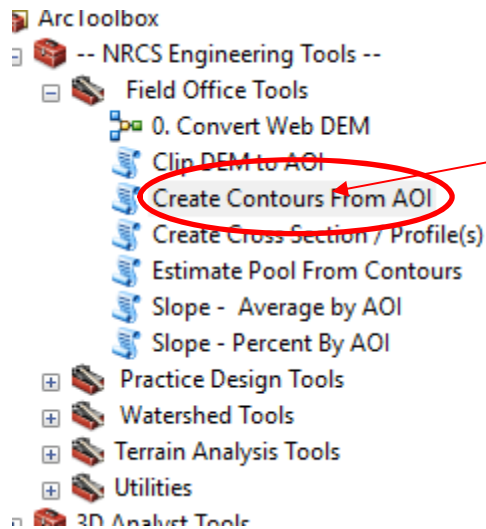This reference guide covers the method for exporting a DEM from ArcMap for use in Engineering Field Tools. This ground surface can be used in preliminary planning of conservation practices including waterways, terraces as well as water and sediment control basins.
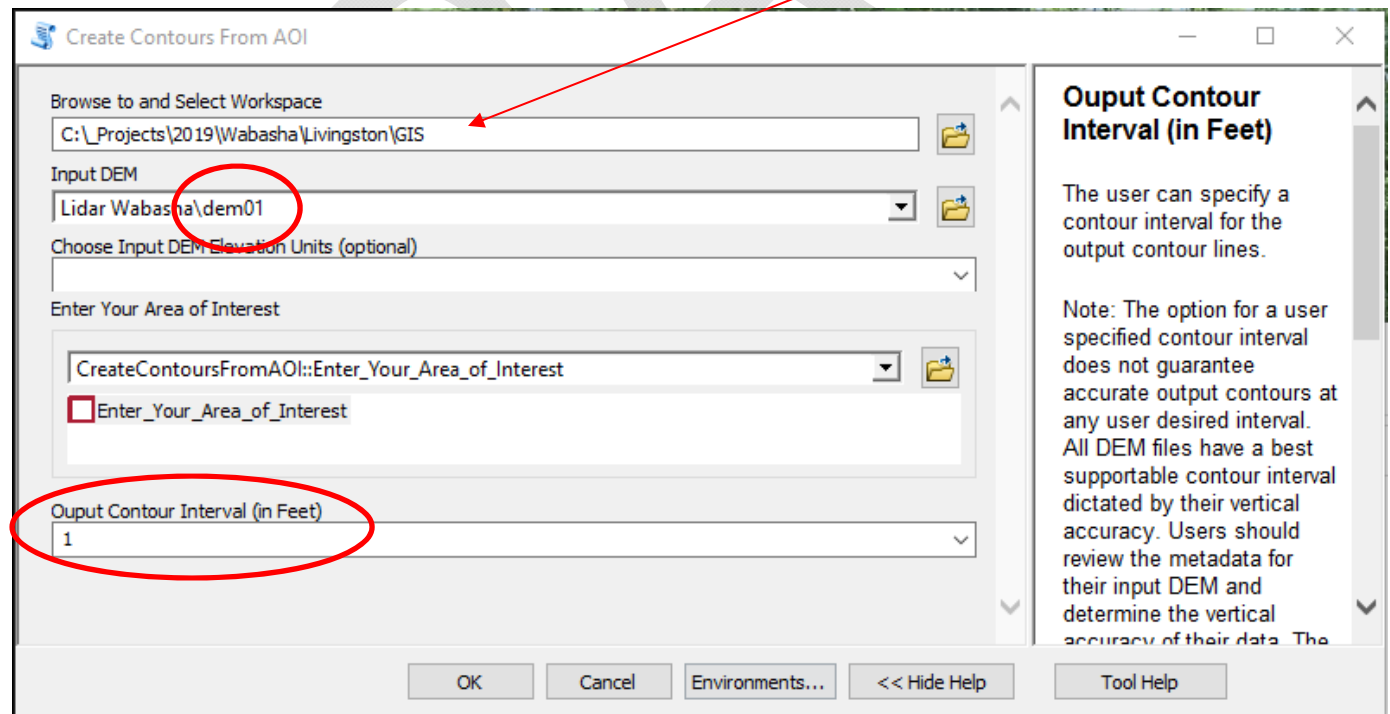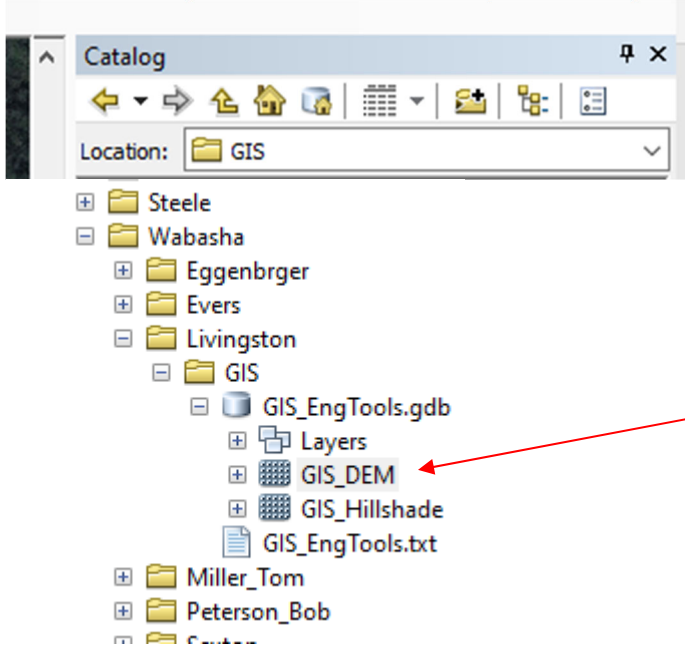
ArcMap

