



Creating Deliverable Shape Files

Process document for Client Deliverables

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Prepared by: Sondra Robinson

Reviewed by: Manager

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Date	Software Version	Changes
2017-06-05	ArcMap: 10.1 MicroStation: 8.1 GlobalMapper: 12.3	Original

1 Overview

This document walks through the steps needed to create the various shape files delivered to client based on client specification worksheet provided by PM. Document is found in reference pool and has the final say. Any information there which is not reflected here is what must be adhered to and this document updated accordingly.

2 Programs Used

You will need Bentley MicroStation, Global Mapper and ArcMAP.

3 Supplied Information

Information which will be provided at the start of the project should include:

- Location of the object files to be used – provided by the Project Lead
- The date the object was flown – Look at the production tracking sheet in reference pool
- Location of the TILES.SHP file provided by the Ortho team
- All references to directories are those found standard within the client's current project object files

4 Directions

4.1 Confirm Elements Needed

Using MicroStation, open the DGN file found within the TEMP directory of the specified file set to make sure the file has everything required before moving forward. You'll find 4 layers:

Raw_Blocks – complete with raw block file names

Final_Blocks – complete with final block file names

Raw outline

Final Outline – double check to confirm no aspect of the final outline lies outside the enclosing raw outline. If so, alert Project Lead immediately and wait for correction before proceeding.

If these layers are not present and fully filled out based on the object requirements, they have not yet been created. See the documents preceding this one for those steps or ask the Project Lead to complete the various layers. Once completed, return here.

Once confirmed, save the current DGN as a DXF file type. Close MicroStation

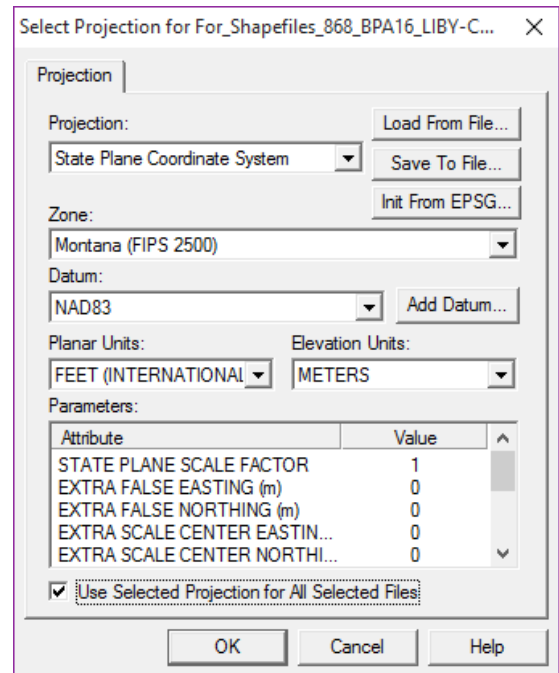
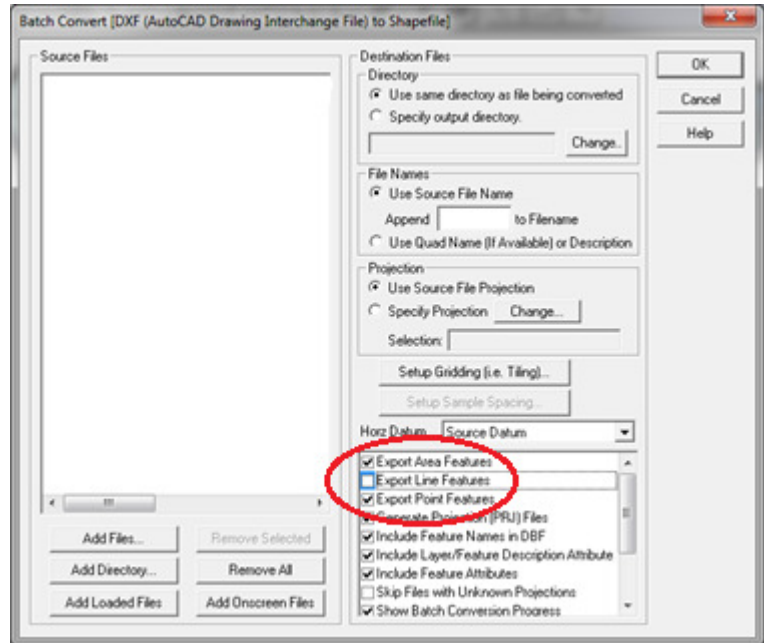
4.2 Create Working Files

Launch Global Mapper and convert the DXF file just worked on into a SHP file. To do:

1. Click on “File” and choose “Batch Convert/Reproject”
2. Select “DXF” as the source file and “SHP” as the ending file type
3. Add the target file and make sure the datum chosen is as shown in the screen shot here:
4. Make sure the projection system matches the information given on the file name itself
 - a. If a system is not found, a prompt will pop-up which enables this to be added
5. Be sure the bottom check box **is marked**
6. Click “OK”
7. Close Global Mapper

NOTE: Sometimes the DXF does not export the area features correctly. If the blocks contain Xs, these are corrupt shapes.

TO FIX: Export the DGN to a Shapefile. Follow steps above, except in step 2 select “DGN” instead of “DXF” and in step 3 only the “Export Area Features” needs to be checked.



