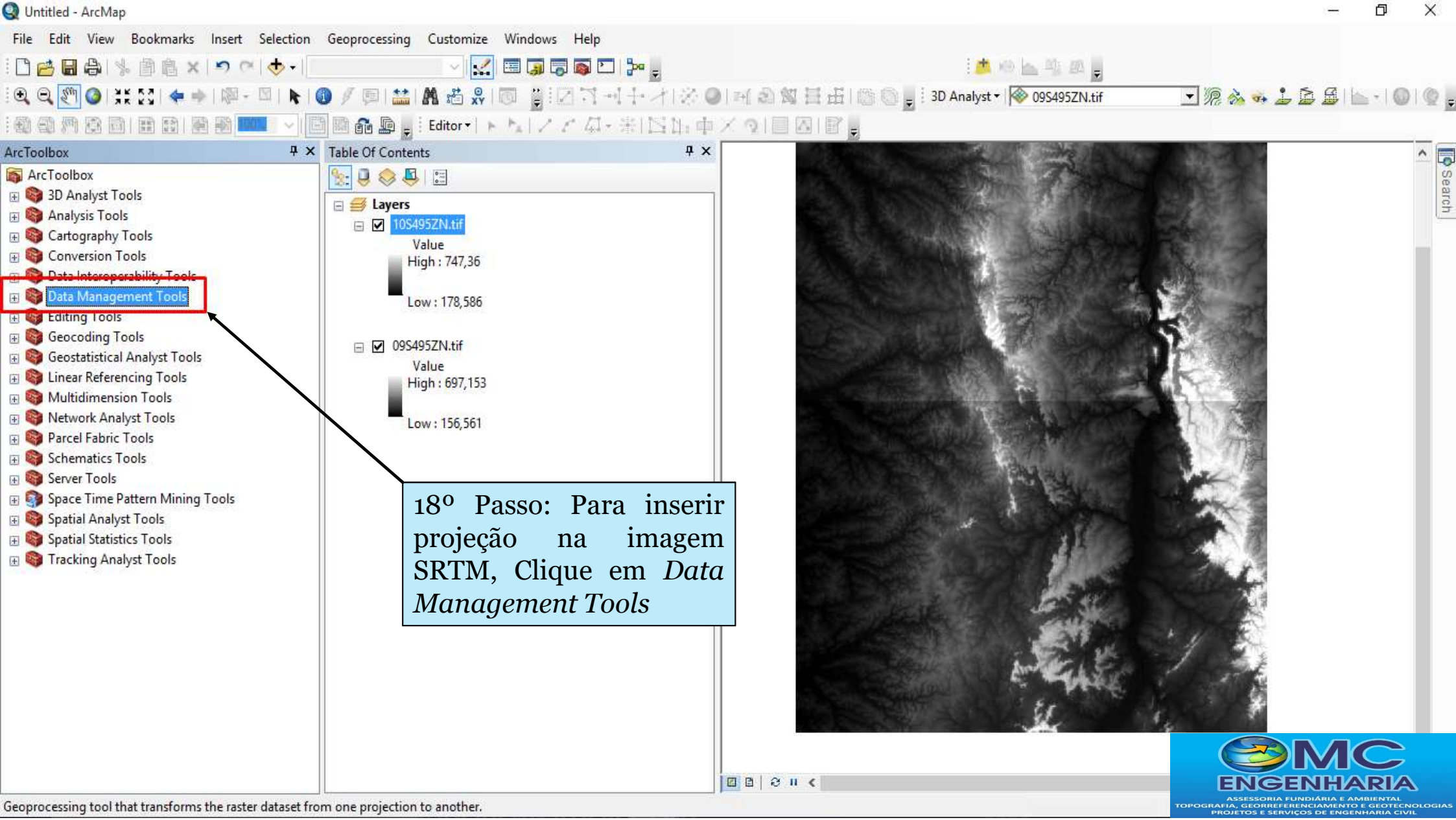

Abrir
SkyDrive Pro
Open with WinRAR
Extract files...
Extract Here
Extract to 09S495ZN\
Google Drive
Abrir com
Restaurar versões anteriores
Enviar para
Recortar
Copiar
Criar atalho
Excluir
Renomear
Propriedades
15º Passo: Extrair os arquivos
10S495ZN
GRADE_TOPODATA_1_250000
12 itens
1 item selecionado 58,9 MB

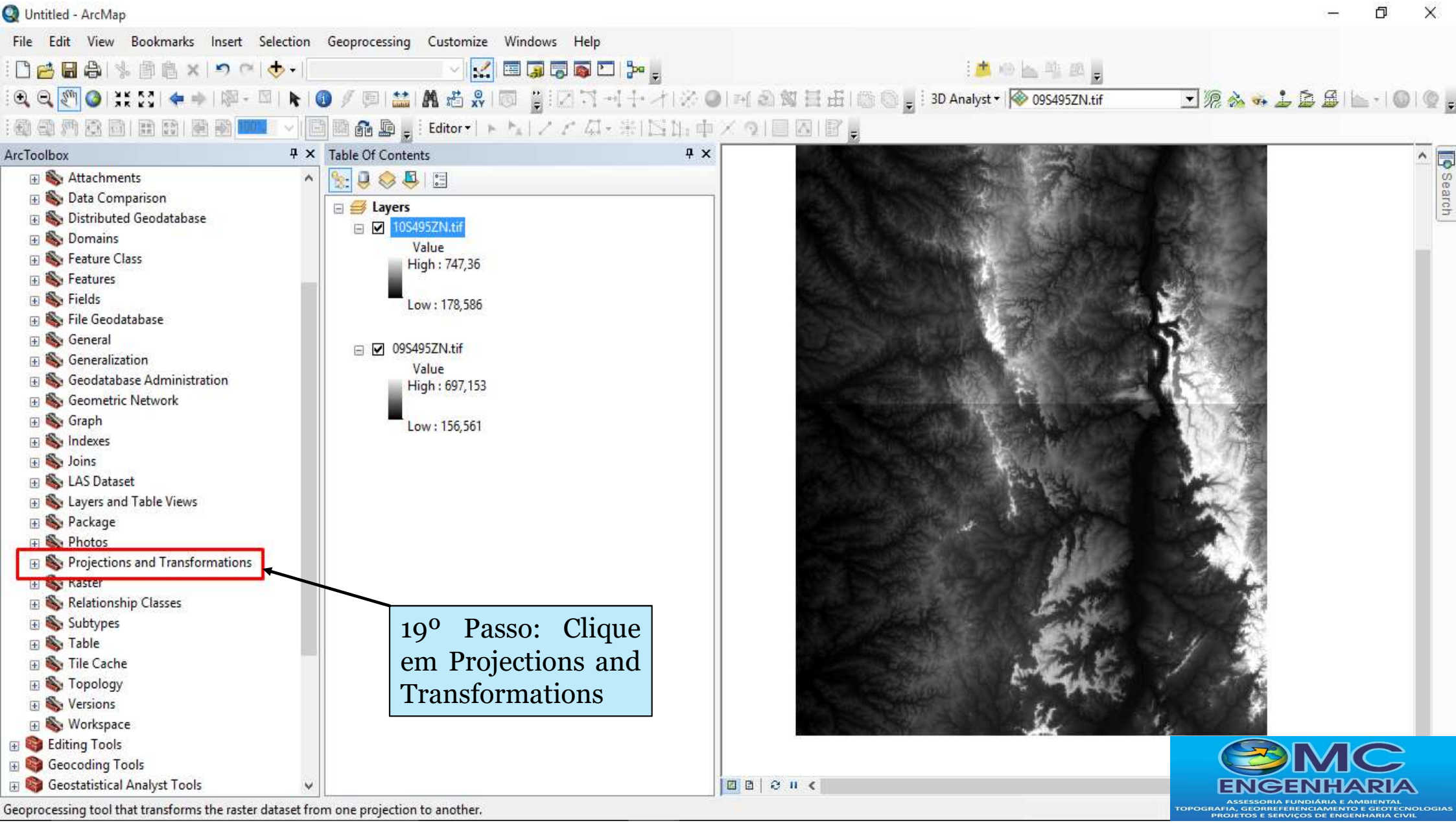

SRTM
Arquivo
Início
Compartilhar
Exibir
Fixar no Acesso rápido
Copiar
Colar
Recortar
Copiar caminho
Colar atalho
Área de Transferência
Mover para
Copiar para
Excluir
Renomear
Organizar
Nova pasta
Novo item
Fácil acesso
Novo
Propriedades
Abrir
Editar
Histórico
Abrir
Selecionar tudo
Selecionar nenhum
Inverter seleção
Selecionar
Este Computador › Disco Local (C:) › Google Drive › Aguinaldo › MINICURSO ULBRA › SRTM
Pesquisar SRTM
Acesso rápido
Este Computador
A360 Drive
Área de Trabalho
Documentos
Downloads
Imagens
Músicas
Vídeos
Disco Local (C:)
ARQUIVOS (D:)
COELHO-BCK (E:)
BASE SIGER (F:)
AGUINALDO (G:)
PROJETOS MC (M:)
Rede
COELHO09-PC
MCENGENHARIA_01
Grupo doméstico
Nome
Data de modificaç...
Tipo
Tamanho
GRADE_TOPODATA_1_250000 17/12/2012 10:18 ArcGIS Layer 7 KB
GRADE_TOPODATA_1_250000.shp.MCEN... 23/04/2018 16:38 Arquivo LOCK 0 KB
GRADE_TOPODATA_1_250000.prj 22/10/2012 15:31 Arquivo PRJ 1 KB
GRADE_TOPODATA_1_250000.sbn 14/12/2012 11:51 Arquivo SBN 6 KB
GRADE_TOPODATA_1_250000.sbx 14/12/2012 11:51 Arquivo SBX 1 KB
09S495ZN 21/09/2011 16:47 Arquivo TIF 75.938 KB
10S495ZN 21/09/2011 16:50 Arquivo TIF 75.938 KB
GRADE_TOPODATA_1_250000 14/12/2012 12:11 AutoCAD Compil... 5 KB
GRADE_TOPODATA_1_250000 14/12/2012 12:11 AutoCAD Shape S... 75 KB
GRADE_TOPODATA_1_250000.shp 14/12/2012 11:48 Documento XML 3 KB
GRADE_TOPODATA_1_250000 14/12/2012 12:11 Planilha OpenOffi... 250 KB
09S495ZN 23/04/2018 16:42 WinRAR ZIP archive 60.375 KB
10S495ZN
GRADE_TOPODATA_1_250000
OBS: Visualizar os arquivos baixados
14 itens

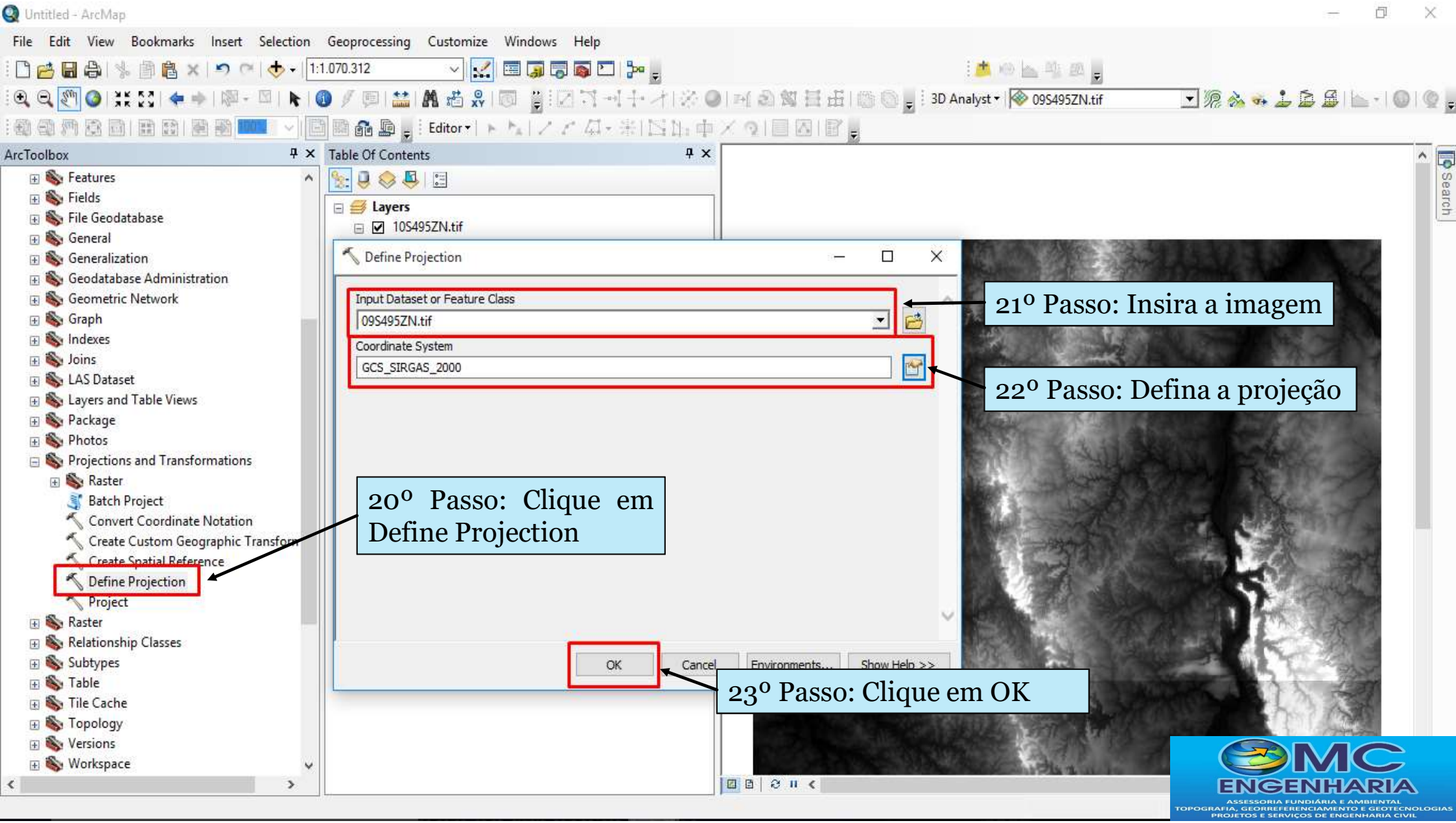


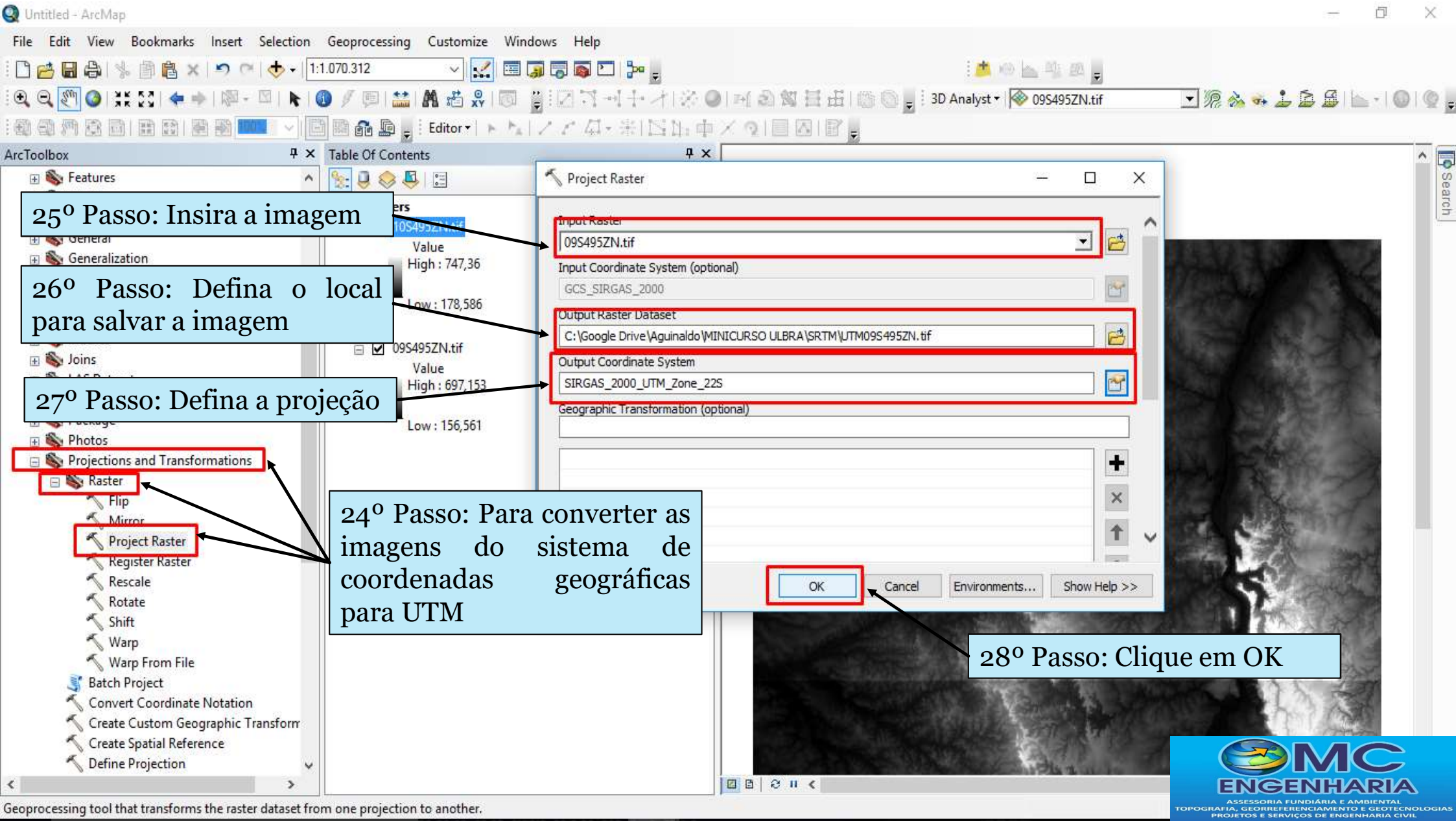

Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
3D Analyst
09S495ZN.tif
Editor
ArcToolbox
ArcToolbox
3D Analyst Tools
Analysis Tools
Cartography Tools
Conversion Tools
Data Interoperability Tools
Data Management Tools
Editing Tools
Multidimension Tools
Network Analyst Tools
Parcel Fabric Tools
Schematics Tools
Server Tools
Space Time Pattern Mining Tools
Spatial Analyst Tools
Spatial Statistics Tools
Tracking Analyst Tools
Table Of Contents
Layers
09S495ZN.tif
Value
High : 697,153
Low : 156,561
16º Passo: Clique em Yes
Create pyramids for 10S495ZN.tif (5400 x 3600)
This raster data source does not have pyramids or contains insufficient pyramids.
Pyramids allow for rapid display at varying resolutions.
Pyramid building may take a few moments.
Would you like to create pyramids?
About pyramids
Yes
No
Cancel
Pyramid resampling technique
Nearest Neighbor
Pyramid compression type
Default
Compression quality
75
Use my choice and do not show this dialog in the future.
Search











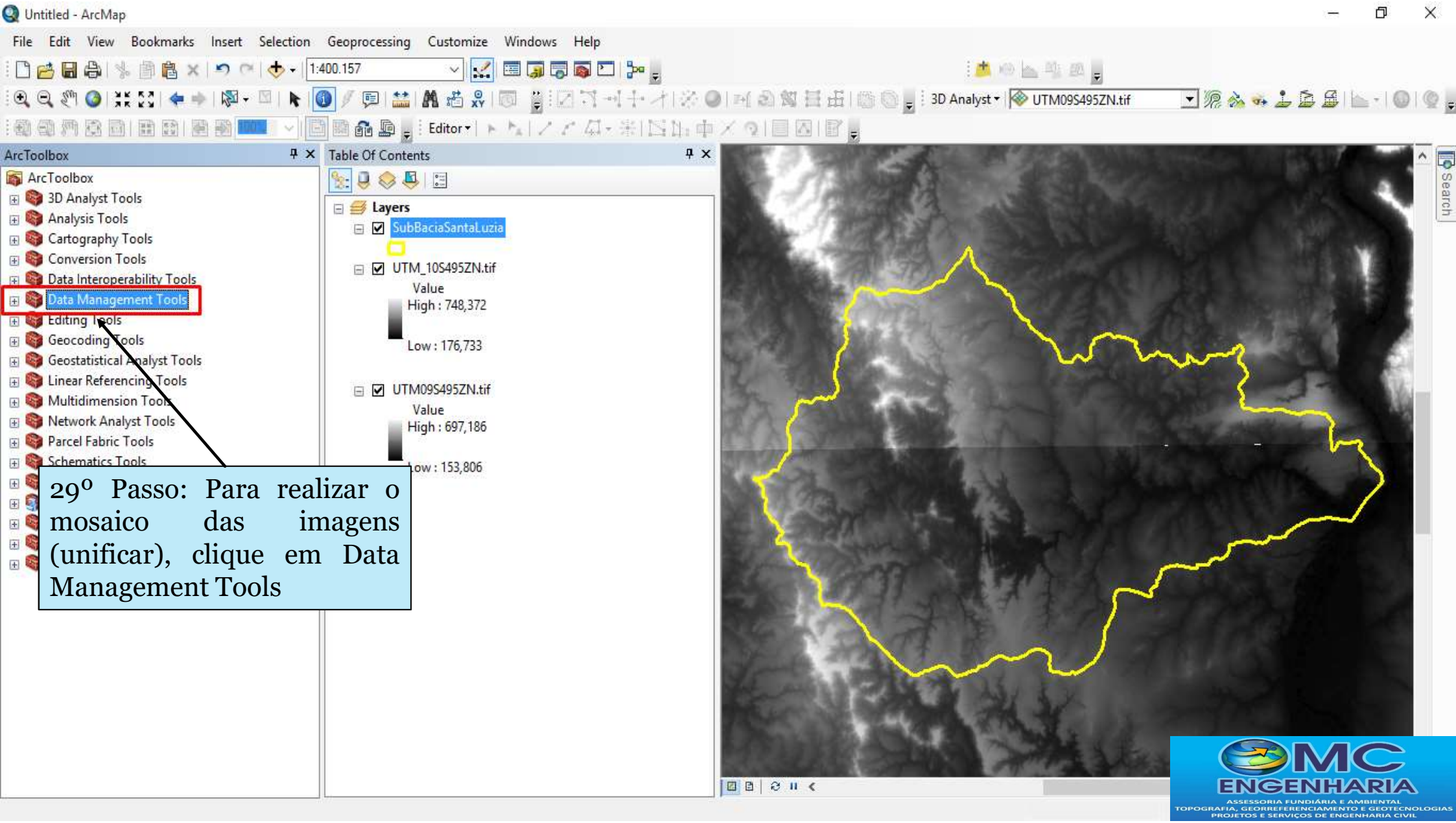
25º Passo: Insira a imagem

26º Passo: Defina o local para salvar a imagem

27º Passo: Defina a projeção

24º Passo: Para converter as imagens do sistema de coordenadas geográficas para UTM

28º Passo: Clique em OK


Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:400.157
3D Analyst
UTM09S495ZN.tif
Editor
ArcToolbox
ArcToolbox
3D Analyst Tools
Analysis Tools
Cartography Tools
Conversion Tools
Data Interoperability Tools
Data Management Tools
Editing Tools
Geocoding Tools
Geostatistical Analyst Tools
Linear Referencing Tools
Multidimension Tools
Network Analyst Tools
Parcel Fabric Tools
Schematics Tools
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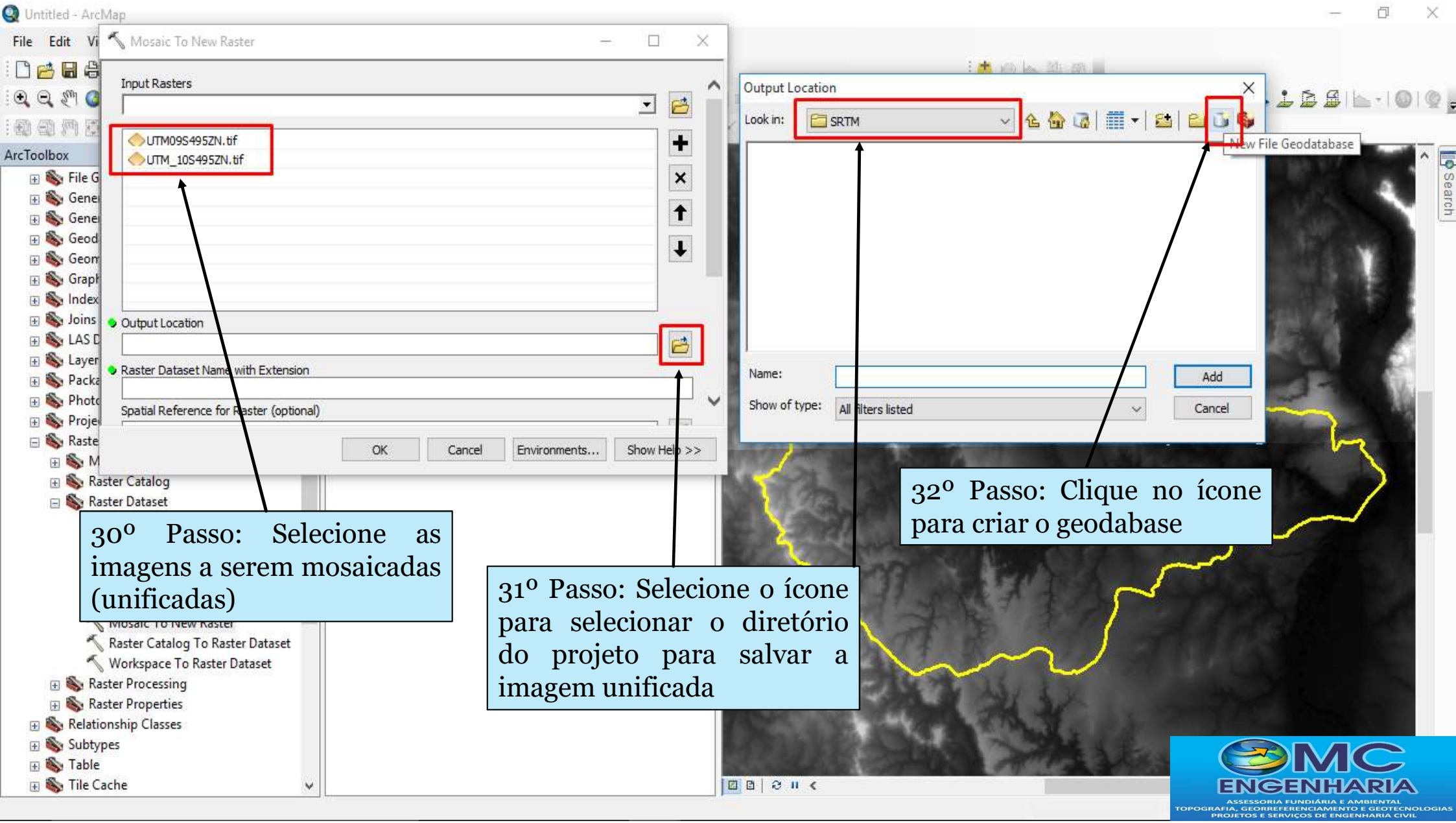
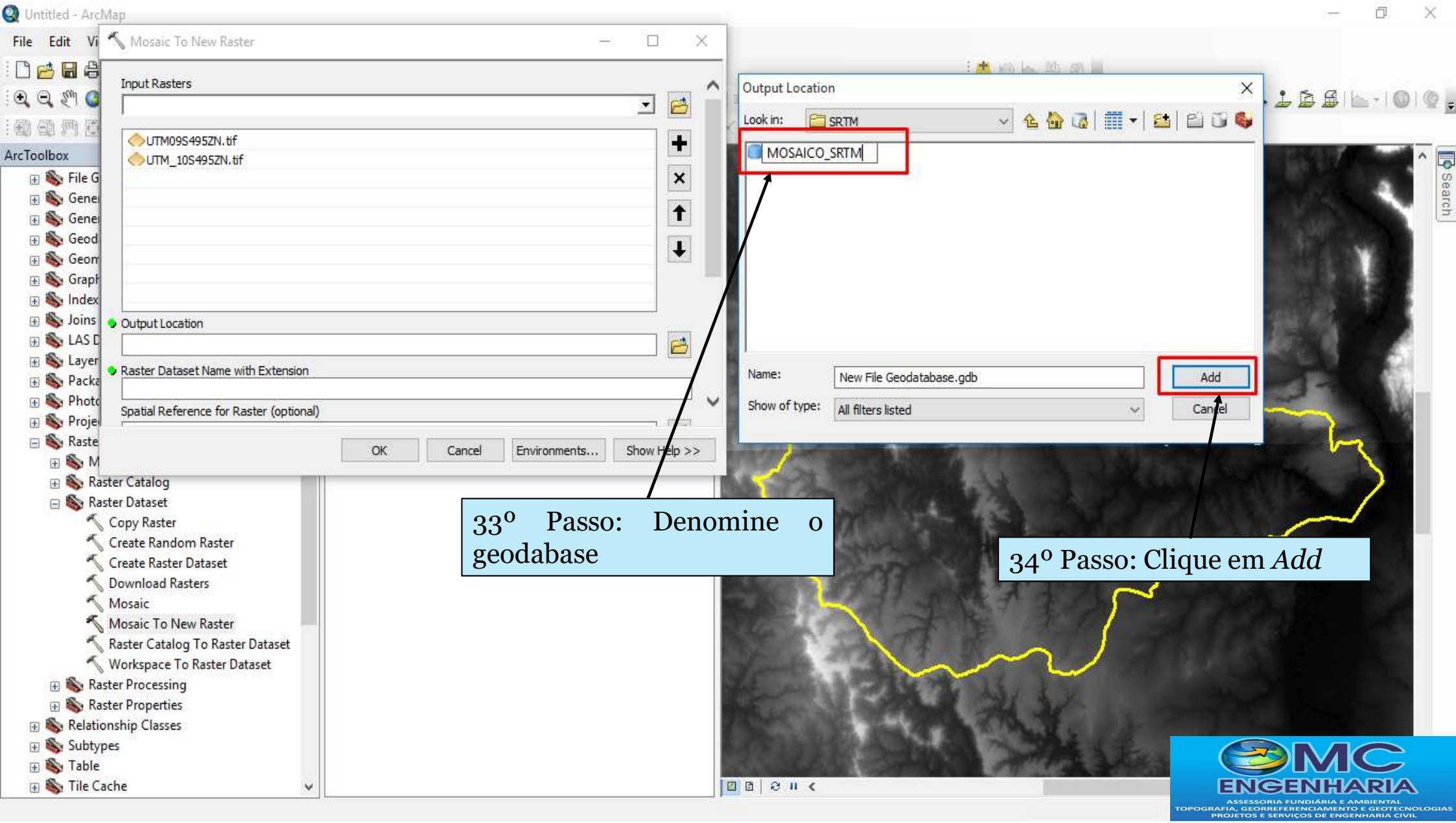
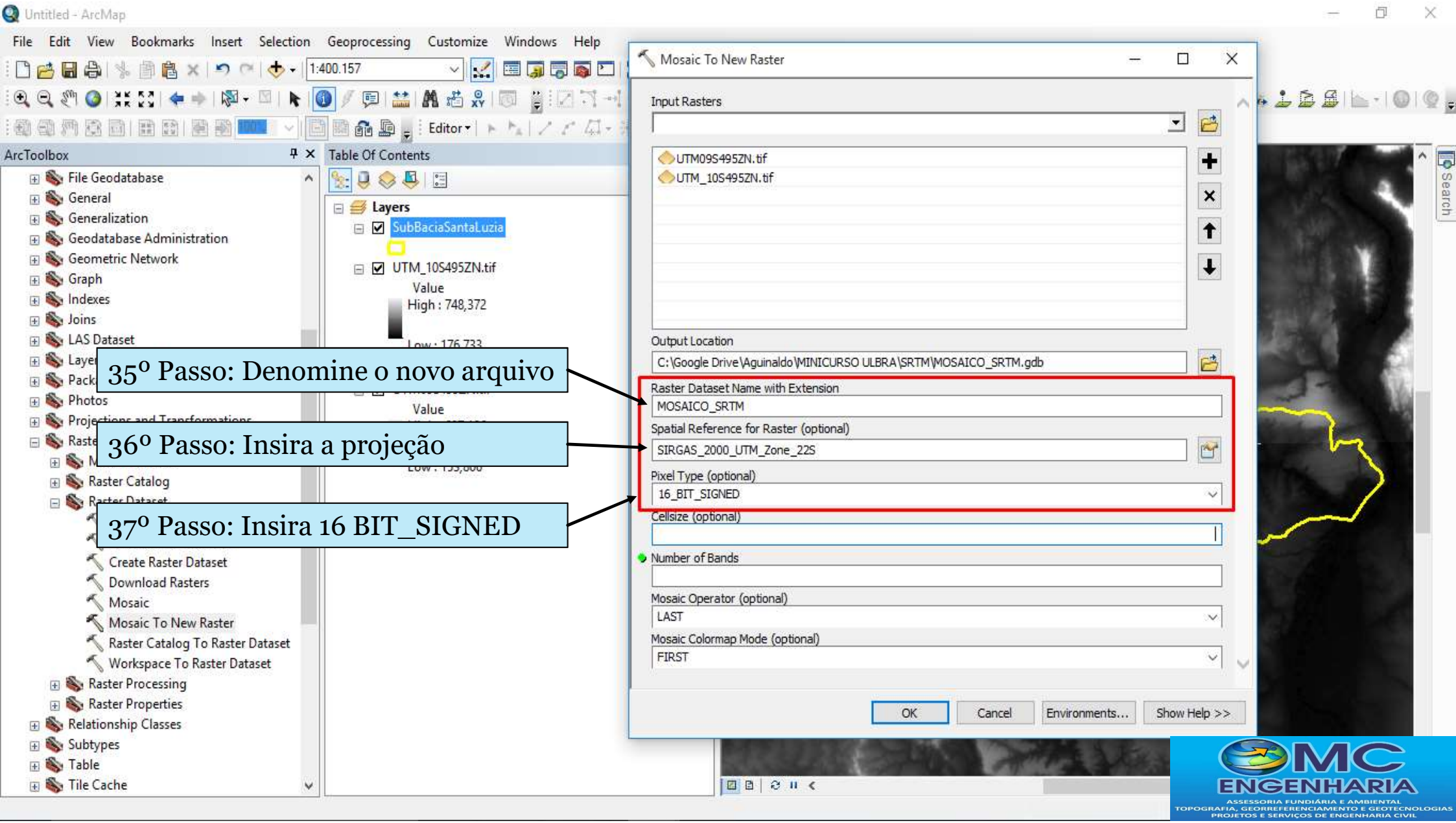
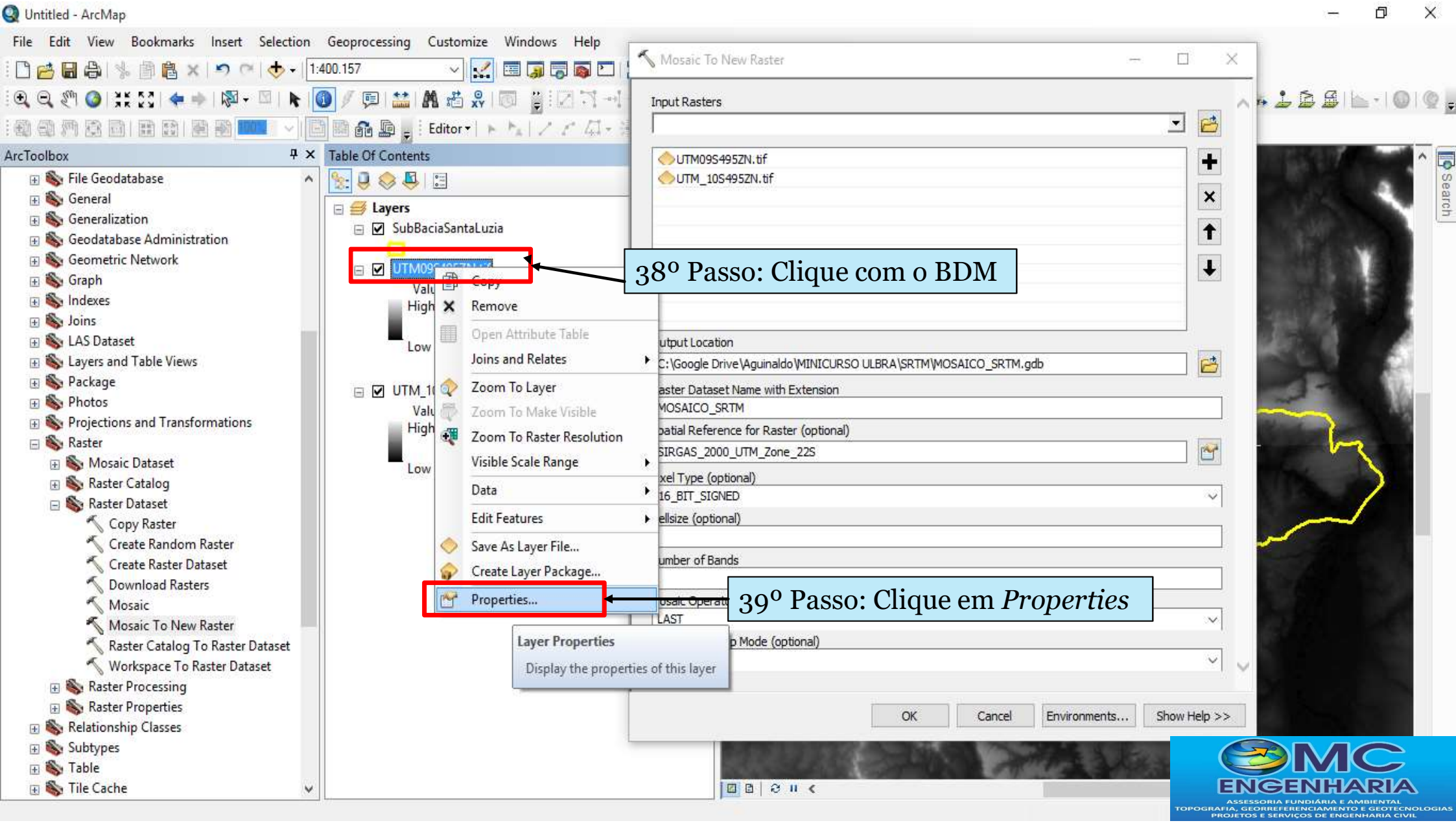
Layers
SubBaciaSantaLuzia
UTM_10S495ZN.tif
Value
High : 748,372
Low : 176,733
UTM09S495ZN.tif
Value
High : 697,186
Low : 153,806
29º Passo: Para realizar o mosaico das imagens (unificar), clique em Data Management Tools
Search
OMC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL






Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:400.157
Editor
ArcToolbox
File Geodatabase
General
Generalization
Geodatabase Administration
Geometric Network
Graph
Indexes
Joins
LAS Dataset
Photos
Raster Catalog
Create Raster Dataset
Download Rasters
Mosaic
Mosaic To New Raster
Raster Catalog To Raster Dataset
Workspace To Raster Dataset
Raster Processing
Raster Properties
Relationship Classes
Subtypes
Table
Tile Cache
Table Of Contents
Layers
SubBaciaSantaLuzia
UTM_10S495ZN.tif
Value
High : 748,372
Mosaic To New Raster
Input Rasters
UTM09S495ZN.tif
UTM_10S495ZN.tif
Output Location
C:\Google Drive\Aguinaldo\MINICURSO ULBRA\SRTM\MOSAICO_SRTM.gdb
Raster Dataset Name with Extension
MOSAICO_SRTM
Spatial Reference for Raster (optional)
SIRGAS_2000_UTM_Zone_22S
Pixel Type (optional)
16_BIT_SIGNED
Cellsize (optional)
Number of Bands
Mosaic Operator (optional)
LAST
Mosaic Colormap Mode (optional)
FIRST
OK
Cancel
Environments...
Show Help >>
35º Passo: Denomine o novo arquivo
36º Passo: Insira a projeção
37º Passo: Insira 16 BIT_SIGNED
Search
OMC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL


Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:400.157
Editor
ArcToolbox
File Geodatabase
General
Generalization
Geodatabase Administration
Geometric Network
Graph
Indexes
Joins
LAS Dataset
Layers and Table Views
Package
Photos
Projections and Transformations
Raster
Mosaic Dataset
Raster Catalog
Raster Dataset
Copy Raster
Create Random Raster
Create Raster Dataset
Download Rasters
Mosaic
Mosaic To New Raster
Raster Catalog To Raster Dataset
Workspace To Raster Dataset
Raster Processing
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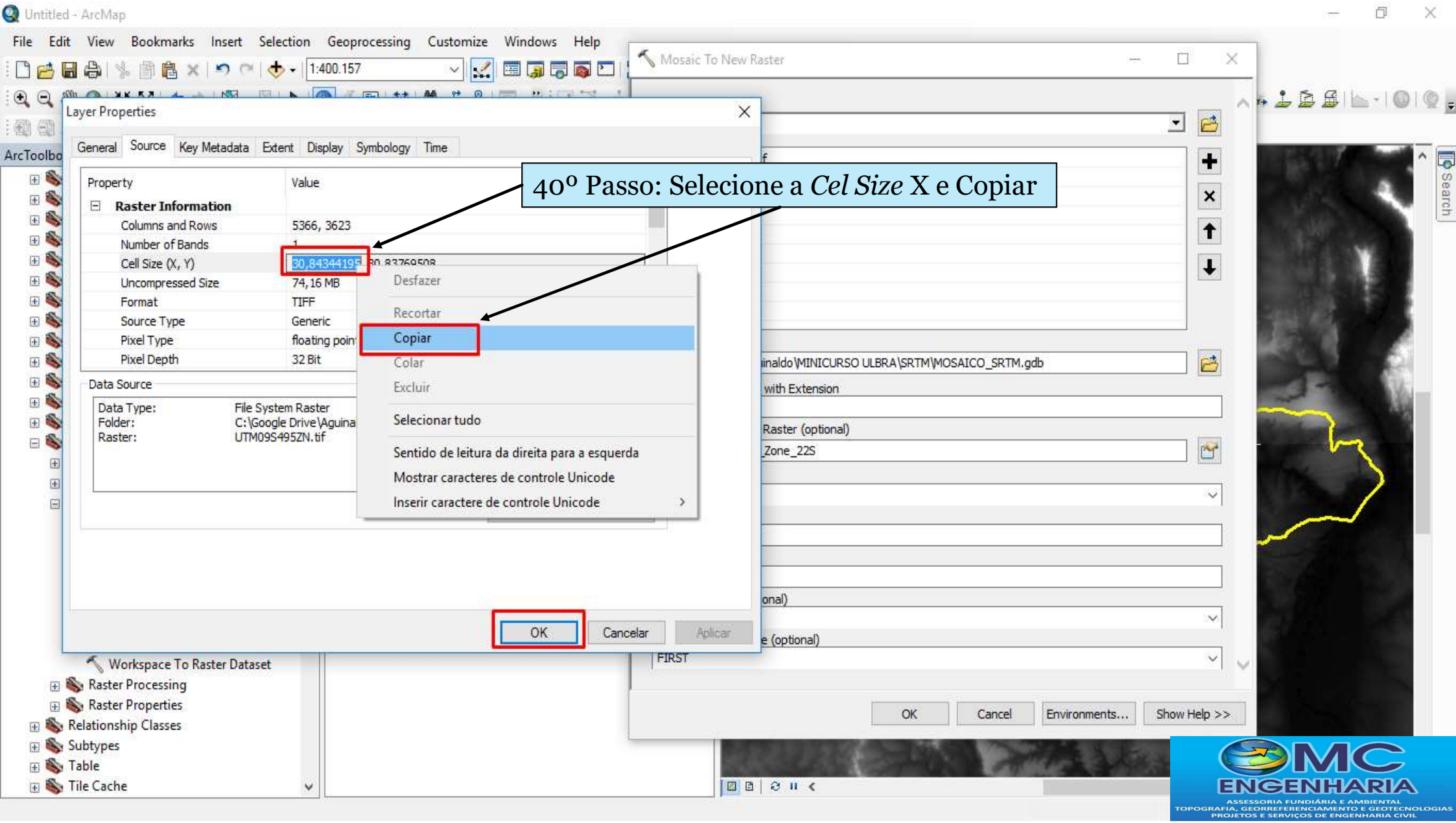
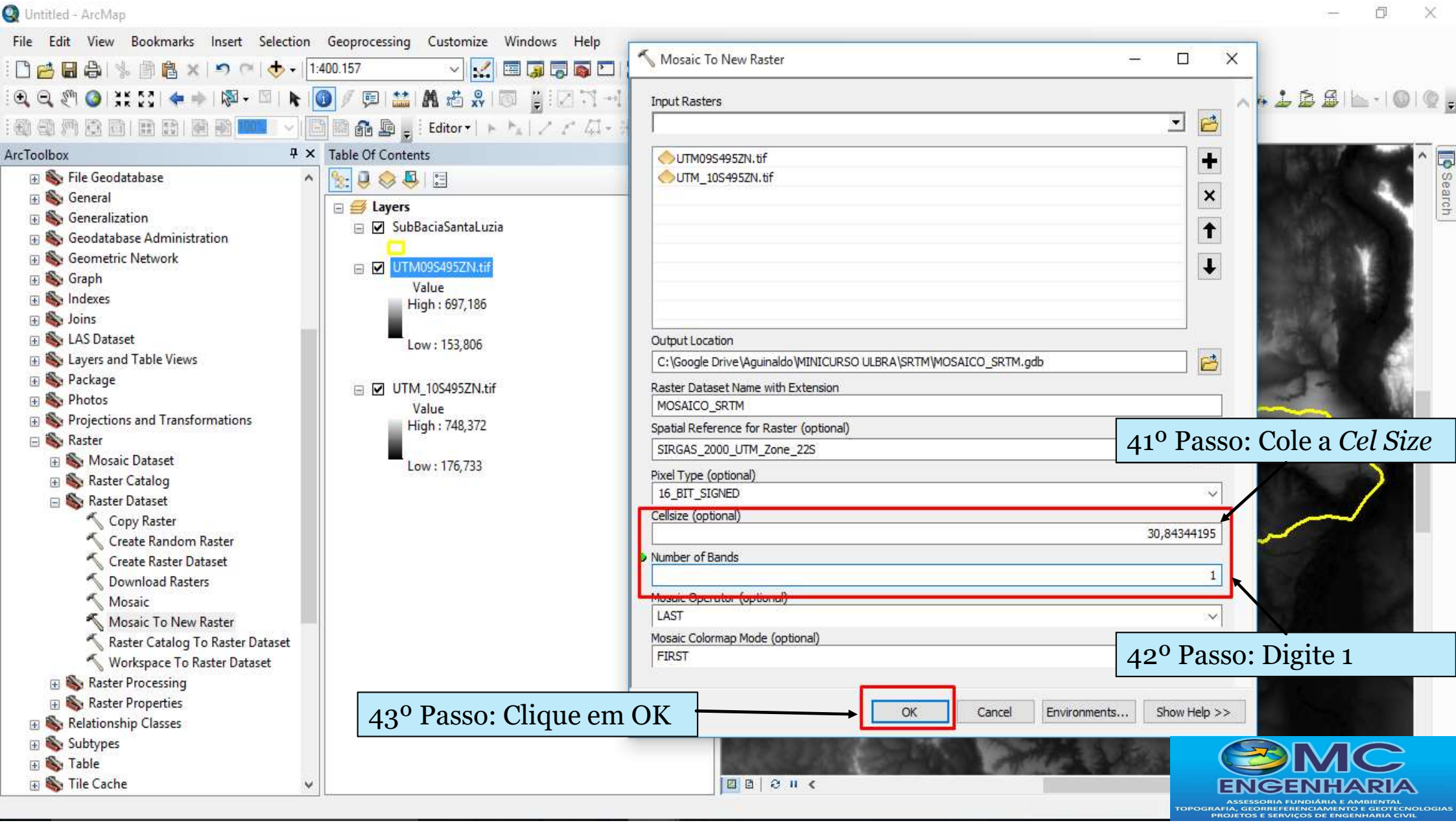
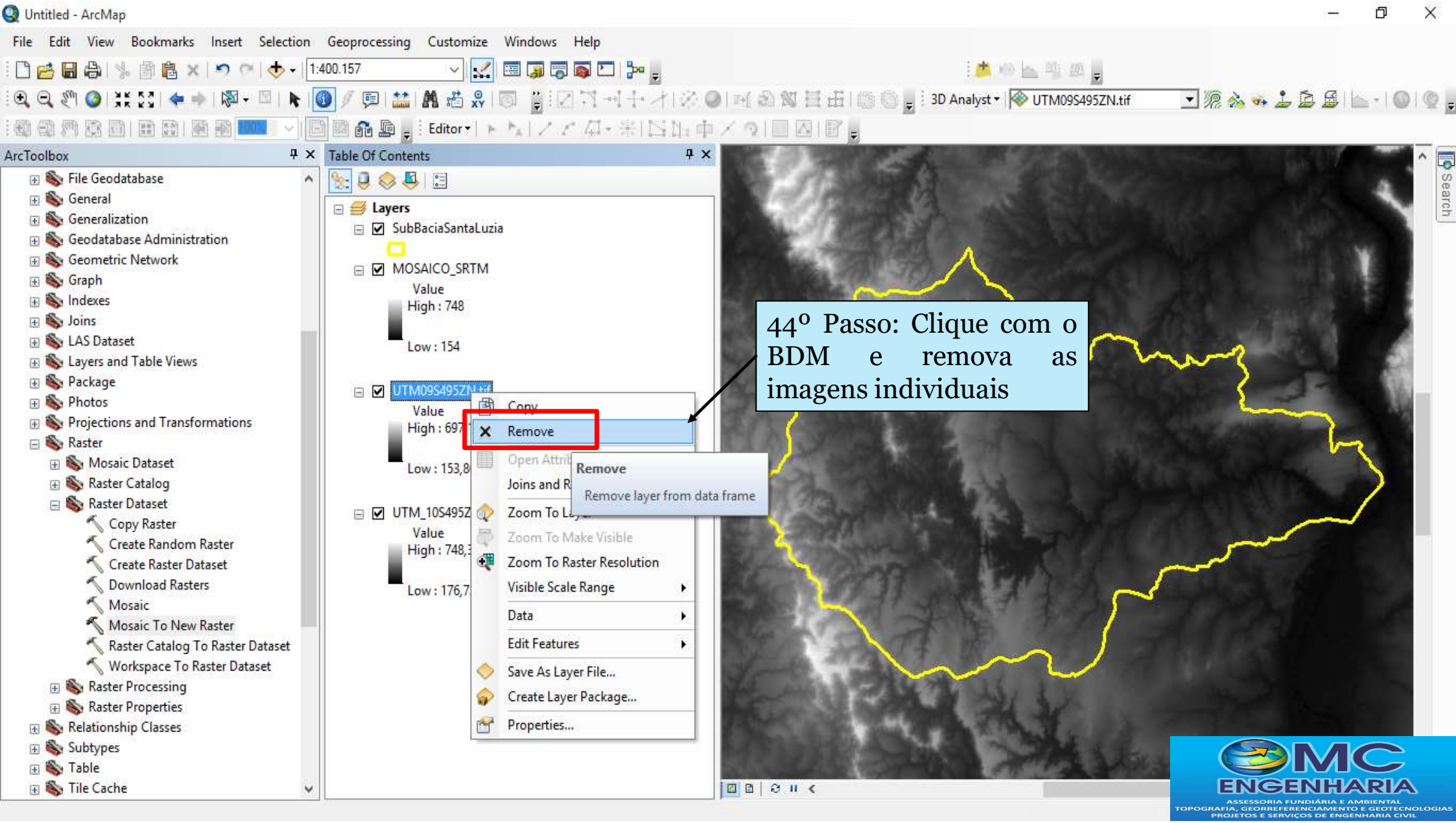
SubBaciaSantaLuzia
Remove
Open Attribute Table
Joins and Relates
Zoom To Layer
Zoom To Make Visible
Zoom To Raster Resolution
Visible Scale Range
Data
Edit Features
Save As Layer File...
Create Layer Package...
Properties...
Layer Properties
Display the properties of this layer
38º Passo: Clique com o BDM
39º Passo: Clique em Properties
Mosaic To New Raster
Input Rasters
UTM09S495ZN.tif
UTM_10S495ZN.tif
C:\Google Drive\Aguinaldo\MINICURSO ULBRA\SRTM\MOSAICO_SRTM.gdb
MOSAICO_SRTM
SIRGAS_2000_UTM_Zone_22S
16_BIT_SIGNED
LAST
OK
Cancel
Environments...
Show Help >>
Search
OMC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL


40º Passo: Selecione a *Cel Size* X e Copiar
Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
Layer Properties
General Source Key Metadata Extent Display Symbology Time
Property Value
Raster Information
Columns and Rows 5366, 3623
Number of Bands 1
Cell Size (X, Y) 30,84344195
Uncompressed Size 74,16 MB
Format TIFF
Source Type Generic
Pixel Type floating poin
Pixel Depth 32 Bit
Data Source
Data Type: File System Raster
Folder: C:\Google Drive\Aguina
Raster: UTM09S495ZN.tif
Desfazer
Recortar
Copiar
Colar
Excluir
Selecionar tudo
Sentido de leitura da direita para a esquerda
Mostrar caracteres de controle Unicode
Inserir caractere de controle Unicode
OK
Cancelar
Aplicar
Mosaic To New Raster
with Extension
Raster (optional)
Zone_22S
FIRST
OK
Cancel
Environments...
Show Help >>
Workspace To Raster Dataset
Raster Processing
Raster Properties
Relationship Classes
Subtypes
Table
Tile Cache
OMC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL




Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:400.157
3D Analyst
UTM09S495ZN.tif
Editor
ArcToolbox
File Geodatabase
General
Generalization
Geodatabase Administration
Geometric Network
Graph
Indexes
Joins
LAS Dataset
Layers and Table Views
Package
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Projections and Transformations
Raster
Mosaic Dataset
Raster Catalog
Raster Dataset
Copy Raster
Create Random Raster
Create Raster Dataset
Download Rasters
Mosaic
Mosaic To New Raster
Raster Catalog To Raster Dataset
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Raster Processing
Raster Properties
Relationship Classes
Subtypes
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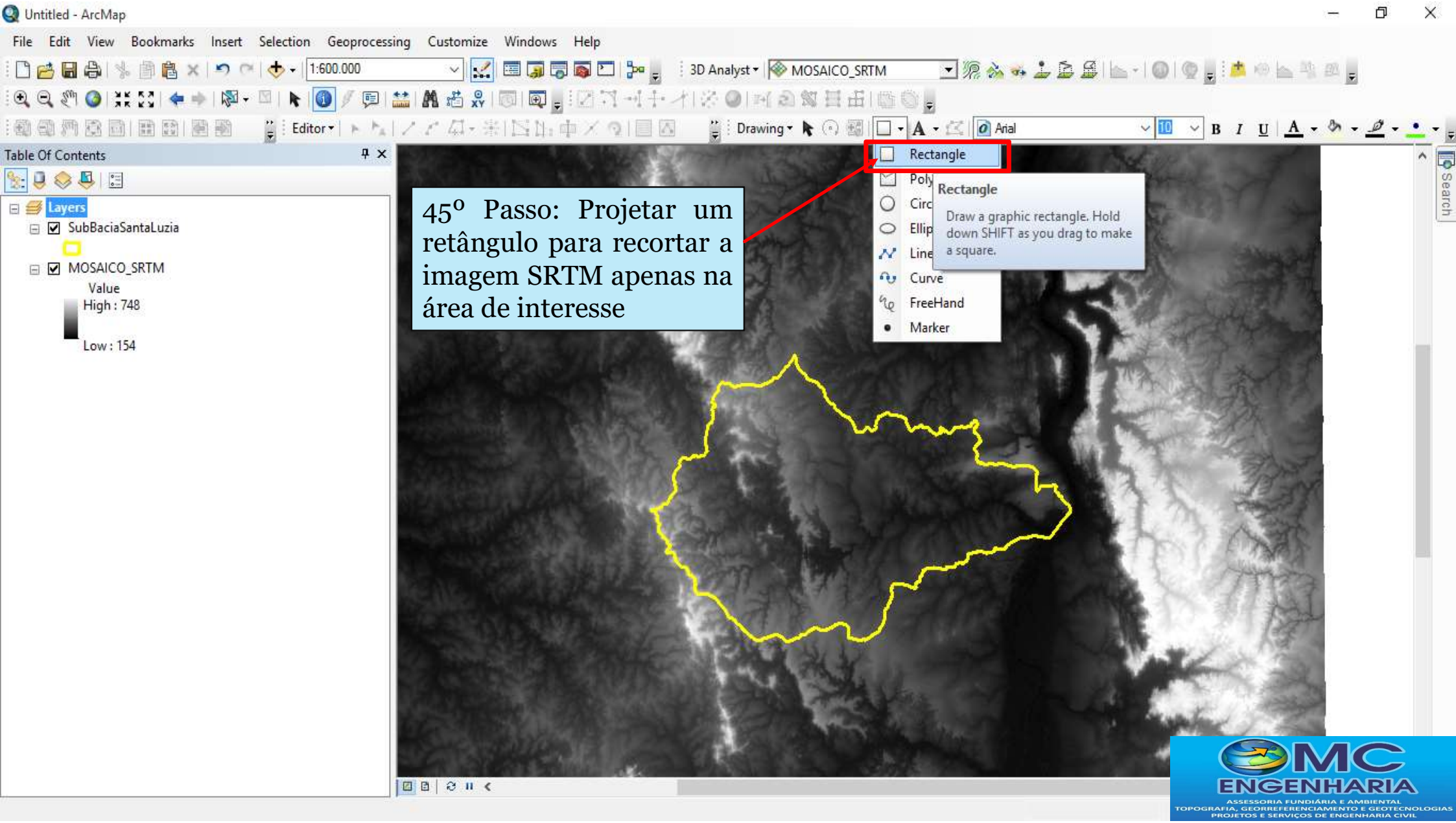
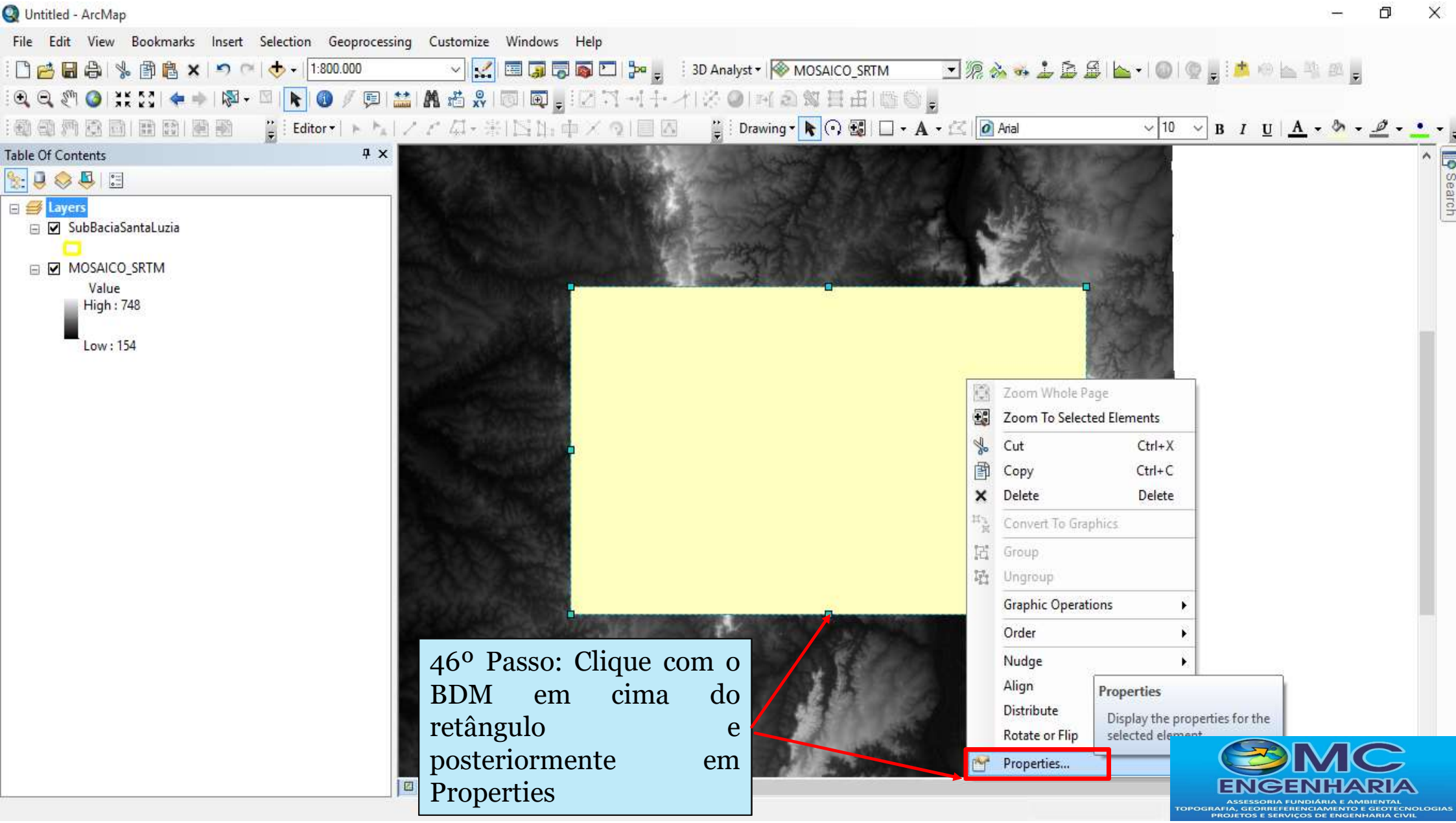
SubBaciaSantaLuzia
MOSAICO_SRTM
Value
High : 748
Low : 154
UTM09S495ZN
Value
High : 697
Low : 153,8
UTM_10S495Z
Value
High : 748,3
Low : 176,7
Copy
Remove
Open Attrib
Joins and R
Zoom To La
Zoom To Make Visible
Zoom To Raster Resolution
Visible Scale Range
Data
Edit Features
Save As Layer File...
Create Layer Package...
Properties...
Remove
Remove layer from data frame
44º Passo: Clique com o BDM e remova as imagens individuais
Search
OMC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL




Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:800.000
3D Analyst
MOSAICO_SRTM
Editor
Drawing
Arial
10
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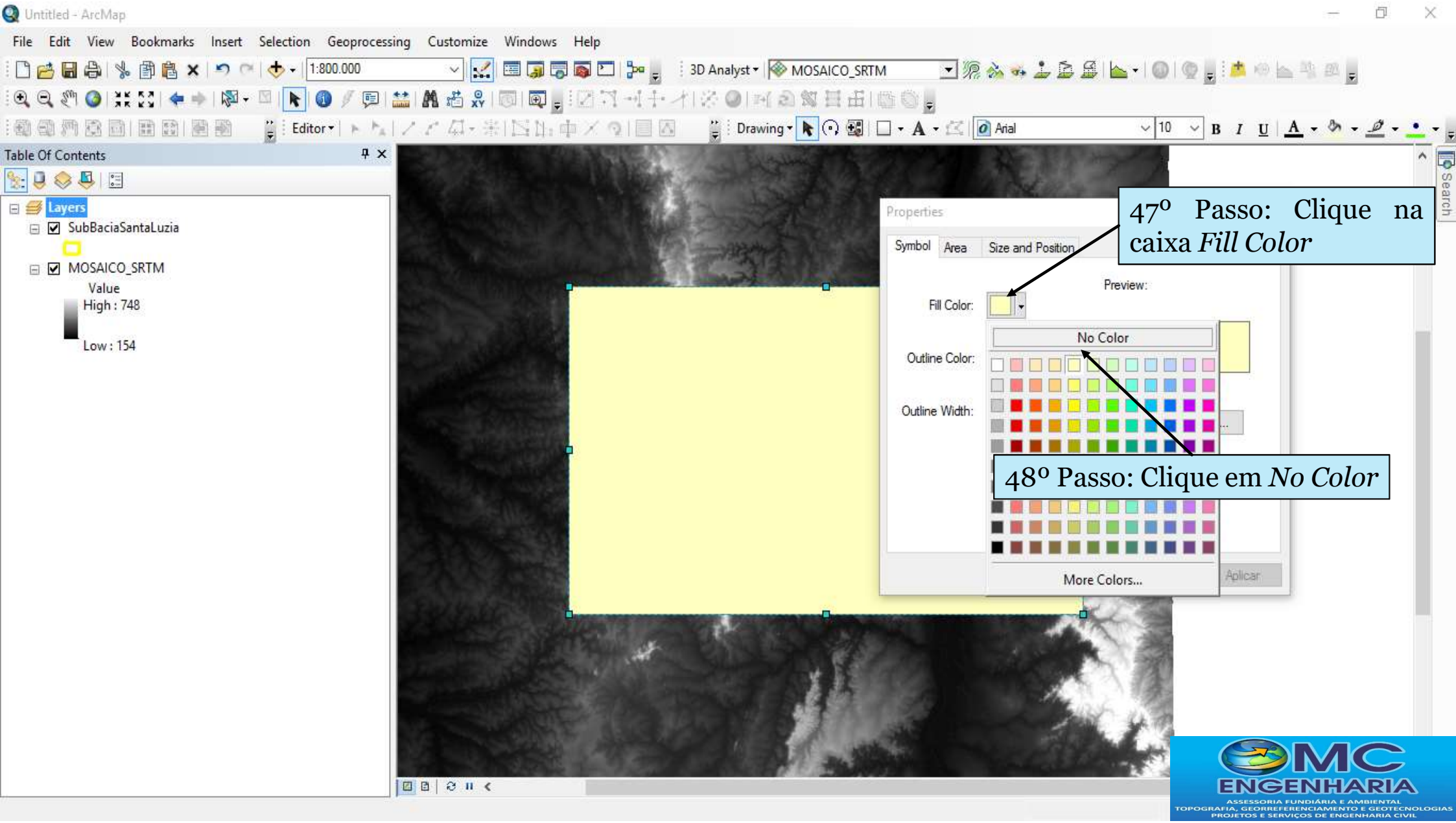
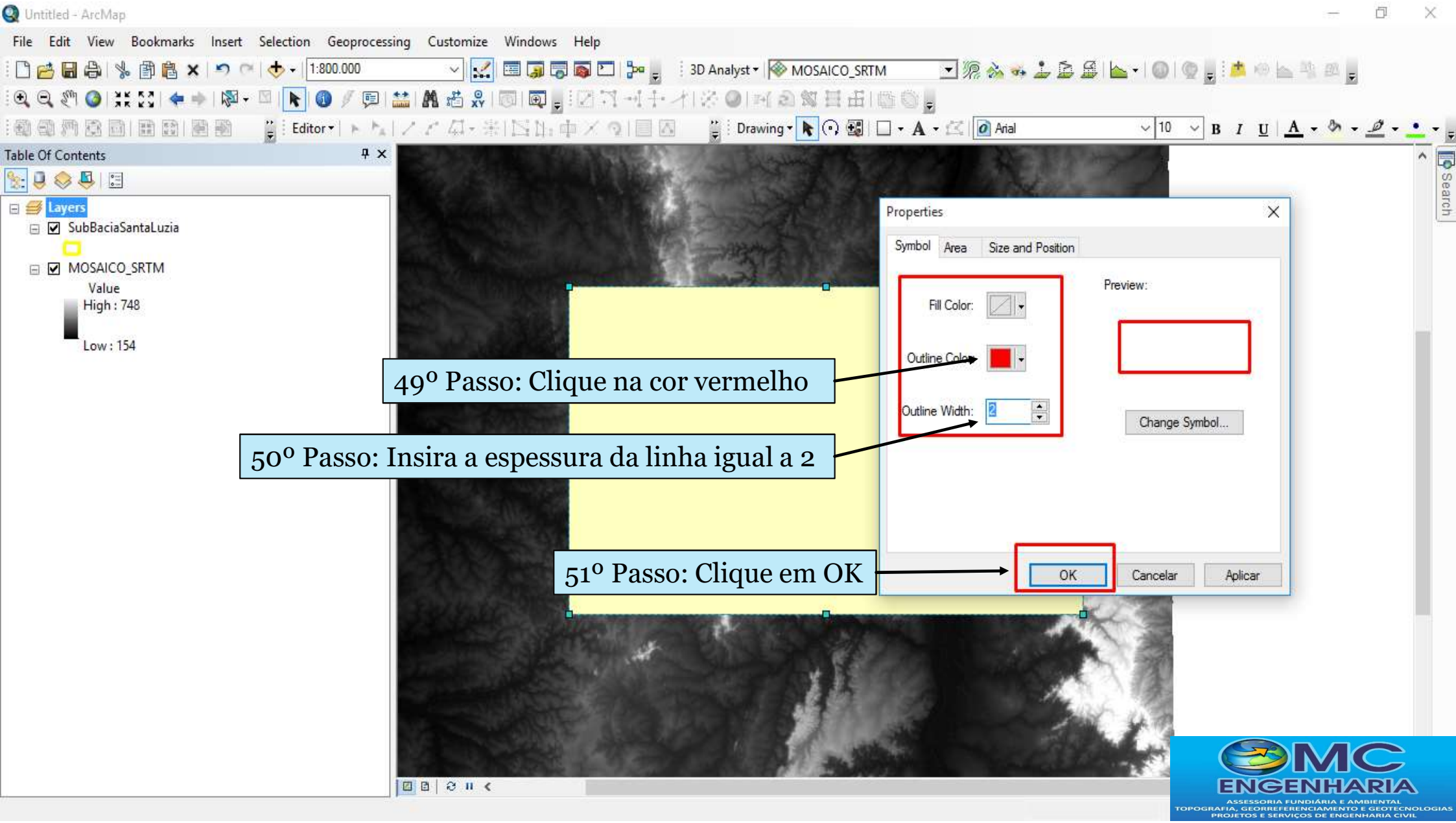
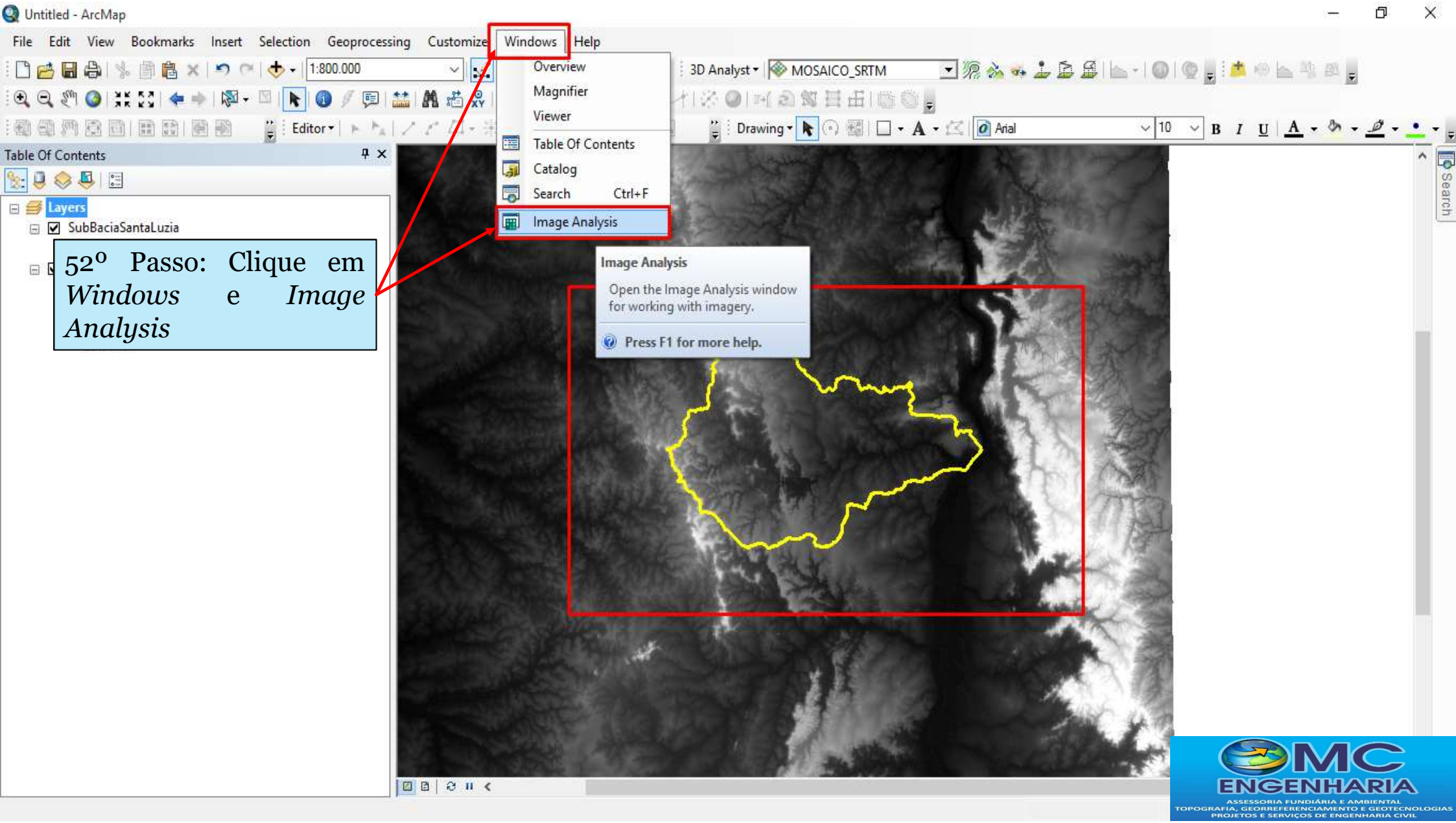
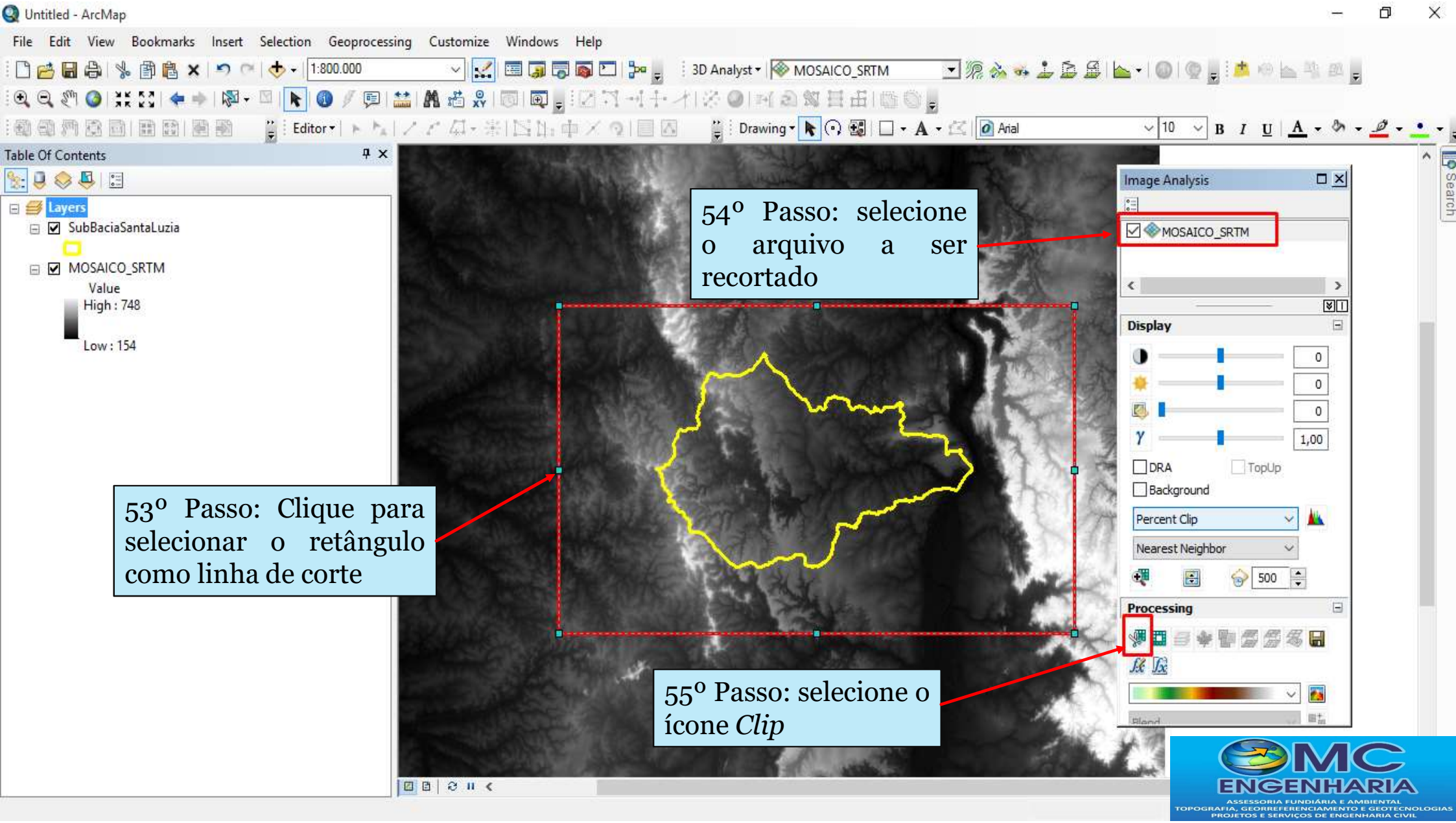
Layers
SubBaciaSantaLuzia
MOSAICO_SRTM
Value
High : 748
Low : 154
Zoom Whole Page
Zoom To Selected Elements
Cut Ctrl+X
Copy Ctrl+C
Delete Delete
Convert To Graphics
Group
Ungroup
Graphic Operations
Order
Nudge
Align
Distribute
Rotate or Flip
Properties...
Properties
Display the properties for the selected element
46º Passo: Clique com o BDM em cima do retângulo e posteriormente em Properties
OMC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL








Untitled - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:800.000
3D Analyst
MOSAICO_SRTM
Editor
Drawing
Arial
10
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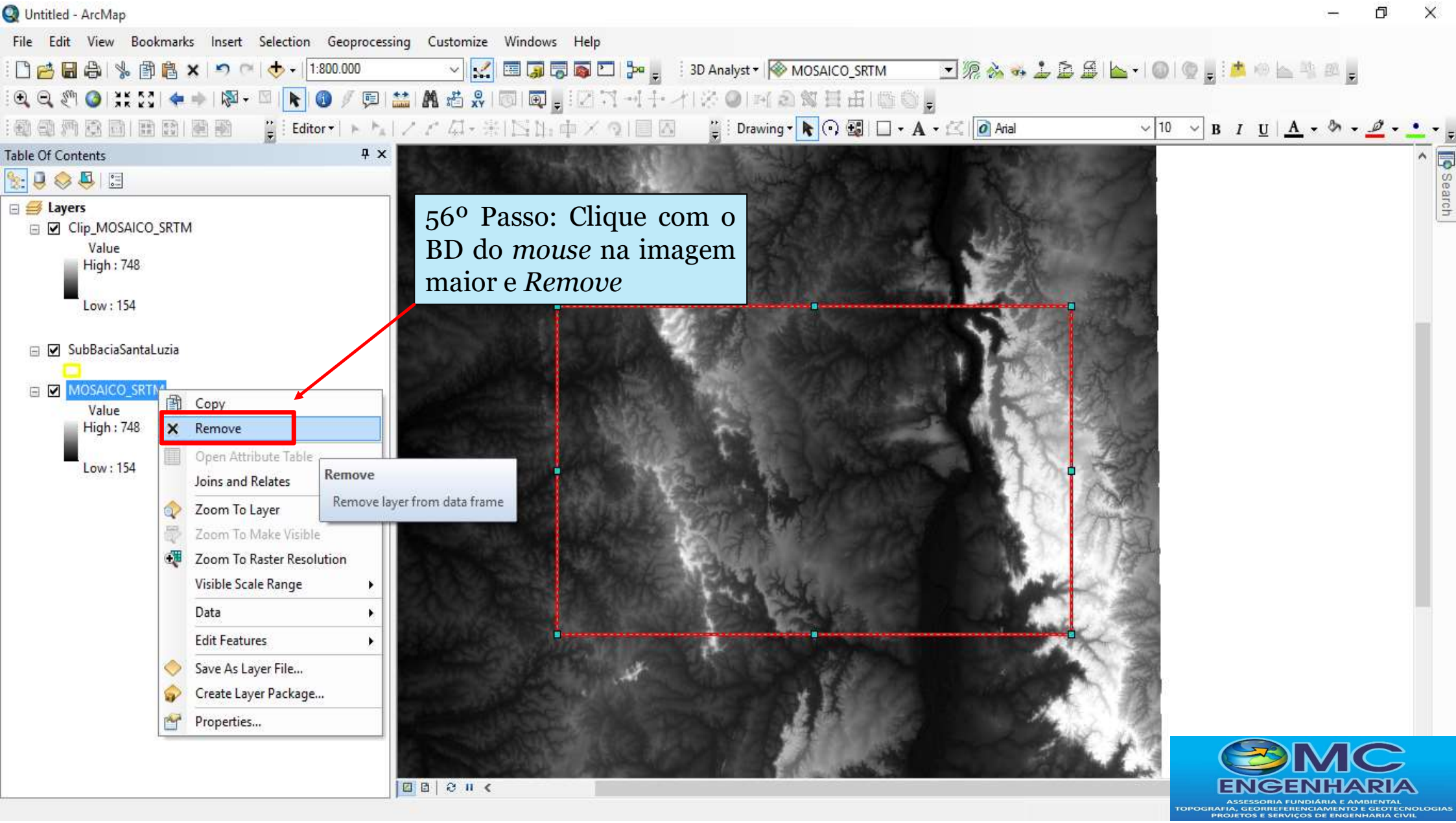
SubBaciaSantaLuzia
MOSAICO_SRTM
Value
High : 748
Low : 154
54º Passo: selecione o arquivo a ser recortado
53º Passo: Clique para selecionar o retângulo como linha de corte
55º Passo: selecione o ícone *Clip*
Image Analysis
MOSAICO_SRTM
Display
0
0
0
1,00
DRA
TopUp
Background
Percent Clip
Nearest Neighbor
500
Processing



Untitled - ArcMap

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:800.000 | 3D Analyst | Clip_MOSAICO_SRTM | Editor | Drawing | Arial | 10

Table Of Contents

Layers

SubBaciaSantaLuzia

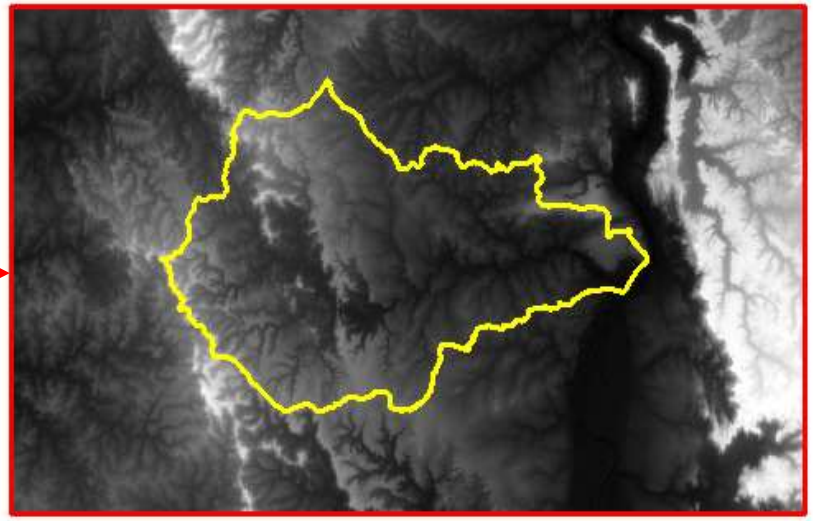
Clip_MOSAICO_SRTM

Value

High : 748

Low : 154

OBS: O tamanho da imagem ficou conforme necessidade para gerar os produtos



Search

MC ENGENHARIA

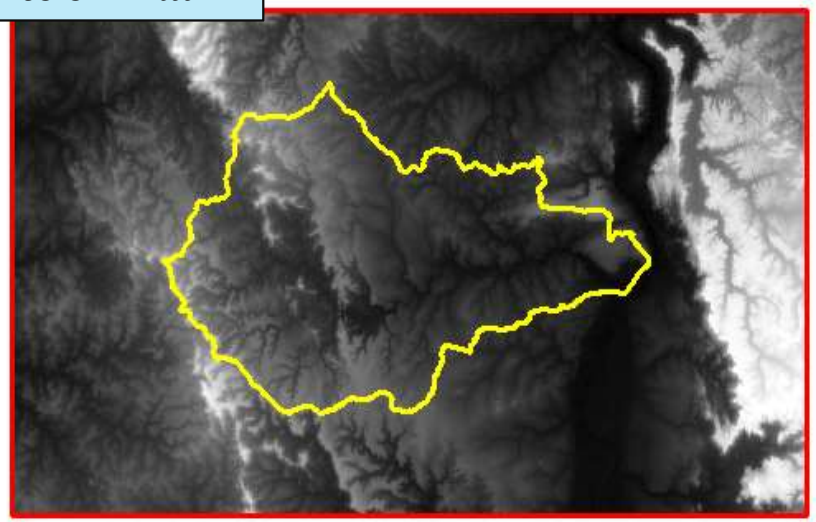
ASSESSORIA FUNDIÁRIA E AMBIENTAL

TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS

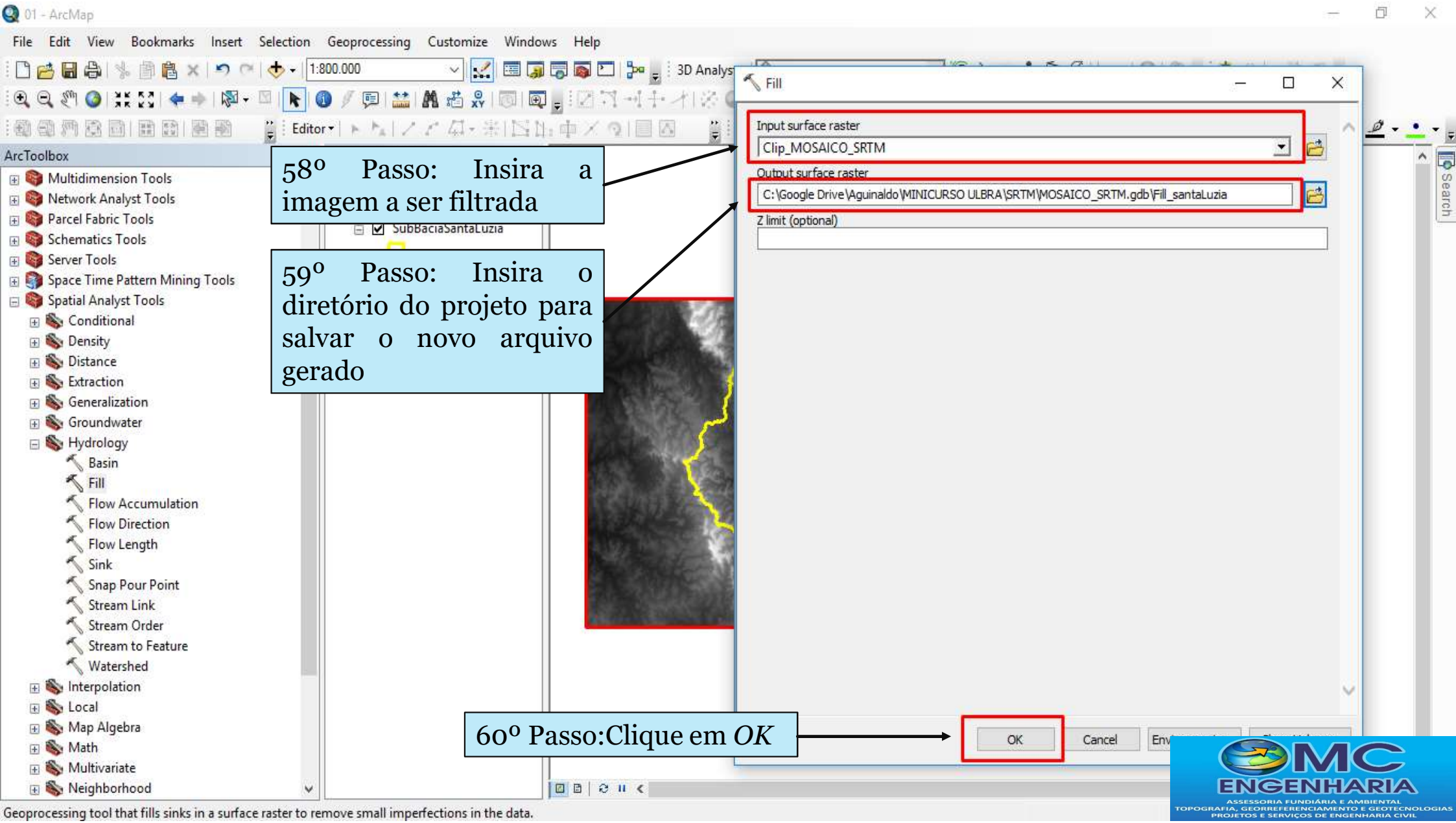
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL

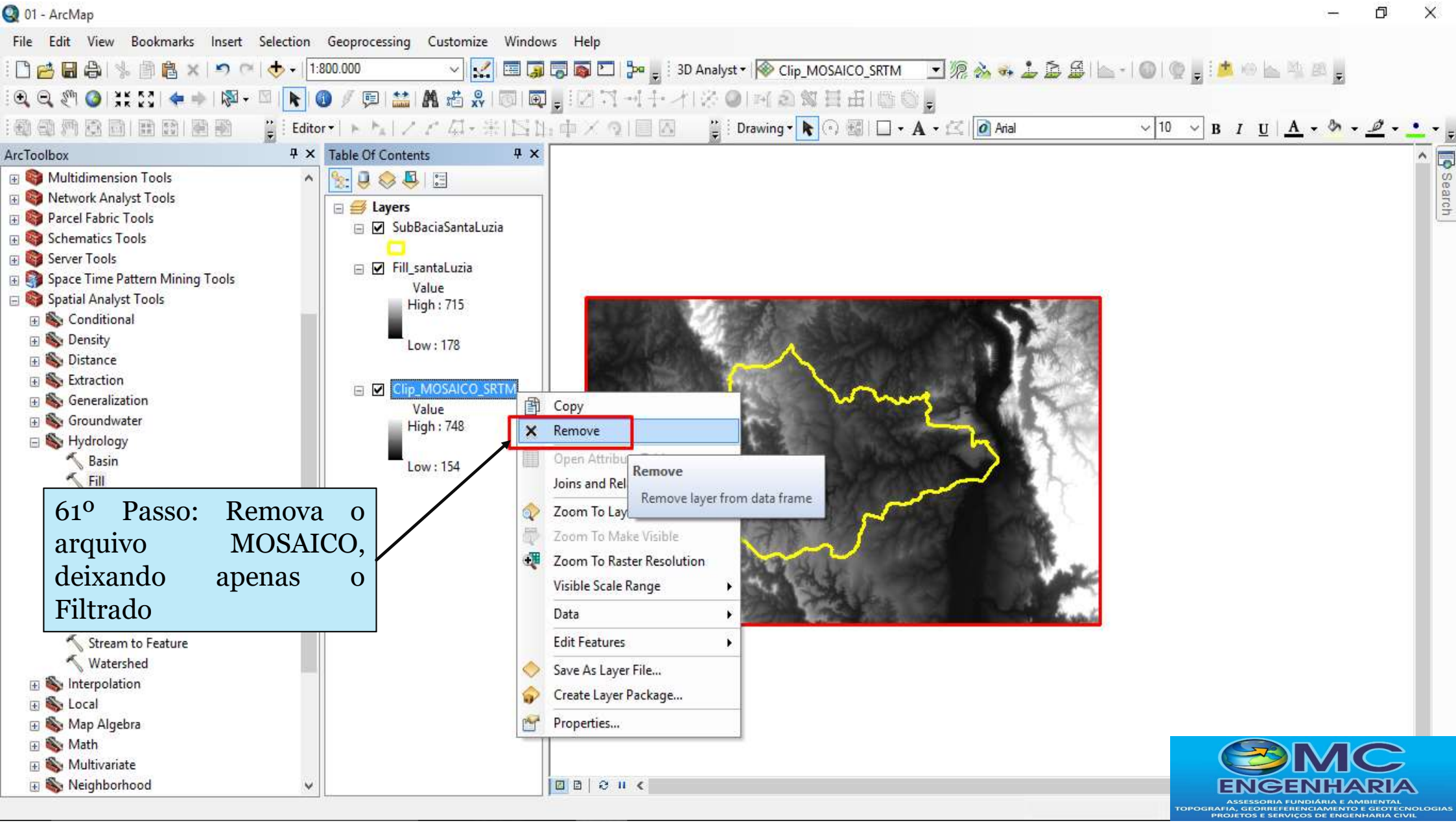
57º Passo: Clique em *Spatial Analyst* Tools e posteriormente em *Fill*

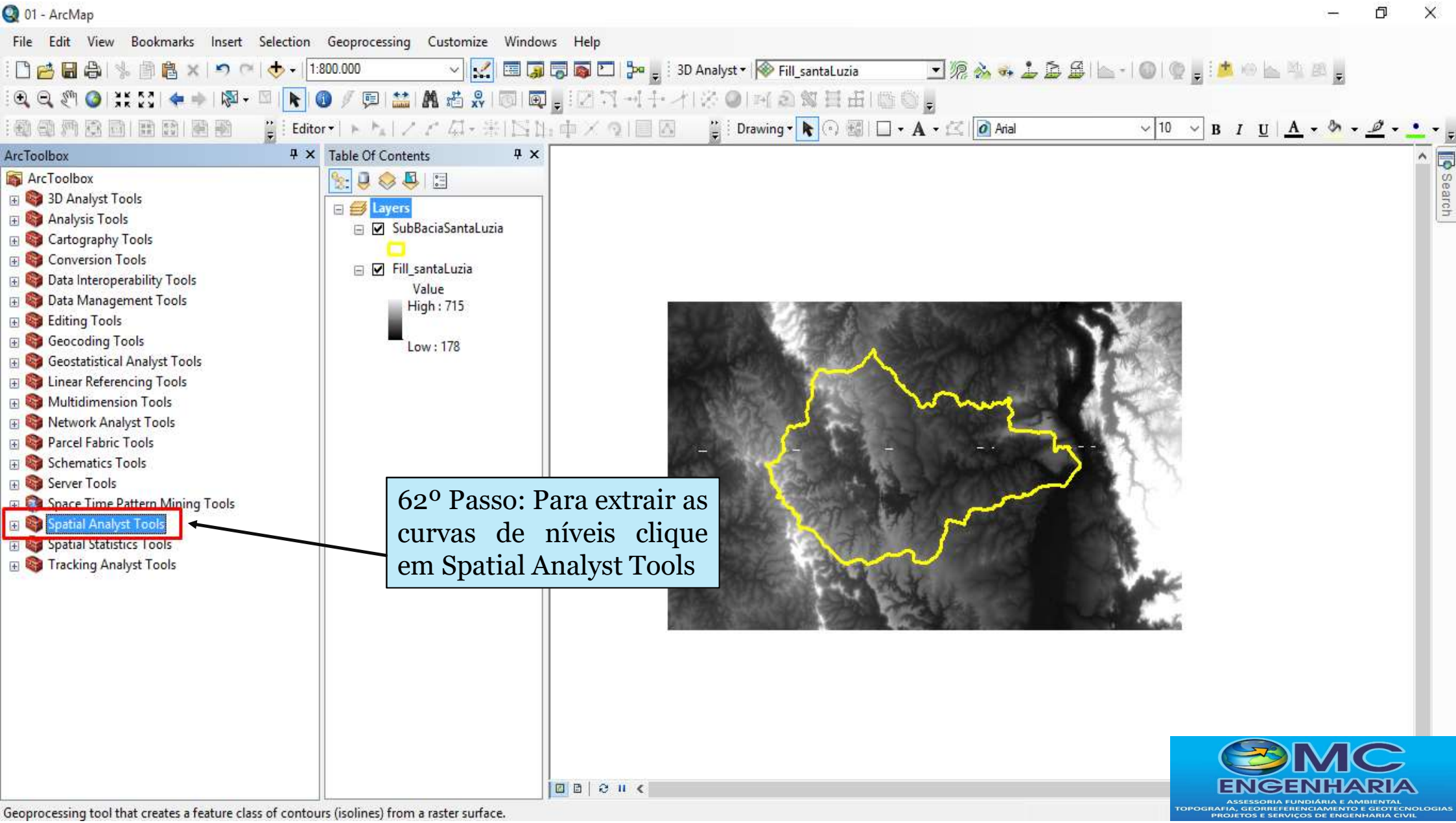
Obs: Este processo é de filtragem dos pixels para corrigir possíveis falhas



Geoprocessing tool that fills sinks in a surface raster to remove small imperfections in the data.


01 - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:800.000
Editor
ArcToolbox
Multidimension Tools
Network Analyst Tools
Parcel Fabric Tools
Schematics Tools
Server Tools
Space Time Pattern Mining Tools
Spatial Analyst Tools
Conditional
Density
Distance
Extraction
Generalization
Groundwater
Hydrology
Basin
Fill
Flow Accumulation
Flow Direction
Flow Length
Sink
Snap Pour Point
Stream Link
Stream Order
Stream to Feature
Watershed
Interpolation
Local
Map Algebra
Math
Multivariate
Neighborhood
SubBaciaSantaLuzia
58º Passo: Insira a imagem a ser filtrada
59º Passo: Insira o diretório do projeto para salvar o novo arquivo gerado
Fill
Input surface raster
Clip_MOSAICO_SRTM
Output surface raster
C:\Google Drive\Aguinaldo\MINICURSO ULBRA\SRTM\MOSAICO_SRTM.gdb\Fill_santaLuzia
Z limit (optional)
60º Passo:Clique em OK
OK
Cancel
Geoprocessing tool that fills sinks in a surface raster to remove small imperfections in the data.




01 - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:800.000
3D Analyst
Fill_santaLuzia
Editor
Drawing
Arial
10
ArcToolbox
ArcToolbox
3D Analyst Tools
Analysis Tools
Cartography Tools
Conversion Tools
Data Interoperability Tools
Data Management Tools
Editing Tools
Geocoding Tools
Geostatistical Analyst Tools
Linear Referencing Tools
Multidimension Tools
Network Analyst Tools
Parcel Fabric Tools
Schematics Tools
Server Tools
Space Time Pattern Mining Tools
Spatial Analyst Tools
Spatial Statistics Tools
Tracking Analyst Tools
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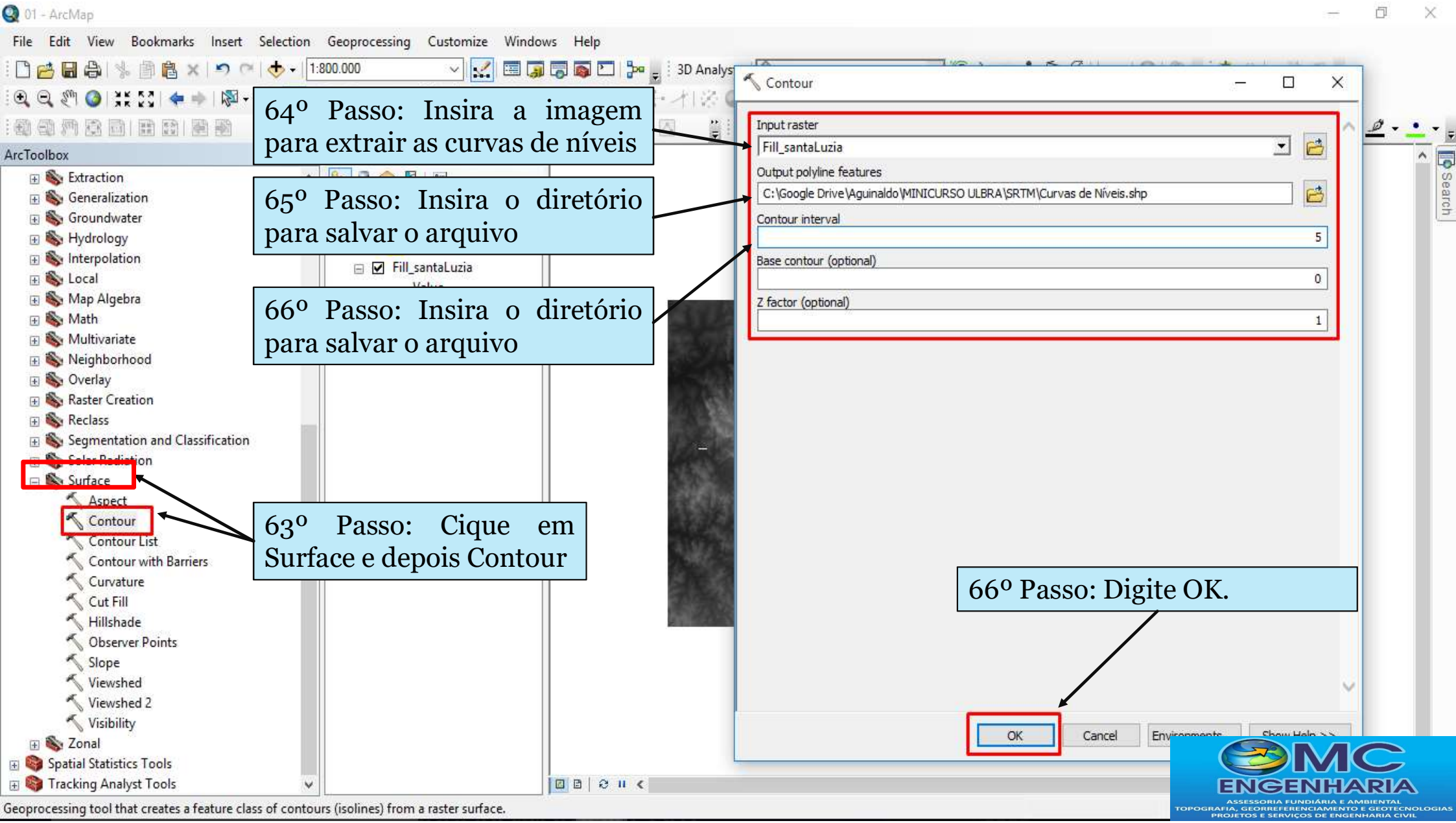
Layers
SubBaciaSantaLuzia
Fill_santaLuzia
Value
High : 715
Low : 178
62º Passo: Para extrair as curvas de níveis clique em Spatial Analyst Tools
Search
Geoprocessing tool that creates a feature class of contours (isolines) from a raster surface.



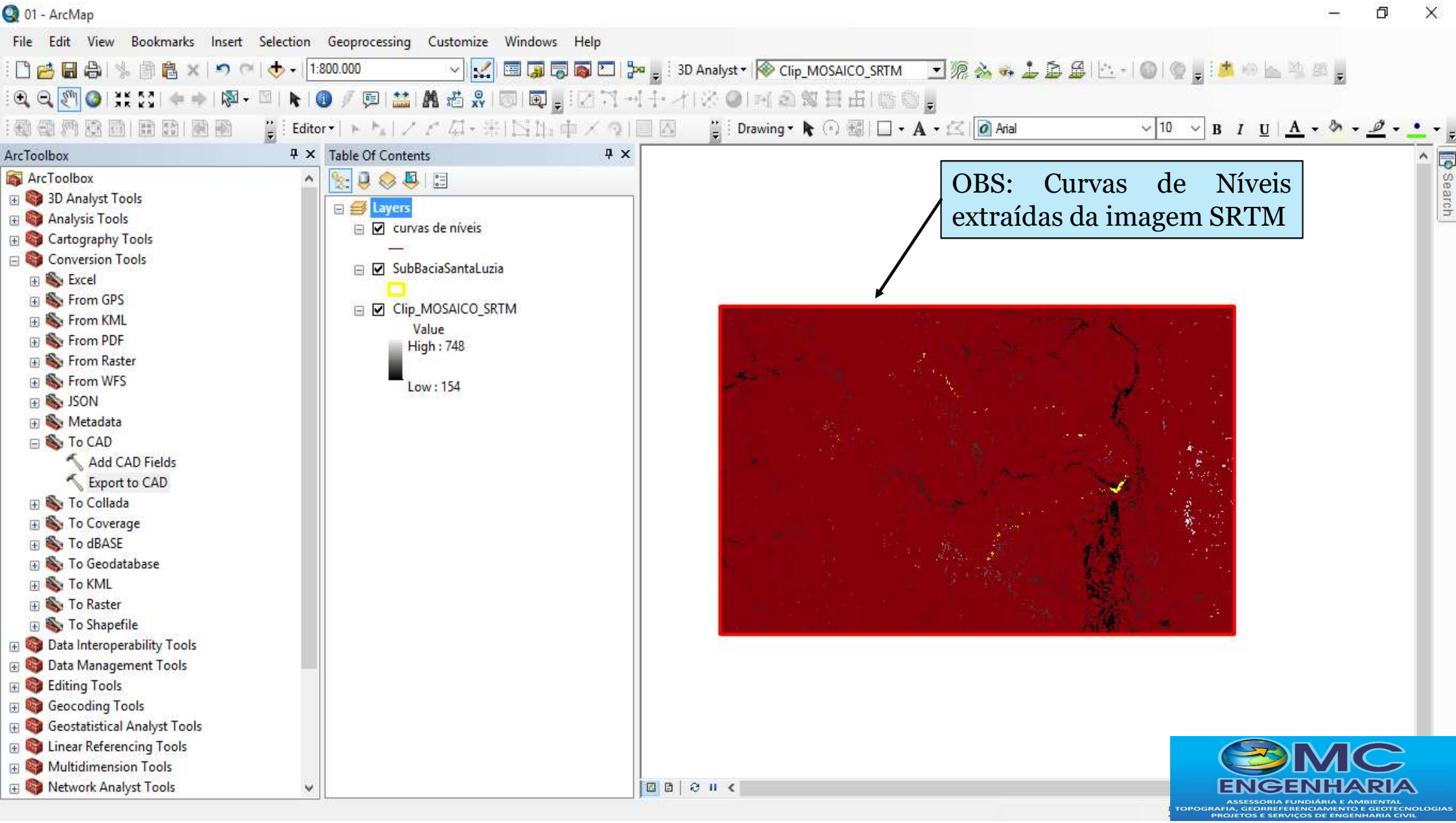
64º Passo: Insira a imagem para extrair as curvas de níveis

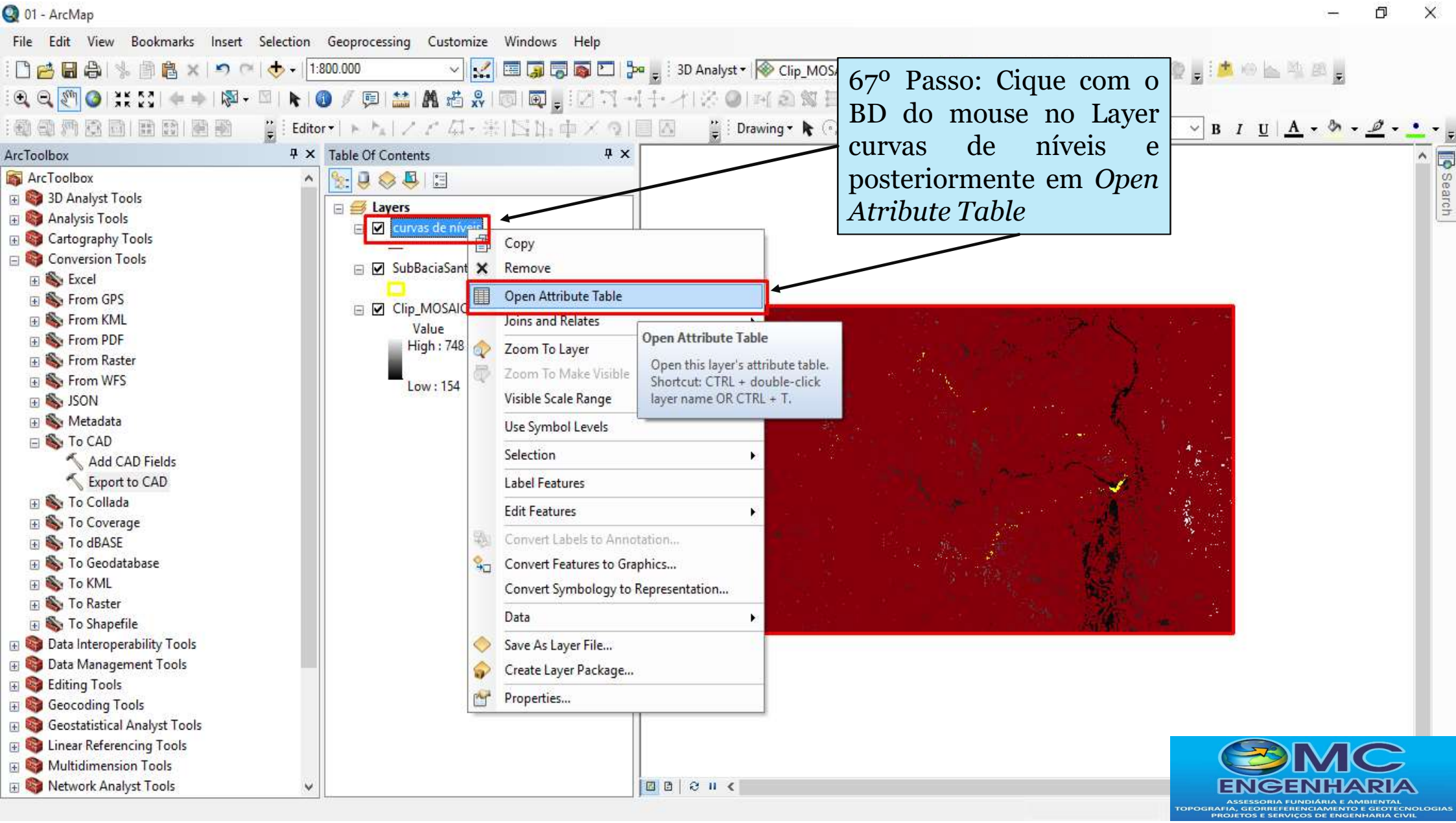
65º Passo: Insira o diretório para salvar o arquivo

66º Passo: Insira o diretório para salvar o arquivo

63º Passo: Cique em Surface e depois Contour

66º Passo: Digite OK.