ArcToolbox
- -- NRCS Engineering Tools --
  - Field Office Tools
    - 0. Convert Web DEM
    - Clip DEM to AOI
    - Create Contours From AOI
    - Create Cross Section / Profile(s)
    - Estimate Pool From Contours
    - Slope - Average by AOI
    - Slope - Percent By AOI
  - Practice Design Tools
  - Watershed Tools
  - Terrain Analysis Tools
  - Utilities
- 3D Analyst Tools

When in ArcMap access the NRCS Engineering Tools toolbox and double click on the Create Contours from AOI.

Below is an screenshot with the information completed to complete the tool. ****Pay special attention to the red circled areas. Note: Plan on using the DEM01 for the Input DEM.

Folder to save files

Create Contours From AOI

Ouput Contour Interval (in Feet)

Browse to and Select Workspace
C:_Projects\2019\Wabasha\Livingston\GIS

Input DEM
Lidar Wabasha\dem01

Choose Input DEM Elevation Units (optional)

Enter Your Area of Interest
CreateContoursFromAOI::Enter_Your_Area_of_Interest
☐ Enter_Your_Area_of_Interest

Ouput Contour Interval (in Feet)
1

The user can specify a contour interval for the output contour lines.

Note: The option for a user specified contour interval does not guarantee accurate output contours at any user desired interval. All DEM files have a best supportable contour interval dictated by their vertical accuracy. Users should review the metadata for their input DEM and determine the vertical accuracy of their data. The

OK   Cancel   Environments...   << Hide Help   Tool Help

In ArcCatalog, browse to the newly created geodatabase:

This tool creates a GIS_DEM that may need to have some adjustments done for units.
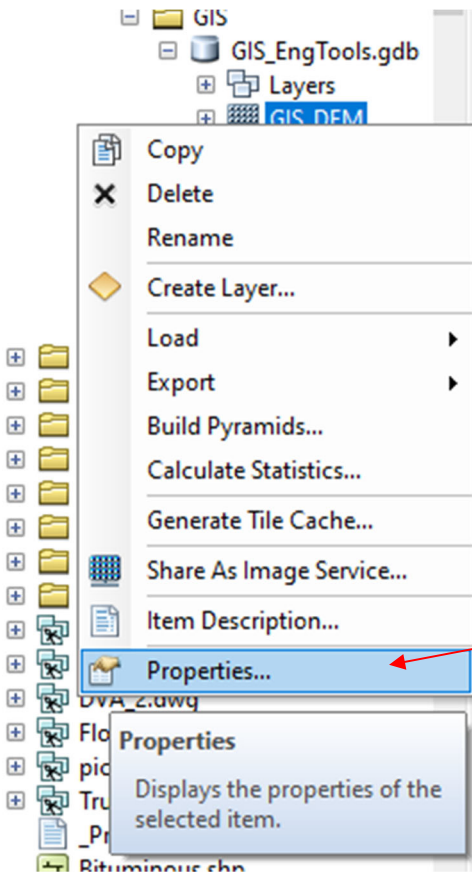
Right click on the GIS_DEM and select properties.

Scroll down in the resulting dialogue box on the **General** tab. Left click the Edit button in the **Spatial Reference** row.

