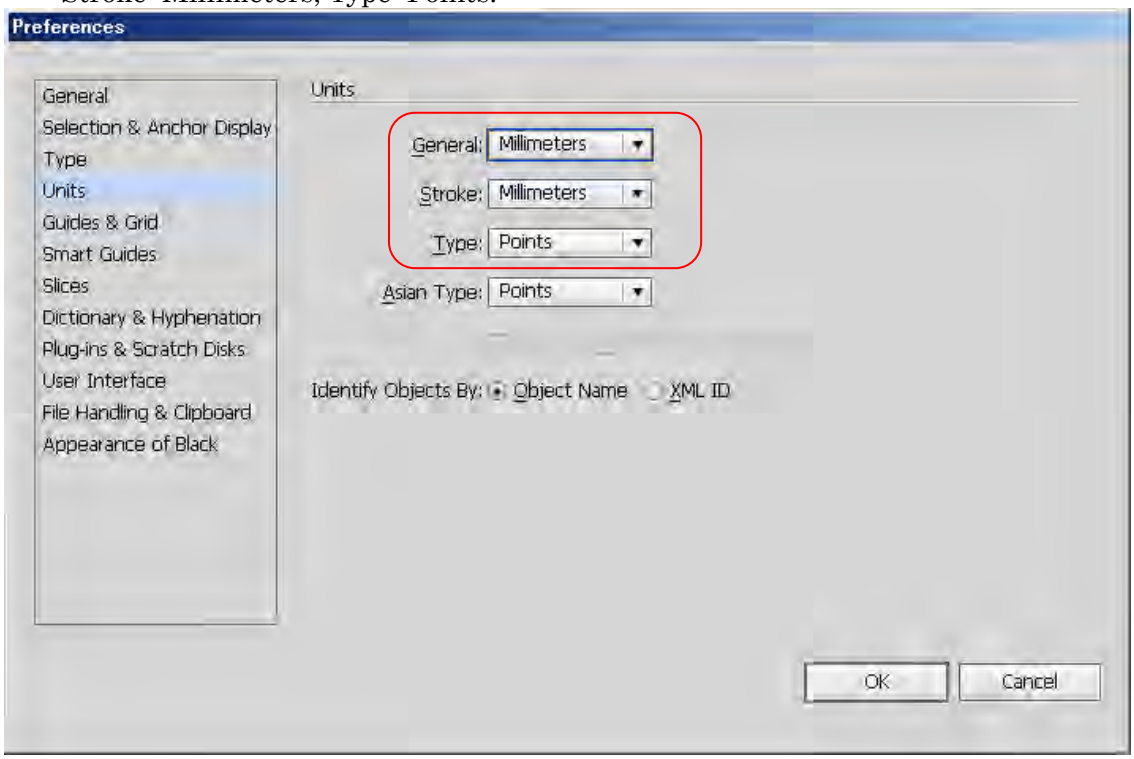
Map Symbolization

Chapter 4 Symbolization

1-1. Preference setting of Illustrator

Before starting, set the units in “Preference” window.

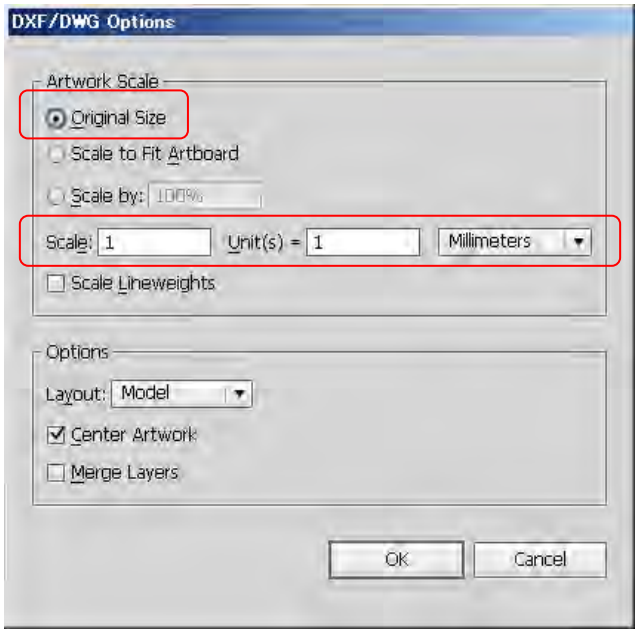
1. Select from Edit / Preferences / Units.
2. Select from each pop-up menu as following then click OK. General: Millimeters, Stroke: Millimeters, Type: Points.



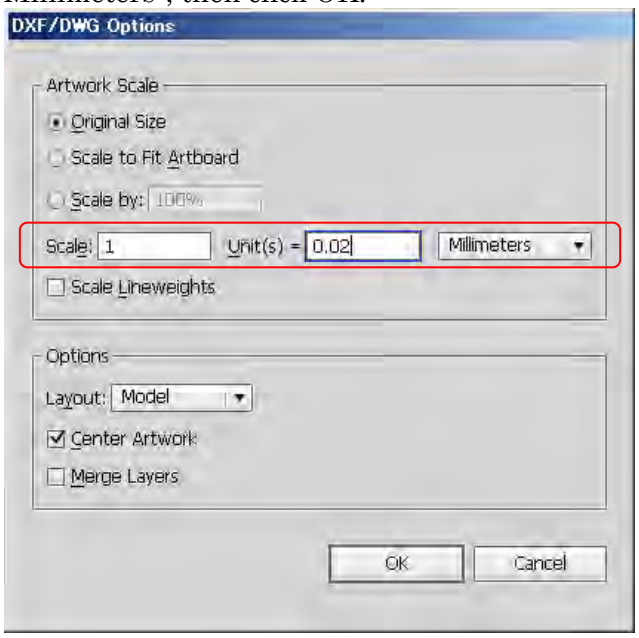
1-2. Import of CAD file

1. Import DXF/DWG file

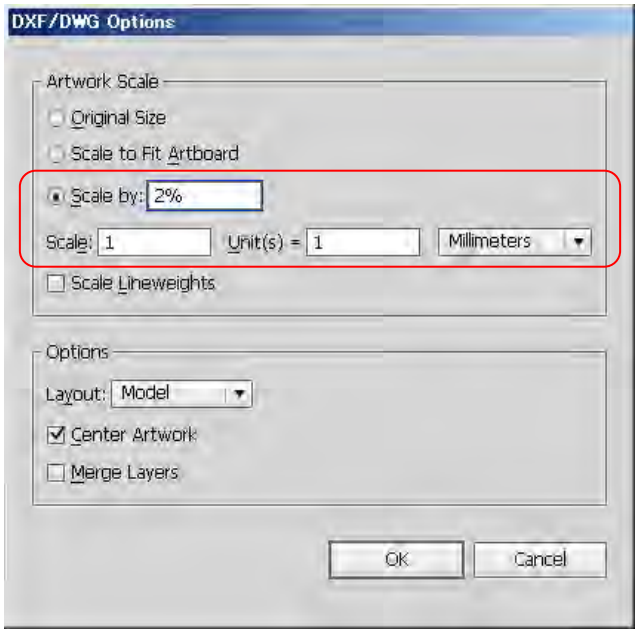
① Select from File / Open.
② Select target (working file) DWG file from your directory then click OK.
③ When open DWG file which have been scaling for symbolization put check mark "Original Size", then it should enter "Scale 1, 1 Unit(s) =1 Millimeters", then click OK.



④ In case of the DWG file which has not been scaled yet, it put check mark "Original Size", then it should entere "Scale 1, 1 Unit(s) =0.02 (scale value of 1/50,000) Millimeters", then click OK.

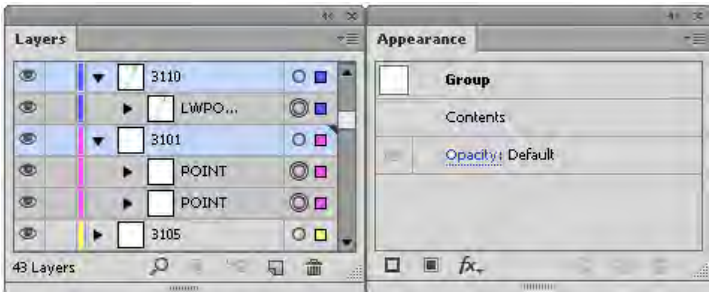


Or put check mark "Scale by" and enter the scale value 2% (scale value of 1/50,000). Then scale window should enter "Scale 1, 1 Unit(s) =1 Millimeters", then click OK.

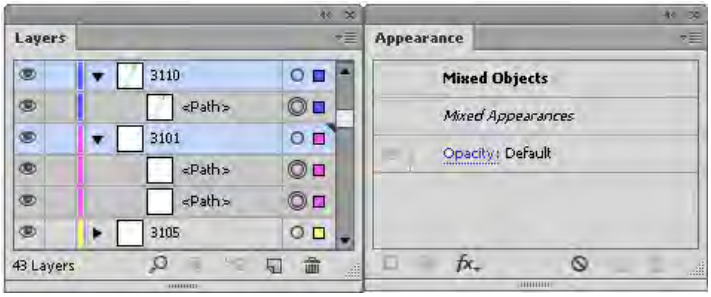


2. Ungroup the objects

① Select all (Ctrl+A).



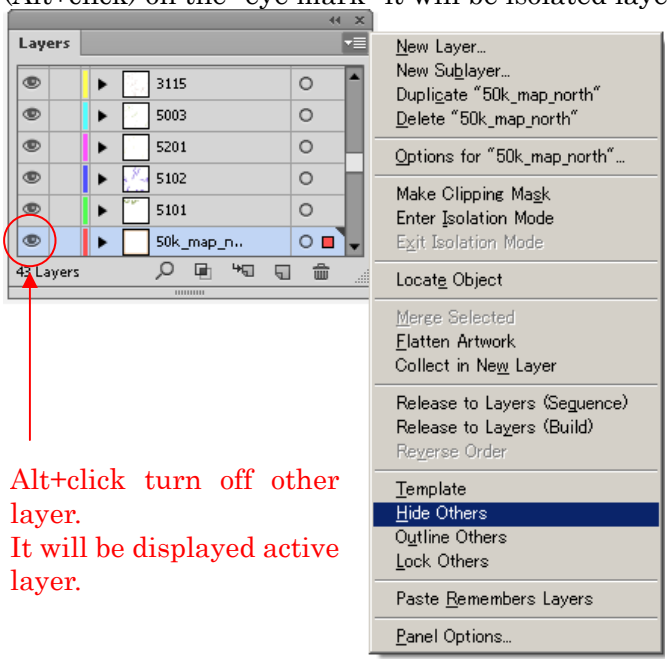
② Select from Object / Ungroup. It might be repeated several times until group will be released.



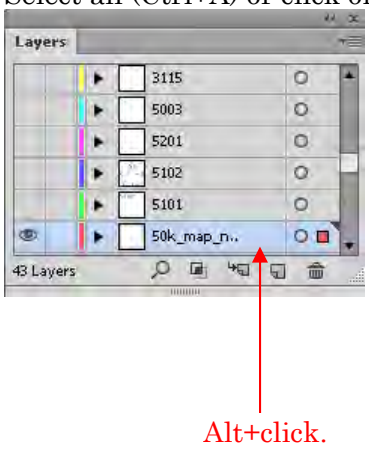
3. Copy all objects

① Show rulers. Select from View / Rulers / Show Rulers.
When the Global ruler is setting, should change to the Artboard rulers.
Select View / Rulers / Change to Artboard Rulers.

② Turn on only neat line layer.
Upper right button on the Layers panel > Pull down > select Hide Others, or Click (Alt+click) on the “eye mark” it will be isolated layer at once.

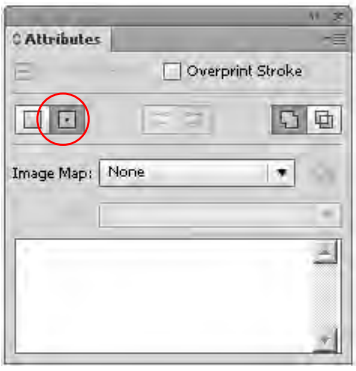


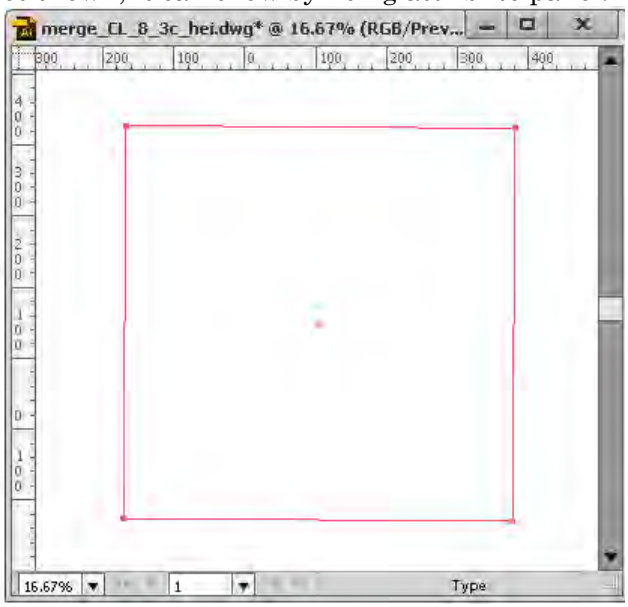
③ Select neat line.
Select all (Ctrl+A) or click on a neatline layer in Layers.



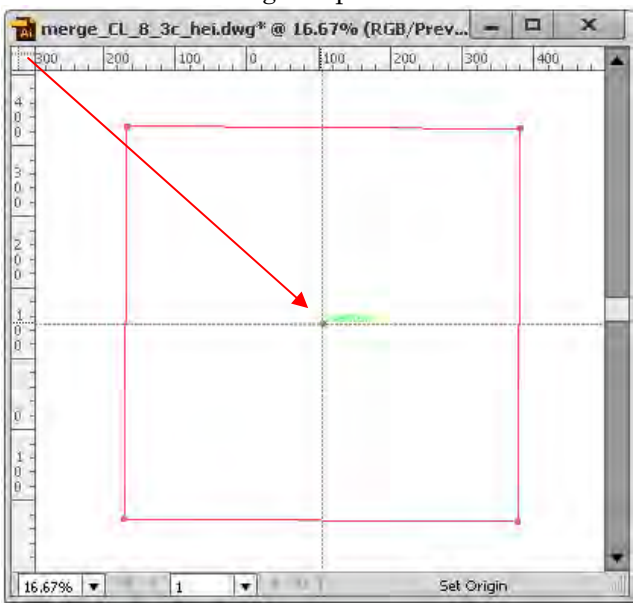
When center point of neatline is not shown, it can show by using attribute panel.

Click “Show center” button.



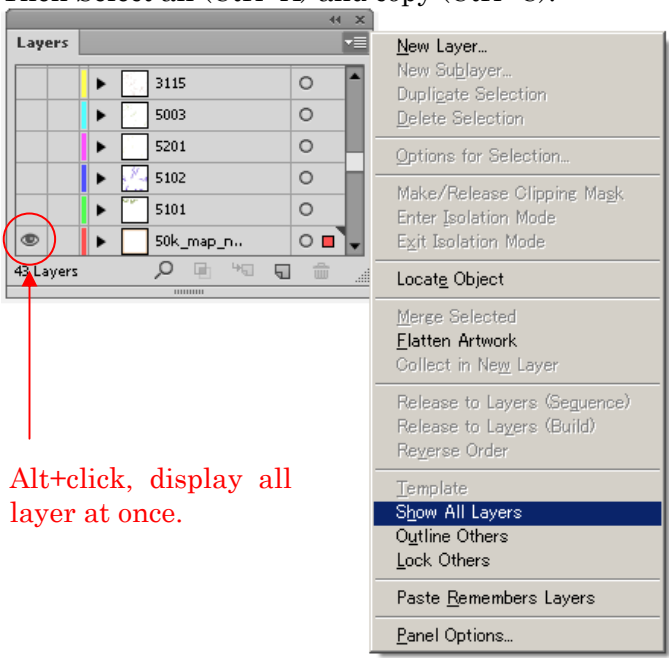


④ Show “Smart Guide (Ctrl+U)”, then it should be coincided with the “center of neat line” with ruler’s original point.



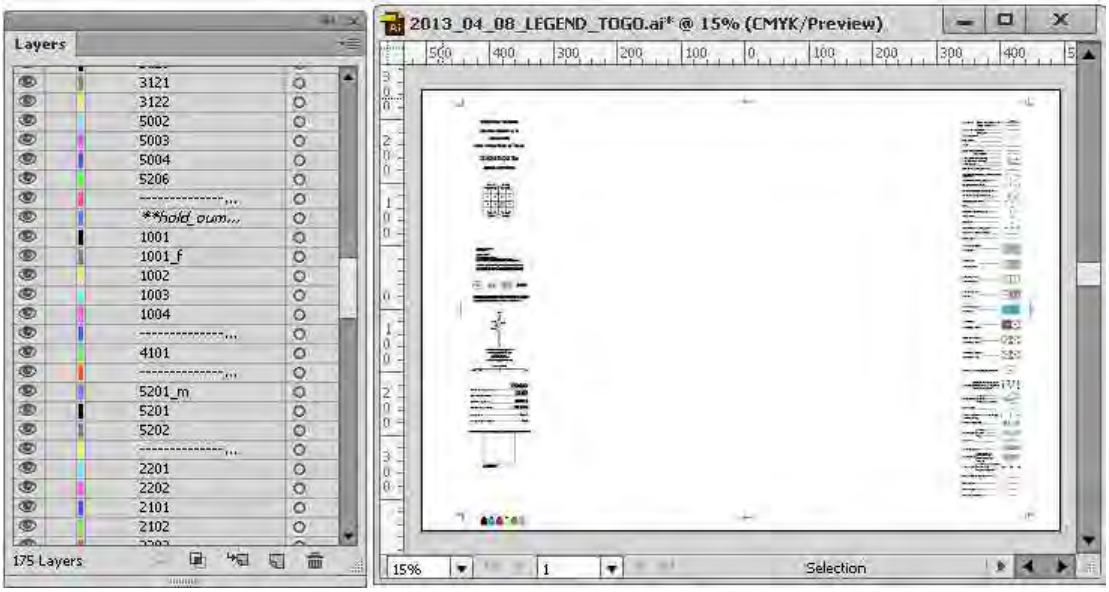
Drag the ruler origin to the center of the neatline.

⑤ Upper right button on the Layers panel > Pull down > Show All Layers, or click (Alt+click) on the “eye mark” it will be display all layers at once
Then Select all (Ctrl+A) and copy (Ctrl+C).

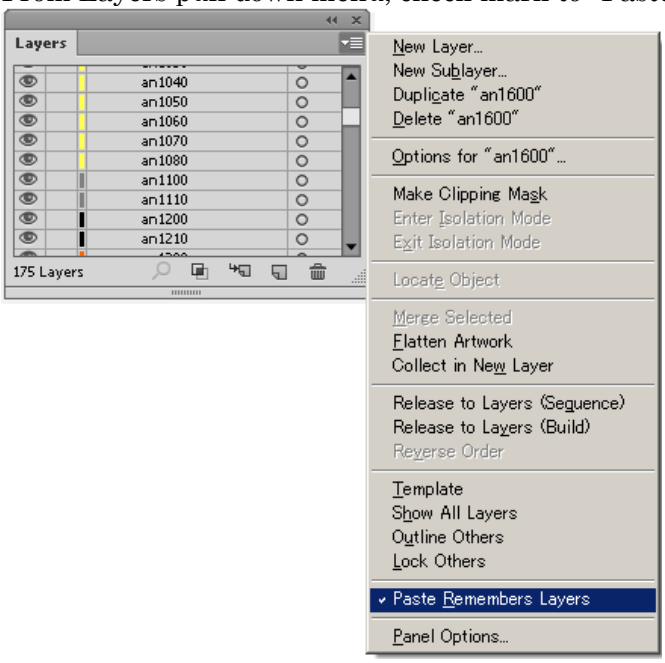


4. Pastes into the LEGEND file

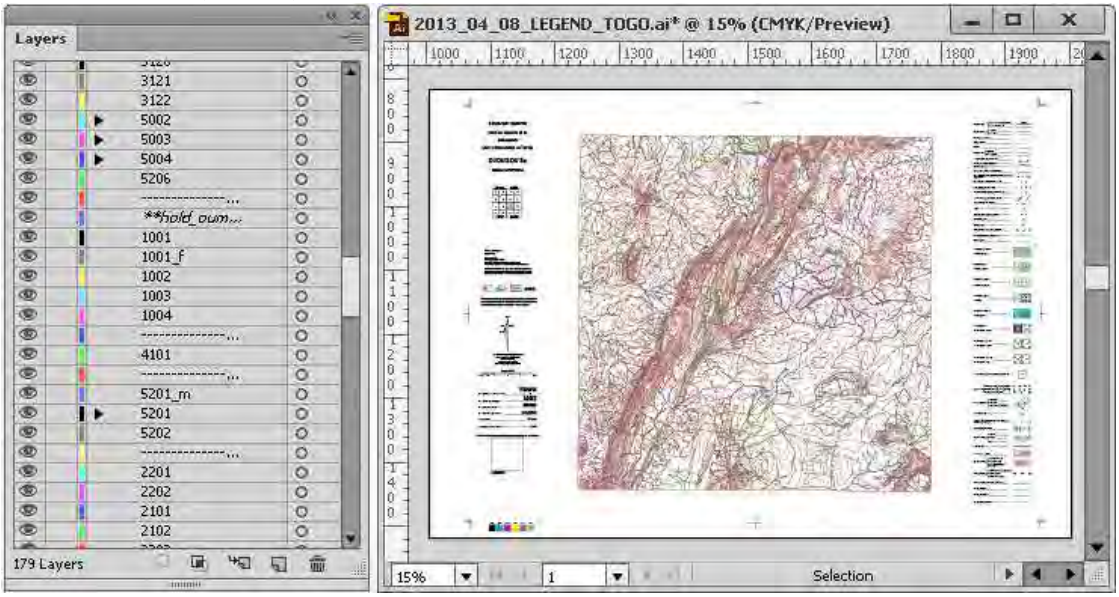
① Open the “LEGEND” file (LEGEND file which is arranged all layers order should be made before symbolization working.)



② From Layers pull down menu, check mark to “Paste Remembers Layers”.

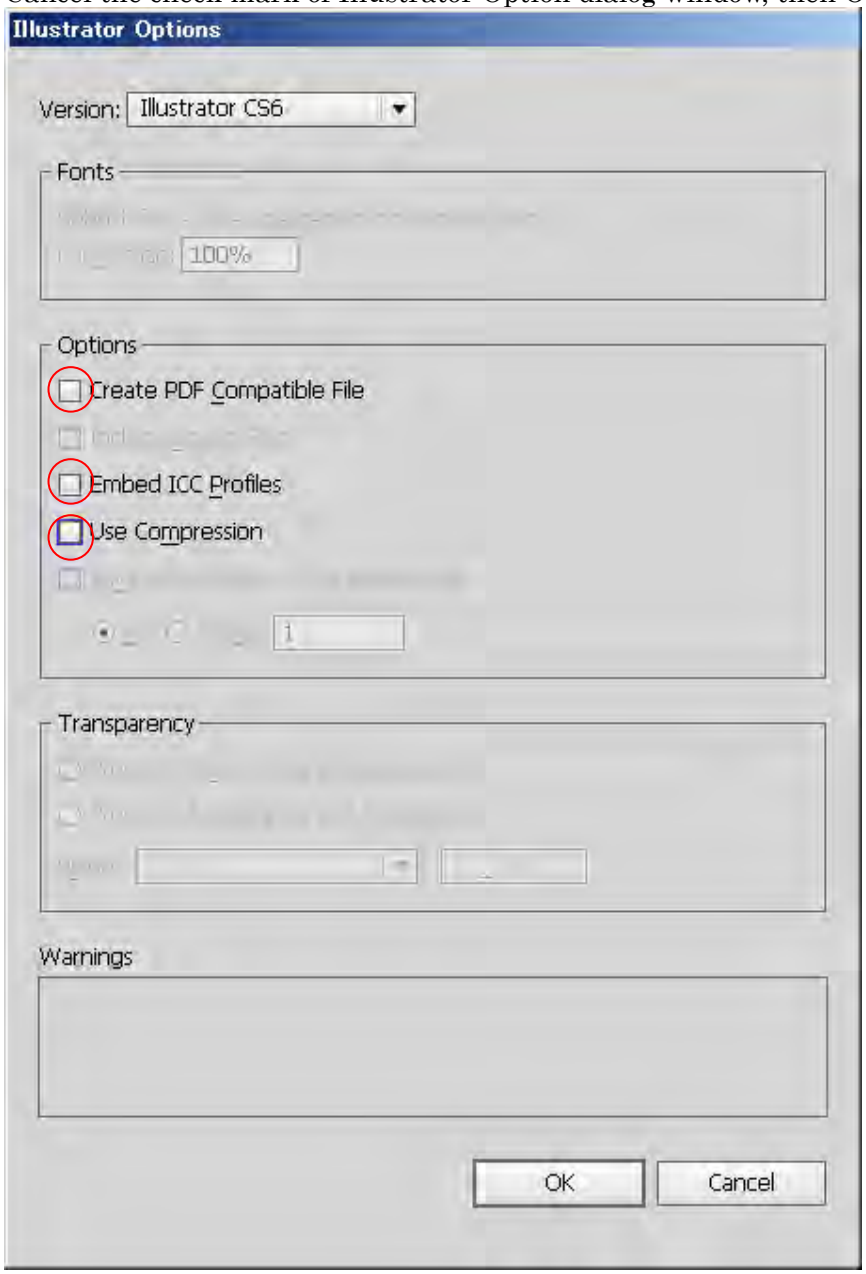


③ Paste in Front (Ctrl+F).



5. Saves as

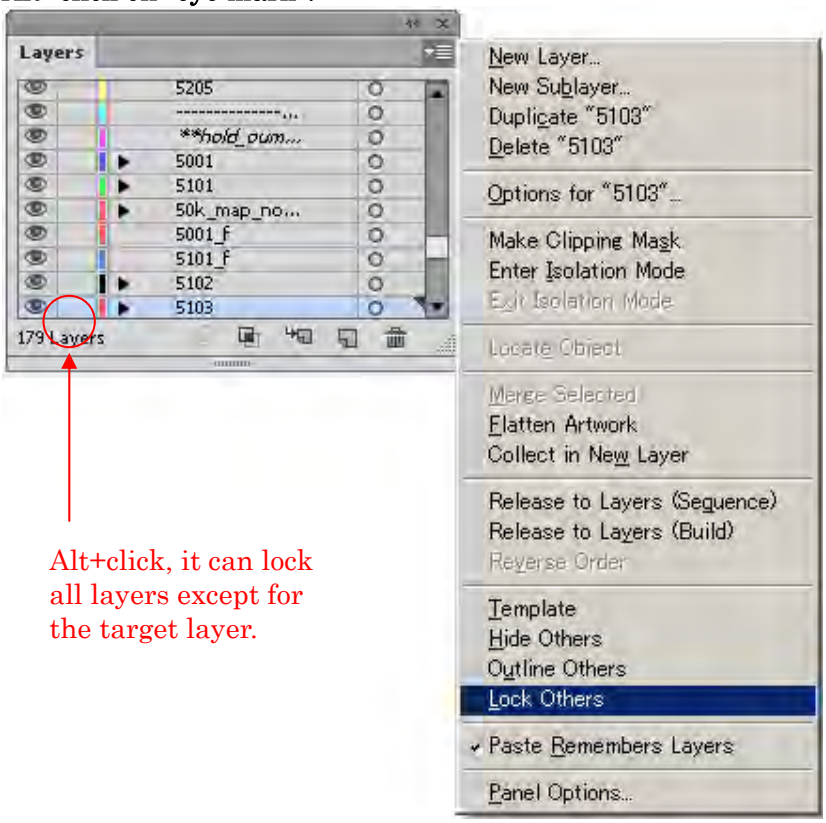
① Select from File > Save As.
② Enter file name, then click “Save”.
③ Cancel the check mark of Illustrator Option dialog window, then OK.



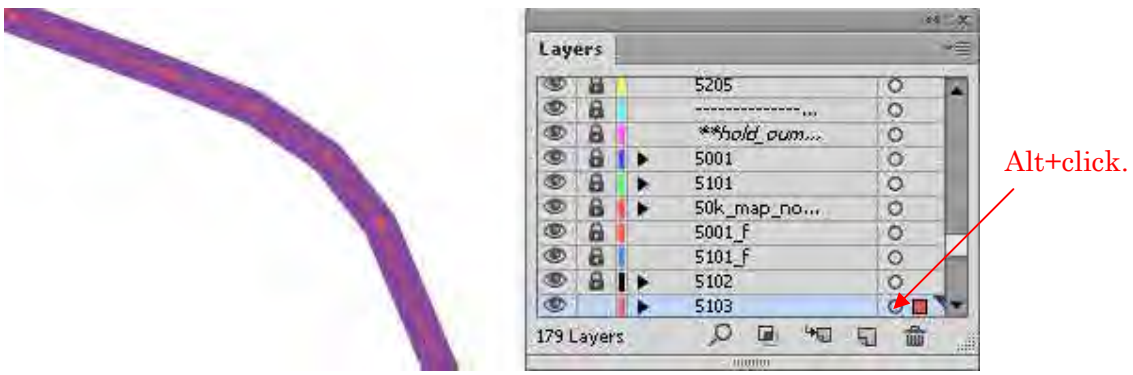
1-3. Basic symbolization

- Liner symbol 1 (liner features, DATA TYPE: Line, ex.: Single line road, Stream, Contour, such like single line representation symbols etc.)

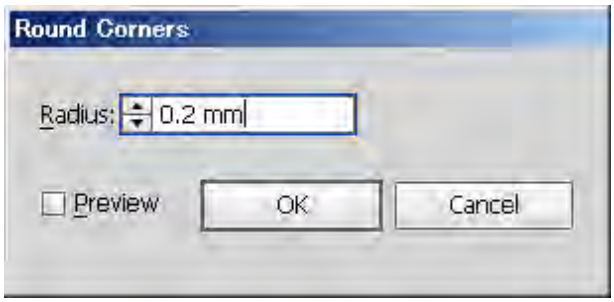
1. **Locks all layers except the target layer. Layer panel > ▼ > lock Others, or Alt+click on "eye mark".**

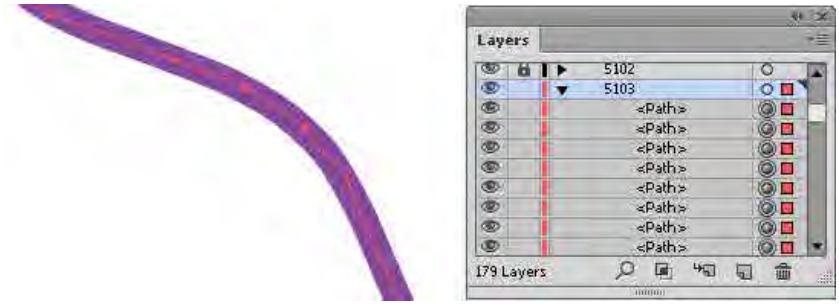


2. **Round corners**
   The path (liner symbol) is made into "a curve line" in order to be smooth appearance.
   Select all paths in the target layer. Ctrl+A or Alt+click on target layer in Layers panel.

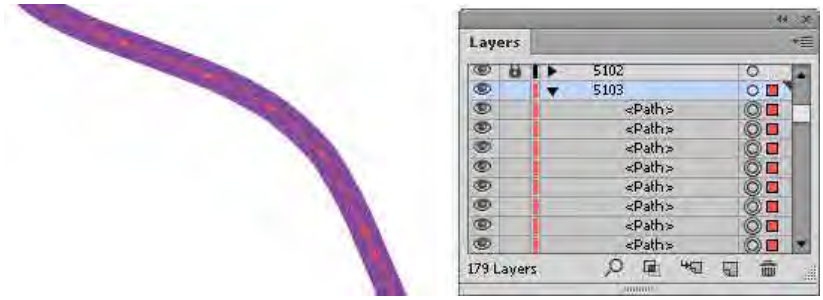


Effect / Stylize / Round Corners.
Input "Radius" value, then click OK. (A radius value is specified according to a line condition. symbols items which are contour, river, road and other required objects are should be smoothness appearance.)

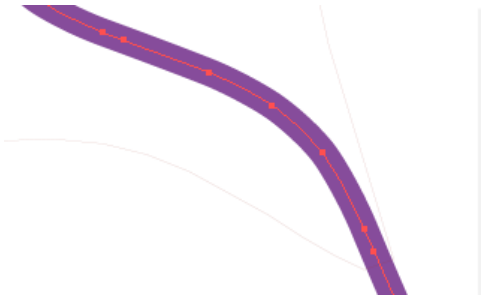




3. **After round corner, it might be done "Expand appearance".**
Object / Expand Appearance.

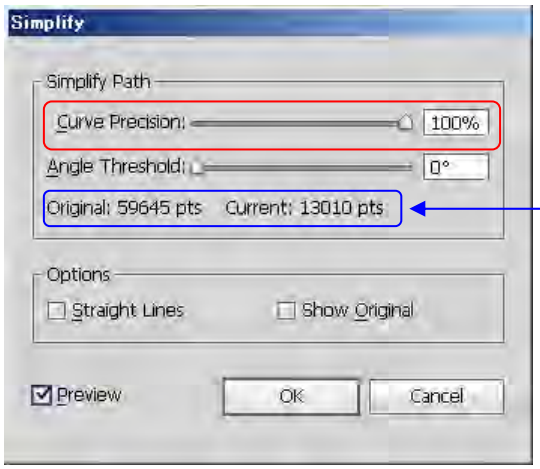


4. **The path might be simplified as need.**
The anchor point in the path will be reduced. The data volume might be smaller than before.



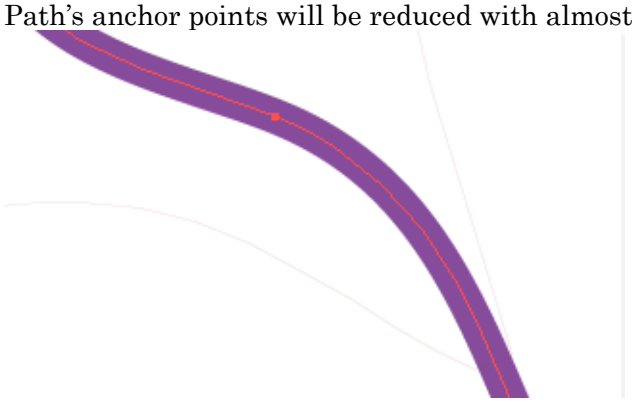
Select Path / Simplify.

"Curve Precision" value should be set exactly 100%, then OK .



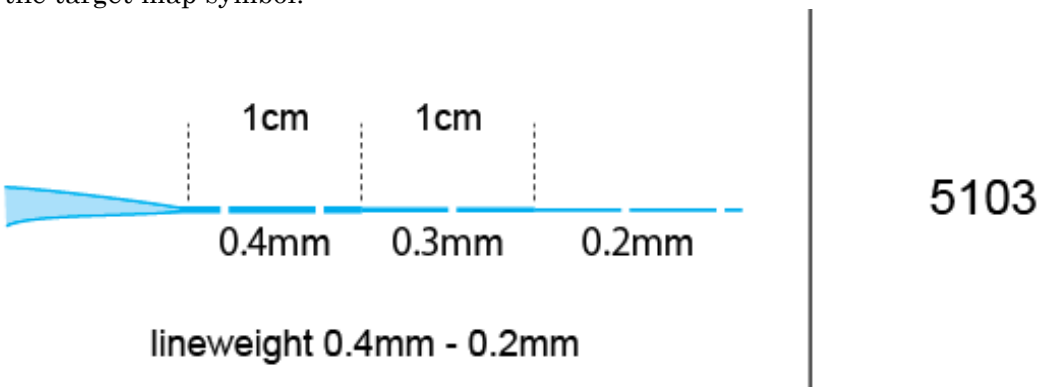
The number of points will be becoming fewer.

Path's anchor points will be reduced with almost keeping the previous path shape.

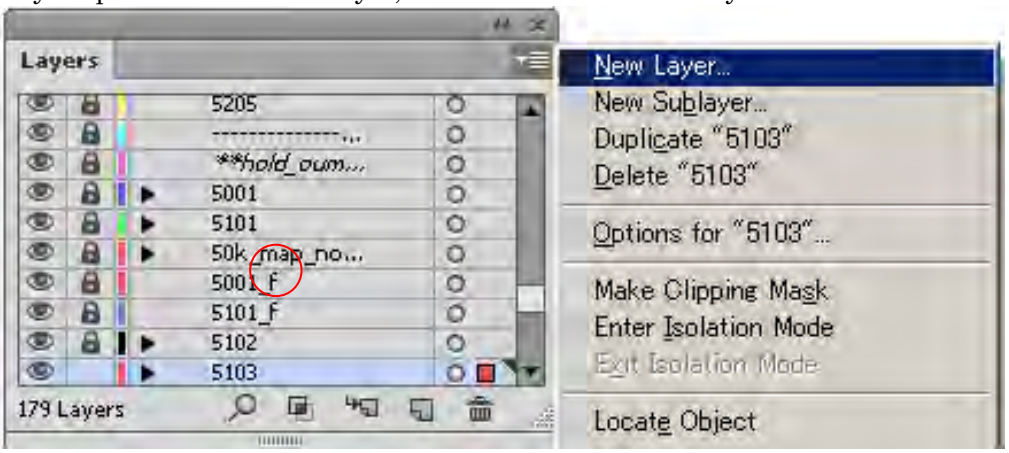


5. Copy a target map symbol from the "Symbolization Specification" file. And then paste into current file at the "temporary layer".

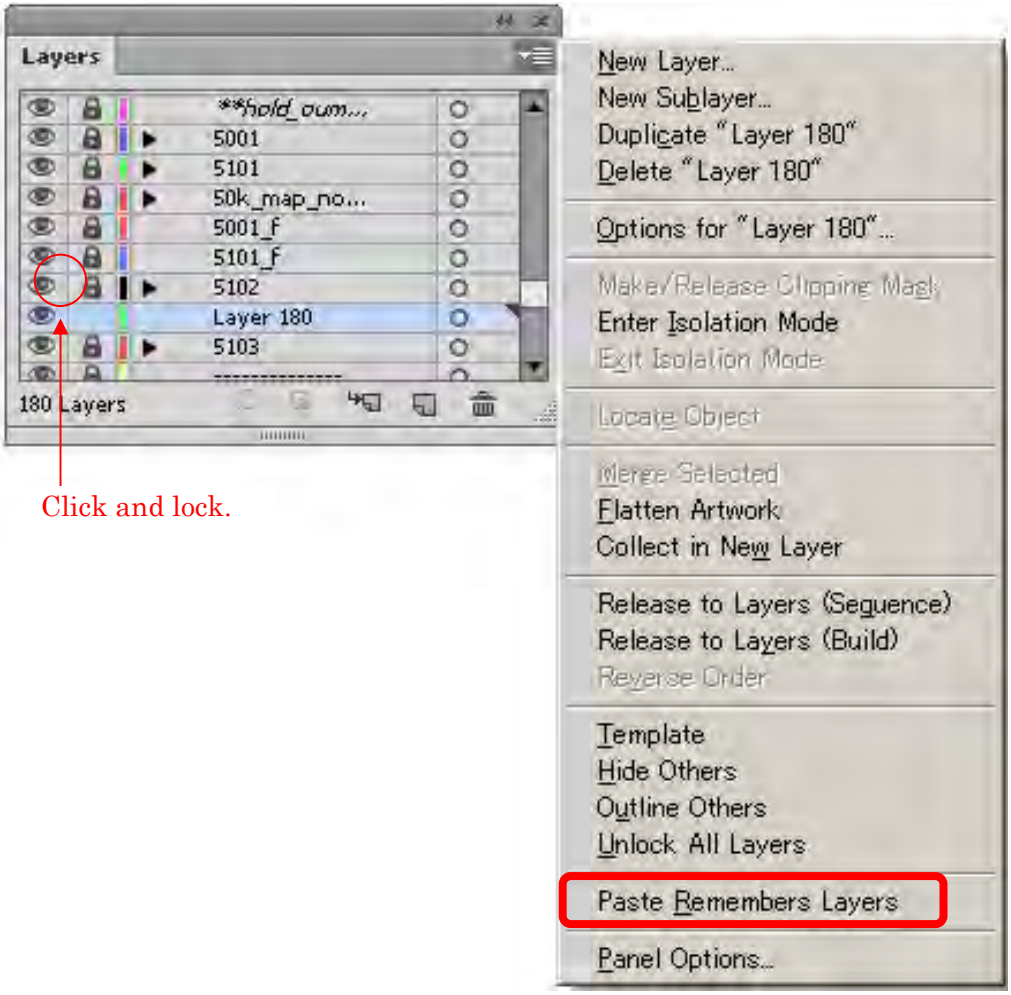
① Copy the target map symbol.



② Back to the current working file, and make new layer such as the “temporary layer” for the target symbol.
Layers panel / ▼ / New Layer, or Click “Create New Layer” button.

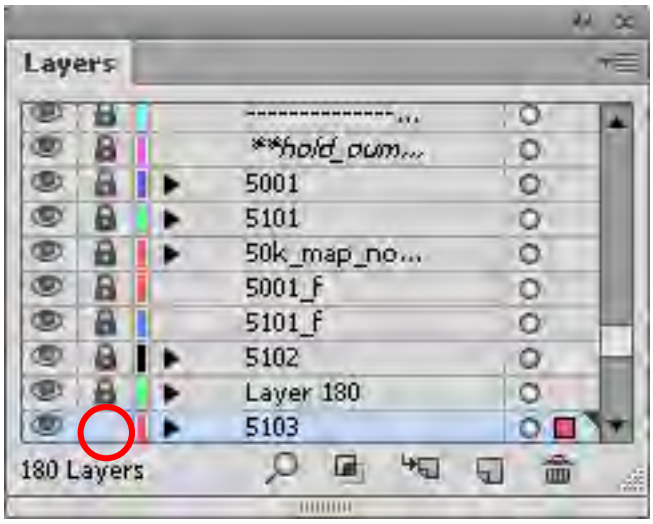


③ Lock all layers other than “temporary layer”.
Release check mark to “Paste Remembers Layers”
then Paste (Ctrl+V).



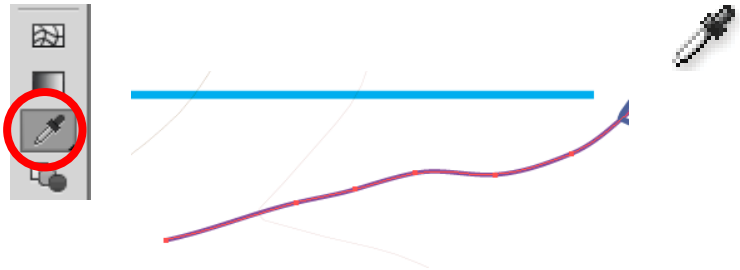
6. Color, line width, dash line intervals attributes can be transferred by using "Eye dropper tool"

① Lock all layers except target layer.
Select all paths in the target layer (Ctrl+A) or Alt+click on target layer in Layers panel.

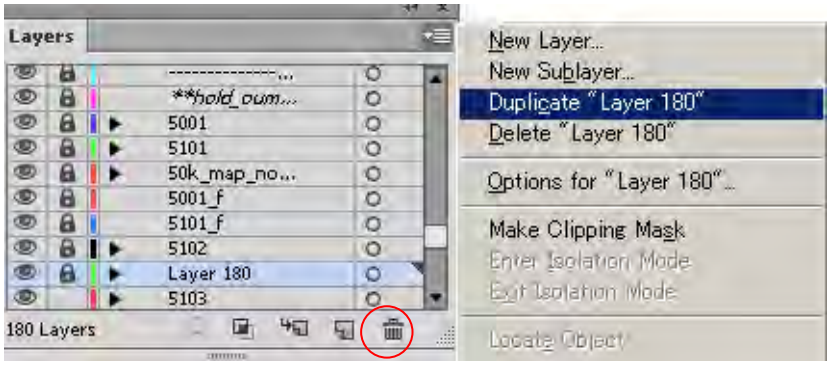


Unlock.

② Select target symbol line, then transferring attributes from the "Symbolization Specification" by using "Eye dropper tool".
The plane line will be changed to same as copied symbol.



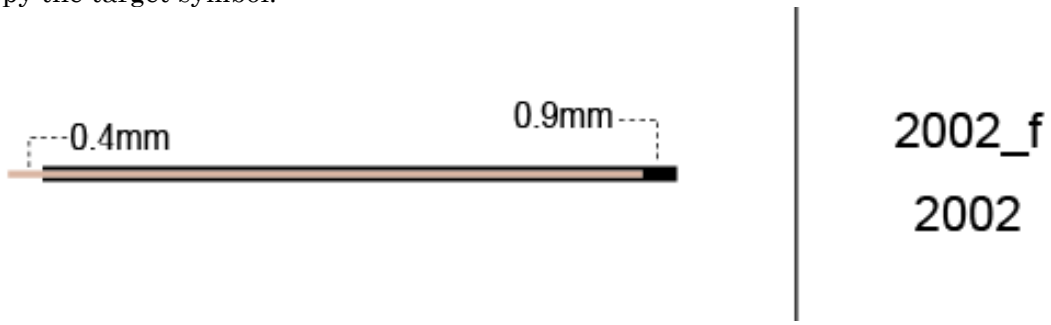
③ After changing, the "temporary layer" should delete.
Layers panel / ▼ / Delete, or Click "Delete Selection" button.



- Liner symbol 2 (DATA TYPE: Line, ex.: double line Road)
  The Path (line symbol) is made into a curve in order to be smooth appearance.
  The Path (line symbol) is simplified a curve in order to reduce the anchor point what for the data might be to smaller.

1. Copy a target map symbol from the "Symbolization Specification" file. And then paste into the "temporary layer".

① Copy the target symbol.

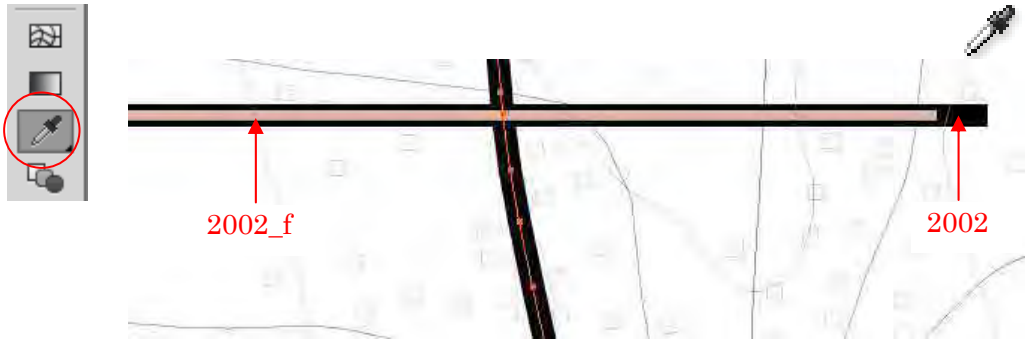


② Back to the current working file, and make new layer as "temporary layer" on the target symbol layer.

③ Lock all layers other than "temporary layer".
Release check mark to "Paste Remembers Layers"
then Paste (Ctrl+V).

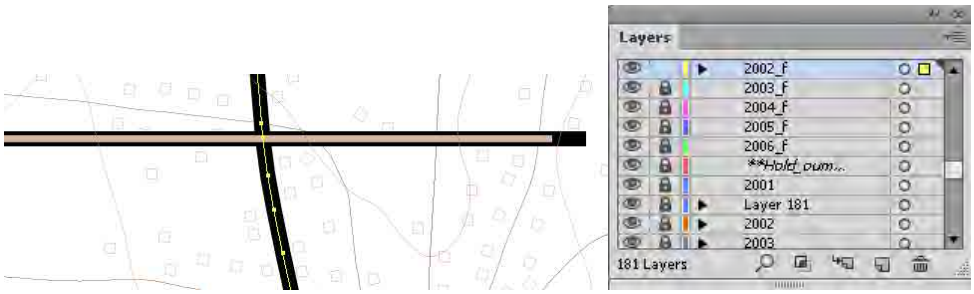
2. At first, apply an attribute to the objects of "2002" layer by using "Eyedropper tool". Then, apply an attribute to the objects of "2002_f" layer in the same way.

① Select target symbol line "layer 2002", then transferring attributes from the copied symbol in the "temporary layer" by using "Eye dropper tool".
The plane line can change to same as copied symbol.



② Select all paths in "2002" layer. Then copy.