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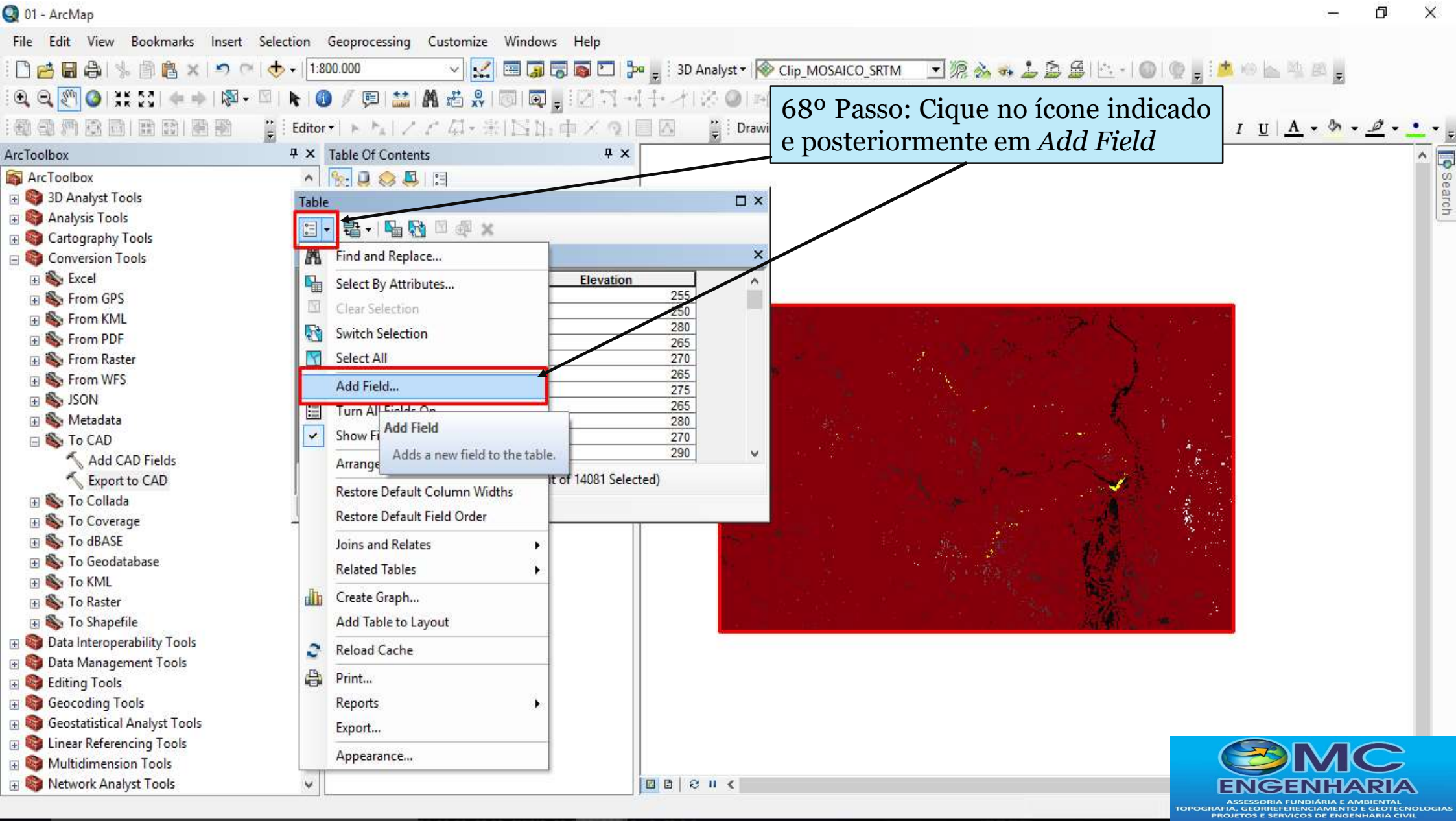
68º Passo: Cique no ícone indicado e posteriormente em *Add Field*
01 - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
ArcToolbox
Table Of Contents
Table
Find and Replace...
Select By Attributes...
Clear Selection
Switch Selection
Select All
Add Field...
Add Field
Adds a new field to the table.
Restore Default Column Widths
Restore Default Field Order
Joins and Relates
Related Tables
Create Graph...
Add Table to Layout
Reload Cache
Print...
Reports
Export...
Appearance...
Elevation
255
250
280
265
270
265
275
265
280
270
290
of 14081 Selected)
ENGENHARIA
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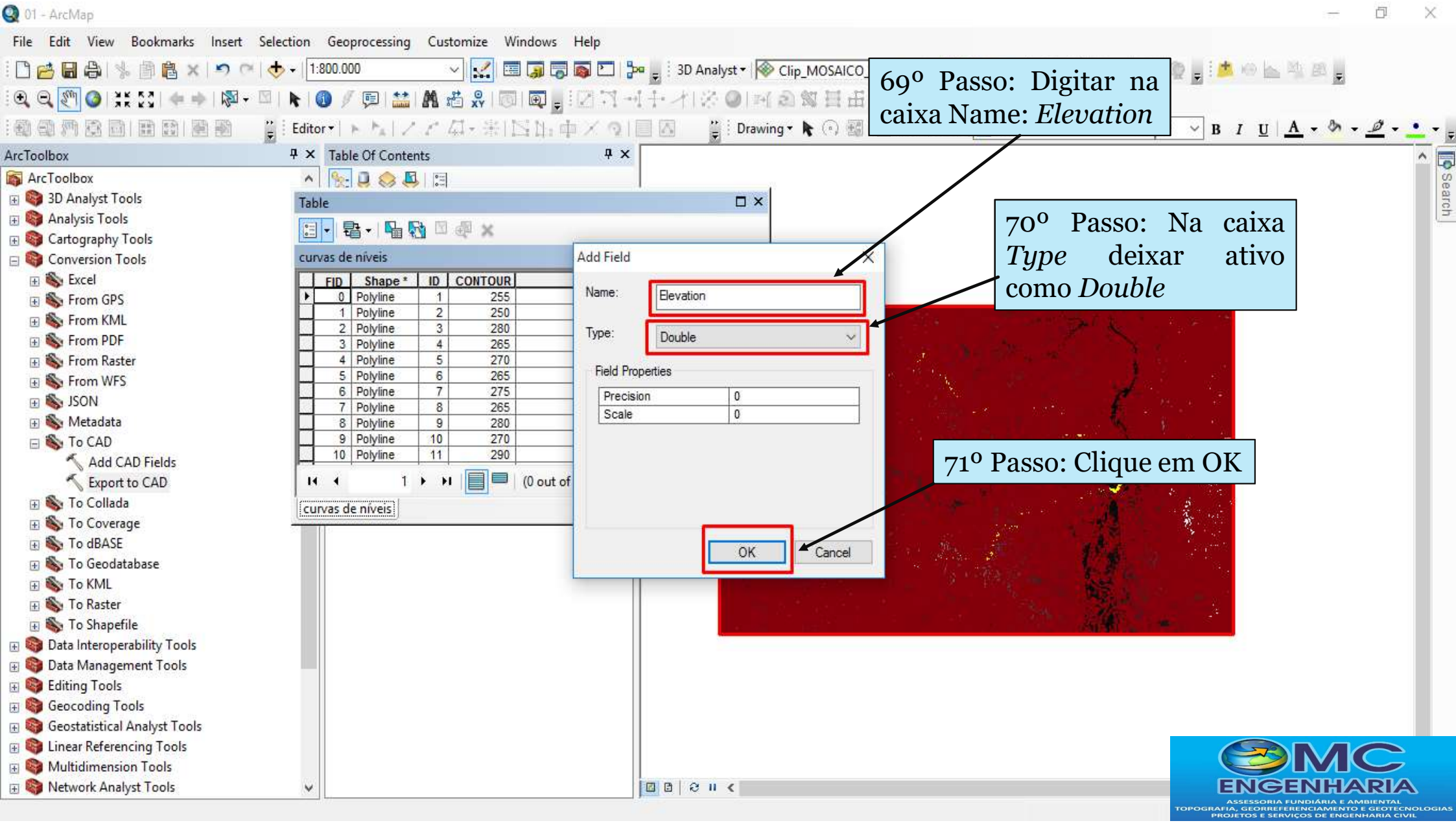
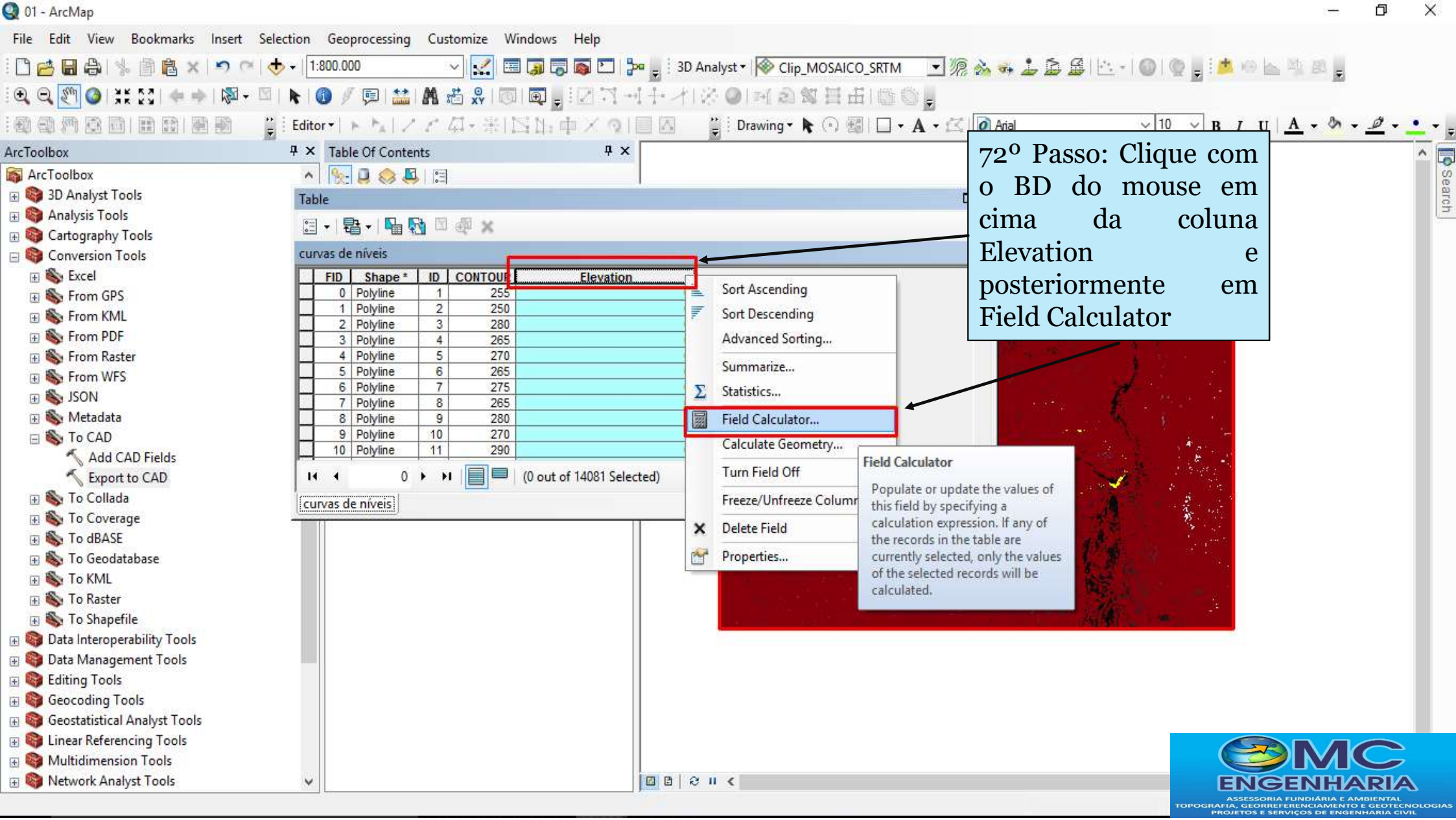
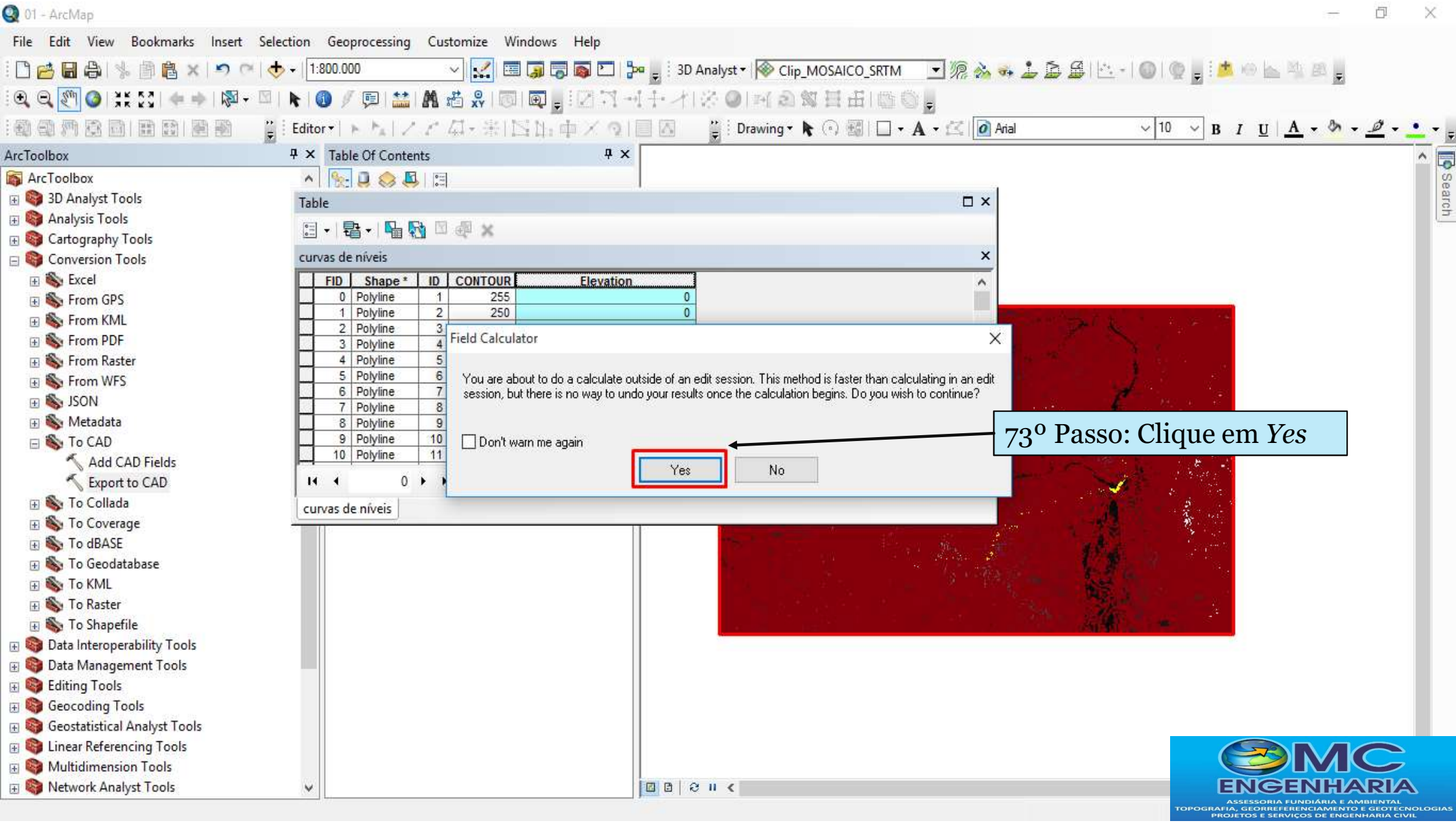
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL






01 - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:800.000
3D Analyst
Clip_MOSAICO_SRTM
Editor
Drawing
Arial
10
ArcToolbox
ArcToolbox
3D Analyst Tools
Analysis Tools
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From GPS
From KML
From PDF
From Raster
From WFS
JSON
Metadata
To CAD
Add CAD Fields
Export to CAD
To Collada
To Coverage
To dBASE
To Geodatabase
To KML
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Geostatistical Analyst Tools
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Network Analyst Tools
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Table
curvas de níveis
FID Shape * ID CONTOUR Elevation
0 Polyline 1 255 0
1 Polyline 2 250 0
2 Polyline 3
3 Polyline 4
4 Polyline 5
5 Polyline 6
6 Polyline 7
7 Polyline 8
8 Polyline 9
9 Polyline 10
10 Polyline 11
curvas de níveis
Field Calculator
You are about to do a calculate outside of an edit session. This method is faster than calculating in an edit session, but there is no way to undo your results once the calculation begins. Do you wish to continue?
Don't warn me again
Yes
No
73º Passo: Clique em Yes
Search

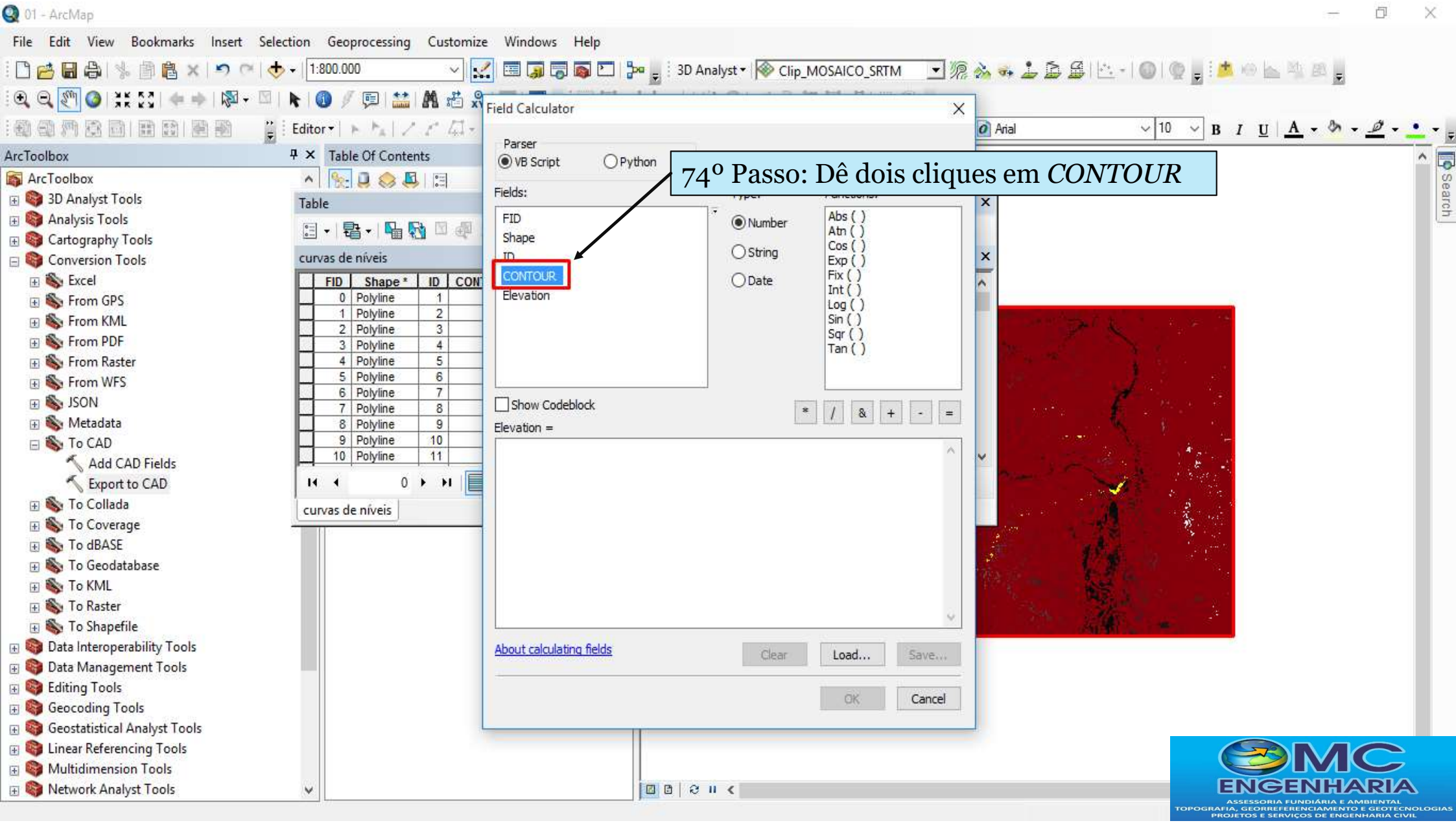
01 - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:800.000
3D Analyst
Clip_MOSAICO_SRTM
Editor
ArcToolbox
ArcToolbox
3D Analyst Tools
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Table
curvas de níveis
FID Shape * ID
0 Polyline 1
1 Polyline 2
2 Polyline 3
3 Polyline 4
4 Polyline 5
5 Polyline 6
6 Polyline 7
7 Polyline 8
8 Polyline 9
9 Polyline 10
10 Polyline 11
curvas de níveis
Field Calculator
Parser
VB Script
Python
Fields:
FID
Shape
ID
CONTOUR
Elevation
Number
String
Date
Abs ( )
Atn ( )
Cos ( )
Exp ( )
Fix ( )
Int ( )
Log ( )
Sin ( )
Sqr ( )
Tan ( )
Show Codeblock
* / & + - =
Elevation =
About calculating fields
Clear
Load...
Save...
OK
Cancel
74º Passo: Dê dois cliques em CONTOUR
Search
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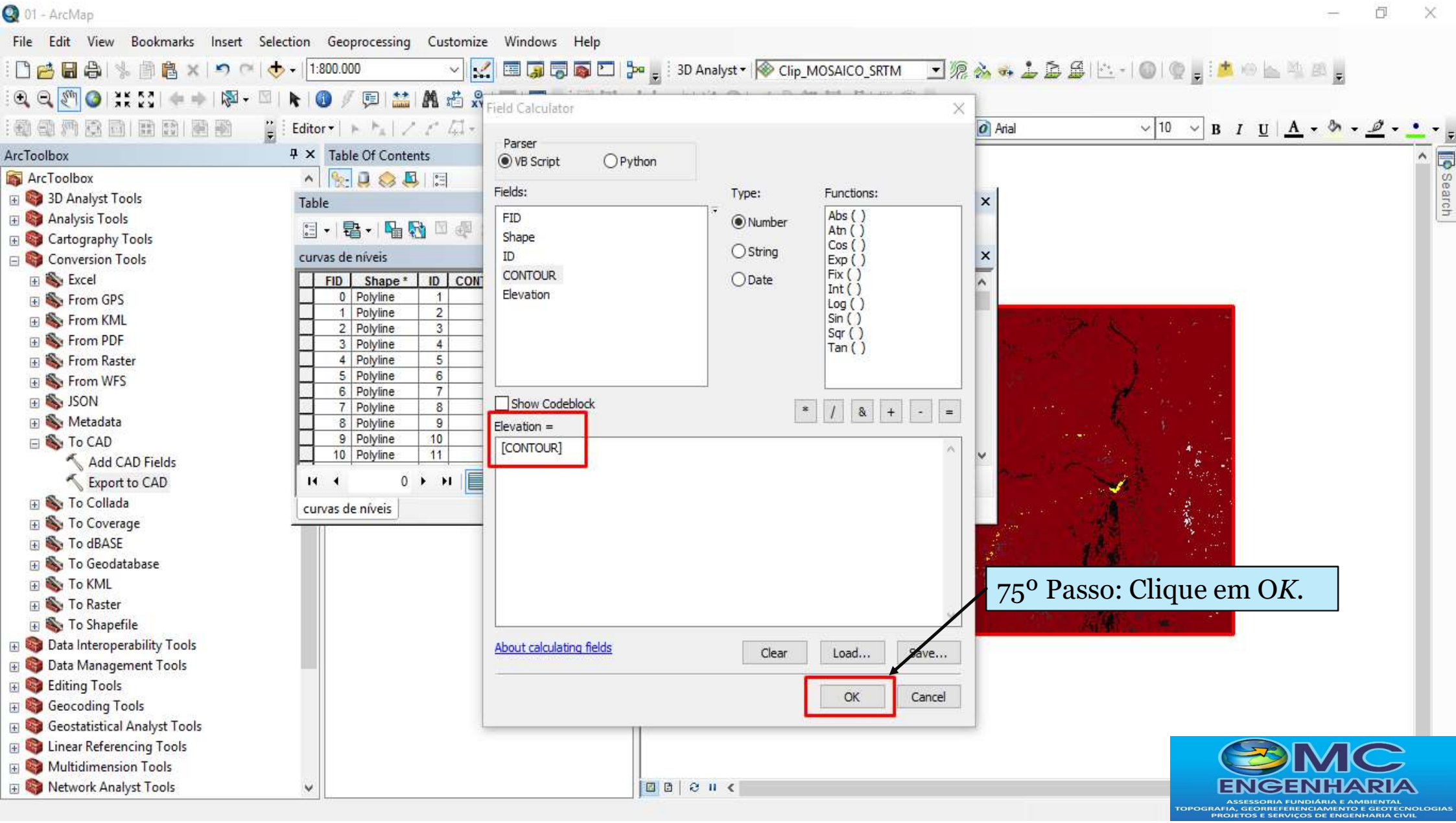

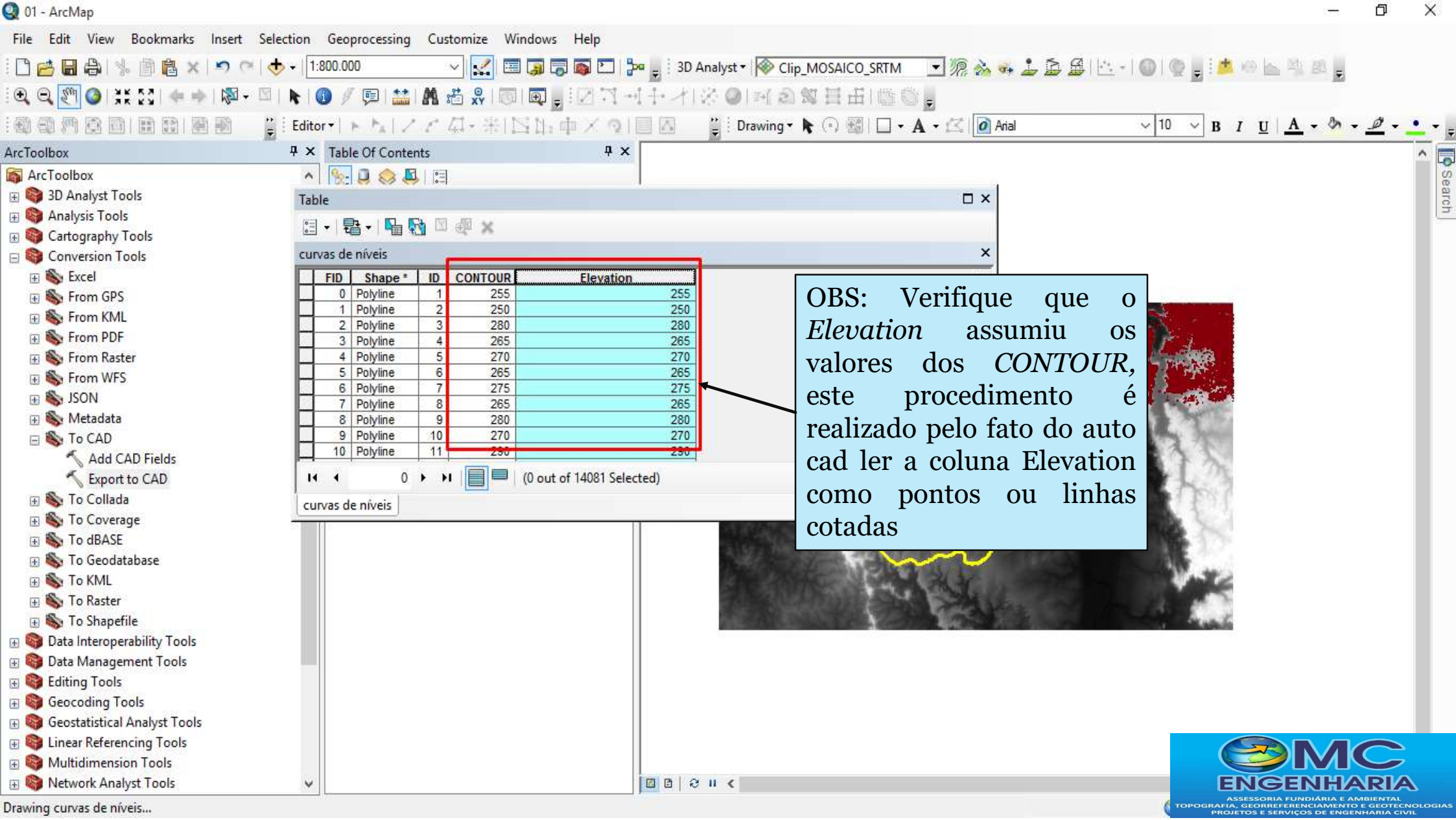
01 - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
1:800.000
3D Analyst
Clip_MOSAICO_SRTM
Editor
Drawing
Arial
10
ArcToolbox
ArcToolbox
3D Analyst Tools
Analysis Tools
Cartography Tools
Conversion Tools
Excel
From GPS
From KML
From PDF
From Raster
From WFS
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Metadata
To CAD
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Network Analyst Tools
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Table
curvas de níveis
FID Shape * ID CONTOUR Elevation
0 Polyline 1 255 255
1 Polyline 2 250 250
2 Polyline 3 280 280
3 Polyline 4 265 265
4 Polyline 5 270 270
5 Polyline 6 265 265
6 Polyline 7 275 275
7 Polyline 8 265 265
8 Polyline 9 280 280
9 Polyline 10 270 270
10 Polyline 11 250
0
(0 out of 14081 Selected)
curvas de níveis
OBS: Verifique que o *Elevation* assumiu os valores dos *CONTOUR*, este procedimento é realizado pelo fato do auto cad ler a coluna Elevation como pontos ou linhas cotadas
Search
Drawing curvas de níveis...
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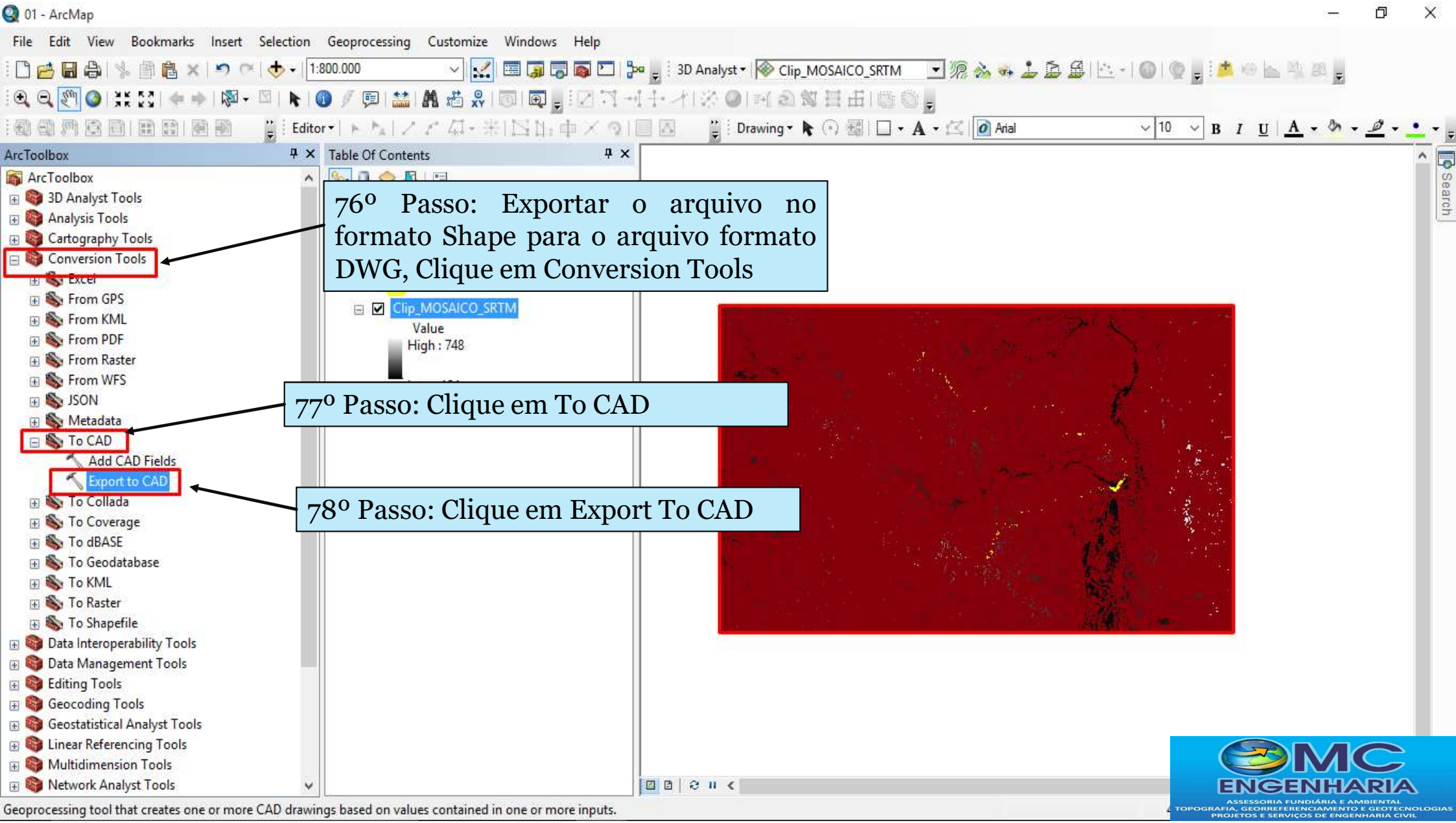

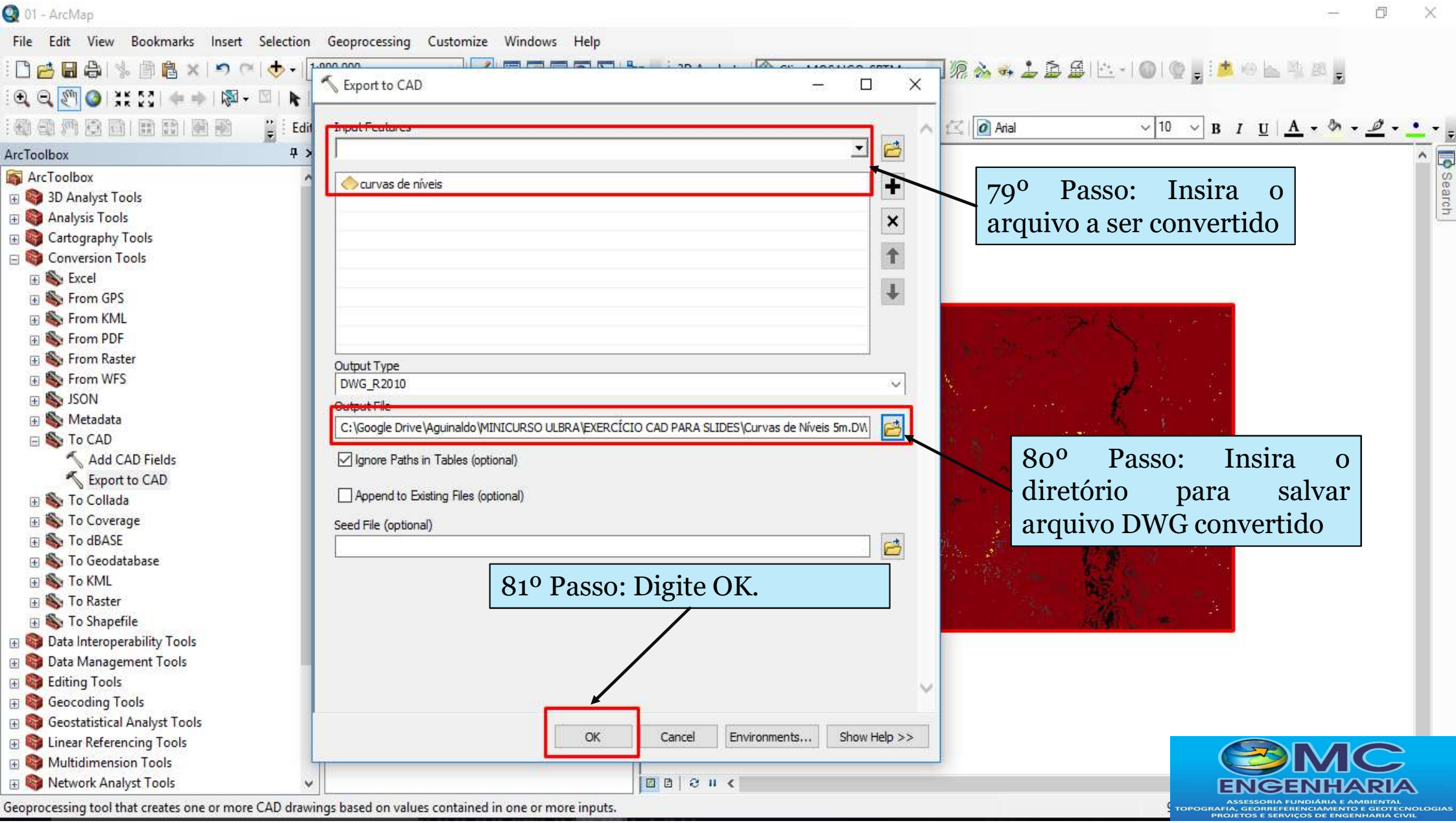
01 - ArcMap
File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help
ArcToolbox
ArcToolbox
3D Analyst Tools
Analysis Tools
Cartography Tools
Conversion Tools
Excel
From GPS
From KML
From PDF
From Raster
From WFS
JSON
Metadata
To CAD
Add CAD Fields
Export to CAD
To Collada
To Coverage
To dBASE
To Geodatabase
To KML
To Raster
To Shapefile
Data Interoperability Tools
Data Management Tools
Editing Tools
Geocoding Tools
Geostatistical Analyst Tools
Linear Referencing Tools
Multidimension Tools
Network Analyst Tools
Export to CAD
Input Features
curvas de níveis
Output Type
DWG_R2010
Output File
C:\Google Drive\Aguinaldo\MINICURSO ULBRA\EXERCÍCIO CAD PARA SLIDES\Curvas de Níveis 5m.DW
Ignore Paths in Tables (optional)
Append to Existing Files (optional)
Seed File (optional)
OK
Cancel
Environments...
Show Help >>
79º Passo: Insira o arquivo a ser convertido
80º Passo: Insira o diretório para salvar arquivo DWG convertido
81º Passo: Digite OK.
Geoprocessing tool that creates one or more CAD drawings based on values contained in one or more inputs.
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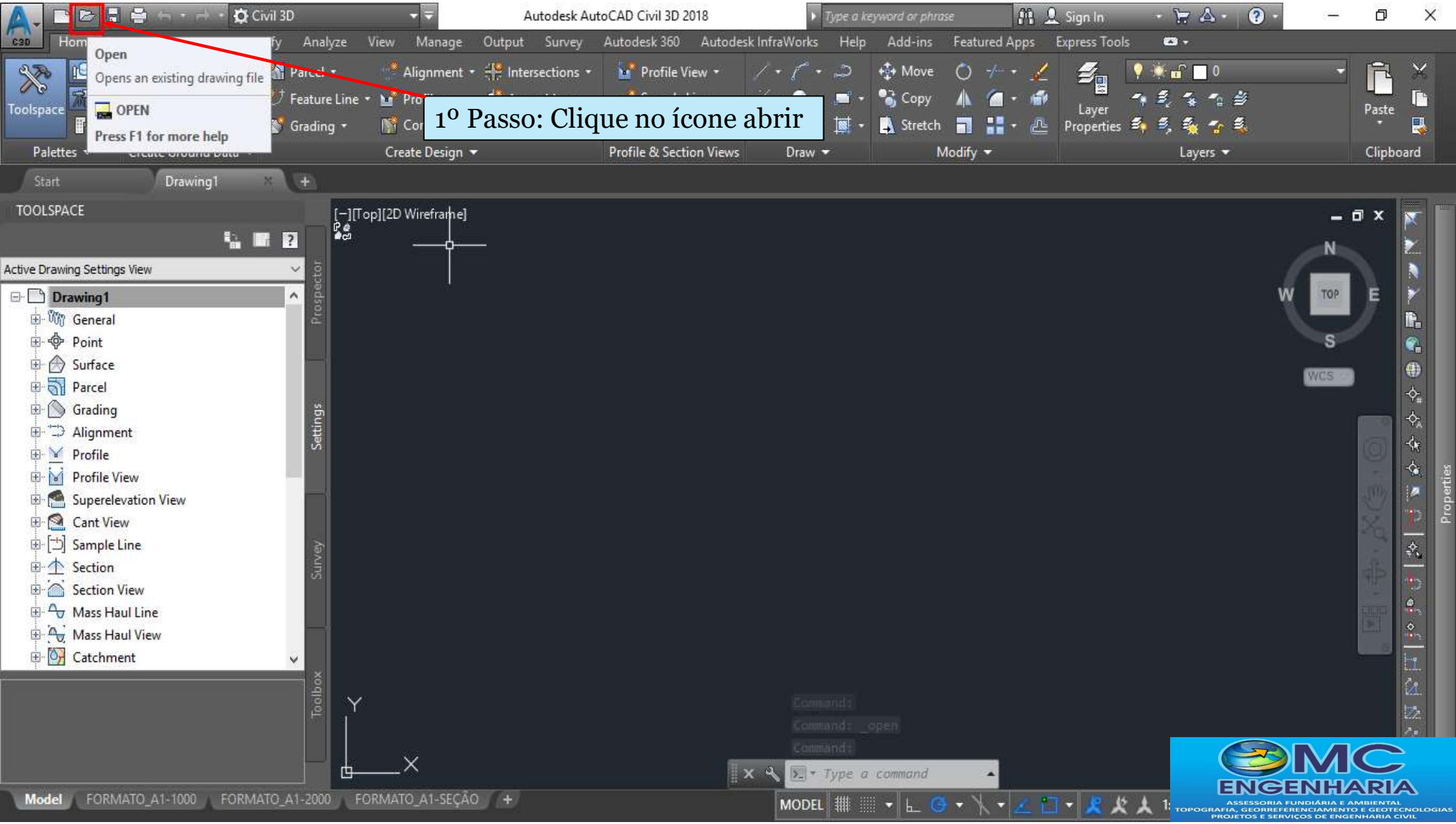
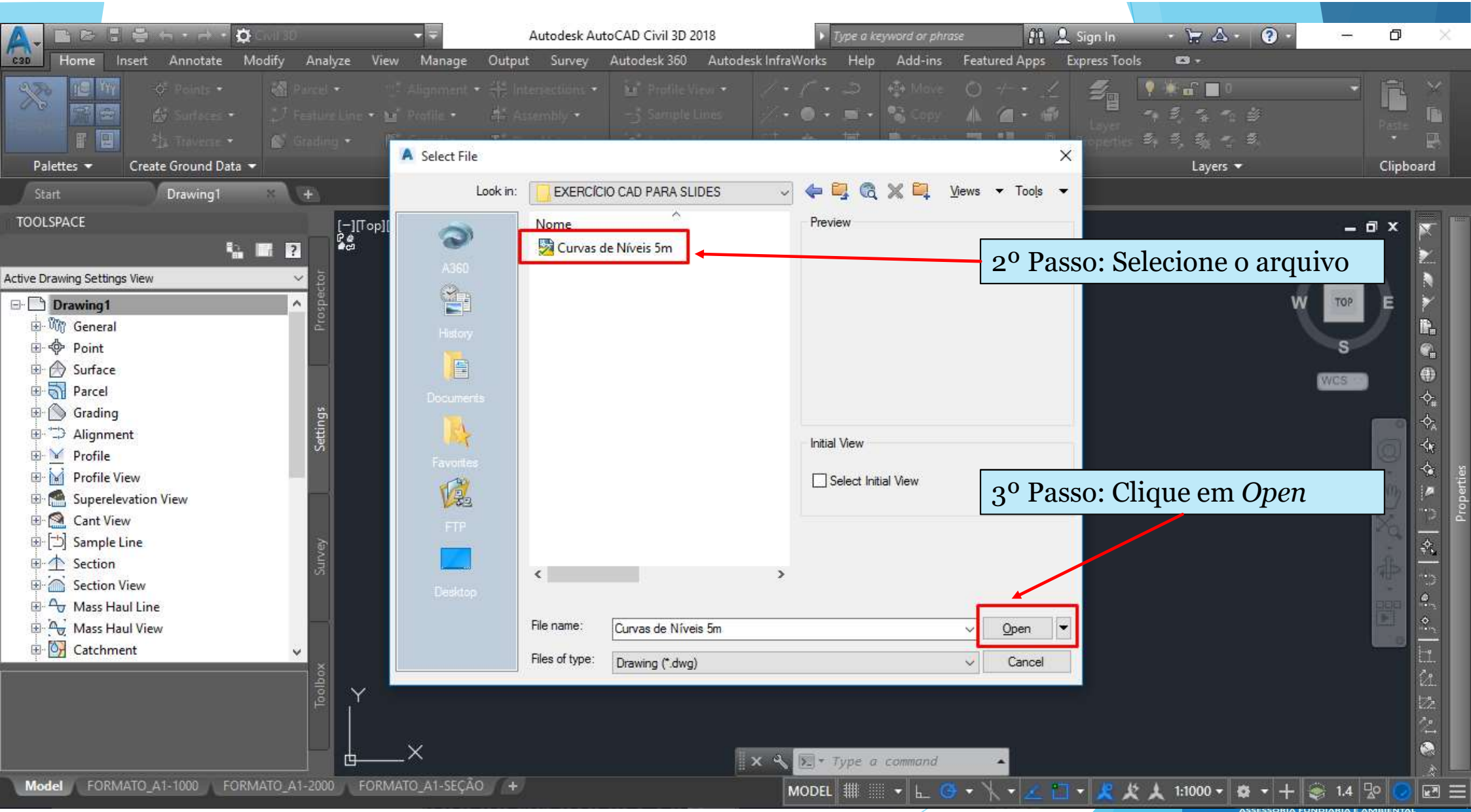
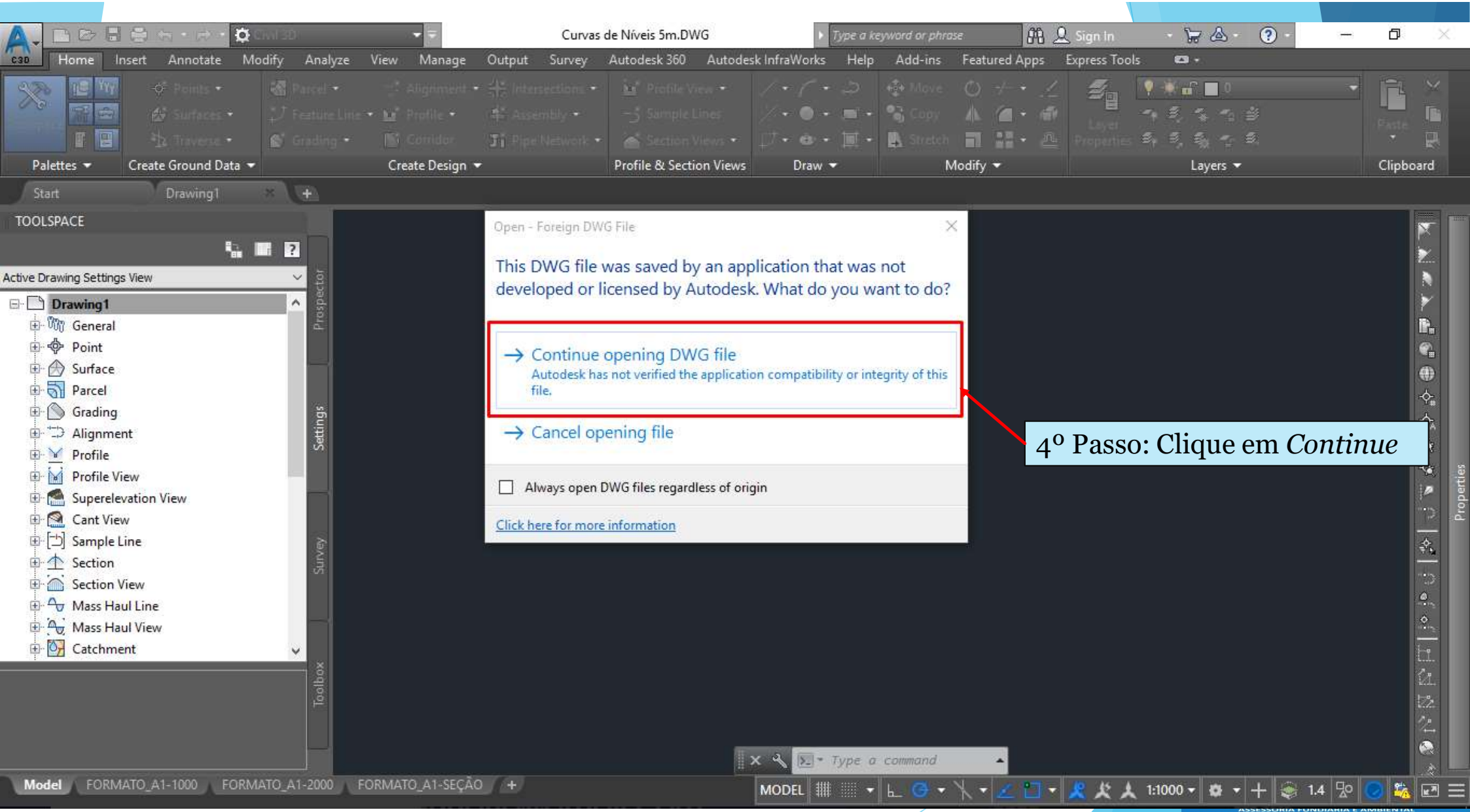
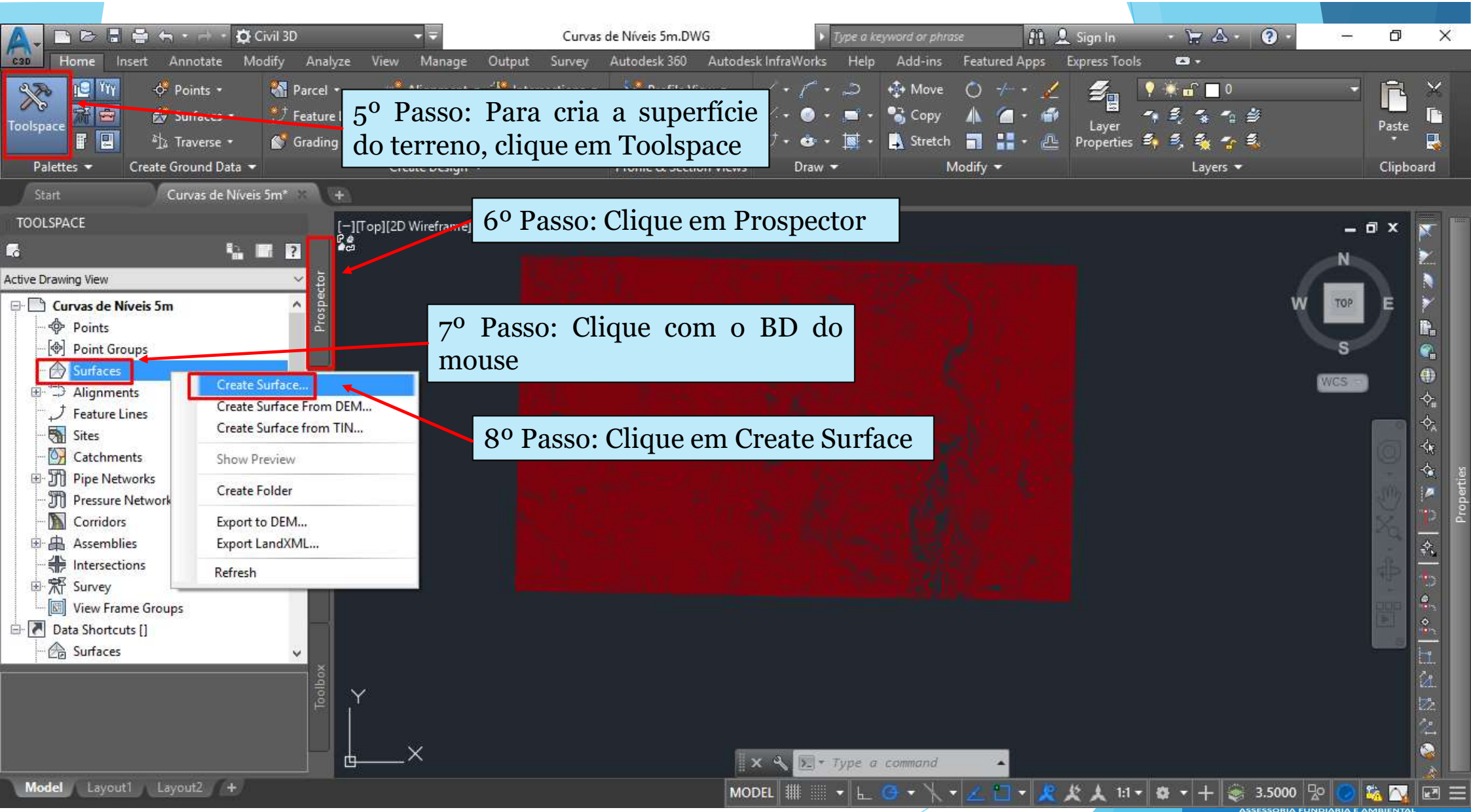
AutoCad Civil 3D

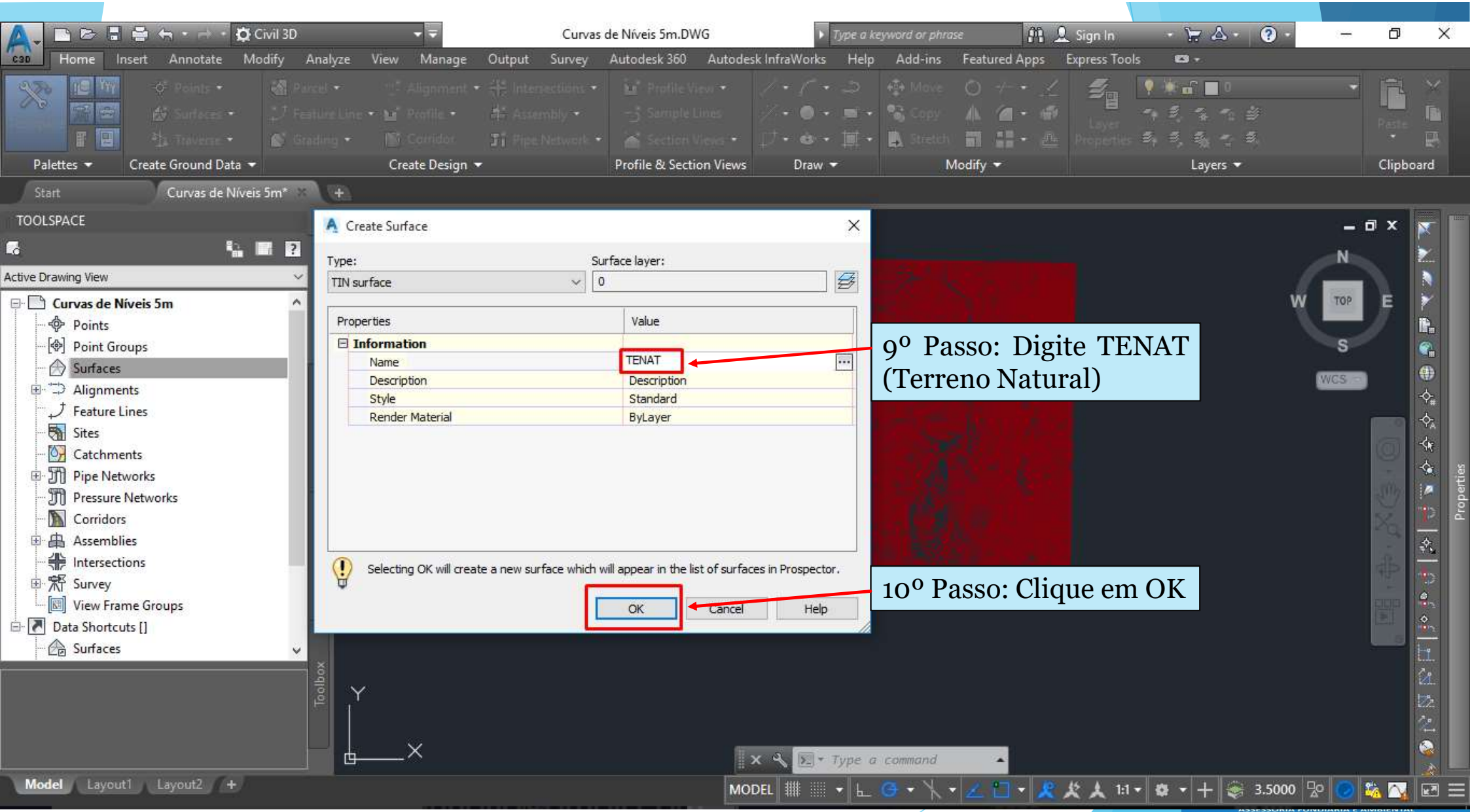
O Civil 3D é um software da linha AutoCAD, desenvolvida pela Autodesk, voltado para elaboração e análise de projetos nos mais diversos ramos da engenharia civil. Além de possuir todas as funcionalidades do AutoCAD, o Civil 3D possui uma gama de ferramentas exclusivas que permitem ao usuário desenvolver, com facilidade, projetos na área de transportes, SIG e inúmeras aplicações envolvendo áreas ligadas ao meio ambiente, como análise de bacias hidrográficas e estudos hidráulicos e hidrológicos.