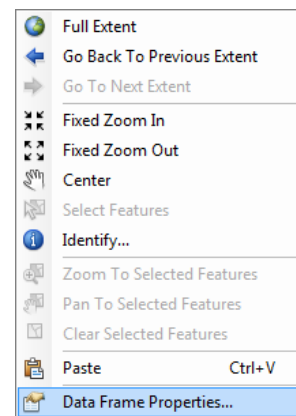
4.3 Create Working Directories

Before going any further, create a couple of new directories within the TEMP directory of the provided location of the utilities object files to be used. Name them as follows:

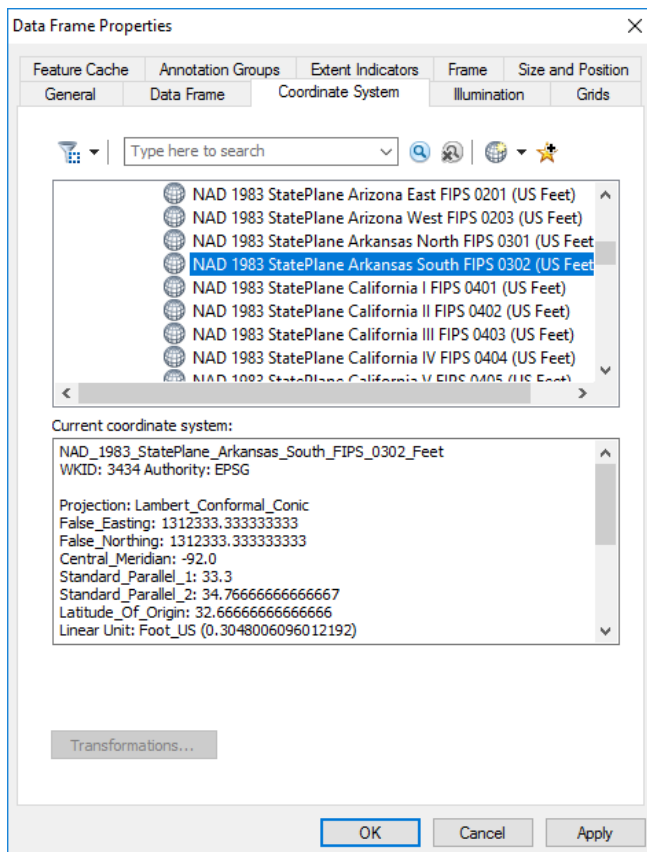
SHAPEFILE_TEMP
SHAPEFILE_FINAL

4.4 Activate Correct Projection

1. Open the ArcMAP program
2. Set the Data Frame by *right-clicking* the mouse anywhere on the program desktop to open the properties menu as illustrated. Select the very last option “Data Frame Properties”.
3. Select the Coordinate System which matches the information provided by the client for this particular object.
4. Once selected, click OK to apply and close.

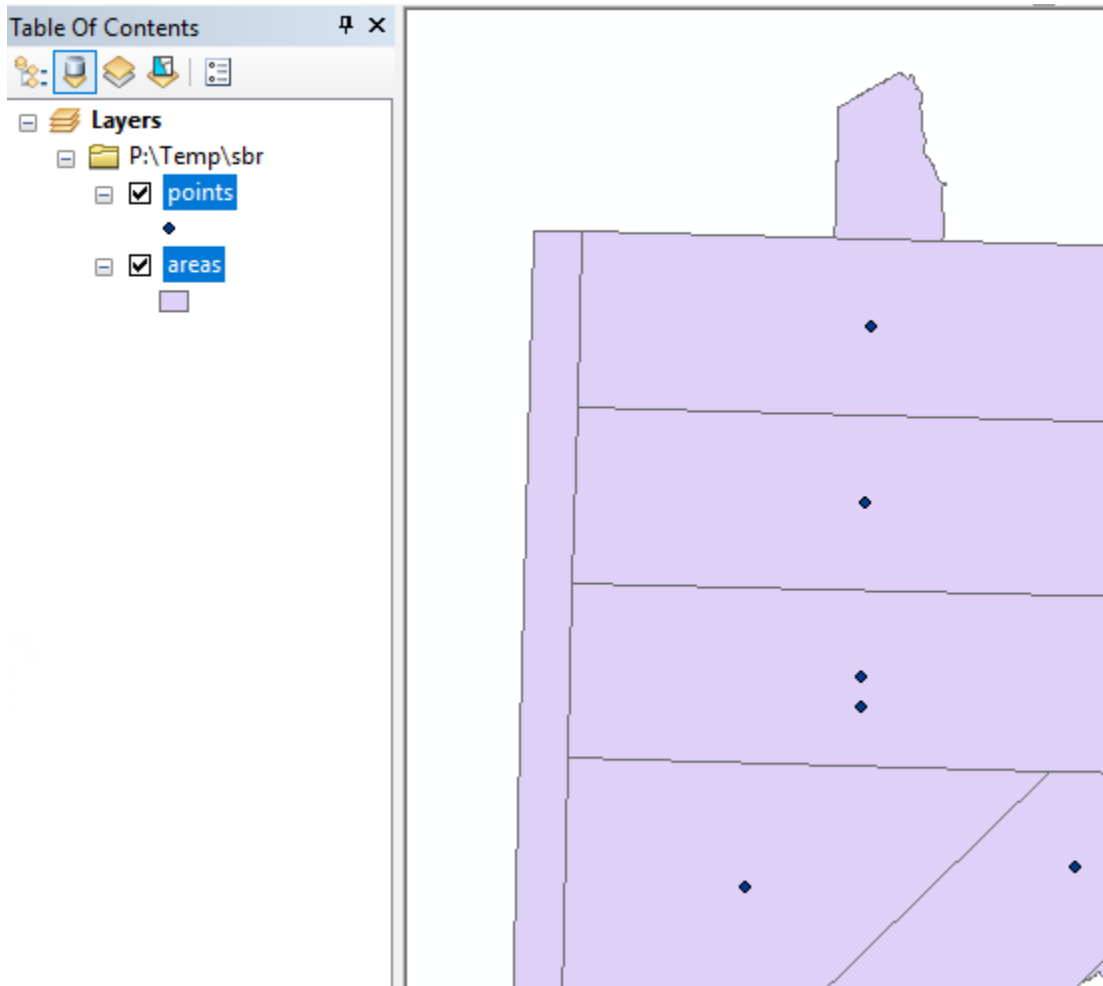


Data Frame Properties
Change the properties of the active data frame in your map, such as coordinate system.