③ Lock all layers except for "2002_f" layer.
Release check mark to "Paste Remembers Layers".
Then "Past in front (Ctrl+F)" in "2002_f" layer.



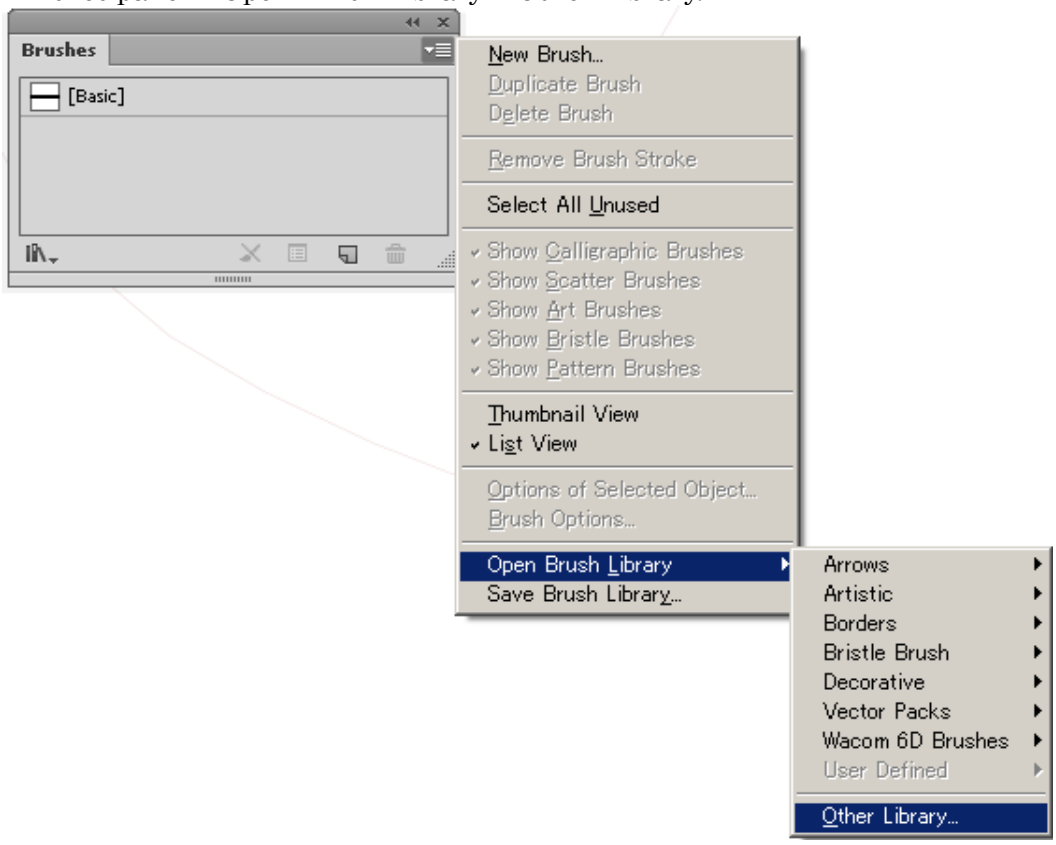
④ Select target symbol line, then transferring attributes from the copied symbol by using "Eye dropper tool".
The plane line can become same as copied symbol.

⑤ After that, the "temporary layer" should delete.

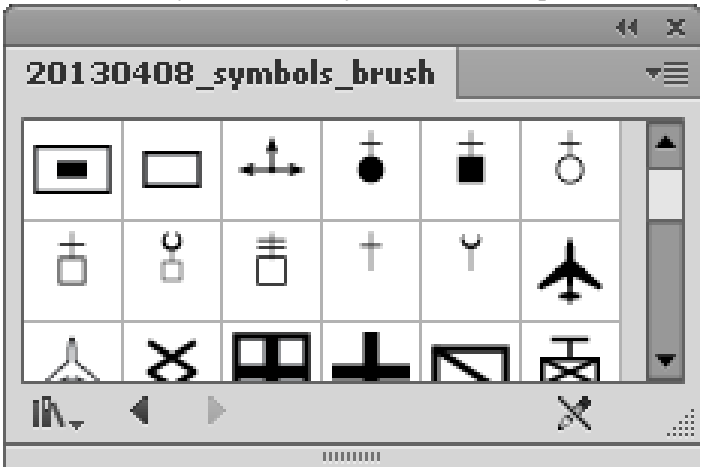
- Point symbol (DATA TYPE: Point, ex.: School)

1. Import "Brush" file which is registered as the brush library from "Brushes" panel. This material file such as "Brushes" should be made before symbolization working.

① Open the brush library.
Brushes panel > Open Brush Library > Other Library.

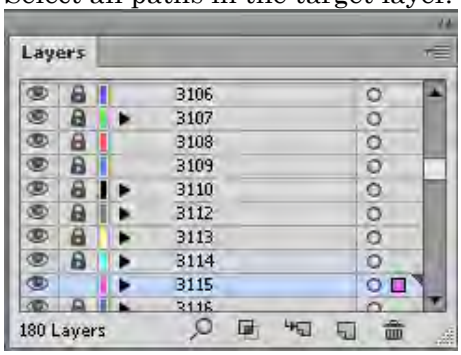


② Select target "Brush" file in your directory, then click "Open"

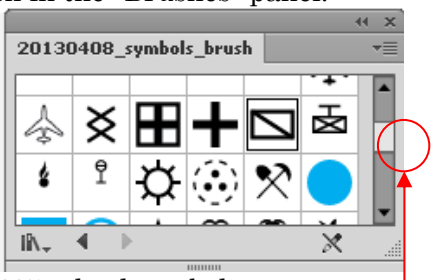


2. Apply brush to the points.

① Select all paths in the target layer.



② Click target brush in the “Brushes” panel.

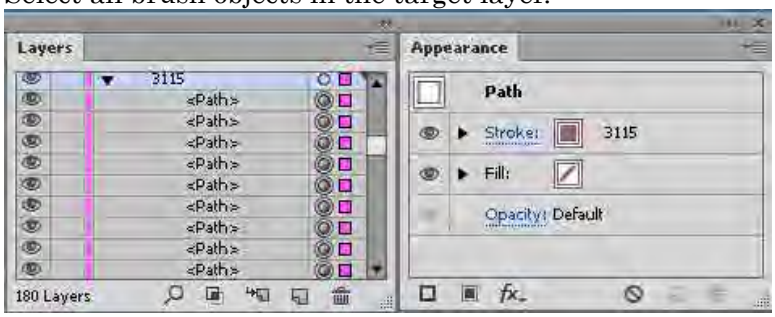


For example, Click 3115 school symbol

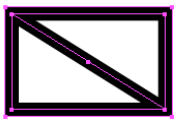
Click.

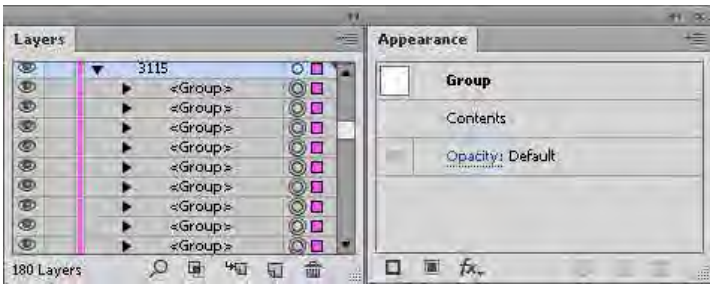
3. After Appling the brushes should make sure to be “Expand appearance”

① Select all brush objects in the target layer.



② Select from Object / Expand Appearance.
After Appling the brushes, these symbols are treating as points. They should be done to be “Expand appearance” in order to change them to normal objects which can rotate, move and scale.

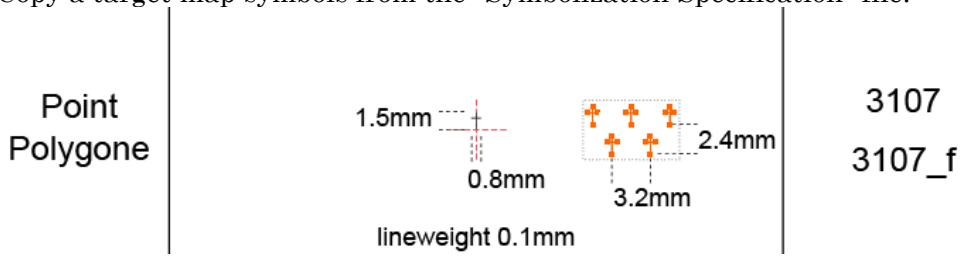




- Polygon symbol 1 (DATA TYPE: Polygon, ex. : Cemetery)

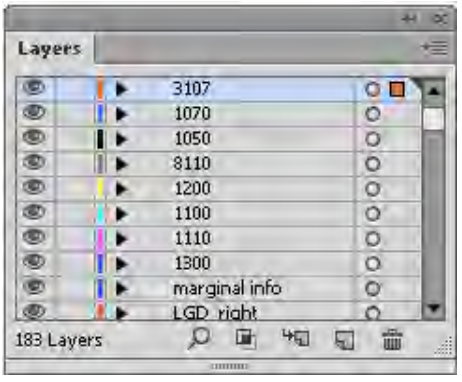
1. Copy a target map symbol from the "Symbolization Specification" file. And then paste into the same layer name of the current working file.

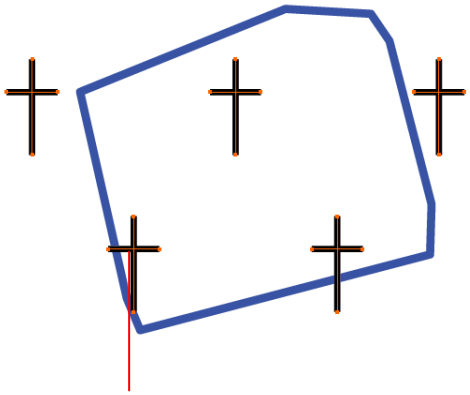
① Copy a target map symbols from the "Symbolization Specification" file.



② Back to the current working file, and check mark to “Paste Remembers Layers”.

③ Paste (Ctrl+V). The symbol will be pasted into the same layer cause “Paste Remembers Layers” function.





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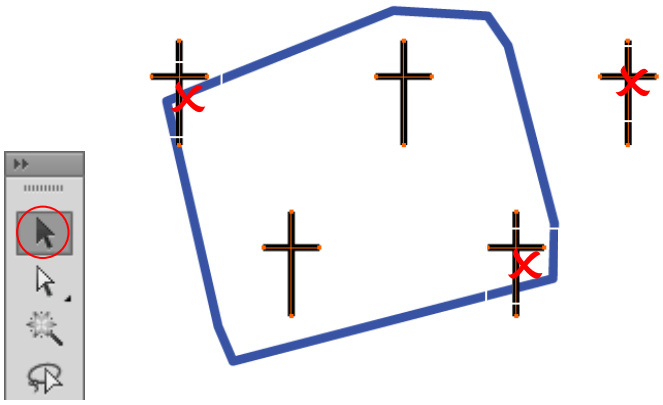
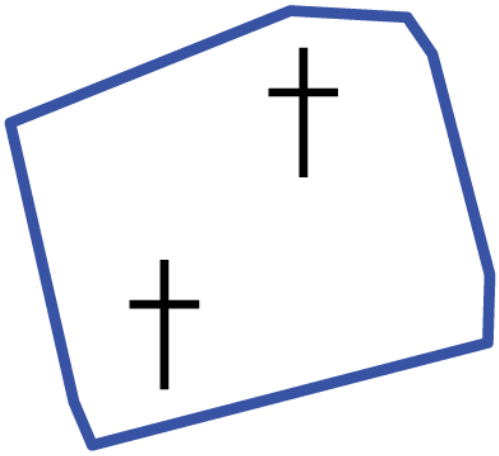
2. Adjust the map symbols.

① Adjust the position, number of the map symbols with the “Selection tool”.

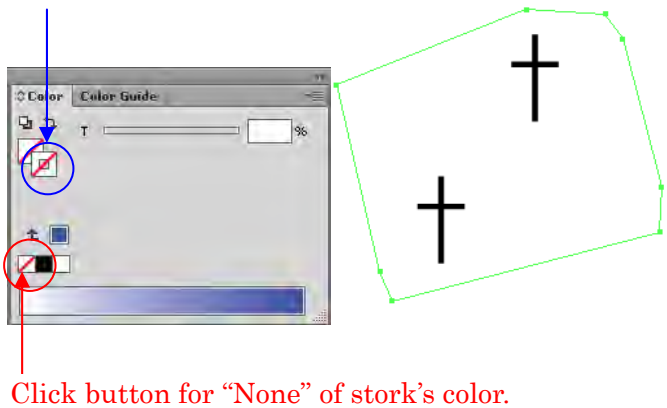


② Select unnecessary map symbols then delete them.



③ The polygon stroke color is not necessary.
To bring “stroke color” to the front, click “stroke color” bottom in “Color panel”.
It will turn on front. Next, click “None box” bottom.

Click “Stroke” button for active stroke.

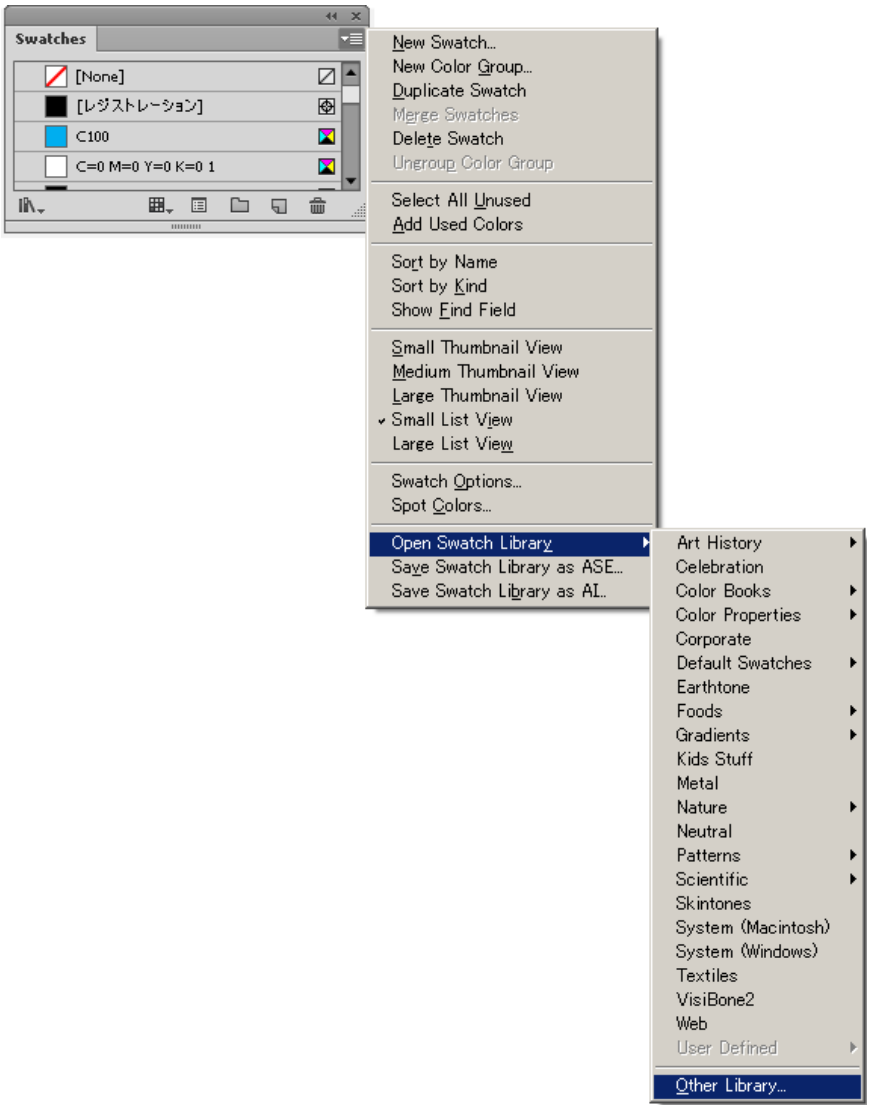


Click button for “None” of stork’s color.

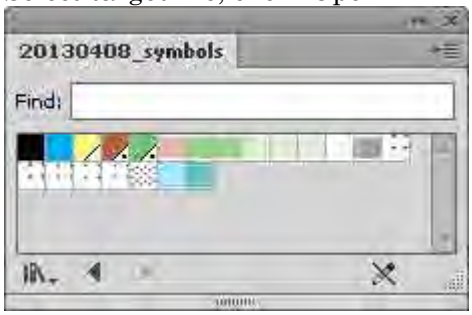
- Polygon symbol 2 (DATA TYPE : Polygon, ex. : Forest, Savanna)

1. Import "Symbolization Specification" file by "Swatches" panel.
This material file such as "Swatches" should be made before symbolization working.

① Open the swatch library.
Swatches panel / Open Swatch Library / Other Library.

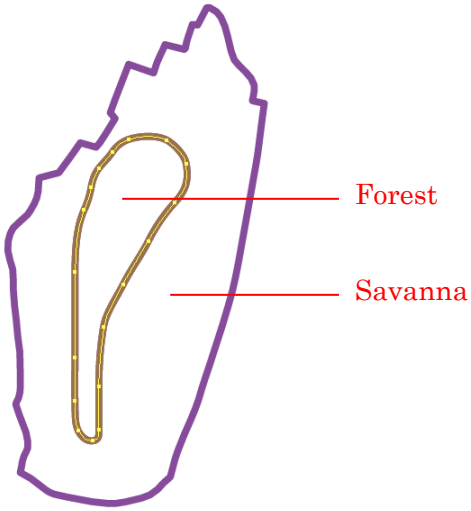


② Select target file, click "Open"



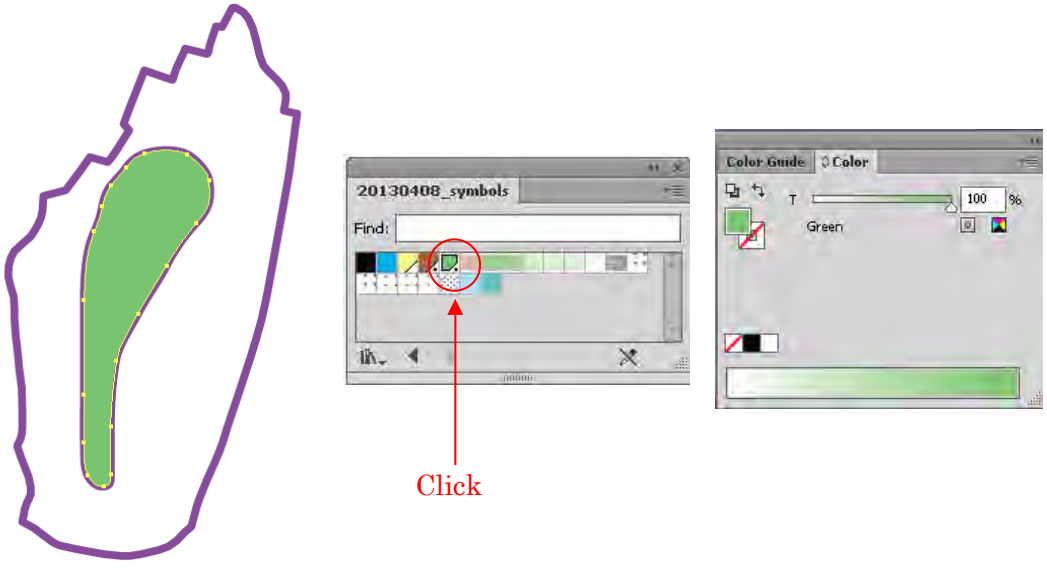
2. Apply filling color to objects by Color panel, Swatches panel.

① Select all objects in the target layer.

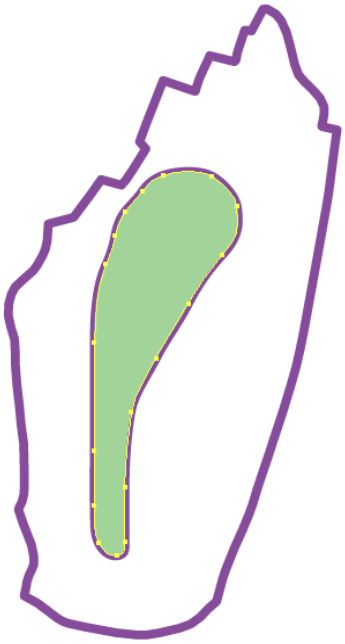


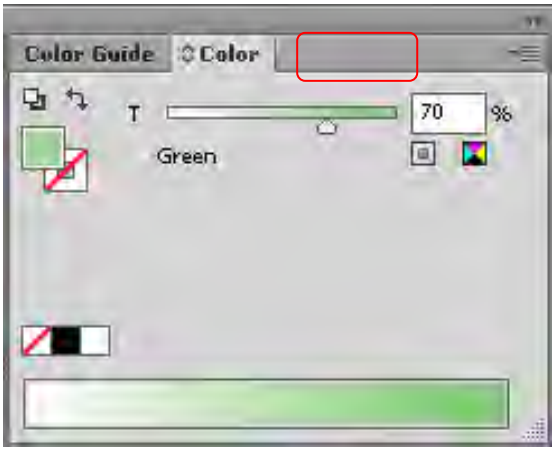
② Storks color to “none” and Fill color turn to active.

③ Choose target color in Swatches panel.

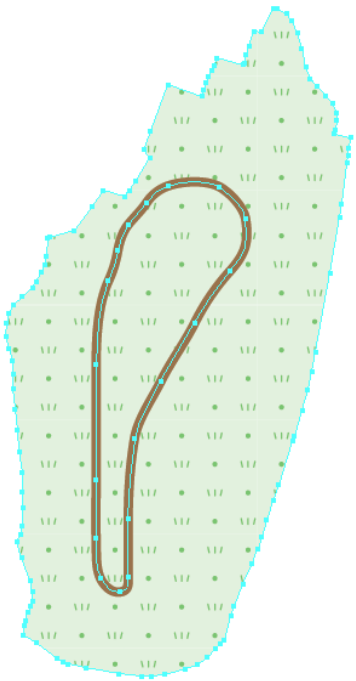


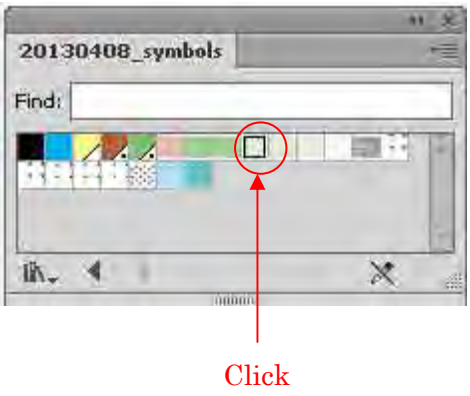
④ Enter color value in %.



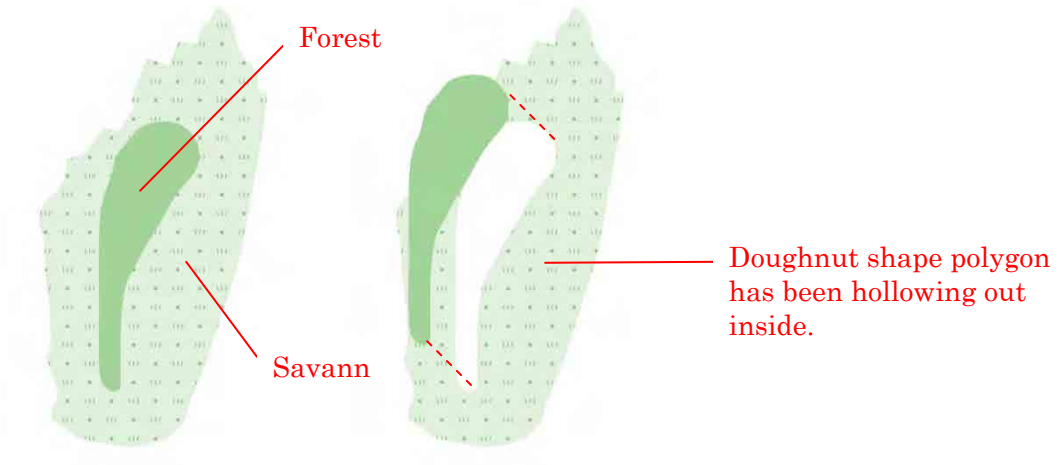


⑤ As for the savanna filling, choose target pattern from Swatches panel.



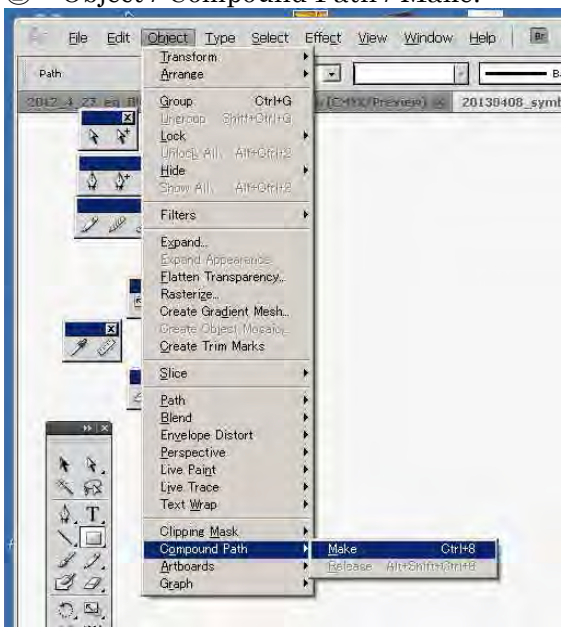


3. Making Compound Path.

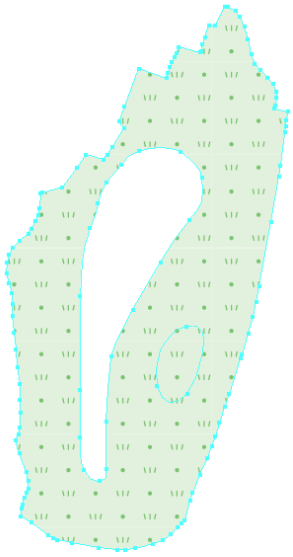


① Select outer polygon and enclosed inner polygon with hold “Shift” key or “Ctrl”

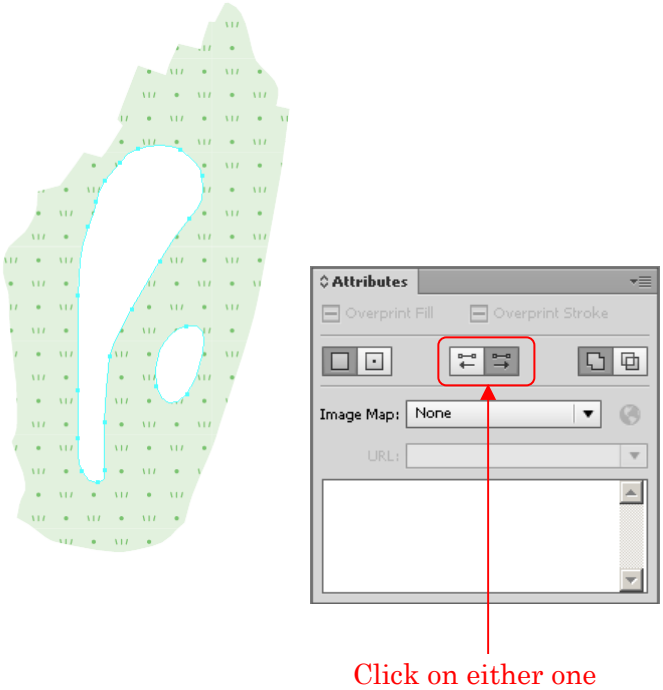
② Object / Compound Path / Make.



③ When inner polygon could not hollow out outer, it might change direction of path by Attributes panel.



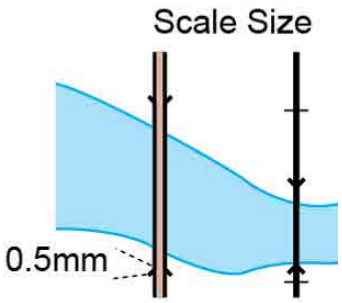
Select the inner failed polygon with “Direct selection tool” then choose either “On or OFF” button in “Reverse Path Direction”.



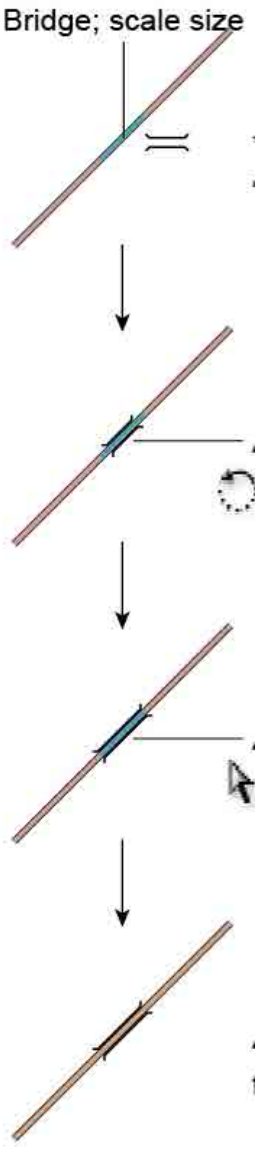
1-4. Other symbolization

1-4-1 Adjust bridge to road

Bridges are longer than 50m in length which are Brick, Metal.



Bridge; scale size (DATA TYPE: Line)

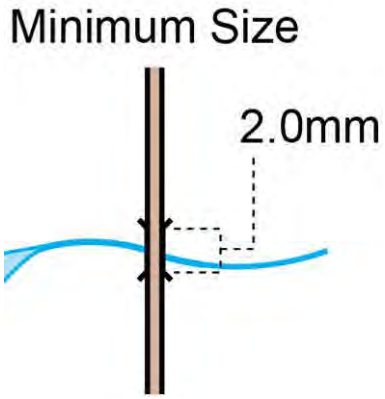


① *Past in same layer from symbol_palette under "Paste remembers layer" setting
-: Check mark to "Paste Remembers La

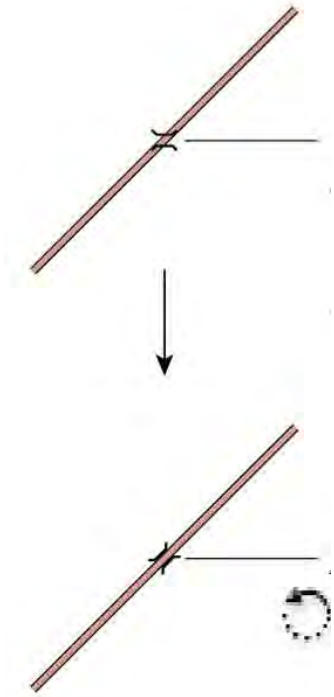
② Align with road by using "Rotate tool"

③ Adjust length by using Direct select tool"

④ After adjust symbol, original line which was from cad data should be deleted.
Bridges are shorter than 50m in length.



Bridge; regular point symbol (DATA TYPE: Point)

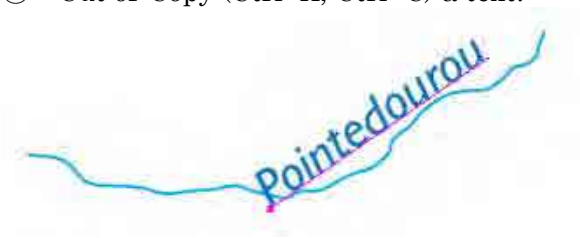


① Paste in same layer from symbol_palette under "Paste remembers layer" setting.
-: The symbols shall be done expanded.
-: Check mark to "Paste Remembers Layer"

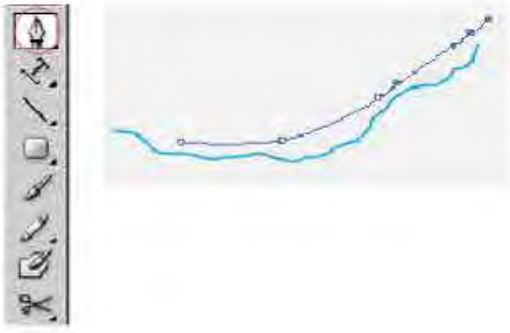
② Align with road by using "Rotate tool"

1-4-2 Align annotation along the liner features which are for river name, mountain name, road and others

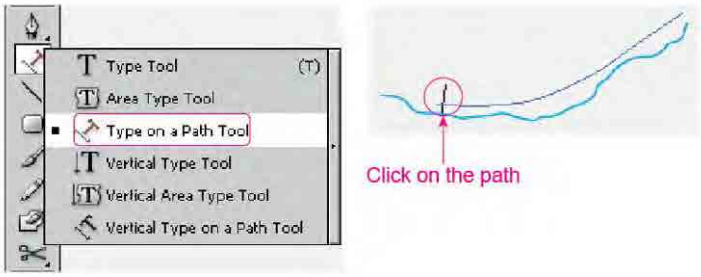
① Cut or Copy (Ctrl+X, Ctrl+C) a text.



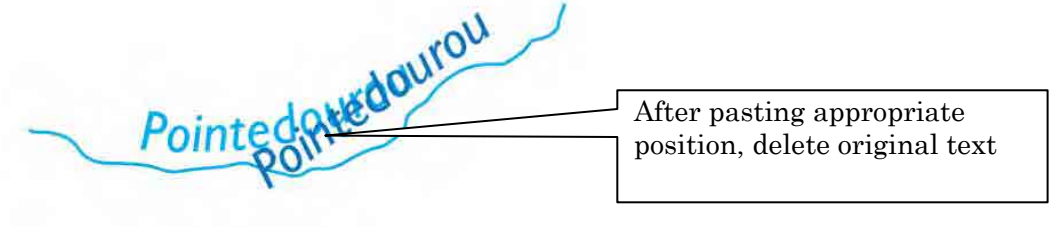
② Draw a path to accommodate annotation along the liner feature with the “Pen tool”.



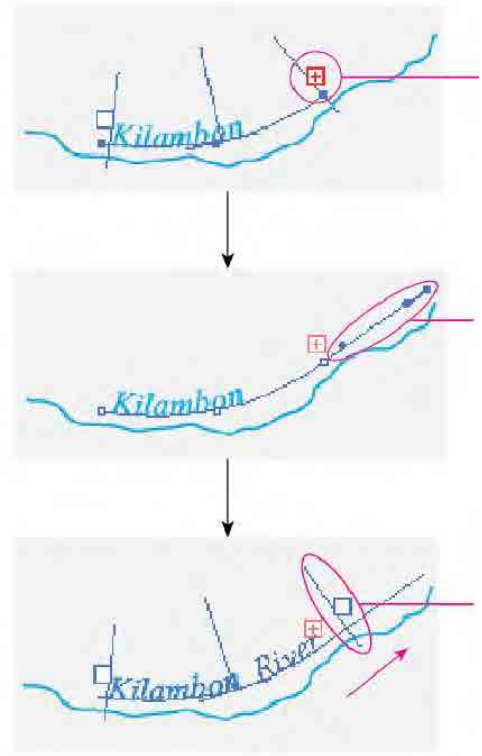
③ Click on the path by the “Type on a Path tool”.



④ After “Paste” (Ctrl+V) In case of copy the text, the original text should be deleted.



⑤ When characters do not fit within along a path, draw the path with the “Pen tool”, or drag the”bracket” at the end of the path as all characters fit.



The sign that Characters are not fit on the path.

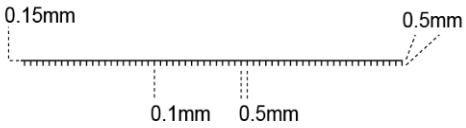
Add the path by the “Pen tool.

When the pointer is bringing closely to the bracket.

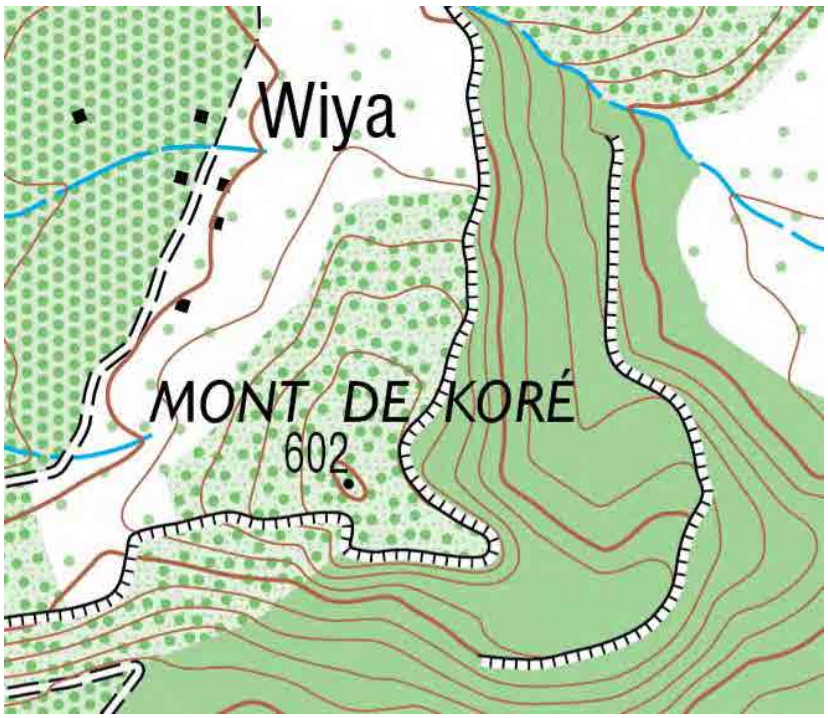
A small icon “ ” will appear then Drag the bracket.

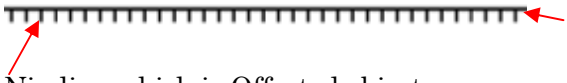
1-4-3 Create with the Offset Path command

Steep slope



Steep slope; (DATA TYPE: Line)



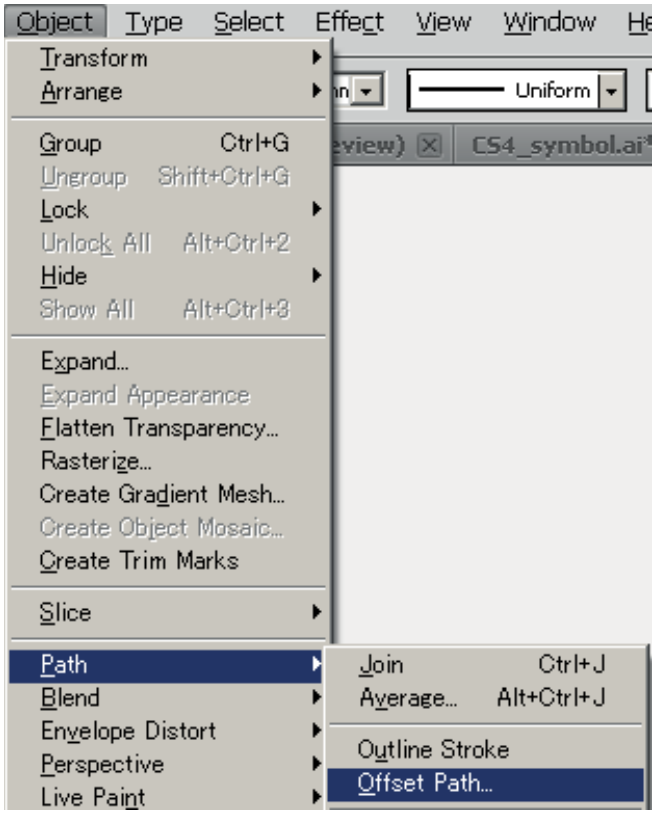


Upper line ; from CAD data

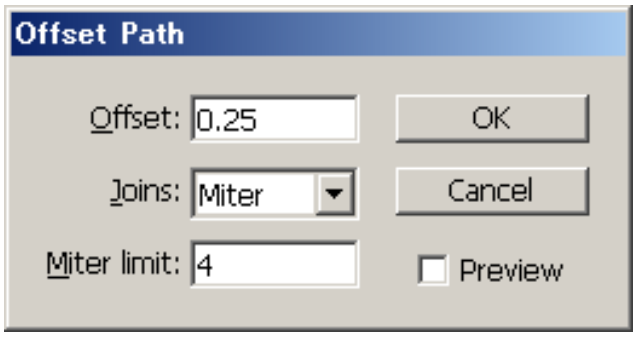
Nip line which is Offseted object

Offset object; making nip lkine

① Select the objects



② Choose Object > Path > Offset Path.



③ Enter the length of half of the nip line in the Offset text box. Then Click “OK”.

＊After offsetting the paths, it might be accommodated into created the certain “temporary layer” because of convenient for next work.

④ Select the objects
The unnecessary path side must be deleted by using Scissors Tool

⑤ Cut the path which are both side

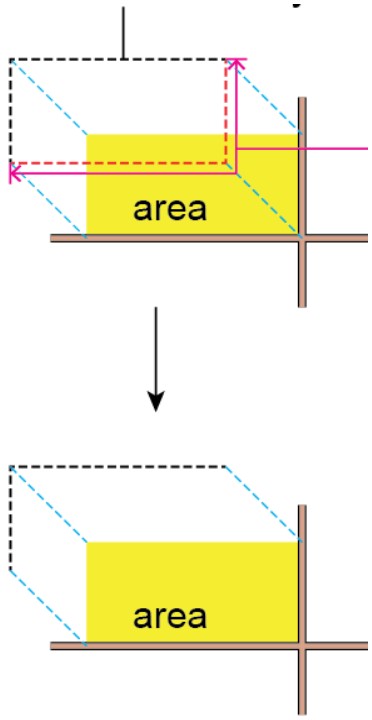
⑥ Apply an attribute with the Eyedropper tool. The line attribute will be tranfured to your line object.

Or enter the value of line attributes in the "STROKE" which are Weight, Dashed line.

1-4-4 Other symbolization

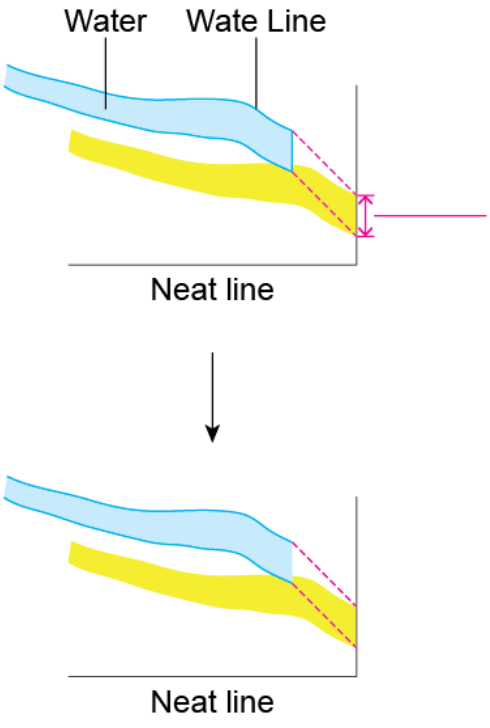
(1) **The overlappong lines with other line features should be deleted.**

A limits of certain lot area



When the limits line overlapping with road feature should be deleted.

(2) **The overlapping lines with neat line must be deleted.**

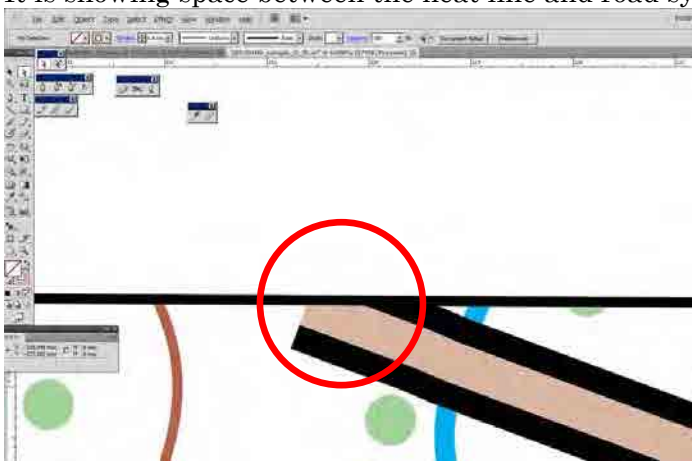


This overlapping water line must be deleted.

When the line which are overlapping with neat line will bring inferior apperrance of final offset printing qualities.

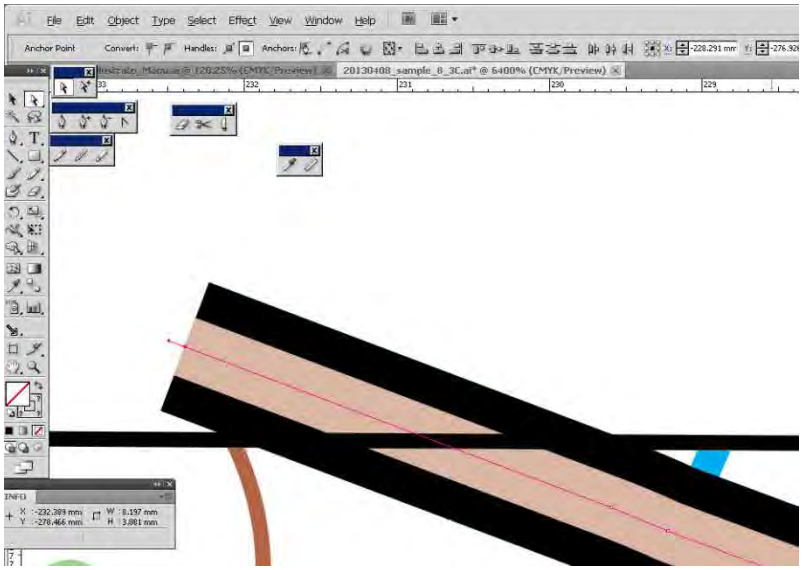
(3) Extend under shoot line to neat line

It is showing space between the neat line and road symbol.

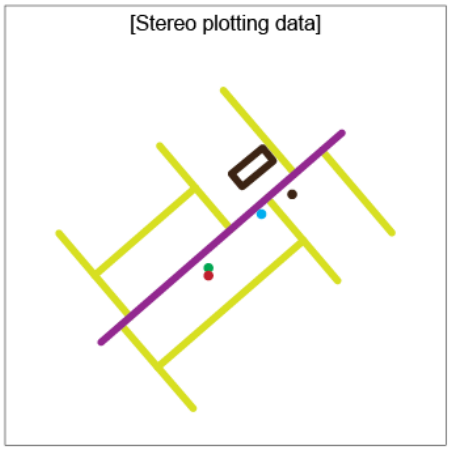


Using the “Pen tool”. Draw line to the outside of the neat line.

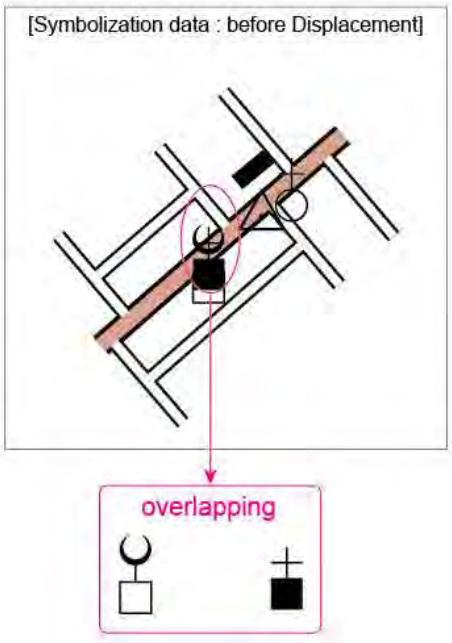
Or, select as enclosing only end points of objects by Direct selection tool”, then pulling selected anchor point to out of neat line with keeping right direction.



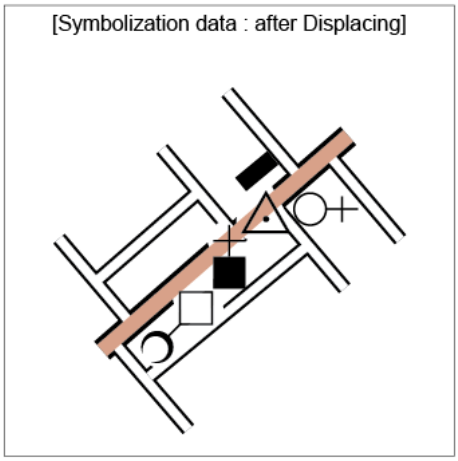
(4) Displacement of overlapping symbols.



① In the stereo plotting data, symbol appearances are in simple geometries which are point, line and polygon.



② After converting simple geometries to appropriate symbols however each symbols are overlapping.