Raster Dataset Properties   ✕

General   Key Metadata

Property	Value	
Left	555753.732276	
Right	556366.732276	
Bottom	4895930.23583	
⊟ **Spatial Reference**		Edit...
XY Coordinate System	NAD_1983_UTM_Zone_15N	
Linear Unit	Meter (1.000000)	
Angular Unit	Degree (0.0174532925199433)	
False_Easting	500000	
False_Northing	0	
Central_Meridian	-93	
Scale_Factor	0.9996	
Latitude_Of_Origin	0	
Datum	D_North_American_1983	
Vertical Coordinate S...	NAVD_1988	
Linear Unit	Foot_US (0.304801)	
Vertical_Shift	0	
Direction	positive up	
Datum	North_American_Vertical_Datum_1988	

Check Vertical Coordinate System. This needs to say **Meters.** If not, complete next two steps.

OK   Cancel   Apply

Select the **Z Coordinate System** tab.

Spatial Reference Properties

XY Coordinate System   Z Coordinate System   Z Domain

Type here to search

Favorites
Vertical Coordinate Systems
Custom
NAVD_1988

Double left click on the **Current Coordinate System**. Reference the box below for the current system used.

Current coordinate system:

NAVD_1988
Authority: Custom

Linear Units: Foot_US
Direction: positive up
Vertical Shift: 0.0
Vertical Datum: North_American_Vertical_Datum_1988

OK   Cancel

This Linear Unit may need to be changed to Meters. ****If this unit is already meters nothing needs to be completed at this level.

Add the GIS_DEM to the table of contents and right click on that file.

Data➔Export Data

Select the location of the file to be created. Ensure that TIFF is the file format selected.

Right click on the GIS_Contour shapefile.