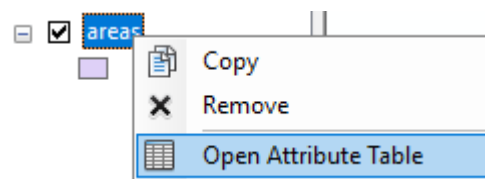


4.5 Create Source Files

1. Drag the AREAS and POINTS SHP files created in Step 4.2 into the program Layers of ArcMap. Drag-and-drop works nicely. They should look like this. If not, revisit the earlier steps.

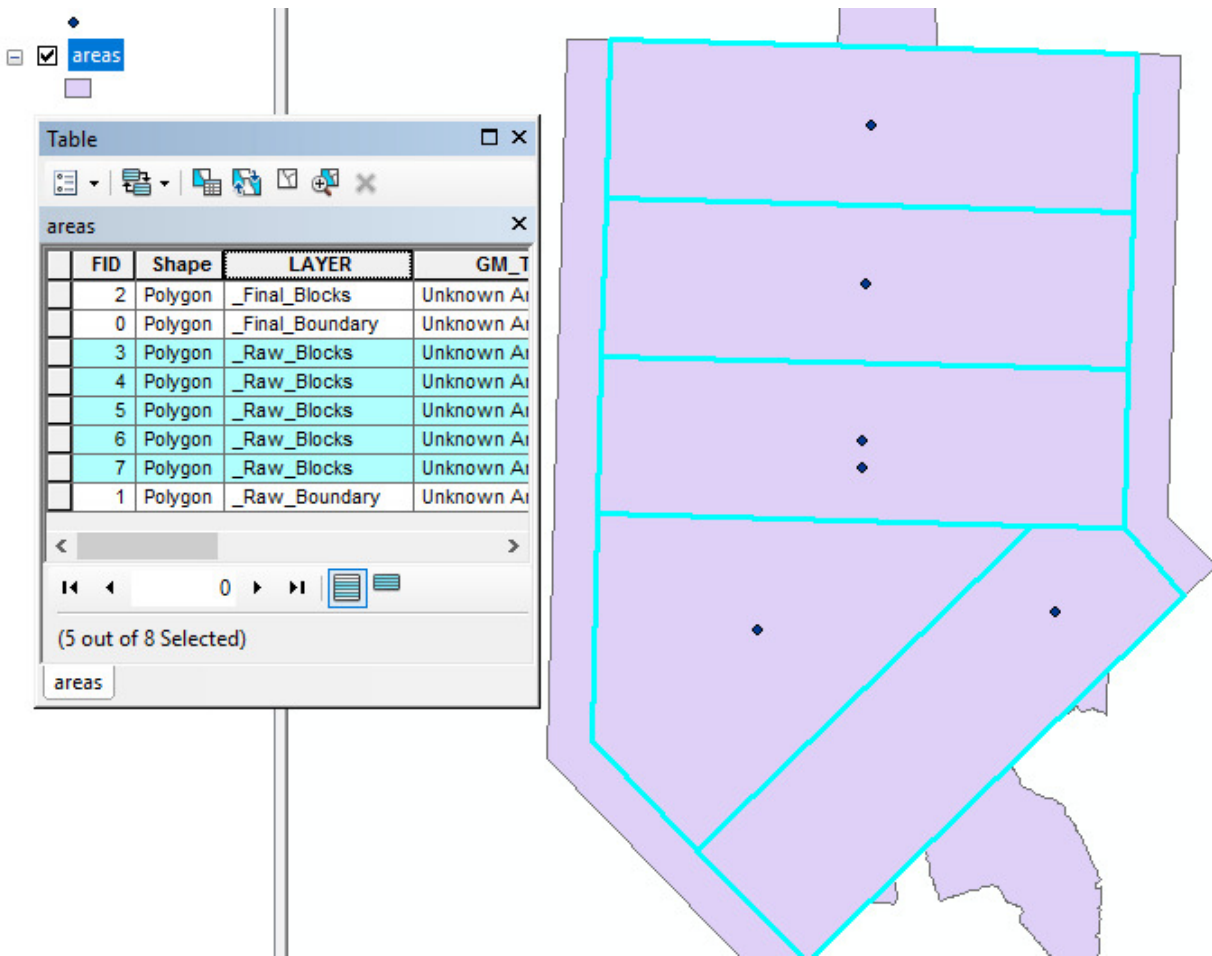


2. For each of the 2 files dragged over, open the Attributes Table by *right-clicking* on the file name and selecting "Open Attribute Table".