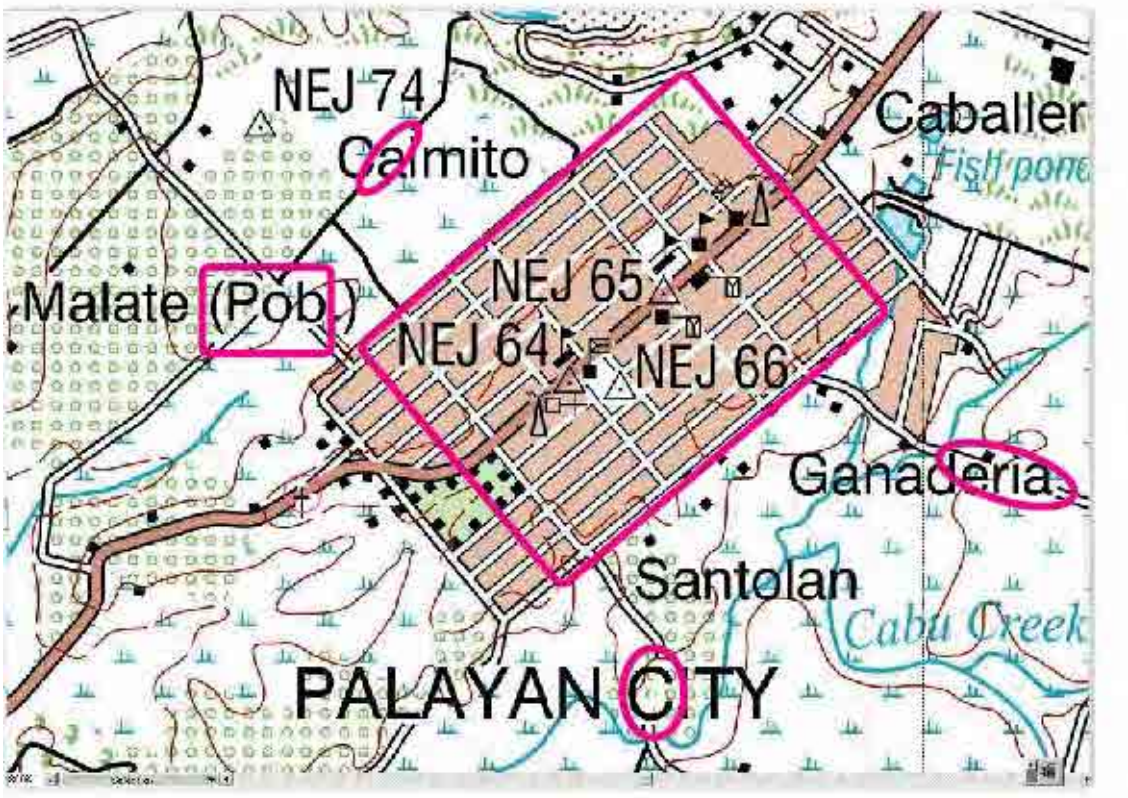
③ Overlapping symbols should be displaced with considering the relationship position of a map scale and features.

When overlapping with road should be masked as interrupted appearance in order to clarify symbols.

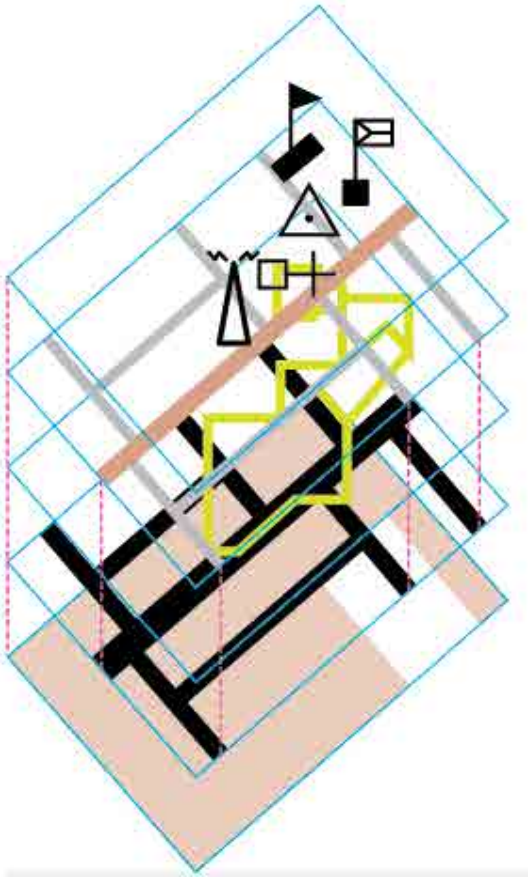
When symbols are displaced, it should be considered “cartographic judgment” to transfer from a true position as less as possible.

Commonly, in 1/50,000 scale map, accumulated displacement distance might be maximum 2.4 - 2.6 mm on the map.
* The point symbols might be scaled down 20% of itself.
* Each point symbol should be spaced at the interval of at least 0.2mm.
* When the color of annotation is same as that of map features or symbols they should be spaced at the interval of at least 0.2mm.
* Horizontal position might be transferred as less as 1.0mm at most 2.4mm

(5) **When the same color line, polygon symbols and same color annotation are overlapped, line, polygon symbols should be masked by so-called the “hold out mask”.**



(6) When draw the "hold out mask" in order to avoid overlapping each the symbols, should considered to respect priority of symbols and layering order.



Front; High priority
The annotations must be more priority than any other else.

Symbols

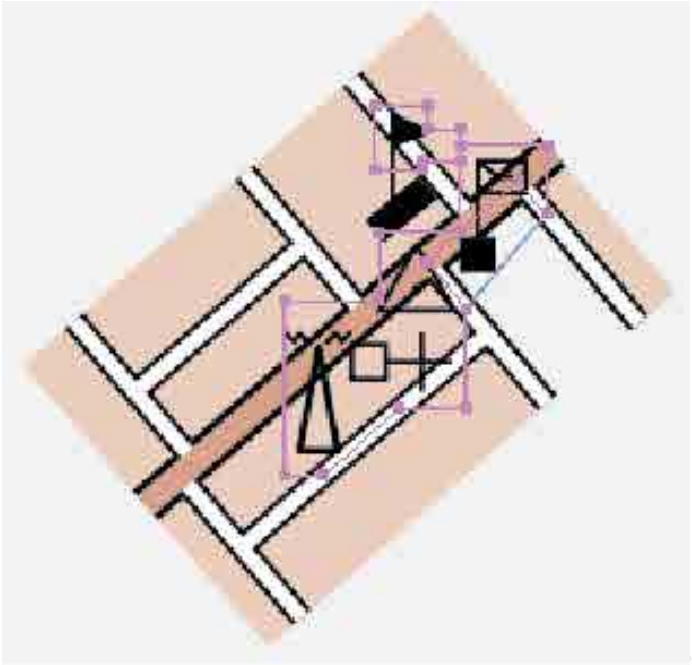
Road "*** f "

Hold out mask

Road

Site (ground color)

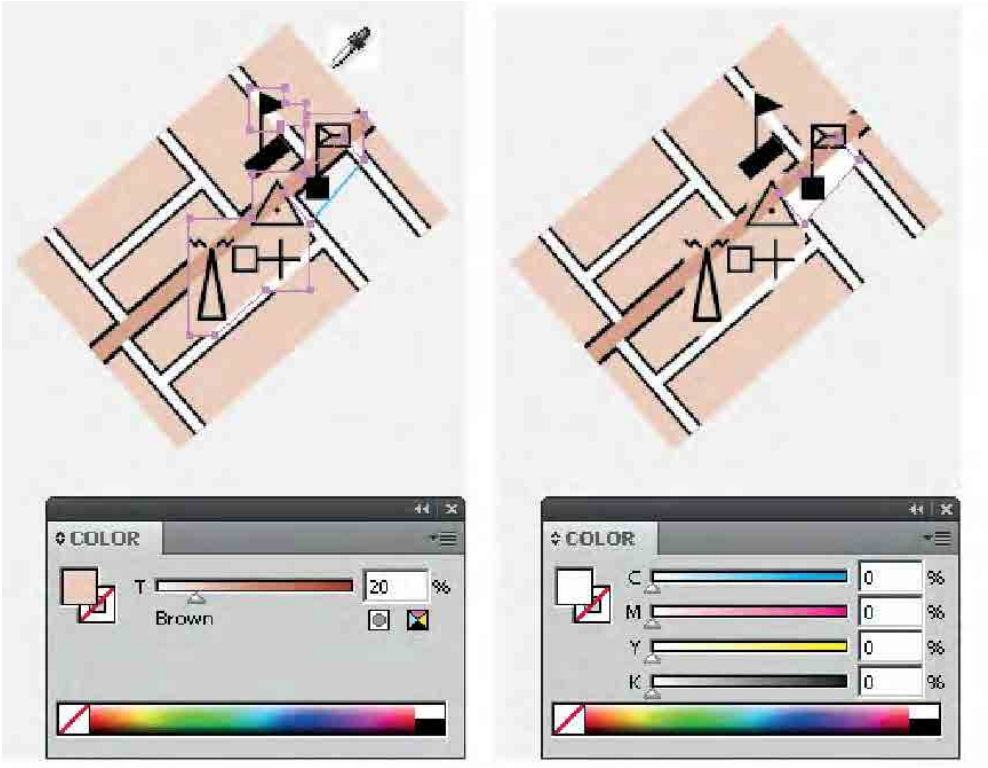
Back; it should be almost filled features which are come as polygon features from cad data.



To draw the "hold out mask" which is following as the background Fill Color or pattern.

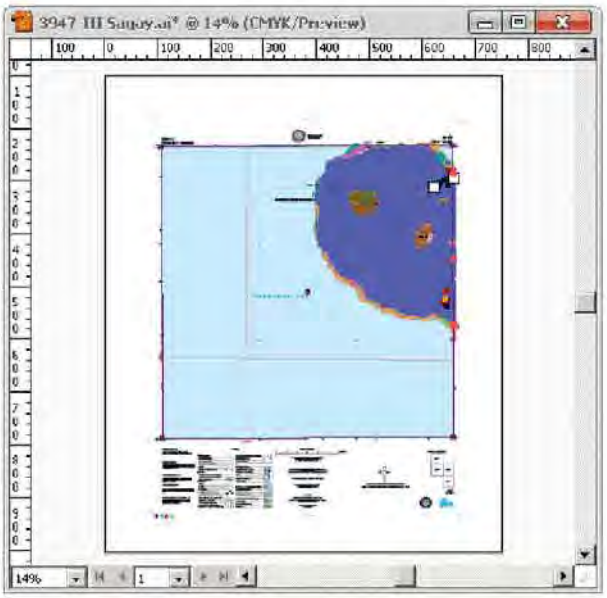
(7) **To set the Fill color to "hold out mask" this should be same as background color.**

It might use "Eyedropper tool" or Color panel.



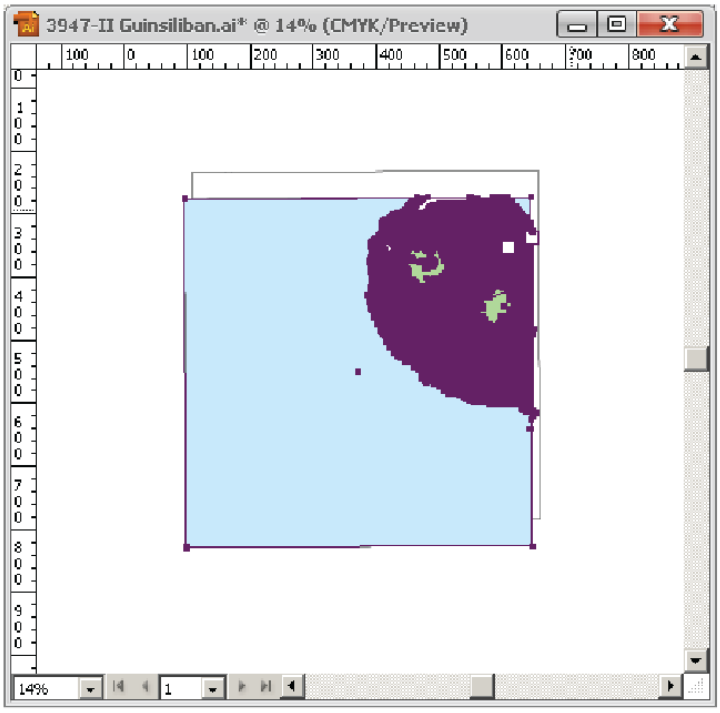
1-5. Adjoin neighboring sheets

① For example, adjoining left and right sheet, Open left side sheet (Ctrl+O), Select right side of adjoining with “direct selection tool” as dragging top right to bottom left then “Copy” (Ctrl+C).



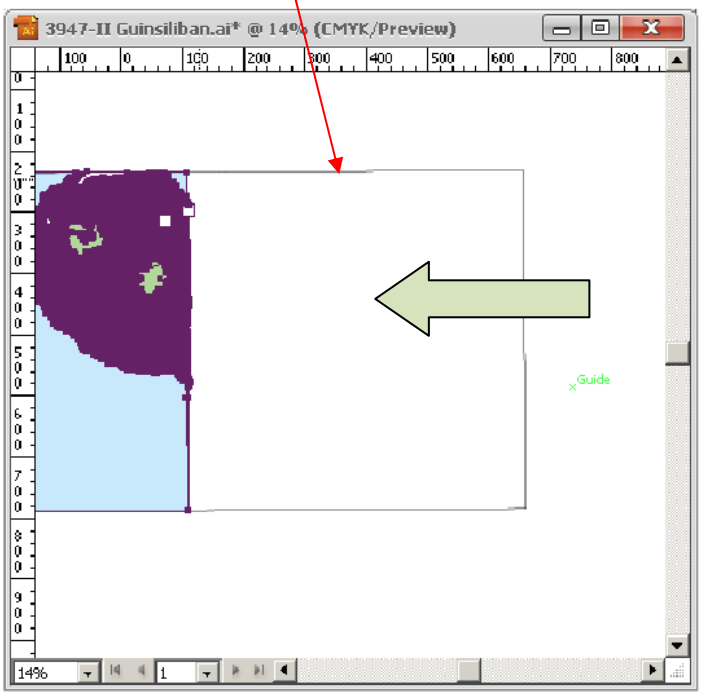
② Open right sheet then Make new layer for “pasting adjoining sheet” cancel Check mark ☑ to ☐ at “Paste Remembers Layers” and turn activate this layer.

③ “Paste “in the new layer which has been made at right sheet file （Ctrl+V）.



④ Set “smart guide” it is from view menu bar pull down menu or (Ctrl+U).

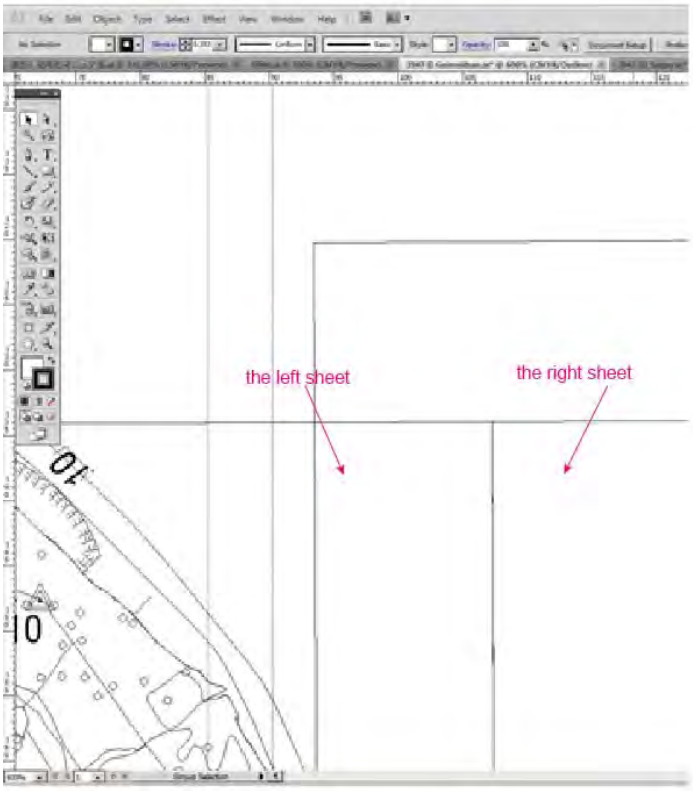
Put “Selection Tool” at the corner of the right side, then move and snap to left side of current map sheet’s the left corner.



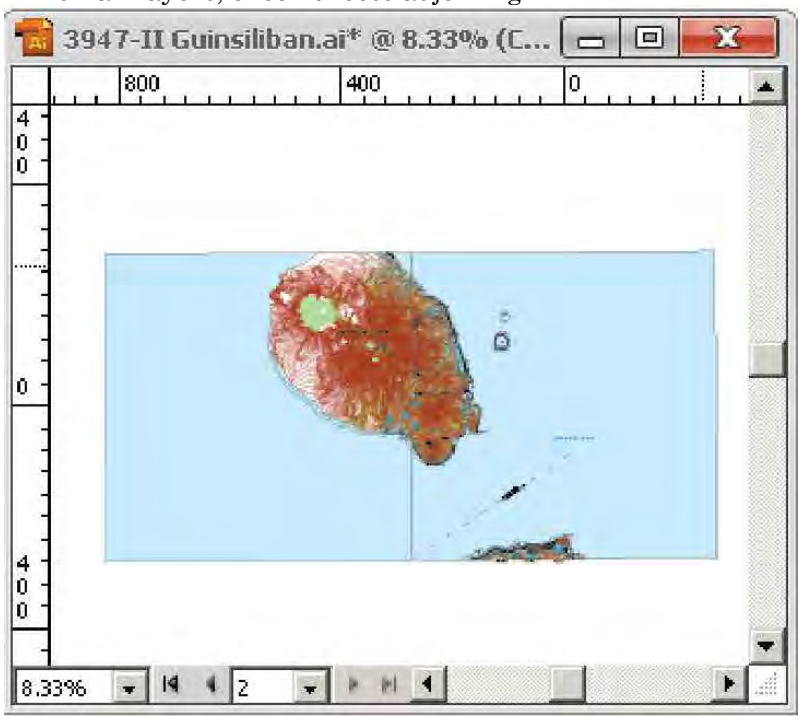
Move with dragging to corner, when it snapped, the arrow mark will turn white.

⑤ Move with dragging to corner, when it snapped, the arrow mark will turn white.

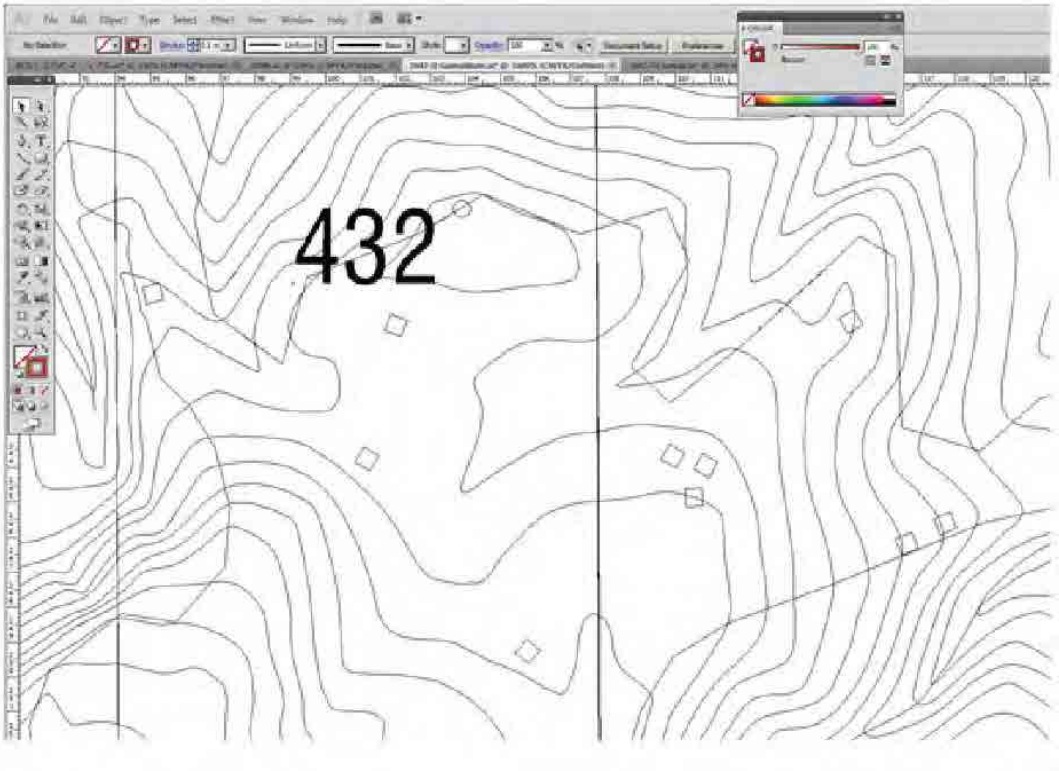
When move and snap to another sheet corner, it should zoom in at the each corner in order to check the matching.



⑥ Turn on all layers, check sheets adjoining



⑦ Change display with Outline view (Ctrl+Y) or zoom in, as need.



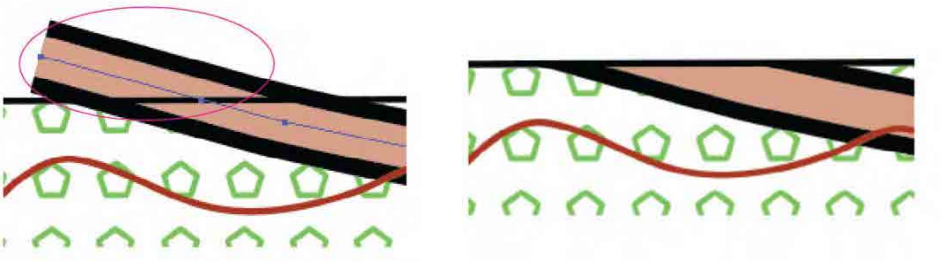
⑧ After adjoining working, the “new layer for map adjoining “should be deleted.

Select Layers panel menu > ▼ > Delete “Layer ***” Or click Delete Selection.

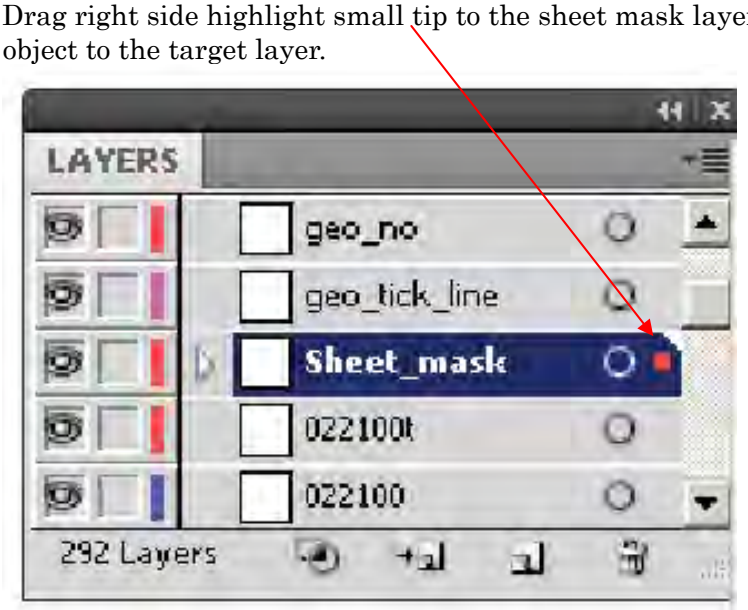
1-6. Create the Hold out mask

- The outside of neat line should be hidden with a mask object is called “sheet MASK” or “Hold out mask for neat line” etc.

① Copy the neat line (Ctrl+C).
Uncheck “Paste Remembers Layers” in the “Layers panel ” menu.

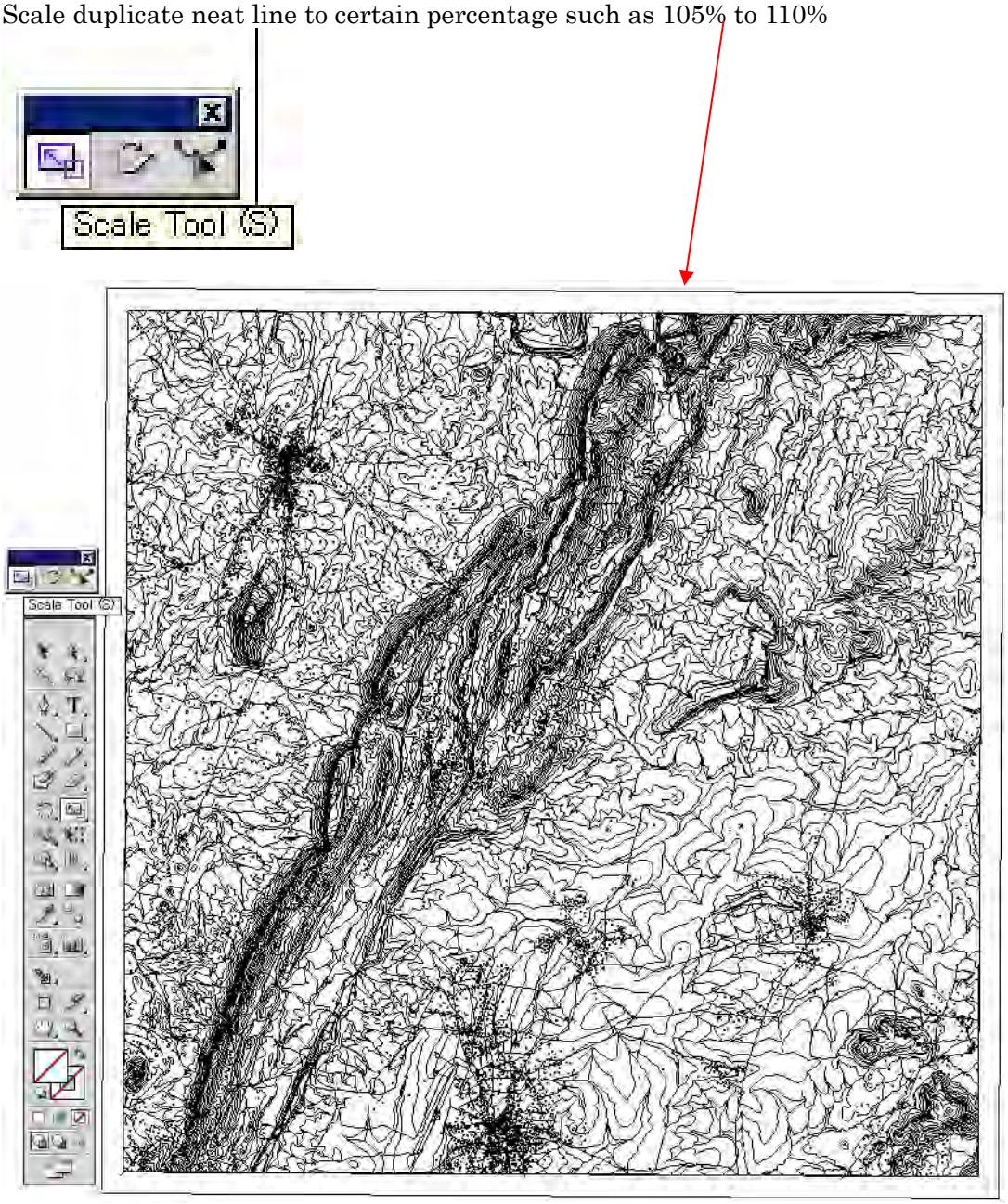


② Select neat line then Copy the neat line (Ctrl+C).
③ Paste in Front (Ctrl+F).
④ Drag right side highlight small tip to the sheet mask layer. It will move pasted object to the target layer.



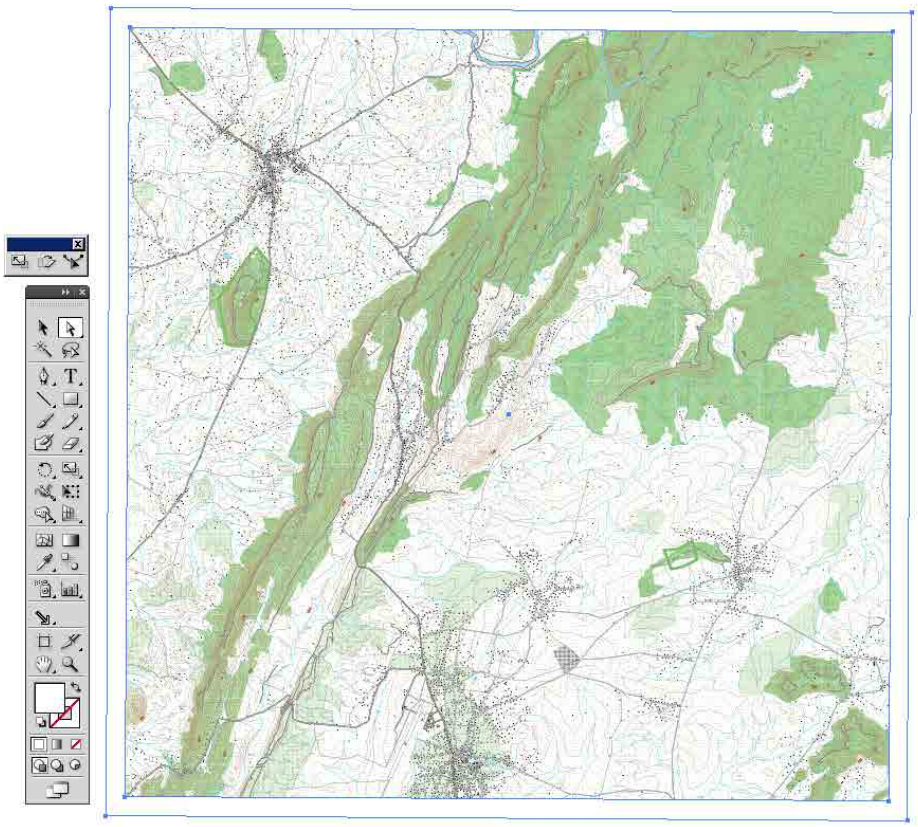
Alt+Click;
Lock all layers at once other than the target one

⑤ Scale duplicate neat line to certain percentage such as 105% to 110%

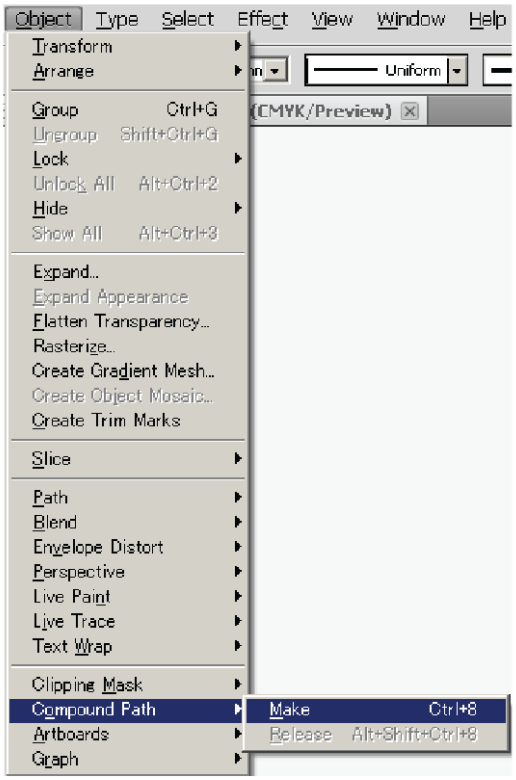


After scaling of the duplicated neat line should be appropriate size.

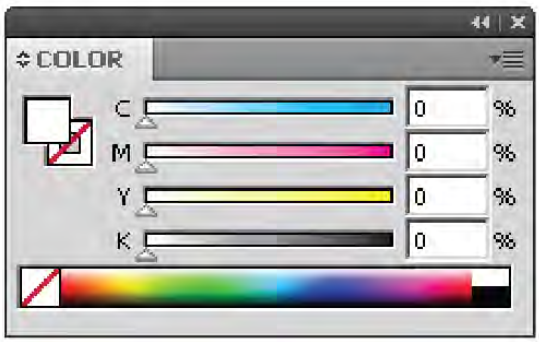
⑥ Create compound path, and Fill color CMYK=0 in the Color panel.



Create compound path. Select the objects and choose Object > Compound Path > Make.

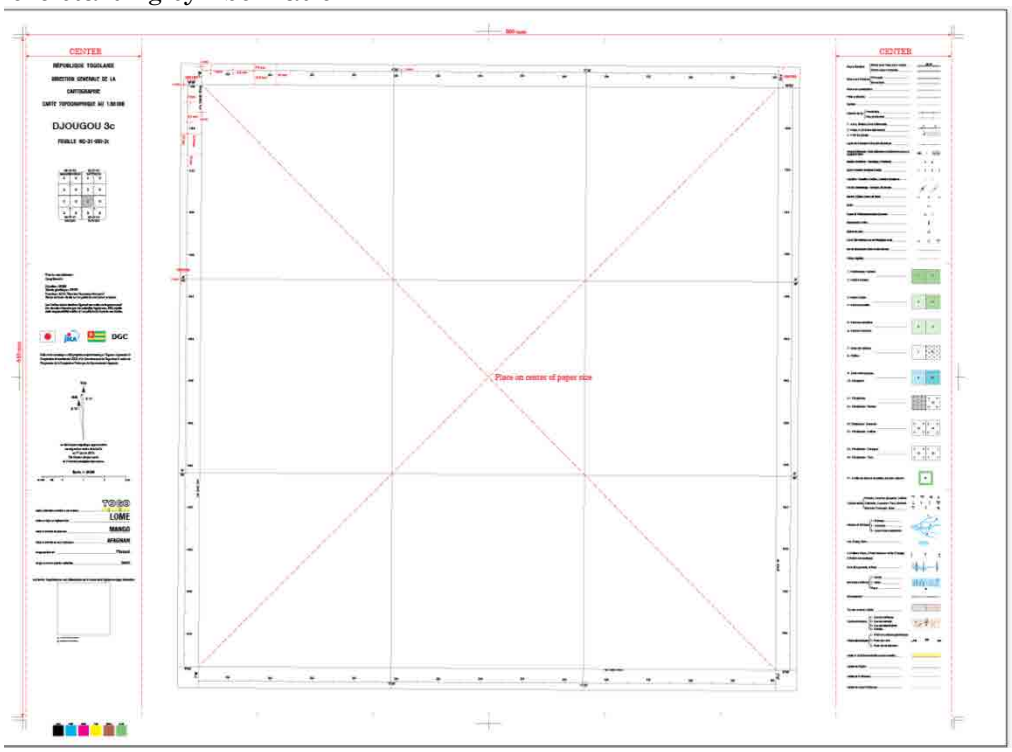


Color panel
Fill: CMYK=0, Stroke: None

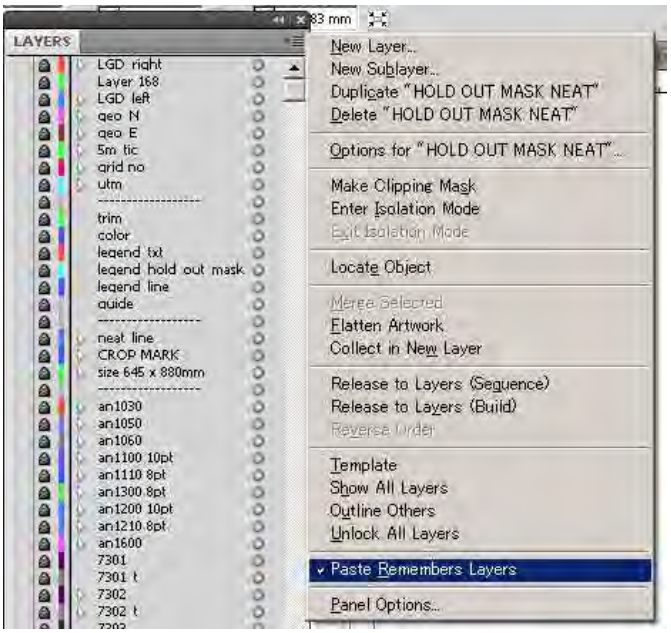


1-7. Legend and Marginal information

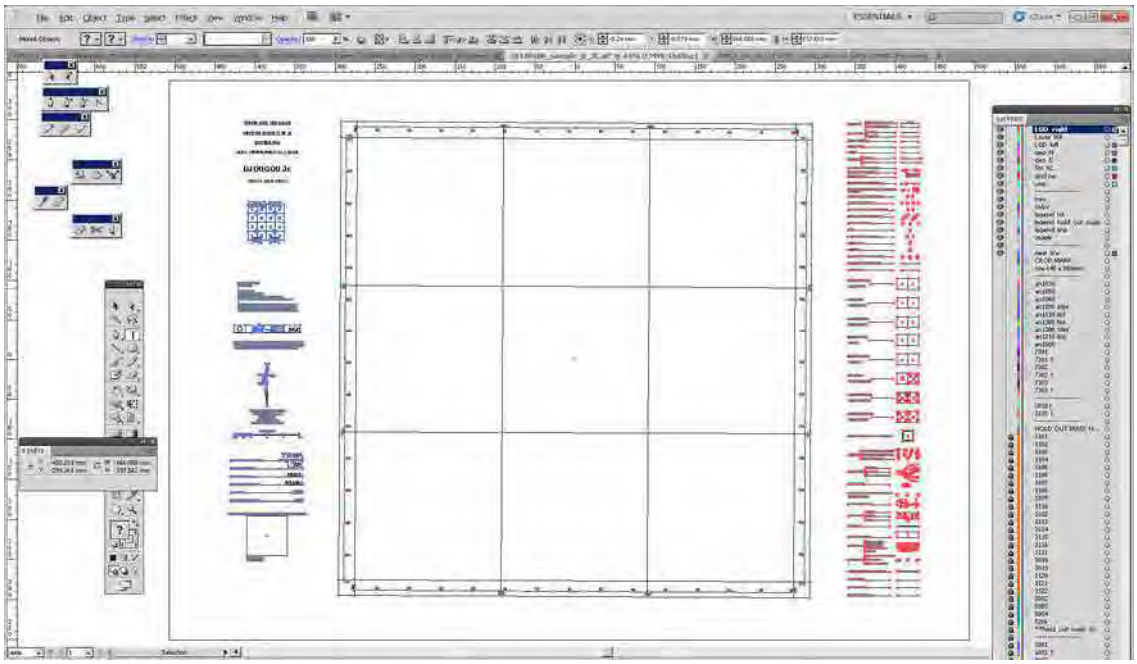
① Open "013_04_08_LEGEND_TOGO.ai" (Ctrl+O) then Select and Copy (Ctrl+C) it. Legend file which has layering, dimension of marginal items should be prepared before starting symbolization



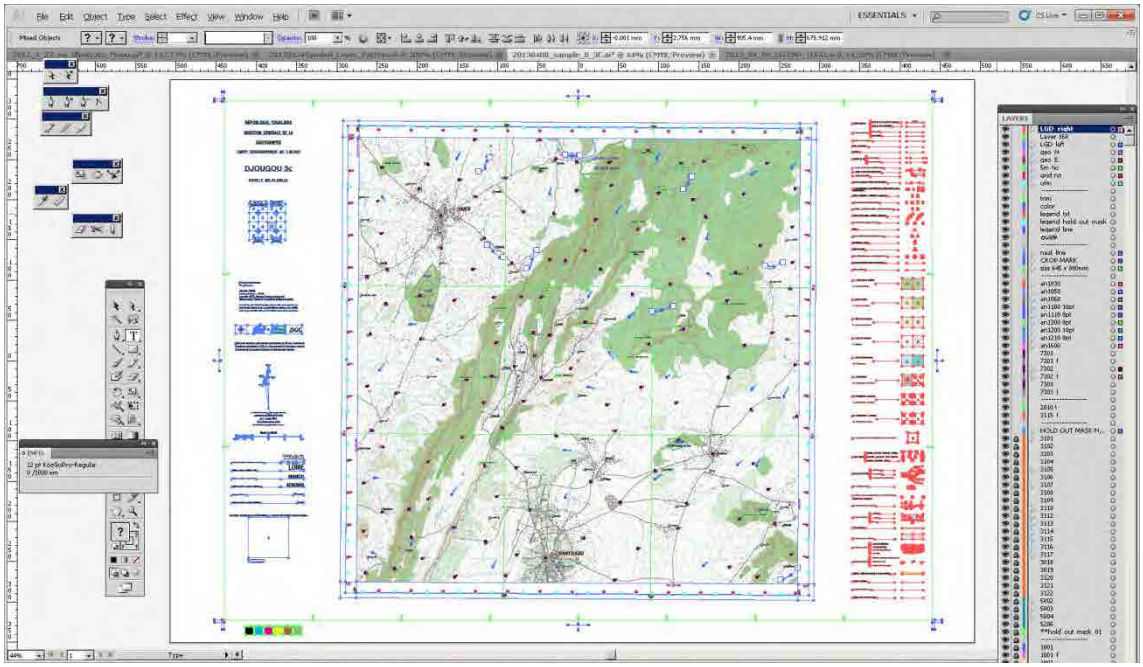
② In current working file, Check ☑ "Paste Remembers Layers " in Layer panel



③ Paste in Front (Ctrl+F).
After pasting, the legend objects should be adjusted appropriate position as need.



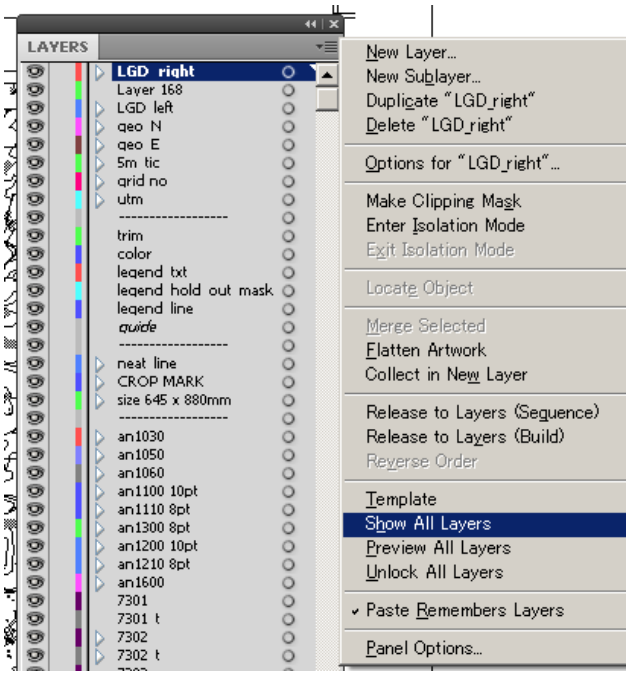
Outline view



Preview

1-8. The outlook of checking before Offset Printing

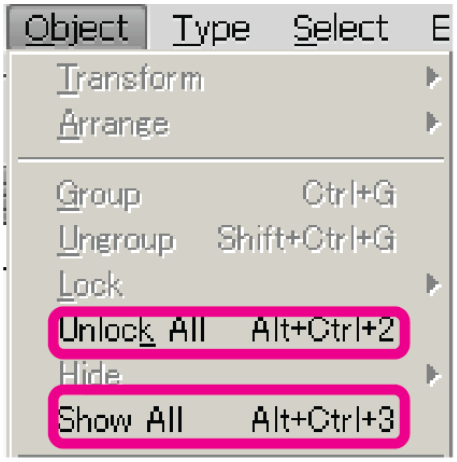
① Show All Layers and Unlock All Layers
Choose from the Layers panel menu.



LAYER panel > ▼ >” Show all layers”

LAYER panel > ▼ >” Unlock all layers”

② Unlock All, and Show All of the objects
Select all the objects (Ctrl+A) and choose from Object pull-down menu.



LAYER panel > ▼ >” Show all layers”

LAYER panel > ▼ >” Unlock all layers”

③ Expand Appearance

For the brush objects which are as point data, “Expend Appearance” should be done.

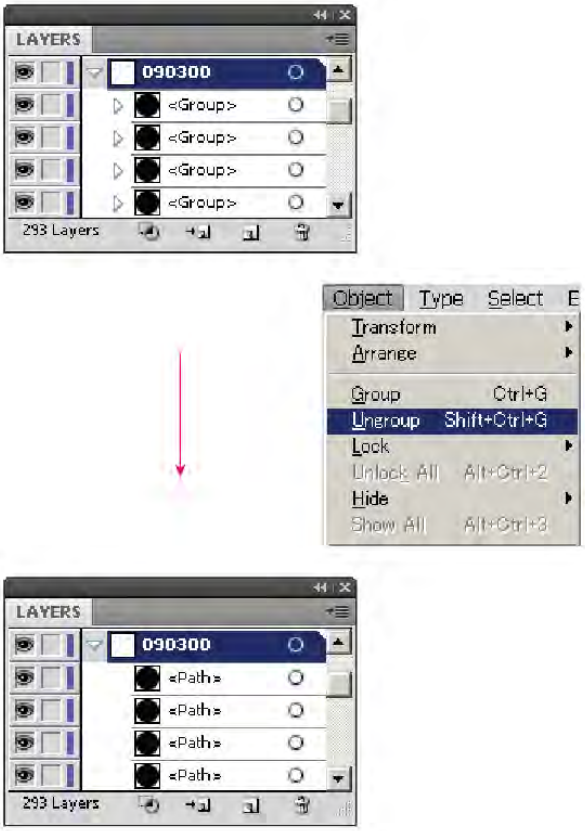
Select all the objects (Ctrl+A) and choose Object > Expand Appearance.

It is unnecessary to expand when turn off the “Expand Appearance”

④ Ungroup

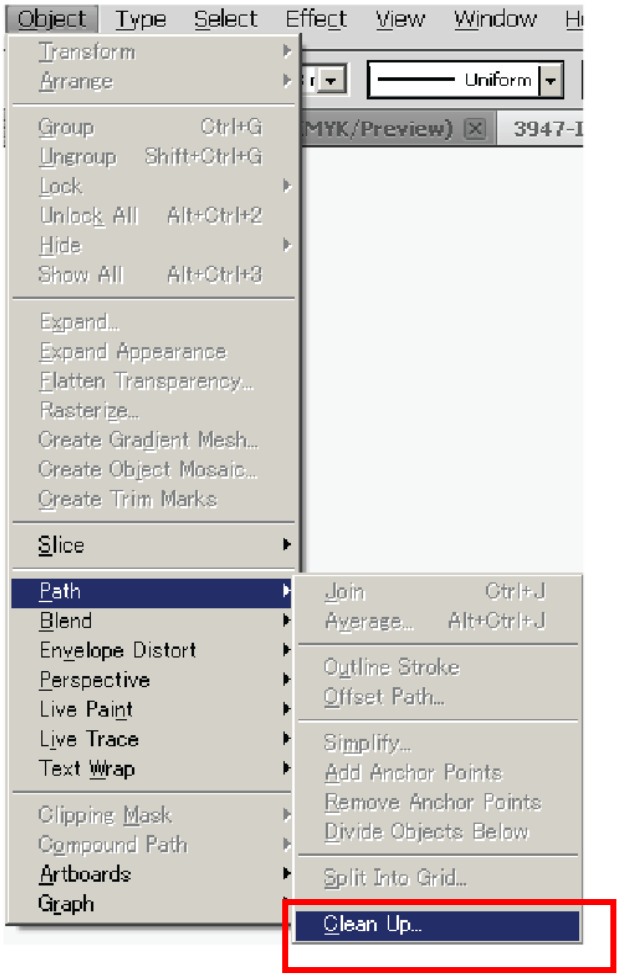
The group which nested unnecessarily should be released.

Select the objects and Choose Object > Ungroup.