Data→Export Data

Export Data
Save this layer's data as a shapefile or geodatabase feature class

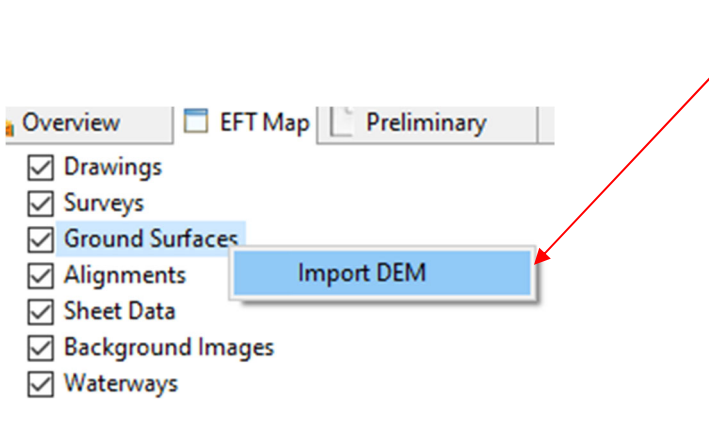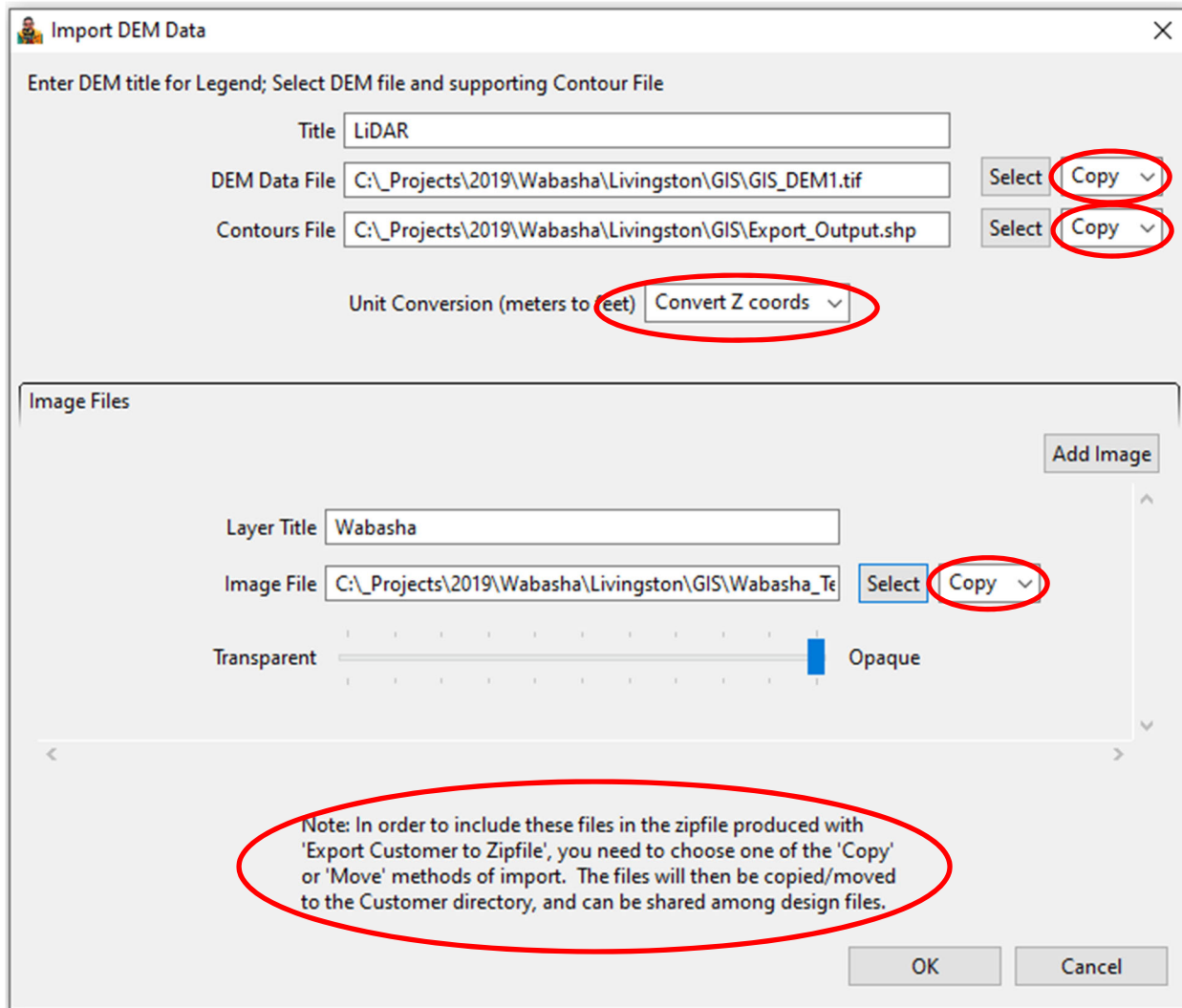

Choose the location to place