Creating and Aligning ContextCapture Reality model to MicroStation Project Ground Coordinates

Update 19

Many Departments of Transportation, rail or spatial base projects use localized or project specific coordinate systems. These localized systems typically will use a scale and or rotation factor from a known Grid. These coordinate values when used for surveyed ground control provide the positioning constraint for photogrammetric Reality Model in ContextCapture. This document refers only to those systems based on feet or survey feet “Local coordinate system”. A “metric” Local coordinate option continues to be available.

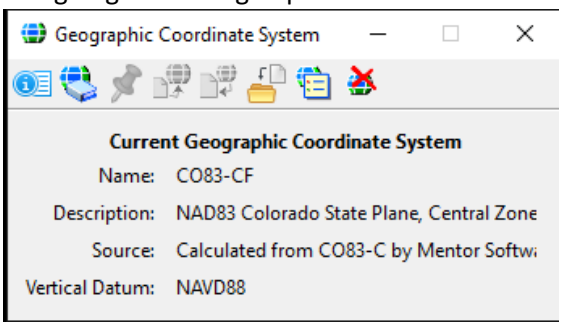
This document will supersede any previous workflows for managing ground or cartesian coordinate systems using imperial units (foot, survey feet).

This document will also provide instruction on properly attaching or referencing the localized (English or metric) reality models (3sm and 3mx) to a MicroStation design file (.dgn)

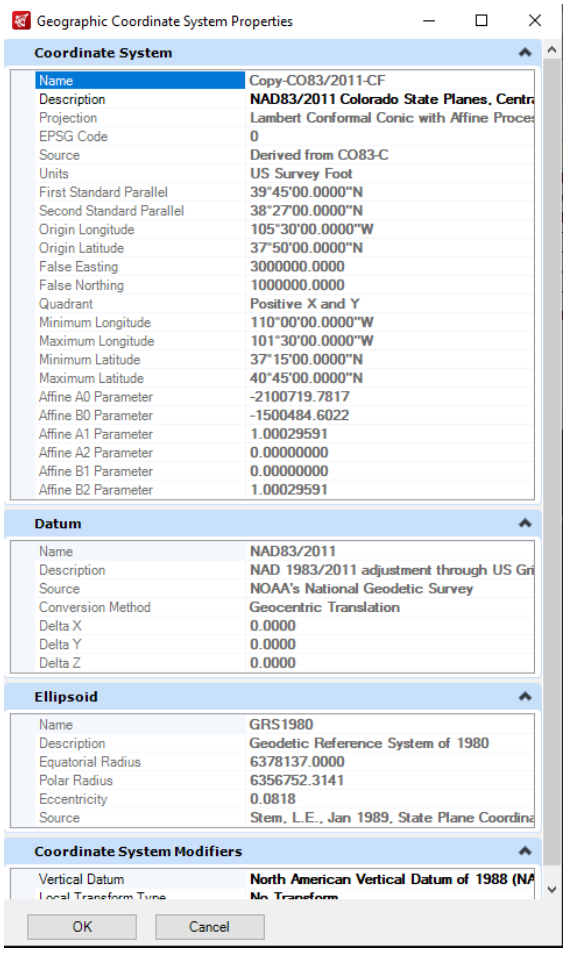
Reviewing the Data

We would like to thank Colorado DOT for providing the dataset including the following.

- Nadir Imagery captured over small portion of project (172 jpg photos)
- Survey ground control EPSG 2232+ 6360 (Referred to as "Grid") csv file
- Same Ground control points converted to "Ground" csv file
- Design dgn including imported "**Grid**" GCP 2232 w/ state plane coordinate system set



- Design dgn including "**Ground**" GCP w/ ground coordinates inc "affine" parameters scale and rotation