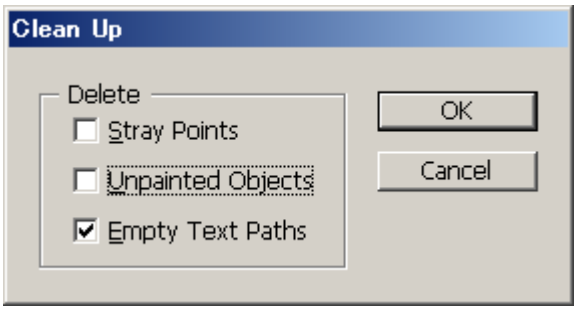

LAYERS
090300
<Group>
<Group>
<Group>
<Group>
293 Layers
Object
Type
Select
Transform
Arrange
Group Ctrl+G
Ungroup Shift+Ctrl+G
Lock
Unlock All Alt+Ctrl+2
Hide
Show All Alt+Ctrl+3
LAYERS
090300
<Path>
<Path>
<Path>
<Path>
293 Layers

⑤ Delete empty text paths

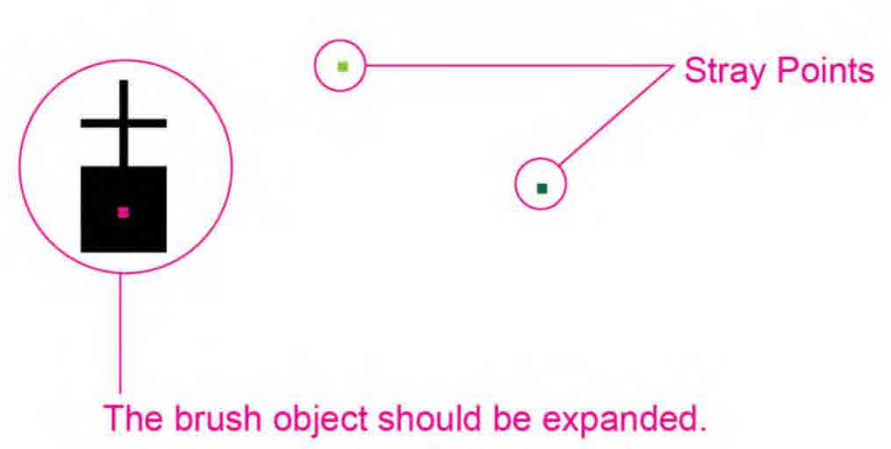
1. Choose Object > Path > Clean Up.



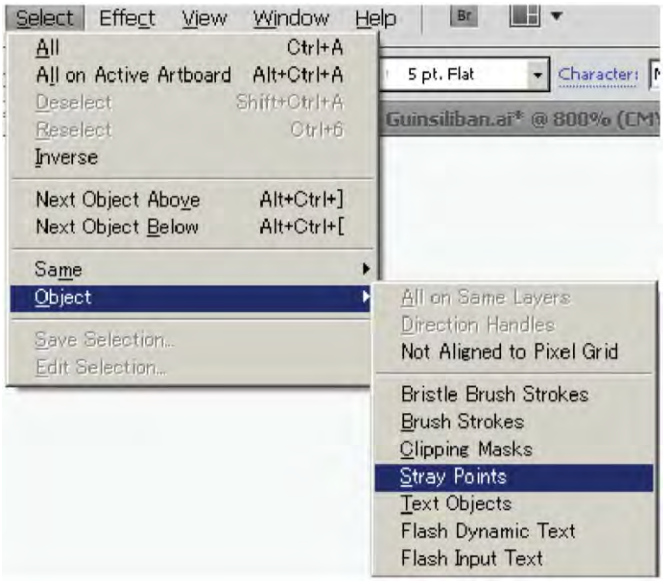
2. Select Empty Text Paths, and click OK.]



⑥ Delete stray points



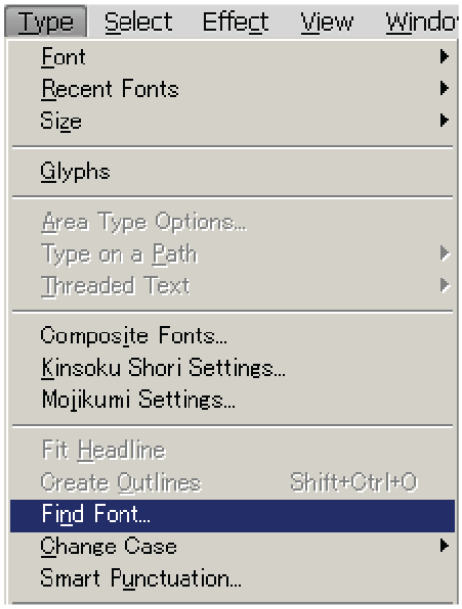
1. Find stray anchor points.
   Choose Select > Object > Stray Points.



2. Delete stray anchor points.
   ＊The brush objects are expanded before run the Stray Points.
   ＊It may be also select isolated points other than the stray points, before deleting should check it can delete or not.

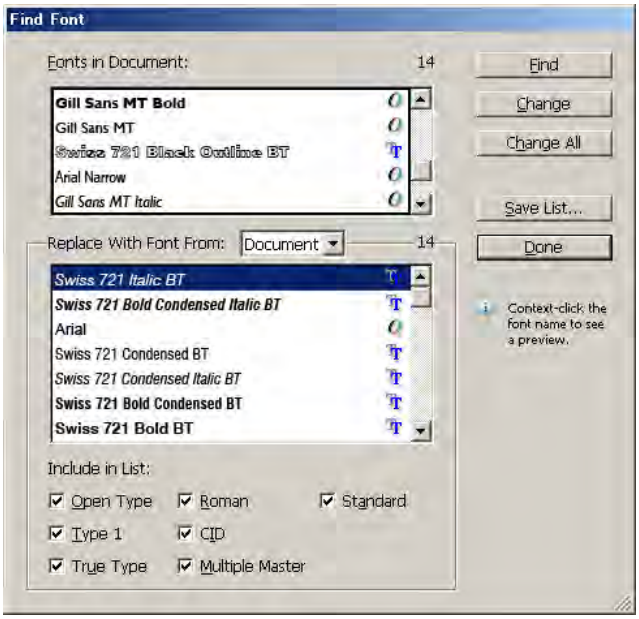
⑦ Checking all texts in the document

1. Check whether you used the fonts that are not specified in the document. Choose Type > Find Font.



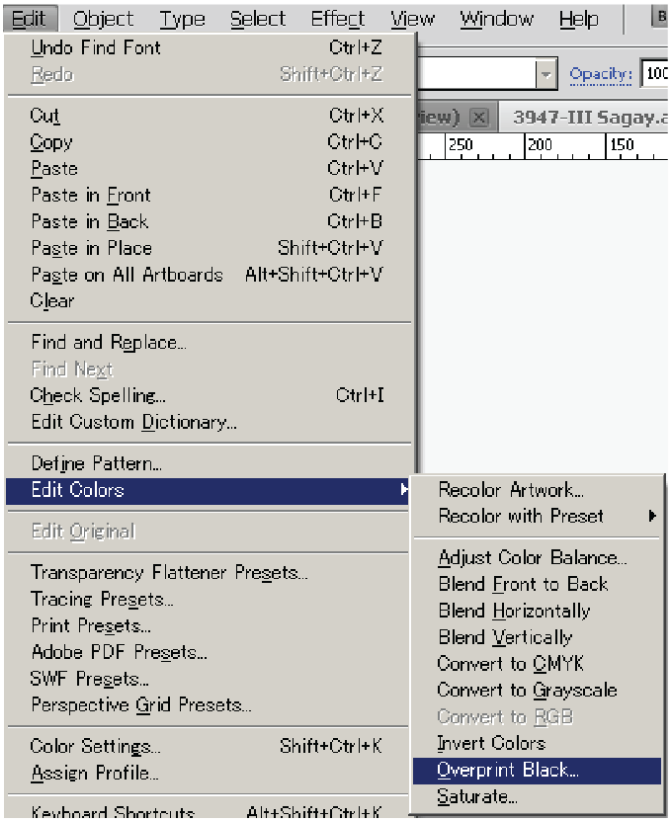
2. Select the name of a font from the lists, and click “Find“ , then the selected font will be automatically searched in your current file.

   Select a replacement font from the following list of the “Replace With” Font From pop-up menu “Document “, in which case only these fonts in the document are displayed, or in the list that appears when you choose “System “, in which case all the fonts in your computer will be displayed.. Click on Change All(any change). “Click Done” to close the dialogue box.



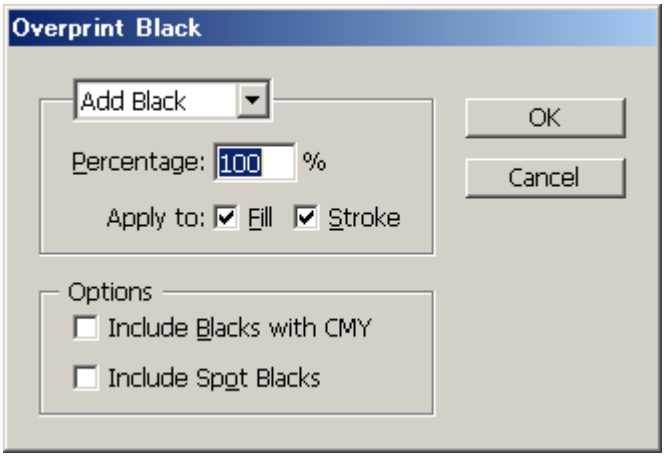
⑧ Set up overprinting

1. To be overprinting all black objects in your artwork, select the Overprint Black. Select all the objects (Ctrl+A) and choose Edit > Edit Colors > Overprint Black.



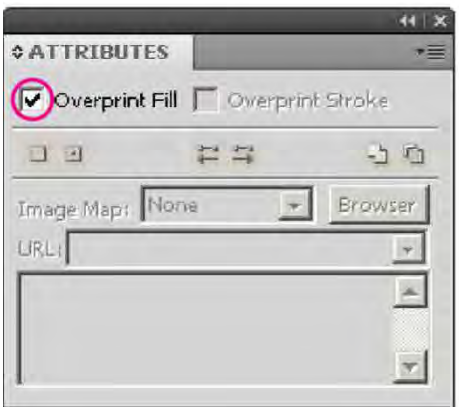
2. Choose “Add Black” from pop-up menu.

Enter “100” in the Percentage text box.
Select Fill and Stroke to specify how to apply the overprinting.
Click OK.

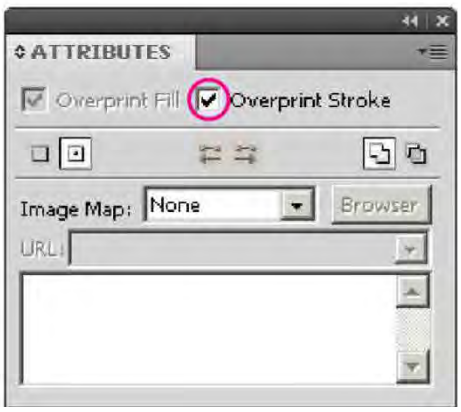


3. 100% of spot colors should be applied overprint in the Attribute panel. Color setting should be done according to the symbol specification.

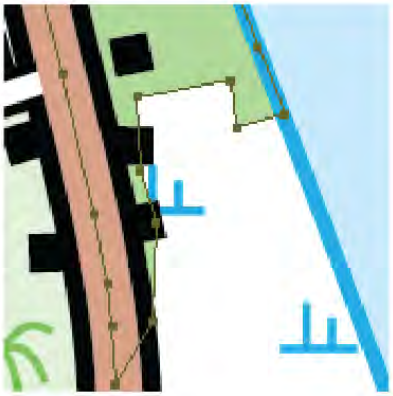
[case at Fill]

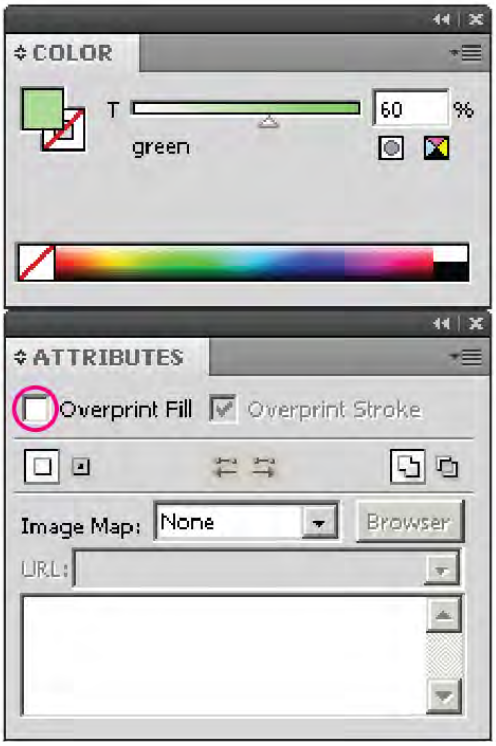


[case at Storke]



4. For the White objects (CMYK 0%) and the fill color less than 100%, the overprint should not be applied. Uncheck the Overprint Fill and stork.

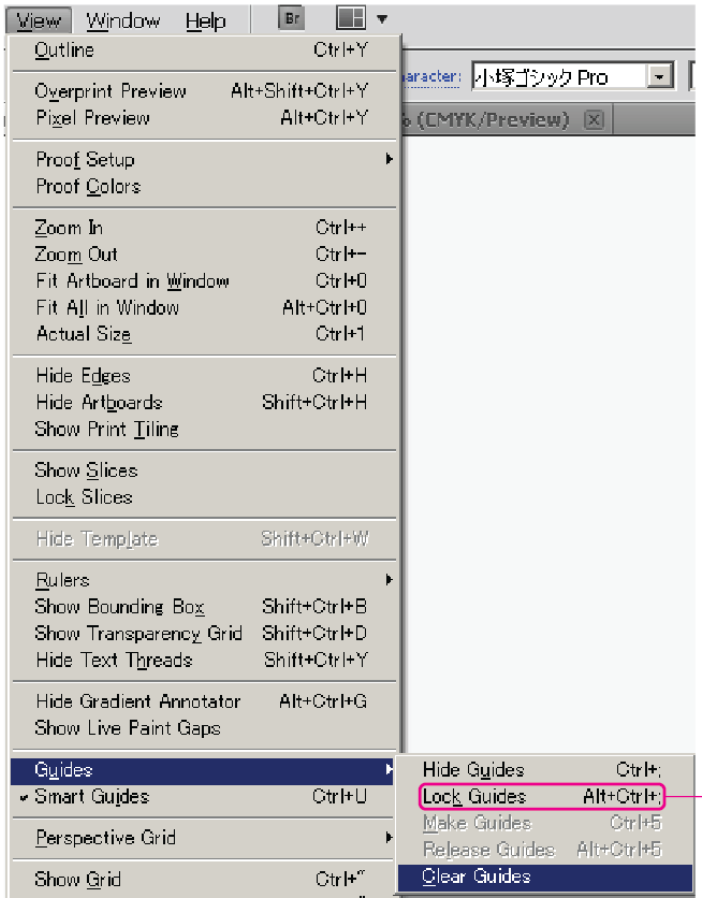




⑨ Delete Guides

Before printing, unnecessary guides should delete. It can clear at once.

Choose View > Guides > Clear Guides.

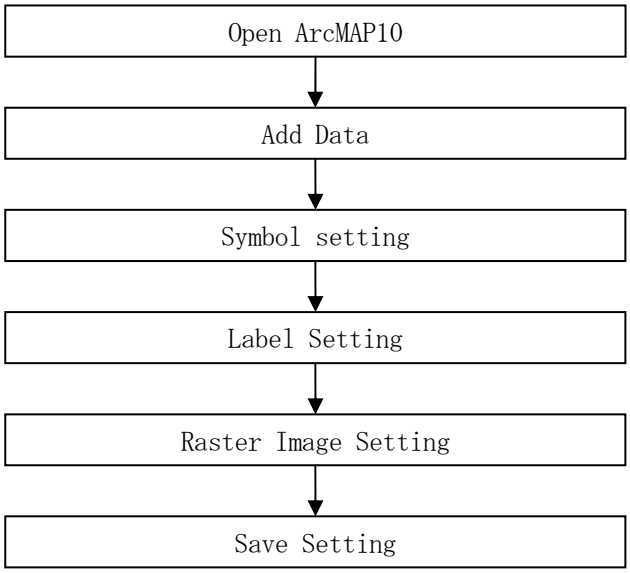


If guides are locked, uncheck it.
Then select the Clear Guides, all guides will be deleted at once.

Structuration

Chapter 5-1-1 Basic Manipulation of ArcGIS

1-1 The work flow

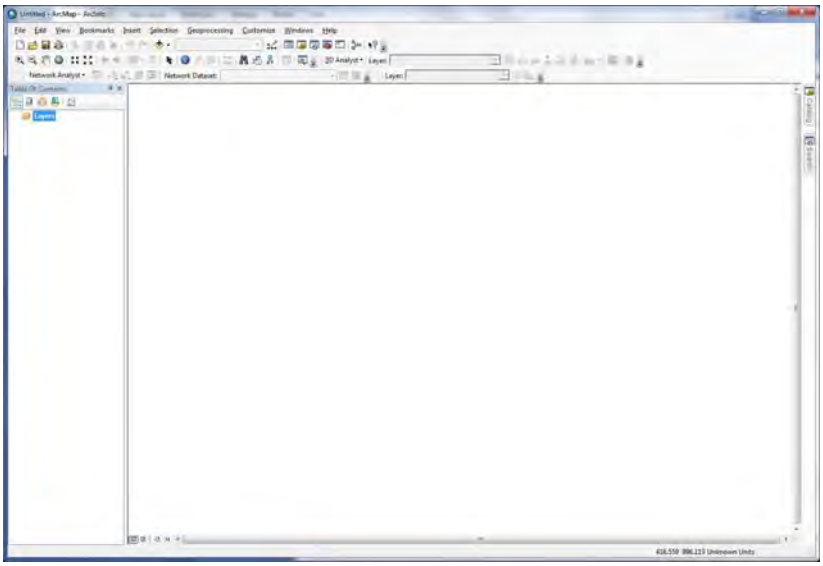


1-2 Open ArcMAP

(1) Open new “ArcMAP10” file

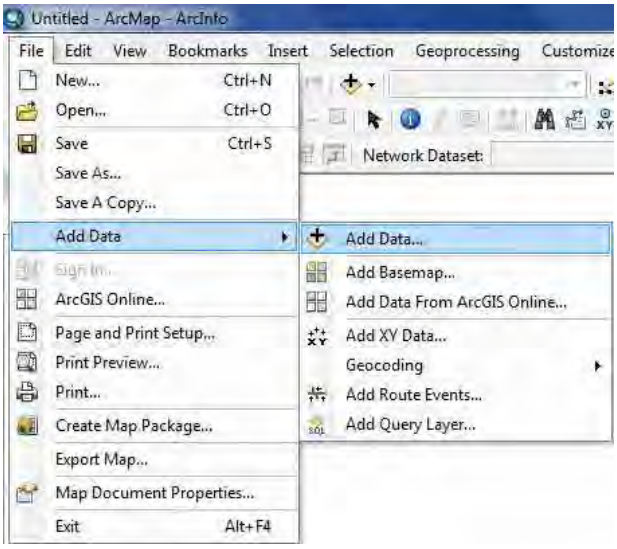
Click shortcut icon of “ArcMAP10” on the Disktop

(2) Opened Window

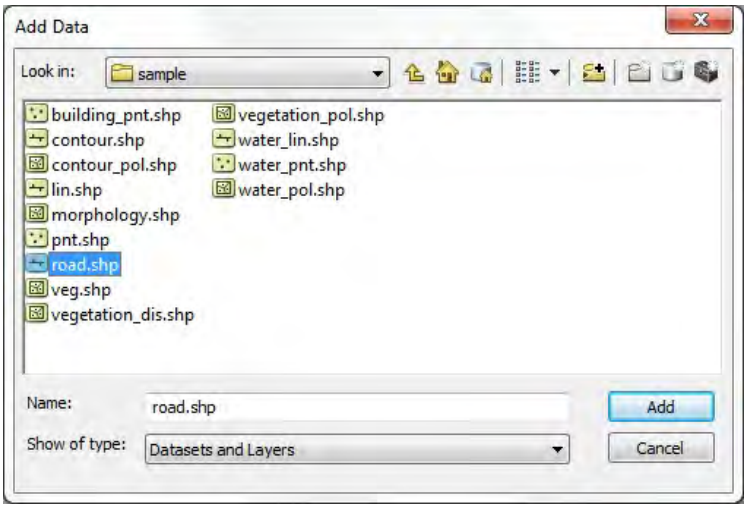


1-3 Add Data

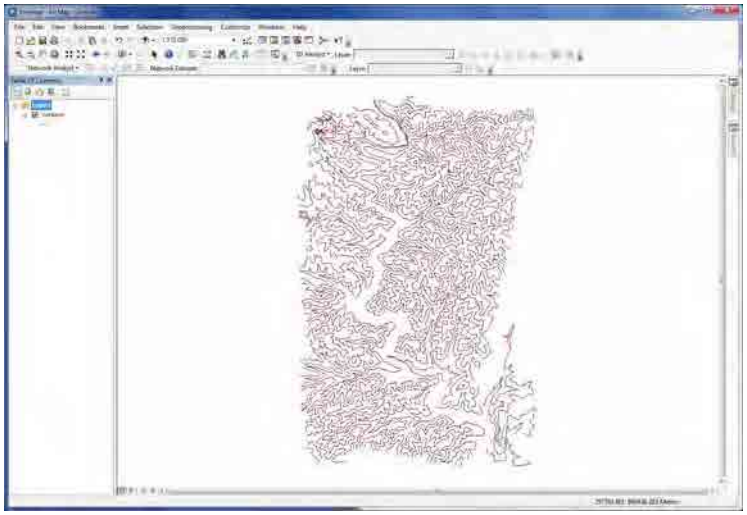
(1) Add Data



(2) Select Files

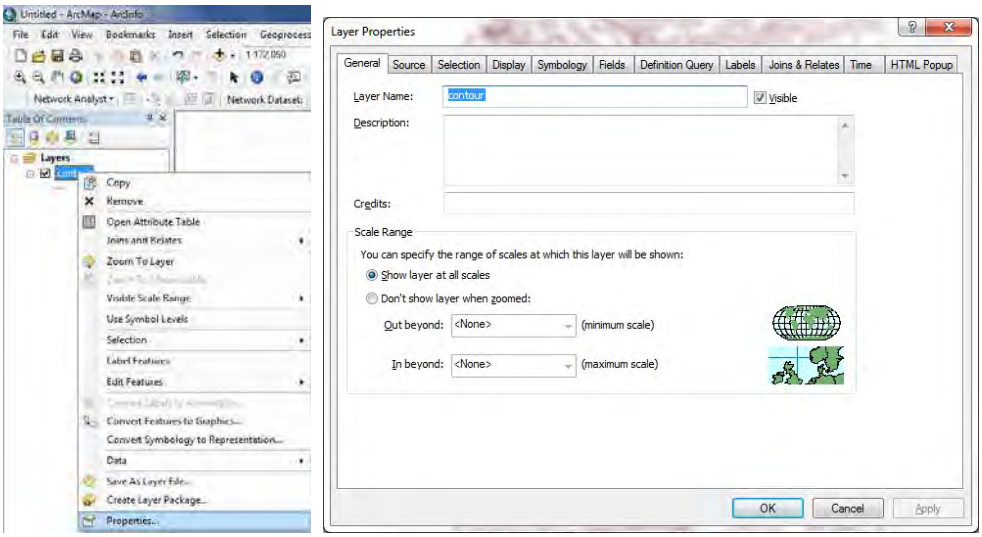


(3) Selected Data are shown in the window

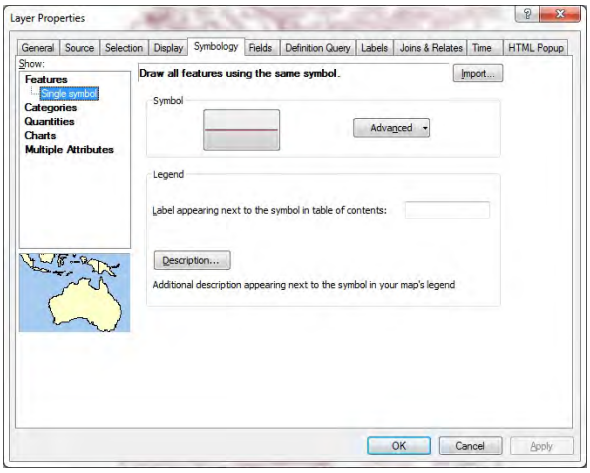


1-4 Symbol Setting

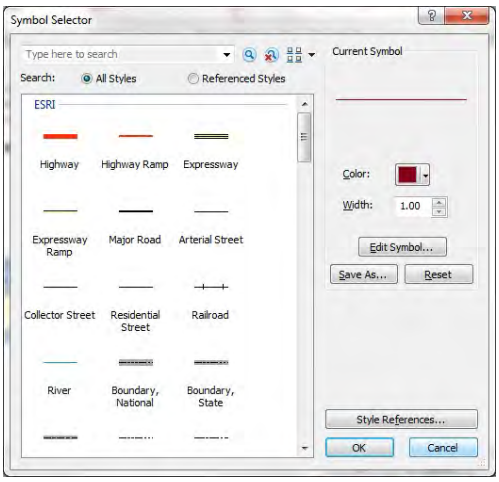
(1) Select Layer for setting and open property window



(2) Go to "Symbology_tag" and Click setting button



(3) Set "Color", "Width", etc… and Click OK

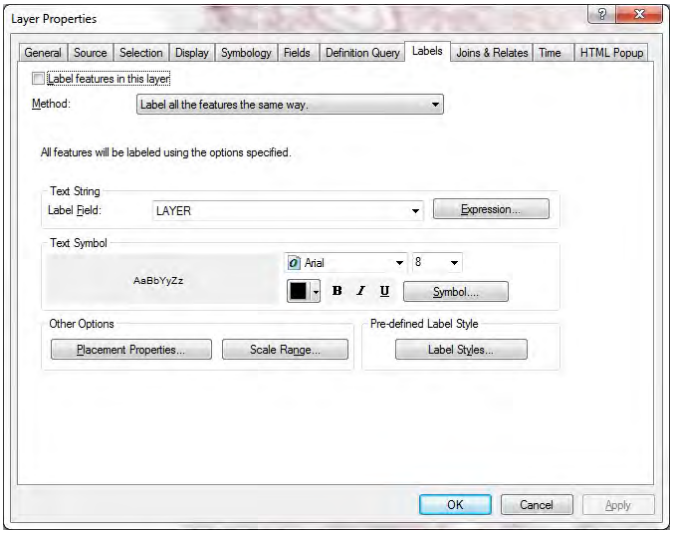


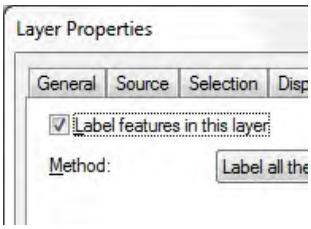
(4) After Return to "Symbology_tag", Click OK in that Tag

1-5 Label Setting

(1) Select Layer for setting and open property window

(2) Go to "Labels_tag" and Check "Label features in this layer"





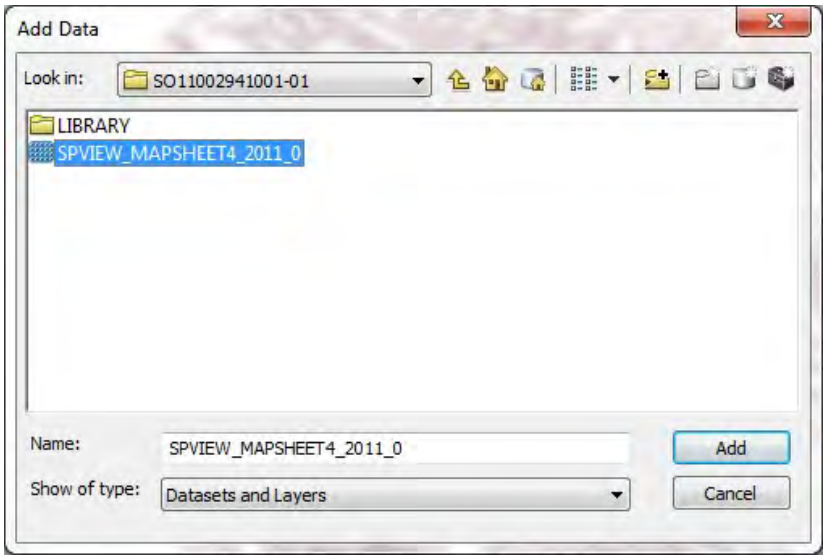
(3) Select "Label Filed" to be displayed and set text symbols(Color, Size etc)

(4) If necessary, Set duplication control by clicking "Placement Properties"

1-6 Raster Image Setting

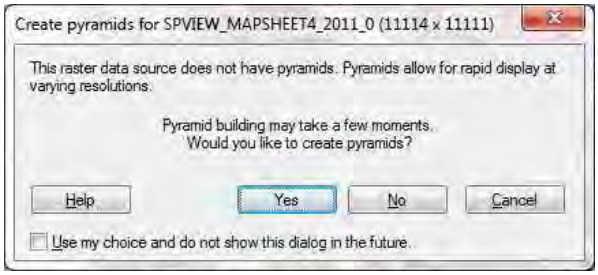
(1) Add Raster Image

Select Image files and Click "Add"

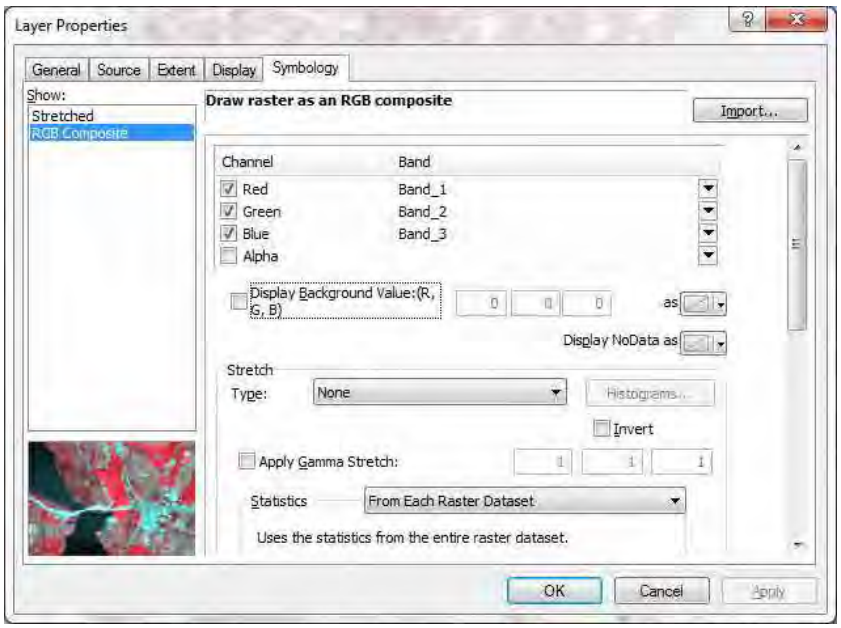


(2) If there is no pyramid file, following window comes.

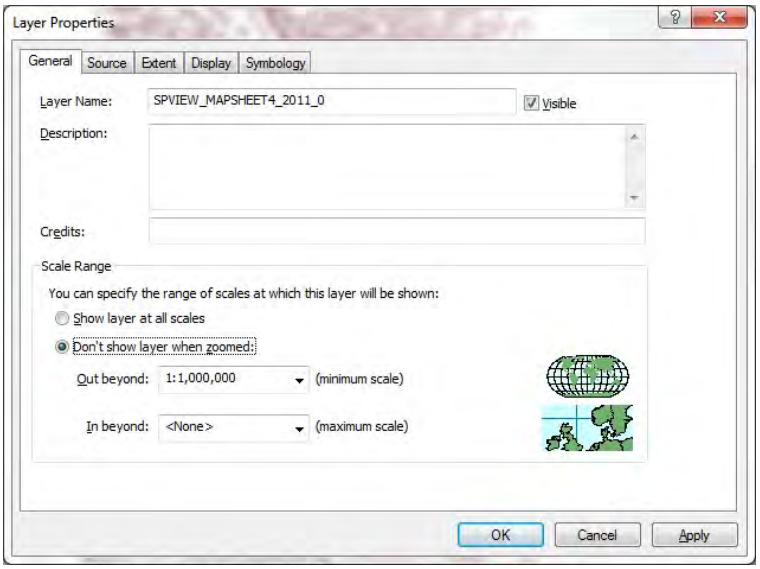
Click "Yes" to create pyramid files



(3) Select added image and open property window

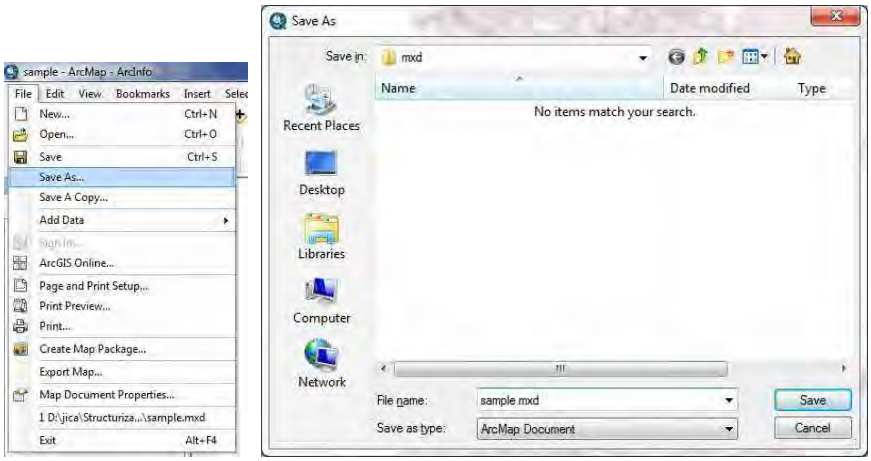


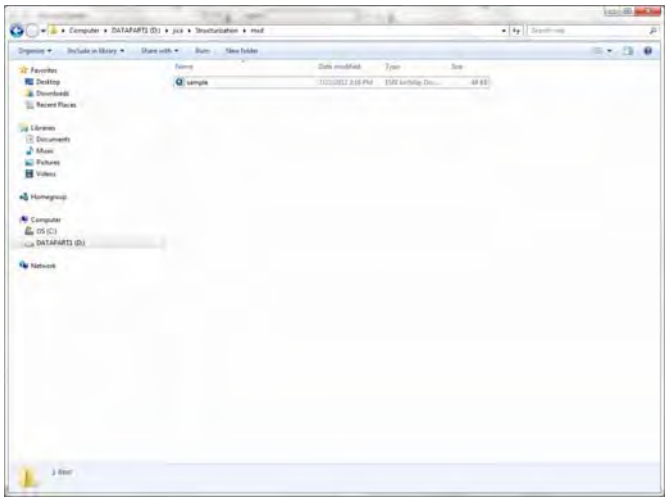
(4) Go to “General_tag” and check “Don’t show layer when zoomed” and set Out byeond scale



1-7 Save Setting

Chose proper folder and save as proper name into “mxd” format



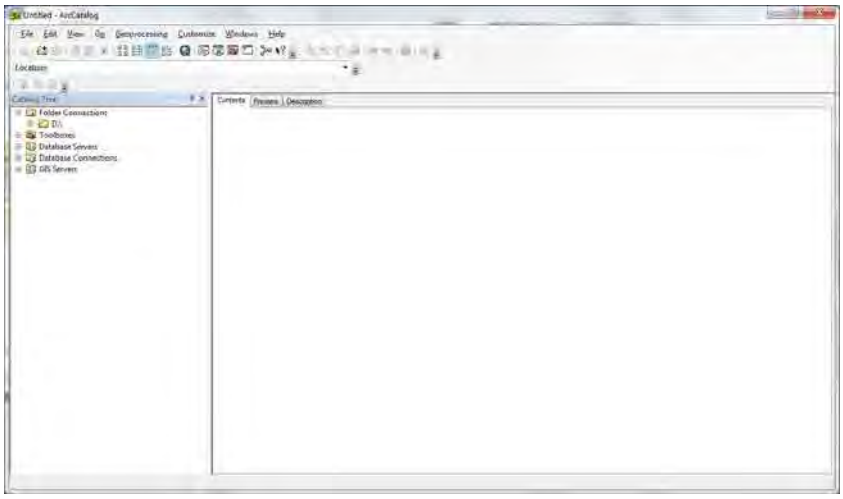


Chapter 5-1-2　Basic manipulation of ArcCatalog

2-1　Open ArcCatalog

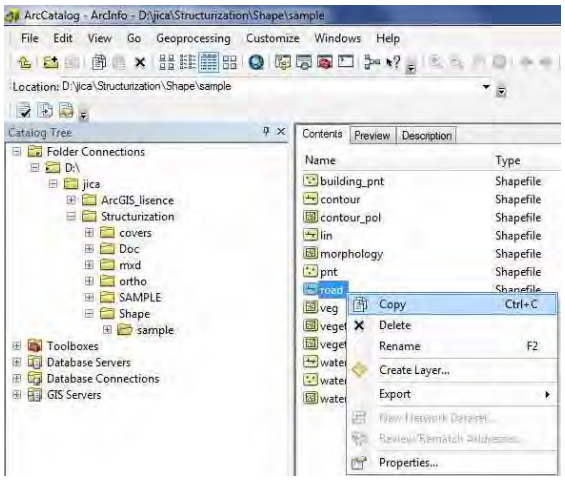
(1) Open “ArcCatalog” from Start menu

(2) Opened Window



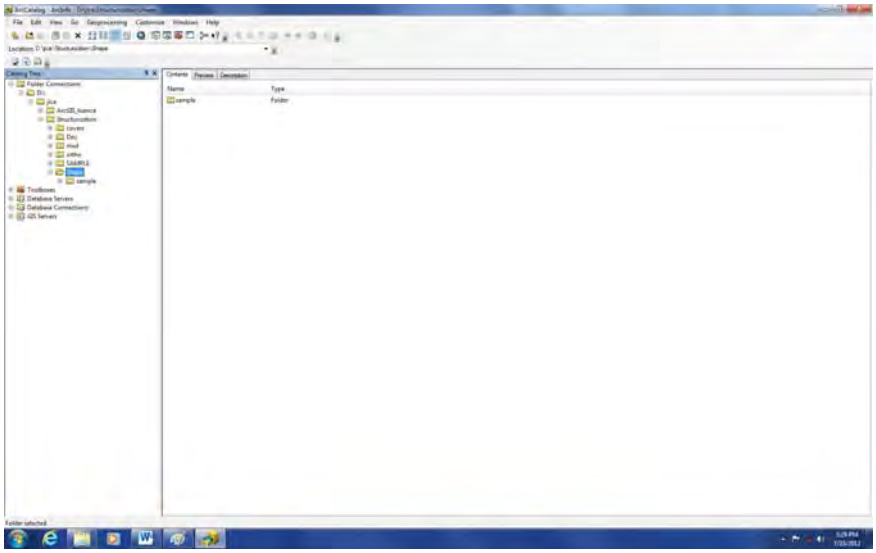
2-2　Copy, Rename, Delete of Shape File

Select file and right click to “Copy”, “Rename”, “Delete” file

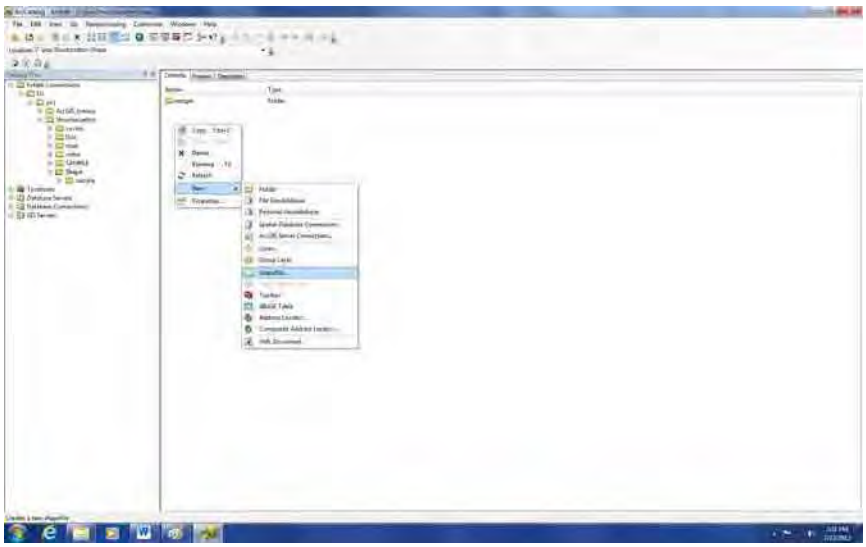


2-3 Create new shape file

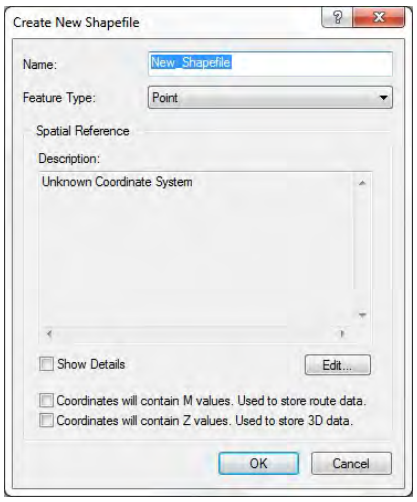
(1) Select folder to be created new shape file from the Catalog tree



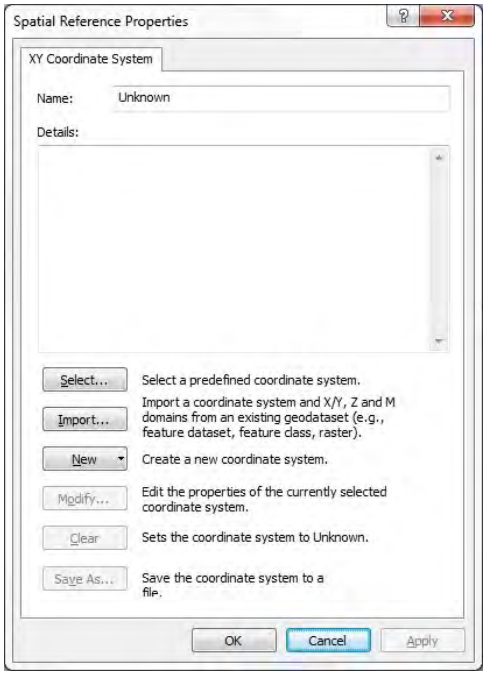
(2) Click right and select "New" -> "Shape file" inside "Contents_tag"



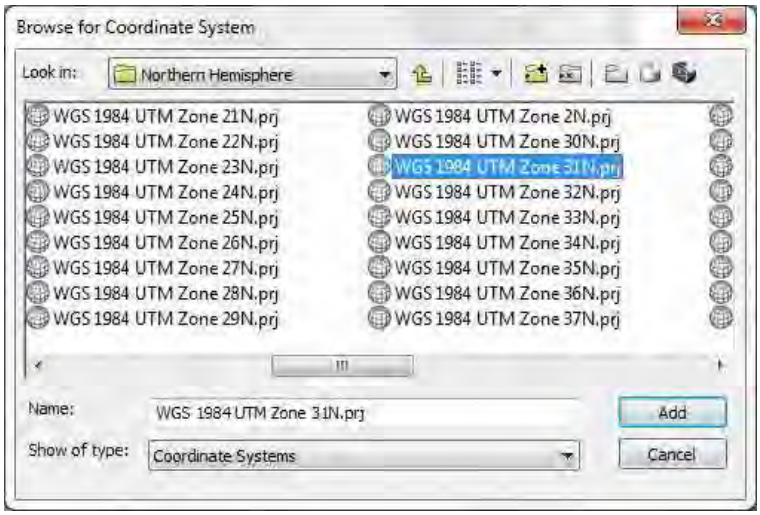
(3) Input Name and choose “Feature type” then click “Edit” button



(4) Click “Select” button

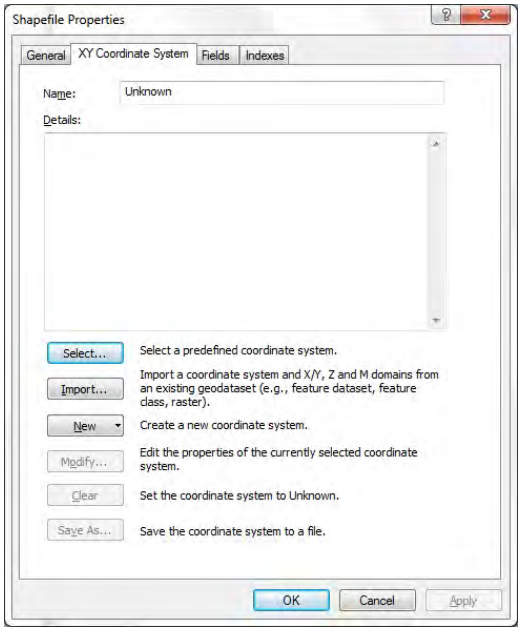


(5) Select Coordinate System


Browse for Coordinate System
Look in:
Northern Hemisphere
WGS 1984 UTM Zone 21N.prj
WGS 1984 UTM Zone 22N.prj
WGS 1984 UTM Zone 23N.prj
WGS 1984 UTM Zone 24N.prj
WGS 1984 UTM Zone 25N.prj
WGS 1984 UTM Zone 26N.prj
WGS 1984 UTM Zone 27N.prj
WGS 1984 UTM Zone 28N.prj
WGS 1984 UTM Zone 29N.prj
WGS 1984 UTM Zone 2N.prj
WGS 1984 UTM Zone 30N.prj
WGS 1984 UTM Zone 31N.prj
WGS 1984 UTM Zone 32N.prj
WGS 1984 UTM Zone 33N.prj
WGS 1984 UTM Zone 34N.prj
WGS 1984 UTM Zone 35N.prj
WGS 1984 UTM Zone 36N.prj
WGS 1984 UTM Zone 37N.prj
Name:
WGS 1984 UTM Zone 31N.prj
Add
Show of type:
Coordinate Systems
Cancel

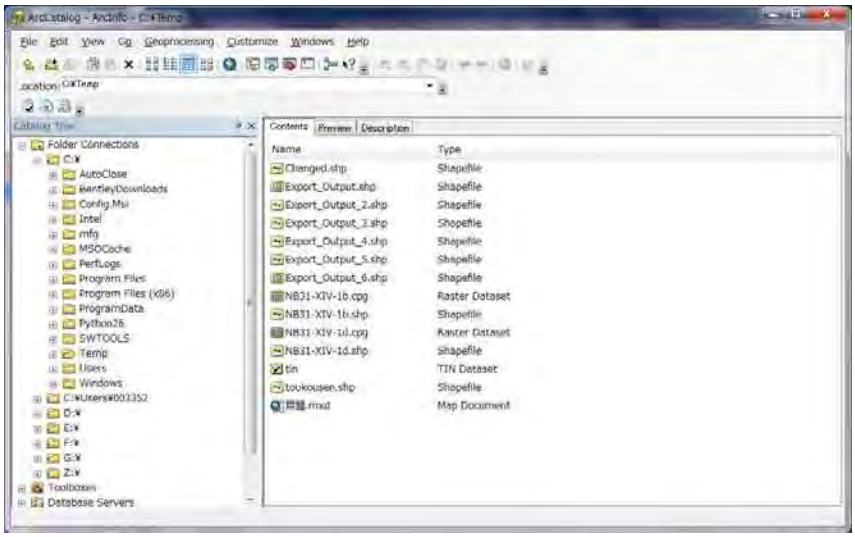
2-4 Projection setting (In case to add Projection into existing file)

(1) Click right on target shape file “Property” and go to “XY coordinate_system tag” then set Projection.