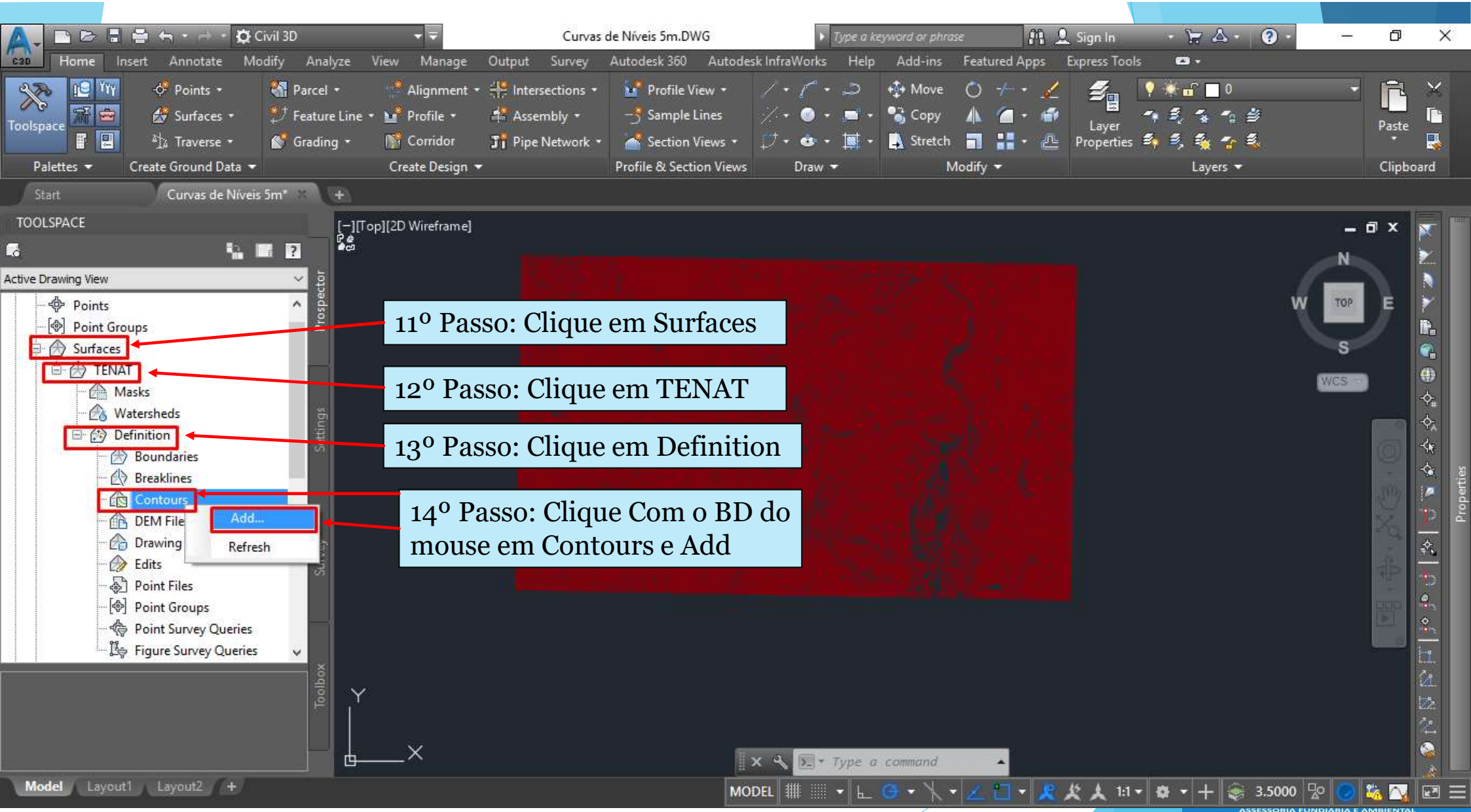


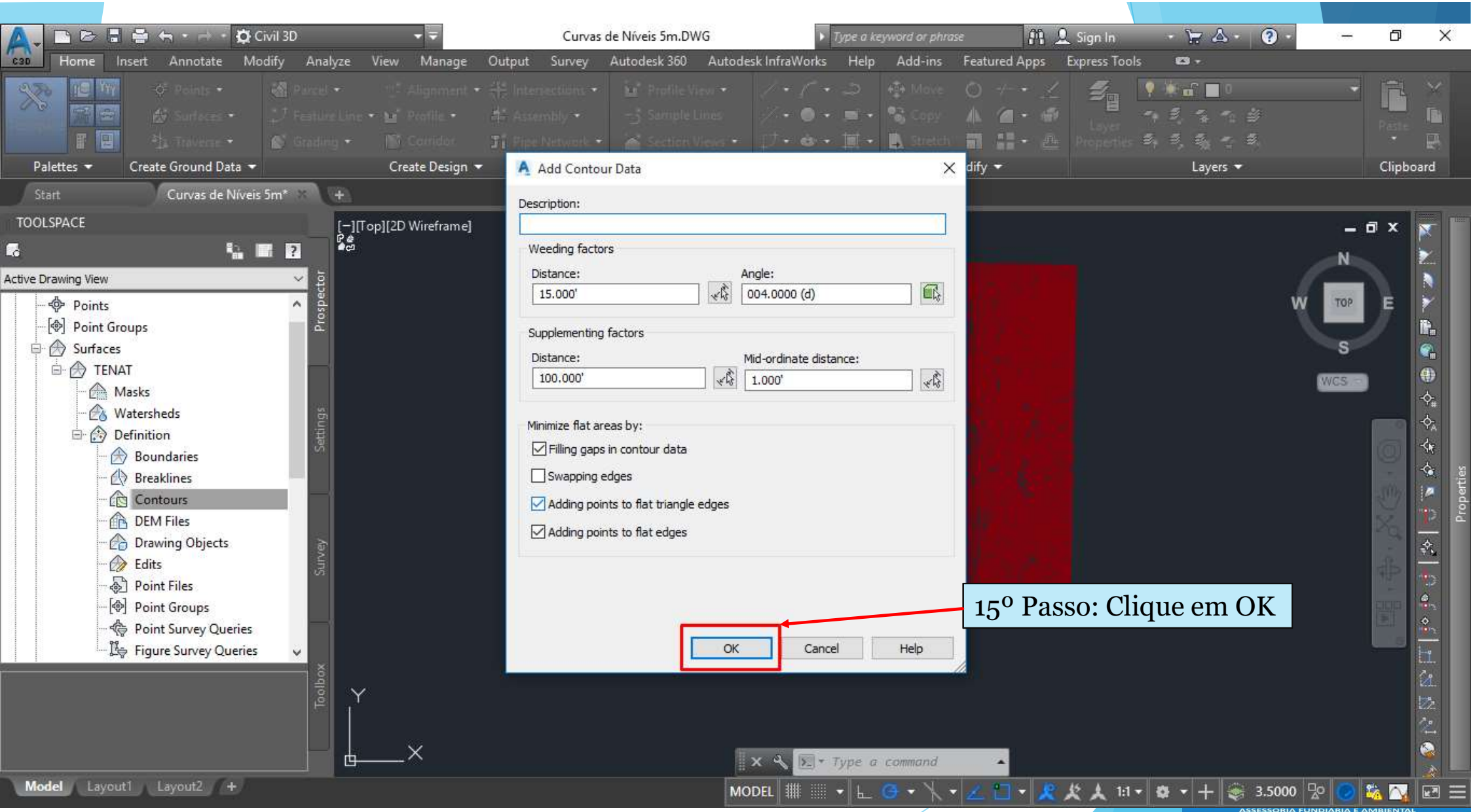

Autodesk AutoCAD Civil 3D 2018
Select File
Look in: EXERCÍCIO CAD PARA SLIDES
Views
Tools
Nome
Curvas de Níveis 5m
Preview
Initial View
Select Initial View
A360
History
Documents
Favorites
FTP
Desktop
File name: Curvas de Níveis 5m
Open
Files of type: Drawing (*.dwg)
Cancel
2º Passo: Selecione o arquivo
3º Passo: Clique em *Open*
TOOLSPACE
Drawing1
General
Point
Surface
Parcel
Grading
Alignment
Profile
Profile View
Superelevation View
Cant View
Sample Line
Section
Section View
Mass Haul Line
Mass Haul View
Catchment
Model
FORMATO_A1-1000
FORMATO_A1-2000
FORMATO_A1-SEÇÃO


Curvas de Níveis 5m.DWG
Open - Foreign DWG File
This DWG file was saved by an application that was not developed or licensed by Autodesk. What do you want to do?
Continue opening DWG file
Autodesk has not verified the application compatibility or integrity of this file.
Cancel opening file
Always open DWG files regardless of origin
Click here for more information
4º Passo: Clique em *Continue*


5º Passo: Para cria a superfície do terreno, clique em Toolspace
6º Passo: Clique em Prospector
7º Passo: Clique com o BD do mouse
8º Passo: Clique em Create Surface
Toolspace
Create Surface...
Create Surface From DEM...
Create Surface from TIN...
Show Preview
Create Folder
Export to DEM...
Export LandXML...
Refresh
Curvas de Níveis 5m
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Prospector
Toolbox
Properties
Model
Layout1
Layout2


Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Palettes
Create Ground Data
Create Design
Profile & Section Views
Draw
Modify
Layers
Clipboard
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Curvas de Níveis 5m
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Create Surface
Type:
TIN surface
Surface layer:
0
Properties
Value
Information
Name
TENAT
Description
Description
Style
Standard
Render Material
ByLayer
Selecting OK will create a new surface which will appear in the list of surfaces in Prospector.
OK
Cancel
Help
9º Passo: Digite TENAT (Terreno Natural)
10º Passo: Clique em OK
N
W
TOP
E
S
WCS
Toolbox
Properties
Type a command
Model
Layout1
Layout2
MODEL
1:1
3.5000




Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Palettes
Create Ground Data
Create Design
Layers
Clipboard
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Points
Point Groups
Surfaces
TENAT
Masks
Watersheds
Definition
Boundaries
Breaklines
Contours
DEM Files
Drawing Objects
Edits
Point Files
Point Groups
Point Survey Queries
Figure Survey Queries
Prospector
Settings
Survey
Toolbox
[−][Top][2D Wireframe]
Add Contour Data
Description:
Weeding factors
Distance:
15.000'
Angle:
004.0000 (d)
Supplementing factors
Distance:
100.000'
Mid-ordinate distance:
1.000'
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
15º Passo: Clique em OK
N
W
TOP
E
S
WCS
Properties
Type a command
Model
Layout1
Layout2
MODEL
1:1
3.5000
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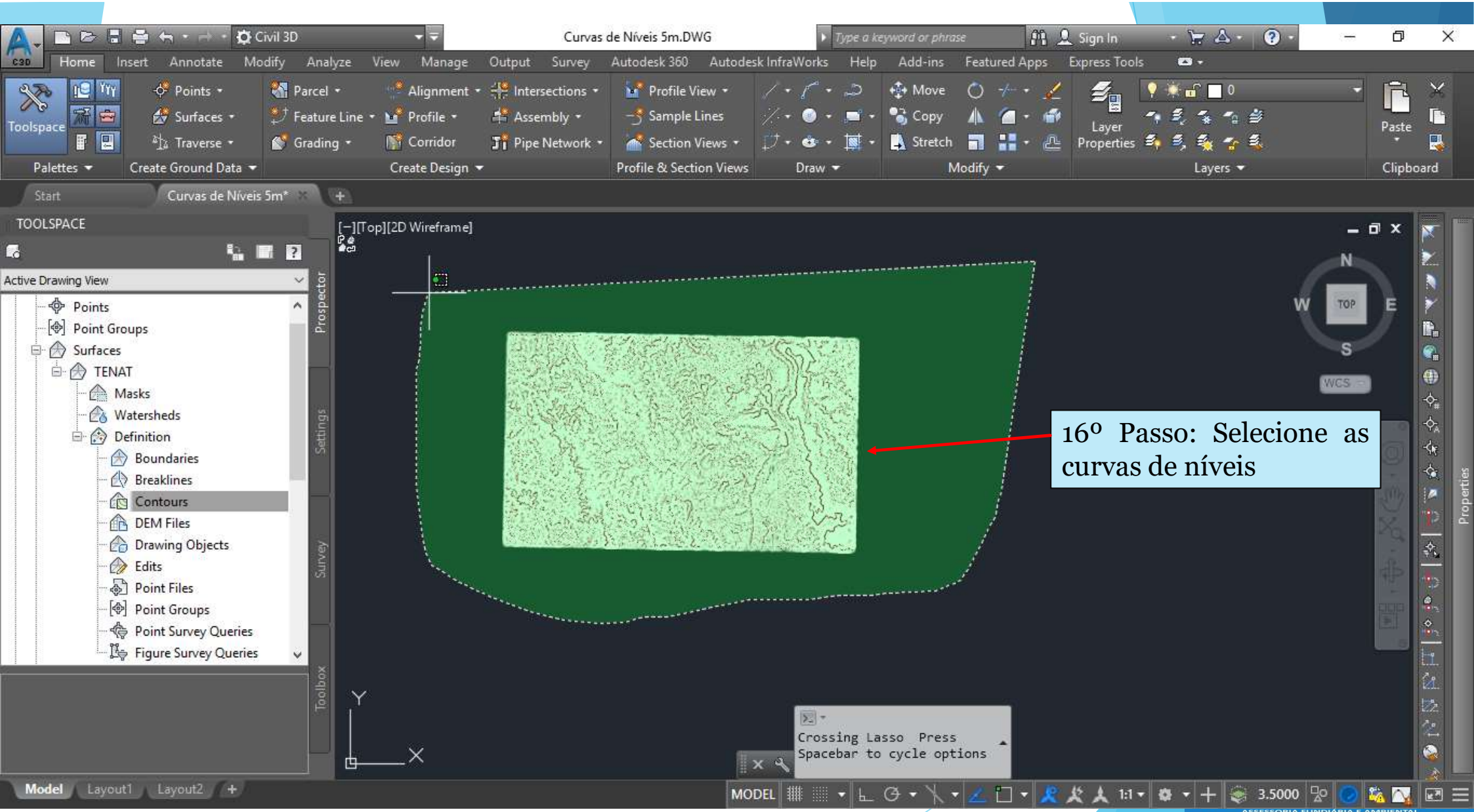
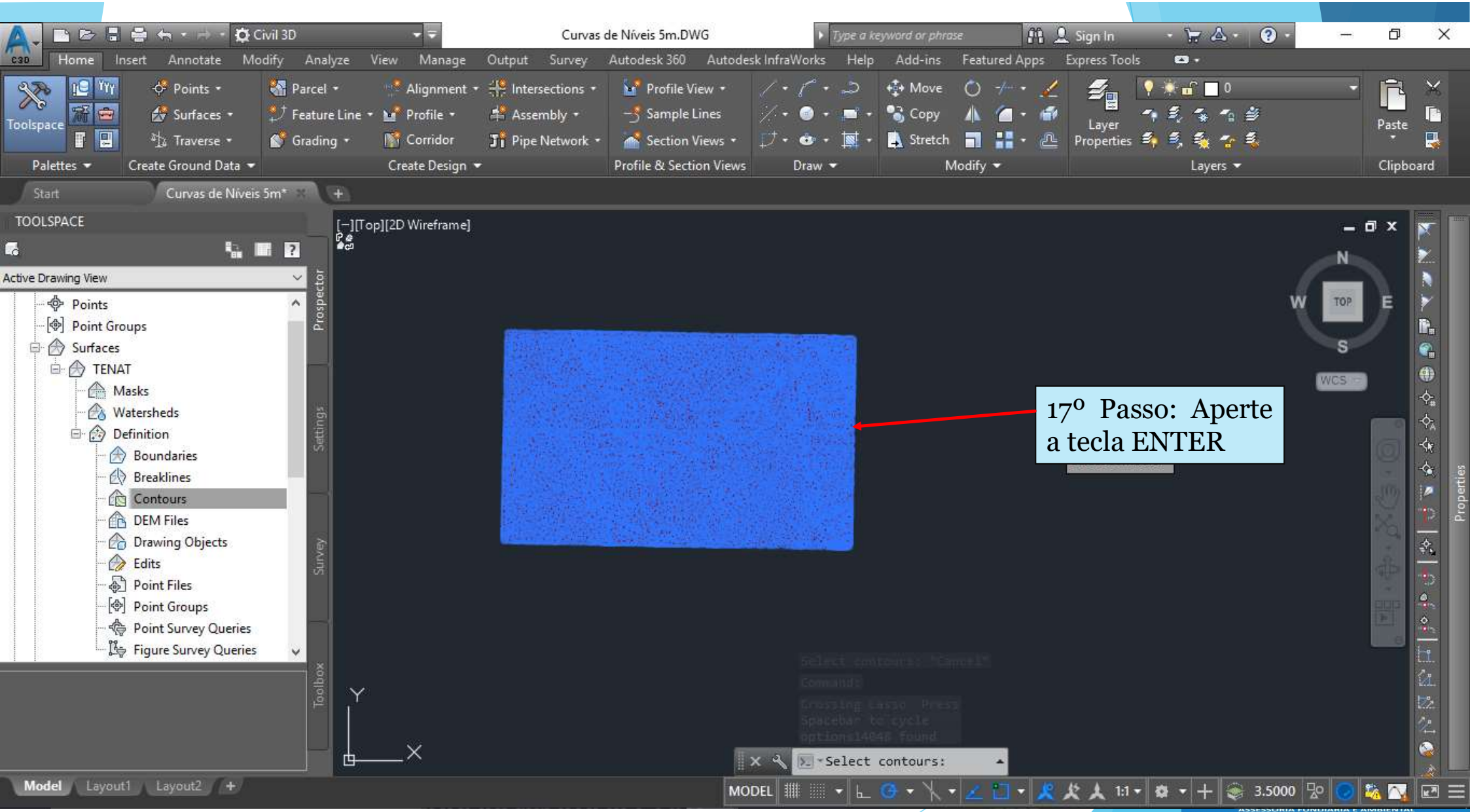
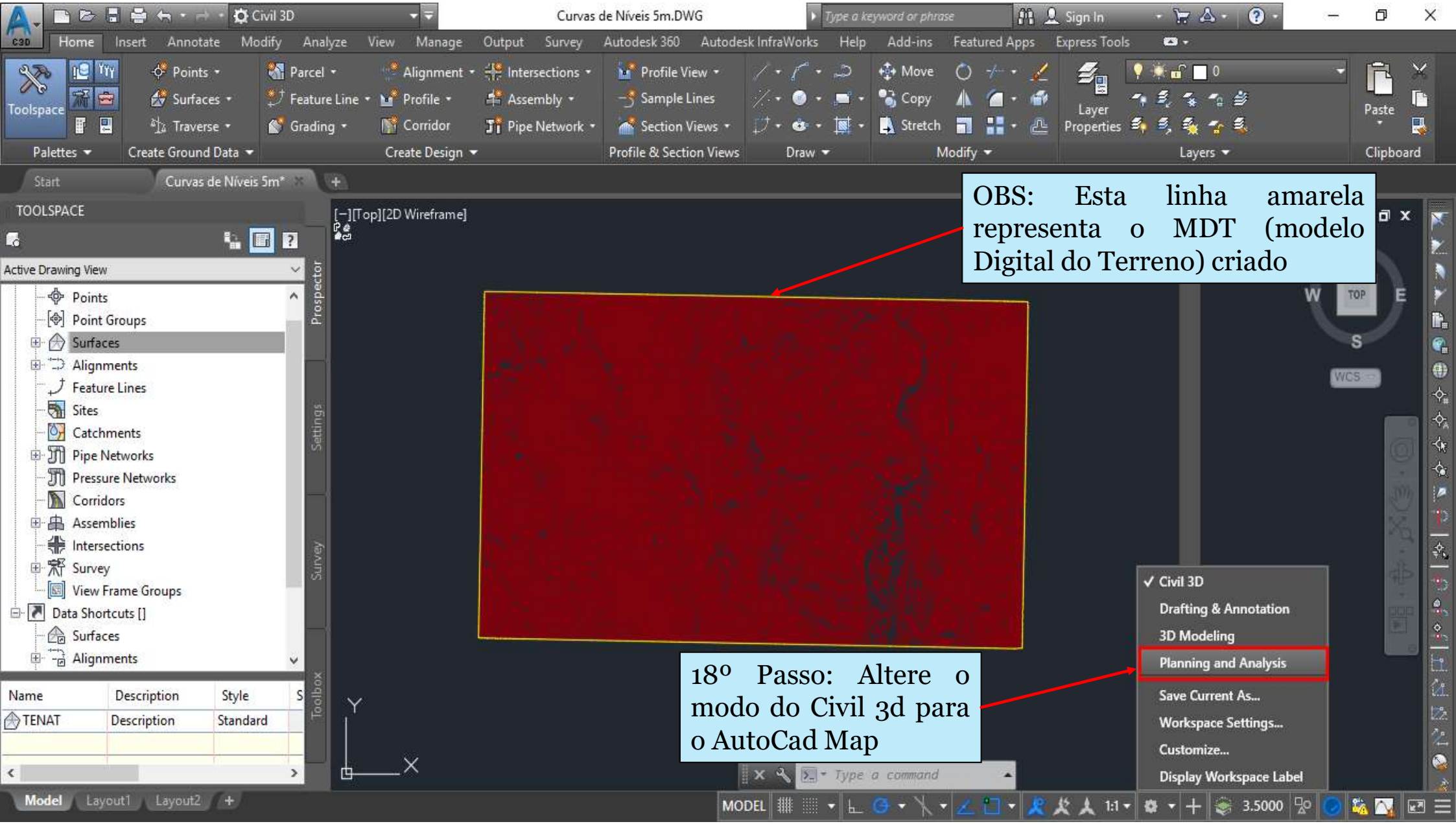
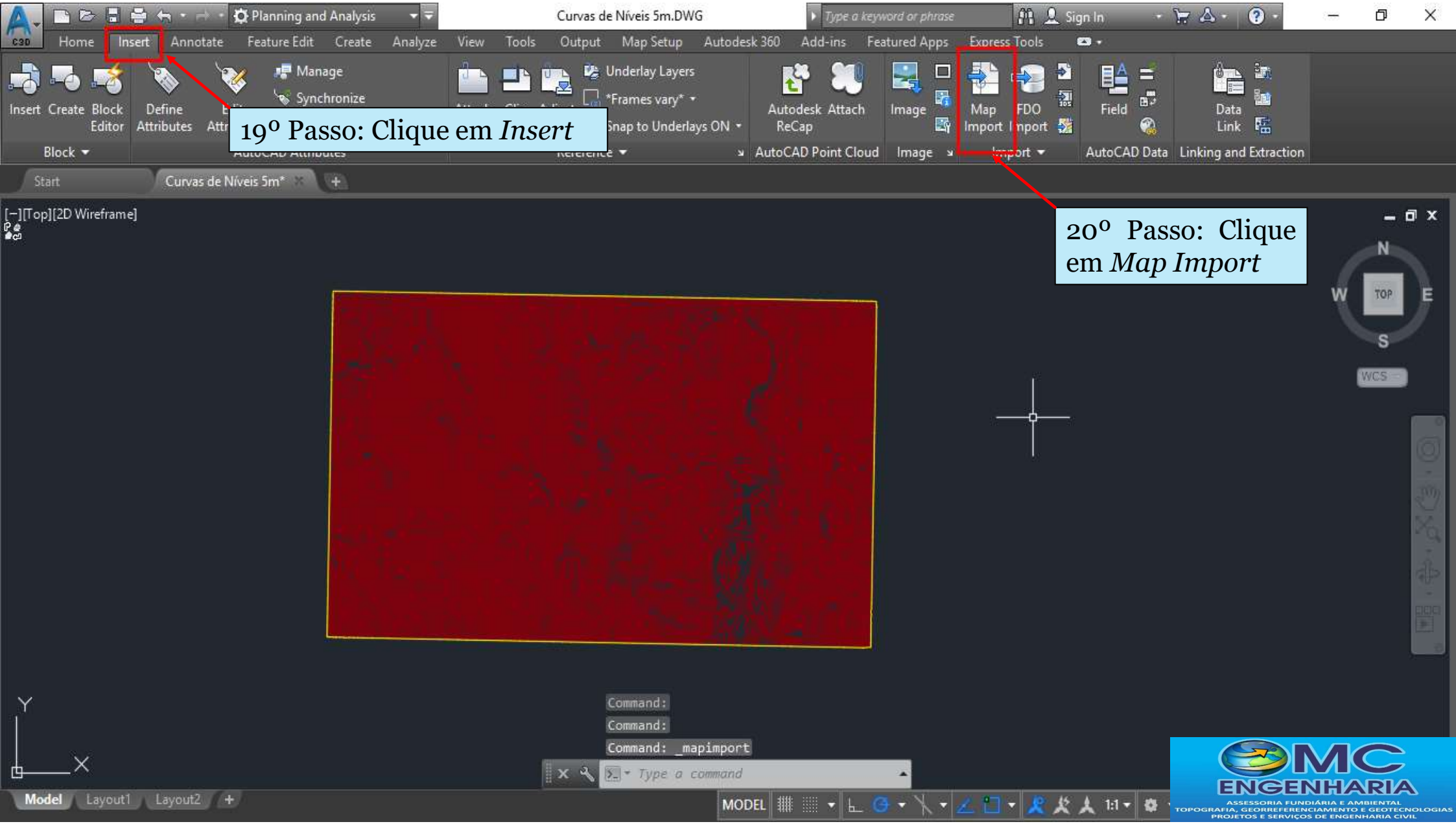

Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Toolspace
Points
Surfaces
Traverse
Parcel
Feature Line
Grading
Alignment
Profile
Corridor
Intersections
Assembly
Pipe Network
Profile View
Sample Lines
Section Views
Move
Copy
Stretch
Layer Properties
Paste
Palettes
Create Ground Data
Create Design
Profile & Section Views
Draw
Modify
Layers
Clipboard
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Points
Point Groups
Surfaces
TENAT
Masks
Watersheds
Definition
Boundaries
Breaklines
Contours
DEM Files
Drawing Objects
Edits
Point Files
Point Groups
Point Survey Queries
Figure Survey Queries
Prospector
Settings
Survey
Toolbox
[−][Top][2D Wireframe]
N
W
TOP
E
S
WCS
16º Passo: Selecione as curvas de níveis
Crossing Lasso Press Spacebar to cycle options
Properties
Model
Layout1
Layout2
MODEL
1:1
3.5000


Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Toolspace
Points
Surfaces
Traverse
Parcel
Feature Line
Grading
Alignment
Profile
Corridor
Intersections
Assembly
Pipe Network
Profile View
Sample Lines
Section Views
Move
Copy
Stretch
Layer Properties
Paste
Palettes
Create Ground Data
Create Design
Profile & Section Views
Draw
Modify
Layers
Clipboard
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Points
Point Groups
Surfaces
TENAT
Masks
Watersheds
Definition
Boundaries
Breaklines
Contours
DEM Files
Drawing Objects
Edits
Point Files
Point Groups
Point Survey Queries
Figure Survey Queries
Prospector
Settings
Survey
Toolbox
[−][Top][2D Wireframe]
N
W
TOP
E
S
WCS
17º Passo: Aperte a tecla ENTER
Select contours:
Model
Layout1
Layout2
MODEL
1:1
3.5000
Properties


Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Toolspace
Points
Surfaces
Traverse
Parcel
Feature Line
Grading
Alignment
Profile
Corridor
Intersections
Assembly
Pipe Network
Profile View
Sample Lines
Section Views
Move
Copy
Stretch
Layer Properties
Paste
Palettes
Create Ground Data
Create Design
Profile & Section Views
Draw
Modify
Layers
Clipboard
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Prospector
Settings
Survey
Toolbox
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Alignments
Name
Description
Style
TENAT
Description
Standard
[−][Top][2D Wireframe]
OBS: Esta linha amarela representa o MDT (modelo Digital do Terreno) criado
18º Passo: Altere o modo do Civil 3d para o AutoCad Map
Civil 3D
Drafting & Annotation
3D Modeling
Planning and Analysis
Save Current As...
Workspace Settings...
Customize...
Display Workspace Label
Type a command
Model
Layout1
Layout2
MODEL
1:1
3.5000


Planning and Analysis
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Feature Edit
Create
Analyze
View
Tools
Output
Map Setup
Autodesk 360
Add-ins
Featured Apps
Express Tools
Insert
Create
Block Editor
Block
Define Attributes
Manage
Synchronize
Underlay Layers
Frames vary
Snap to Underlays ON
Autodesk ReCap
Attach
AutoCAD Point Cloud
Image
Map Import
FDO Import
Field
AutoCAD Data
Data Link
Linking and Extraction
19º Passo: Clique em *Insert*
20º Passo: Clique em *Map Import*
Start
Curvas de Níveis 5m*
[−][Top][2D Wireframe]
N
W
TOP
E
S
WCS
Command:
Command:
Command: _mapimport
Type a command
Model
Layout1
Layout2
MODEL
1:1
OMC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
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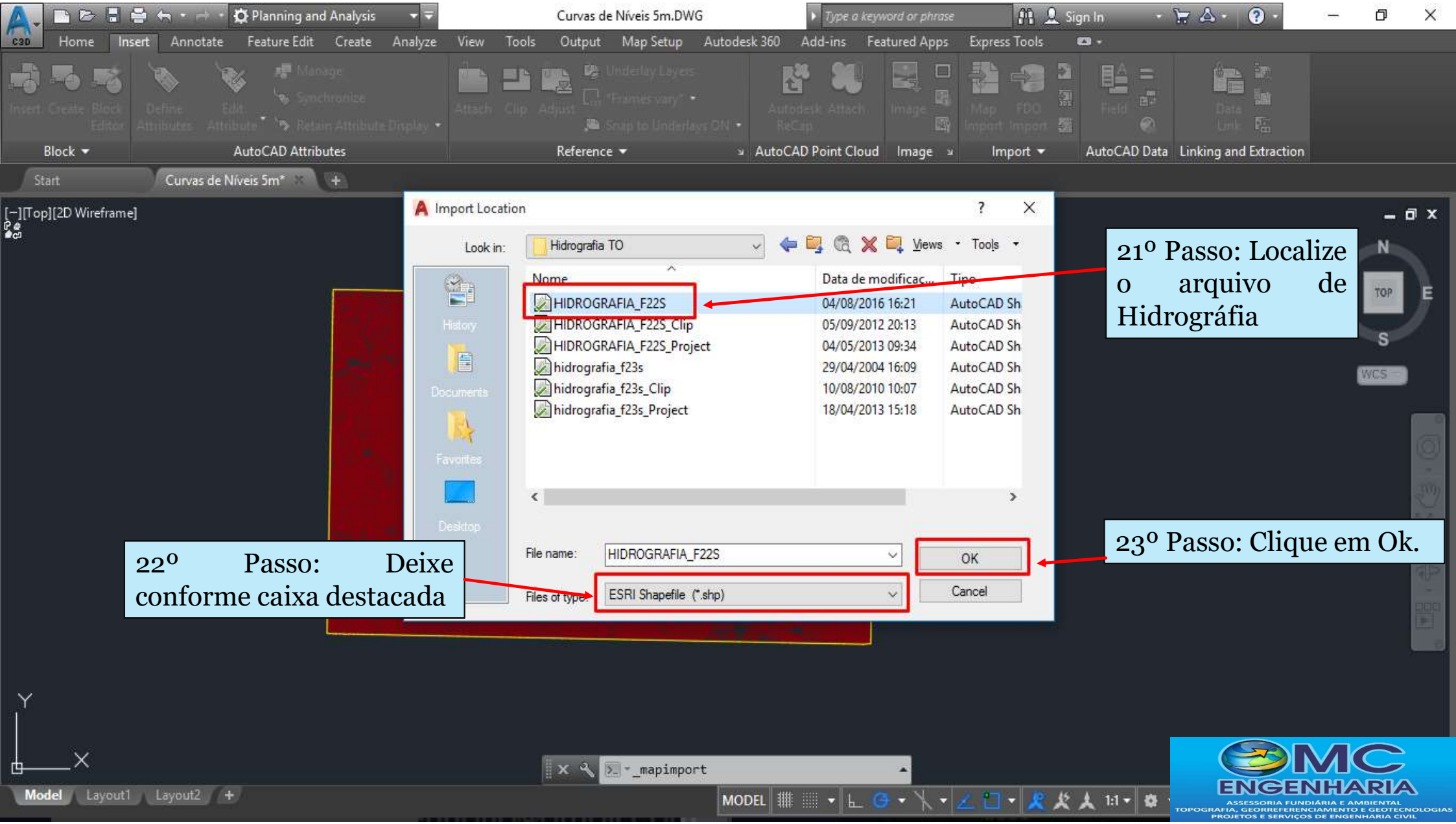
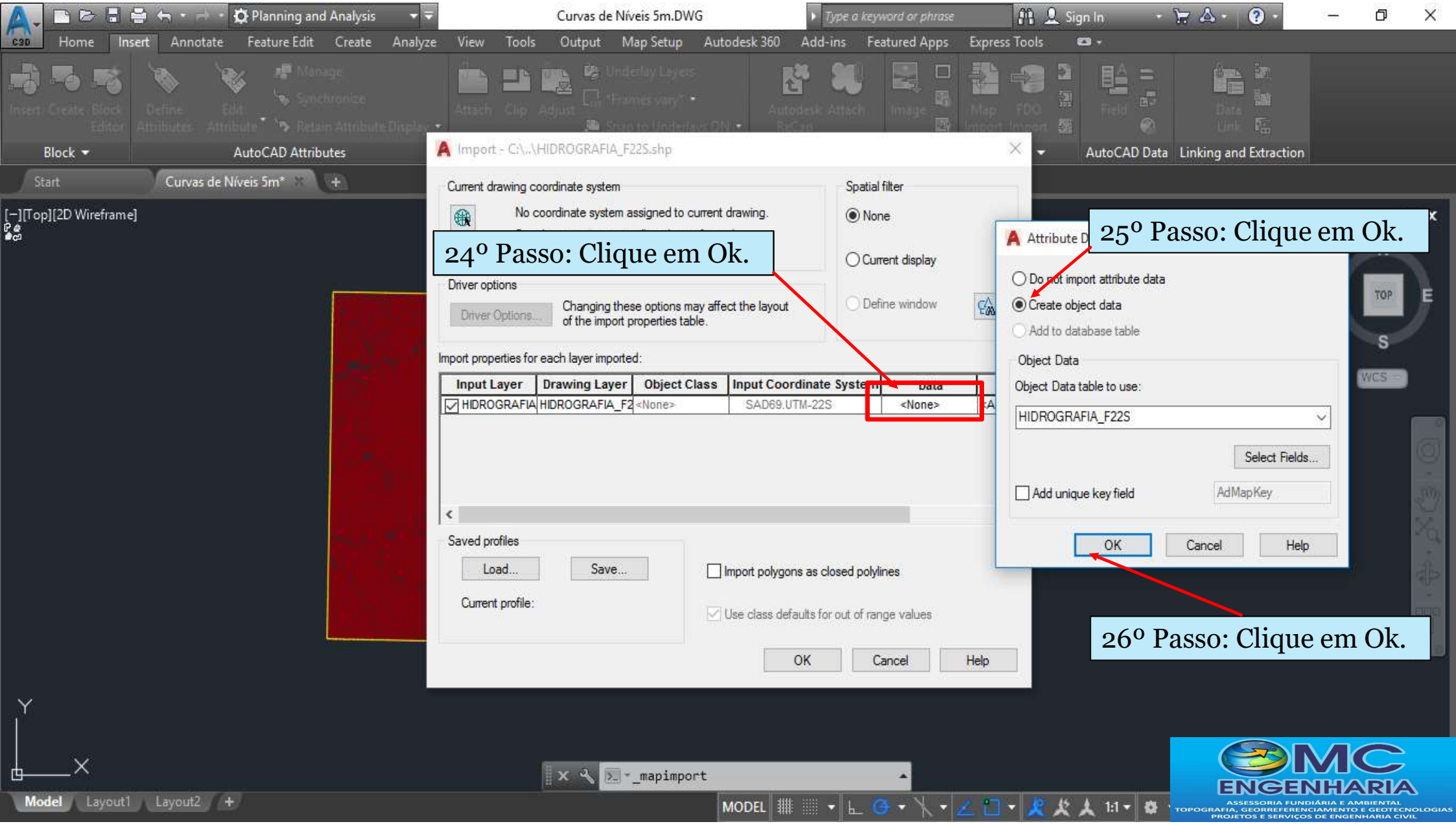

Curvas de Níveis 5m.DWG
Import Location
Look in: Hidrografia TO
Nome
Data de modificac...
Tipo
HIDROGRAFIA_F22S 04/08/2016 16:21 AutoCAD Sh
HIDROGRAFIA_F22S_Clip 05/09/2012 20:13 AutoCAD Sh
HIDROGRAFIA_F22S_Project 04/05/2013 09:34 AutoCAD Sh
hidrografia_f23s 29/04/2004 16:09 AutoCAD Sh
hidrografia_f23s_Clip 10/08/2010 10:07 AutoCAD Sh
hidrografia_f23s_Project 18/04/2013 15:18 AutoCAD Sh
File name: HIDROGRAFIA_F22S
Files of type: ESRI Shapefile (*.shp)
OK
Cancel
21º Passo: Localize o arquivo de Hidrográfia
22º Passo: Deixe conforme caixa destacada
23º Passo: Clique em Ok.
_mapimport
Model
Layout1
Layout2
MODEL


Curvas de Níveis 5m.DWG
Import - C:\...\HIDROGRAFIA_F22S.shp
Current drawing coordinate system
No coordinate system assigned to current drawing.
Spatial filter
None
Current display
Define window
Driver options
Driver Options...
Changing these options may affect the layout of the import properties table.
Import properties for each layer imported:
Input Layer
Drawing Layer
Object Class
Input Coordinate System
Data
HIDROGRAFIA
HIDROGRAFIA_F2
<None>
SAD69.UTM-22S
<None>
Saved profiles
Load...
Save...
Current profile:
Import polygons as closed polylines
Use class defaults for out of range values
OK
Cancel
Help
24º Passo: Clique em Ok.
Attribute D
Do not import attribute data
Create object data
Add to database table
Object Data
Object Data table to use:
HIDROGRAFIA_F22S
Select Fields...
Add unique key field
AdMapKey
OK
Cancel
Help
25º Passo: Clique em Ok.
26º Passo: Clique em Ok.
_mapimport
Model
Layout1
Layout2
MODEL
OMC ENGENHARIA
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TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
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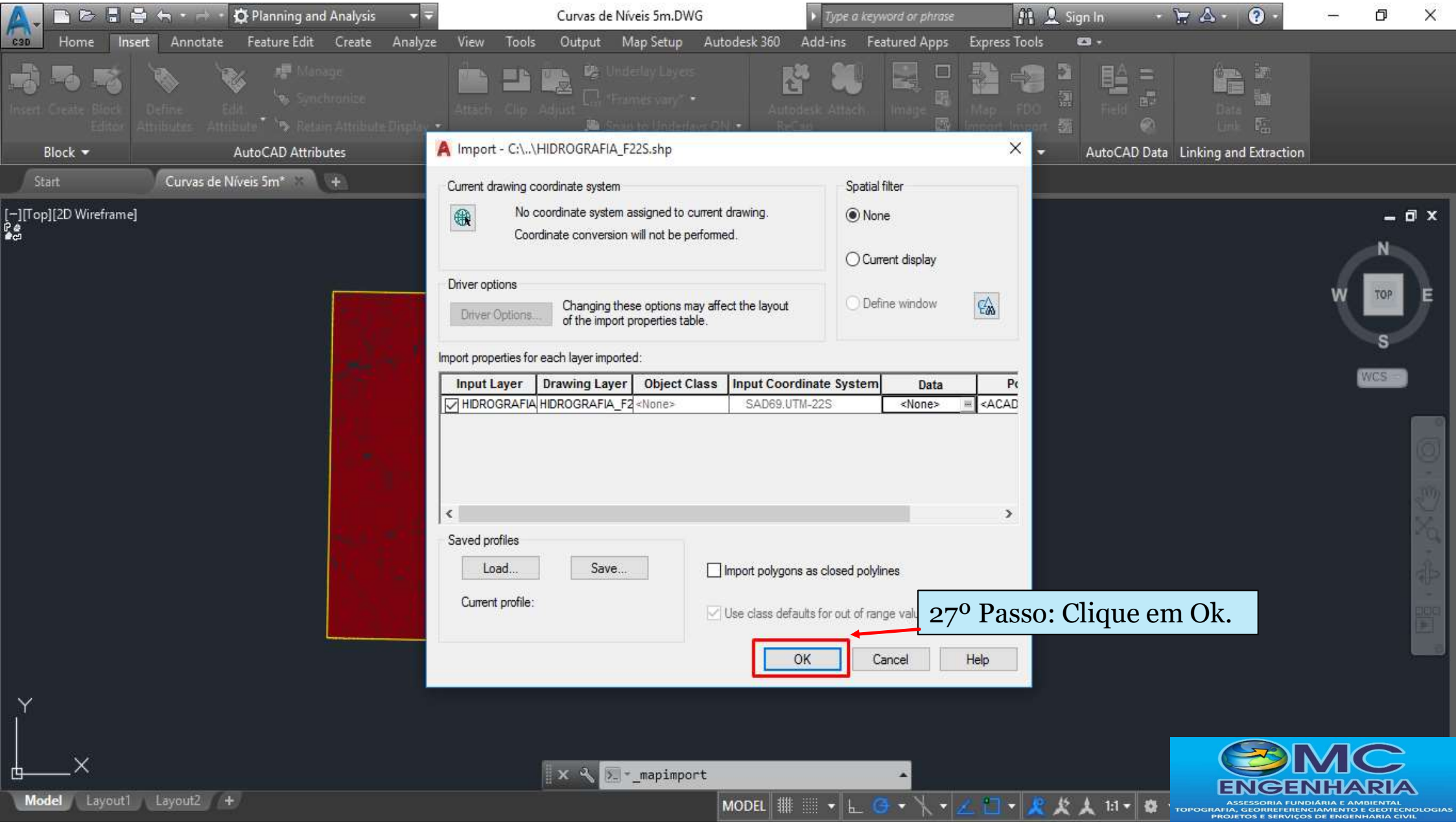
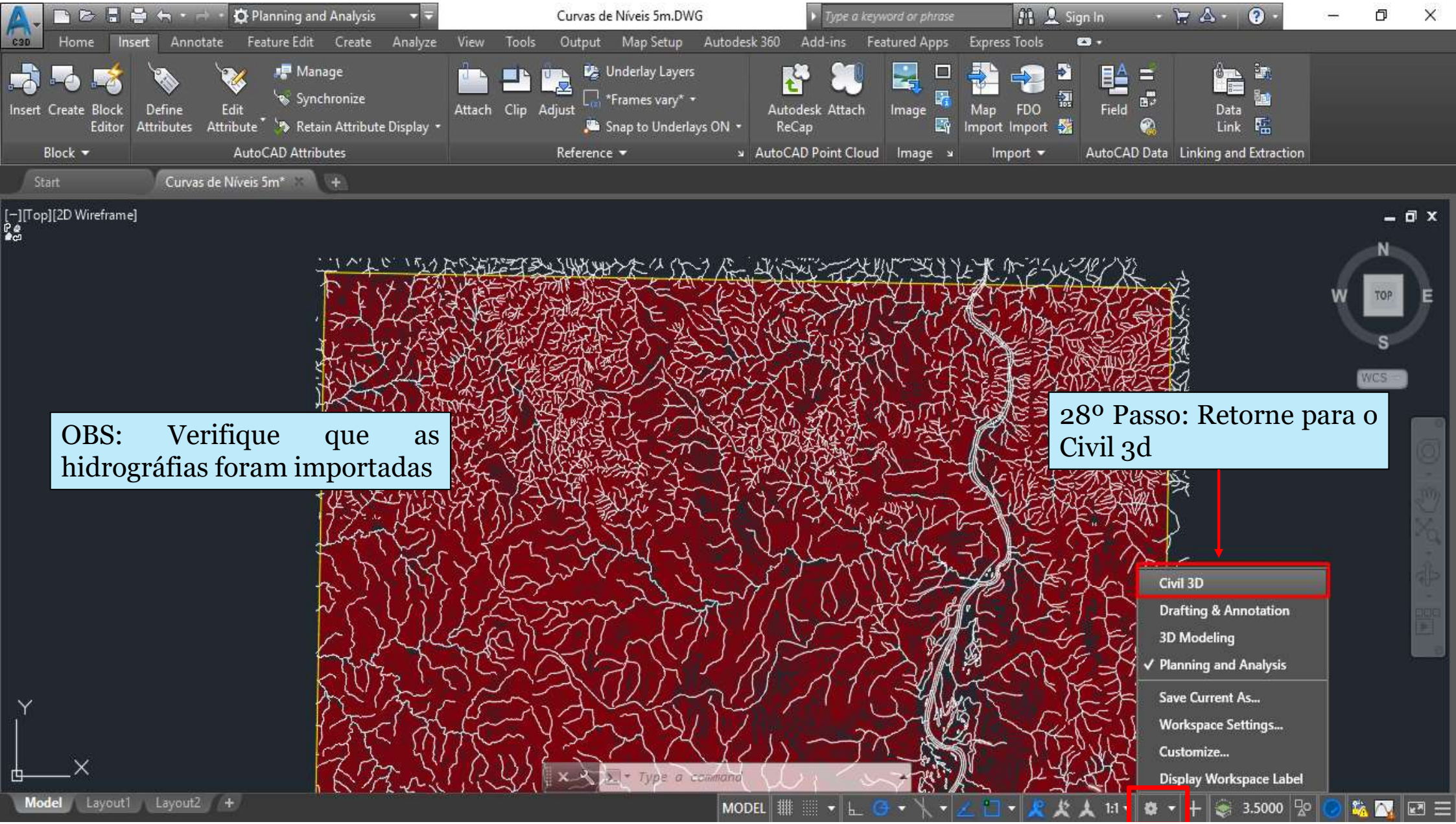
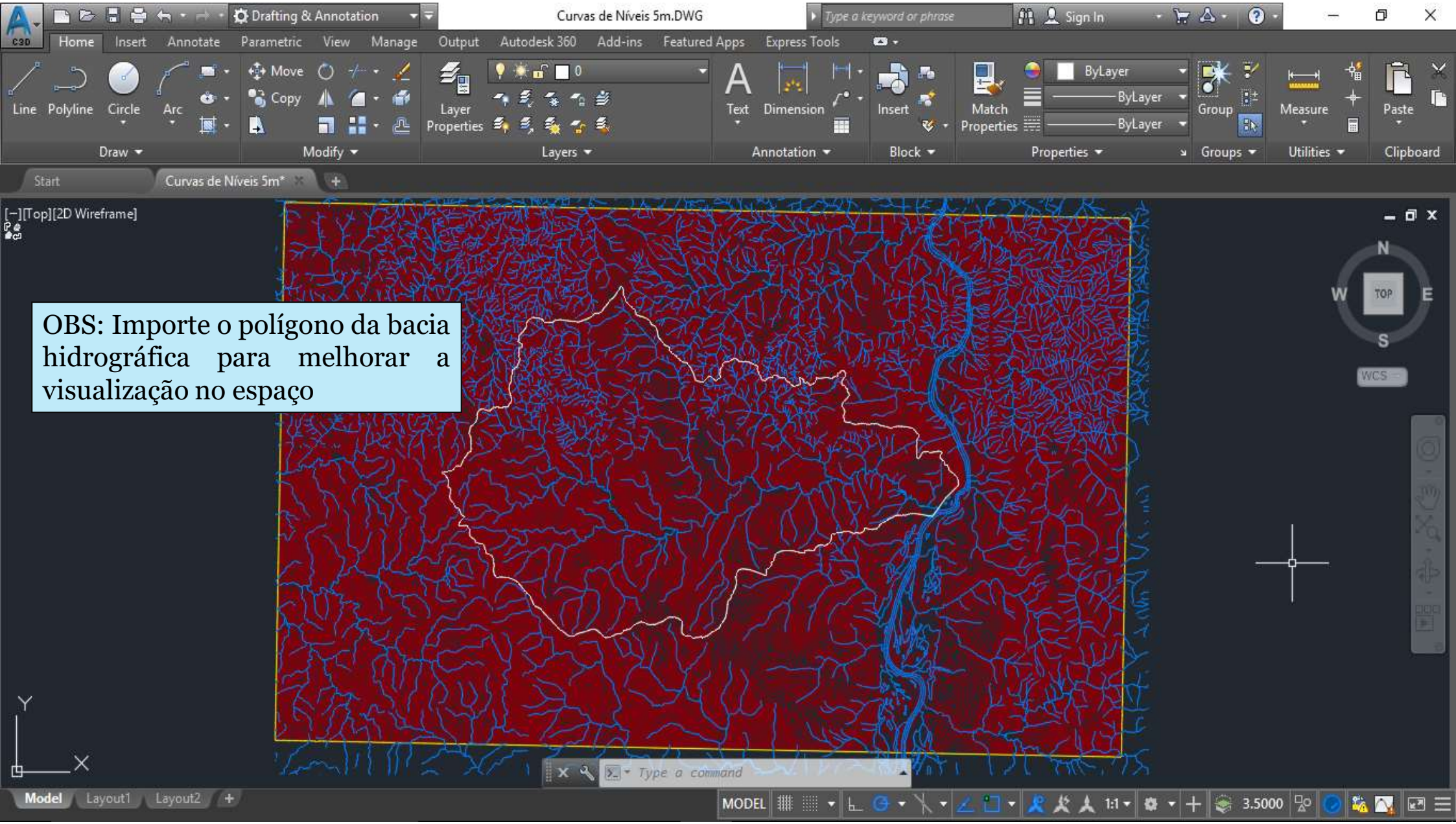
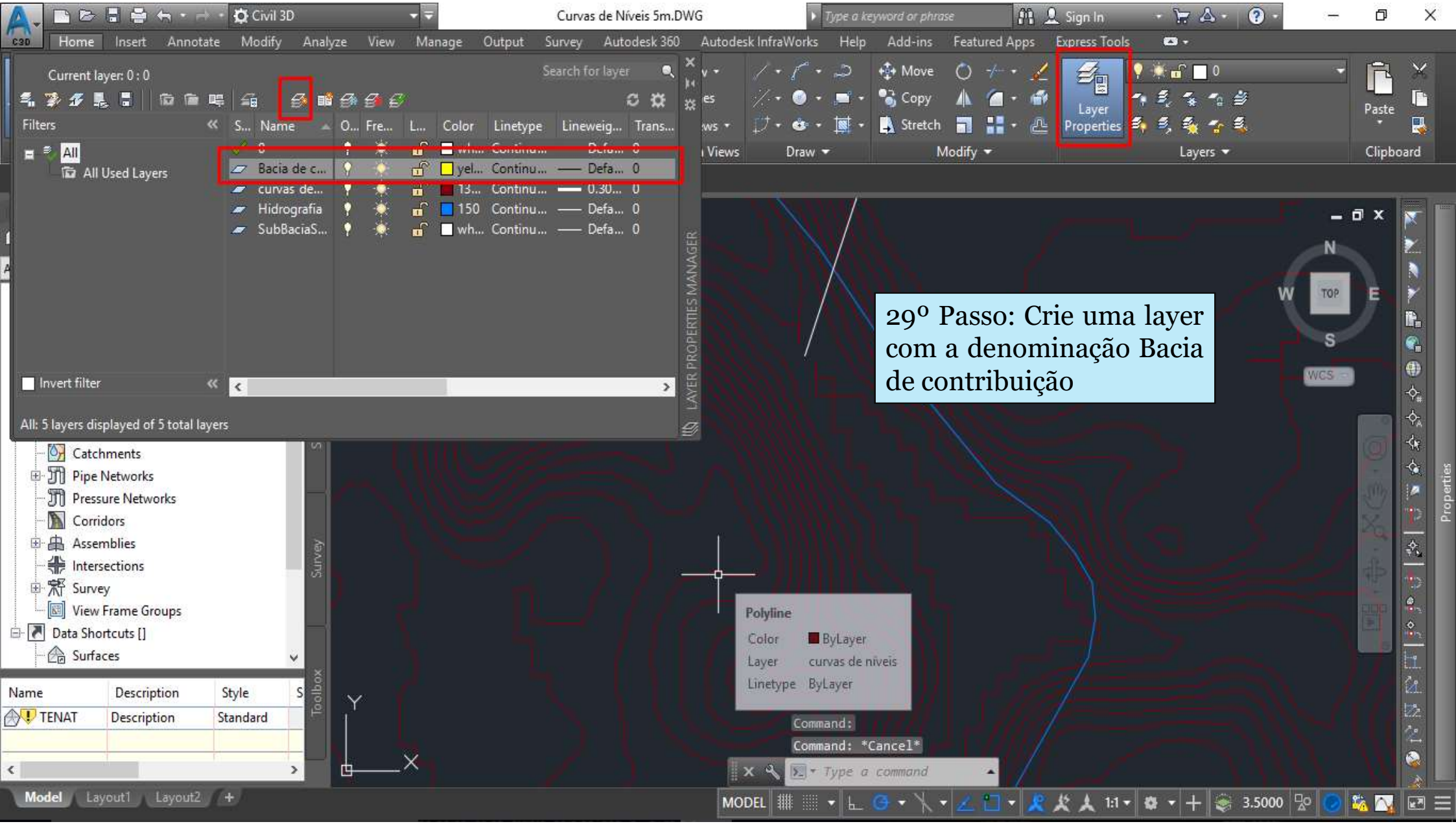
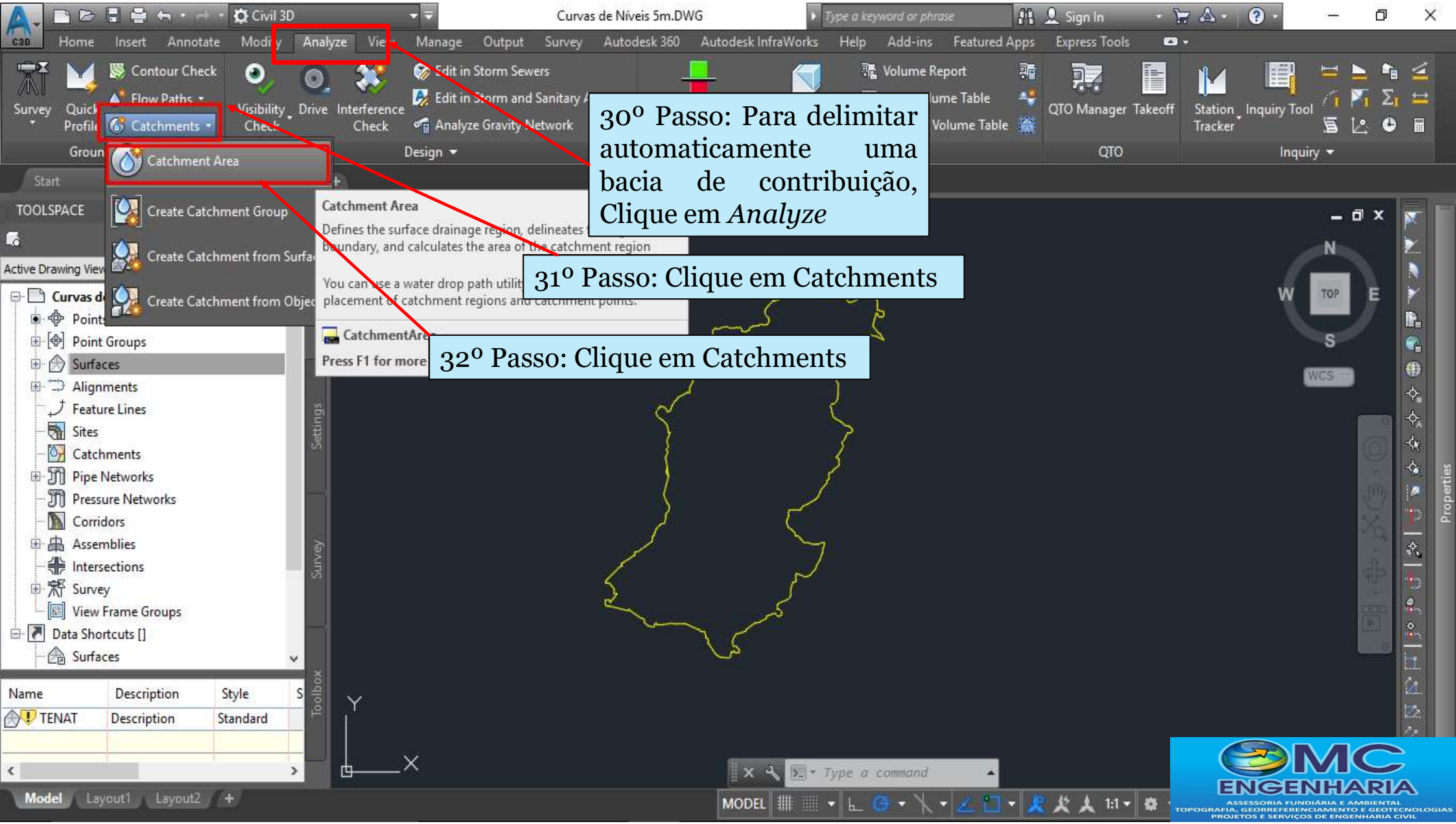