the resulting .shp file.
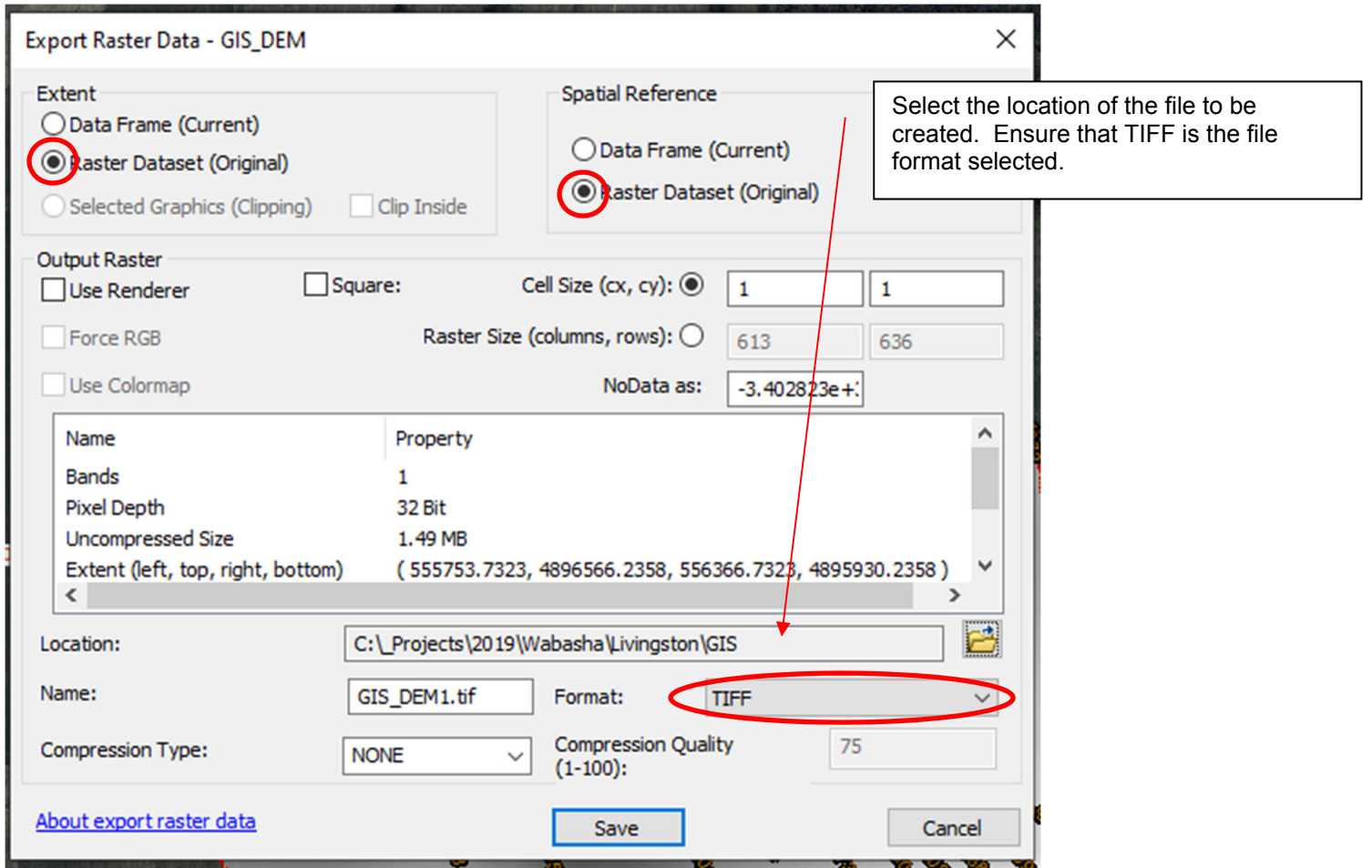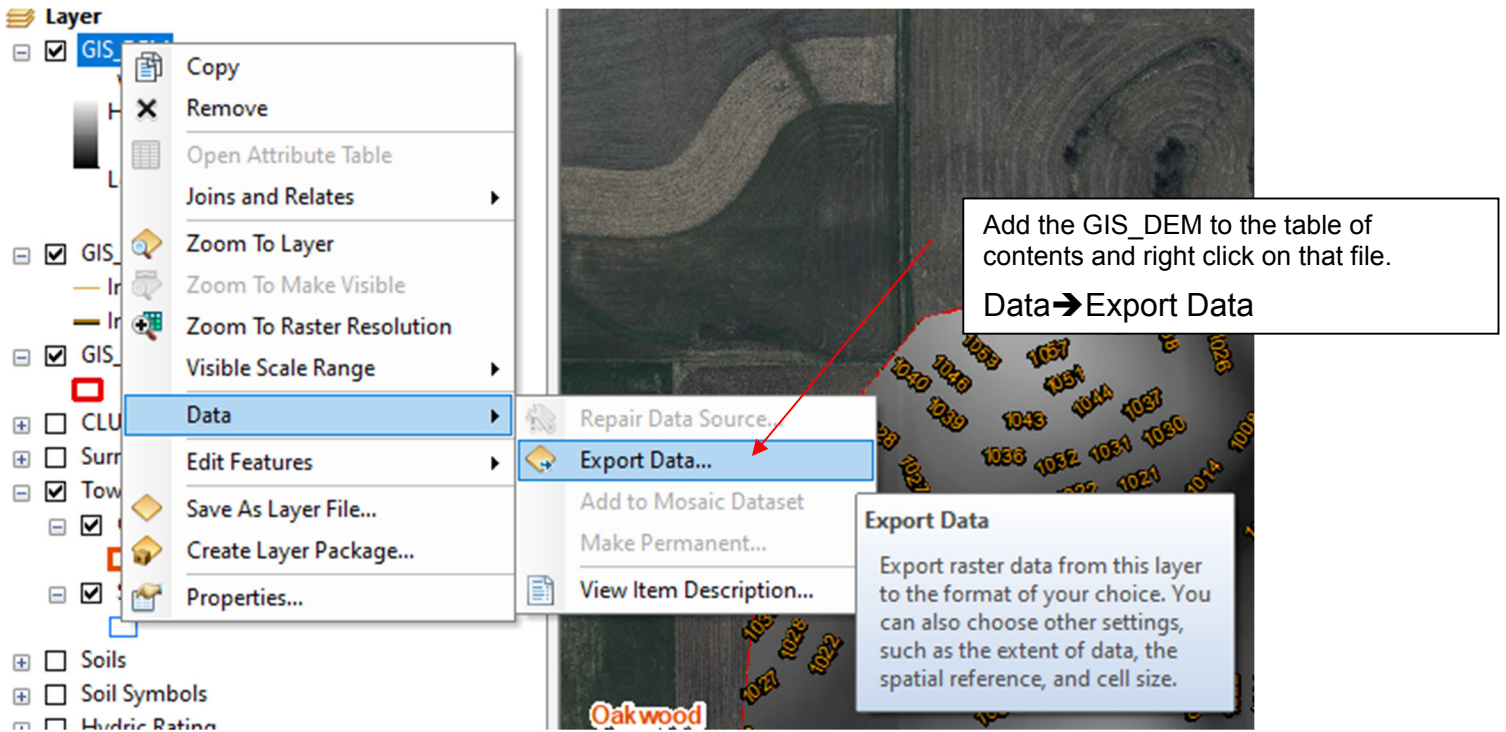