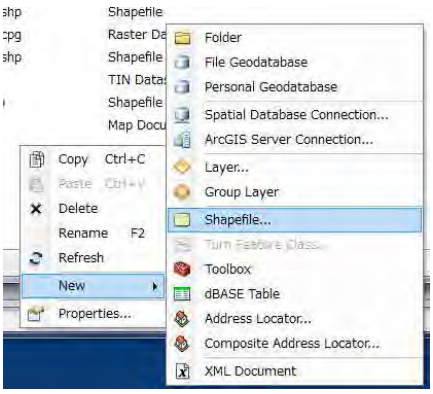


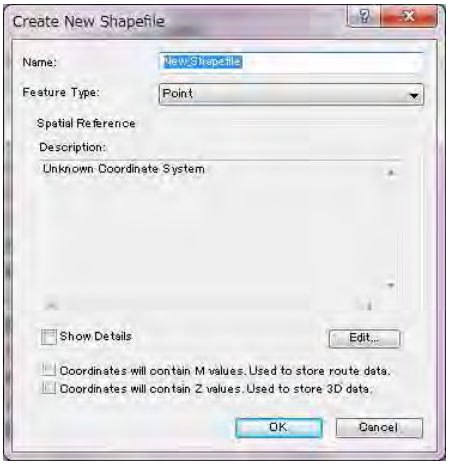
Practice①

Startup “ArcCatarog”



Create New Shapefile

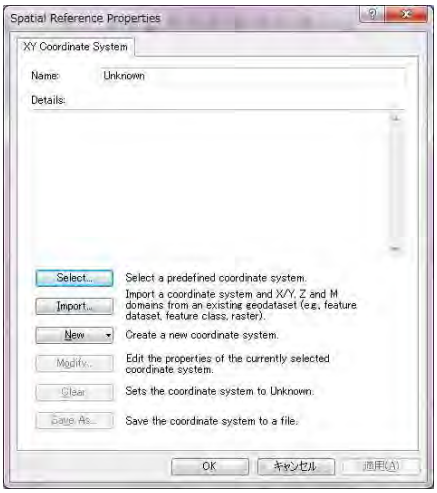




1. Input Name.

2. Select “Feature Type”.

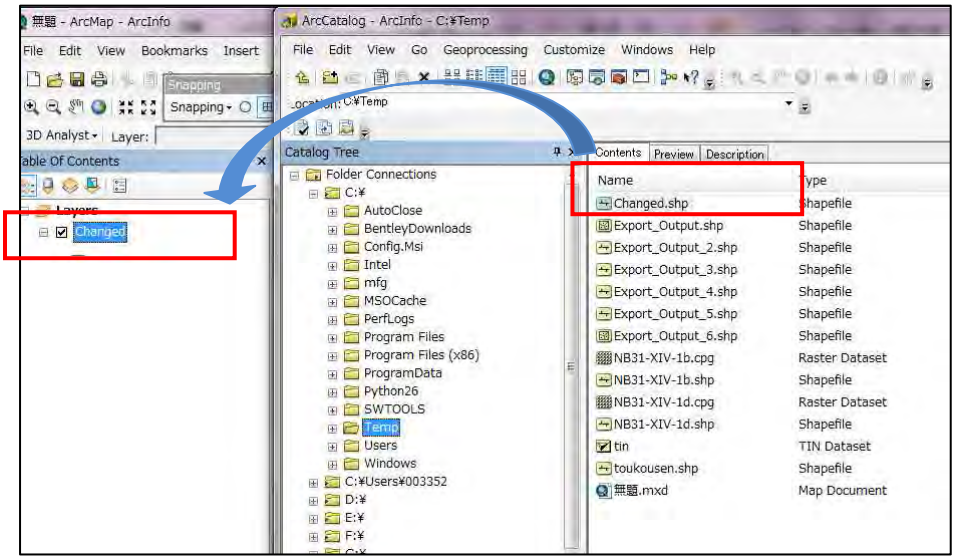
3. Choose “Edit”.



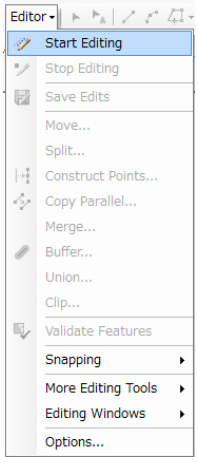
4. Set “Coordinate System”.

5. Choose “Apply” and “OK”.

New Shapefile Created in the ArcCatalog window.



Drop Shapefile from ArcCatalog window to ArcMap Window

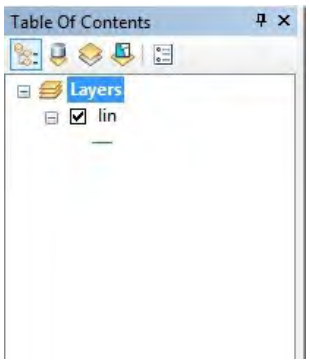


Choose “Start Editing” from Editor Menu.

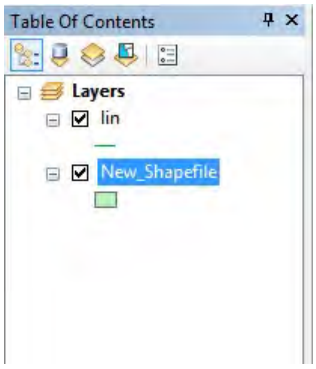
Chapter 5-1-3 Data acquisition in ArcGIS

3-1 Data acquisition of “Polygon”, “Polyline”, “Point”

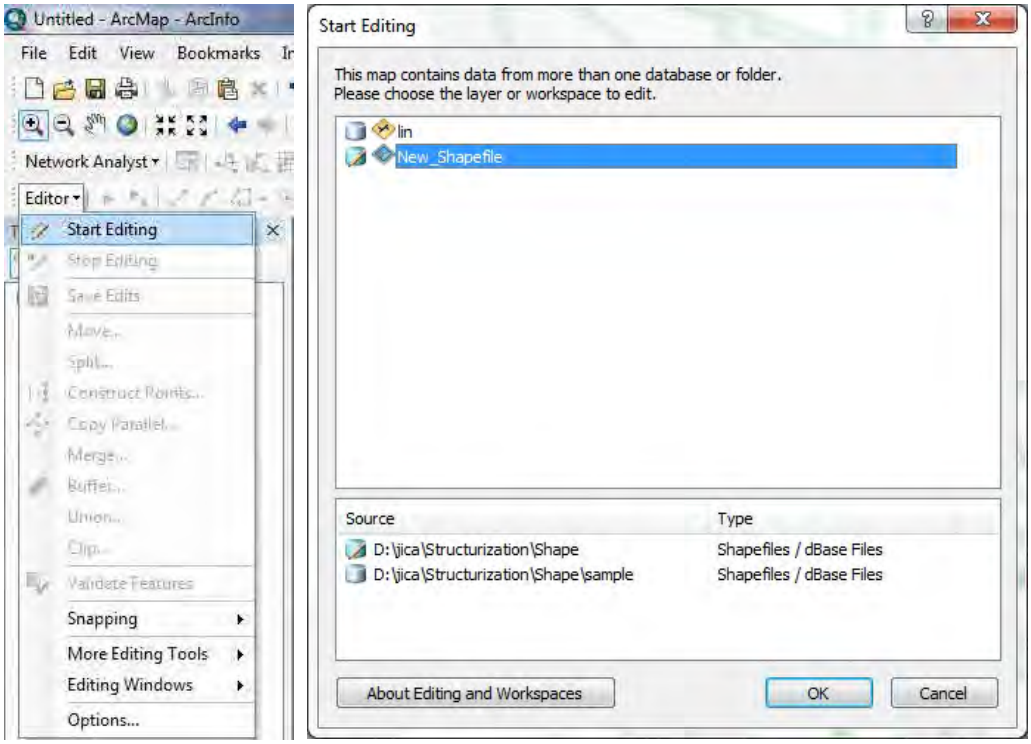
(1) Open ArcMAP (If necessary, add reference file)



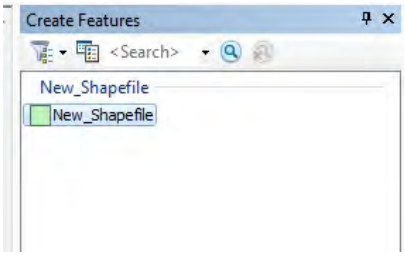
(2) Open shape file for input(acquisition) into ArcMAP(ex:new_pol)



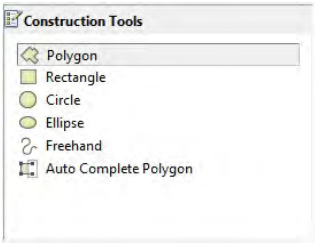
(3) Choose “Start Editing” from “Edit” menu

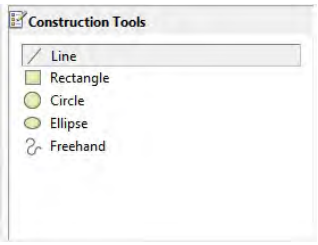


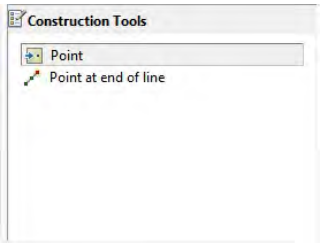
(4) Go to “Create features” and select feature to create



(5) Select data type for input and start acquisition





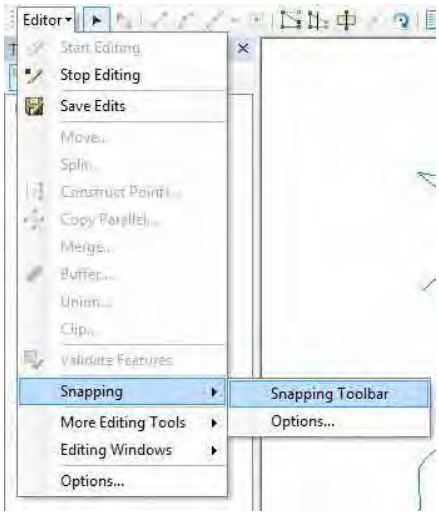


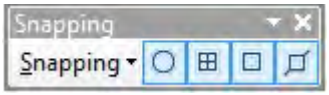
(6) Save edit from “Edit ” menu

(7) Then End Edit

3-2 Data acquisition with "SNAP" mode

If the data acquisition needs to snap into reference data, Open "Snap toolbar" from "Edit" menu





Snapping

Point snapping

End snapping

Vertex snapping

Edge snapping

3-3 Notice for data acquisition in SNAP mode

(1) Polygon Acquisition

All points(end point, vertex) must be snapped to neigbouring polygon

In case of doughnut type polygon, acquire inner polygon first and outer polygon next, then crop inner polygon.

(2) Polyline Acquisition

In case of acquiring duplicatively, all points must be snapped, and in case no snap point, create end point.

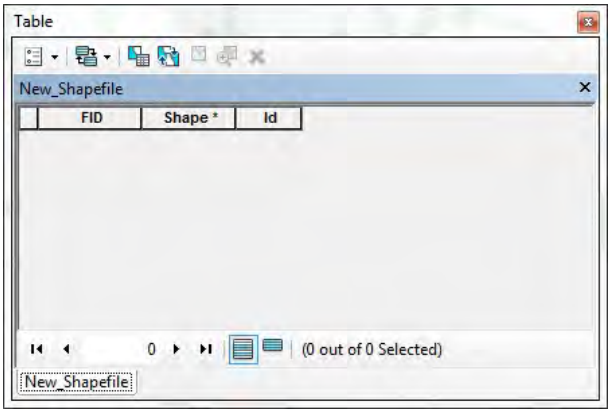
(3) Point Acquisition

In case acquire on a line or a polygon, point must be snapped to the point on the line or the polygon.

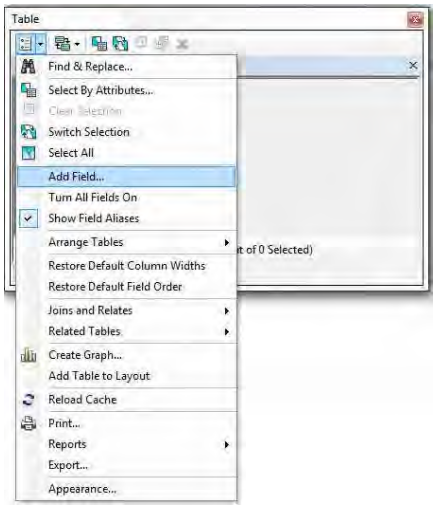
Chapter 5-1-4 Attribute management in ArcGIS

4-1 Add Field

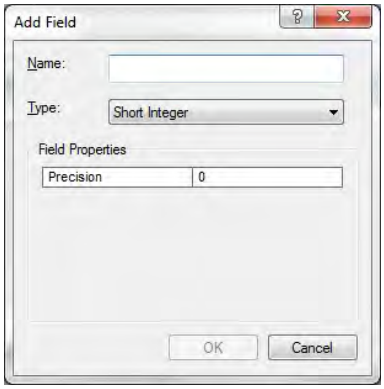
(1) Click right on the target shape and choose “Open attribute table” then open “Attribute table”



(2) Choose “Add field” from table option

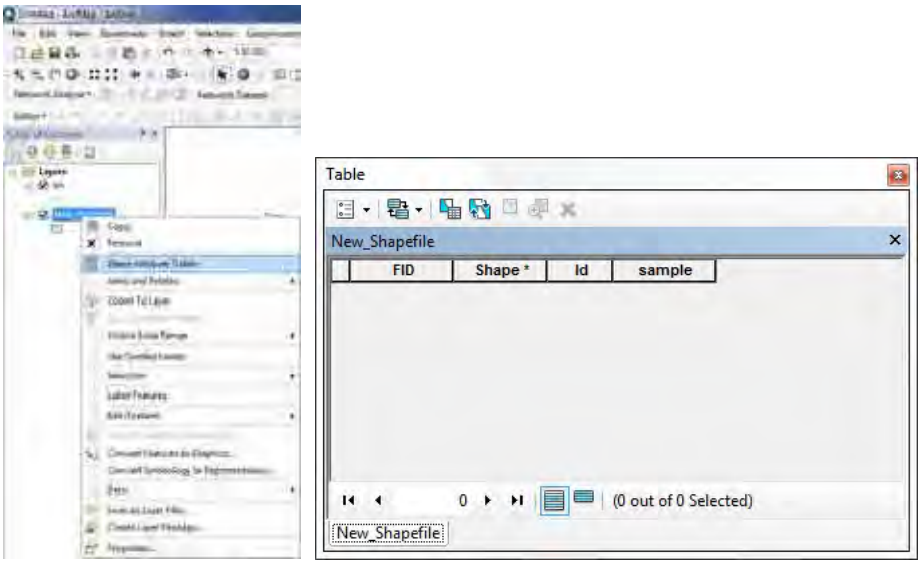


(3) Input “Field name”, Choose “Type (Integer, double, Text, etc)” and precision.



4-2 Delete Field

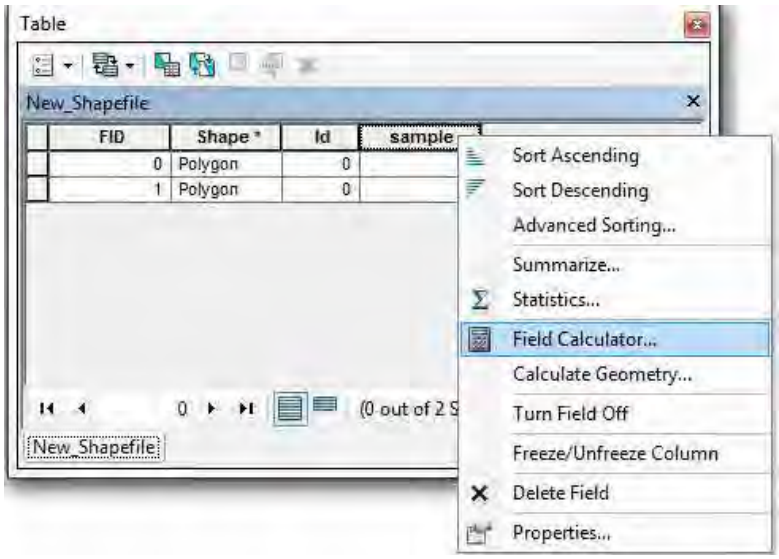
(1) Click right on the target shape and choose “Open attribute table” then open “Attribute table”



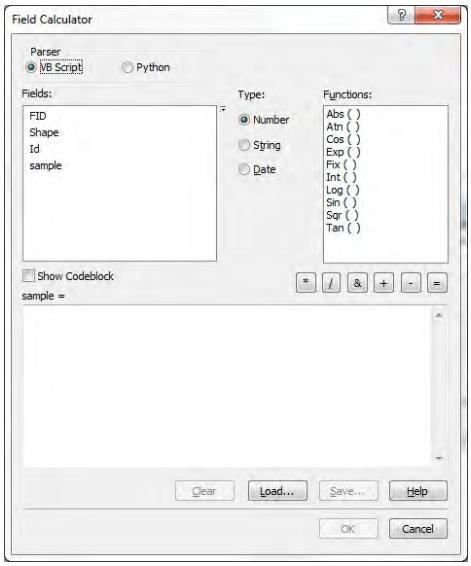
(2) Click right on the target field then choose “Delete Field”

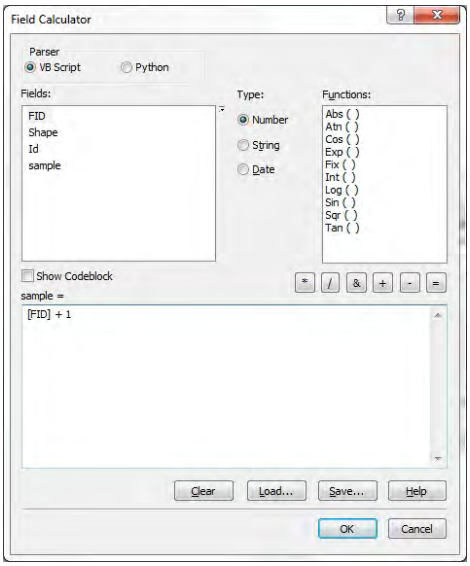
4-3 Input Attribute

(1) Click right on the Field name and Choose "Field " in the attribute table



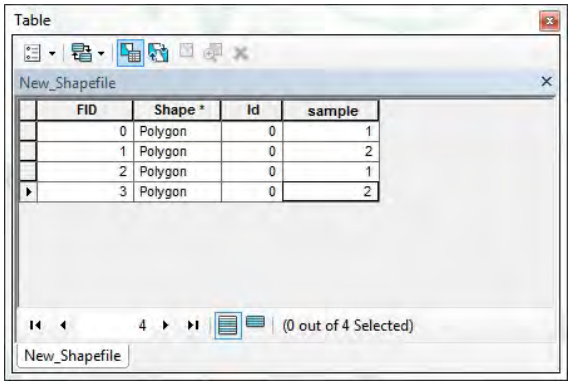
(2) Input formula or value into bottom window then "OK"



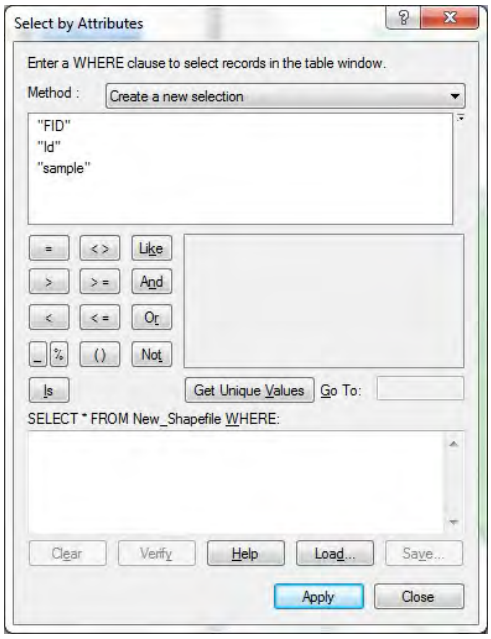


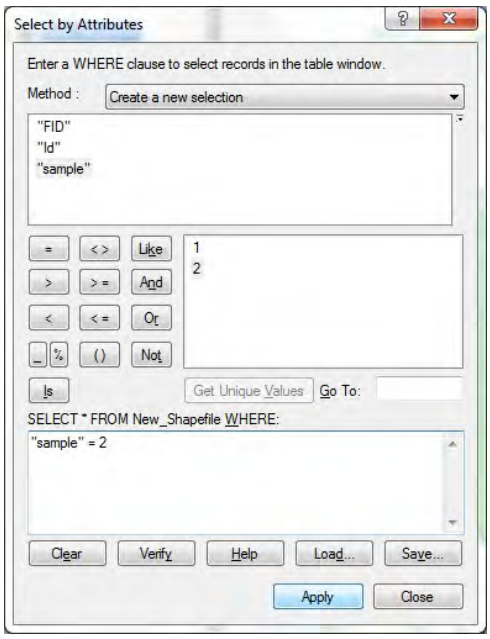
4-4 Find Data by attribute

(1) Click “Select By Attributes” button in the attribute table



(2) Input formula or value into bottom window then “Apply”.



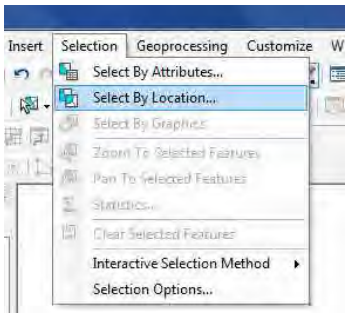


(3) The number of record found is displayed in the bottom of window.

Chapter 5-1-5 Spacial Analysis / Basic Analysis

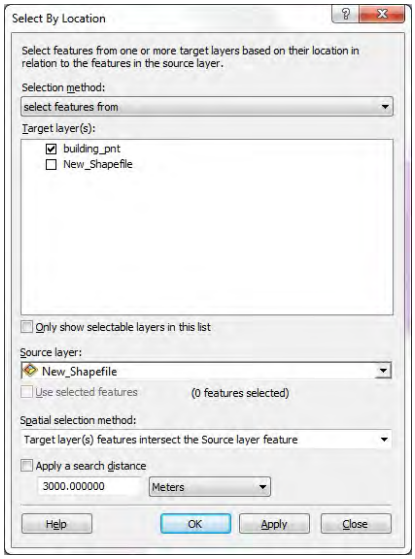
5-1 Spacial Analysis

(1) Click "Select By Location" from "Selection" in the menu.



(2) Input find condition

Input "Selection method", "Target layer(s)", "Source layer", "Spatial selection method", etc then "Apply".



(3) The number of record found is displayed in the lower_bottom of window.

5-2 Basic Analysis

(1) Buffer

Create polygon data outside target layer with the input Buffer. Buffer

(2) Clip

Create polygon data inside Clip_layer from target layer.

(3) Intersect

Create Polygon data inside Intersect_Layer from target layers.

(4) Union

Create a layer from selected layers(Incase of duplication, Attribute shall be one).

Period

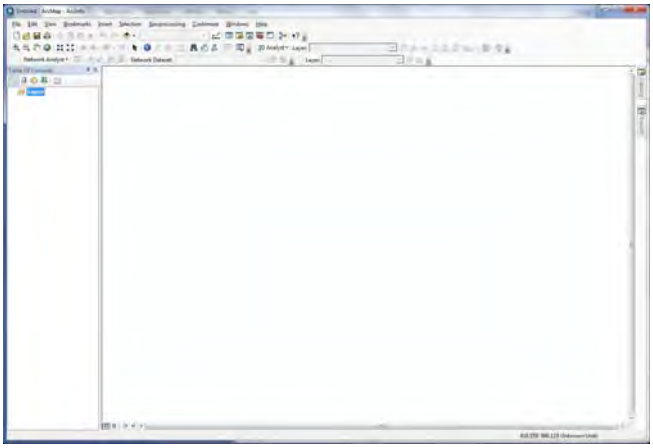
Chapter 5-2-1 Basic Technique of ArcGIS (Part 1)

1-1 Open ArcMAP

(1) Open new “ArcMAP10” file

Click shortcut icon of “ArcMAP10” on the Disktop

(2) Opened Window

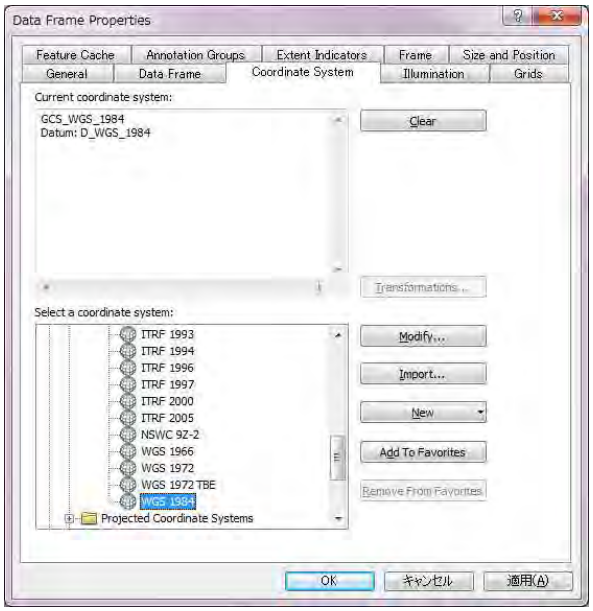


1-2 Add XY Data

(1) Check “Coordinate System” of the XY Data (Excel Data).

(2) Apply “Coordinate System”.

From “View” menu, Choose “Data Frame Properties”, then the “Data Frame Properties” window will be opened. And next Select “Coordinate System” tag.

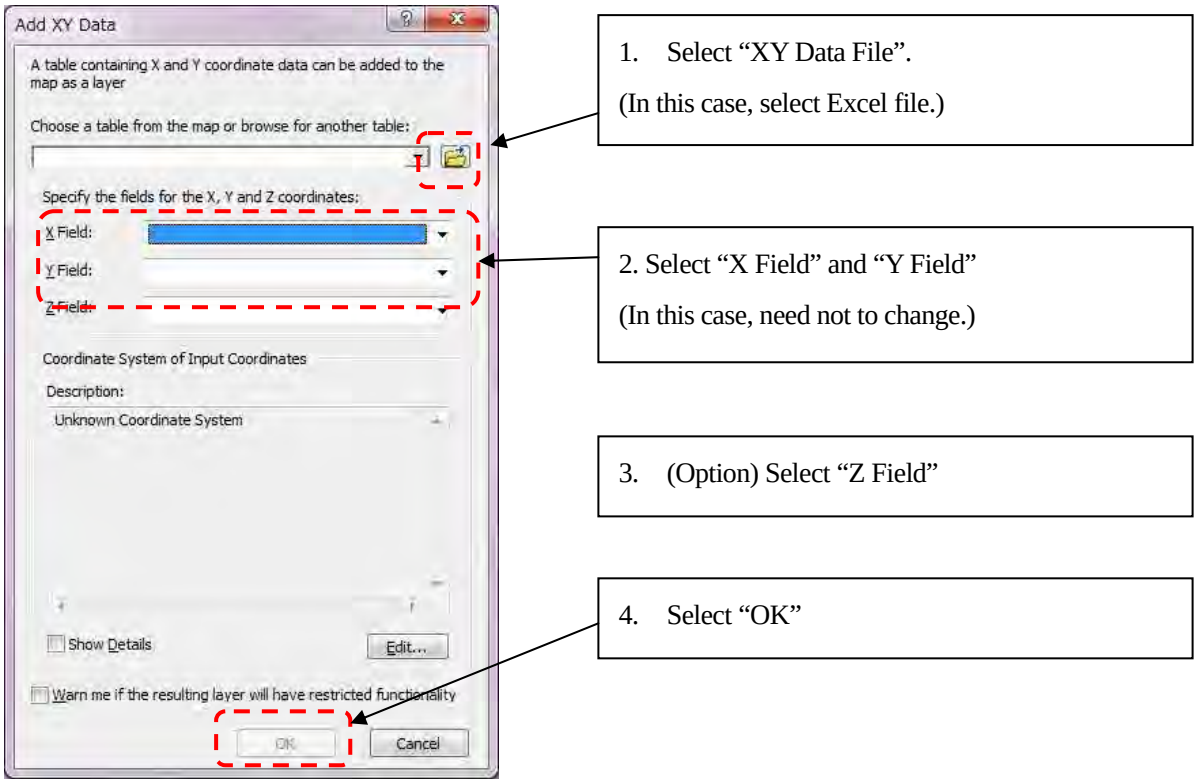


1. Select “Coordinate System”
(In this case, coordinate system is “WGS 1984”)

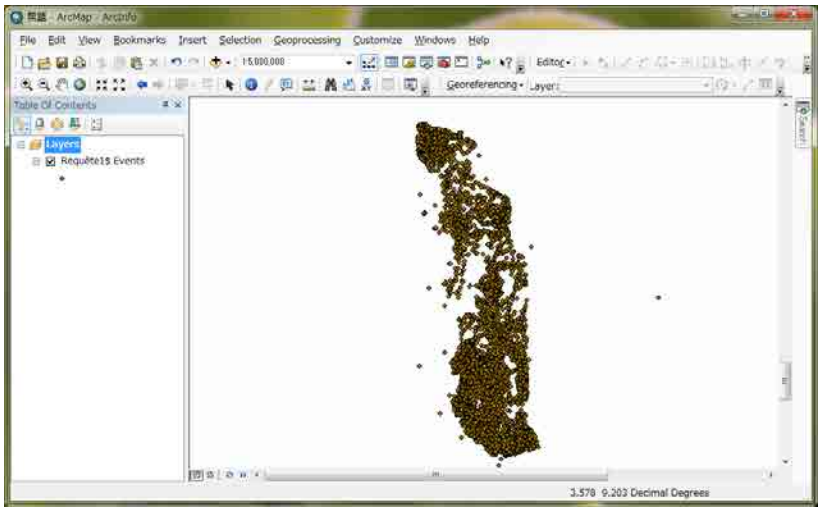
2. Select “OK”

(3) Add “XY Data”

From “File” menu, Choose “Add Data”, “Add XY Data”, and then the following window will be opened.

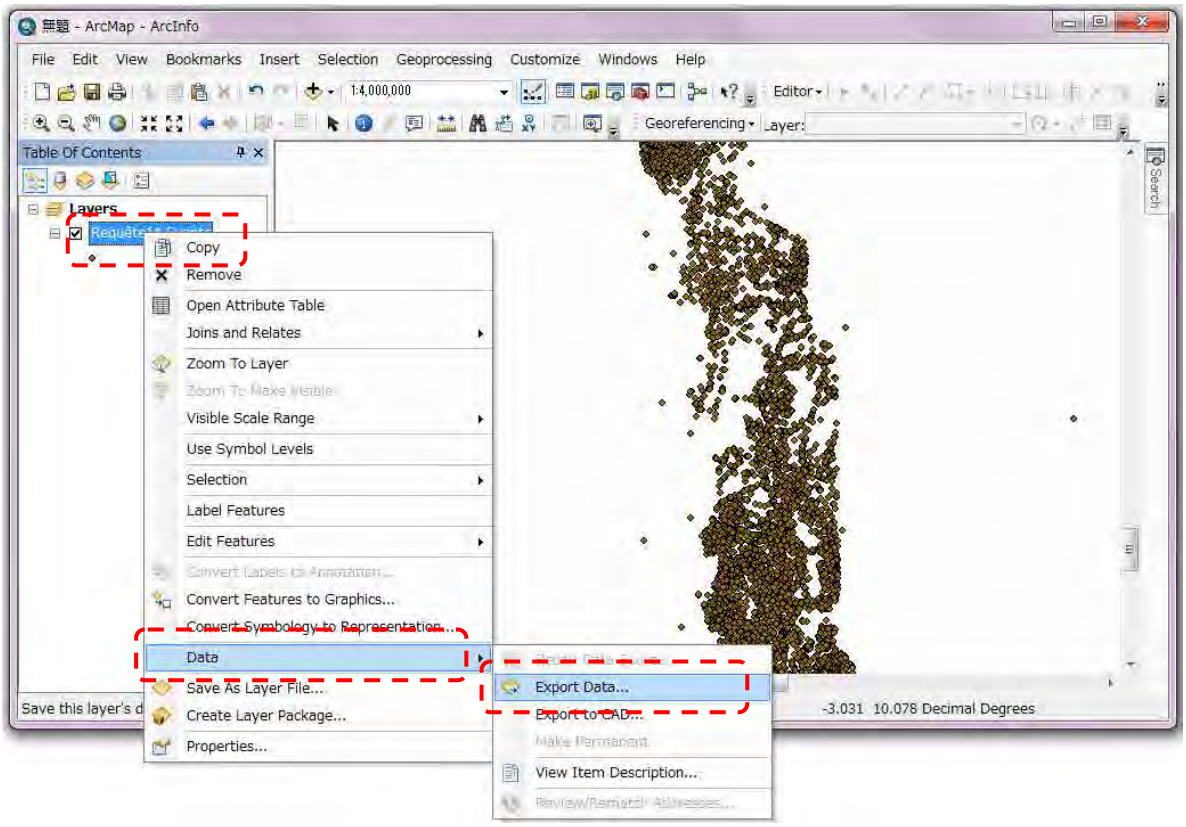


The points will be shown as following.

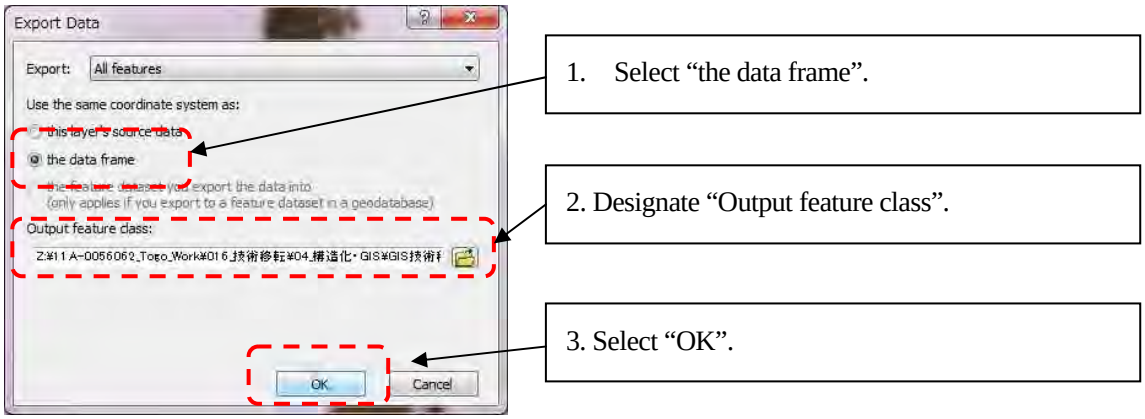


(4) Save files as Shape format.

Select Point Data layer, and Right-click, and choose “Data”→“Export Data”.



Then the following window will open.

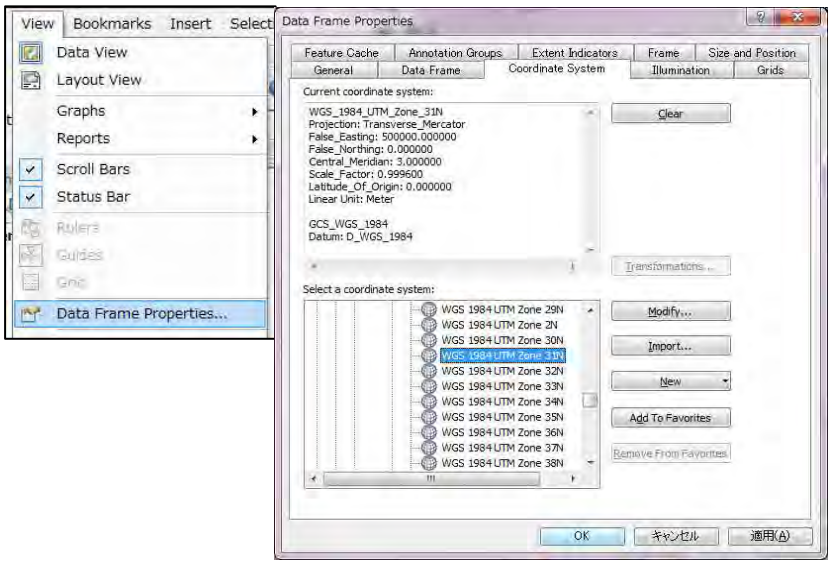


The Shape file Data will be exported.

1-3 Coordinate Transformation

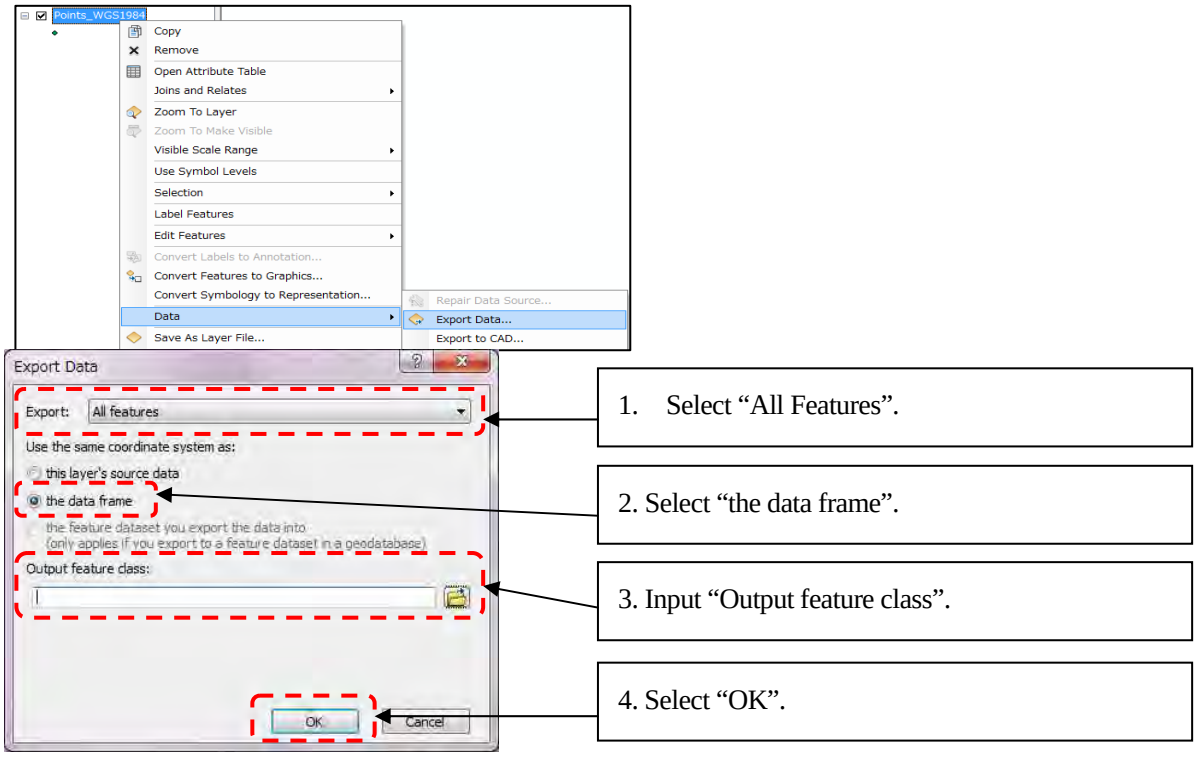
(1) Open New ArcGIS project. From “View” menu, Choose “Data Frame Properties”. And Apply “Coordinate System”.

(In this case, choose “WGS_1984_UTM_ZOON31N”.)



(2) Add Data for Coordinate Transformation. (In this case, add the data before exported in this manual at “1-2(4)”.)

(3) Select Point Data, Right-click, “Data”, “Export Data”, and then “Export Data” window will open.

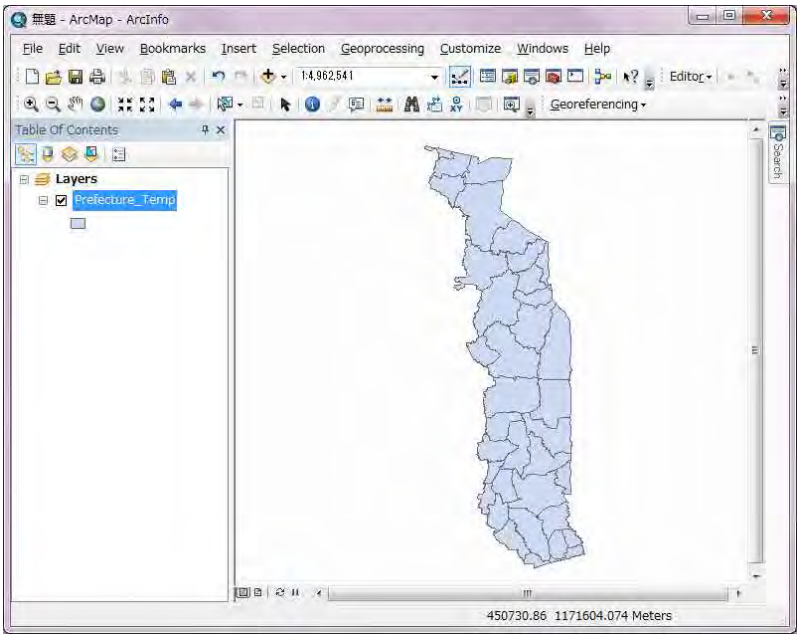


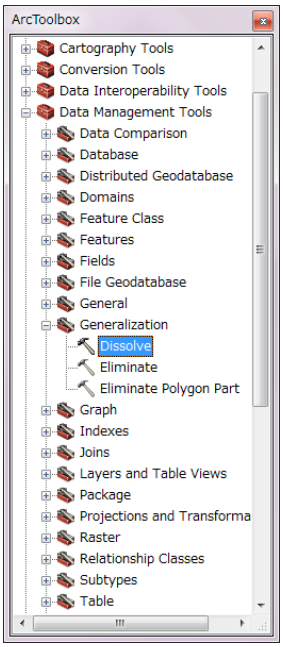
The transformed data will be exported.

1-4 Dissolve

(1) Open New ArcGIS project. And Add data for merge.

(2) Open “Arc Toolbox”, And Select “Data Management Tools”, “Generalization”, “Dissolve”.





1. Select “Input Features”.

2. Designate “Output feature class”.

3. Select “Dissolve Field”.

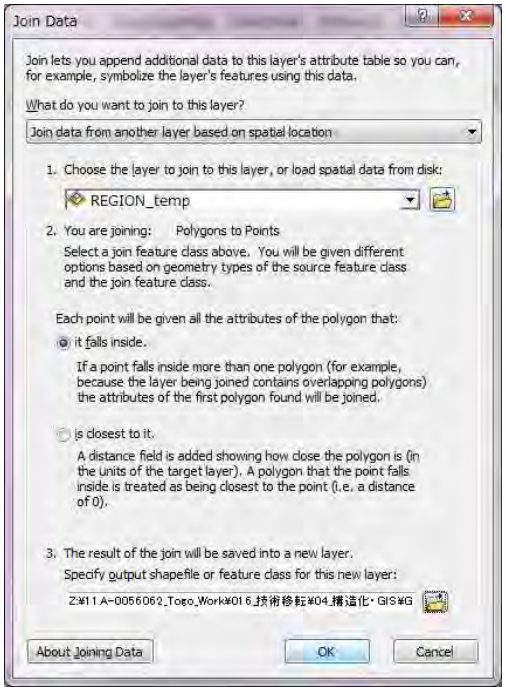
4. Select “OK”.

The Dissolved Data will be shown in the Map window.

1-5 Totalization

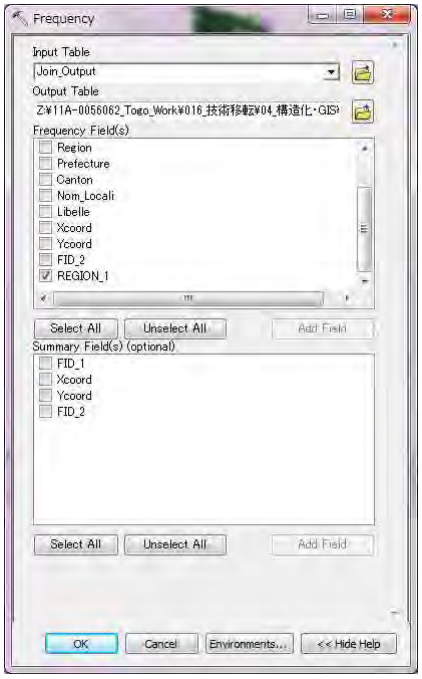
(1) Add data for Overlay. (Polygon and Point Data)

(2) Select Point Data , and Right-click, “Joins and Relates”, “Join”.



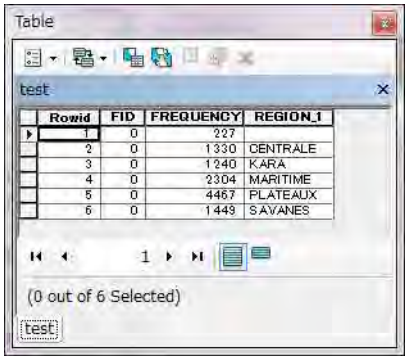
1. Select the layer to join to this layer.
2. Select “it falls inside”.
3. Designate “Output feature class”.
4. Select “OK”.

(3) Open “Arc Toolbox”, And Select “Analysis Tools”, “Statistics”, “Frequency”.



1. Select “Input Table”.
2. Designate “Output Table”.
3. Choose “Frequency Field”.
4. Select “OK”.

The new Table will be shown.



1-6 Visualization

(1) Select “View”, “Graphs”, “Create”, And then the “Create Graph Wizard” will be shown.

(2) Follow the wizard, Create Graphs as you like.

Chapter 5-2-2 Basic Technique of ArcGIS (Part 2)

2-1 Editing Atrribute Table (Part 1)

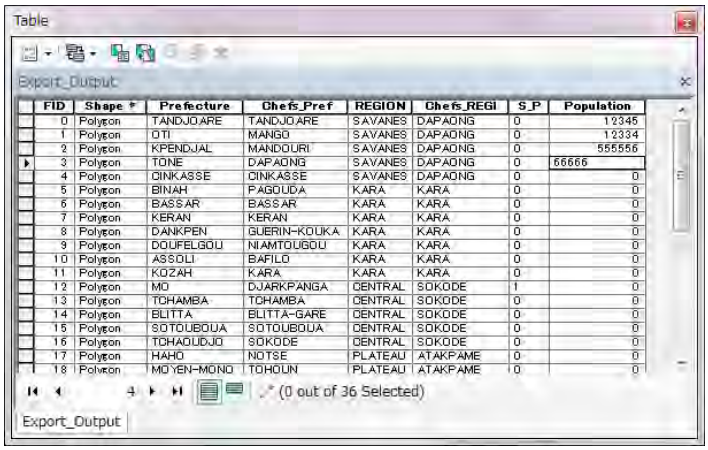
(1) Open “ArcGIS”, and Add data.

(2) Open Attribute Table.

(3) Add Field. Input “Name”, Select “Type”and “Field Properties”.

(4) Select “Editor”toolbar, “Start Editing”.

(5) You can edit the attribute table , and input new data.



FID	Shape *	Prefecture	Chefs_Pref	REGION	Chefs_REGI	S_P	Population
0	Polygon	TANDJOARE	TANDJOARE	SAVANES	DAPAONG	0	12345
1	Polygon	OTI	MANGO	SAVANES	DAPAONG	0	12334
2	Polygon	KPENDJAL	MANDOURI	SAVANES	DAPAONG	0	555556
3	Polygon	TONE	DAPAONG	SAVANES	DAPAONG	0	66666
4	Polygon	OINKASSE	OINKASSE	SAVANES	DAPAONG	0	0
5	Polygon	BINAH	PAGOUDA	KARA	KARA	0	0
6	Polygon	BASSAR	BASSAR	KARA	KARA	0	0
7	Polygon	KERAN	KERAN	KARA	KARA	0	0
8	Polygon	DANKPEN	GUERIN-KOUKA	KARA	KARA	0	0
9	Polygon	DOUFELGOU	NIAMTOUGOU	KARA	KARA	0	0
10	Polygon	ASSOLI	BAFILO	KARA	KARA	0	0
11	Polygon	KOZAH	KARA	KARA	KARA	0	0
12	Polygon	MO	DJARKPANGA	CENTRAL	SOKODE	1	0
13	Polygon	TCHAMBA	TCHAMBA	CENTRAL	SOKODE	0	0
14	Polygon	BLITTA	BLITTA-GARE	CENTRAL	SOKODE	0	0
15	Polygon	SOTOUBOUA	SOTOUBOUA	CENTRAL	SOKODE	0	0
16	Polygon	TCHAOUDJO	SOKODE	CENTRAL	SOKODE	0	0
17	Polygon	HAHO	NOTSE	PLATEAU	ATAKPAME	0	0
18	Polygon	MOYEN-MONO	TOHOUN	PLATEAU	ATAKPAME	0	0

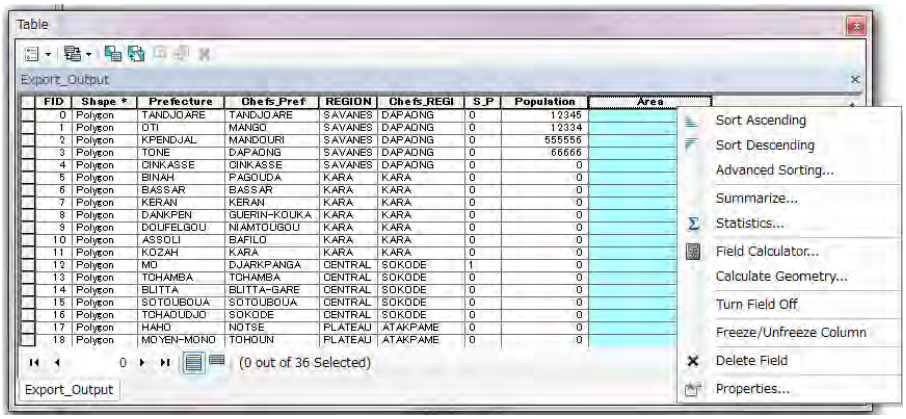
(6) When you finish editing, Select “Editor” toolbar, “Stop Editing”, and Save Data.

2-2 Editing Atrribute Table (Part 2)

(1) Open Attribute Table.

