Geospatial Modeling & Visualization

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Using Leica's COE Plug-in in Cyclone

This workflow will show you how to use Leica's COE plug-in to import and export objects and points in Cyclone.
Hint: You can click on any image to see a larger version.

IMPORTING & EXPORTING

Importing & Exporting Objects and Points in Cyclone with COE Files

I. Importing files into Cyclone is done through the Navigator window, where a new MS is created with the imported file -> Open Cyclone Navigator -> Select Database/ModelSpaces Folder -> RC -> Import -> browse to COE file -> Open -> MS View appears named by default with the COE file location

> **NOTE:** You cannot import a COE into a MS view, rather it must be imported into the overall "ModelSpaces" project folder at which time a new MS view is created for editing. While most objects can be imported into Cyclone, complex objects (ie: beveled edges, rounded corners, notches) may be translated into a collection of lines and arcs versus objects when imported

MANAGING THE COE-MS

II. Managing the COE-MS -> Open the COE ModelSpace that has automatically been created -> It is recommended that you group objects and place them on individual layers as needed in this original COE MS (to group -> Select Objects -> Edit -> Group -> Group -> Objects can be ungrouped at any time with this command as well) -> Copy all objects -> Close COE MS

PASTING COE OBJECTS INTO ORIGINAL MS

III. Pasting COE objects into Original MS -> Its highly recommended to copy and paste the original MS as a copied/working MS in Cyclone Navigator; use this copied MS to insert objects, updating the original MS only as a final step -> Open copied MS -> Paste objects that were copied from COE file in Step II -> NOTE: if coordinates were maintained and referenced throughout the modeling and export process, the object should automatically paste into the correct position. If references/links have been lost, the imported objects may need to be moved/rotated (select objects -> RC -> move/rotate)

> **NOTE:** When moving grouped or multiple objects, faces and lines may appear to remain in their original position or become displaced during manipulation; as long as all objects are selected or grouped/selected, this is only a refreshing issue -> View Properties (Shift + L) -> Selectable/Visible Tab -> toggle the visibility of the object type off (ie: mesh or patch, etc) and when toggled back on, the view of all objects should be refreshed.

COMPARING MODELED OBJECTS WITH ORIGINAL POINTS

Comparing Modeled Objects with Original Points in Cyclone

I. Import the COE file into Cyclone Navigator

II. Upon importing, the COE creates its own MS that loses many of the editing/manipulation options -> Open the COE MS -> Select All -> Copy -> Open Working MS (containing points to compare/analyze) -> Paste COE object(s) into Working MS; NOTE: Pay attention to the layers in Cyclone: all ACAD layers accompany the object when imported however when copied/pasted objects are placed on a layer named 'default~'; Manually assign the correct layer to the object in the Working MS and delete unnecessary layers.

CALCULATE MESH TO POINT CLOUD DEVIATION

III. Calculate Mesh to Point Cloud Deviation -> Multi-select the object mesh and the point cloud (Its recommended to view the mesh in "per-face normals" setting > Shift + L for Layers > View As tab) -> Tools -> Measure -> Mesh to Points Deviation -> Dialogue Box Options:

> Slider bar allows user to adjust and preview deviations on the mesh faces above a user-set limit; minimum and maximum boxes are read-only
> Distance computation – user decides whether those faces that are highlighted are based on maximum or average deviation and Absolute (no positive/negative distances) or Signed Distance
> Details – displays total mesh faces, # of faces deviating, what percentage of the whole that represents, and total # of points

CALCULATING DEVIATION – CONT.

IV. Calculate Object to Point Cloud Deviation when Object is created in Cyclone > Object (ie: cylinder, primitives) -> after creation, select object and RC -> Info dialogue tells Fit Quality including Error Mean, Error Std. Deviation, and Absolute Errors; Interfering Points may also be calculated

V. Calculate Object to Point Cloud Deviation when Object is created outside of Cyclone -> Interfering Points -> Multi-select object and point cloud -> Tools -> Measure -> Interfering Points -> Dialogue box appears in which user can adjust the tolerance to calculate -> all cloud points that are within the user-specified distance of the selected object are highlighted and can be segmented from the rest of the cloud (See Cyclone help 'How to Segment interfering points' for more details) and dialogue box displays the percentage of points interfering and the percentage of points inside the object (useful in volumes); this analysis is limited in many modeling applications as accurately modeled objects rarely lie completely on one side of the points referenced

You are reading the series: Using Leica's COE Plug-In with Point Clouds and AutoCAD 2010
Using Leica's COE Plug-in in Cyclone