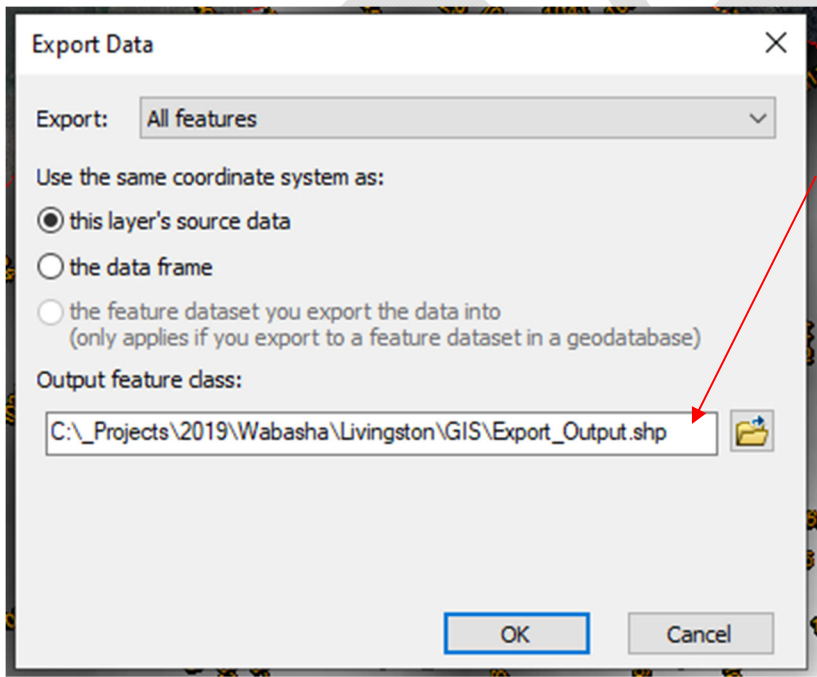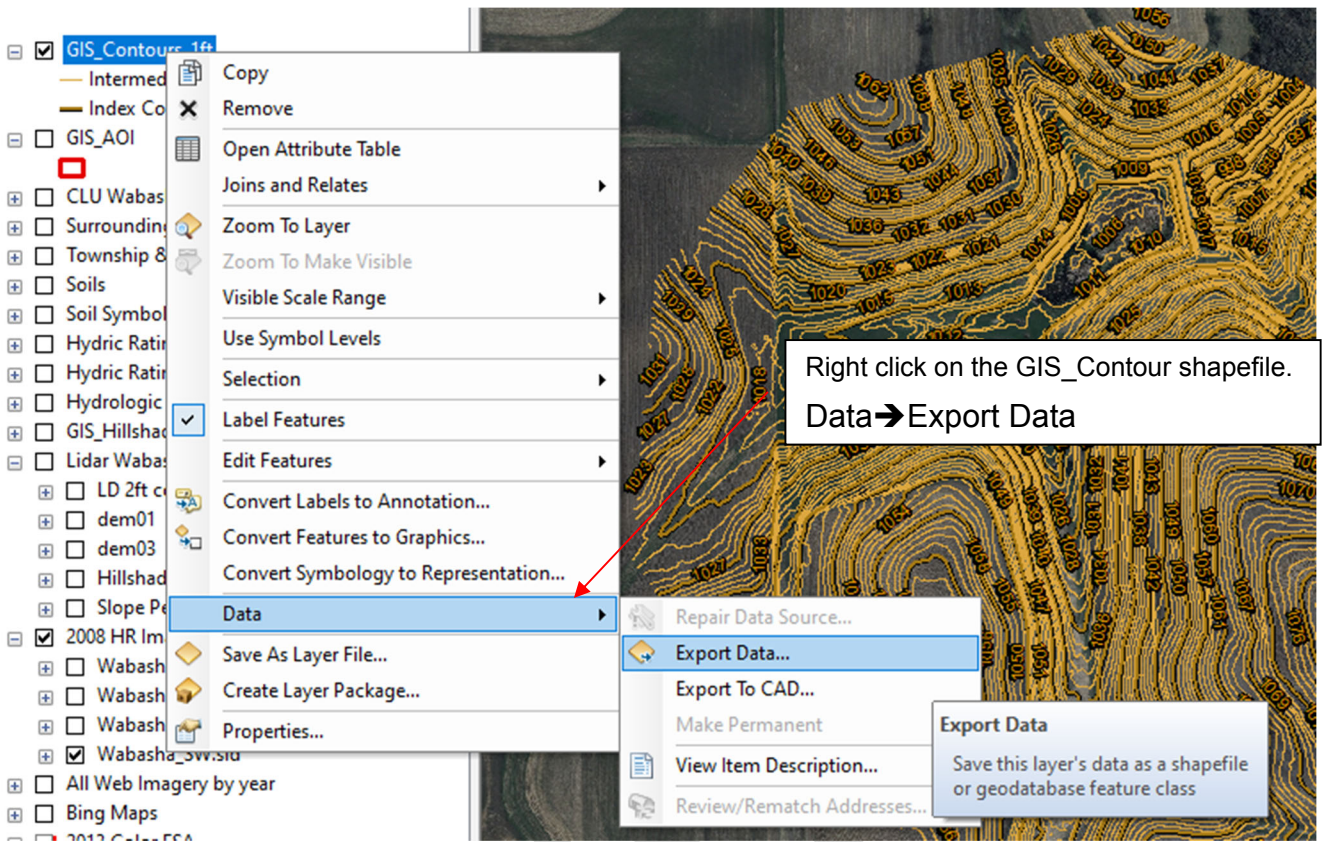
Engineering Field Tools