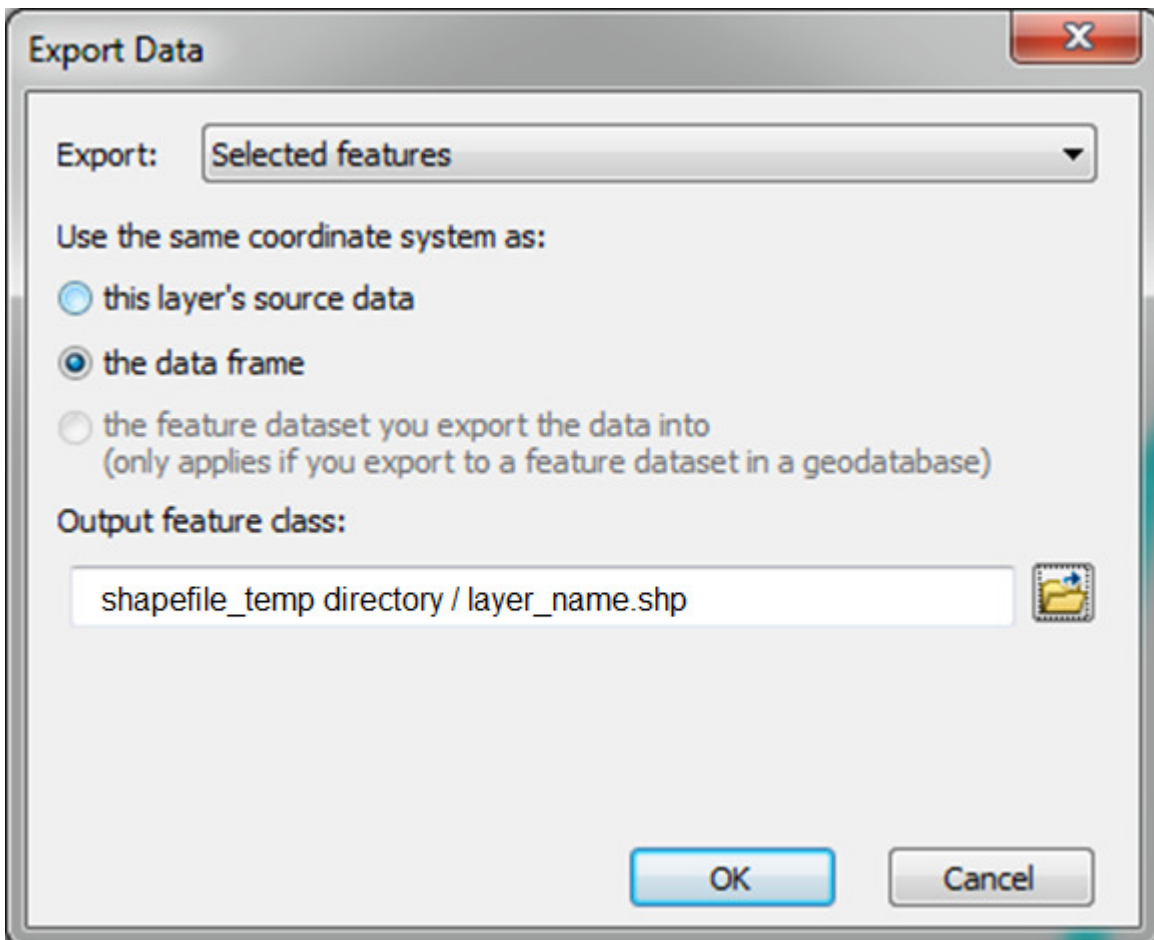
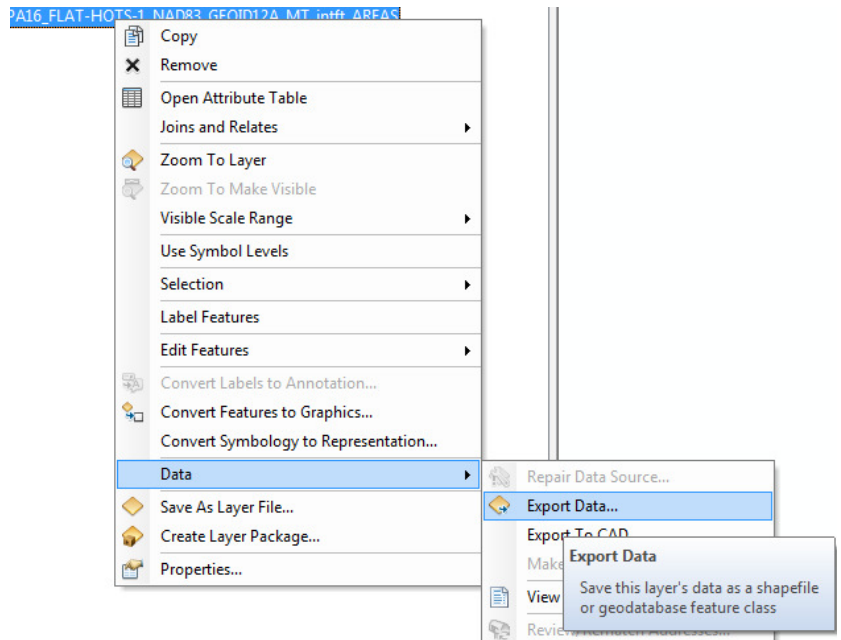
3. Look for the field named Layer.
 - a. There should be 4 types present in the AREAS file: Blocks_Raw, Blocks_Final, Buffer/Outline_Raw, and Buffer/Outline_Final.
 - b. There should be 2 types present in the POINTS file: Blocks_Raw & Blocks_Final
 - c. Any other layer types can be ignored.

- d. Recommend: Also load the Tiles.shp (Step 6) and compare to make sure all files cover the exact same area. If they do not line up, contact Project Lead for assistance.
4. Each individual types will be exported as a separate file. From the Attributes Table, *right-click* on Layer name and select sort by type. Once sorted, select all of the type chosen. See the selected items highlighted on the main screen in ArcMap.



5. If there are TWO or MORE Outline fields, skip to the section for Special Cases - "Donuts". DO THIS BEFORE CONTINUING if applicable.

6. Once all elements within a single Layer type have been selected, export the data by *right-clicking* on the file name and selecting “Data” then “Export Data...”
7. Look at Export Data window below to make sure all options are chosen correctly.