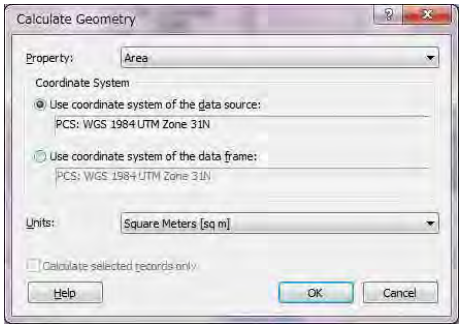
(2) Add Field. Input “Name”, Select “Type” and “Field Properties”.

(3) Select New Field, and Right-click, select “Calculate Geometry”



FID	Shape *	Prefecture	Chefs_Pref	REGION	Chefs_REGI	S_P	Population	Area
0	Polygon	TANDJOARE	TANDJOARE	SAVANES	DAPAONG	0	12345	
1	Polygon	OTI	MANGO	SAVANES	DAPAONG	0	12334	
2	Polygon	KPENDJAL	MANDOURI	SAVANES	DAPAONG	0	555556	
3	Polygon	TONE	DAPAONG	SAVANES	DAPAONG	0	66666	
4	Polygon	OINKASSE	OINKASSE	SAVANES	DAPAONG	0	0	
5	Polygon	BINAH	PAGOUDA	KARA	KARA	0	0	
6	Polygon	BASSAR	BASSAR	KARA	KARA	0	0	
7	Polygon	KERAN	KERAN	KARA	KARA	0	0	
8	Polygon	DANKPEN	GUERIN-KOUKA	KARA	KARA	0	0	
9	Polygon	DOUFELGOU	NIAMTOUGOU	KARA	KARA	0	0	
10	Polygon	ASSOLI	BAFILO	KARA	KARA	0	0	
11	Polygon	KOZAH	KARA	KARA	KARA	0	0	
12	Polygon	MO	DJARKPANGA	CENTRAL	SOKODE	1	0	
13	Polygon	TCHAMBA	TCHAMBA	CENTRAL	SOKODE	0	0	
14	Polygon	BLITTA	BLITTA-GARE	CENTRAL	SOKODE	0	0	
15	Polygon	SOTOUBOUA	SOTOUBOUA	CENTRAL	SOKODE	0	0	
16	Polygon	TCHAOUDJO	SOKODE	CENTRAL	SOKODE	0	0	
17	Polygon	HAHO	NOTSE	PLATEAU	ATAKPAME	0	0	
18	Polygon	MOYEN-MONO	TOHOUN	PLATEAU	ATAKPAME	0	0	

And then , the following window will be shown.



1. Check setting.

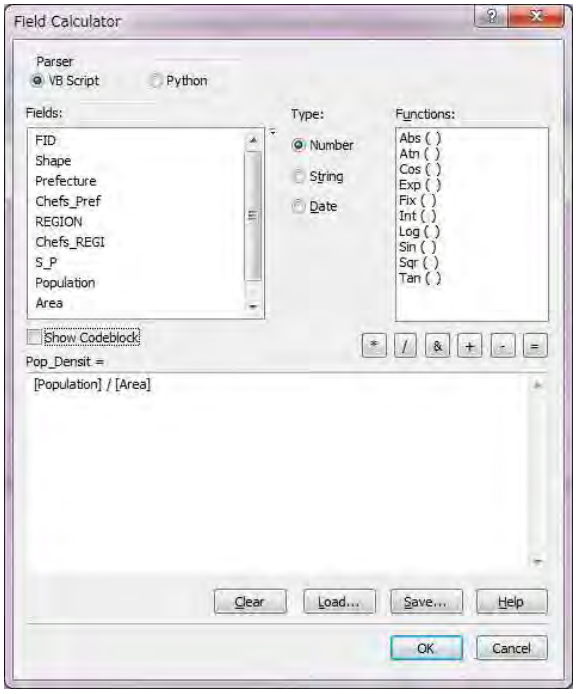
2. Select “OK”.

2-3 Editing Atrribute Table (Part 3)

(1) Open Attribute Table.

(2) Add Field. Input “Name”, Select “Type” and “Field Properties”.

(3) Select New Field, and Right-click, select “Field calculator”.



1. Enter calculation formula.

2. Select “OK”.

2-4 Visualization

(1) Changing Symbology Setting or Creating Graphs will be able you to visualize the result.

Chapter 5-2-3 Basic Technique of ArcGIS (Part 3)

3-1 Open ArcMAP

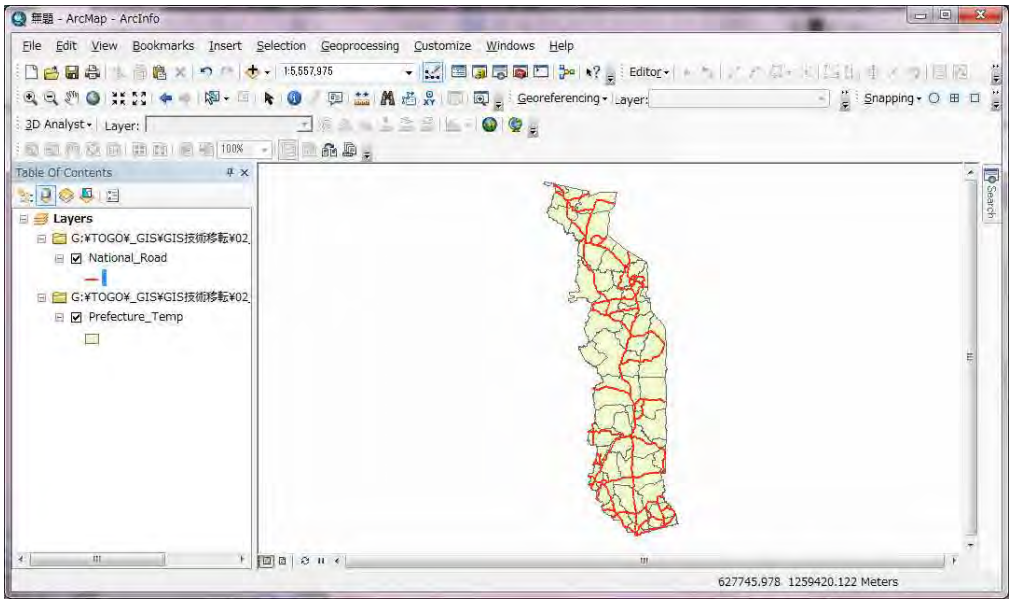
Open New ArcMAP window. And Set Coordinate system.

From “View” menu, select “Data Frame Properties…”.

Select “Coordinate System” tag, set coordinate system “WGS_1984_UTM_ZOME_31N”.

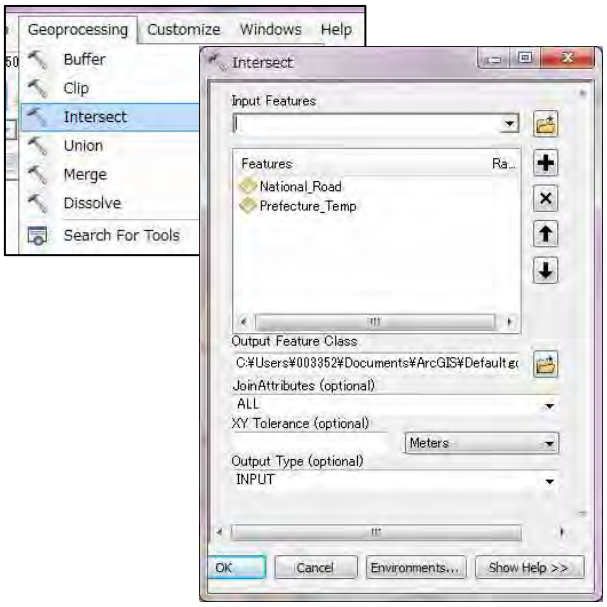
3-2 Add Data

Add prefecture data and national road data from data folder.



3-3 Intersect Data

From “Geoprocessing” menu, select “Intersect”.



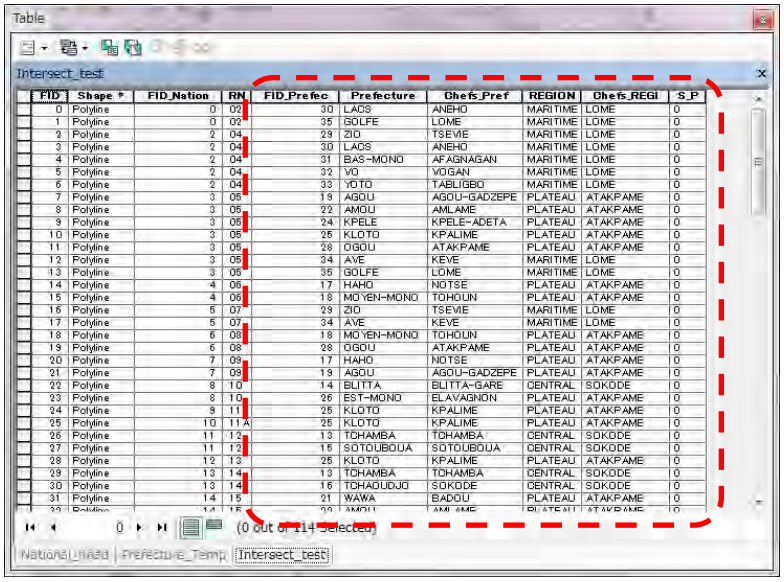
1. Enter Input Features.
(National_Road.shp and Prefecture.shp)

2. Enter Output Feature Class.

3. Click “OK”.

New Line Layer will be created in the ArcMAP window.

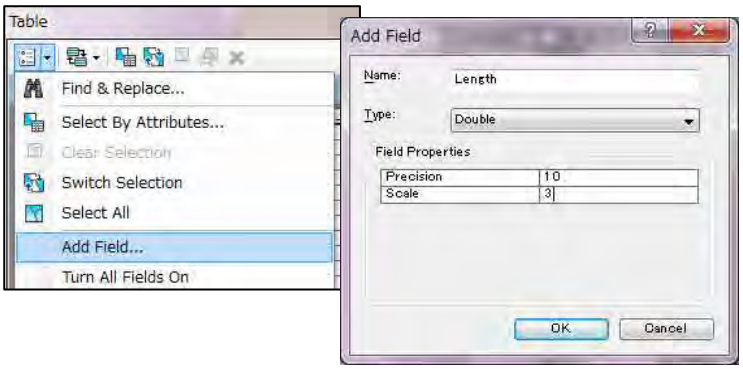
And Open Attribute Table of new line layer.



Prefecture data's attribute are imported.

Next, from "Table Option", select "Add Field".

Set as following picture. And click "OK".



Name: Length

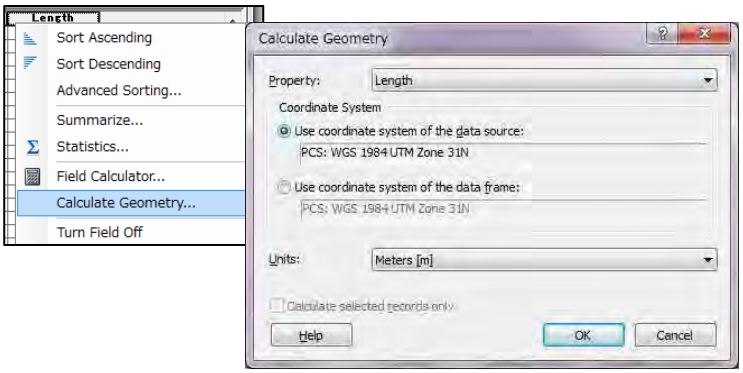
Type: Double

Precision: 10

Scale: 3

Select New "Length" Field and right-click, select "Calculate Geometry".

Set as following picture. And click "OK".

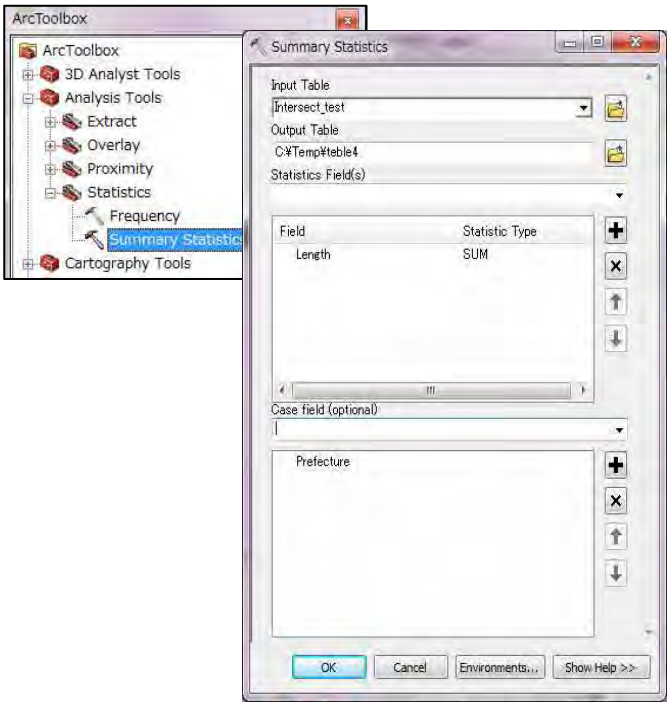


Property: Length

Units: Meters [m]

3-4 Summary Statistics

From “Arc Toolbox”, select “Analysis Tools”, “Statistics”, “Summary Statistics”.



1. Enter Input Table.
(Intersected Line Shape)

2. Enter Output Table.

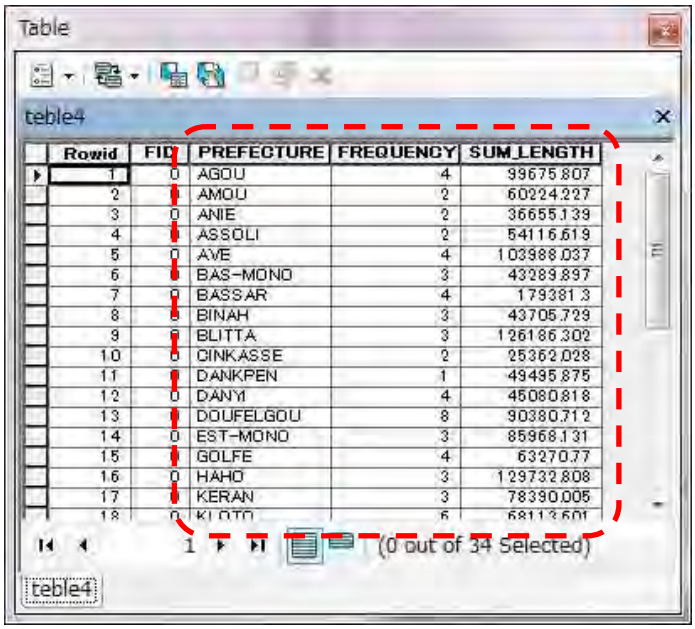
3. Select Statistics Field.
(Length field)
And select Statistics Type.
(SUM)

4. Select Case Field.
(Prefecture field)

5. Click “OK”.

New table will be created, open a new table.

“Frequency” and “Sum_Length” fields will be created in each prefecture as follows.

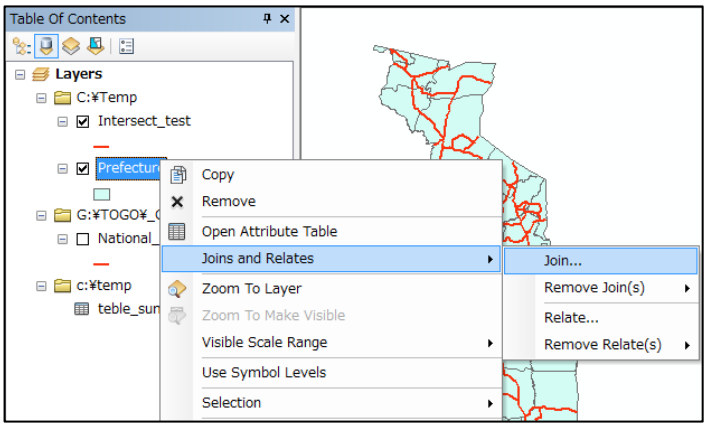


Rowid	FID	PREFECTURE	FREQUENCY	SUM_LENGTH
1	0	AGOU	4	99675.807
2	0	AMOU	2	60224.227
3	0	ANIE	2	36655.139
4	0	ASSOLI	2	54116.619
5	0	AVE	4	103988.037
6	0	BAS-MONO	3	43289.897
7	0	BASSAR	4	179381.3
8	0	BINAH	3	43705.729
9	0	BLITTA	3	126186.302
10	0	CINKASSE	2	25362.028
11	0	DANKPEN	1	49495.875
12	0	DANYI	4	45080.818
13	0	DOUFELGOU	8	90380.712
14	0	EST-MONO	3	85968.131
15	0	GOLFE	4	63270.77
16	0	HAHO	3	129732.808
17	0	KERAN	3	78390.005
18	0	KLOTO	6	68113.601

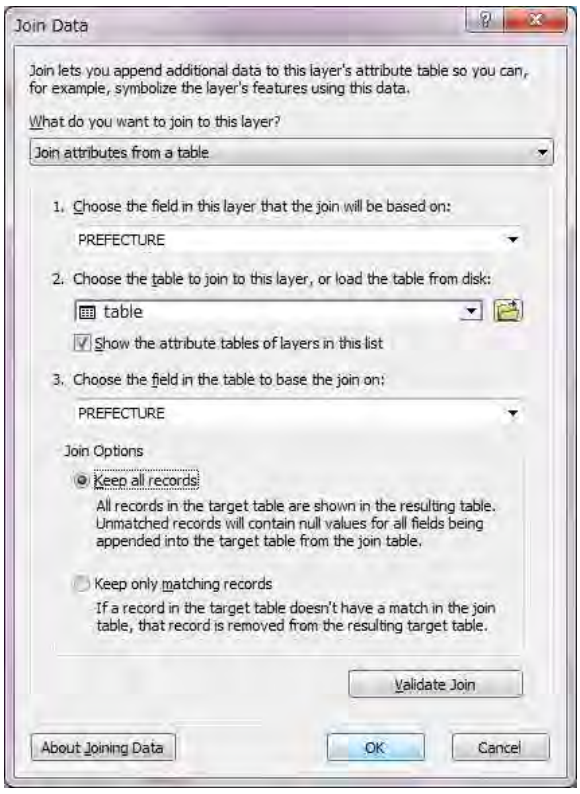
From this table, you will be able to create a graph.

3-5 Join attributes from a table

Select prefecture polygon layer. And right-click. Select “Joins and Relates” and “Join”.



“Join Data” window will be open. And set as follows.



1. Select the option.
(Join attributes from a table)

2. Choose the field.
(PREFECTURE)

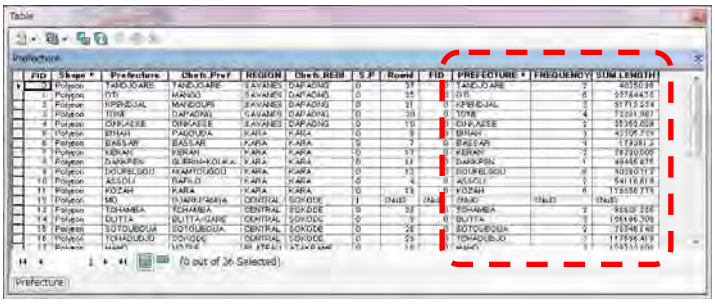
3. Choose the table to join.

4. Choose the field.
(PREFECTURE)

5. Select Join Options.
(Keep all records)

6. Click “OK”.

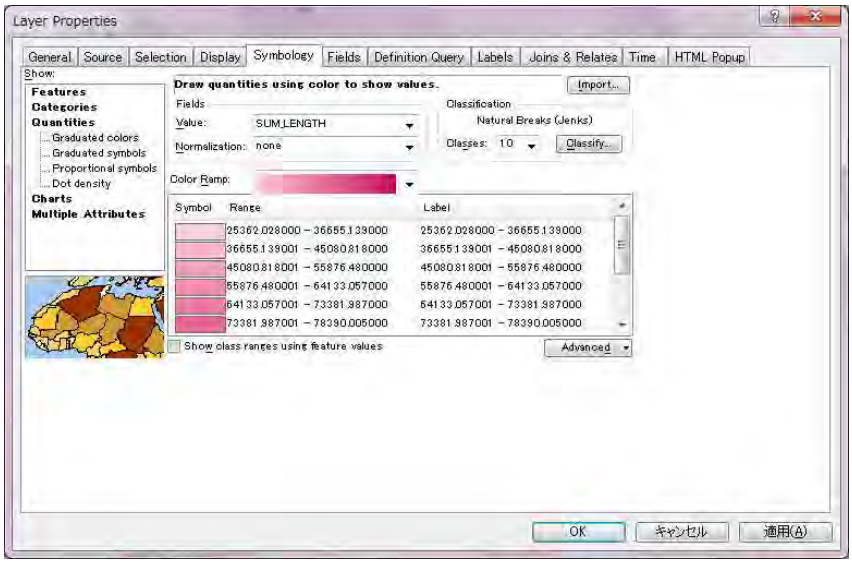
Some fields will be joined in the previous layer’s table.



3-6 Visualization

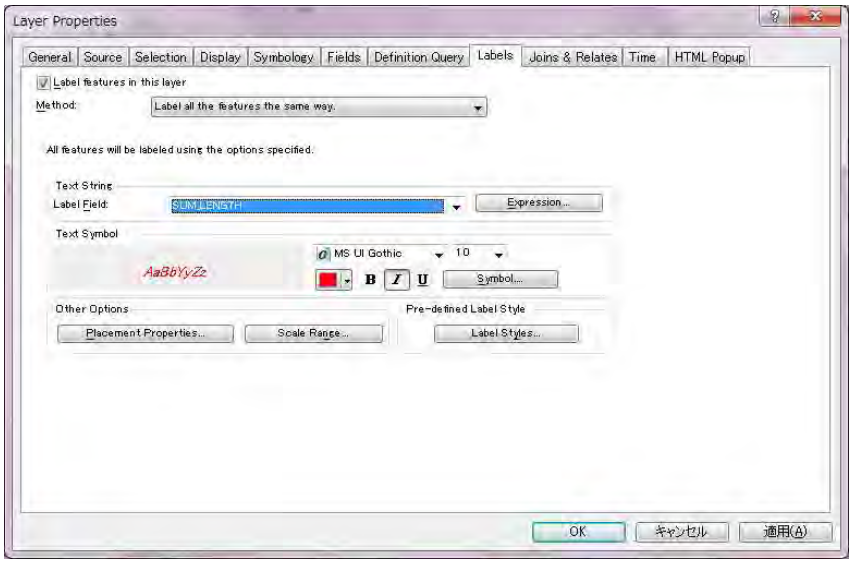
Select prefecture polygon layer. Choose “Properties” → ”Symbology” tag.

Change symbols as you like.



Select prefecture polygon layer. Choose “Properties” → ”Labels” tag.

Change labels setting as you like.

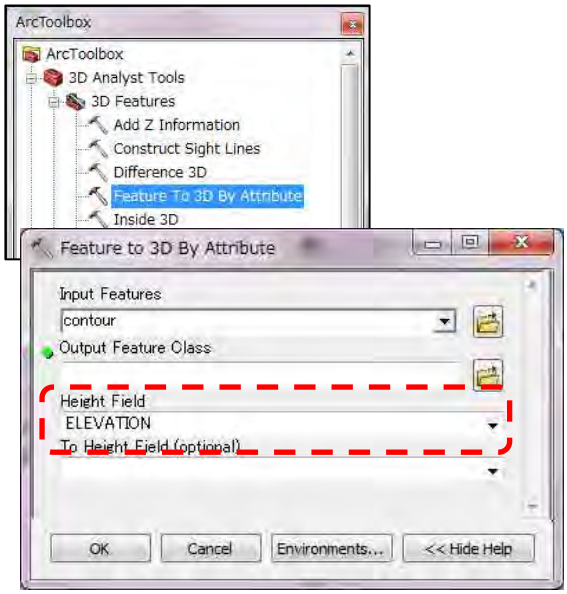


Chapter 5-2-4　3D Analyst

4-1 Create 3D Features

(1) Open New ArcGIS Project, and Add 2D features (for conversion to 3d features)

(2) Open “Arc Toolbox”, And Select “3D Analyst Tools”, “3D Features”, “Feature To 3D By Attribute”.



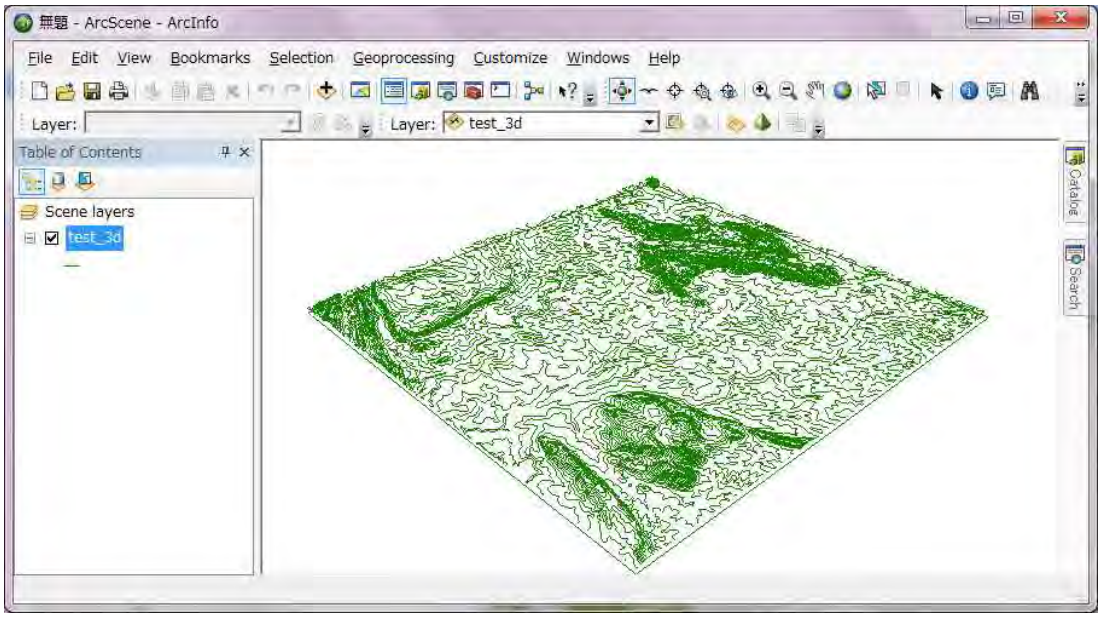
1. Choose “Input Features”.

2. Designate “Output Features Class”.

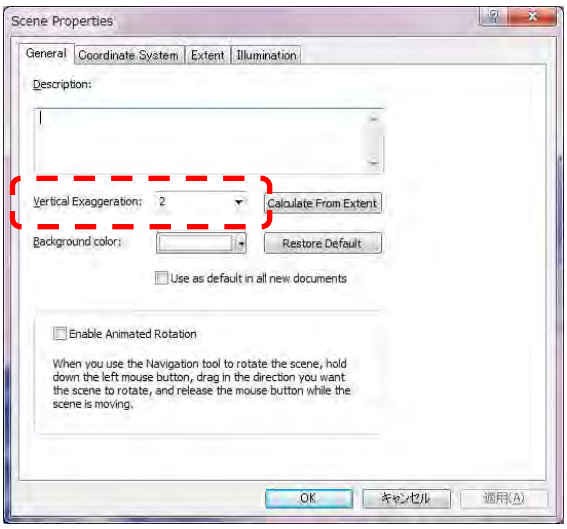
3. Select “Height Field”.

4. Select “OK”.

(3) Open New ArcScene Project, and Add 3D features.



(4) Select “View”, “Scene Properties”, and then the following window will be shown.



1. Set “Vertical Exaggeration”.
(Usually about“5” is better.)

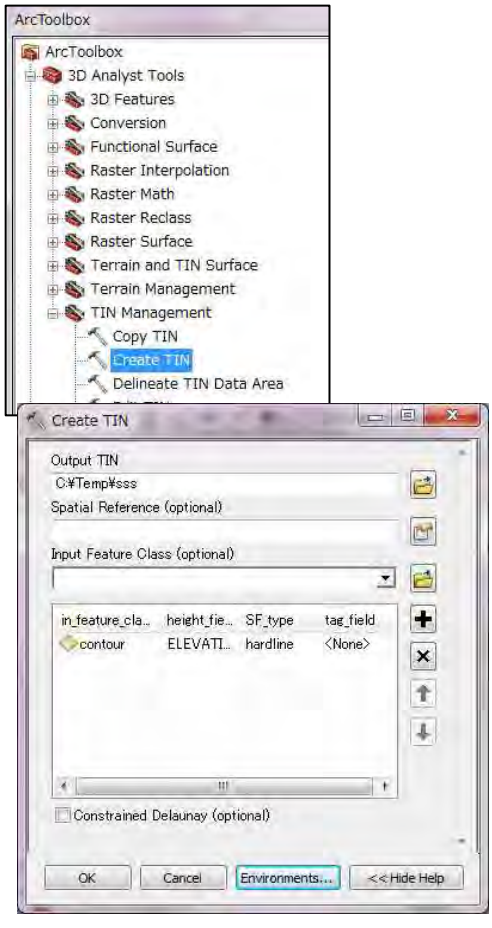
2. Select “OK”.

And You will be able to see 3D model in the Arc Scene Window.

4-2 Create TIN Data

(1) Open New ArcGIS Project, and Add 3D Features.

(2) Open “Arc Toolbox”, And Select “3D Analyst Tools”, “TIN Management”, “Craete TIN”.



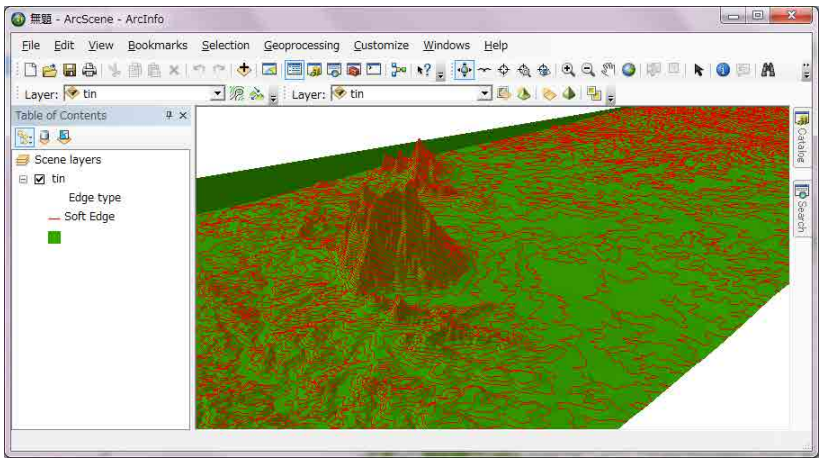
1. Designate “Output TIN”.

2. Choose “Input Feature Class”.

3. Choose “Height Field”.

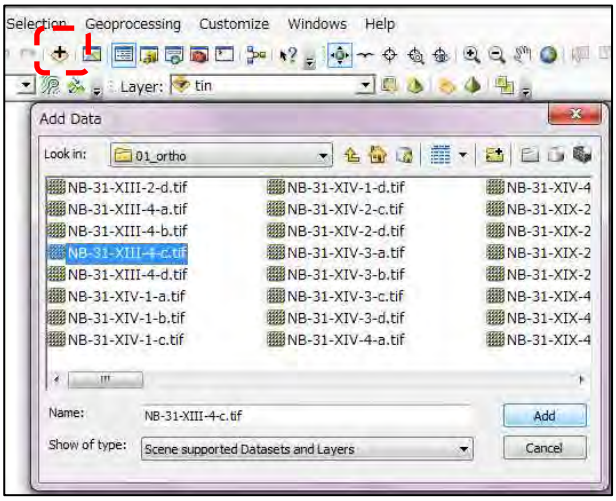
4. Select “OK”.

(3) Open New ArcScene Project, and Add TIN.



4-3 Drape Ortho Image Data

(1) Add Ortho Image Data.



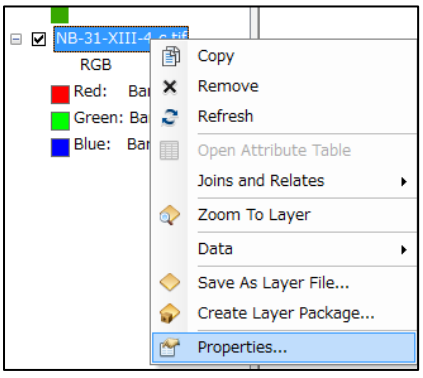
1. Add Data.

2. Open Add Data Window.

3. Choose Ortho Image Data.

4. Select “Add”.

(2) Select Image layer, And right-click, “Properties”.



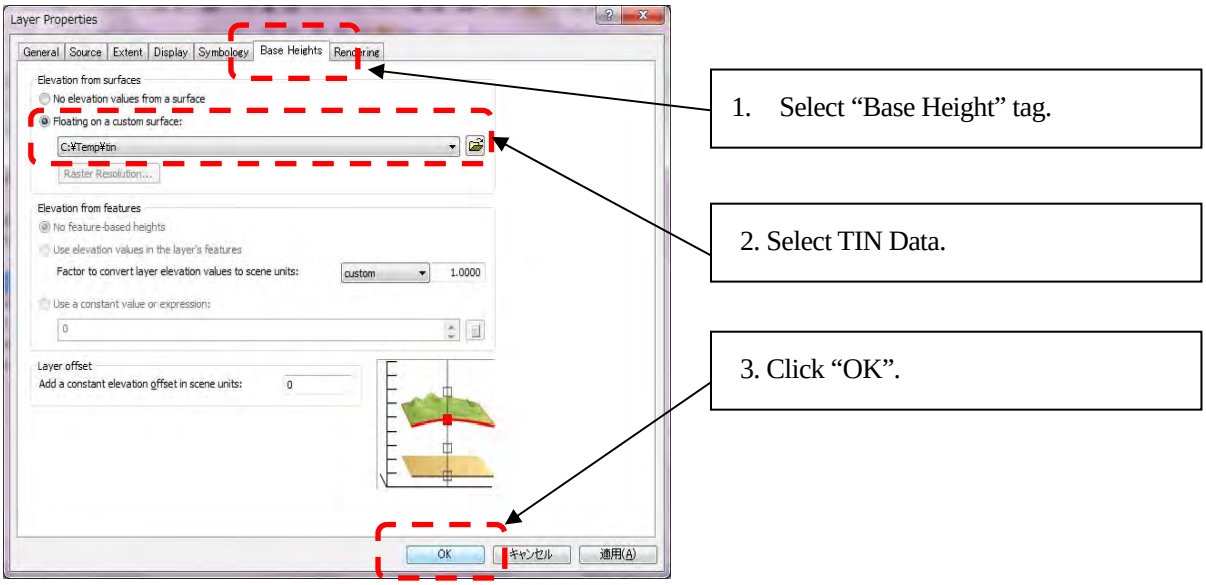


Image will be shown in 3D.

Period

Chapter 5-3-1 Data Structurization

1-1 Check "Definition Document of Topographic Database"

Check the database definition document, which defines the contents of the structured data to be created.

In particular, review the data type of shape data, the data code, attribute definition, and the contents of the attribute.

1-2 Data Structuring

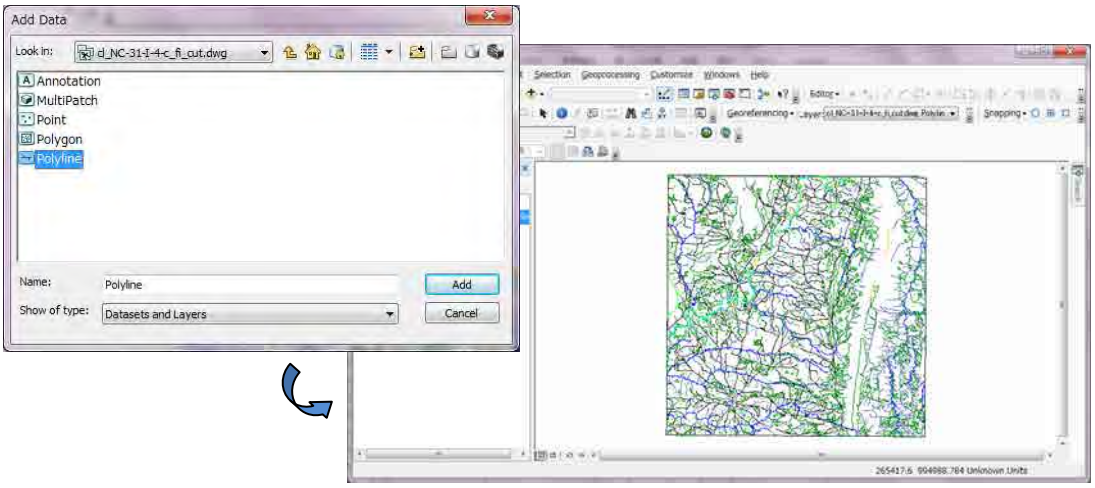
(1) Limit (From line to polygon feature)

First open ArcMAP and Set Coordinate System.

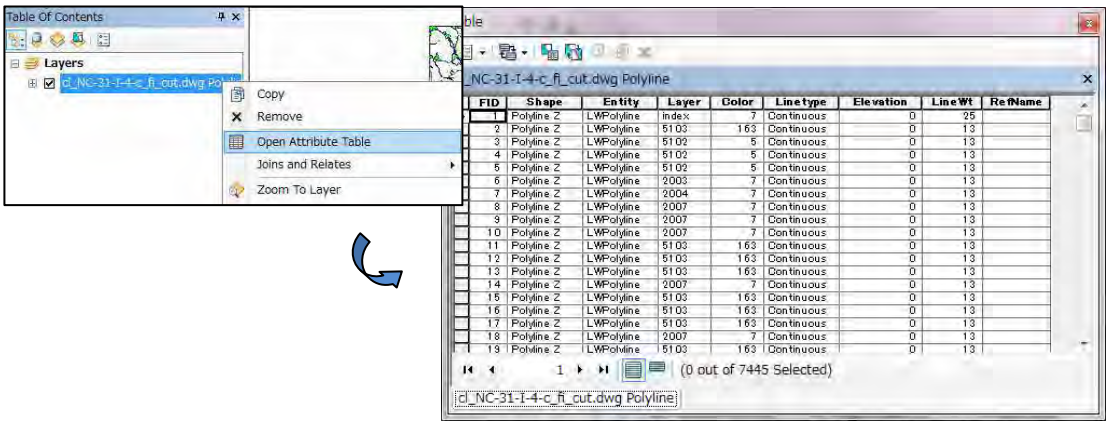
From "View" menu, select Data Frame Properties, and go Coordinate System tag.

(In this case, choose "WGS_1984_UTM_Zone_31N" from Projected Coordinate Systems folder.)

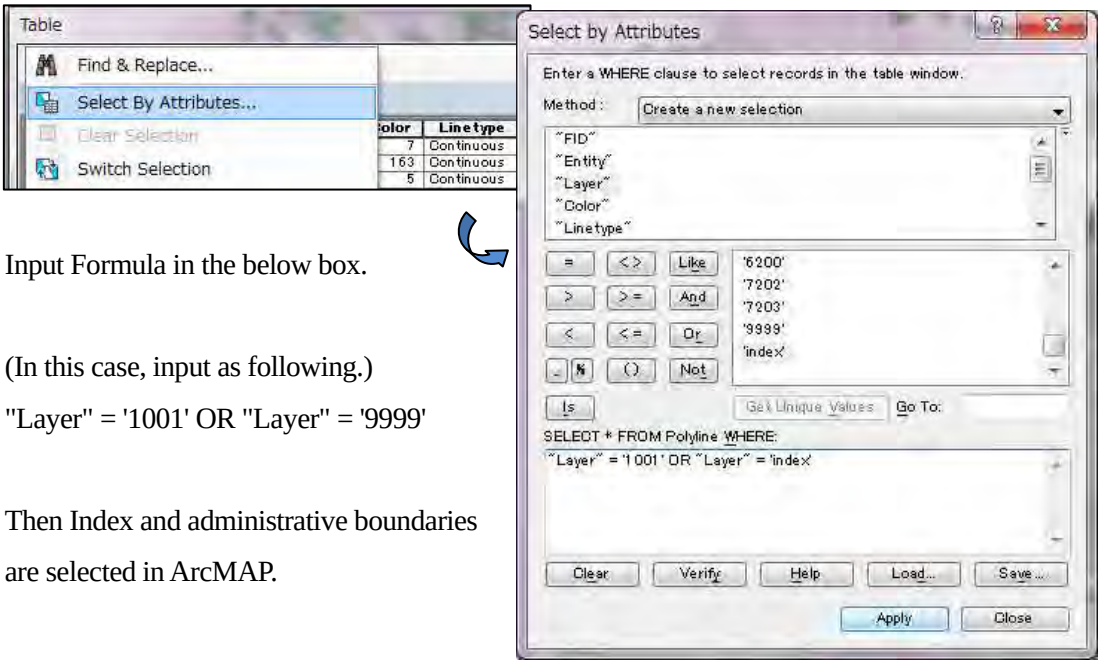
Add to ArcMAP line data of DWG data index and administrative boundaries are included.



Select the added data, and right-click, choose "Open Attribute Table".



From "Table Option", Select "Select by Attributes".

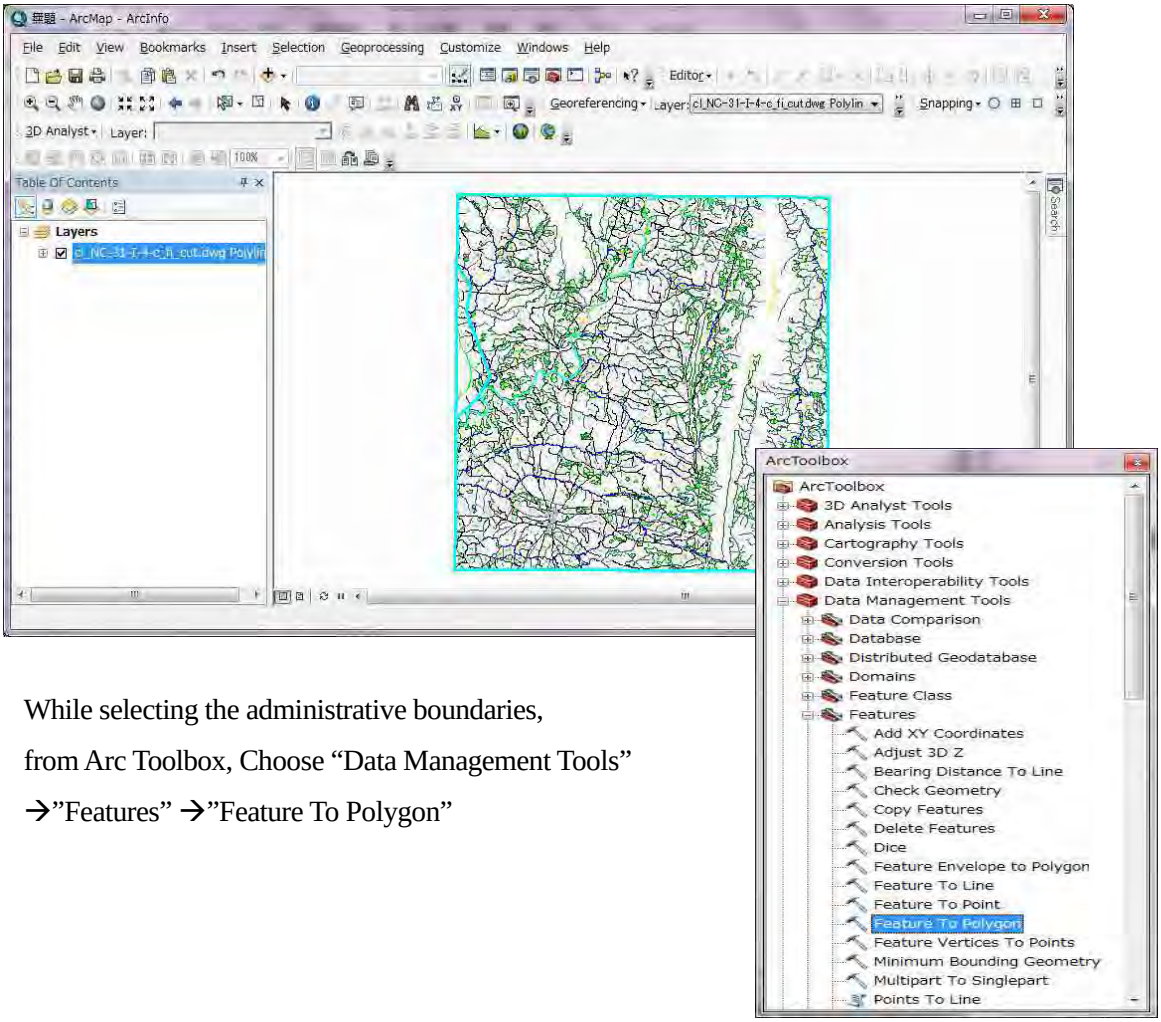


Input Formula in the below box.

(In this case, input as following.)

"Layer" = '1001' OR "Layer" = '9999'

Then Index and administrative boundaries are selected in ArcMAP.



While selecting the administrative boundaries,

from Arc Toolbox, Choose “Data Management Tools” →”Features” →”Feature To Polygon”

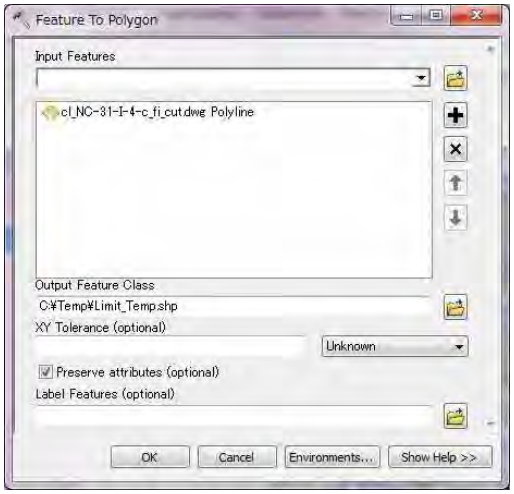
Choose “Input Features”.

Designate The output polygon feature class.

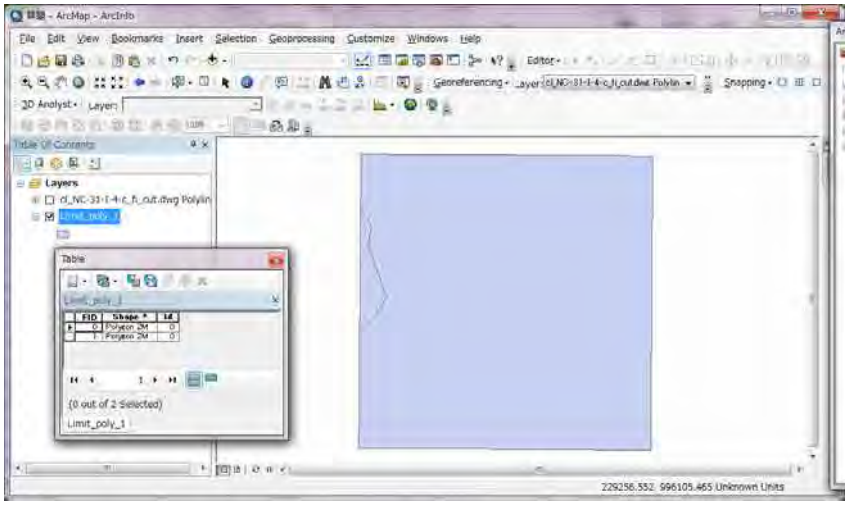
And click “OK”.

(In this case, The output feature name is as following.)

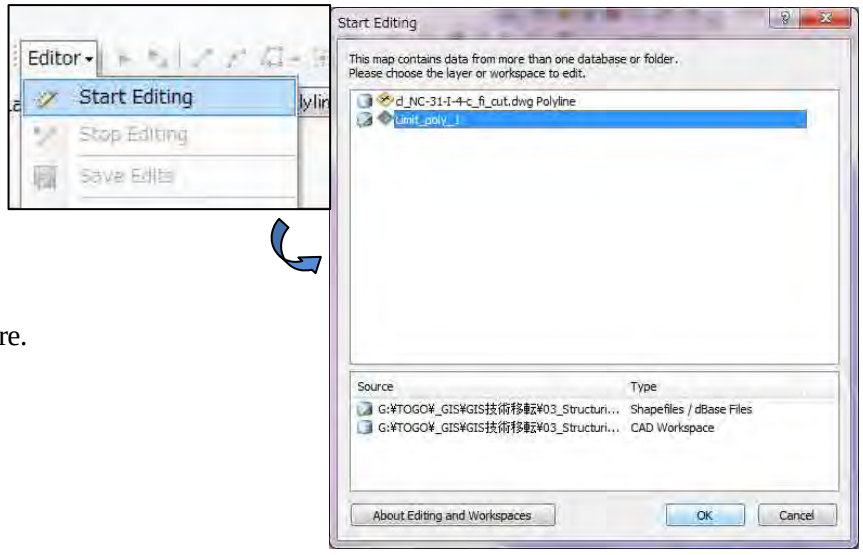
Limit_poly_1.shp



Then, the new polygon shape file is created as following.