Curvas de Níveis 5m.DWG
Import - C:\..\HIDROGRAFIA_F22S.shp
Current drawing coordinate system
No coordinate system assigned to current drawing.
Coordinate conversion will not be performed.
Spatial filter
None
Current display
Define window
Driver options
Driver Options...
Changing these options may affect the layout of the import properties table.
Import properties for each layer imported:
Input Layer
Drawing Layer
Object Class
Input Coordinate System
Data
HIDROGRAFIA
HIDROGRAFIA_F2
<None>
SAD69.UTM-22S
<None>
Saved profiles
Load...
Save...
Current profile:
Import polygons as closed polylines
Use class defaults for out of range valu
OK
Cancel
Help
27º Passo: Clique em Ok.
_mapimport
Model
Layout1
Layout2
MODEL


Planning and Analysis
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Feature Edit
Create
Analyze
View
Tools
Output
Map Setup
Autodesk 360
Add-ins
Featured Apps
Express Tools
Insert
Create
Block Editor
Block
Define Attributes
Edit Attribute
Manage
Synchronize
Retain Attribute Display
AutoCAD Attributes
Attach
Clip
Adjust
Underlay Layers
Frames vary
Snap to Underlays ON
Reference
Autodesk ReCap
Attach
AutoCAD Point Cloud
Image
Map Import
FDO Import
Import
Field
AutoCAD Data
Data Link
Linking and Extraction
Start
Curvas de Níveis 5m*
[−][Top][2D Wireframe]
N
W
TOP
E
S
WCS
OBS: Verifique que as hidrográfias foram importadas
28º Passo: Retorne para o Civil 3d
Civil 3D
Drafting & Annotation
3D Modeling
Planning and Analysis
Save Current As...
Workspace Settings...
Customize...
Display Workspace Label
Y
X
Type a command
Model
Layout1
Layout2
MODEL
1:1
3.5000


Drafting & Annotation
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Parametric
View
Manage
Output
Autodesk 360
Add-ins
Featured Apps
Express Tools
Line
Polyline
Circle
Arc
Move
Copy
Layer Properties
Text
Dimension
Insert
Match Properties
ByLayer
Group
Measure
Paste
Draw
Modify
Layers
Annotation
Block
Properties
Groups
Utilities
Clipboard
Start
Curvas de Níveis 5m*
[−][Top][2D Wireframe]
OBS: Importe o polígono da bacia hidrográfica para melhorar a visualização no espaço
N
W
TOP
E
S
WCS
Y
X
Type a command
Model
Layout1
Layout2
MODEL
1:1
3.5000


Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Current layer: 0 : 0
Search for layer
Filters
All
All Used Layers
Name
Color
Linetype
Lineweig...
Trans...
Bacia de c...
curvas de...
Hidrografia
SubBaciaS...
Invert filter
All: 5 layers displayed of 5 total layers
LAYER PROPERTIES MANAGER
Move
Copy
Stretch
Draw
Modify
Layer Properties
Layers
Paste
Clipboard
29º Passo: Crie uma layer com a denominação Bacia de contribuição
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Name
Description
Style
TENAT
Description
Standard
Survey
Toolbox
Polyline
Color ByLayer
Layer curvas de níveis
Linetype ByLayer
Command:
Command: *Cancel*
Type a command
Model
Layout1
Layout2
MODEL
1:1
3.5000
Properties


Curvas de Níveis 5m.DWG
Civil 3D
Analyze
Contour Check
Flow Paths
Catchments
Visibility Check
Drive
Interference Check
Edit in Storm Sewers
Edit in Storm and Sanitary A
Analyze Gravity Network
Volume Report
Volume Table
QTO Manager
Takeoff
Station Tracker
Inquiry Tool
Design
QTO
Inquiry
Catchment Area
Create Catchment Group
Create Catchment from Surfa
Create Catchment from Objec
Catchment Area
Defines the surface drainage region, delineates
boundary, and calculates the area of the catchment region
You can use a water drop path utilit
placement of catchment regions and catchment points.
CatchmentAre
Press F1 for more
30º Passo: Para delimitar automaticamente uma bacia de contribuição, Clique em Analyze
31º Passo: Clique em Catchments
32º Passo: Clique em Catchments
TOOLSPACE
Curvas d
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Name
Description
Style
TENAT
Description
Standard
Model
Layout1
Layout2
MODEL
Type a command
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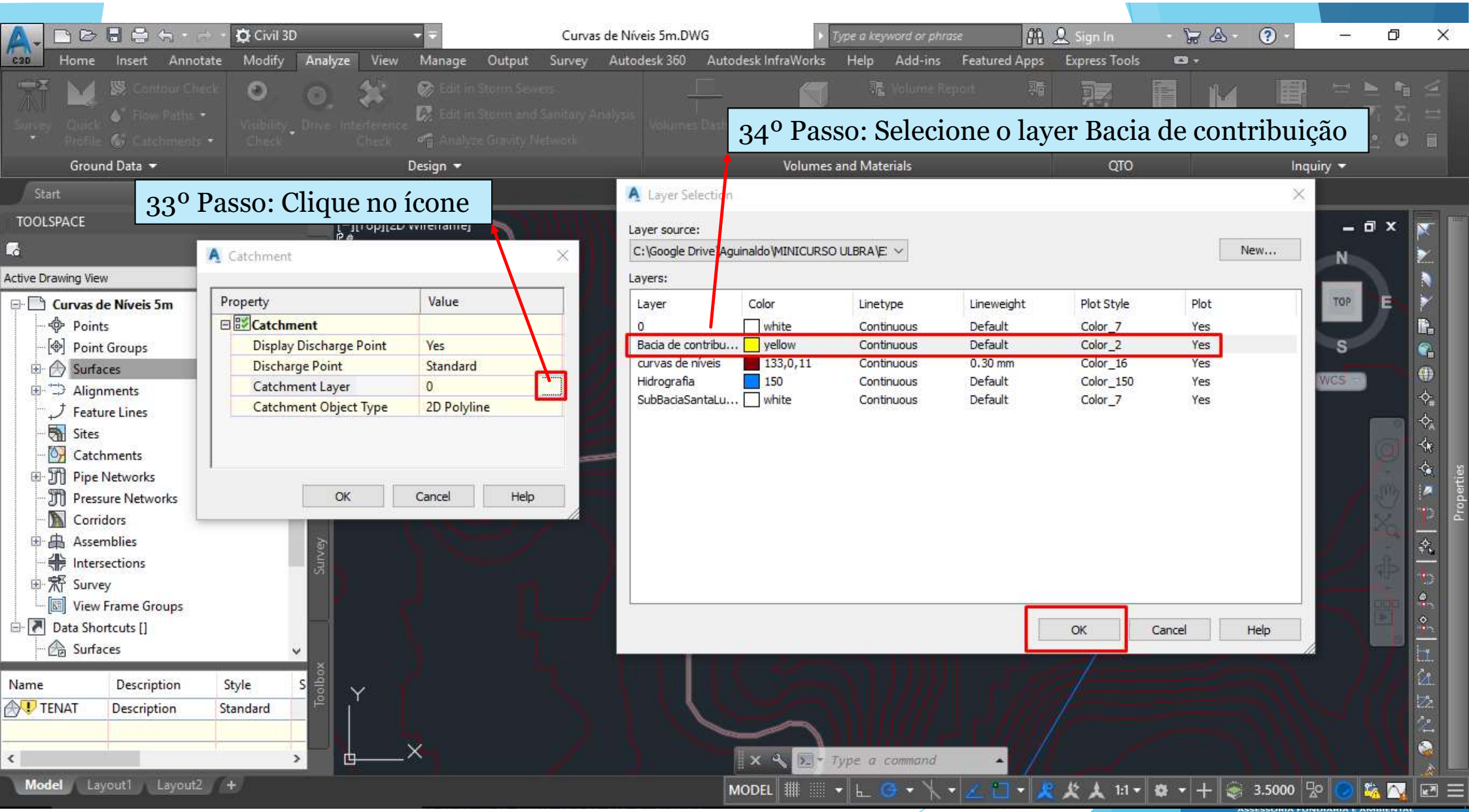
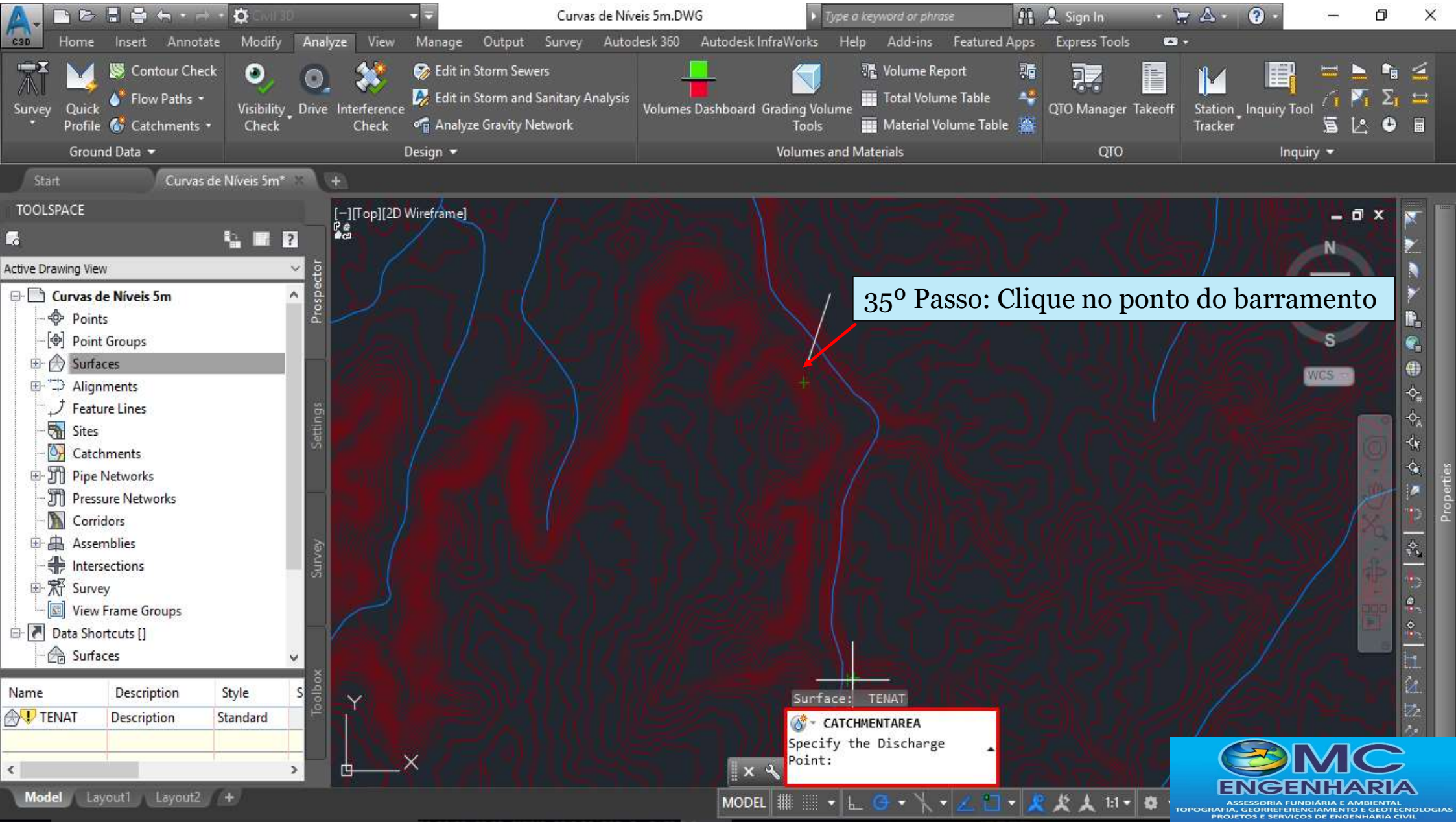

Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home Insert Annotate Modify Analyze View Manage Output Survey Autodesk 360 Autodesk InfraWorks Help Add-ins Featured Apps Express Tools
Ground Data
Design
Volumes and Materials
QTO
Inquiry
34º Passo: Selecione o layer Bacia de contribuição
33º Passo: Clique no ícone
Start
TOOLSPACE
Active Drawing View
Curvas de Níveis 5m
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Catchment
Property
Value
Catchment
Display Discharge Point
Yes
Discharge Point
Standard
Catchment Layer
0
Catchment Object Type
2D Polyline
OK
Cancel
Help
Layer Selection
Layer source:
C:\Google Drive\Aguinaldo\MINICURSO ULBRA\E:
New...
Layers:
Layer
Color
Linetype
Lineweight
Plot Style
Plot
0
white
Continuous
Default
Color_7
Yes
Bacia de contribu...
yellow
Continuous
Default
Color_2
Yes
curvas de níveis
133,0,11
Continuous
0.30 mm
Color_16
Yes
Hidrografia
150
Continuous
Default
Color_150
Yes
SubBaciaSantaLu...
white
Continuous
Default
Color_7
Yes
OK
Cancel
Help
Name
Description
Style
TENAT
Description
Standard
Survey
Toolbox
Properties
Type a command
Model
Layout1
Layout2
MODEL
1:1
3.5000


Curvas de Níveis 5m.DWG
Home Insert Annotate Modify Analyze View Manage Output Survey Autodesk 360 Autodesk InfraWorks Help Add-ins Featured Apps Express Tools
Survey
Quick Profile
Contour Check
Flow Paths
Catchments
Visibility Check
Drive
Interference Check
Edit in Storm Sewers
Edit in Storm and Sanitary Analysis
Analyze Gravity Network
Volumes Dashboard
Grading Volume Tools
Volume Report
Total Volume Table
Material Volume Table
QTO Manager
Takeoff
Station Tracker
Inquiry Tool
Ground Data
Design
Volumes and Materials
QTO
Inquiry
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Curvas de Níveis 5m
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Prospector
Settings
Survey
Toolbox
Name Description Style
TENAT Description Standard
[−][Top][2D Wireframe]
35º Passo: Clique no ponto do barramento
N
S
WCS
Surface: TENAT
CATCHMENTAREA
Specify the Discharge Point:
Properties
Model Layout1 Layout2
MODEL
1:1
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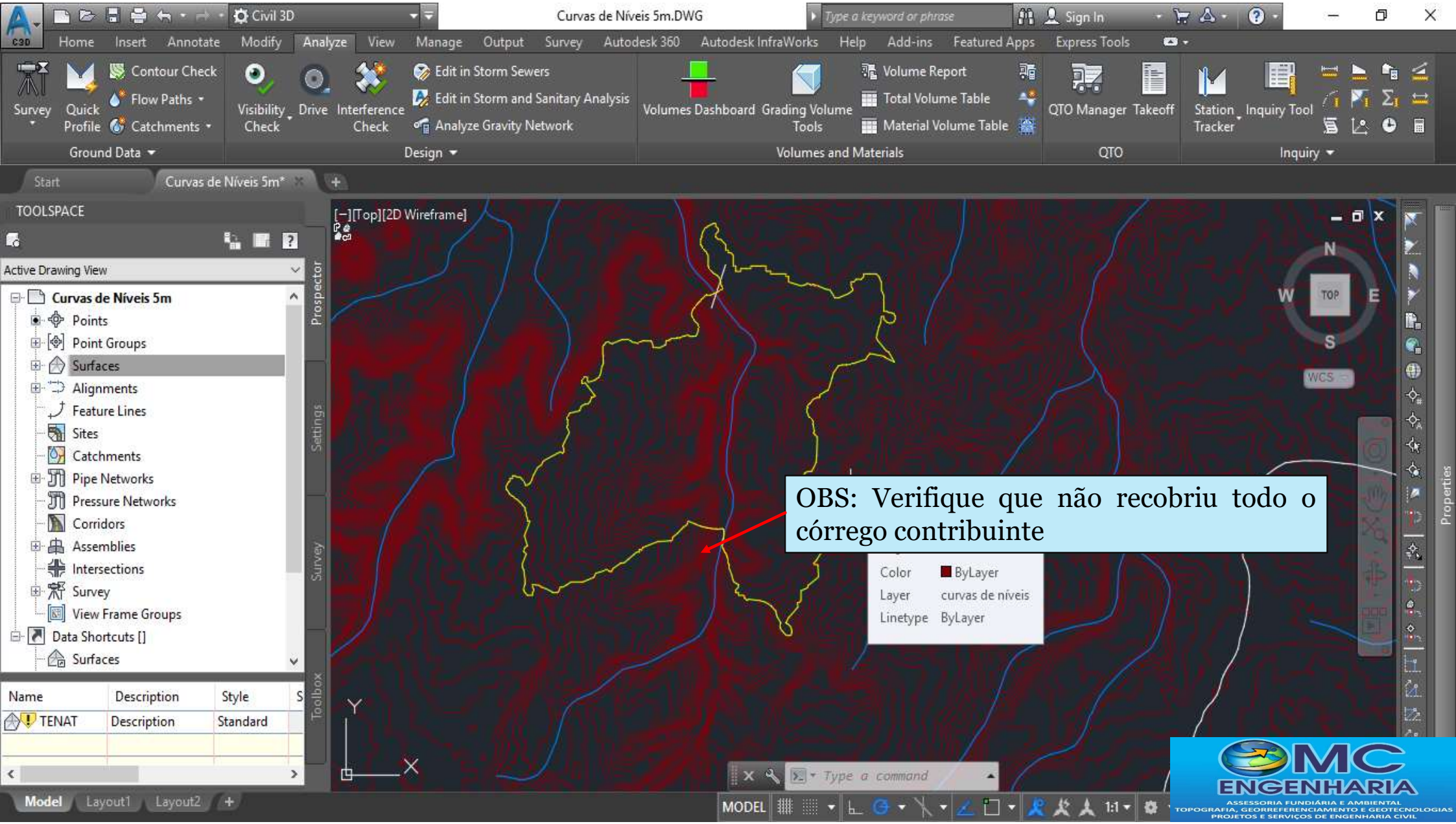

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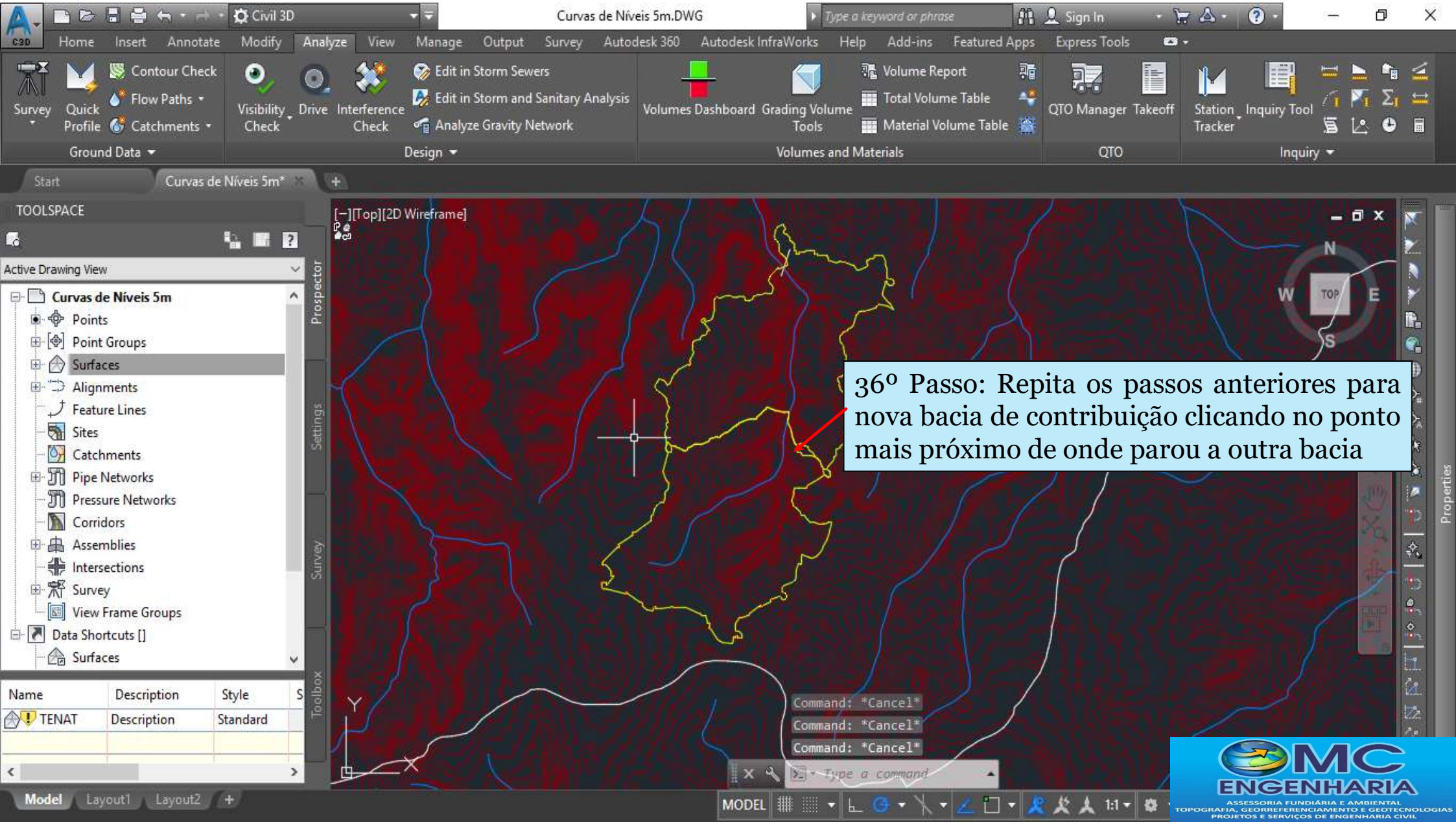
Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home Insert Annotate Modify Analyze View Manage Output Survey Autodesk 360 Autodesk InfraWorks Help Add-ins Featured Apps Express Tools
Survey
Quick Profile
Contour Check
Flow Paths
Catchments
Ground Data
Visibility Check
Drive
Interference Check
Edit in Storm Sewers
Edit in Storm and Sanitary Analysis
Analyze Gravity Network
Design
Volumes Dashboard
Grading Volume Tools
Volume Report
Total Volume Table
Material Volume Table
Volumes and Materials
QTO Manager
Takeoff
QTO
Station Tracker
Inquiry Tool
Inquiry
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Curvas de Níveis 5m
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Prospector
Settings
Survey
Toolbox
Name
Description
Style
TENAT
Description
Standard
[−][Top][2D Wireframe]
N
W
TOP
E
S
36º Passo: Repita os passos anteriores para nova bacia de contribuição clicando no ponto mais próximo de onde parou a outra bacia
Command: *Cancel*
Command: *Cancel*
Command: *Cancel*
Type a command
Properties
Model
Layout1
Layout2
MODEL
1:1
OMC ENGENHARIA
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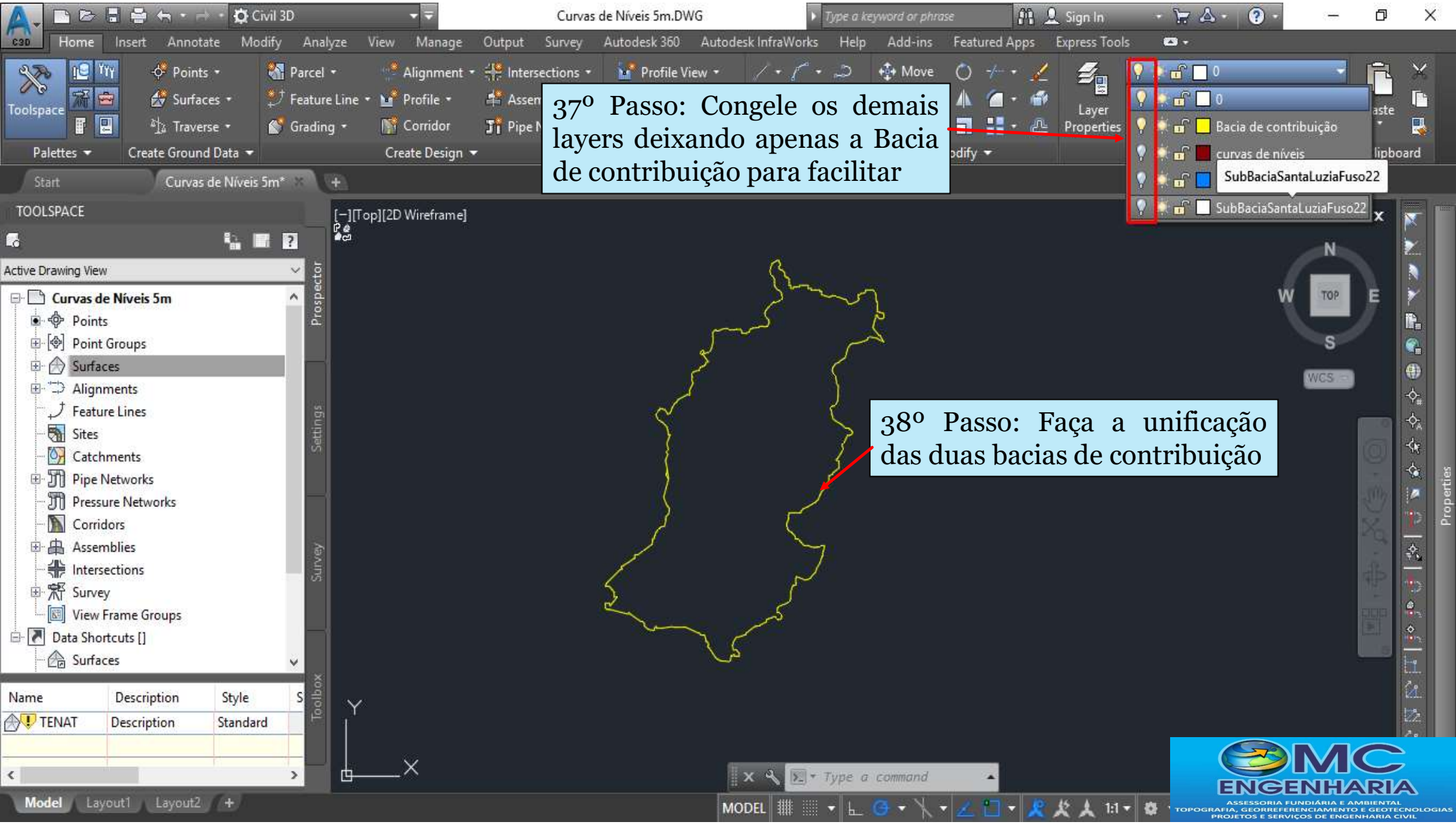
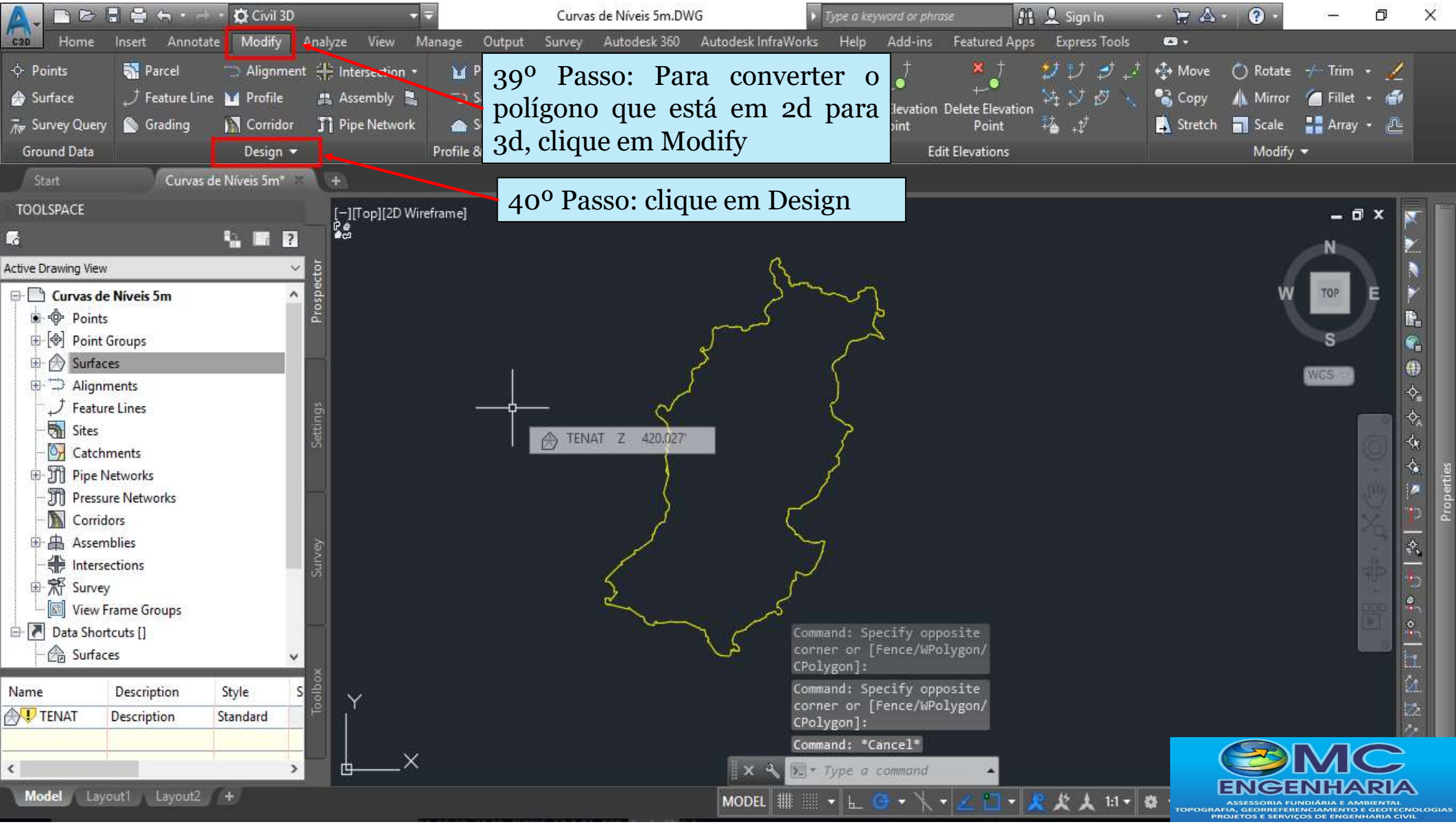
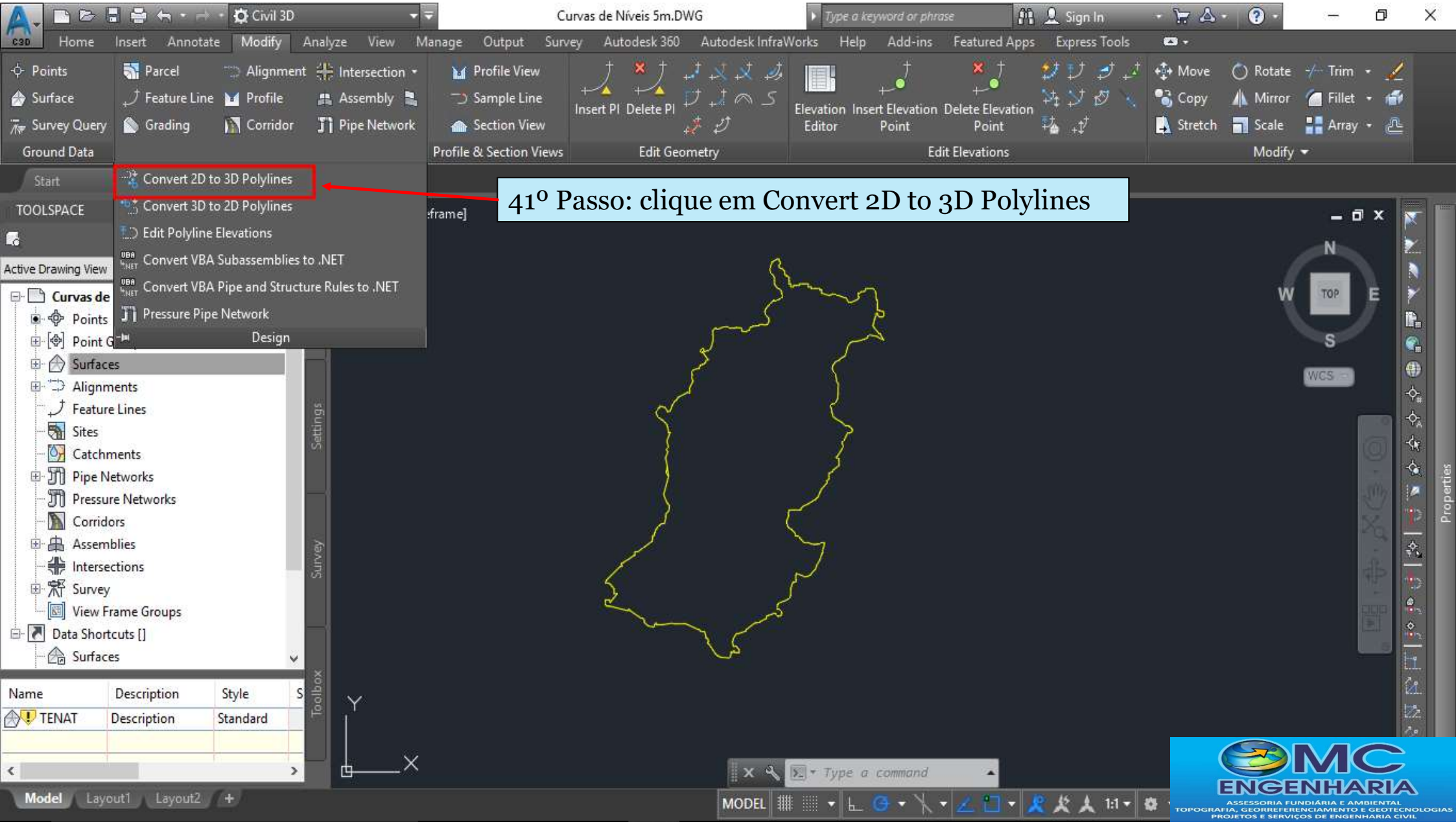

Curvas de Níveis 5m.DWG
Civil 3D
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Toolspace
Points
Surfaces
Traverse
Parcel
Feature Line
Grading
Alignment
Profile
Corridor
Intersections
Profile View
Move
Layer Properties
Palettes
Create Ground Data
Create Design
37º Passo: Congele os demais layers deixando apenas a Bacia de contribuição para facilitar
0
Bacia de contribuição
curvas de níveis
SubBaciaSantaLuziaFuso22
SubBaciaSantaLuziaFuso22
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Curvas de Níveis 5m
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Prospector
Settings
Survey
Toolbox
Name
Description
Style
TENAT
Description
Standard
[−][Top][2D Wireframe]
N
W
TOP
E
S
WCS
38º Passo: Faça a unificação das duas bacias de contribuição
Y
X
Properties
Type a command
Model
Layout1
Layout2
MODEL
1:1
OMC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL


39º Passo: Para converter o polígono que está em 2d para 3d, clique em Modify
40º Passo: clique em Design
Civil 3D
Curvas de Níveis 5m.DWG
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Points
Surface
Survey Query
Ground Data
Parcel
Feature Line
Grading
Alignment
Profile
Corridor
Intersection
Assembly
Pipe Network
Design
Delete Elevation Point
Edit Elevations
Move
Copy
Stretch
Rotate
Mirror
Scale
Trim
Fillet
Array
Modify
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Curvas de Níveis 5m
Points
Point Groups
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Prospector
Settings
Survey
Toolbox
Name
Description
Style
TENAT
Description
Standard
[−][Top][2D Wireframe]
TENAT Z 420.027'
N
W
TOP
E
S
WCS
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
Command: Specify opposite corner or [Fence/WPolygon/CPolygon]:
Command: *Cancel*
Type a command
Properties
Model
Layout1
Layout2
MODEL
1:1
OMC ENGENHARIA
ASSESSORIA FUNDIÁRIA E AMBIENTAL
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL


Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
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Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
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Intersection
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Profile View
Sample Line
Section View
Profile & Section Views
Insert PI
Delete PI
Edit Geometry
Elevation Editor
Insert Elevation Point
Delete Elevation Point
Edit Elevations
Move
Copy
Stretch
Rotate
Mirror
Scale
Trim
Fillet
Array
Modify
Convert 2D to 3D Polylines
Convert 3D to 2D Polylines
Edit Polyline Elevations
Convert VBA Subassemblies to .NET
Convert VBA Pipe and Structure Rules to .NET
Pressure Pipe Network
Design
41º Passo: clique em Convert 2D to 3D Polylines
TOOLSPACE
Active Drawing View
Curvas de
Points
Point G
Surfaces
Alignments
Feature Lines
Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Name
Description
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TENAT
Description
Standard
Settings
Survey
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Type a command
MODEL
Model
Layout1
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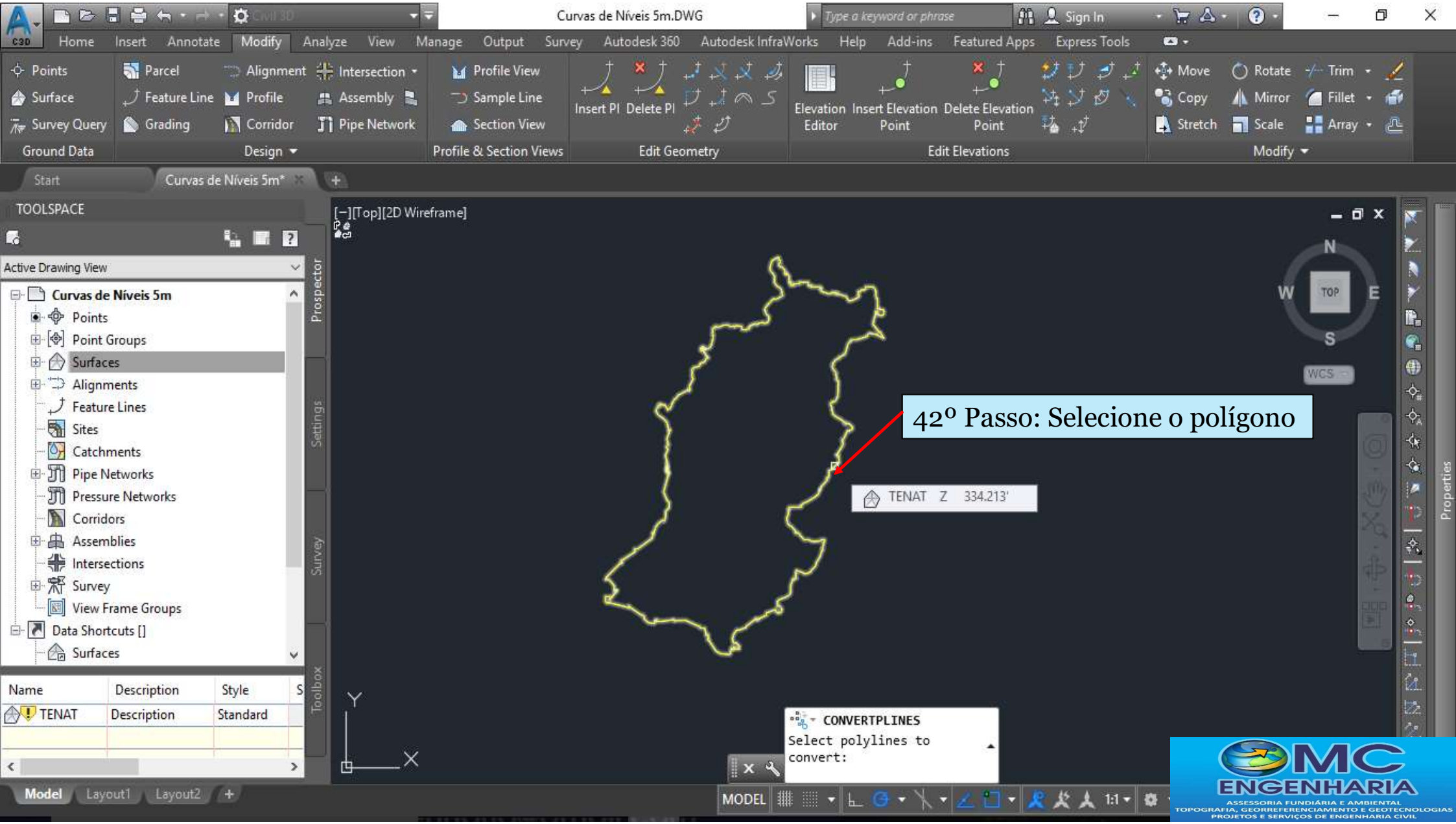
Curvas de Níveis 5m.DWG
Home Insert Annotate Modify Analyze View Manage Output Survey Autodesk 360 Autodesk InfraWorks Help Add-ins Featured Apps Express Tools
Points Surface Survey Query Ground Data
Parcel Feature Line Grading Alignment Profile Corridor Intersection Assembly Pipe Network Design
Profile View Sample Line Section View Profile & Section Views
Insert PI Delete PI Edit Geometry
Elevation Editor Insert Elevation Point Delete Elevation Point Edit Elevations
Move Copy Stretch Rotate Mirror Scale Trim Fillet Array Modify
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Curvas de Níveis 5m
Points
Point Groups
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Alignments
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Sites
Catchments
Pipe Networks
Pressure Networks
Corridors
Assemblies
Intersections
Survey
View Frame Groups
Data Shortcuts []
Surfaces
Prospector
Settings
Survey
Toolbox
Name Description Style
TENAT Description Standard
[−][Top][2D Wireframe]
N W TOP E S
WCS
42º Passo: Selecione o polígono
TENAT Z 334.213'
CONVERTPLINES
Select polylines to convert:
Properties
Model Layout1 Layout2
MODEL
1:1
OMC ENGENHARIA
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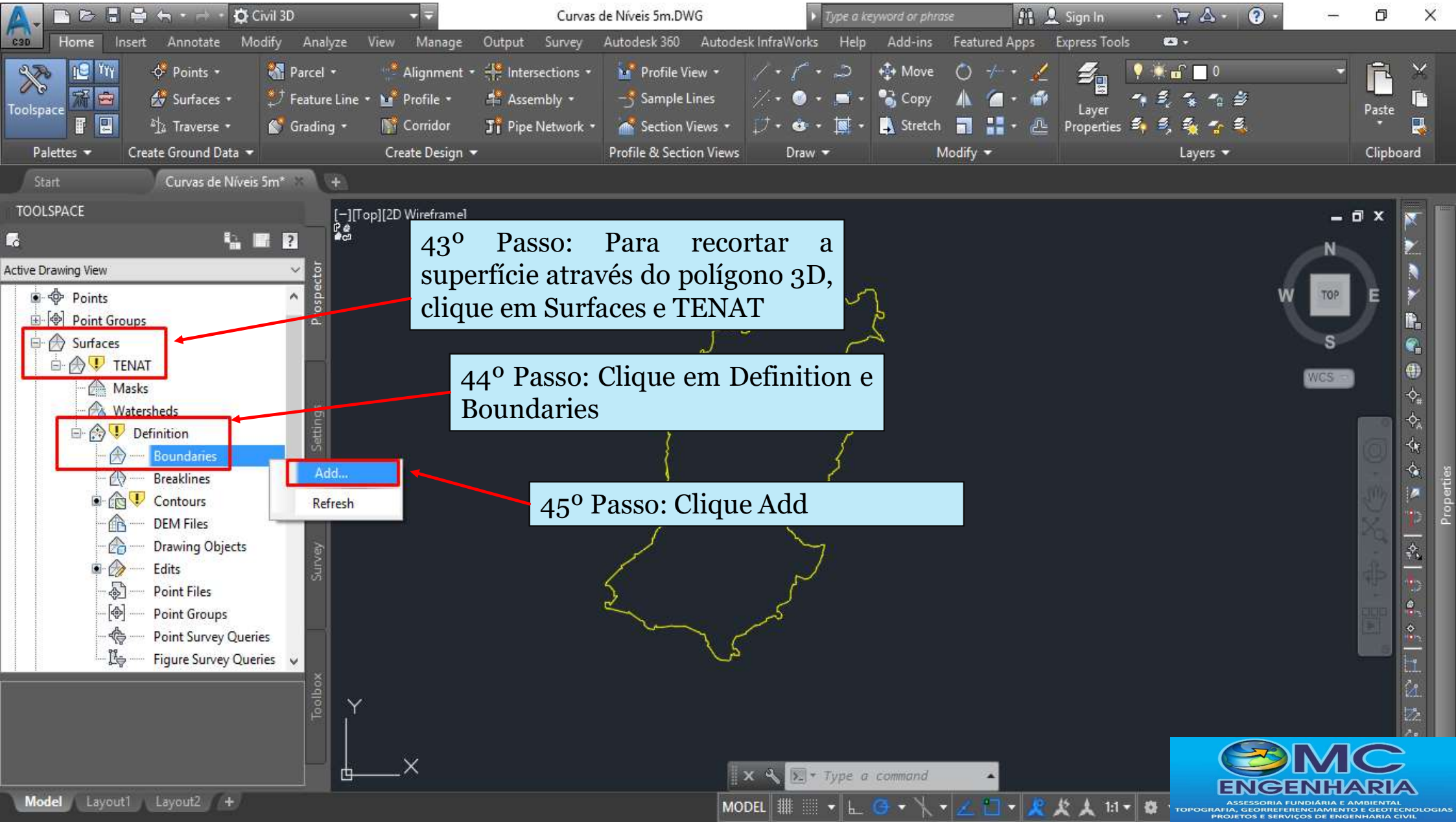
Curvas de Níveis 5m.DWG
Civil 3D
Home
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Annotate
Modify
Analyze
View
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Output
Survey
Autodesk 360
Autodesk InfraWorks
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Move
Copy
Stretch
Layer Properties
Paste
Palettes
Create Ground Data
Create Design
Profile & Section Views
Draw
Modify
Layers
Clipboard
Start
Curvas de Níveis 5m*
TOOLSPACE
[−][Top][2D Wireframe]
Active Drawing View
Points
Point Groups
Surfaces
TENAT
Masks
Watersheds
Definition
Boundaries
Breaklines
Contours
DEM Files
Drawing Objects
Edits
Point Files
Point Groups
Point Survey Queries
Figure Survey Queries
Add...
Refresh
Prospector
Settings
Survey
Toolbox
Properties
N
W
TOP
E
S
WCS
Type a command
MODEL
Model
Layout1
Layout2
43º Passo: Para recortar a superfície através do polígono 3D, clique em Surfaces e TENAT
44º Passo: Clique em Definition e Boundaries
45º Passo: Clique Add
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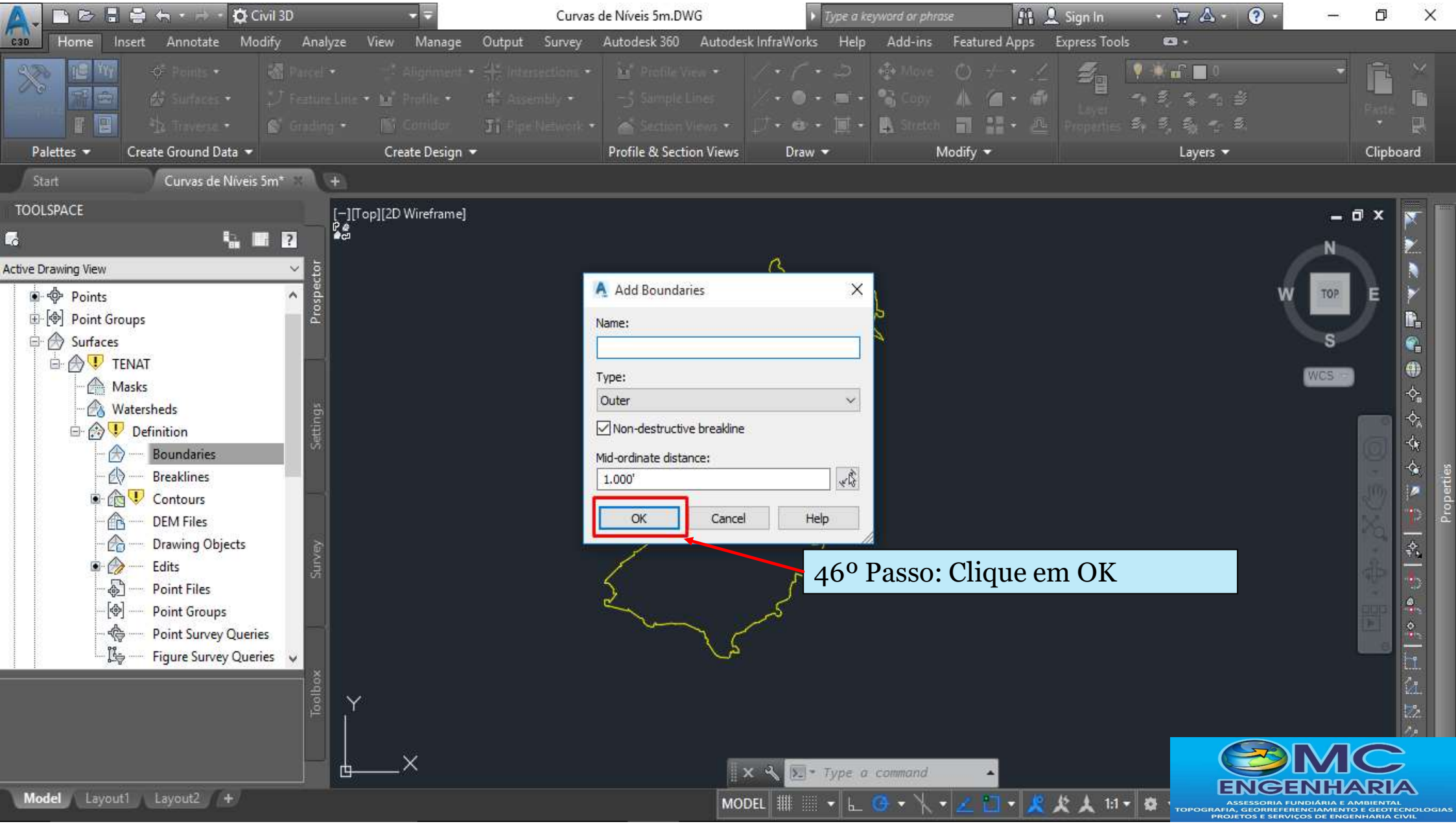
Curvas de Níveis 5m.DWG
Civil 3D
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
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Palettes
Create Ground Data
Create Design
Profile & Section Views
Draw
Modify
Layers
Clipboard
Start
Curvas de Níveis 5m*
TOOLSPACE
Active Drawing View
Points
Point Groups
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TENAT
Masks
Watersheds
Definition
Boundaries
Breaklines
Contours
DEM Files
Drawing Objects
Edits
Point Files
Point Groups
Point Survey Queries
Figure Survey Queries
Prospector
Settings
Survey
Toolbox
[−][Top][2D Wireframe]
Add Boundaries
Name:
Type:
Outer
Non-destructive breakline
Mid-ordinate distance:
1.000'
OK
Cancel
Help
46º Passo: Clique em OK
N
W
TOP
E
S
WCS
Properties
Type a command
MODEL
Model
Layout1
Layout2
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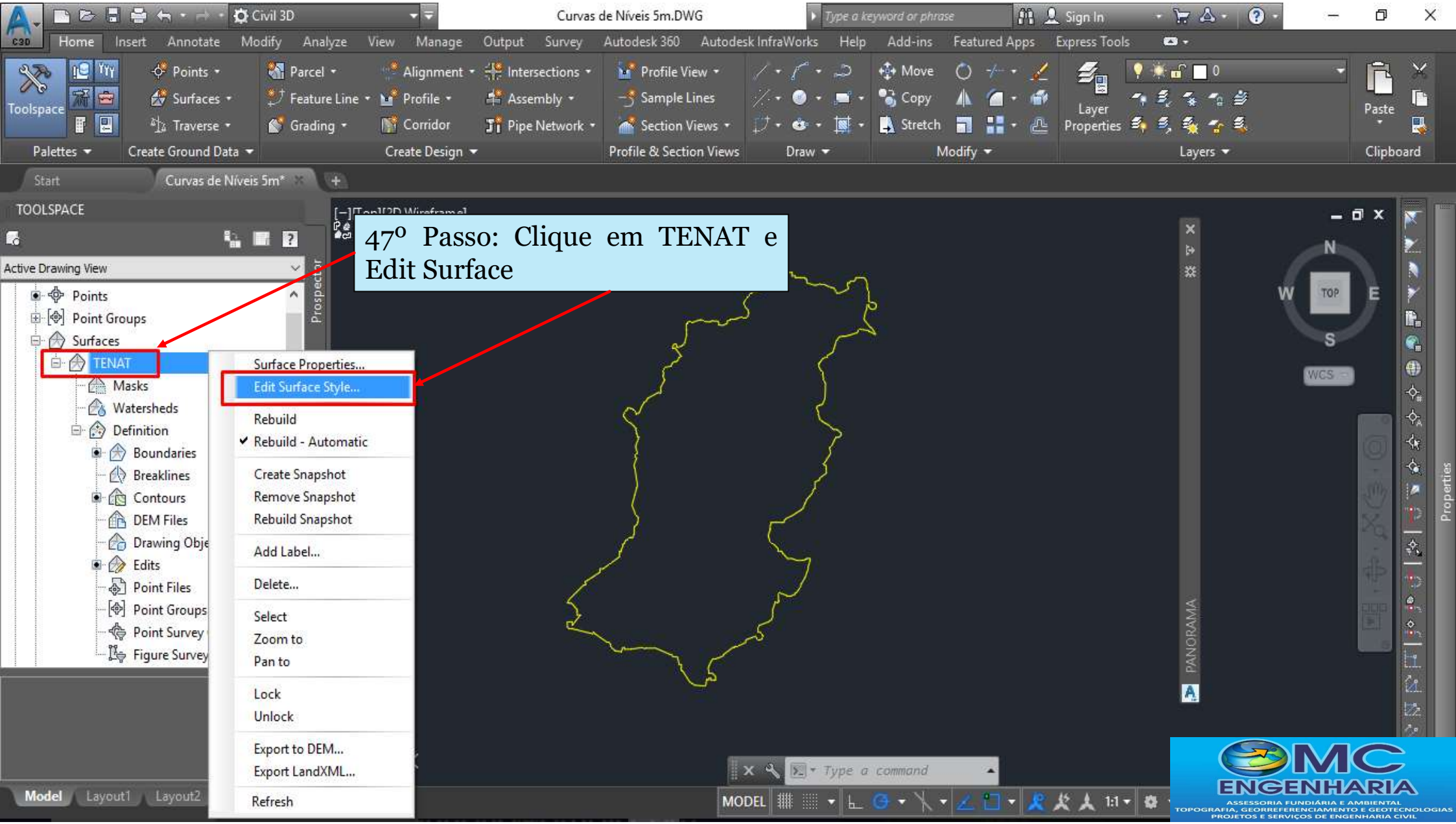
47º Passo: Clique em TENAT e Edit Surface
Curvas de Níveis 5m.DWG
Civil 3D
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Point Files
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Point Survey
Figure Survey
Surface Properties...
Edit Surface Style...
Rebuild
Rebuild - Automatic
Create Snapshot
Remove Snapshot
Rebuild Snapshot
Add Label...
Delete...
Select
Zoom to
Pan to
Lock
Unlock
Export to DEM...
Export LandXML...
Refresh
Prospector
Properties
PANORAMA
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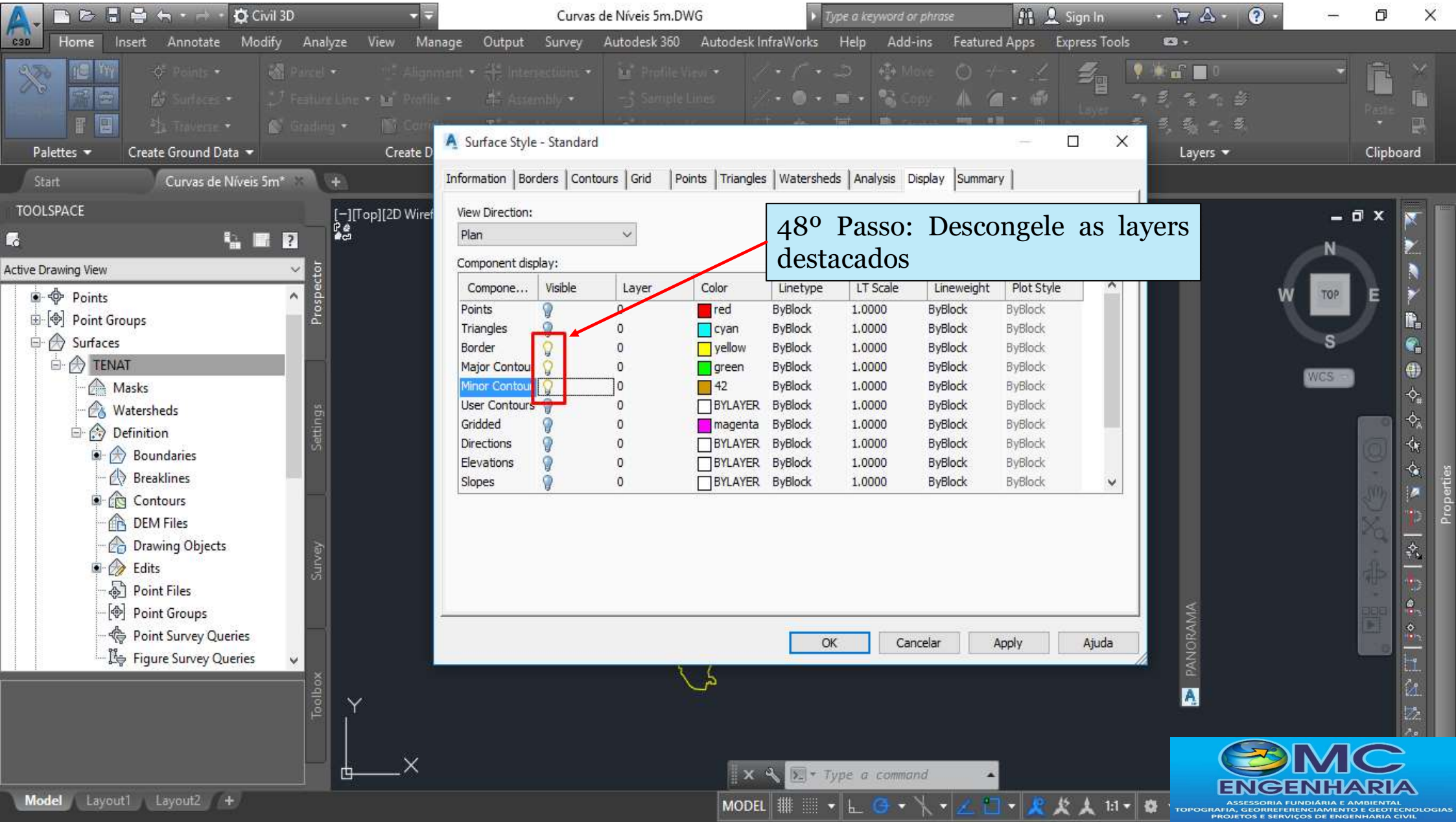
Curvas de Níveis 5m.DWG
Surface Style - Standard
Information
Borders
Contours
Grid
Points
Triangles
Watersheds
Analysis
Display
Summary
View Direction:
Plan
Component display:
Compone...
Visible
Layer
Color
Linetype
LT Scale
Lineweight
Plot Style
Points
Triangles
Border
Major Contou
Minor Contou
User Contours
Gridded
Directions
Elevations
Slopes
red
cyan
yellow
green
42
BYLAYER
magenta
ByBlock
1.0000
OK
Cancelar
Apply
Ajuda
48º Passo: Descongele as layers destacados
TOOLSPACE
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Contours
DEM Files
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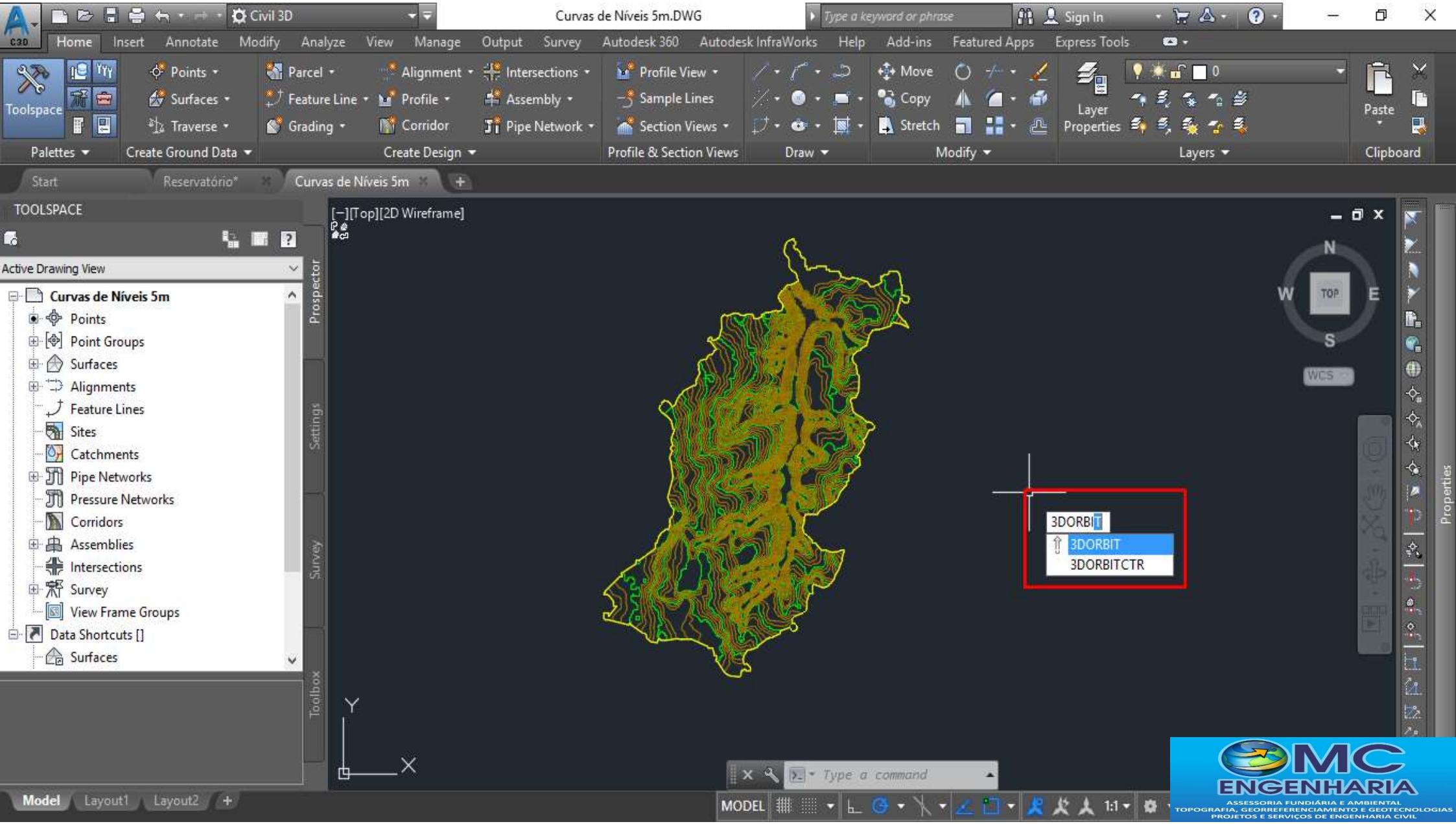
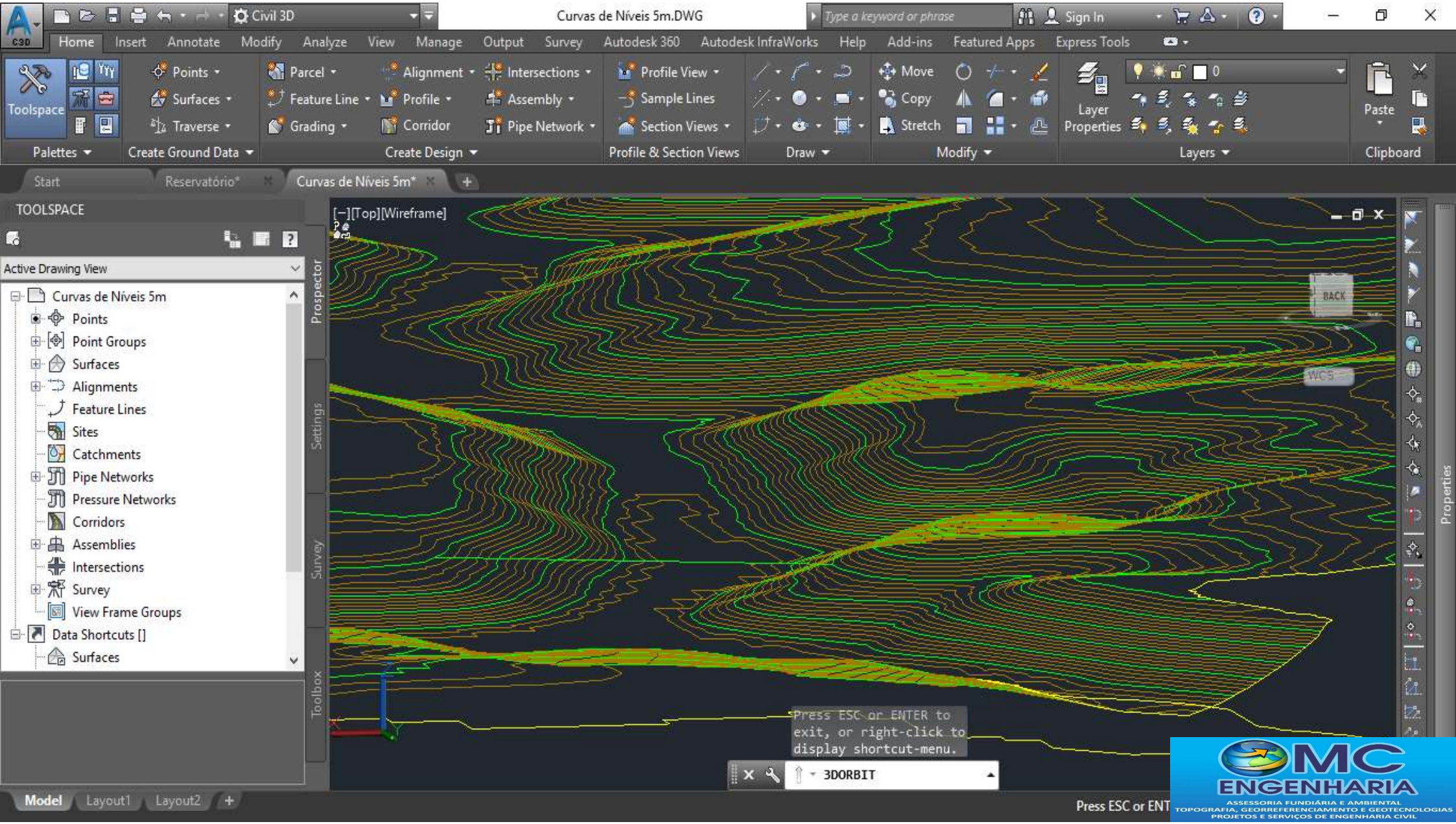
MODEL
Type a command




Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
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View Frame Groups
Data Shortcuts []
Surfaces
Prospector
Settings
Survey
Toolbox
[−][Top][Wireframe]
BACK
WCS
Press ESC or ENTER to exit, or right-click to display shortcut-menu.
3DORBIT
Properties
Model
Layout1
Layout2
Press ESC or ENT
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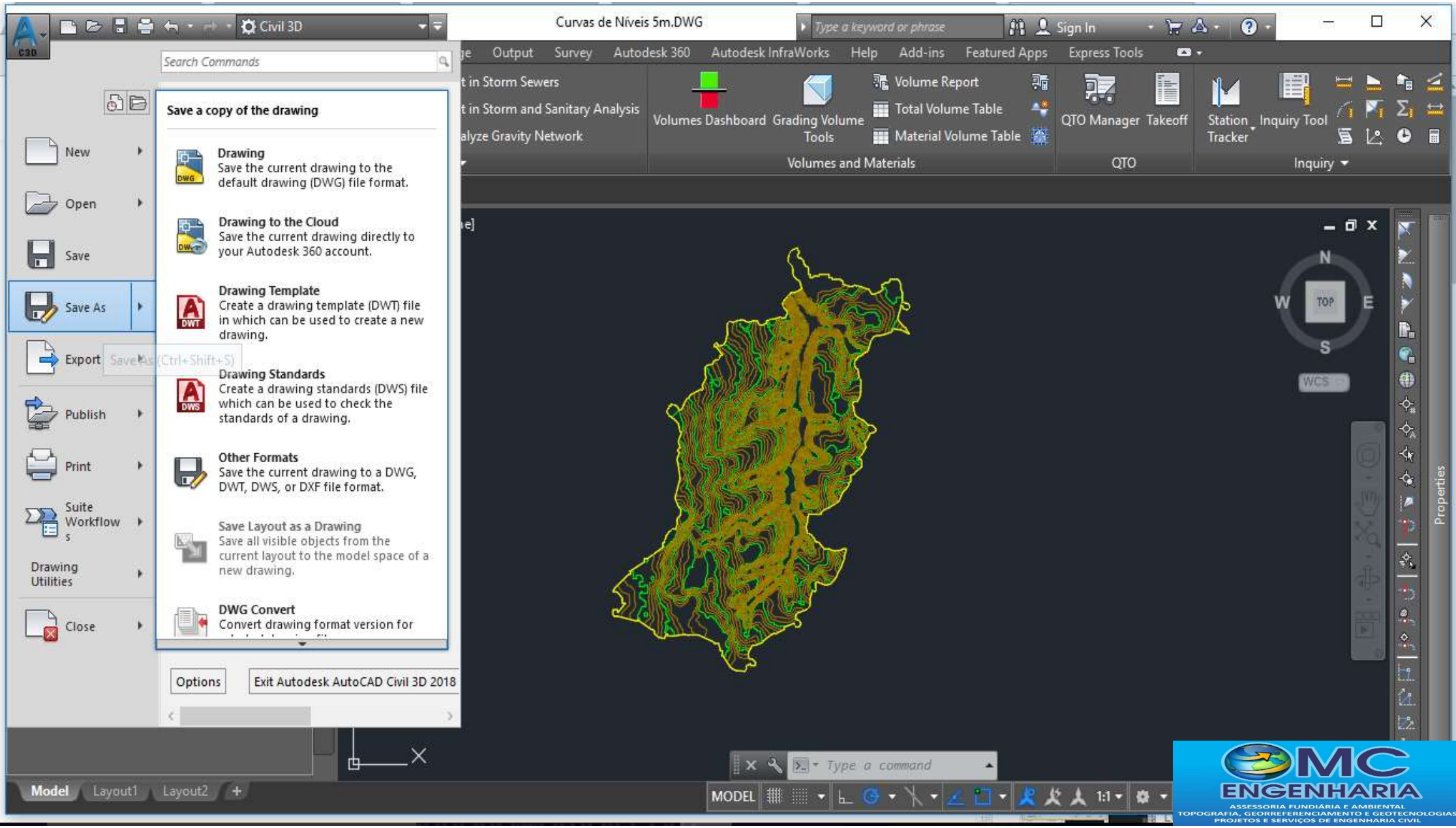

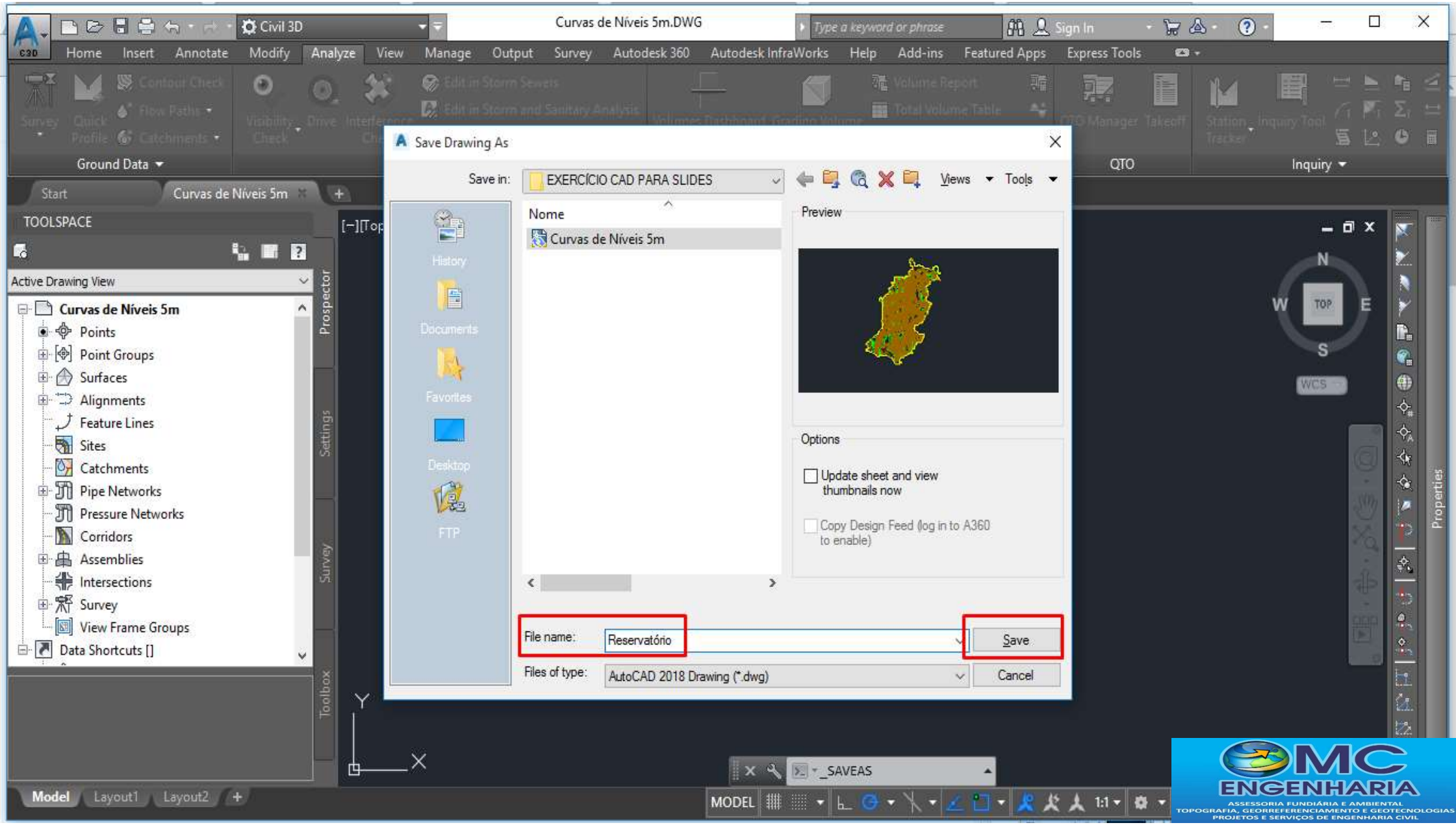
Civil 3D
Curvas de Níveis 5m.DWG
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Sign In
Home Insert Annotate Modify Analyze View Manage Output Survey Autodesk 360 Autodesk InfraWorks Help Add-ins Featured Apps Express Tools
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Curvas de Níveis 5m
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Save Drawing As
Save in: EXERCÍCIO CAD PARA SLIDES
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FTP
Nome
Curvas de Níveis 5m
Preview
Options
Update sheet and view thumbnails now
Copy Design Feed (log in to A360 to enable)
File name: Reservatório
Save
Files of type: AutoCAD 2018 Drawing (*.dwg)
Cancel
N
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Properties
_SAVEAS
MODEL
Model
Layout1
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OMC ENGENHARIA
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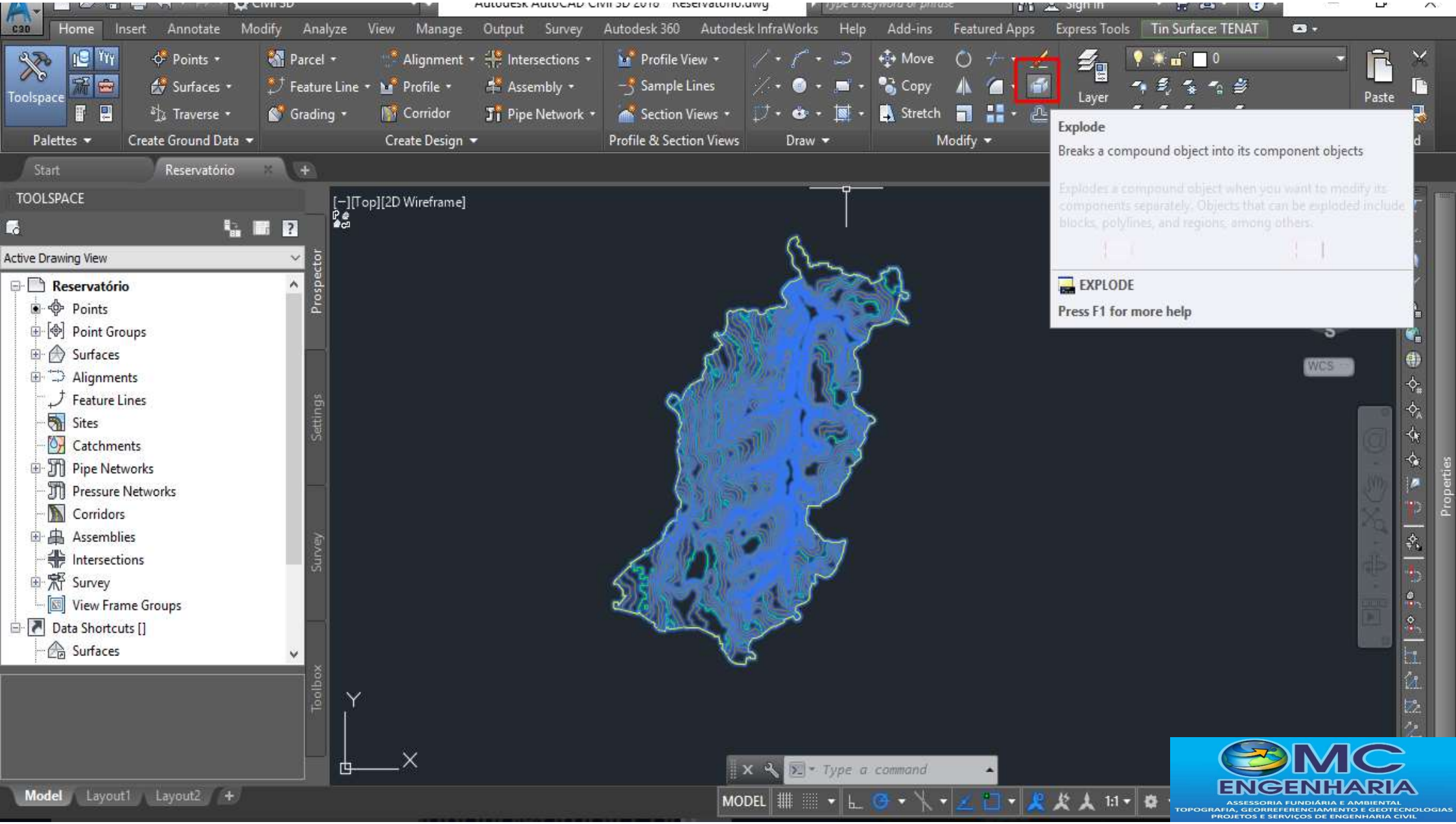
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Featured Apps
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Stretch
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Paste
Palettes
Create Ground Data
Create Design
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Draw
Modify
Explode
Breaks a compound object into its component objects
Explodes a compound object when you want to modify its components separately. Objects that can be exploded include blocks, polylines, and regions, among others.
EXPLODE
Press F1 for more help
Start
Reservatório
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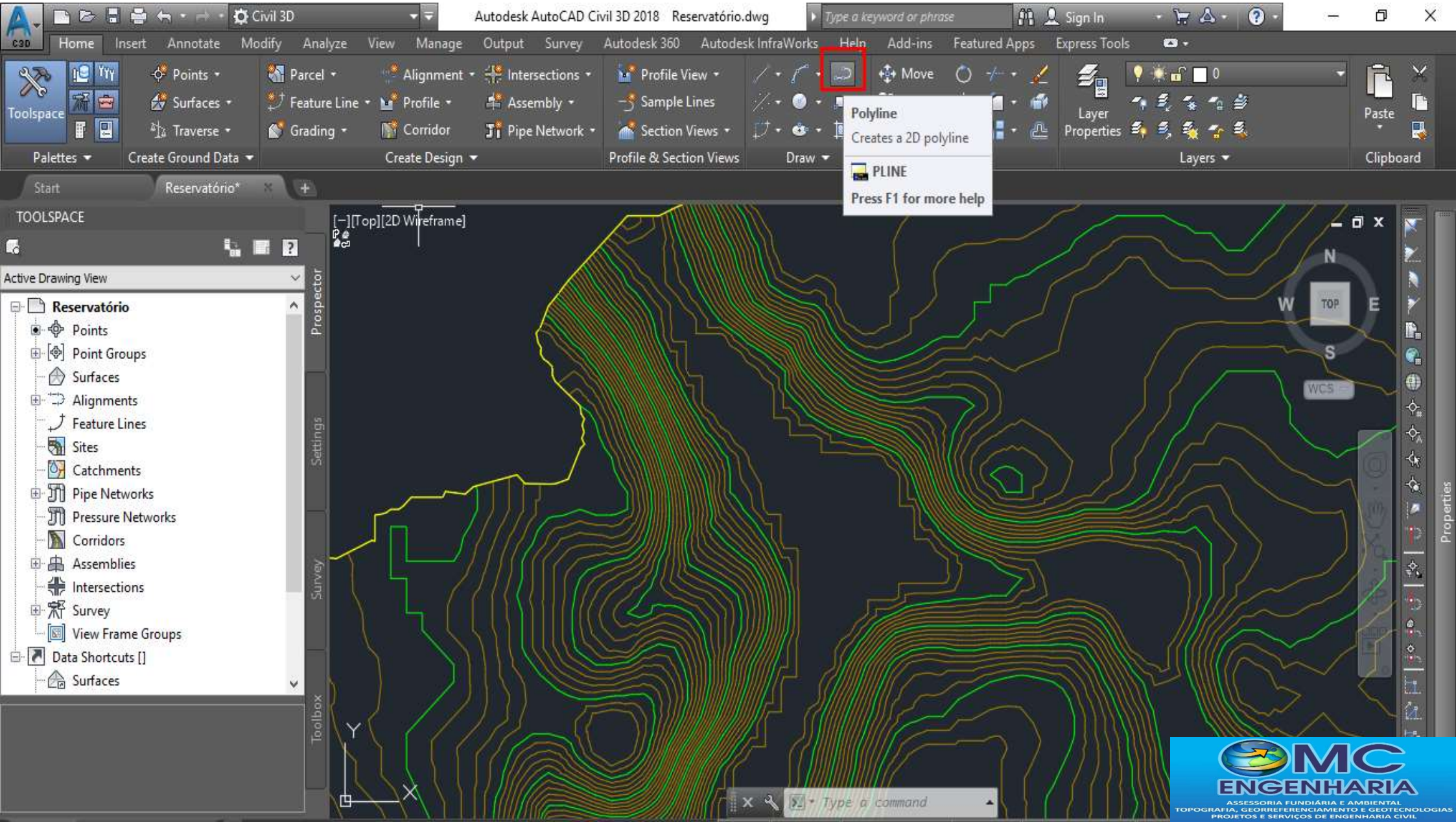
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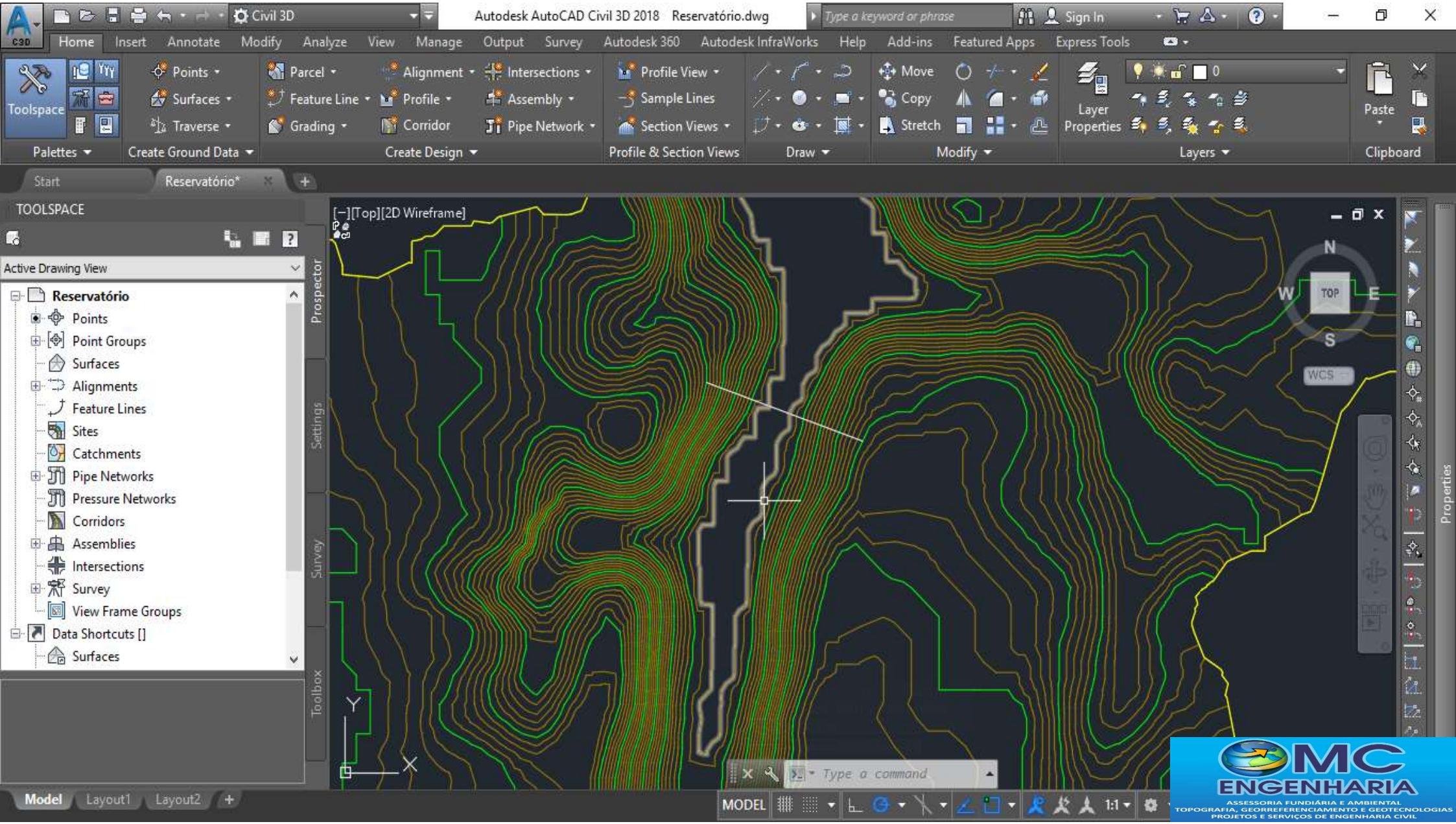
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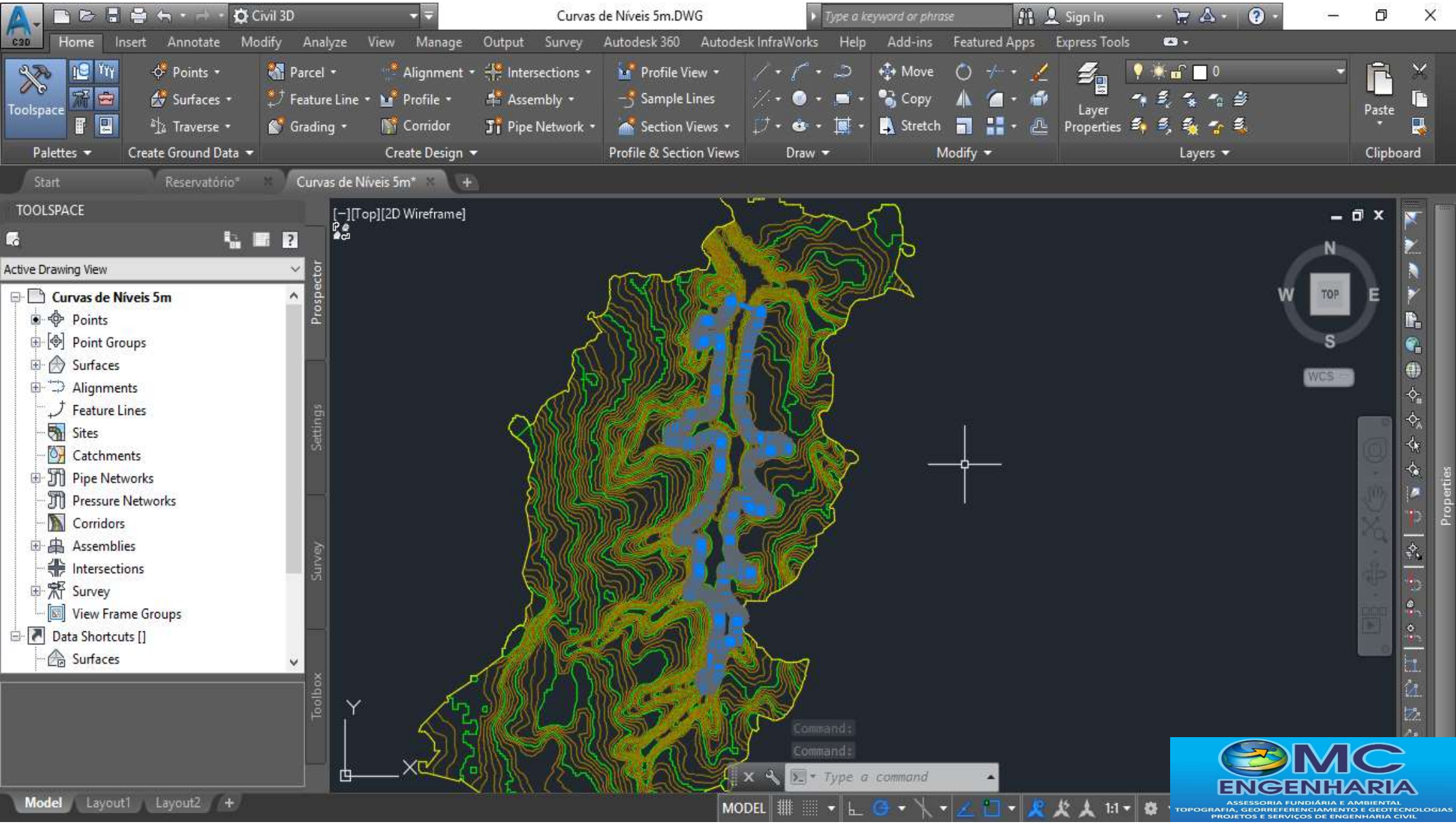