8. Save the file to the newly created SHAPEFILE_TEMP working directory using the following naming convention:

AREAS file:

BLOCKS_RAW Layer → BLOCKS_RAW.SHP

BLOCKS_FINAL Layer → BLOCKS_FINAL.SHP

OUTLINE_RAW Layer → OUTLINE_RAW.SHP

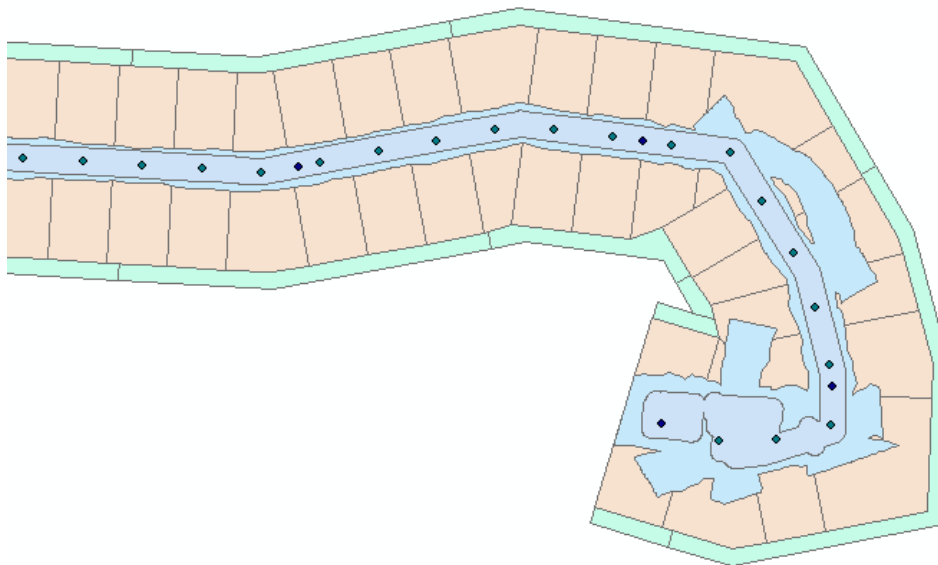
OUTLINE_FINAL Layer → OUTLINE_FINAL.SHP

POINTS file:

BLOCKS_RAW Layer → POINTS_RAW.SHP

BLOCKS_FINAL Layer → POINTS_FINAL.SHP

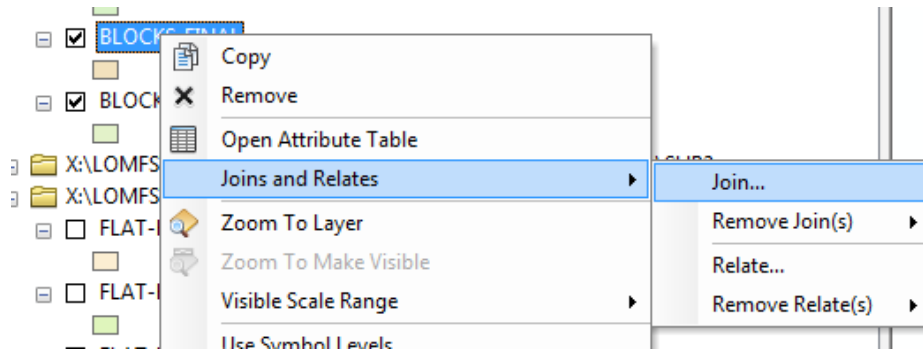
9. When saving, choose the option which opens the newly made file in ArcMap.
10. Repeat steps 6-8 for each of the layer types.
11. Close AREAS.SHP and POINTS.SHP before proceeding, leaving open only the 6 new files created.
12. For reference, they should look like this when finished.



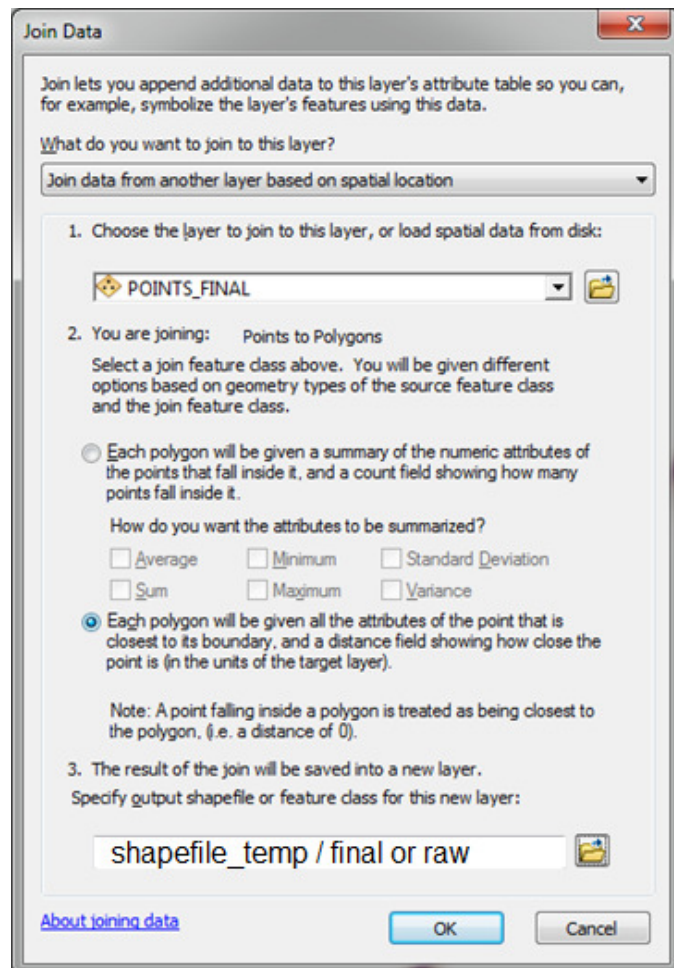
4.6 Join Blocks with Points

For the BLOCKS files (lidar shapes), they must each be joined to the POINTS files (lidar file names) as follows:

1. Select the Blocks_Final file and right click to select Joins & Relates → Join...

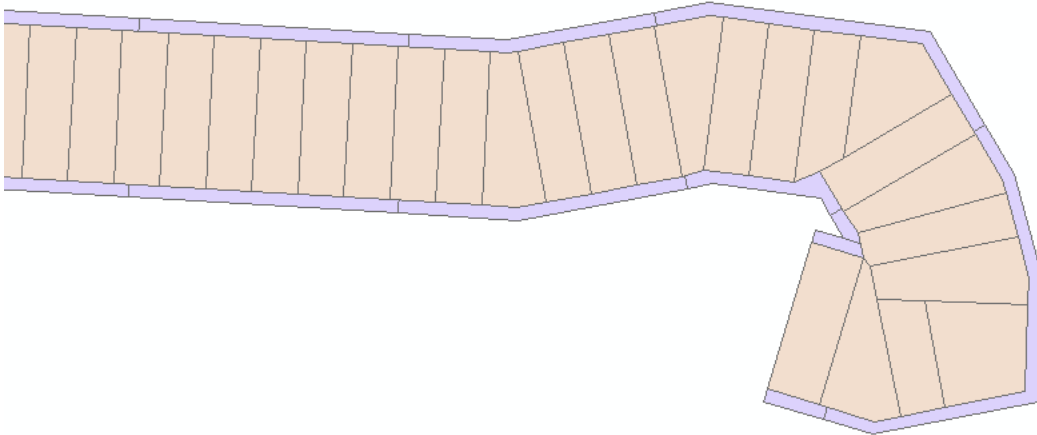


2. Fill out the resulting window as shown to the right, matching the Block type and the Points type (*final to final, raw to raw*):
3. Save the file in the SHAPEFILE_TEMP directory using a short name such as Final or Raw.
4. When saving, choose the option which opens the newly made file in ArcMap.
5. Once both join files are done, Remove the final_blocks, raw_blocks, raw_points, and final_points source files from ArcMap. Only the new joined files and the outlines should still be open.



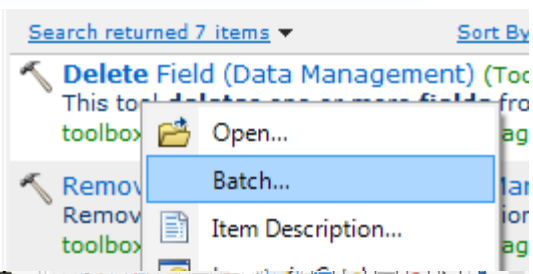
4.7 Remove Non-Name Attribute Fields

Once both joins are completed, the final files should look like this – with the larger final and the smaller raw. Opening the Attributes table should now include a unique file name with each line.

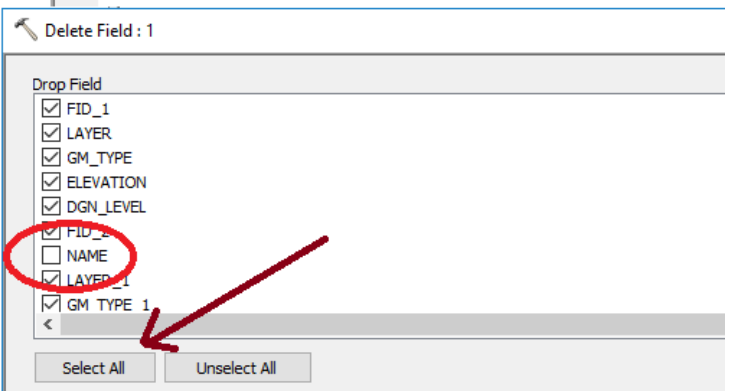


Get rid of all extra attribute columns from the new files.

1. To do this, select Search → Delete Fields → *right-click* “Batch”
2. Select both join files and drag them under the Input Table field.
3. Double click in the “Drop Field” section to open the selection window.
4. Click “Select All” then uncheck the NAME field only. Repeat for both join files and wait for process to complete after clicking OK.