Create a new survey, terrace or waterway design in a selected customer/project folder.

Right click on Ground Surfaces.

Select **Import DEM**

Below is a screenshot of the window and fields completed for importing the DEM, Contour shapefile and imagery (if needed).

****Pay special attention to the red circled options.

Overview   ☐ EFT Map | Preliminary

- ☑ Drawings
- ☑ Surveys
- ☑ Ground Surfaces   **Import DEM**
- ☑ Alignments
- ☑ Sheet Data
- ☑ Background Images
- ☑ Waterways

Import DEM Data   ✕

Enter DEM title for Legend; Select DEM file and supporting Contour File

Title	LiDAR
DEM Data File	C:_Projects\2019\Wabasha\Livingston\GIS\GIS_DEM1.tif Select Copy ⌄
Contours File	C:_Projects\2019\Wabasha\Livingston\GIS\Export_Output.shp Select Copy ⌄

Unit Conversion (meters to feet)   Convert Z coords ⌄

Image Files

Add Image

Layer Title	Wabasha
Image File	C:_Projects\2019\Wabasha\Livingston\GIS\Wabasha_Te Select Copy ⌄

Transparent |————————————████— Opaque

Note: In order to include these files in the zipfile produced with 'Export Customer to Zipfile', you need to choose one of the 'Copy' or 'Move' methods of import. The files will then be copied/moved to the Customer directory, and can be shared among design files.
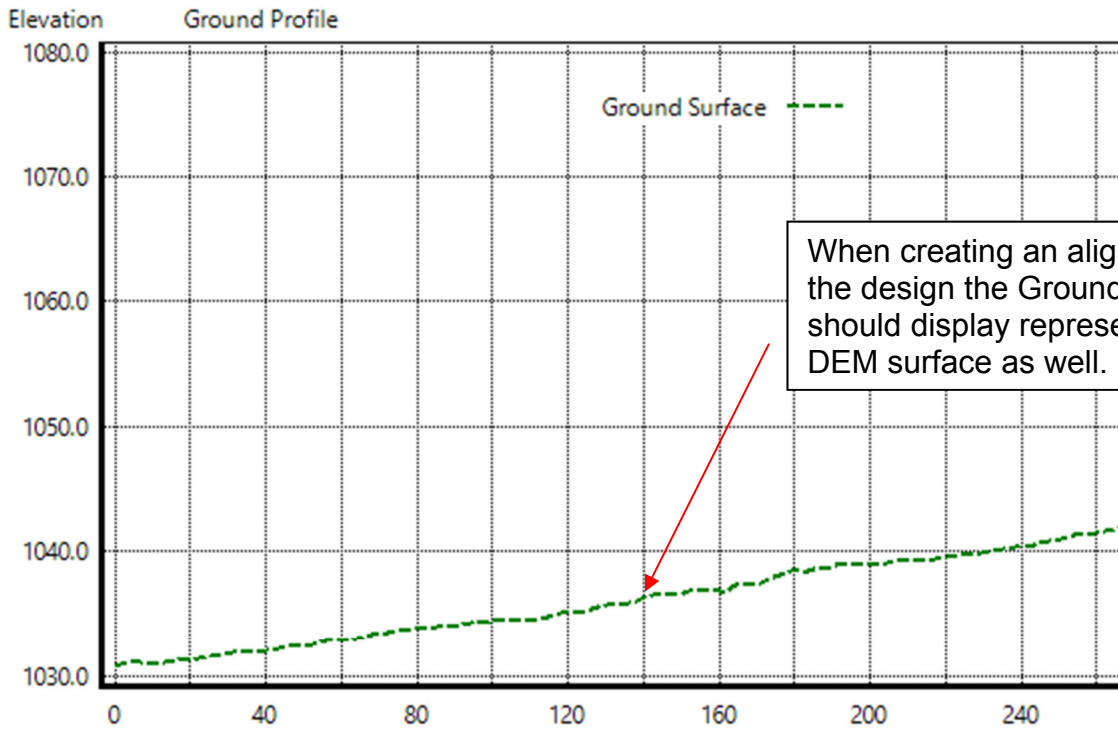
OK   Cancel
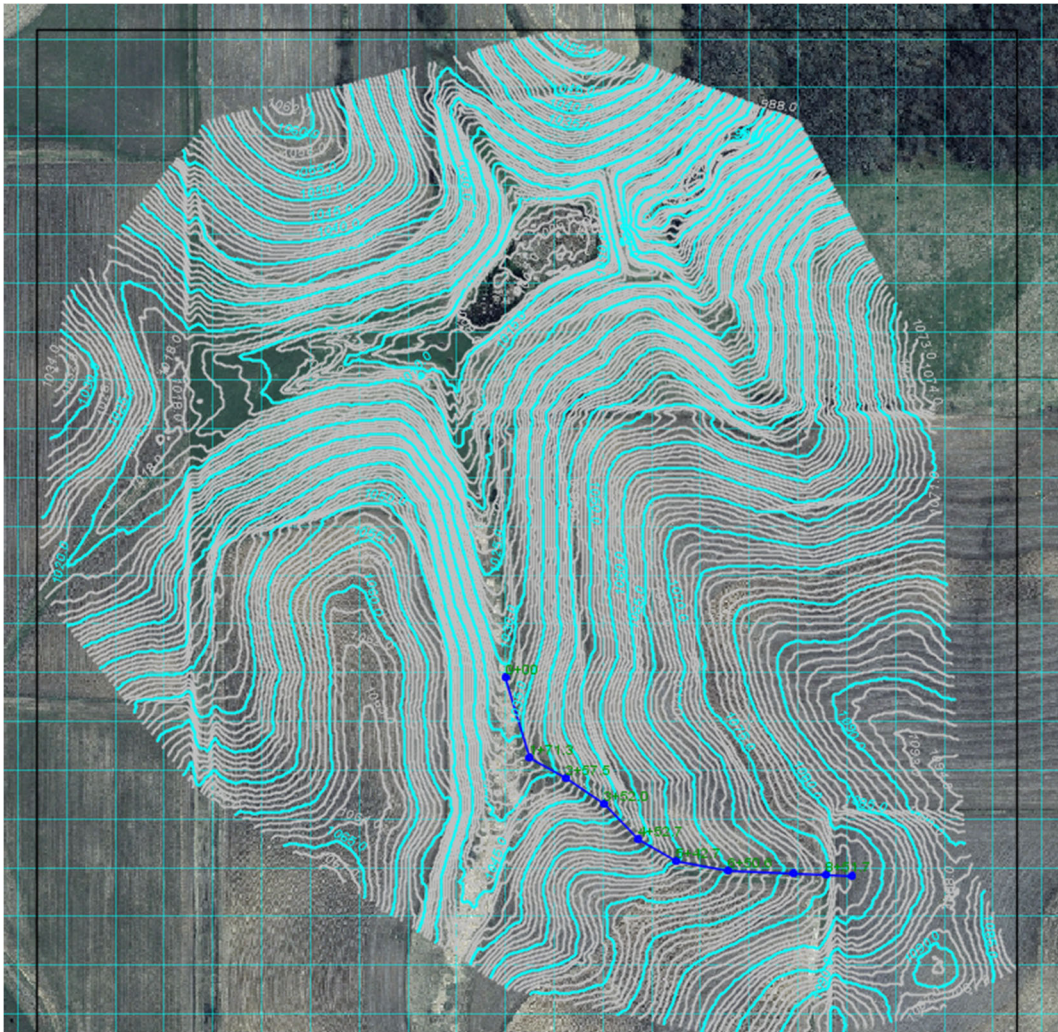
If done correctly, when the cursor hovers over the DEM/Contour Area, the elevation should be displayed in US Survey Feet.

US Survey feet   X (Easting): 1,823,938.07   Y (Northing): 16,063,298.4   Z (Elevation): 1,059.61

UTM_15N   Elev. from DEM LiDAR

When creating an alignment for the design the Ground Surface should display representing the DEM surface as well.