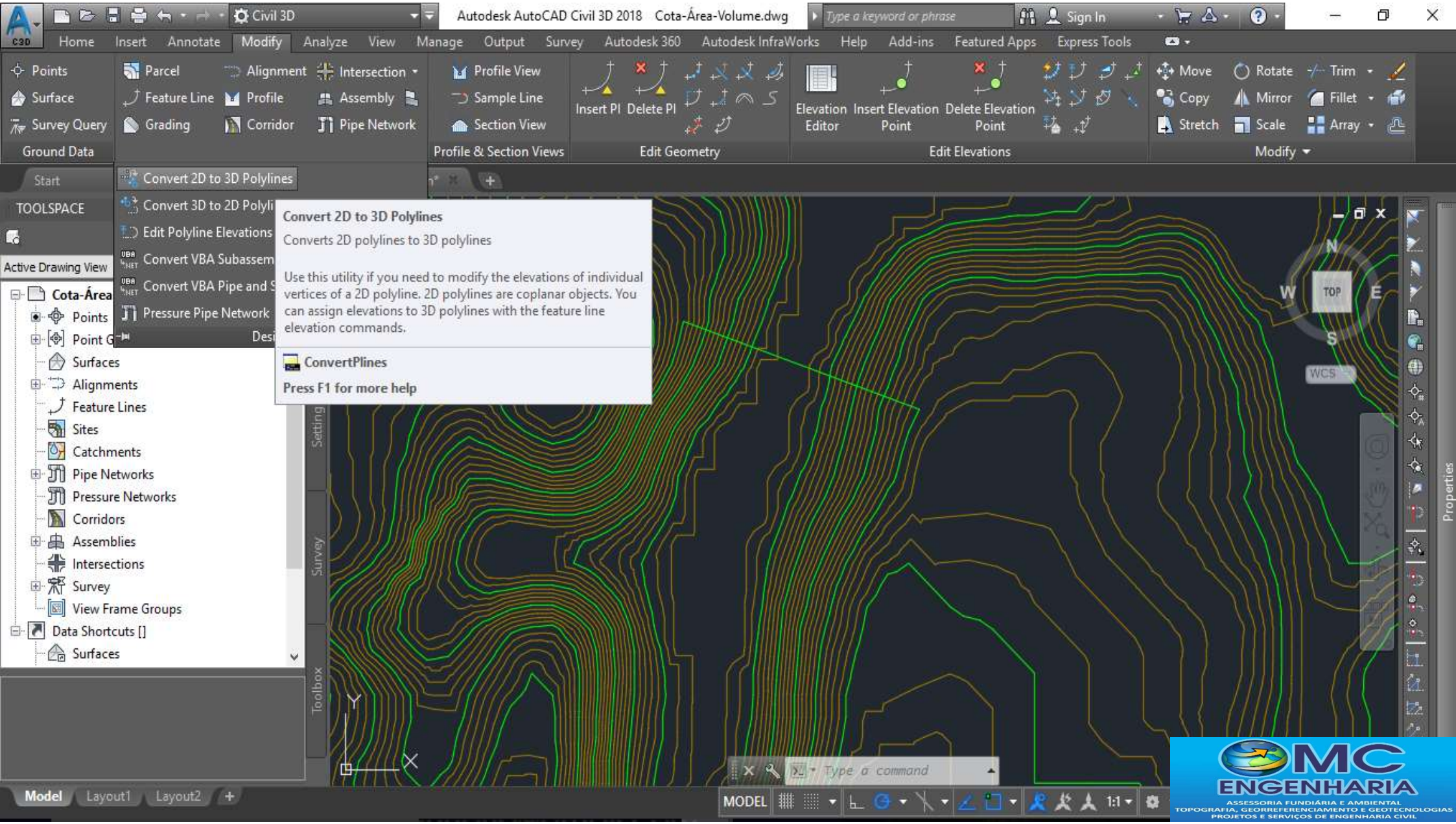

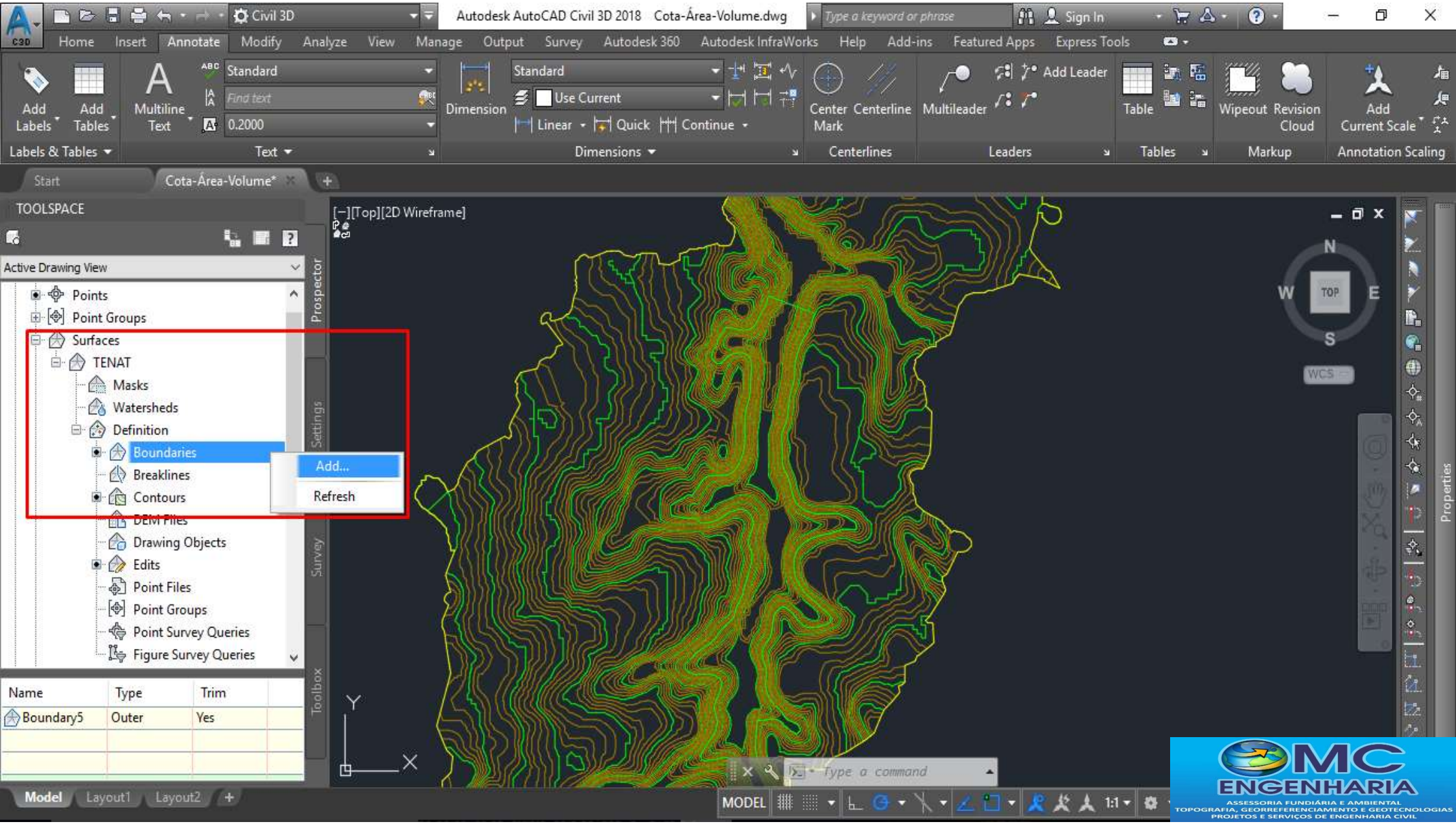
Civil 3D
Autodesk AutoCAD Civil 3D 2018 Cota-Área-Volume.dwg
Type a keyword or phrase
Sign In
Home Insert Annotate Modify Analyze View Manage Output Survey Autodesk 360 Autodesk InfraWorks Help Add-ins Featured Apps Express Tools
Add Labels
Add Tables
Multiline Text
Standard
Find text
0.2000
Dimension
Standard
Use Current
Linear Quick Continue
Center Mark
Centerline
Multileader
Add Leader
Table
Wipeout
Revision Cloud
Add Current Scale
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Figure Survey Queries
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Name Type Trim
Boundary5 Outer Yes
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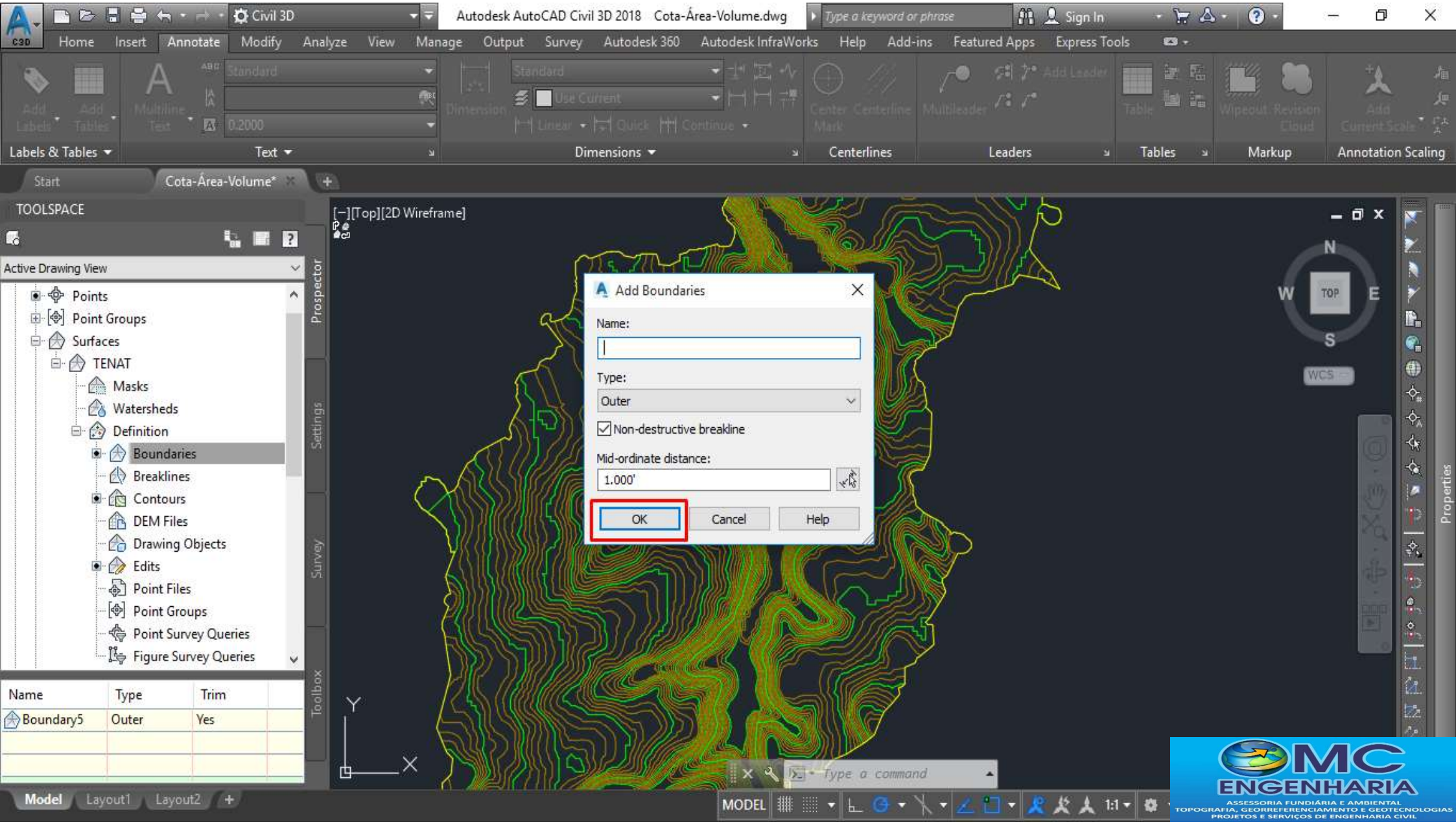
Civil 3D
Autodesk AutoCAD Civil 3D 2018 Cota-Área-Volume.dwg
Type a keyword or phrase
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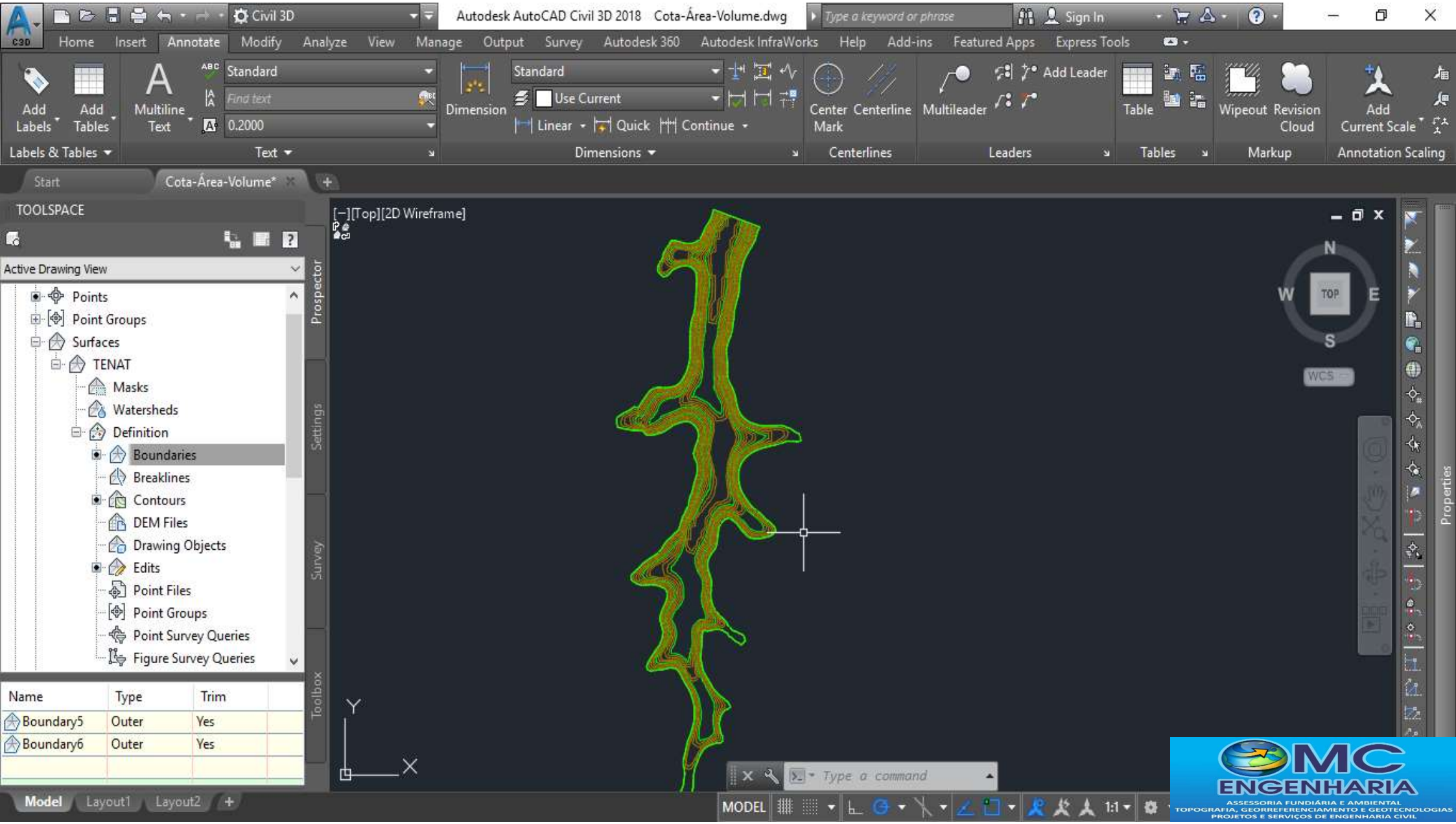
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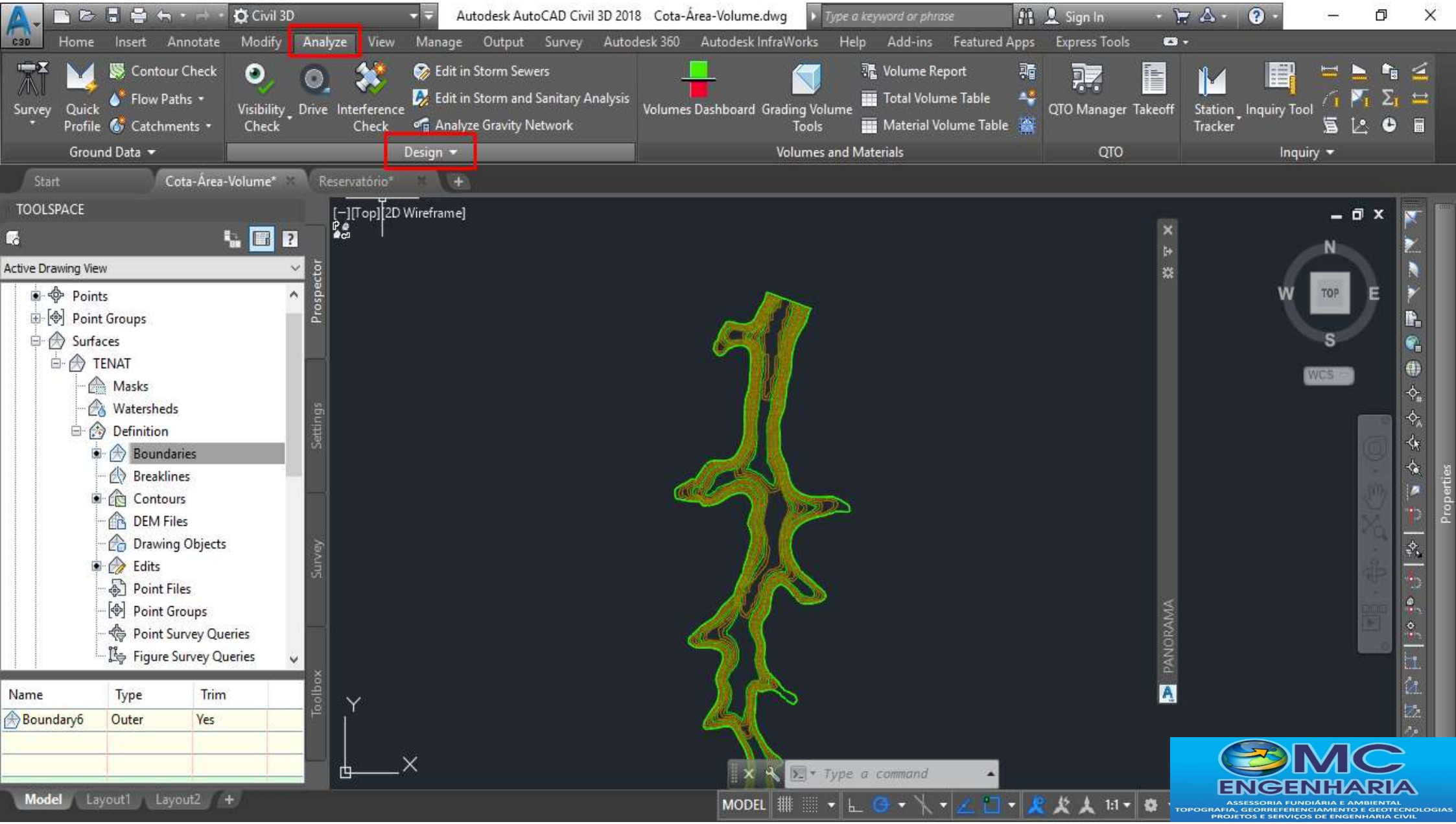
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Flow Paths
Catchments
Ground Data
Visibility Check
Drive
Interference Check
Edit in Storm Sewers
Edit in Storm and Sanitary Analysis
Analyze Gravity Network
Design
Volumes Dashboard
Grading Volume Tools
Volume Report
Total Volume Table
Material Volume Table
Volumes and Materials
QTO Manager
Takeoff
QTO
Station Tracker
Inquiry Tool
Inquiry
Start
Cota-Área-Volume*
Reservatório*
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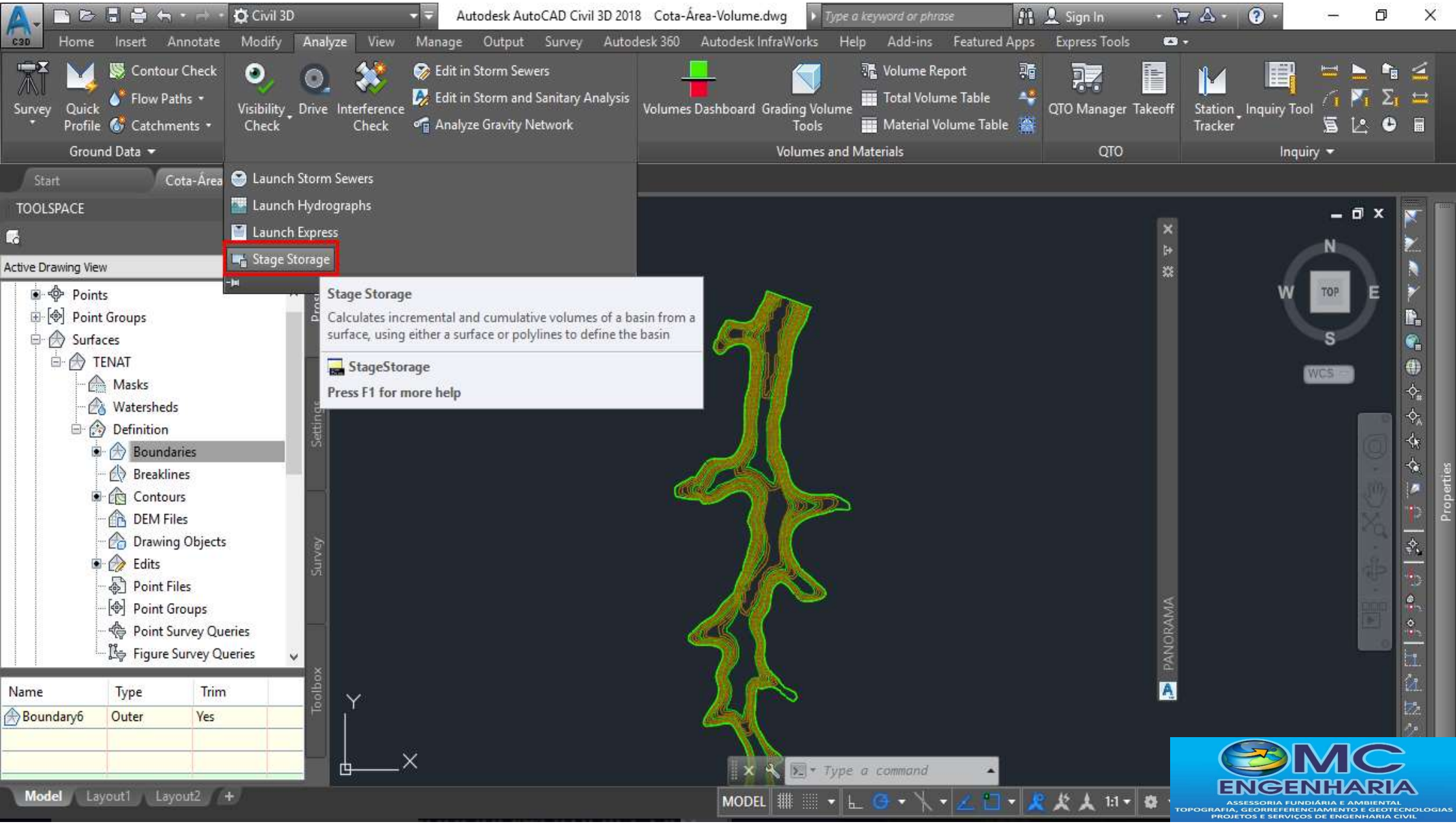
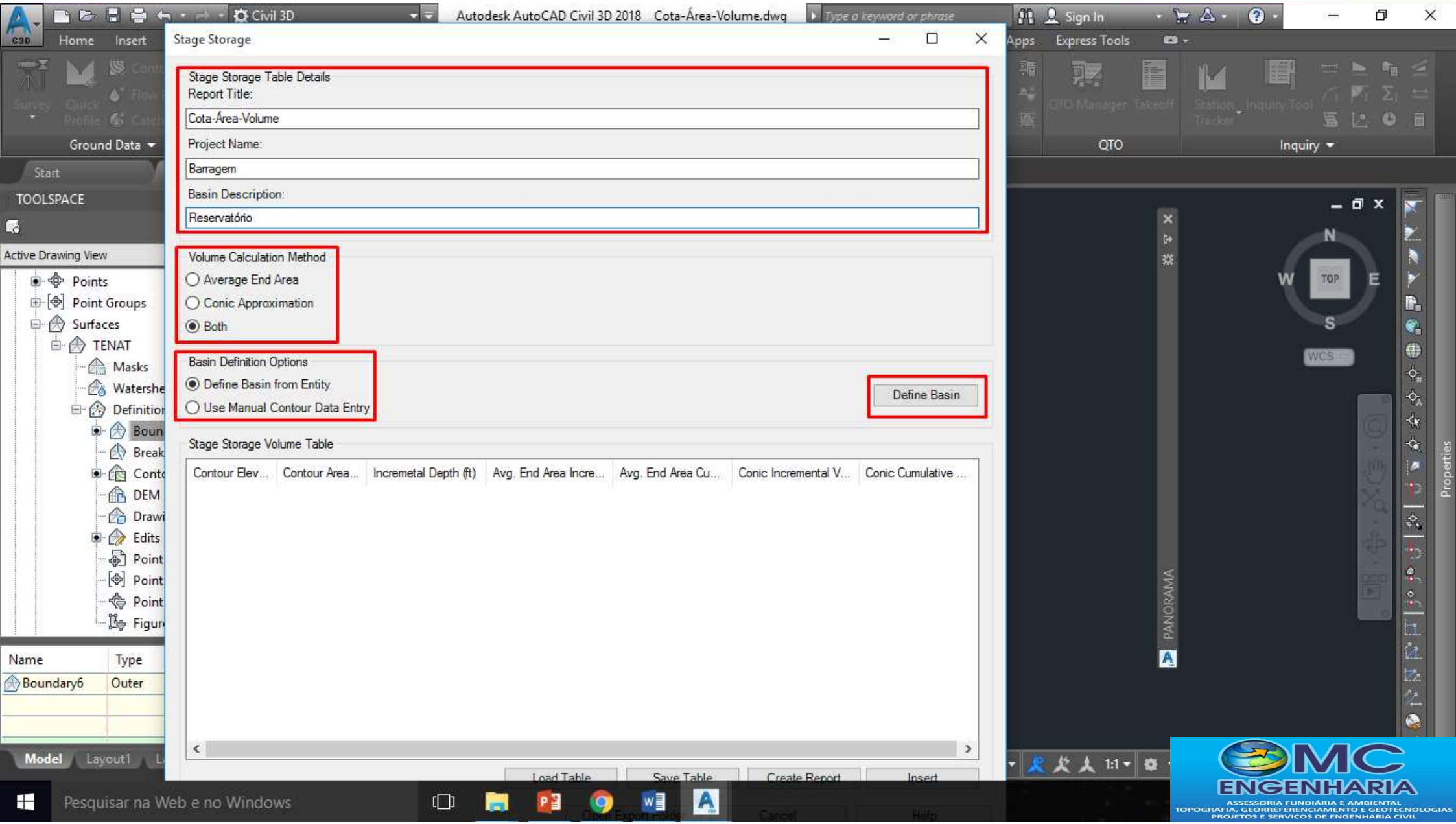
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL

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Project Name:
Barragem
Basin Description:
Reservatório
Volume Calculation Method
Average End Area
Conic Approximation
Both
Basin Definition Options
Define Basin from Entity
Use Manual Contour Data Entry
Define Basin
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Contour Area...
Incremetal Depth (ft)
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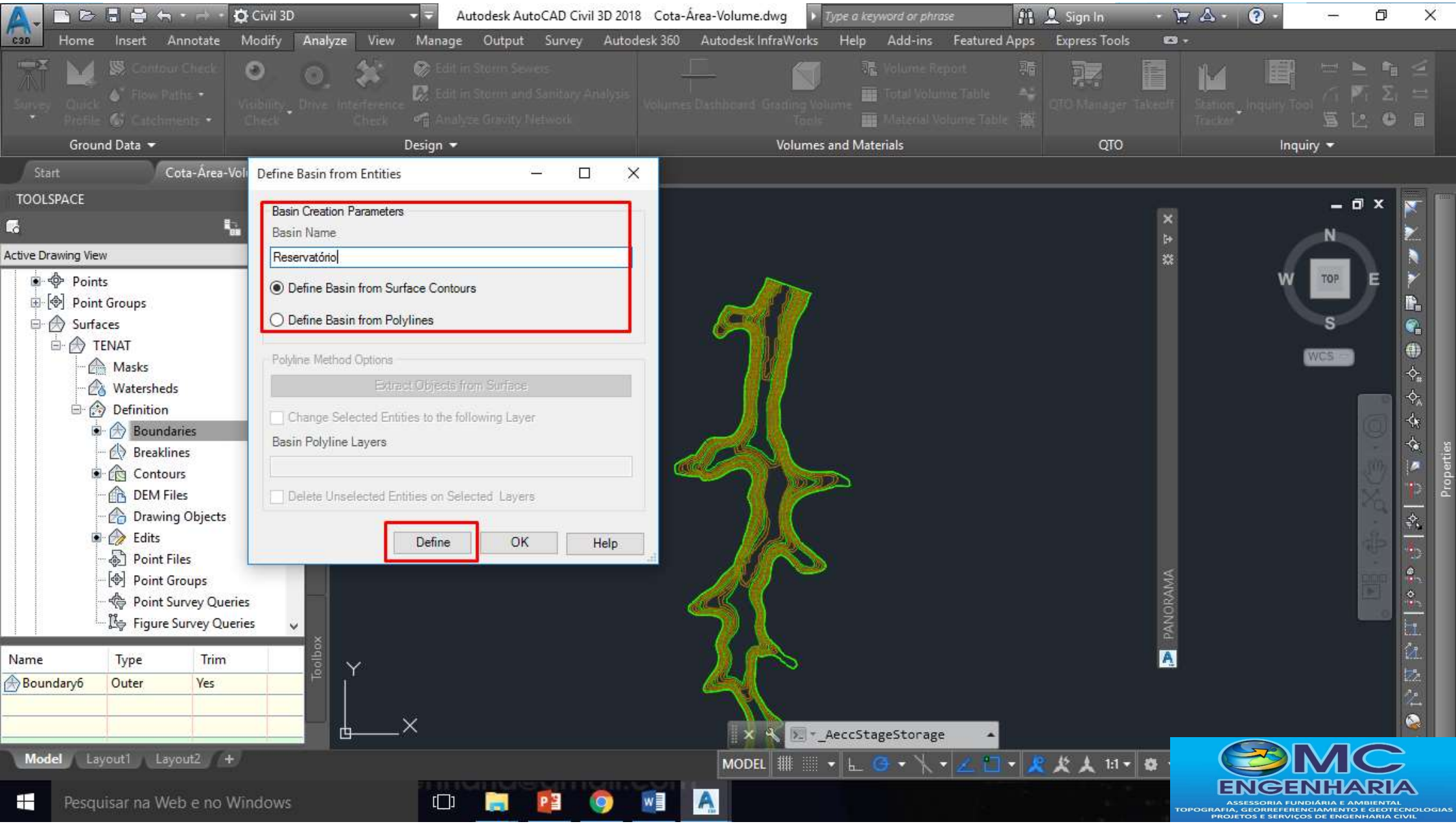
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL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Design
Volumes and Materials
QTO
Inquiry
Define Basin from Entities
Basin Creation Parameters
Basin Name
Reservatório
Define Basin from Surface Contours
Define Basin from Polylines
Polyline Method Options
Extract Objects from Surface
Change Selected Entities to the following Layer
Basin Polyline Layers
Delete Unselected Entities on Selected Layers
Define
OK
Help
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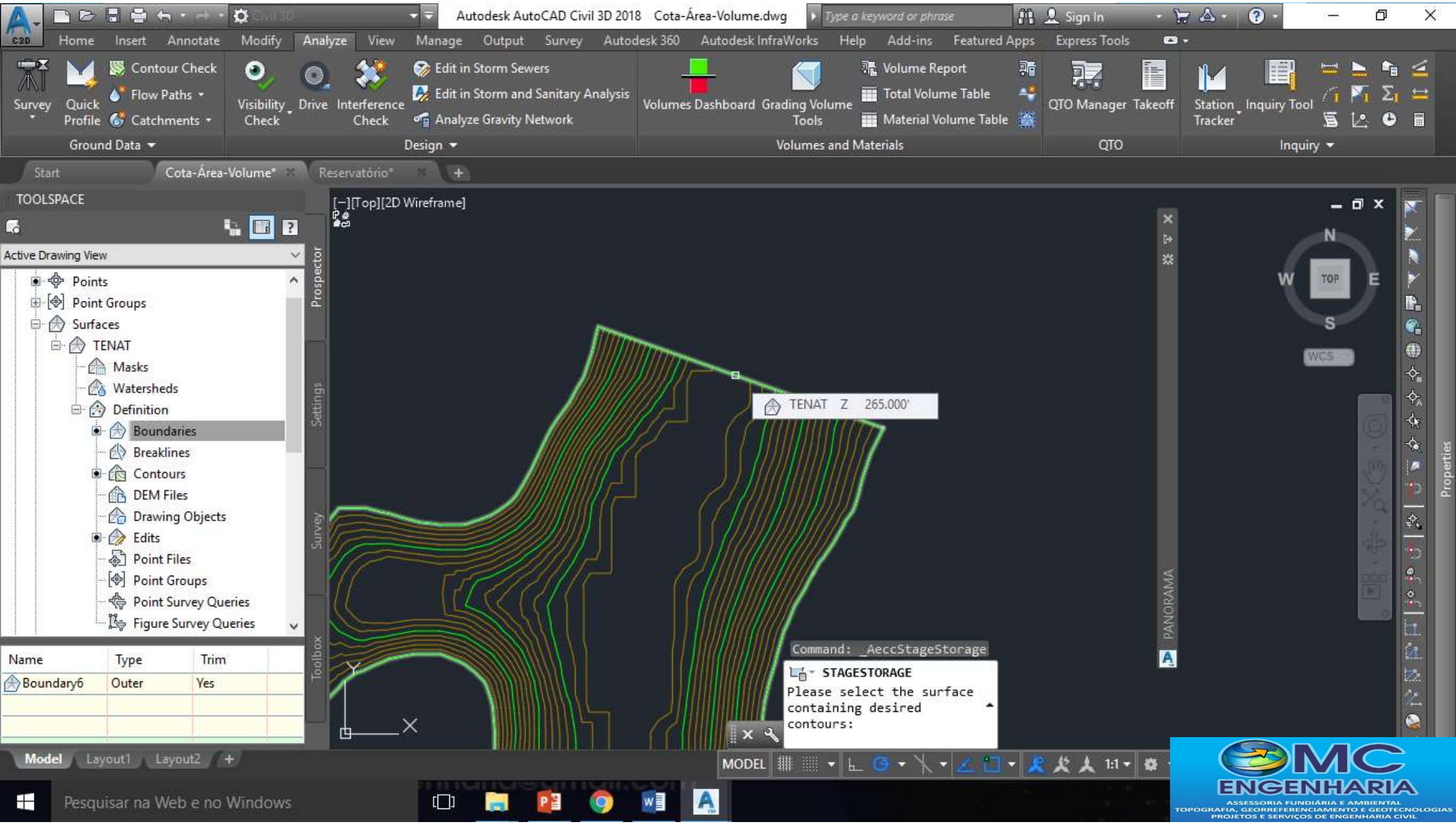
TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL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Survey Quick Profile Contour Check Flow Paths Catchments Ground Data
Visibility Check Drive Interference Check Edit in Storm Sewers Edit in Storm and Sanitary Analysis Analyze Gravity Network Design
Volumes Dashboard Grading Volume Tools Volume Report Total Volume Table Material Volume Table Volumes and Materials
QTO Manager Takeoff QTO
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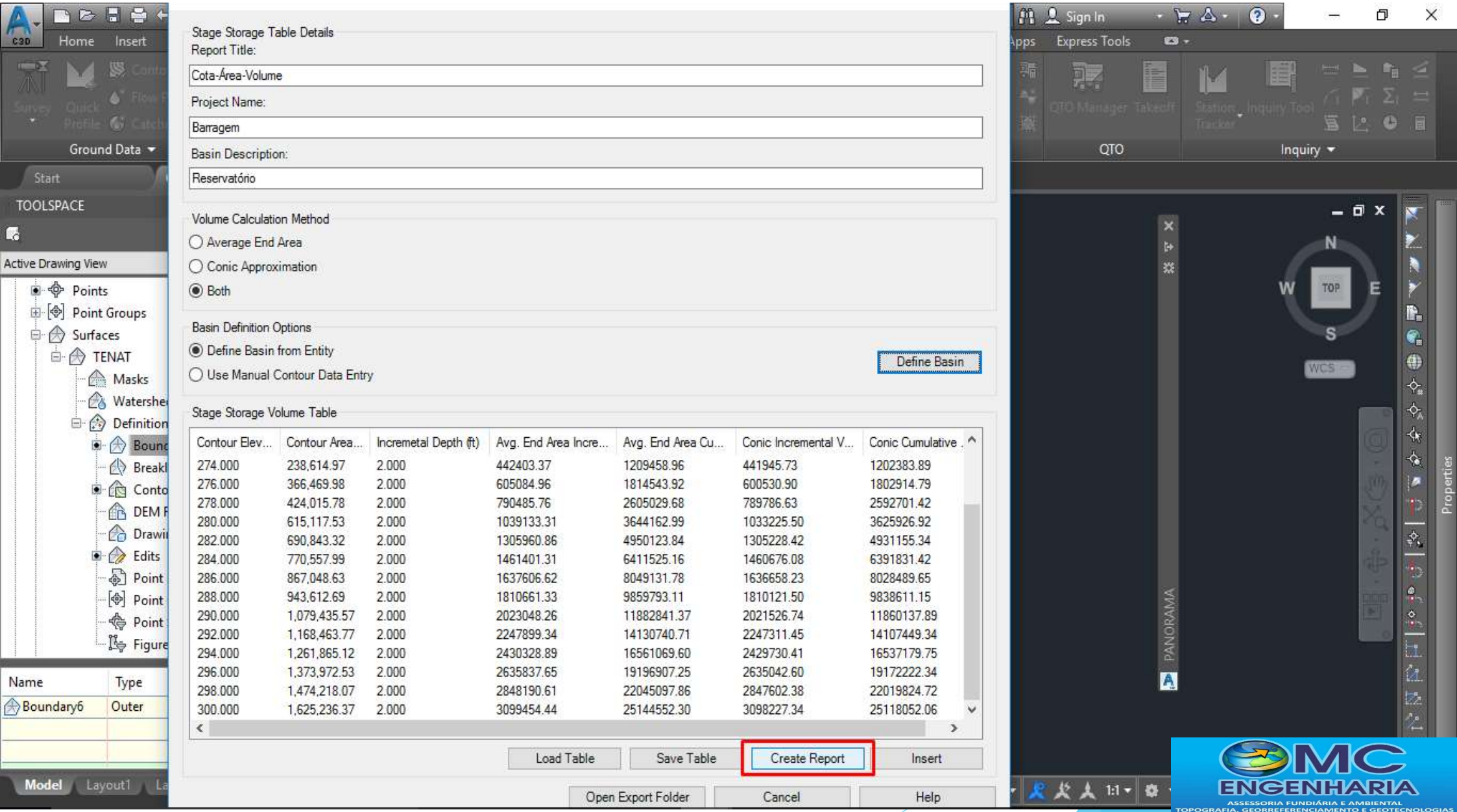
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Report Title:
Cota-Área-Volume
Project Name:
Barragem
Basin Description:
Reservatório
Volume Calculation Method
Average End Area
Conic Approximation
Both
Basin Definition Options
Define Basin from Entity
Use Manual Contour Data Entry
Define Basin
Stage Storage Volume Table
Contour Elev... | Contour Area... | Incremetal Depth (ft) | Avg. End Area Incre... | Avg. End Area Cu... | Conic Incremental V... | Conic Cumulative ...
274.000 | 238,614.97 | 2.000 | 442403.37 | 1209458.96 | 441945.73 | 1202383.89
276.000 | 366,469.98 | 2.000 | 605084.96 | 1814543.92 | 600530.90 | 1802914.79
278.000 | 424,015.78 | 2.000 | 790485.76 | 2605029.68 | 789786.63 | 2592701.42
280.000 | 615,117.53 | 2.000 | 1039133.31 | 3644162.99 | 1033225.50 | 3625926.92
282.000 | 690,843.32 | 2.000 | 1305960.86 | 4950123.84 | 1305228.42 | 4931155.34
284.000 | 770,557.99 | 2.000 | 1461401.31 | 6411525.16 | 1460676.08 | 6391831.42
286.000 | 867,048.63 | 2.000 | 1637606.62 | 8049131.78 | 1636658.23 | 8028489.65
288.000 | 943,612.69 | 2.000 | 1810661.33 | 9859793.11 | 1810121.50 | 9838611.15
290.000 | 1,079,435.57 | 2.000 | 2023048.26 | 11882841.37 | 2021526.74 | 11860137.89
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294.000 | 1,261,865.12 | 2.000 | 2430328.89 | 16561069.60 | 2429730.41 | 16537179.75
296.000 | 1,373,972.53 | 2.000 | 2635837.65 | 19196907.25 | 2635042.60 | 19172222.34
298.000 | 1,474,218.07 | 2.000 | 2848190.61 | 22045097.86 | 2847602.38 | 22019824.72
300.000 | 1,625,236.37 | 2.000 | 3099454.44 | 25144552.30 | 3098227.34 | 25118052.06
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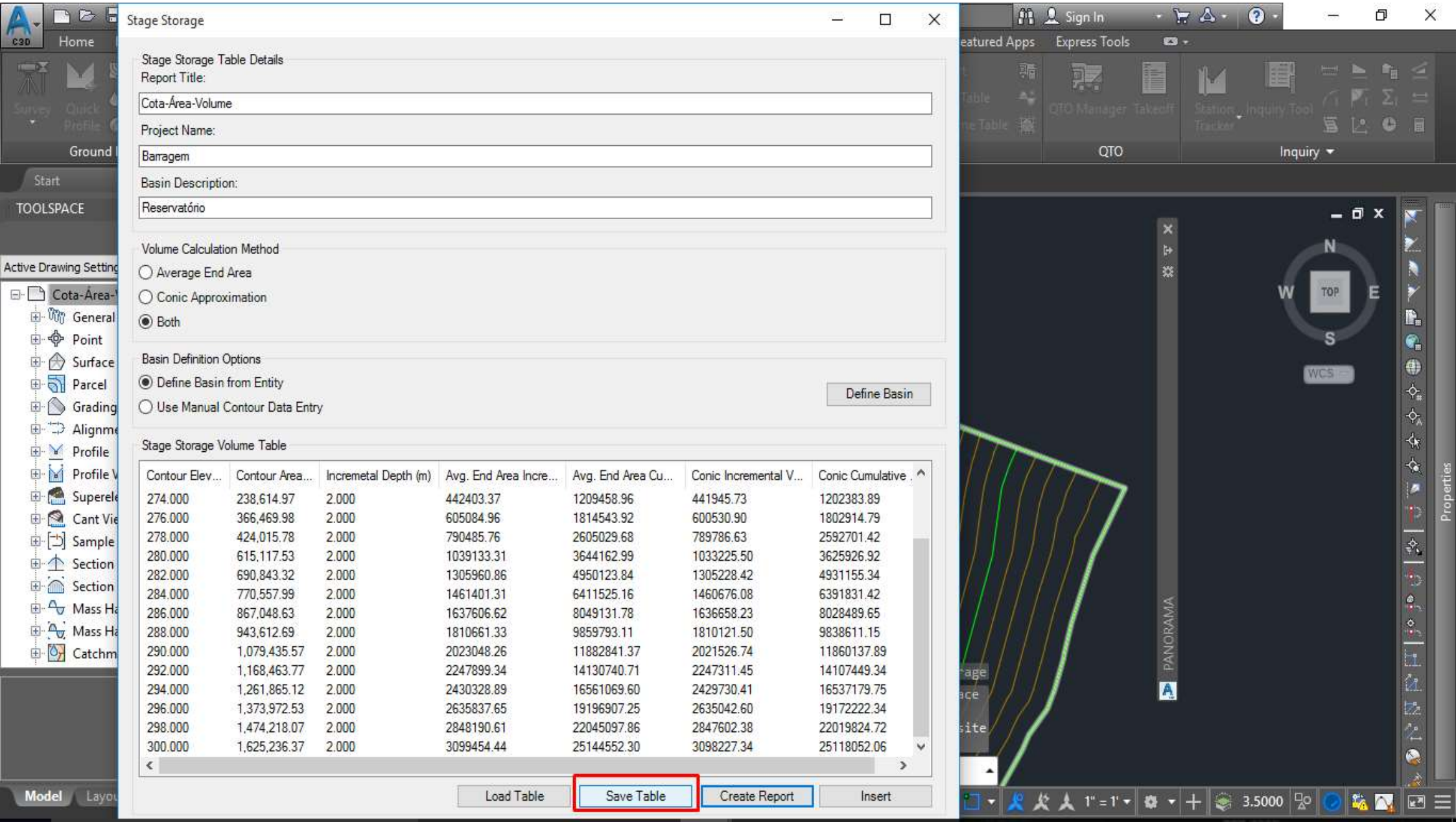
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Report Title:
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Project Name:
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278.000 | 424,015.78 | 2.000 | 790485.76 | 2605029.68 | 789786.63 | 2592701.42
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290.000 | 1,079,435.57 | 2.000 | 2023048.26 | 11882841.37 | 2021526.74 | 11860137.89
292.000 | 1,168,463.77 | 2.000 | 2247899.34 | 14130740.71 | 2247311.45 | 14107449.34
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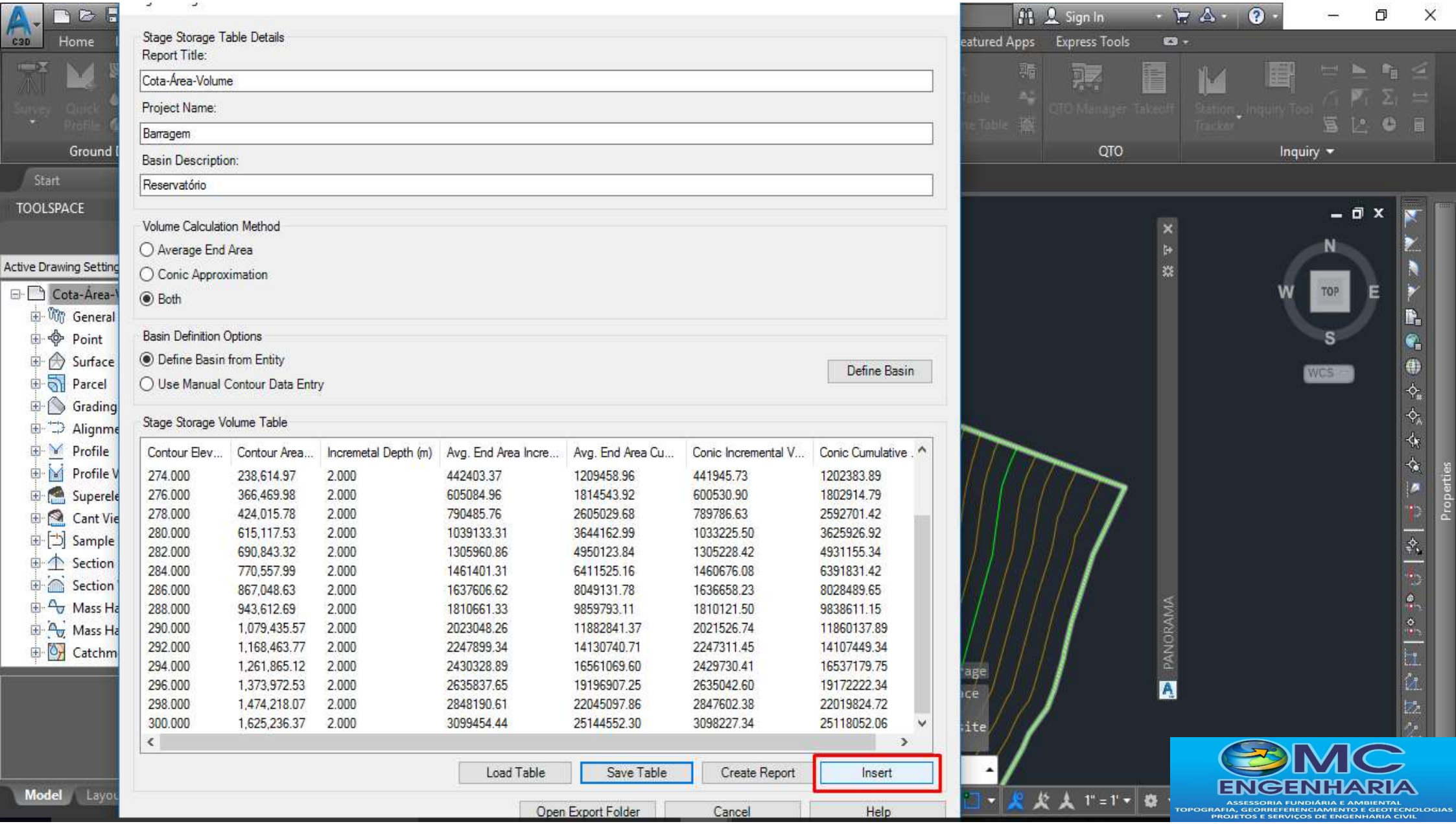
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Project Name:
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Basin Description:
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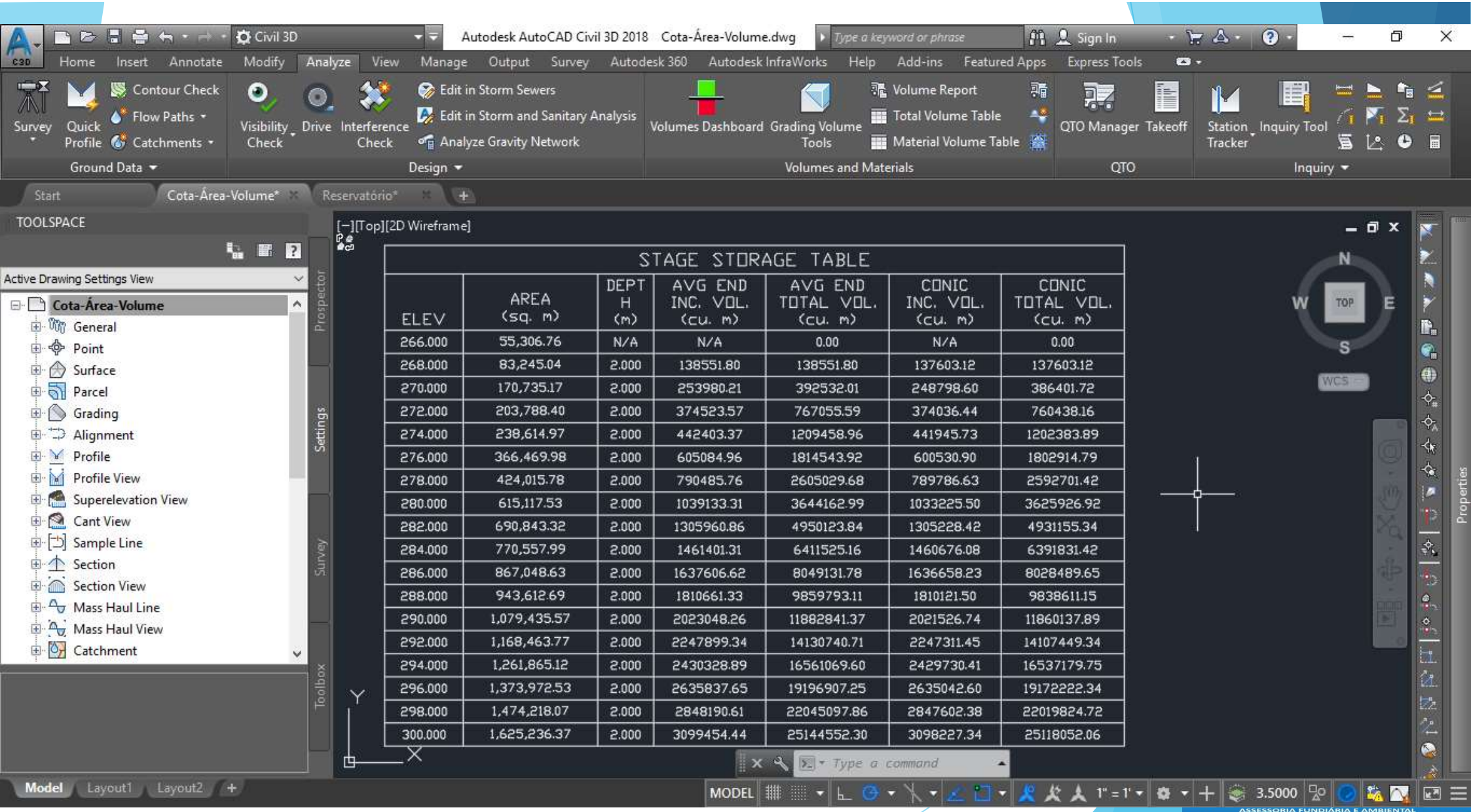

STAGE STORAGE TABLE

ELEV	AREA (sq. m)	DEPTH (m)	AVG END INC. VOL. (cu. m)	AVG END TOTAL VOL. (cu. m)	CONIC INC. VOL. (cu. m)	CONIC TOTAL VOL. (cu. m)
266.000	55,306.76	N/A	N/A	0.00	N/A	0.00
268.000	83,245.04	2.000	138551.80	138551.80	137603.12	137603.12
270.000	170,735.17	2.000	253980.21	392532.01	248798.60	386401.72
272.000	203,788.40	2.000	374523.57	767055.59	374036.44	760438.16
274.000	238,614.97	2.000	442403.37	1209458.96	441945.73	1202383.89
276.000	366,469.98	2.000	605084.96	1814543.92	600530.90	1802914.79
278.000	424,015.78	2.000	790485.76	2605029.68	789786.63	2592701.42
280.000	615,117.53	2.000	1039133.31	3644162.99	1033225.50	3625926.92
282.000	690,843.32	2.000	1305960.86	4950123.84	1305228.42	4931155.34
284.000	770,557.99	2.000	1461401.31	6411525.16	1460676.08	6391831.42
286.000	867,048.63	2.000	1637606.62	8049131.78	1636658.23	8028489.65
288.000	943,612.69	2.000	1810661.33	9859793.11	1810121.50	9838611.15
290.000	1,079,435.57	2.000	2023048.26	11882841.37	2021526.74	11860137.89
292.000	1,168,463.77	2.000	2247899.34	14130740.71	2247311.45	14107449.34
294.000	1,261,865.12	2.000	2430328.89	16561069.60	2429730.41	16537179.75
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298.000	1,474,218.07	2.000	2848190.61	22045097.86	2847602.38	22019824.72
300.000	1,625,236.37	2.000	3099454.44	25144552.30	3098227.34	25118052.06

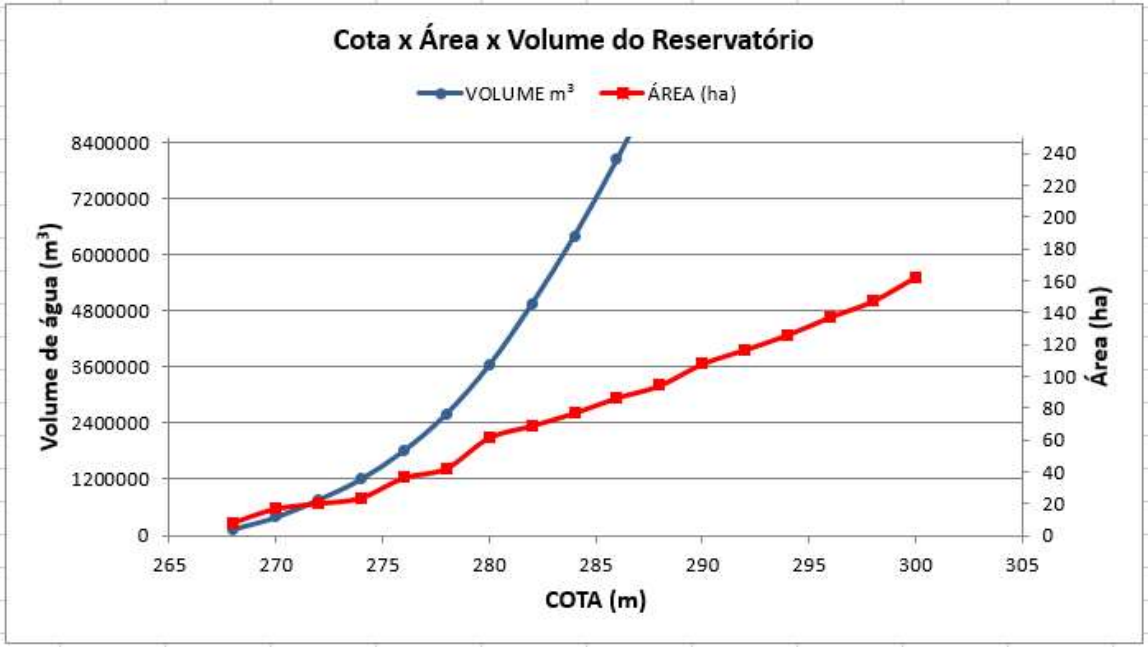
Planilha Cota-Área-volume - Excel

ARQUIVO | PÁGINA INICIAL | INSERIR | LAYOUT DA PÁGINA | FÓRMULAS | DADOS | REVISÃO | EXIBIÇÃO | Entrar

Colar | Área de Transf... | Calibri | 11 | Fonte | Quebrar Texto Automaticamente | Mesclar e Centralizar | Alinhamento | Geral | Número | Formatação Condicional | Formatar como Tabela | Estilos de Célula | Estilo | Inserir | Excluir | Formatar | Células | Classificar e Filtrar | Localizar e Selecionar | Edição

S9

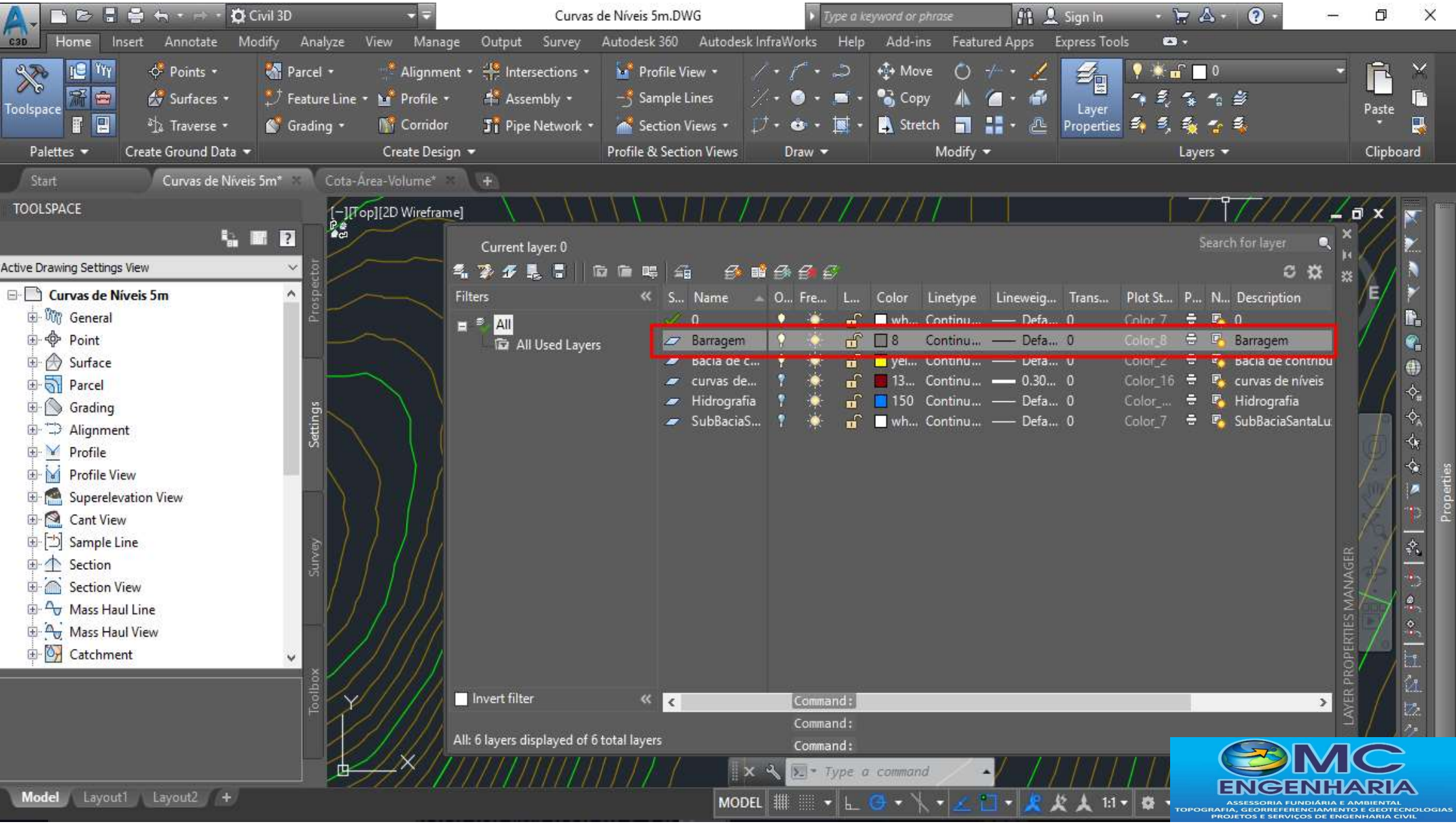
	A	B	C
1	COTA (m)	ÁREA (ha)	VOLUME m³
2	268	8,32	138551
3	270	17,05	392532
4	272	20,38	767055
5	274	23,86	1209458
6	276	36,47	1814543
7	278	42,4	2605029
8	280	61,51	3644162
9	282	69,08	4950123
10	284	77,06	6411525
11	286	86,7	8049131
12	288	94,36	9859793
13	290	107,94	11882841
14	292	116,84	14130740
15	294	126,19	16561069
16	296	137,4	19196907
17	298	147,42	22045097
18	300	162,52	25144552



Plan1 | Plan2 | Plan3

PRONTO

100%


Civil 3D
Curvas de Níveis 5m.DWG
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Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Toolspace
Points
Surfaces
Traverse
Parcel
Feature Line
Grading
Alignment
Profile
Corridor
Intersections
Assembly
Pipe Network
Profile View
Sample Lines
Section Views
Move
Copy
Stretch
Layer Properties
Paste
Palettes
Create Ground Data
Create Design
Profile & Section Views
Draw
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Curvas de Níveis 5m*
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TOOLSPACE
Active Drawing Settings View
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Layout2
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OMC ENGENHARIA
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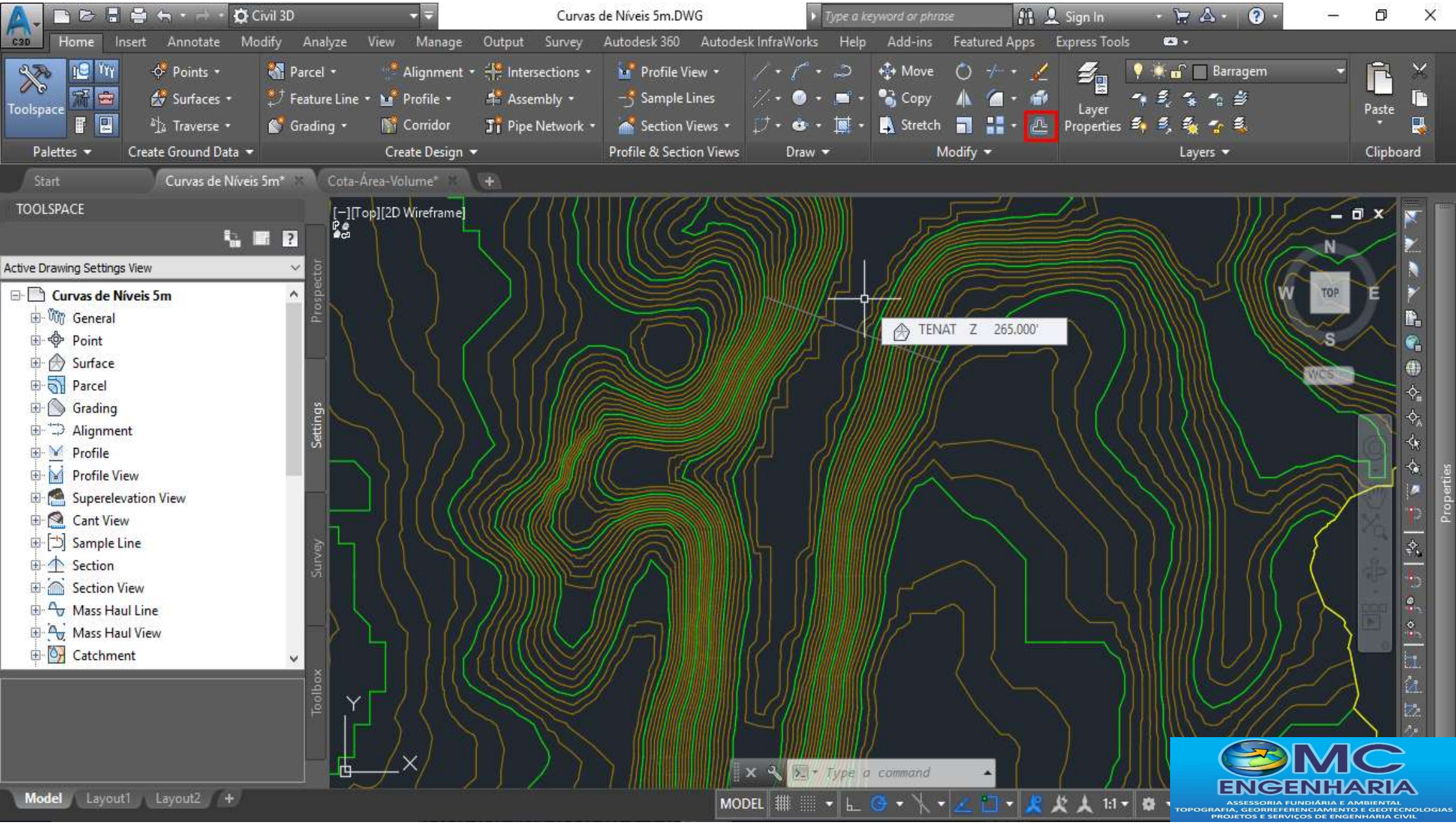
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL


Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
Insert
Annotate
Modify
Analyze
View
Manage
Output
Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
Express Tools
Toolspace
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Surfaces
Traverse
Parcel
Feature Line
Grading
Alignment
Profile
Corridor
Intersections
Assembly
Pipe Network
Profile View
Sample Lines
Section Views
Move
Copy
Stretch
Layer Properties
Barragem
Paste
Palettes
Create Ground Data
Create Design
Profile & Section Views
Draw
Modify
Layers
Clipboard
Start
Curvas de Níveis 5m*
Cota-Área-Volume*
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OMC ENGENHARIA
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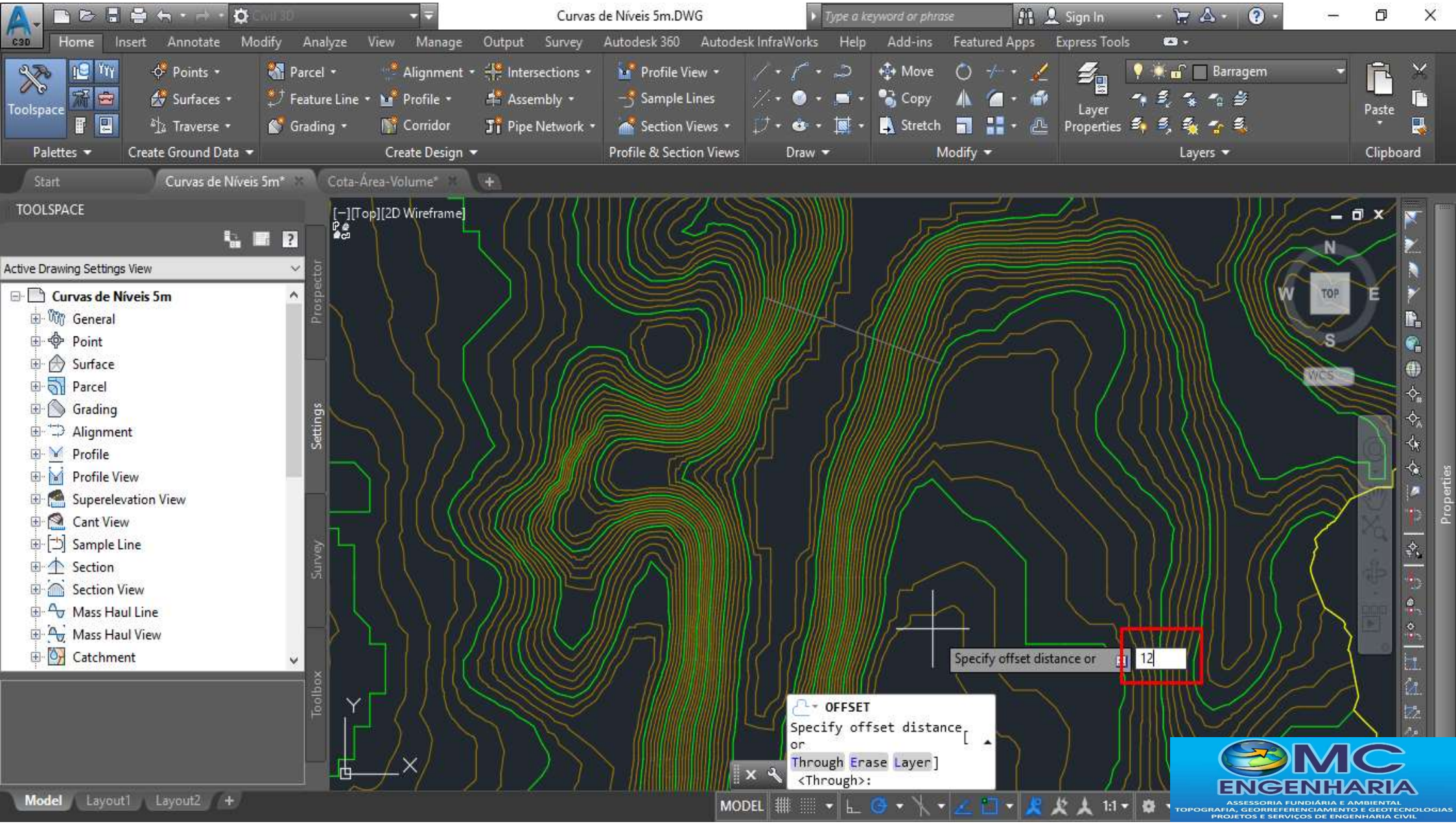
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL


Curvas de Níveis 5m.DWG
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Assembly
Pipe Network
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Sample Lines
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Barragem
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Palettes
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Profile & Section Views
Draw
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Clipboard
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Cota-Área-Volume*
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OMC ENGENHARIA
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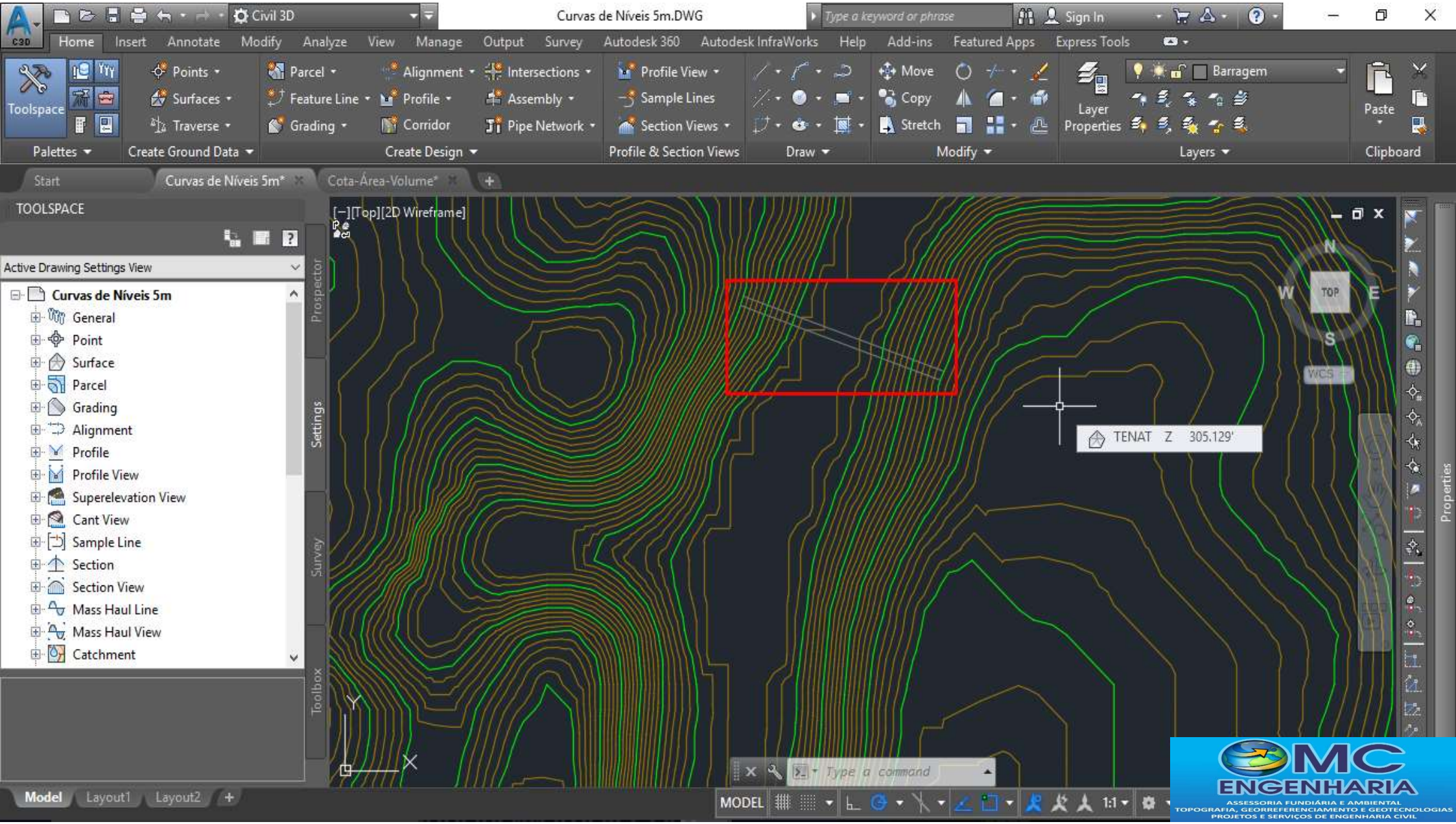

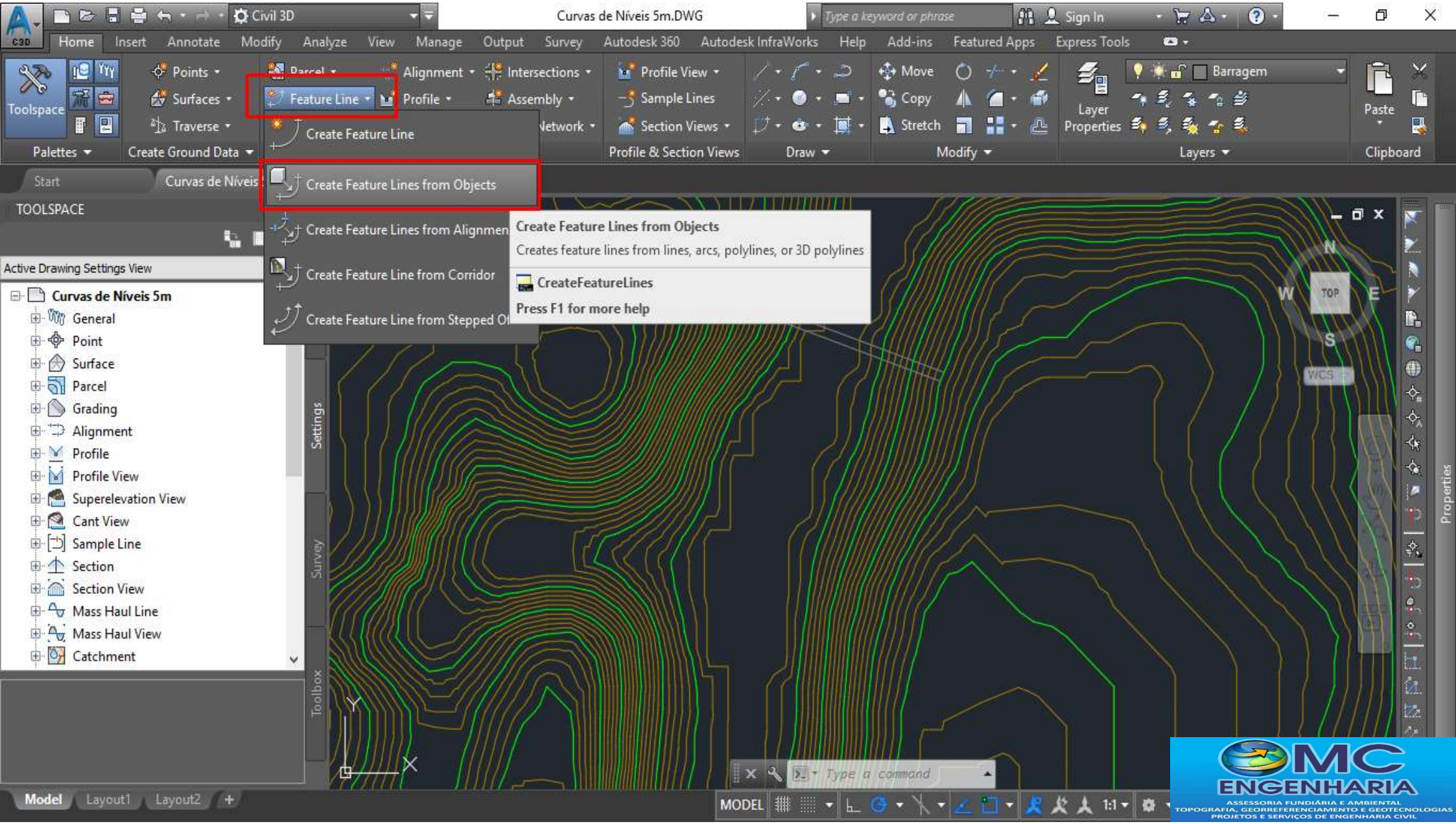
Civil 3D
Curvas de Níveis 5m.DWG
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Add-ins
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Sample Lines
Section Views
Move
Copy
Stretch
Layer Properties
Barragem
Paste
Palettes
Create Ground Data
Profile & Section Views
Draw
Modify
Layers
Clipboard
Create Feature Line
Create Feature Lines from Objects
Create Feature Lines from Alignmen
Create Feature Line from Corridor
Create Feature Line from Stepped O
Create Feature Lines from Objects
Creates feature lines from lines, arcs, polylines, or 3D polylines
CreateFeatureLines
Press F1 for more help
Start
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Parcel
Grading
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Superelevation View
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Mass Haul Line
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Type a command
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MODEL
1:1
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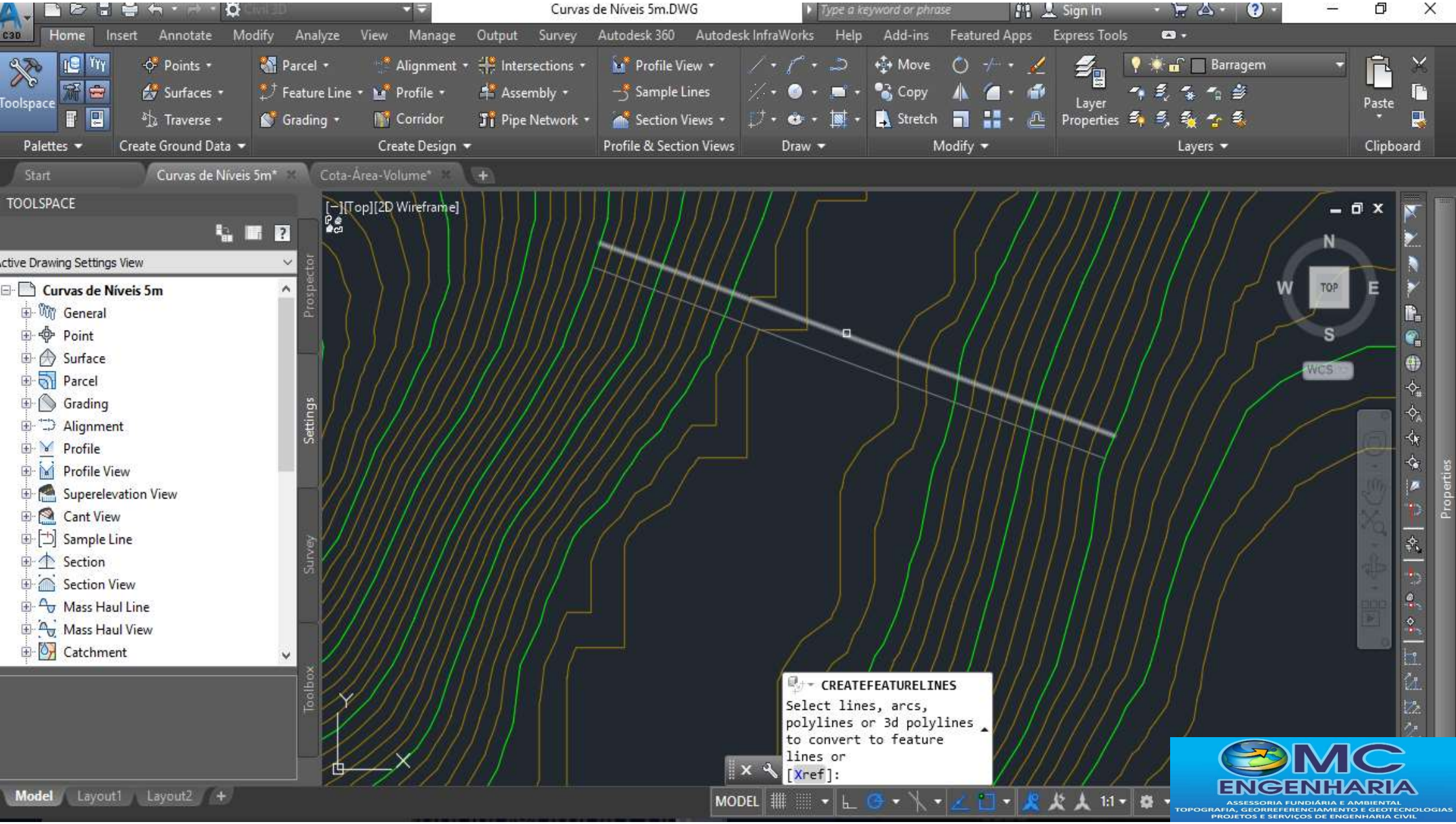
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Start
Curvas de Níveis 5m*
Cota-Área-Volume*
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Curvas de Níveis 5m
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Profile View
Superelevation View
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Sample Line
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Mass Haul Line
Mass Haul View
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Settings
Survey
Toolbox
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CREATEFEATURELINES
Select lines, arcs, polylines or 3d polylines to convert to feature lines or
[Xref]:
Model
Layout1
Layout2
MODEL
1:1
Properties
OMC ENGENHARIA
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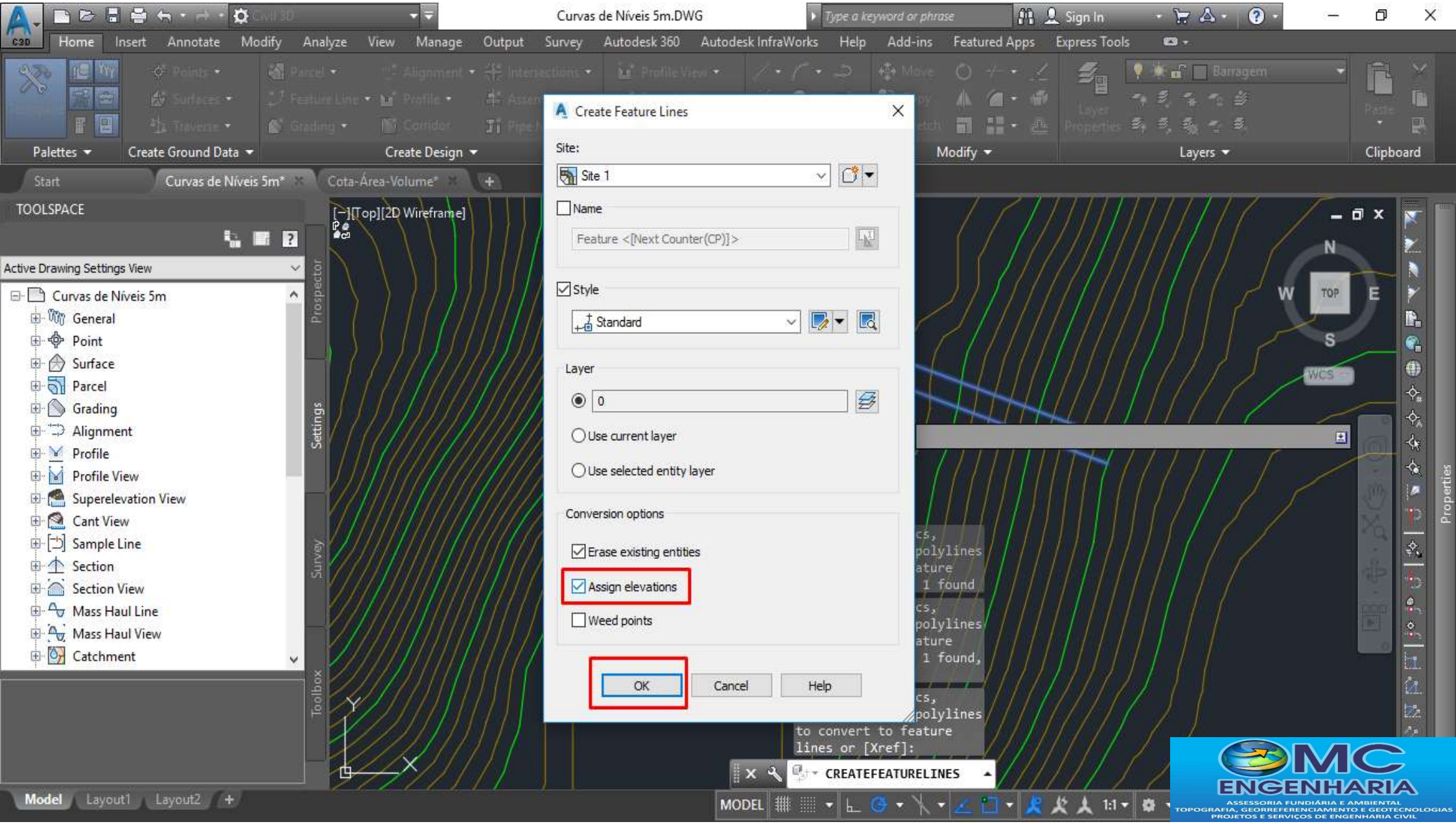
PROJETOS E SERVIÇOS DE ENGENHARIA CIVIL


Curvas de Níveis 5m.DWG
Create Feature Lines
Site:
Site 1
Name
Feature <[Next Counter(CP)]>
Style
Standard
Layer
0
Use current layer
Use selected entity layer
Conversion options
Erase existing entities
Assign elevations
Weed points
OK
Cancel
Help
TOOLSPACE
Active Drawing Settings View
Curvas de Níveis 5m
General
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Surface
Parcel
Grading
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OMC ENGENHARIA
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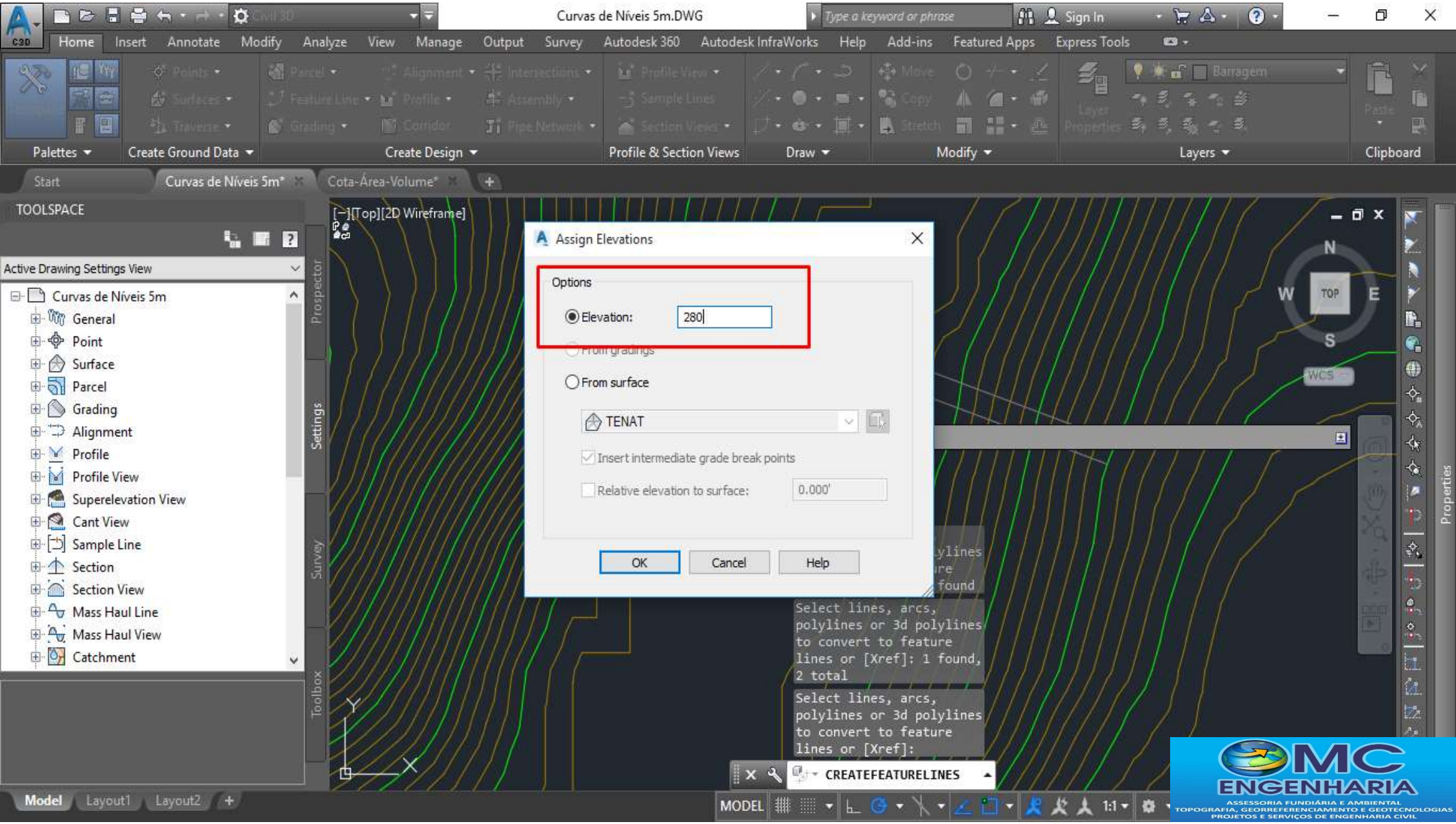
Curvas de Níveis 5m.DWG
Assign Elevations
Options
Elevation:
280
From gradings
From surface
TENAT
Insert intermediate grade break points
Relative elevation to surface:
0.000'
OK
Cancel
Help
Select lines, arcs, polylines or 3d polylines to convert to feature lines or [Xref]: 1 found, 2 total
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CREATEFEATURELINES
TOOLSPACE
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OMC ENGENHARIA
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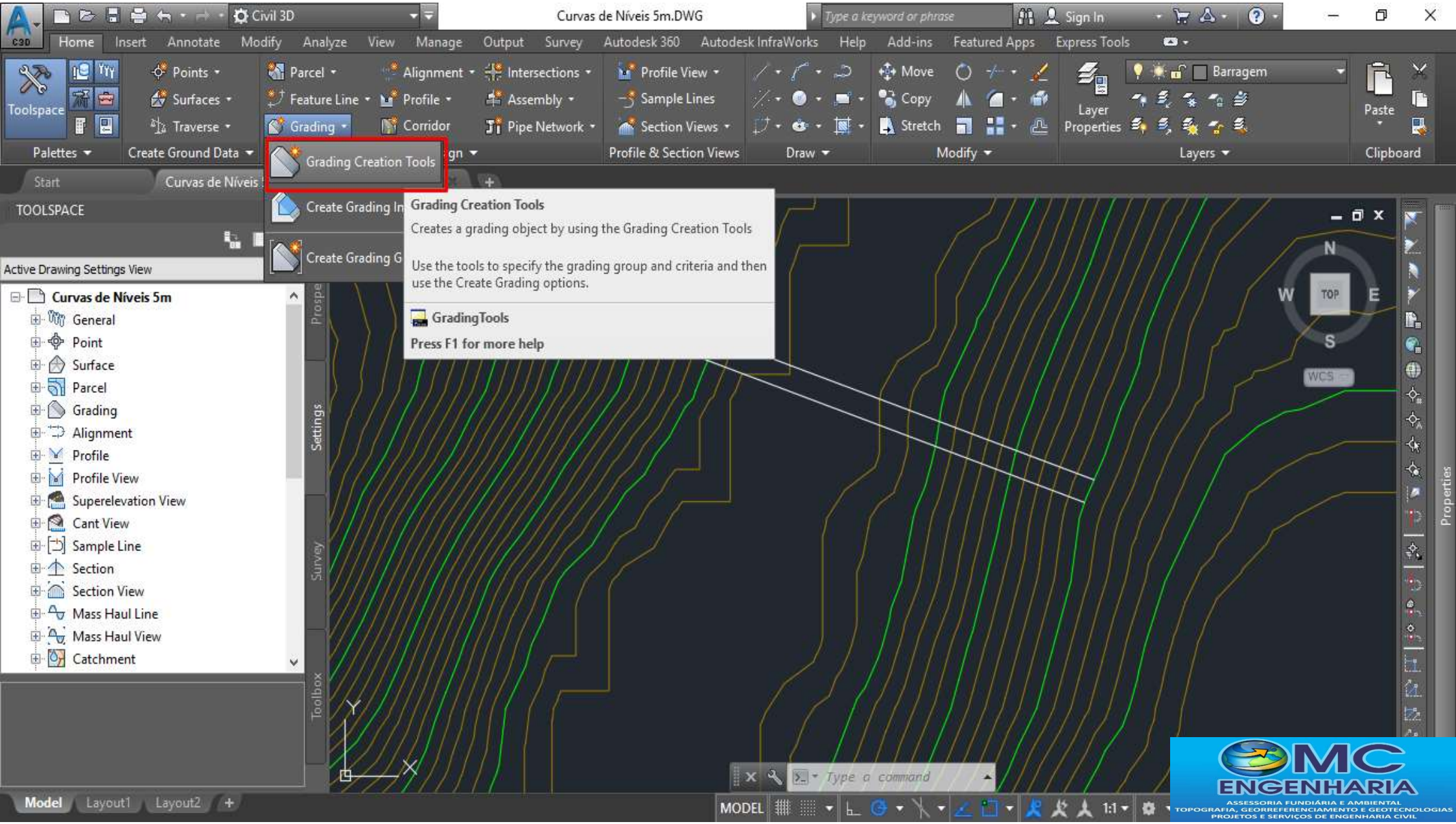
Civil 3D
Curvas de Níveis 5m.DWG
Type a keyword or phrase
Sign In
Home
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Survey
Autodesk 360
Autodesk InfraWorks
Help
Add-ins
Featured Apps
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Grading Creation Tools
Creates a grading object by using the Grading Creation Tools
Use the tools to specify the grading group and criteria and then use the Create Grading options.
GradingTools
Press F1 for more help
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Properties
Type a command
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OMC ENGENHARIA
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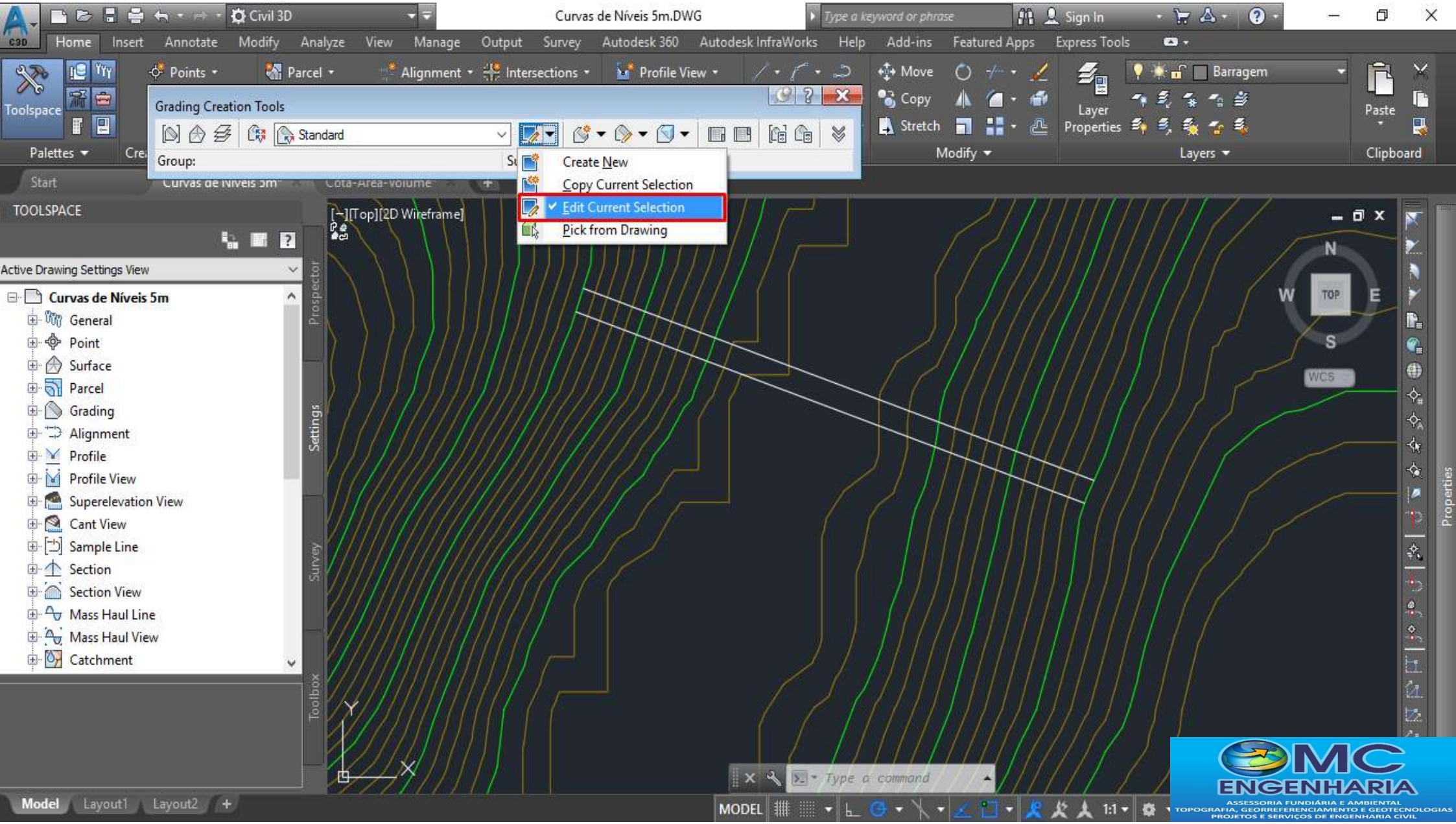
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Palettes
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Intersections
Profile View
Grading Creation Tools
Standard
Group:
Create New
Copy Current Selection
Edit Current Selection
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OMC ENGENHARIA
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TOPOGRAFIA, GEORREFERENCIAMENTO E GEOTECNOLOGIAS
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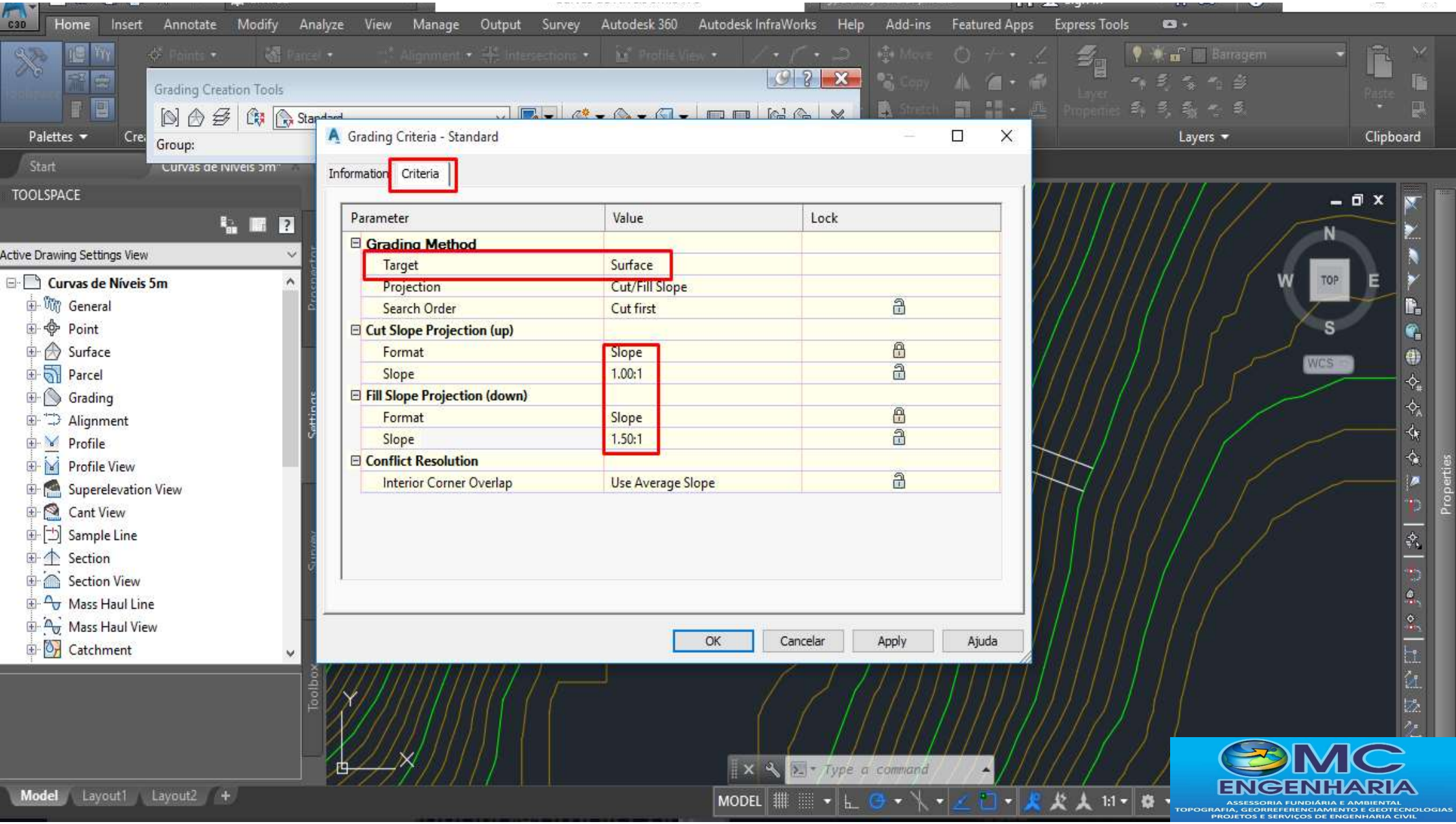
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Featured Apps
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Group:
Grading Criteria - Standard
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Grading Method
Target
Surface
Projection
Cut/Fill Slope
Search Order
Cut first
Cut Slope Projection (up)
Format
Slope
Slope
1.00:1
Fill Slope Projection (down)
Format
Slope
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1.50:1
Conflict Resolution
Interior Corner Overlap
Use Average Slope
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Cancelar
Apply
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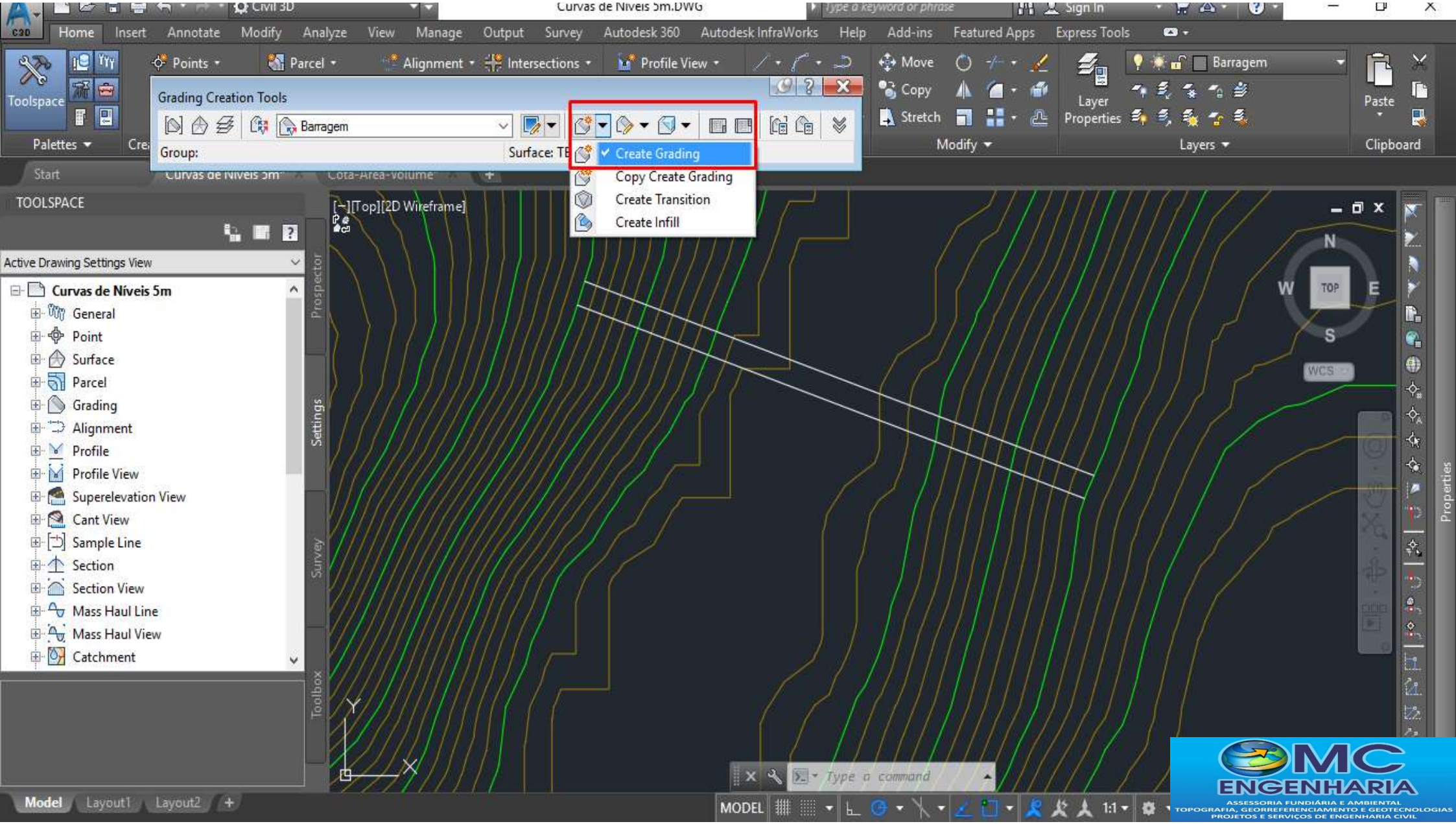
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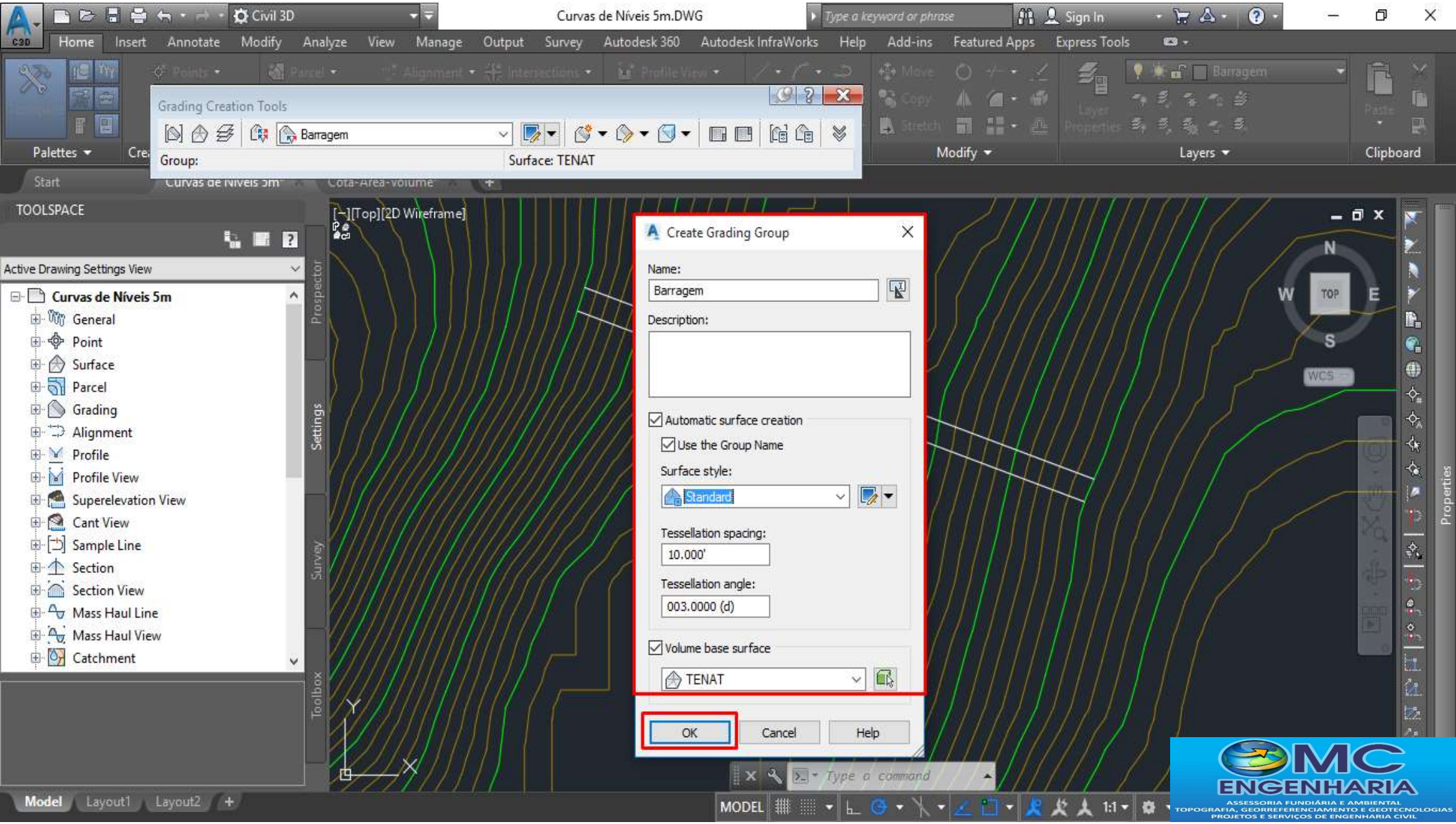
Civil 3D
Curvas de Níveis 5m.DWG
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Mass Haul Line
Mass Haul View
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Prospector
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Toolbox
[−][Top][2D Wireframe]
Create Grading Group
Name:
Barragem
Description:
Automatic surface creation
Use the Group Name
Surface style:
Standard
Tessellation spacing:
10.000'
Tessellation angle:
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Volume base surface
TENAT
OK
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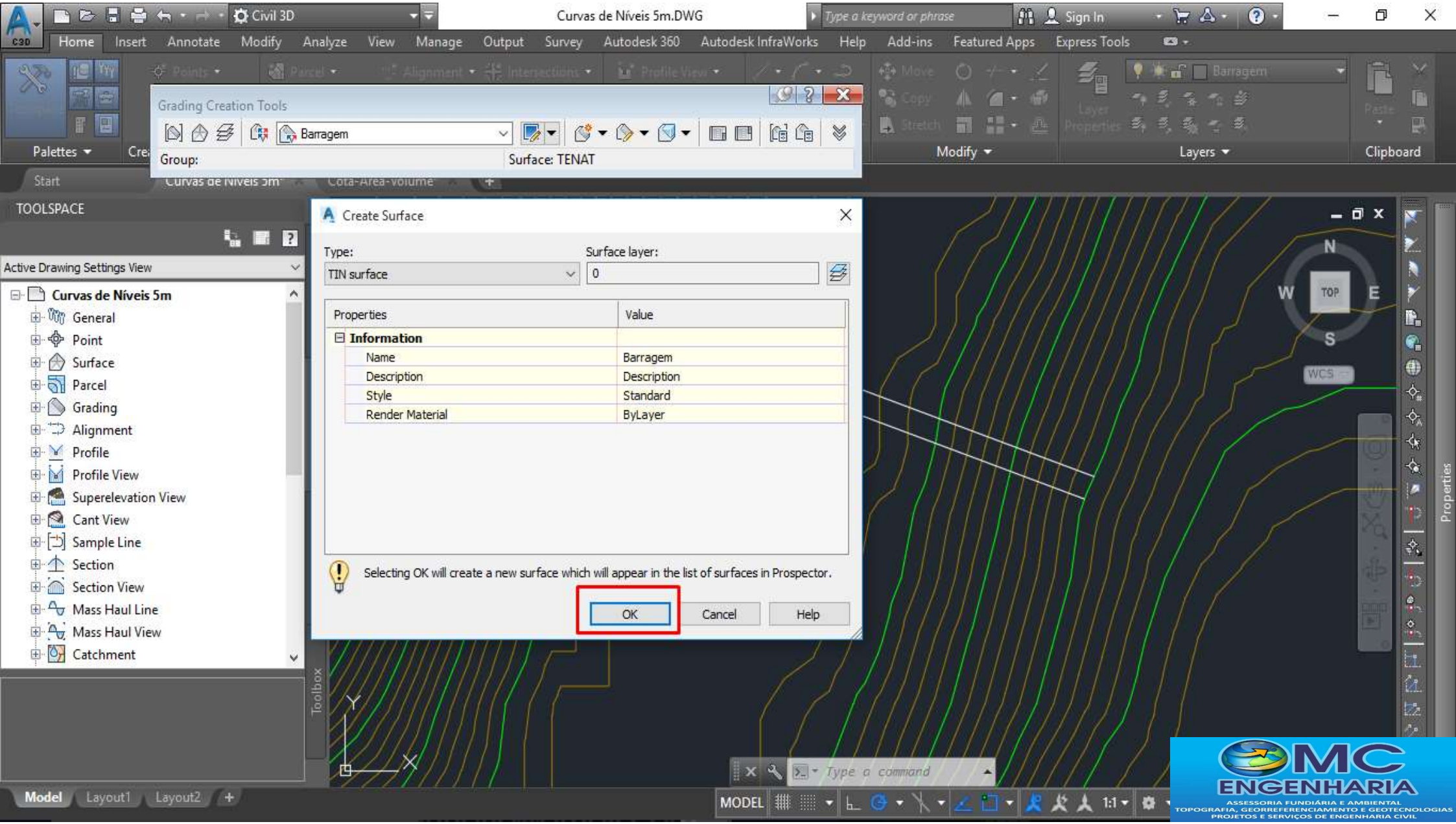

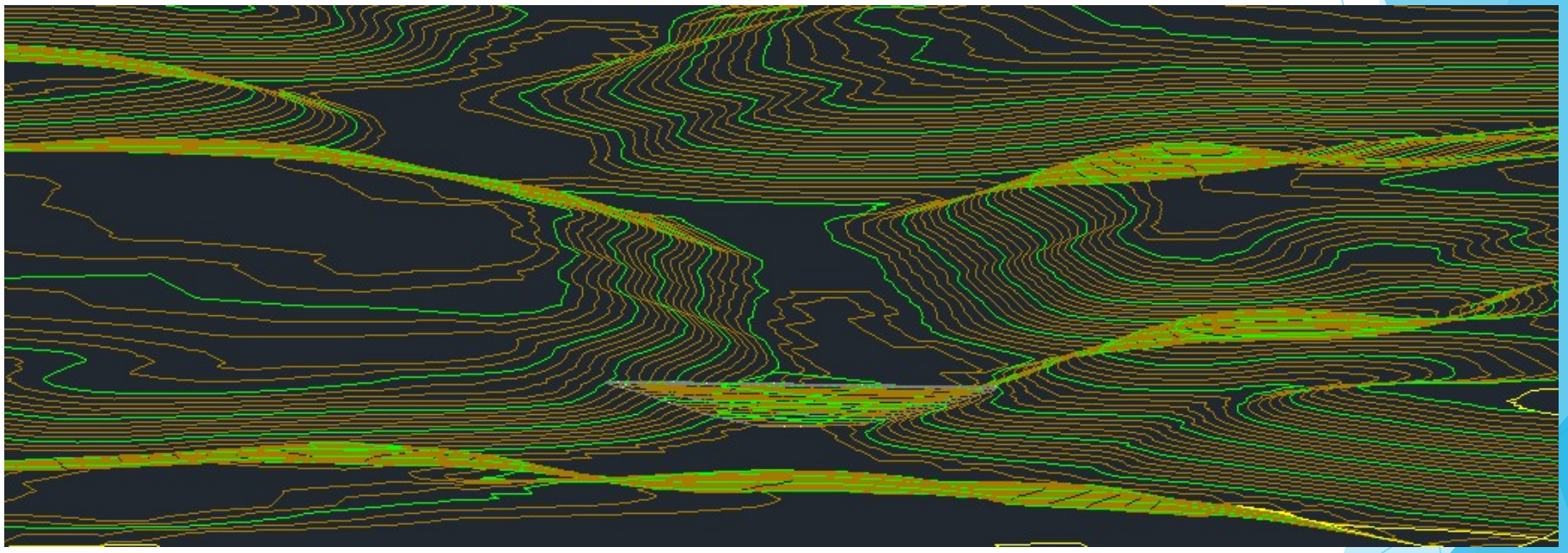

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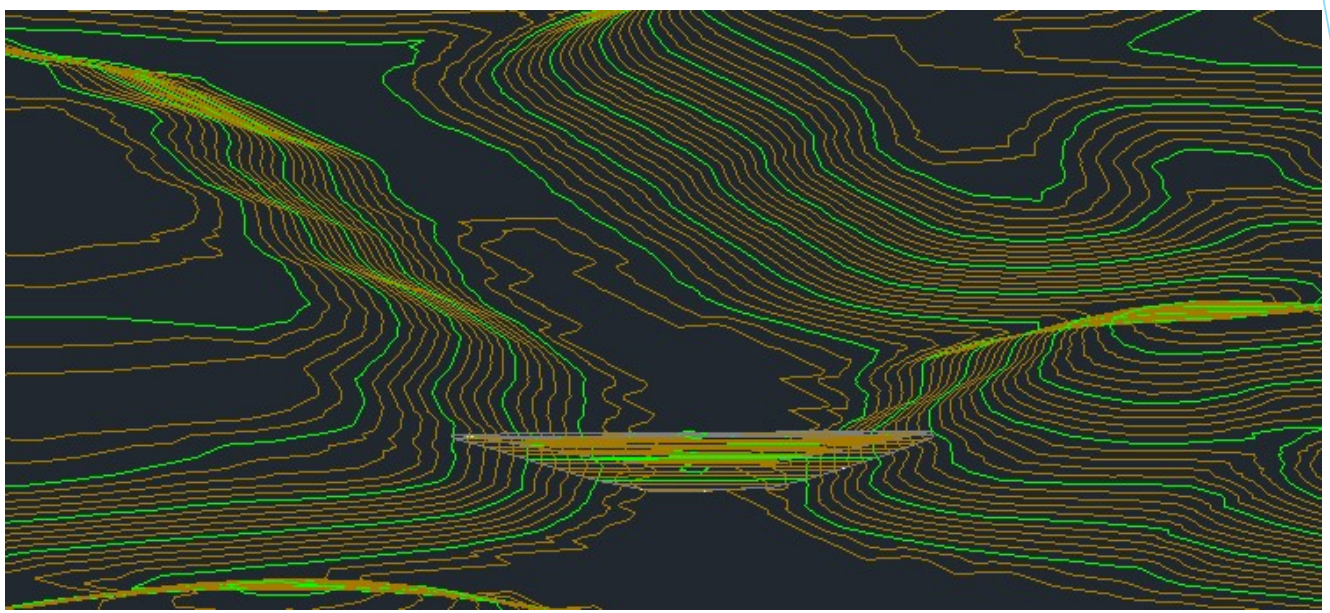

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"Uso das Geotecnologias para projetos de estudos iniciais de pequenas Barragens de Terra"

Aguinaldo Pires Coelho
Engenheiro Civil - Bacharel em Direito
Especialista em Auditoria e Perícia Ambiental
Especialista em Georreferenciamento e geoprocessamento

Email: aguinaldo.mcengenharia@gmail.com
Tel: (63) 99992-8587 / 98411-8697

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CENTRO UNIVERSITÁRIO LUTERANO DE PALMAS

Palmas 25 de abril de 2018

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