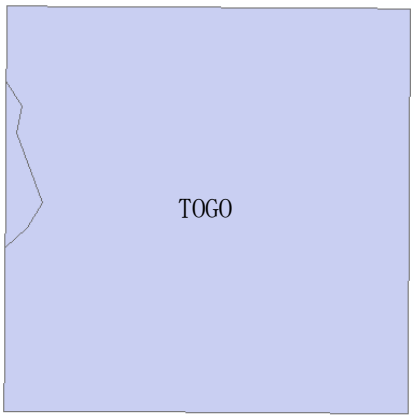
From Editor toolbar, select “Start Editing”.



And Choose Target feature.

In this case, small polygon on the right is not needed.
(Because of being outside of TOGO)
So delete the outside polygon.
(Select the polygon and press “Delete” button on the keyboard.)

Boundary→



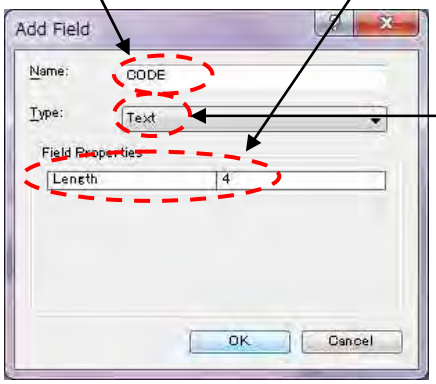
Exit the edit mode once, and then save the data. Since in edit mode, you will not be able to add the attribute fields.
After saving, open attribute table and add field according to the attribute definition. And input attributes.

Add “CODE” field as following.

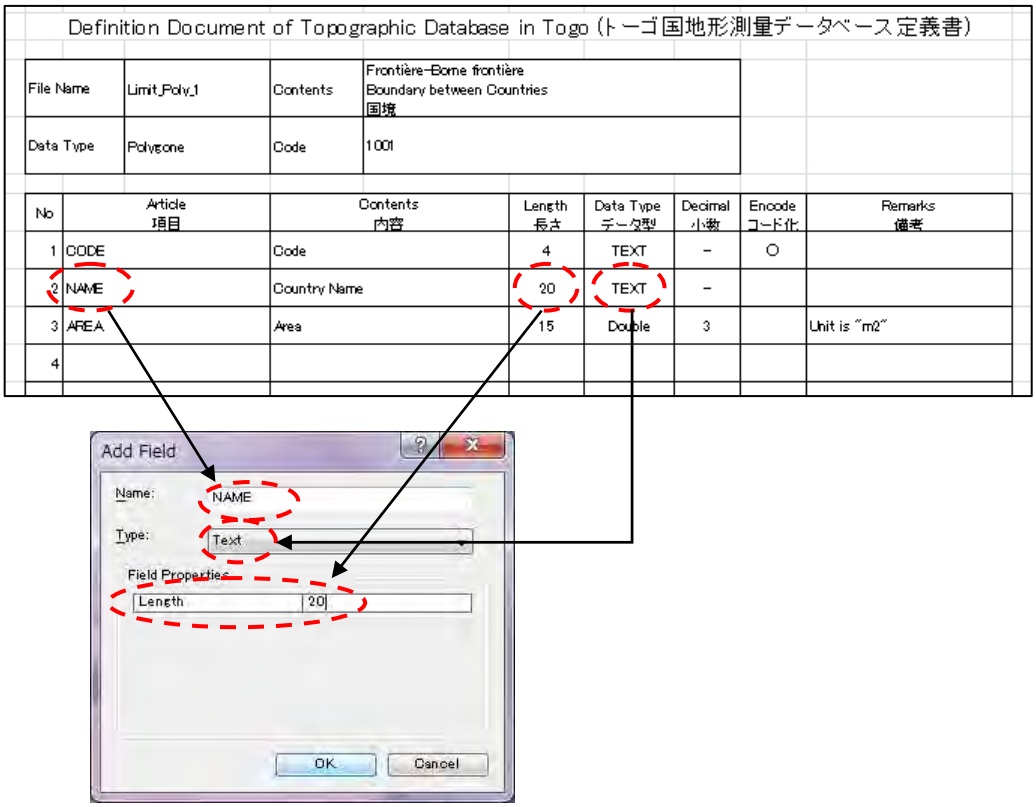
Definition Document of Topographic Database in Togo (トーゴ国地形測量データベース定義書)

File Name	Limit_Poly_1	Contents	Frontière-Borne frontière Boundary between Countries 国境
Data Type	Polygone	Code	1001

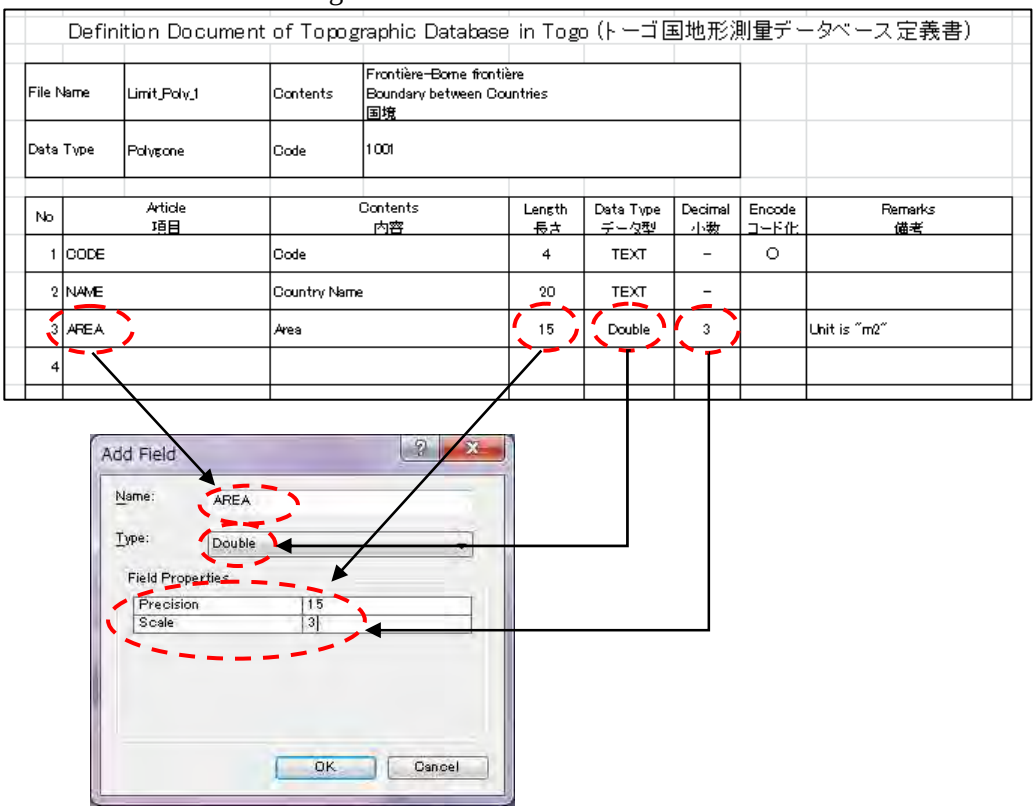
No	Article 項目	Contents 内容	Length 長さ	Data Type データ型	Decimal 小数	Encode コード化	Remarks 備考
1	CODE	Code	4	TEXT	-	O	
2	NAME	Country Name	20	TEXT	-		
3	AREA	Area	15	Double	3		Unit is “m2”
4							



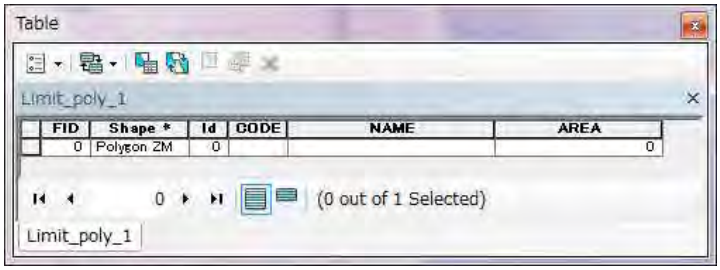
Add “NAME” field as following.



Add “AREA” field as following.



Attribute table is created, it is displayed as follows.



Next, input and edit attribute value.

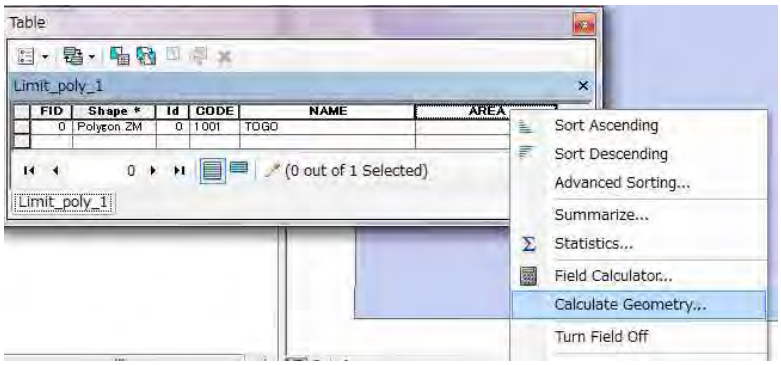
From Editor toolbar, select “Start Editing” again.

Input “CODE” value directly. (In this case, the value is “1001”.)

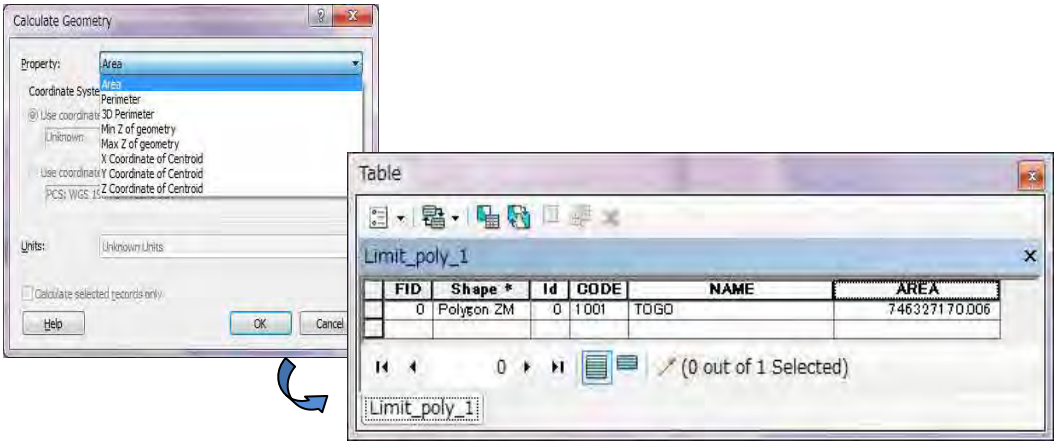
And also input “NAME” value. (In this case, the value is “TOGO”.)

“AREA” value is calculated automatically as following way.

Choose “AREA” field, and right-click. Select “Calculate Geometry”.



In the following window, choose “Area” from Property pull-down menu. And click “OK”.

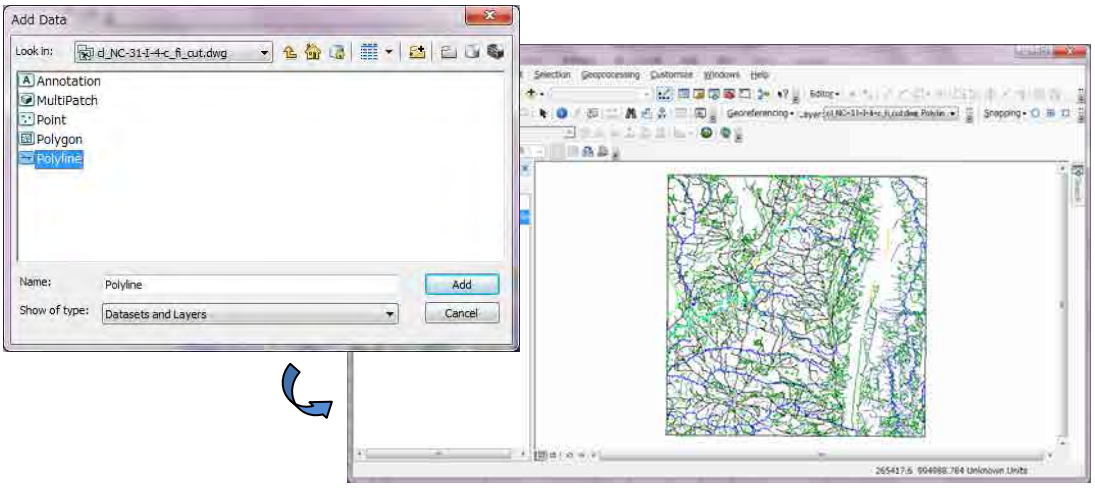


Attributes that are required will be entered all. Save data and Stop editing.

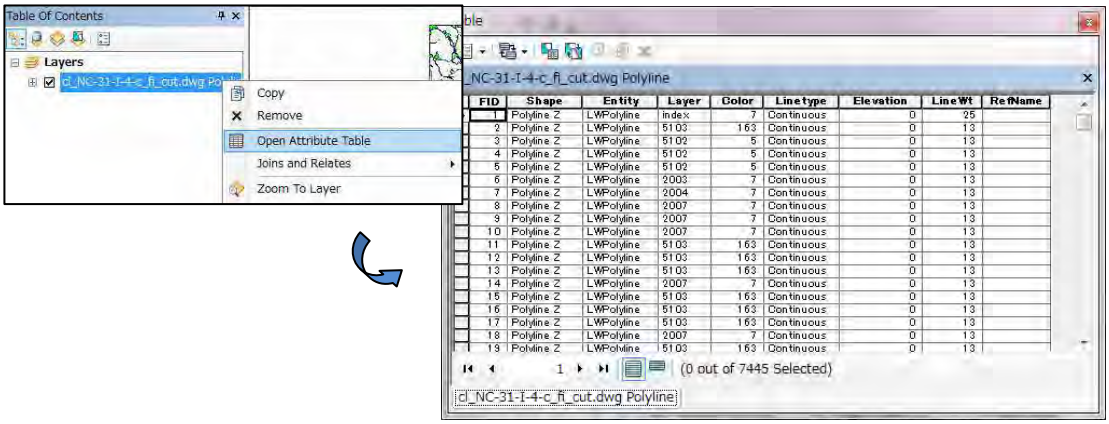
Open Arc Catalog, set Coordinate System (“WGS_1984_UTM_Zone_31N”) of the edited data.

(2) Road (From line to line feature)

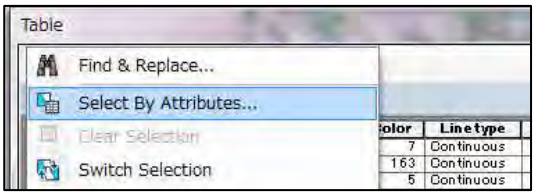
Add to ArcMAP DWG line data that includes road data.



Select added data, and right-click, choose “Open Attribute Table”.



From “Table Option”, Select “Select by Attributes”.



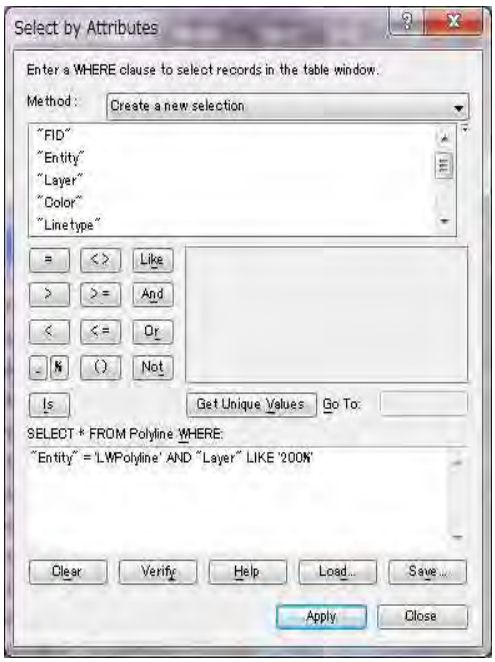
Input Formula in the below box.

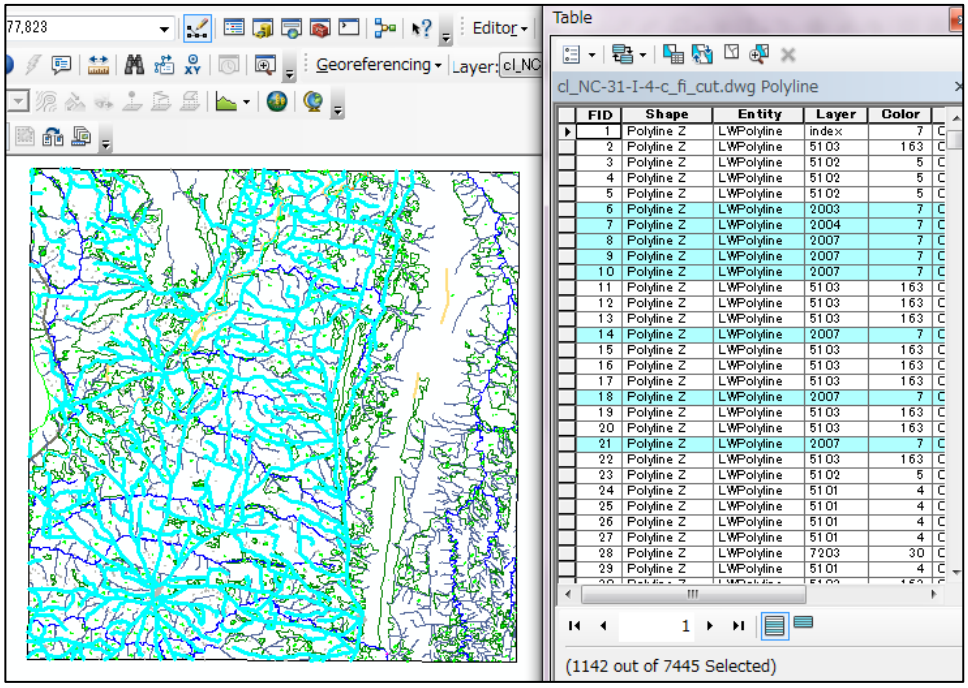
(In this case, input as following.)

"Layer" LIKE '200%’

And click “Apply”.

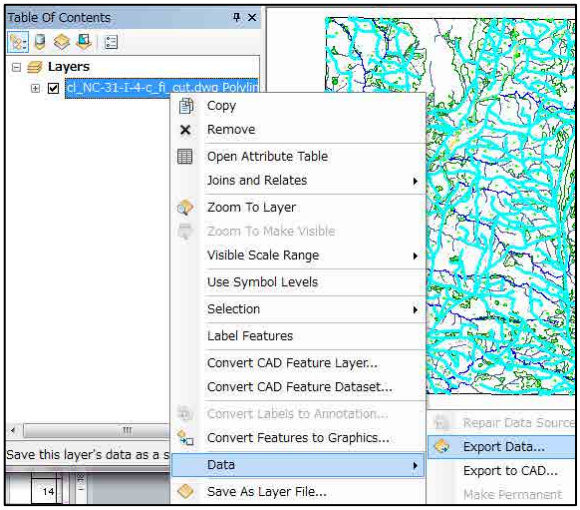
Then road line data are selected in ArcMAP.

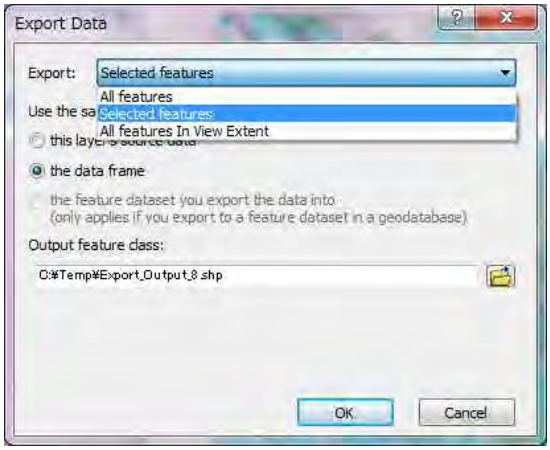




Select added data, and right-click,

choose “Data”→”Export Data”.





Set as following, and click “OK”.

Export: Selected features

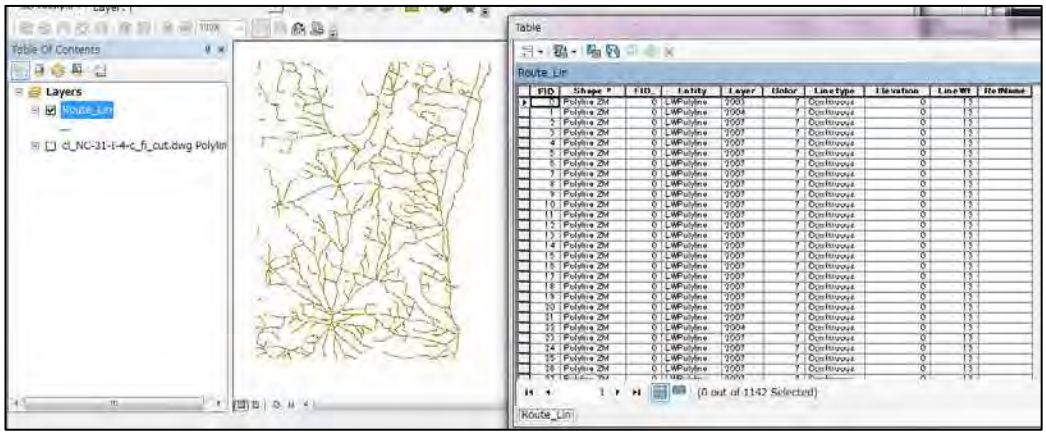
Use the same coordinate system as:

the data frame

Output feature class: (data directory/)

Route_Lin.shp

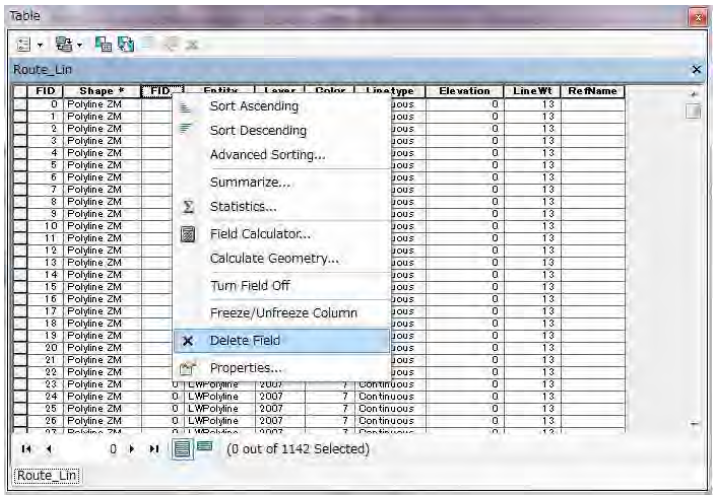
Route_Lin.shp is added in the ArcMAP window. And open attribute table.



Remove unnecessary fields. (In this case, delete “FID_”, “Entity”, “Color”, “Linetype”, “Elevation”, “LineWt”, and “RefName”.)

Select field, right-click, and choose “Delete Field”.

Do not remove the Layer field, because the content of this field is the same as CODE field.

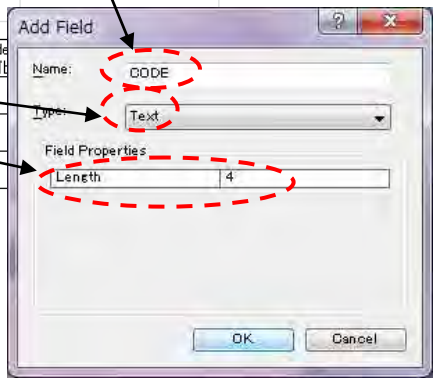


Add “CODE” field as following.

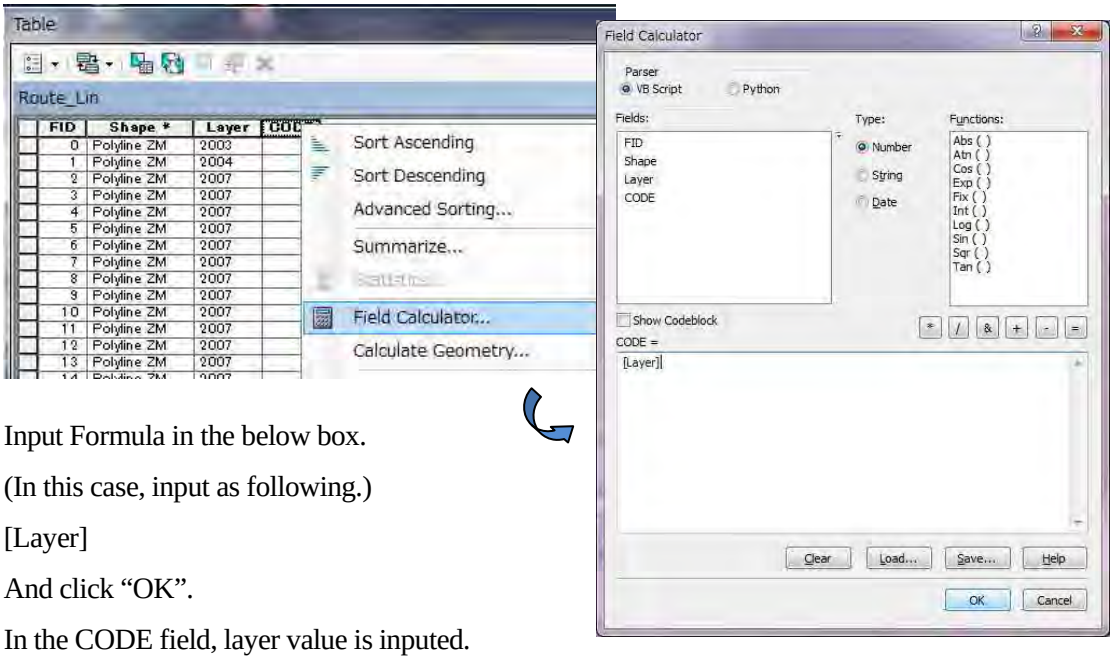
Definition Document of Topographic Database in Togo (トーゴ国地形測量データベース定義書)

File Name	Route_Lin	Contents	Routes Roads 道路
Data Type	Ligne	Code	2001 - 2007

No	Article 項目	Contents 内容	Length 長さ	Data Type データ型	Decimal 小数	Encode コード化
1	CODE	Code	4	TEXT	-	○
2	NAME	National Road Name	20	TEXT	-	
3	LENGTH	Length	10	Double	3	



Select “CODE” field, right-click, and choose “Field Calculator”.



Input Formula in the below box.

(In this case, input as following.)

[Layer]

And click “OK”.

In the CODE field, layer value is inputed.

Delete Layer field.

Then add “NAME”, and “LENGTH” field according to the attribute definition.

Definition Document of Topographic Database in Togo (トーゴ国地形測量データベース定義書)

File Name	Route_Lin	Contents	Routes Roads 道路
Data Type	Ligne	Code	2001 - 2007

No	Article 項目	Contents 内容	Length 長さ	Data Type データ型	Decimal 小数	Encode コード化	Remarks 備考
1	CODE	Code	4	TEXT	-	○	
2	NAME	National Road Name	20	TEXT	-		National Road Only “RN 15” etc…
3	LENGTH	Length	10	Double	3		Unit is “m”

Only to the national road, enter a value in the “NAME” field. With reference to national road name data, you will be able to determine the need for input. Without national road in the map, then there is no need to enter the value of “NAME” field. With national road in the map, start editing and enter the name in the table directly. (Like “RN 15”)

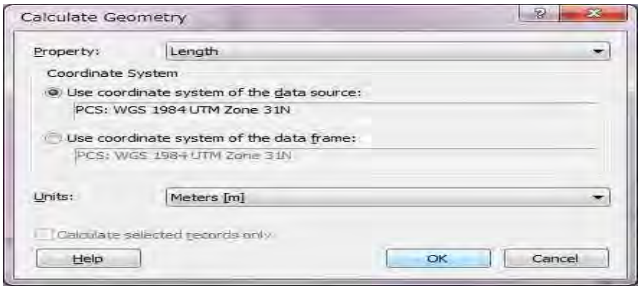
Next, calculate “LENGTH” field value by the “Calculate Geometry”.

Select “LENGTH” field , right-click, and choose “Calculate Geometry”.

Property: Length

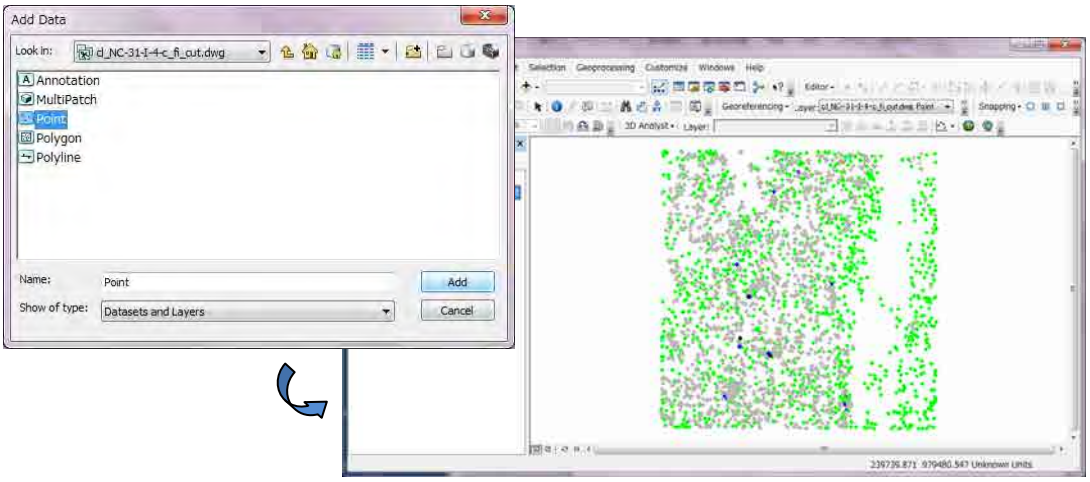
Units: Meters [m]

And click “OK”.

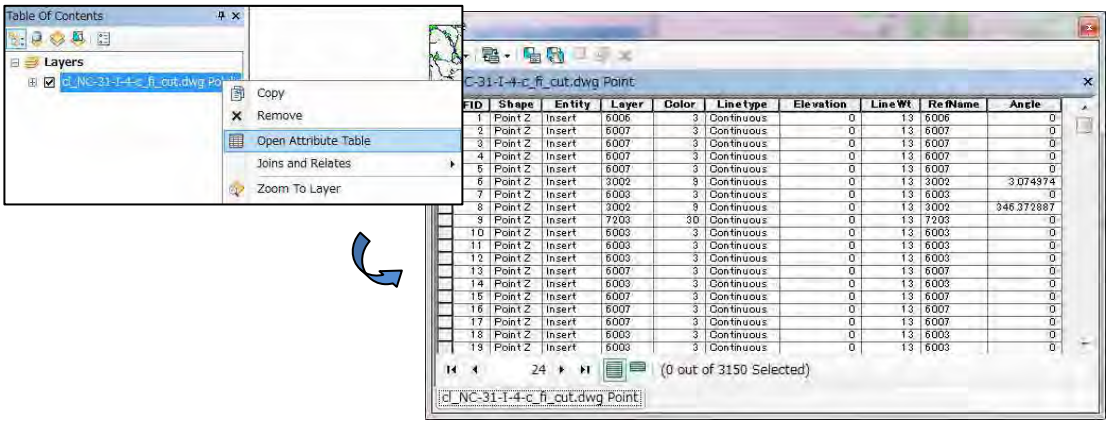


(3) Small Buildings (From point to point feature with angle attribute)

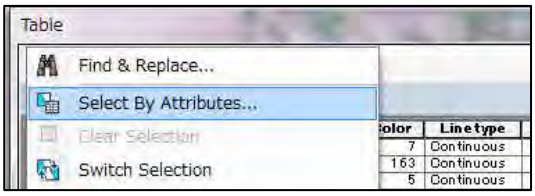
Add to ArcMAP DWG point data that includes small buildings data.



Select the added data, and right-click, choose “Open Attribute Table”.



From “Table Option”, Select “Select by Attributes”.



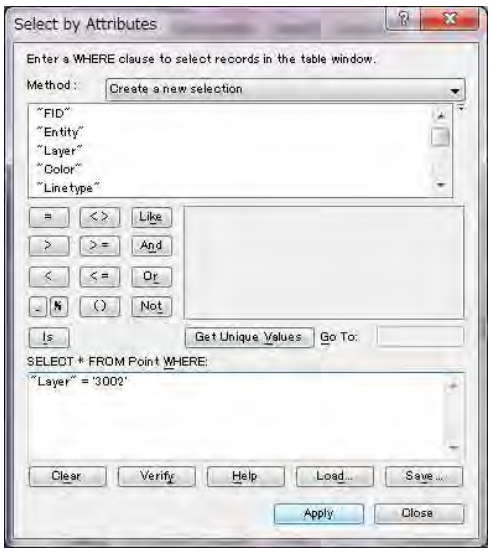
Input Formula in the below box.

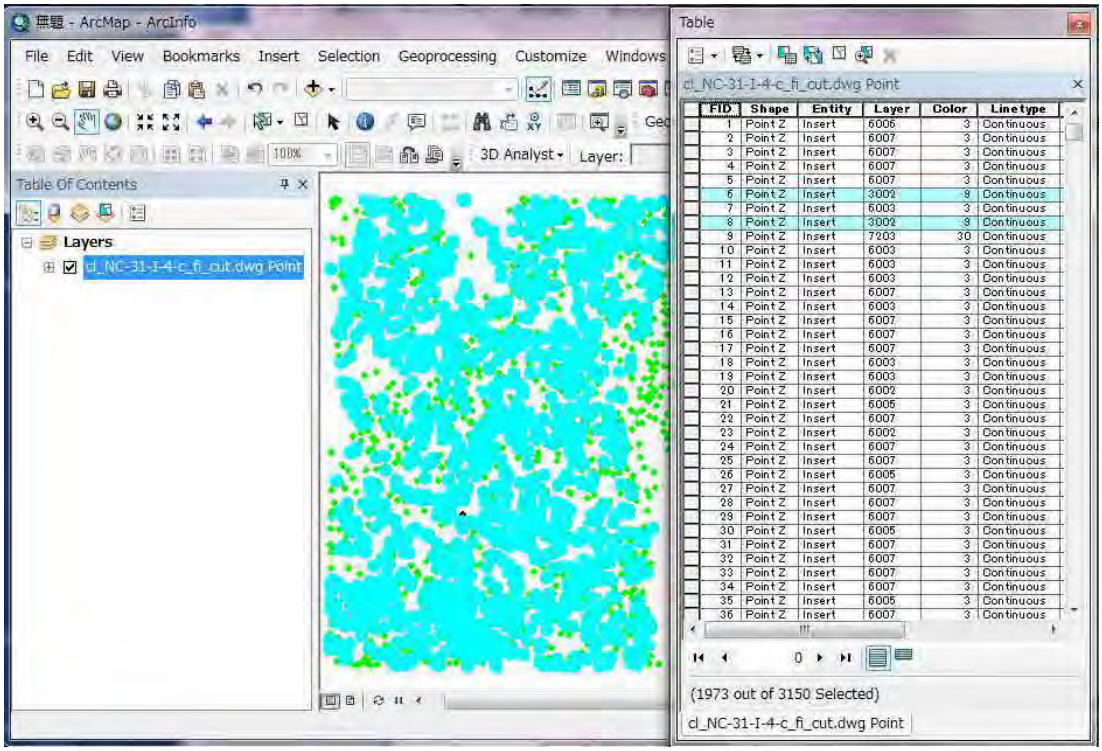
(In this case, input as following.)

"Layer" = '3002'

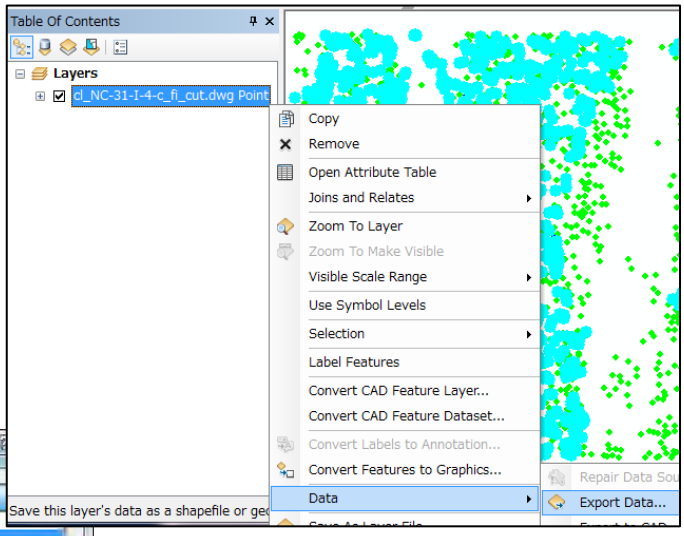
And click “Apply”.

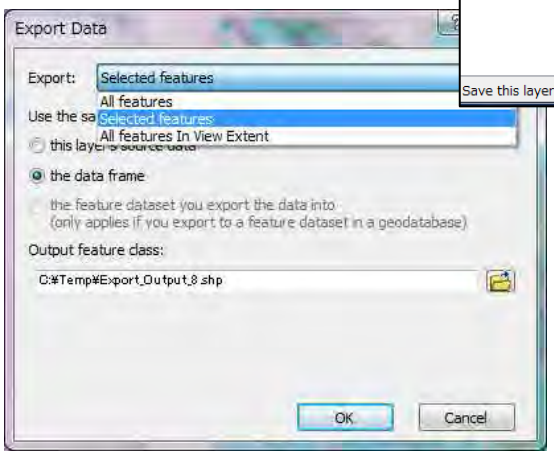
Then small buildings point data are selected in ArcMAP.





Select the added data, and right-click, choose “Data”→”Export Data”.





Set as following, and click “OK”.

Export: Selected features

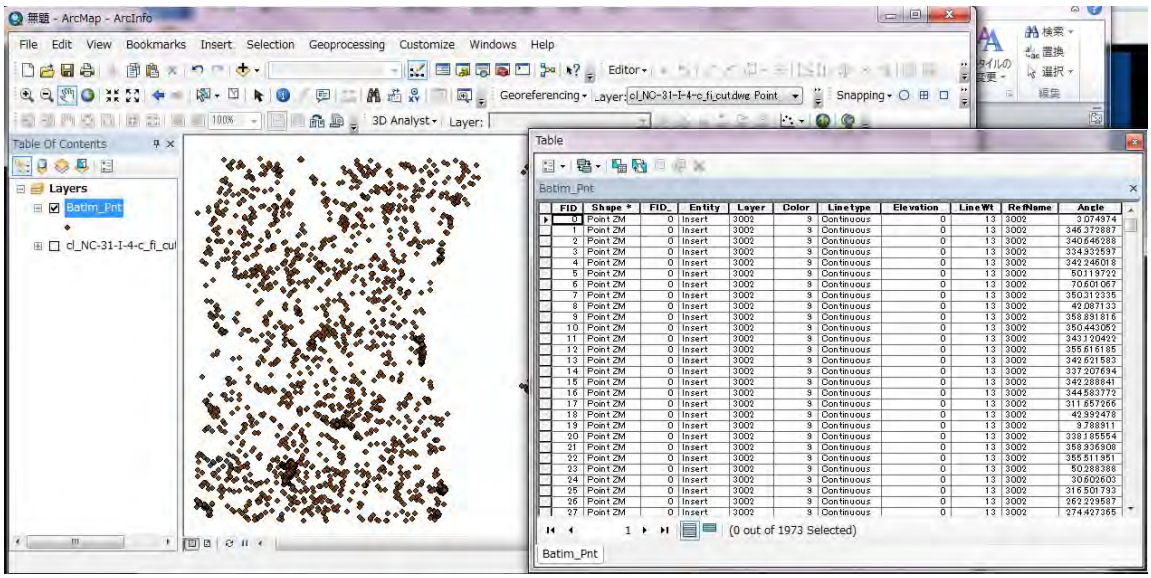
Use the same coordinate system as:

the data frame

Output feature class: (data directory/)

Batim_Pnt.shp

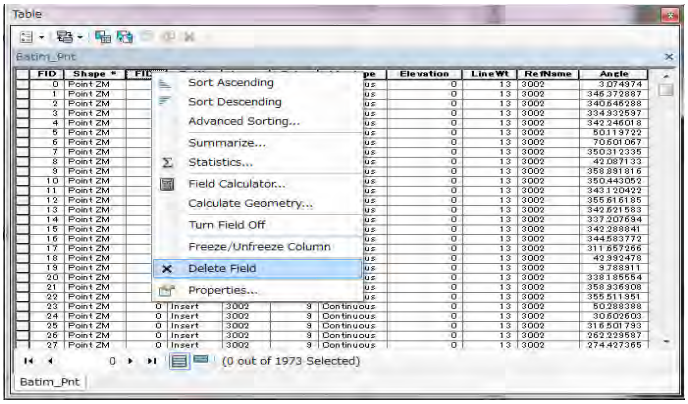
Batim_Pnt.shp is added in the ArcMAP window. And open attribute table.



Remove unnecessary fields. (In this case, delete “FID_”, “Entity”, “Color”, “Linetype”, “Elevation”, “LineWt”, and “RefName”.)

Select field, right-click, and choose “Delete Field”.

Do not remove the Layer field, because the content of this field is the same as CODE field.

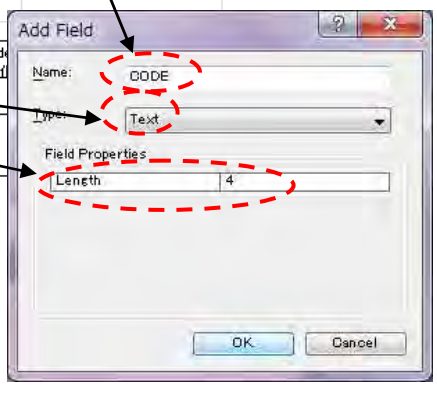


Add “CODE” field as following.

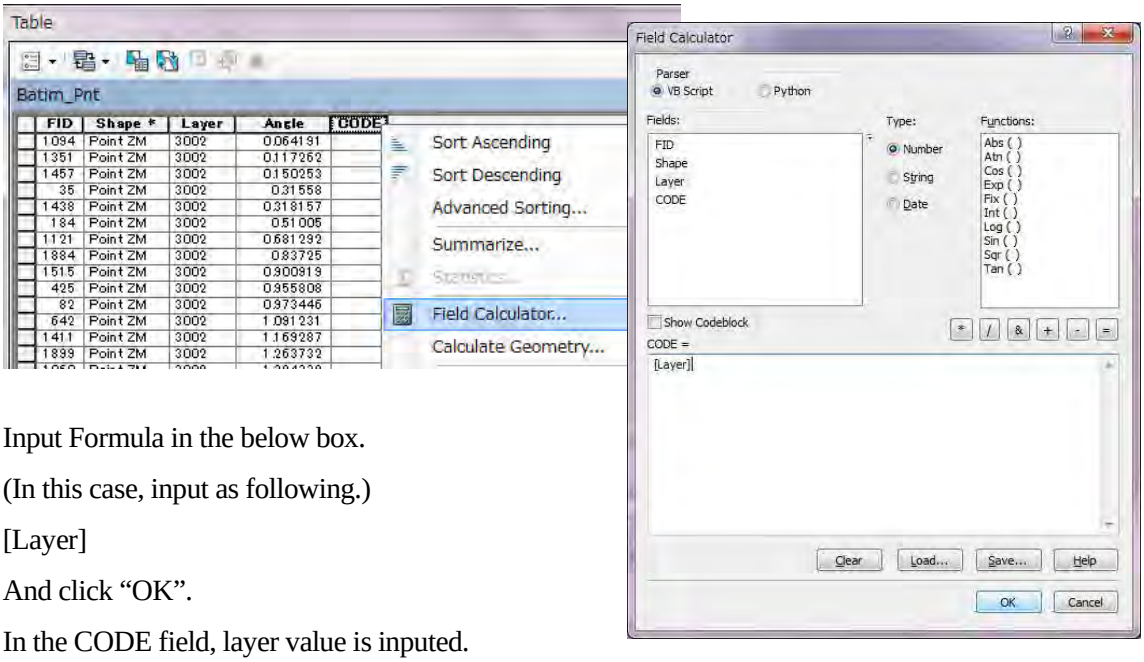
Definition Document of Topographic Database in Togo (トーゴ国地形測量データベース定義書)

File Name	Batim_Pnt	Contents	Petits Bâtiments ou Bâtiments banco Small buildings or 小さい建物あるいは土壁建物
Data Type	Point	Code	3002

No	Article 項目	Contents 内容	Length 長さ	Data Type データ型	Decimal 小数	Encod コード
1	CODE	Code	4	TEXT		O
2	ANGLE	Angle	3	Short Int		



Select “CODE” field, right-click, and choose “Field Calculator”.



Input Formula in the below box.

(In this case, input as following.)

[Layer]

And click “OK”.

In the CODE field, layer value is inputed.

Delete Layer field.

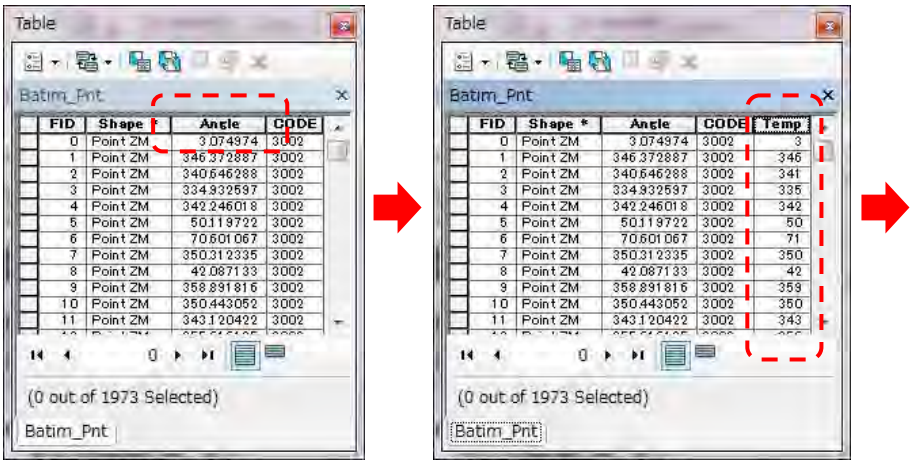
Then add “ANGLE” field according to the attribute definition.

Definition Document of Topographic Database in Togo (トーゴ国地形測量データベース定義書)

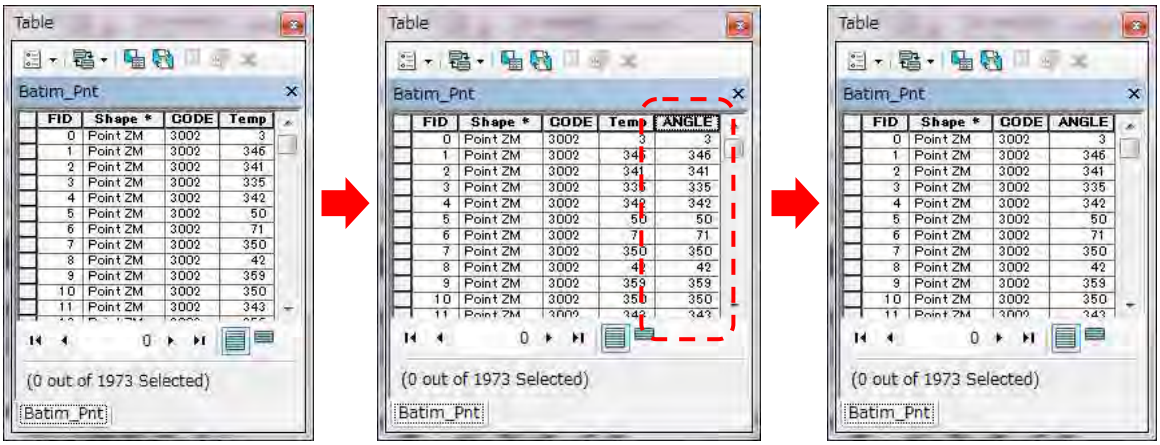
File Name	Batim_Pnt	Contents	Petits Bâtiments ou Bâtiments banco Small buildings or 小さい建物あるいは土壁建物
Data Type	Point	Code	3002

No	Article 項目	Contents 内容	Length 長さ	Data Type データ型	Decimal 小数	Encode コード化	Remarks 備考
1	CODE	Code	4	TEXT	-	O	
2	ANGLE	Angle	3	Short Int	-		Unit is “Degree”. Origin is East. Direction is anti-clockwise.