	Input Table	Drop Field
1	Final	<i>click in here to open options window</i>
2	Raw	



Drop Field

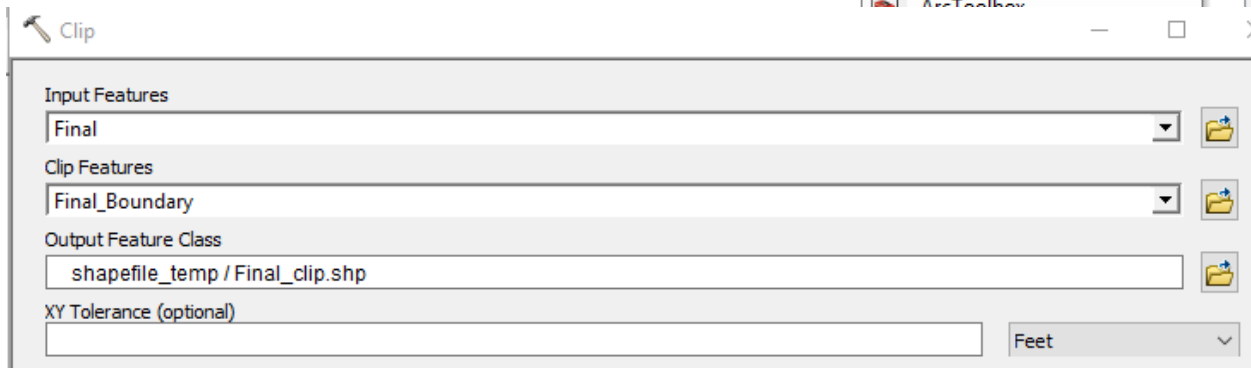
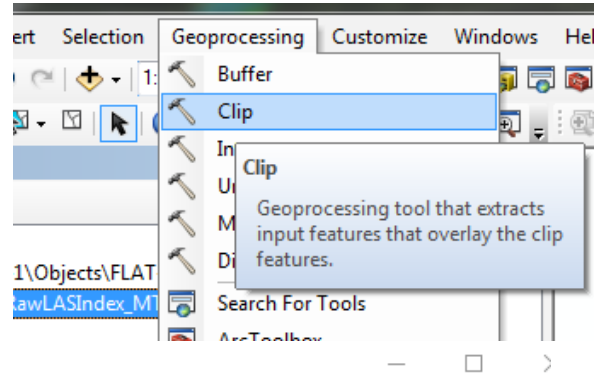
- FID_1
- LAYER
- GM_TYPE
- ELEVATION
- DGN_LEVEL
- FID_2
- NAME
- LAYER_1
- GM_TYPE 1

Select All Unselect All

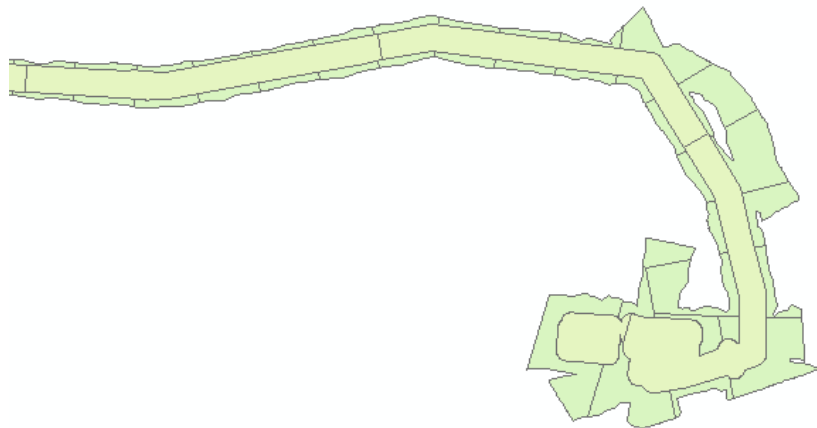
4.8 Clip to Outline

Clip the Final & Raw files to the appropriate OUTLINE files.

1. Click on Geoprocessing → Clip
2. Drag the RAW or FINAL file into the “Input Features” slot and the correct matching outline file into the “Clip Features” slot. Just RAW_BLOCKS went with RAW_POINTS, here the RAW is clipped to the RAW_OUTLINE and FINAL to the FINAL_OUTLINE.

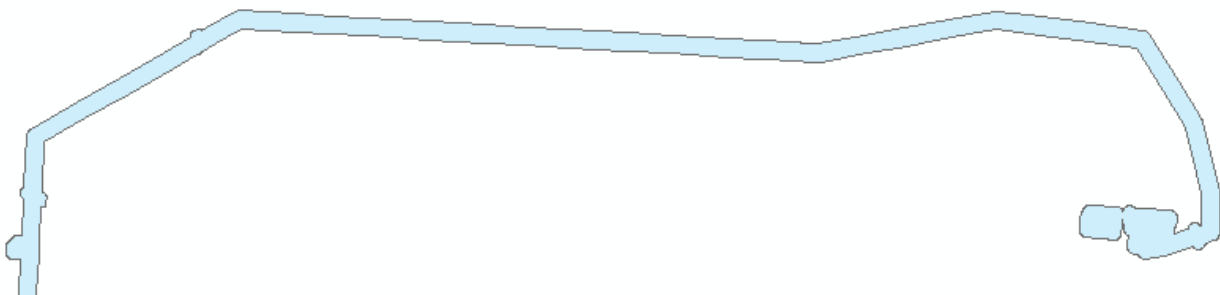


3. Save to the SHAPEFILE_TEMP directory using either RAW_CLIP or FINAL_CLIP for the name.
 - a. If the clipping errors out, it’s likely either the name is too long or the polygons are not fully linked and need to be kicked back to be fixed.
4. When saving, choose the option which opens the newly made file in ArcMap.
5. Once both files are clipped, removed source files to leave only:
 - a. RAW_CLIP
 - b. FINAL_CLIP
 - c. FINAL_OUTLINE (if it says boundary or buffer instead of outline, no problem)
6. Now the files should look like this:



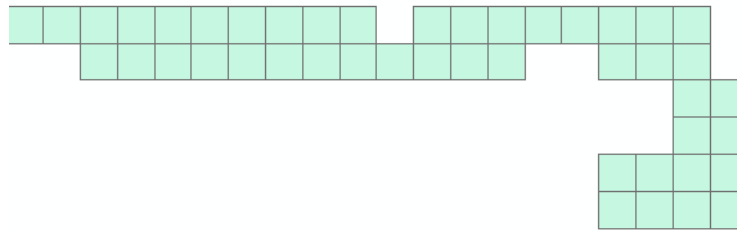
4.9 Finalize Deliverable Files

1. Confirm the following:
 - a. FINAL_CLIP and RAW_CLIP files contain the correct file names in each line of the table and no other fields are present in the file
 - b. In the OUTLINE_FINAL file, delete all fields so the attributes table contains only the shape and FID fields.
2. Finalize the RAW_CLIP file as follows:
 - a. Select file name, right-click and Data → Export Data to save the file in the SHAPEFILE_FINAL directory.
 - b. It should be named as per the client spec documentation such as:
(object)_RAW_LiDAR.shp
3. Finalize the RAW_CLIP file as follows:
 - a. Select file name, right-click and Data → Export Data to save the file in the SHAPEFILE_FINAL directory.
 - b. It should be named as per the client spec documentation such as:
(object)_Classified_LiDAR.shp
4. Finalize the OUTLINE_FINAL as follows:
 - a. Select file name, right-click and Data → Export Data to save the file in the SHAPEFILE_FINAL directory.
 - b. It should be named as per the client spec documentation such as:
(object)_Ortho_Outline.shp
 - c. Unlike the joined (object)_Classified_LiDAR.shp shape which is divided into pieces, the (object)_Ortho_Outline.shp should be a continuous single shape as per example below.



4.10 Finalize Ortho Tile Deliverable

1. This file is provided by the Ortho team.
2. Once available, copy the shapefiles into the SHAPEFILE_TEMP directory.
3. Open the TILES.SHP in the layers side of the ArcMap. For reference, it needs to look like this:



4. Remove all non-name attribute fields using the exact same steps given in Section 4.7.
5. Finalize the TILES as follows:
 - a. Select file name, right-click and Data → Export Data to save the file in the SHAPEFILE_FINAL directory.
 - b. It should be named as per the client spec documentation such as:
(object)_Ortho_Index.shp

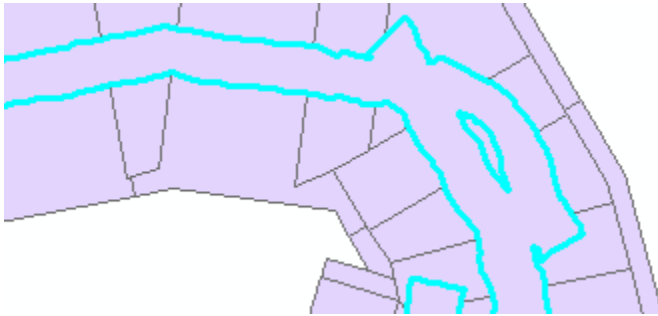
4.11 Ready for Delivery

With all 4 files complete and in the correct projection, copy/paste the finished files into the Deliverables directory in the client project folder.

Mark the tracking sheet as this step being completed.

4.12 Special Use Case – “Donuts”

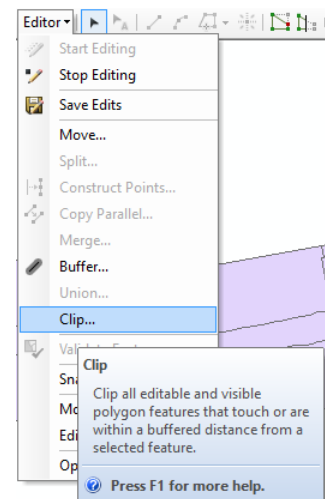
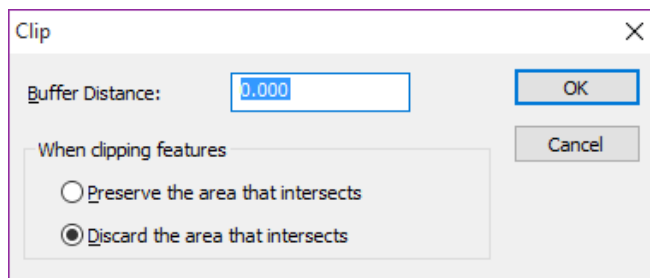
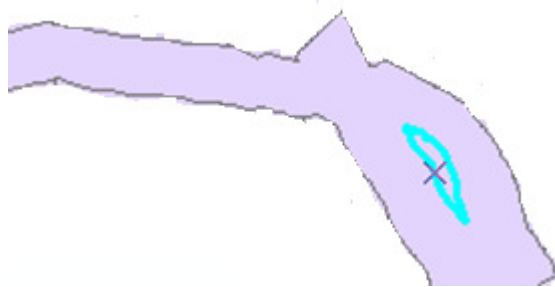
Sometimes an outline has an empty space which is not captured in the final release (such as pictured below). When there are multiple Buffer/Outline/Boundary field types, this is where the extra pieces need to be removed.



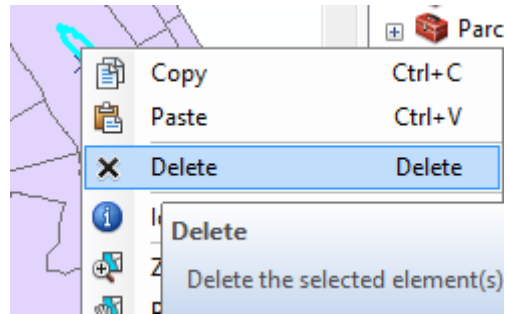
FID	Shape	LAYER
0	Polygon	OUTLINE_RAW
1	Polygon	OUTLINE_RAW
581	Polygon	OUTLINE_RAW

Confirm to ensure all shapes are complete polygons. That will need to be removed as follows:

1. In the Layer section of ArcMap, uncheck all layers visible that should NOT be trimmed. Leave only the target layer visible.
2. Select specific polygon to be clipped through the Attributes Table.
3. Once selected, go back to back to Editor to select “clip...” →
4. At the pop-up prompt, select the “Discard the area that intersects” and after clicking “OK” the clip is complete.



5. Once clipped, delete the removed piece by hovering over the area and *right-clicking* to get the context menu.





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