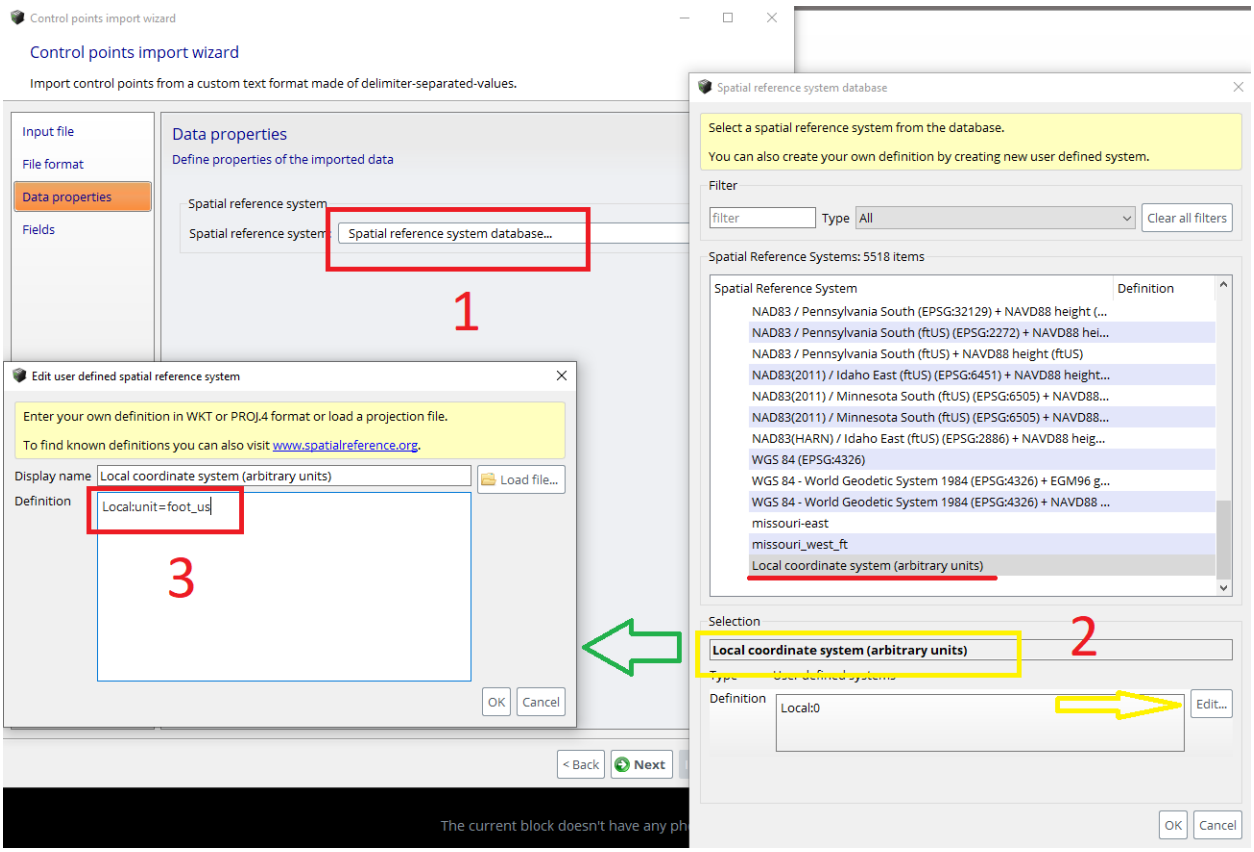


You can learn more here on [how to create a custom Coordinate System in MicroStation]

Creating a Reality Model in ContextCapture with survey ft GCP

This section will detail the process of creating the Local coordinate system for survey feet

1. Open ContextCapture and create a new project
2. Import your photos > adjust the height reference as needed for sea level or ellipsoid as needed
3. Import your survey control
4. On the Data Properties open the “spatial Reference System dialog (1)
5. Scroll down and select Local Coordinate System Arbitrary Units > click Edit (2)
6. In the Edit Dialog enter the text *Local:unit=foot_us*
7. you can – rename the- coordinate display name to “Local Survey ft” Click ok and accept the changes



8. finish importing the GCP by specifying the fields to the cooresponding Name, Y, X and Z

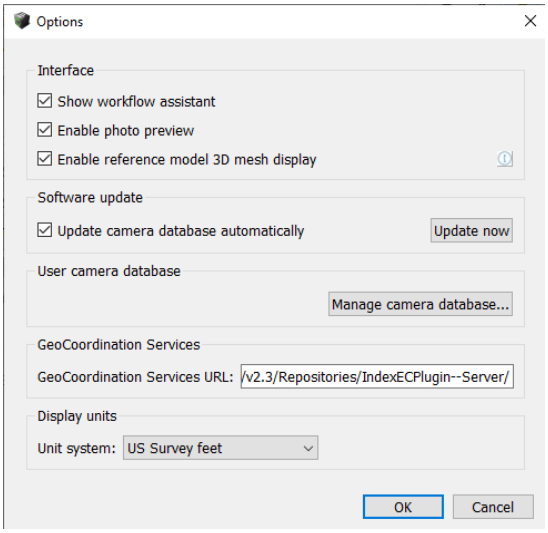
   you are now ready to mark the appropriate photos to the correct control point.

Important- because the image geotags will be using GPS coordinates they will not immediately correlate the local coordinates to the imagery.. marking the GCP in the field with the corresponding point number can save time to set the first couple of points. The software will attempt to locate images for the remaining controls.

9. Submit Aerotriangulation –

Note : the majority of time default settings can be used. This document is meant to guide a user through the process. If you would like more information on GCP settings you can download and review the Bentley learn Documents on working with GCP

10. Review the AT results in the 3D view
11. Set the measuring options under the tools > Options menu > change the units to “survey feet”



12. Use the measurement command in the 3d View and check a know distance to confirm the scale is accurate

13. Create a 3D reconstruction > Note the spatial framework tab – No spatial reference system is available as this model is using “Local Coordinates”
14. Set the tiling as needed (Adaptive if you are unsure and do not adjust ram usage)
15. Create a production “3D Mesh > choose **3mx** > on completion create a second 3D mesh **3sm**

    Note: Spatial Reference will be unavailable as this is a “local coordinate system” (meaning it is using a scale factor to adjust for the grids projection)

    When the productions complete you will have two Reality models ready to use in your project or cartesian design