But in this data, “Angle” field exits already. So make temporary field like “Temp”. And move the value of angle attribute to temporary field.

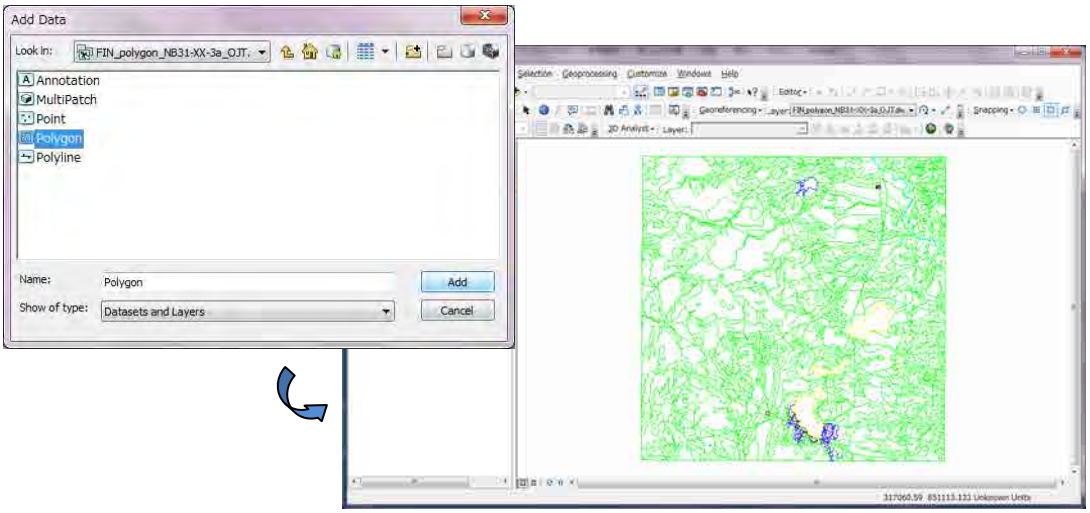


Next, delete “Angle” field, then add new “ANGLE” field according to the attribute definition. Finally move the value of attribute to new “ANGLE” field, and delete temporary field.

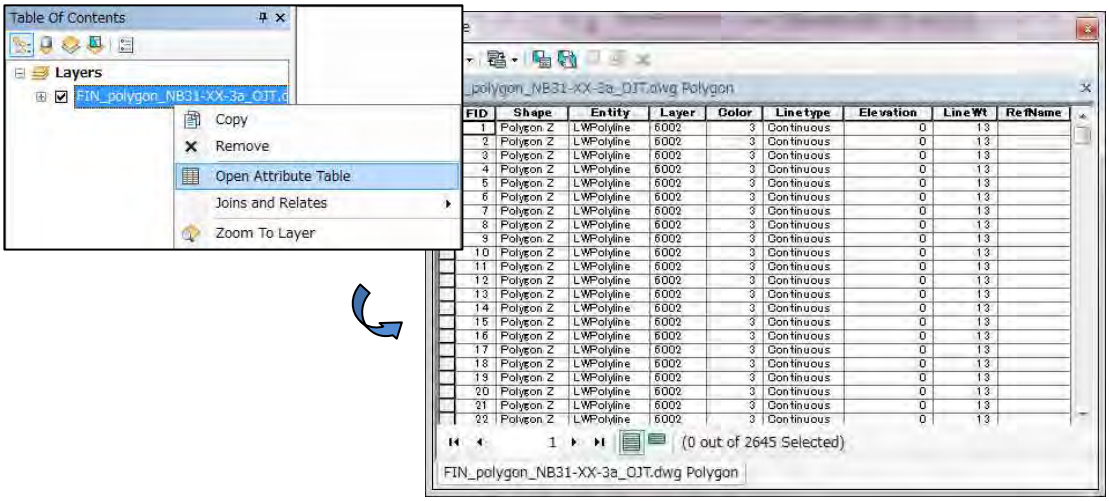


(4) Boundary of Forest reservation, National park (From polygon to polygon feature)

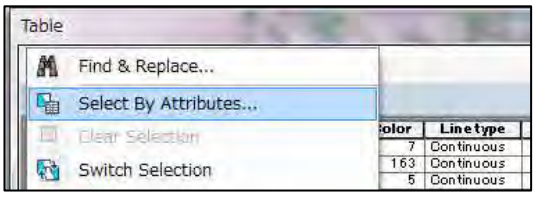
Add to ArcMAP DWG polygon data that includes forest reservation and National park data.



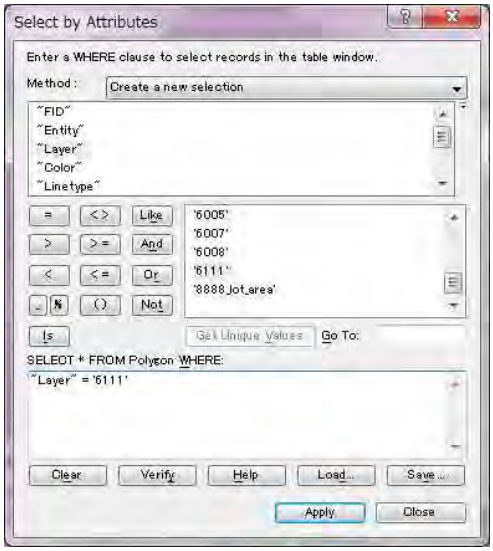
Select the added data, and right-click, choose “Open Attribute Table”



From “Table Option”, Select “Select by Attributes”.



Input Formula in the below box.

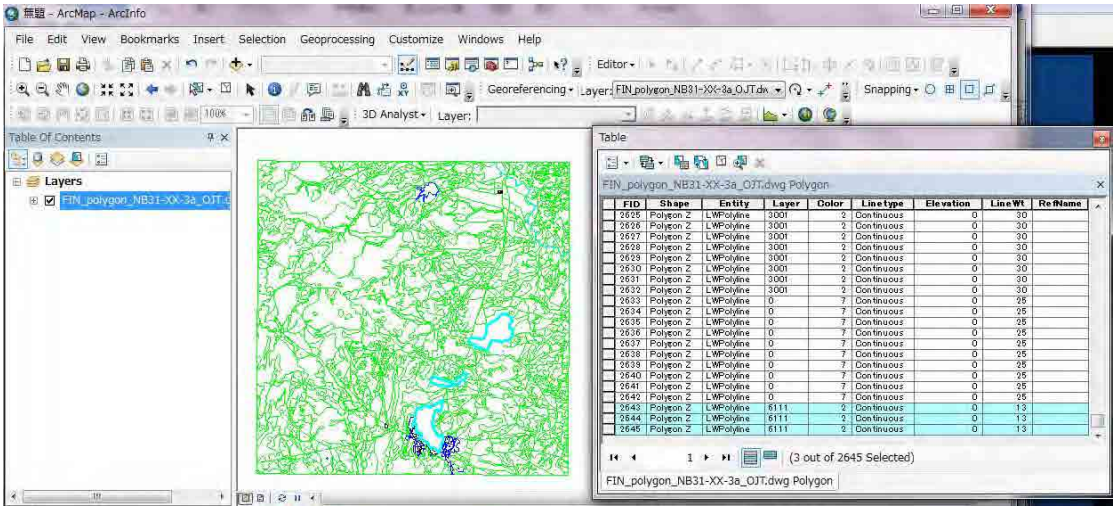


(In this case, input as following.)

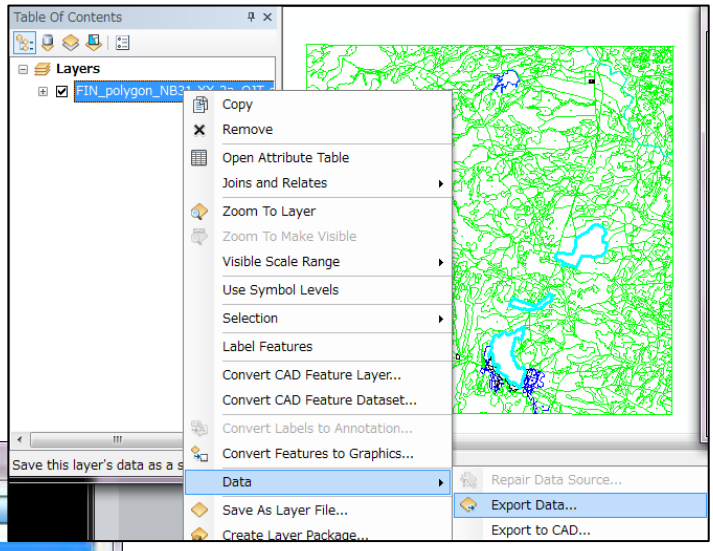
"Layer" = '6111'

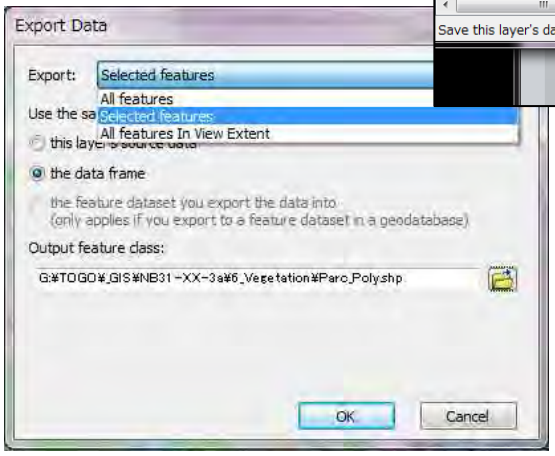
And click “Apply”.

Then parks polygon data are selected in ArcMAP.



Select the added data, and right-click, choose “Data”→”Export Data”.





Set as following, and click “OK”.

Export: Selected features

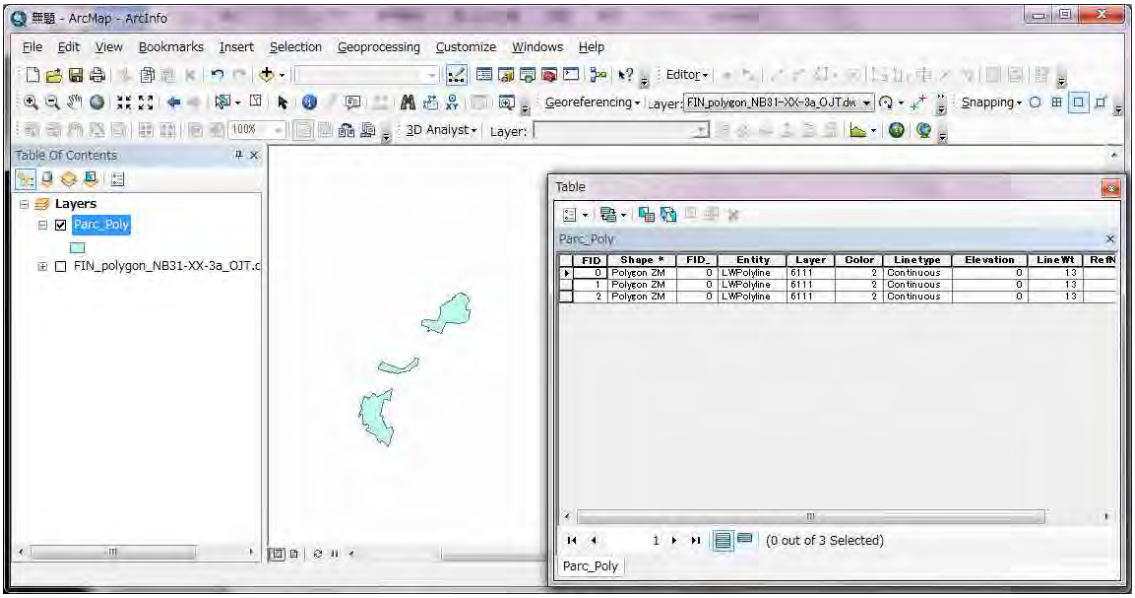
Use the same coordinate system as:

the data frame

Output feature class: (data directory/)

Parc_Poly.shp

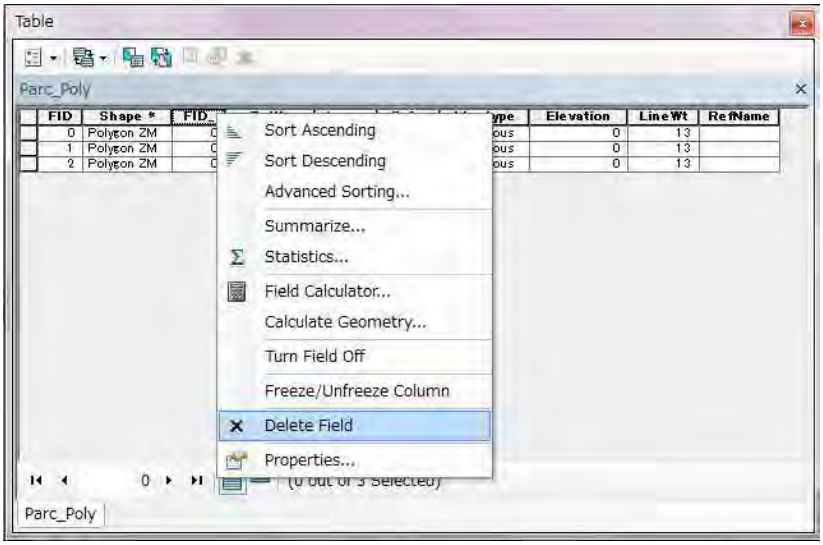
Parc_Poly.shp is added in the ArcMAP window. And open attribute table.



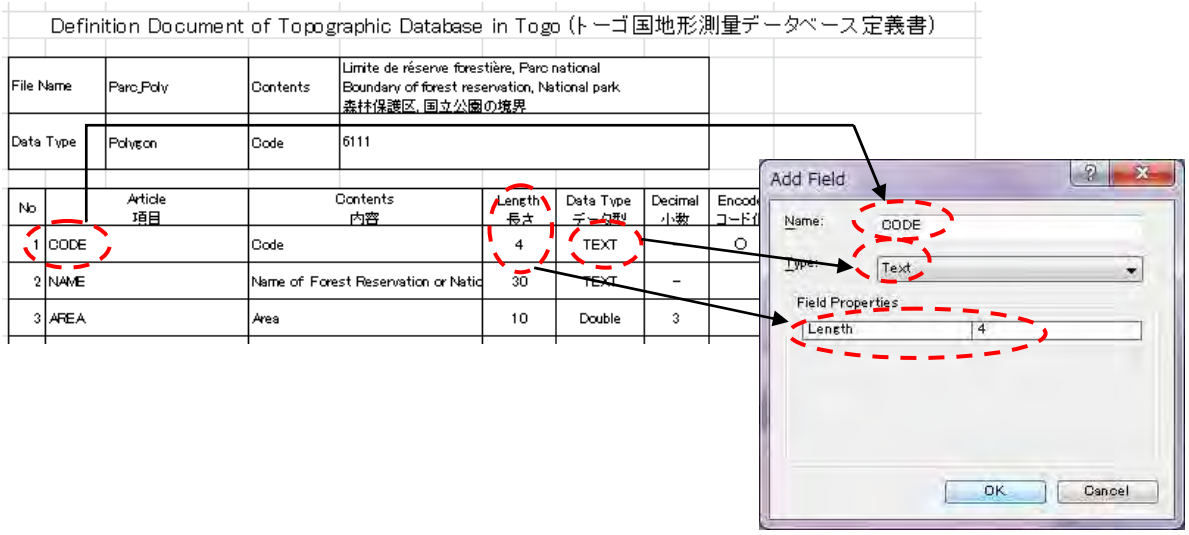
Remove unnecessary fields. (In this case, delete “FID_”, “Entity”, “Color”, “Linetype”, “Elevation”, “LineWt”, and “RefName”.)

Select field, right-click, and choose “Delete Field”.

Do not remove the Layer field, because the content of this field is the same as CODE field.



Add “CODE” field as following.

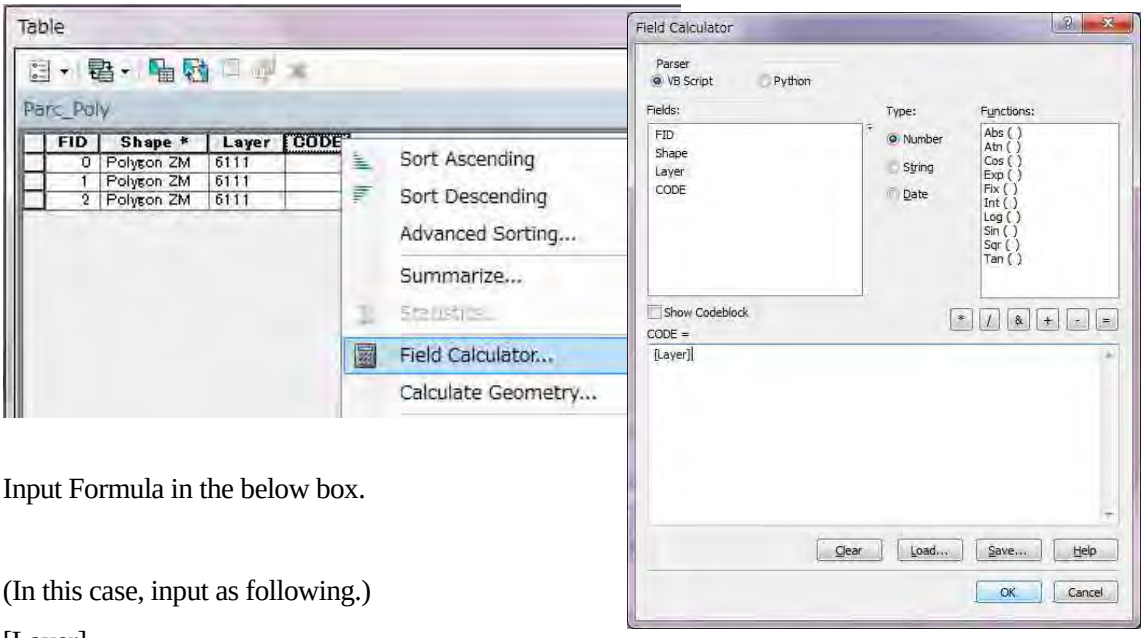


Definition Document of Topographic Database in Togo (トーゴ国地形測量データベース定義書)

File Name	Parc_Poly	Contents	Limite de réserve forestière, Parc national Boundary of forest reservation, National park 森林保護区, 国立公園の境界
Data Type	Polygon	Code	6111

No	Article 項目	Contents 内容	Length 長さ	Data Type データ型	Decimal 小数	Encod コードf
1	CODE	Code	4	TEXT		○
2	NAME	Name of Forest Reservation or Natio	30	TEXT	-	
3	AREA	Area	10	Double	3	

Select “CODE” field, right-click, and choose “Field Calculator”.



Input Formula in the below box.

(In this case, input as following.)

[Layer]

And click “OK”.

In the CODE field, layer value is inputed.

Delete Layer field.

Then add “NAME”, and “AREA” field according to the attribute definition.

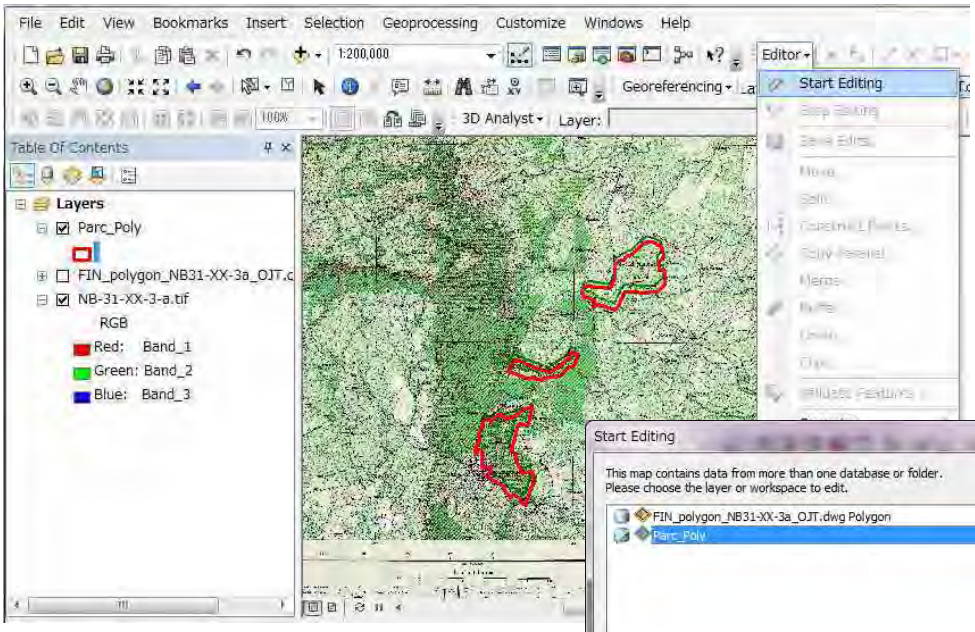
Definition Document of Topographic Database in Togo (トーゴ国地形測量データベース定義書)

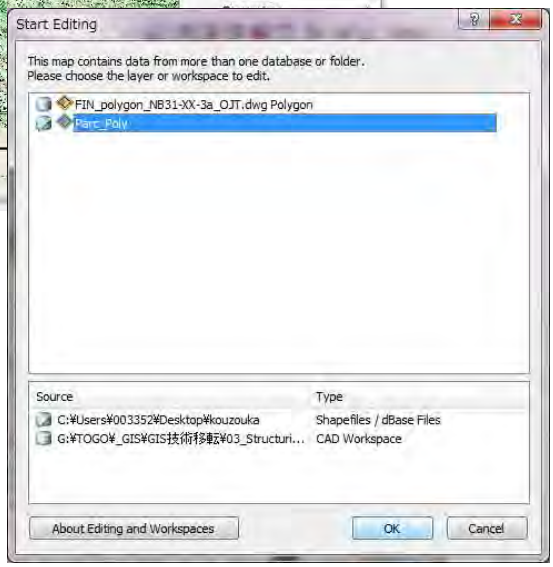
File Name	Parc_Poly	Contents	Limite de réserve forestière, Parc national Boundary of forest reservation, National park 森林保護区, 国立公園の境界
Data Type	Polygon	Code	6111

No	Article 項目	Contents 内容	Length 長さ	Data Type データ型	Decimal 小数	Encode コード化	Remarks 備考
1	CODE	Code	4	TEXT	-	○	
2	NAME	Name of Forest Reservation or Natic	30	TEXT	-		In capital letters
3	AREA	Area	10	Double	3		Unit is "m2"

Enter values in the “NAME” field with reference to Forest reservation and National park name data such as old maps.

Add old map data. And from Editor toolbar, select “Start Editing”.

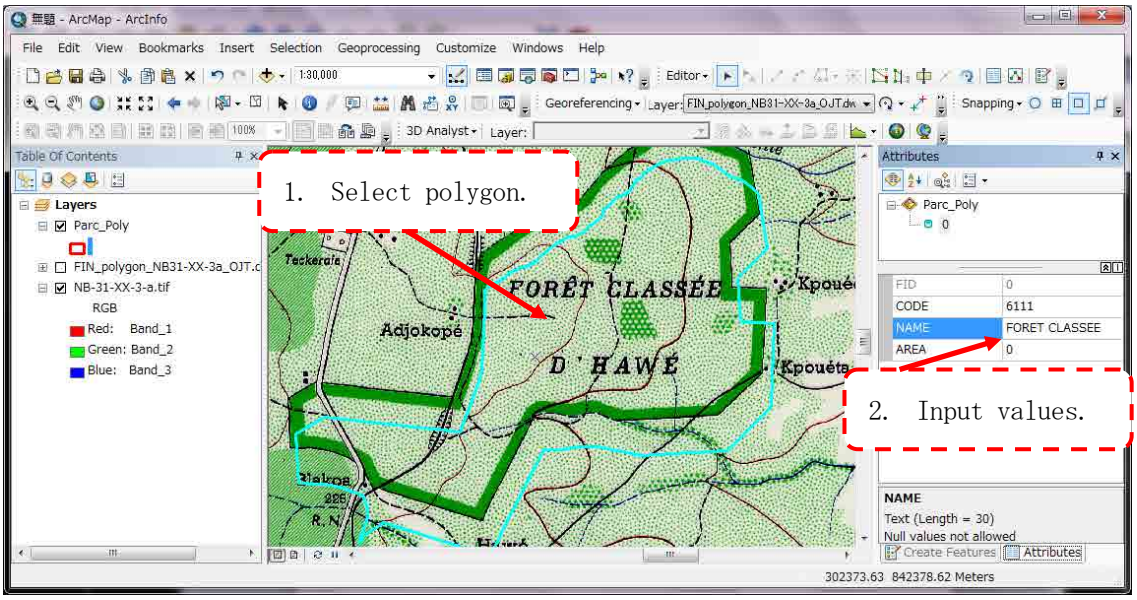




In the “Start Editing” window, select “Parc_Poly”. And click “OK”

From Editor toolbar, choose “Attributes” button.

Next, select polygon in the map window. And then input the “NAME” values in the attributes table.



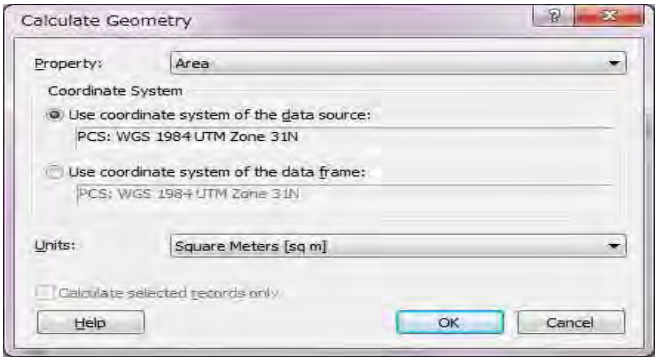
Calculate “AREA” field value by the “Calculate Geometry”.

Select “AREA” field , right-click, and choose “Calculate Geometry”.

Property: AREA

Units: Square Meters [sq m]

And click “OK”.



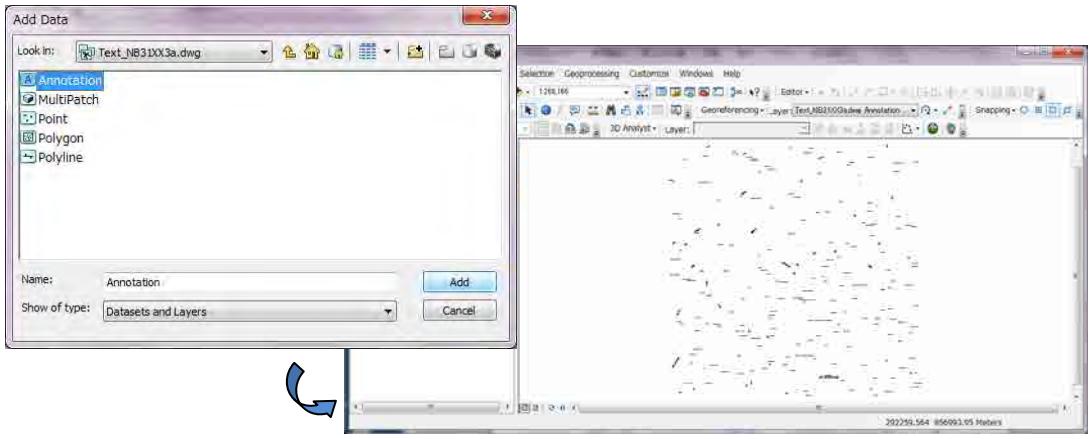
(5) Annotation (From annotation to point feature)

First open ArcMAP and Set Coordinate System.

From “View” menu, select Data Frame Properties, and go Coordinate System tag.

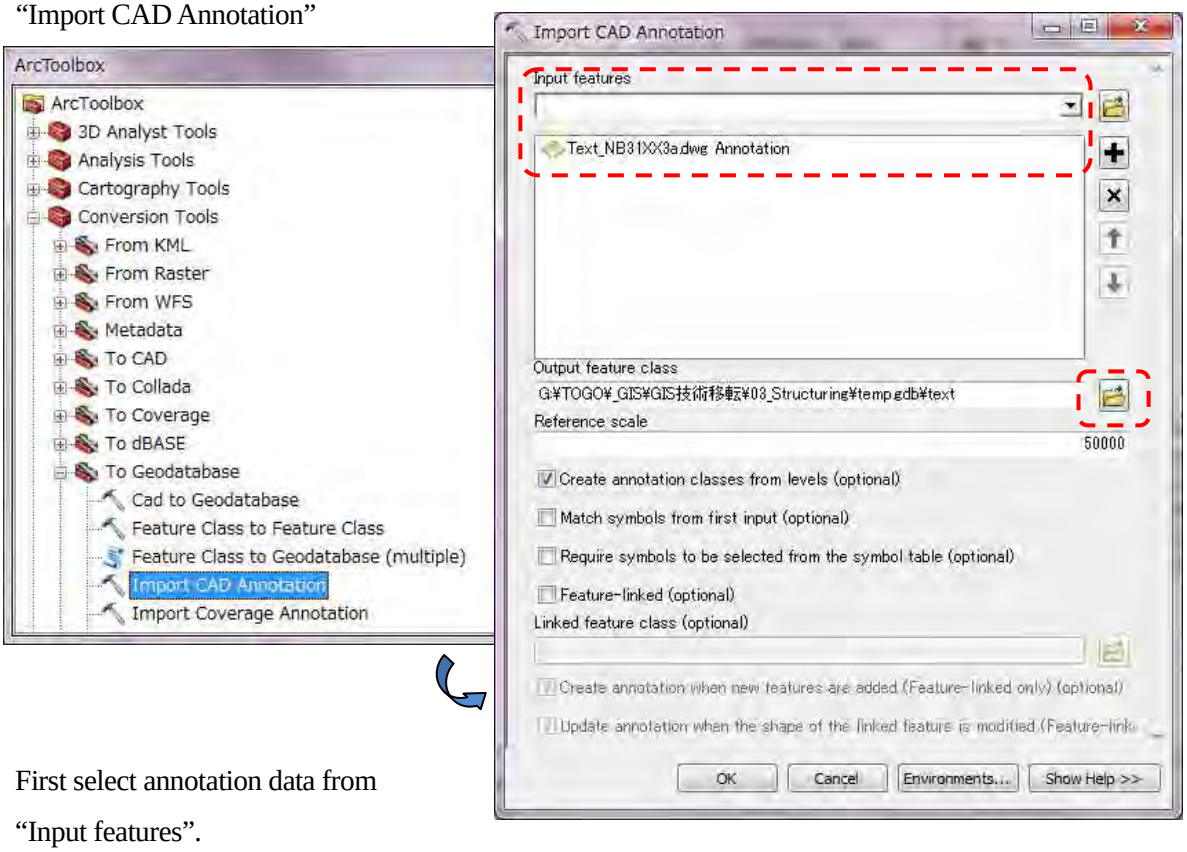
(In this case, choose “WGS_1984_UTM_Zone_31N” from Projected Coordinate Systems folder.)

Add DWG annotation data to ArcMAP.



Open Arc Toolbox, and select “Conversion Tools” → “To Geodatabase” →

“Import CAD Annotation”

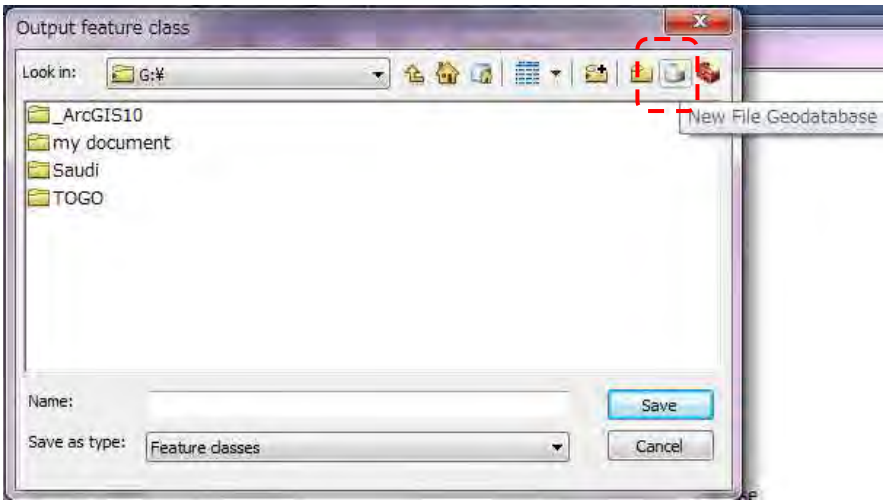


First select annotation data from

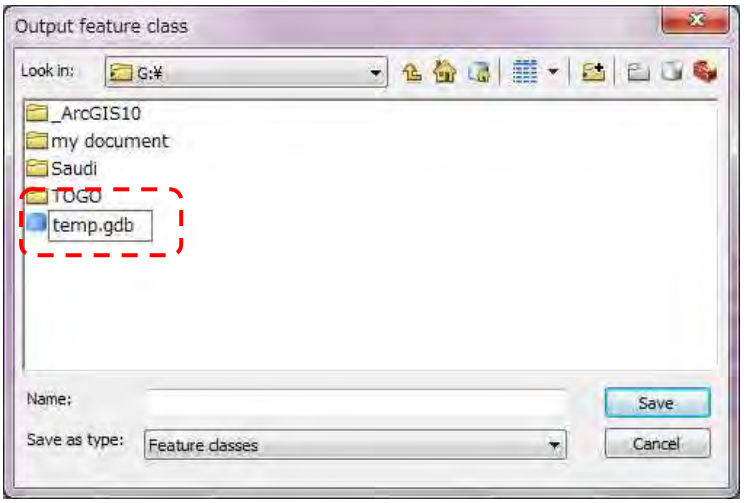
“Input features”.

Next click “Output feature class” button, and move to the appropriate folder.

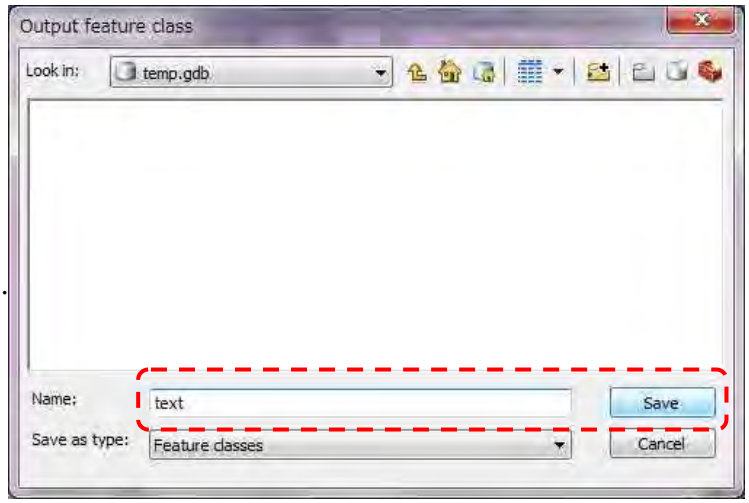
In the folder, select “New File Geodatabase” button.



And create temporary file geodatabase as follows. Then double click new geodatabase.



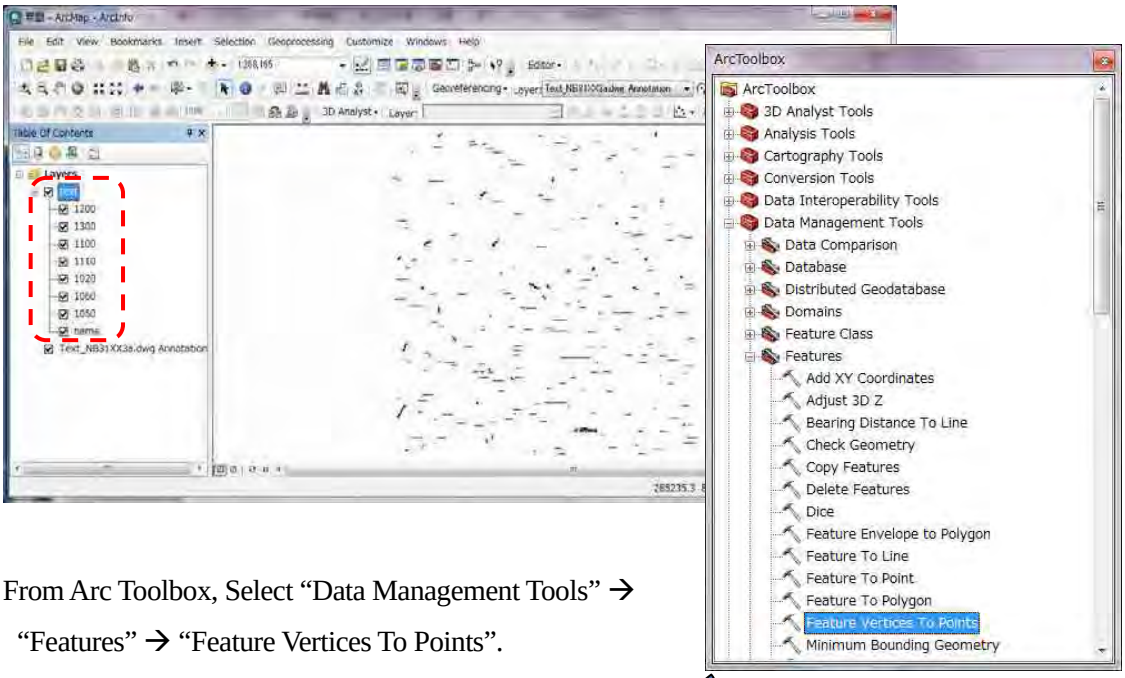
Input temporary feature name as follows. And click “Save” button.



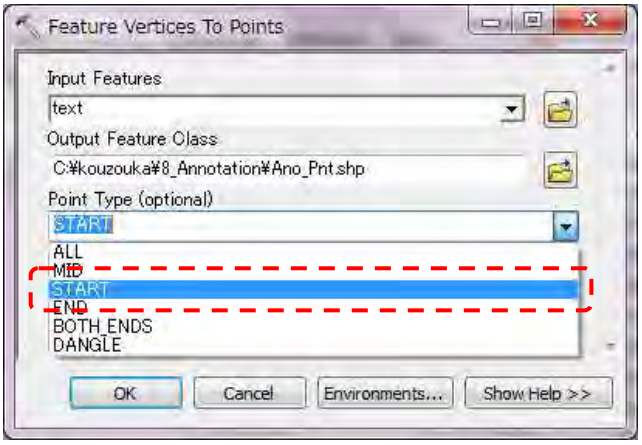
In the “Import CAD Annotation” window, input “Reference scale”. (In this case, input “50000”.)

And click “OK”.

Geodatabase annotation will be imported in the map window.



From Arc Toolbox, Select “Data Management Tools” → “Features” → “Feature Vertices To Points”.



Set as following, and click “OK”.

Input Features:

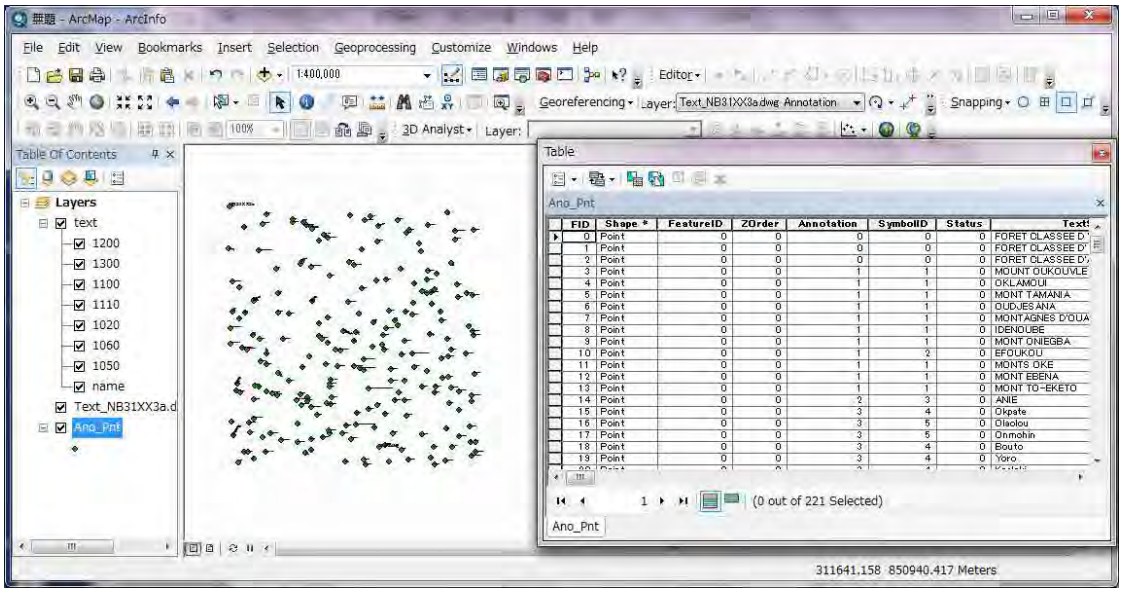
geodatabase annotation data

Output feature class: (data directory/)

Ano_Pnt.shp

Point Type: START

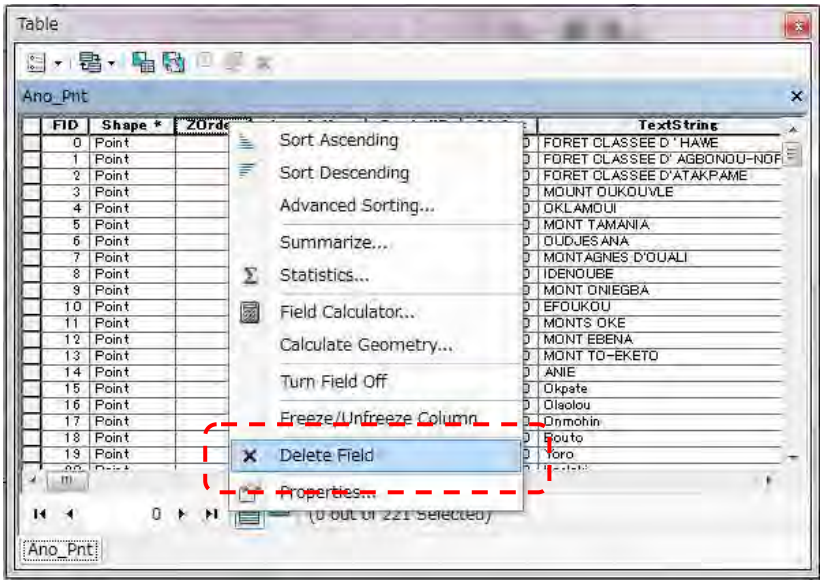
Point data will be shown in the map window. And open attribute table of the Ano_Pnt.shp.



Remove unnecessary fields. (In this case, delete attributes other than “Layer”, Text” and “Txt Angle”.)

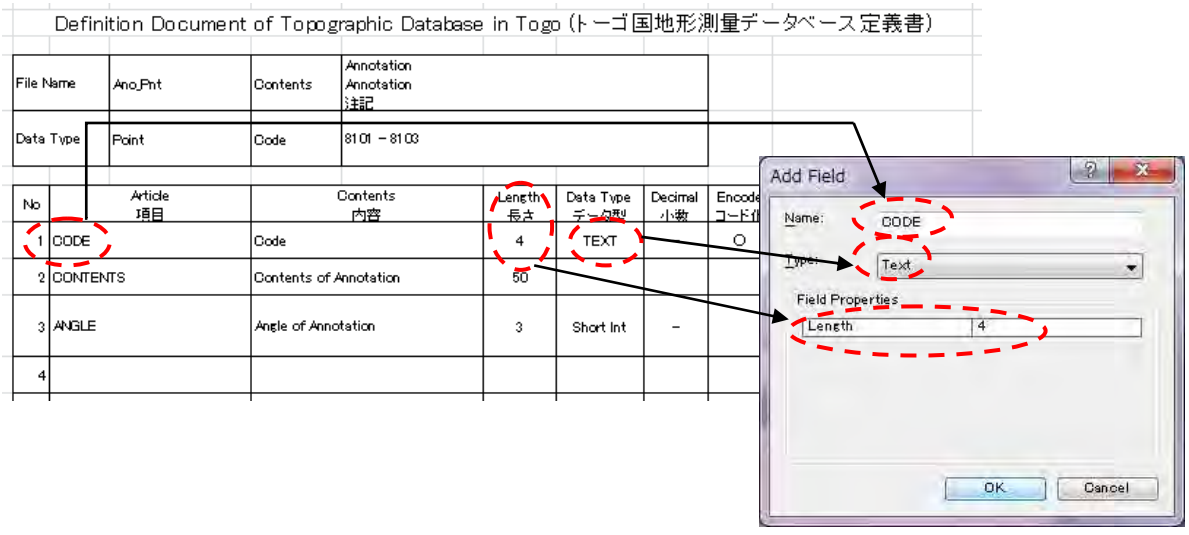
Select field, right-click, and choose “Delete Field”.

Do not remove the Layer, Text and Txt Angle fields, because the contents of these fields are the same as CODE, CONTENTS, and ANGLE fields.

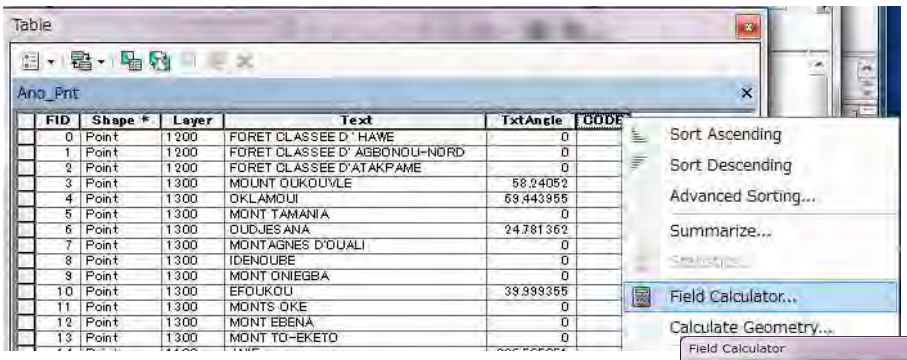


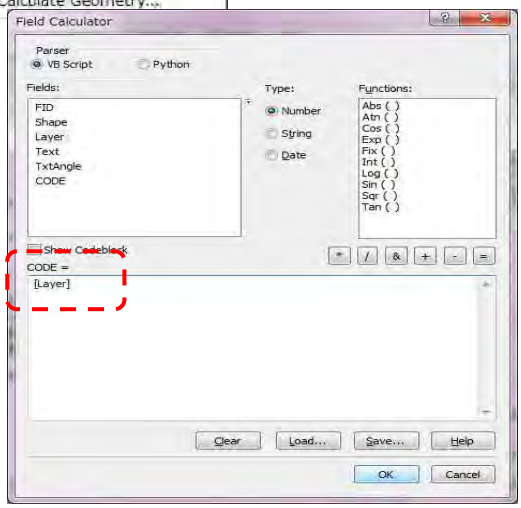
(From Arc Toolbox, Select “Data Management Tools” → “Fields” → “Delete Fields”, you can delete some fields at once.)

Add “CODE” field as following.



Select “CODE” field, right-click, and choose “Field Calculator”.





Input Formula in the below box.

(In this case, input as following.)

[Layer]

And click “OK”.

In the CODE field, layer value is inputed.

Delete Layer field.

Then add “CONTENTS”, and “ANGLE” field according to the attribute definition.

Definition Document of Topographic Database in Togo (トーゴ国地形測量データベース定義書)

File Name	Ano_Pnt	Contents	Annotation Annotation 注記
Data Type	Point	Code	8101 – 8103

No	Article 項目	Contents 内容	Length 長さ	Data Type データ型	Decimal 小数	Encode コード化	Remarks 備考
1	CODE	Code	4	TEXT	-	O	
2	CONTENTS	Contents of Annotation	50				
3	ANGLE	Angle of Annotation	3	Short Int	-		Unit is “Degree”. Origin is East. Direction is anti-clockwise.
4							

As in the case of “CODE”, by using “Field Calculator” function, calculate the “CONTENTS” and “ANGLE” field’s values.

Open Arc Catalog, set Coordinate System (“WGS_1984_UTM_Zone_31N”) of the edited data.

Period