GPS LANDS GEOSPATIALSOLUTIONS

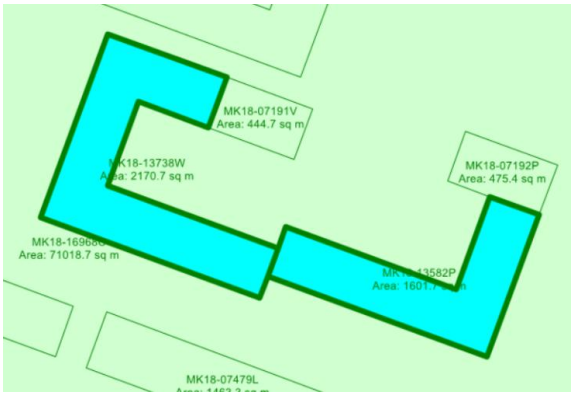
GeoCadastral version 2018

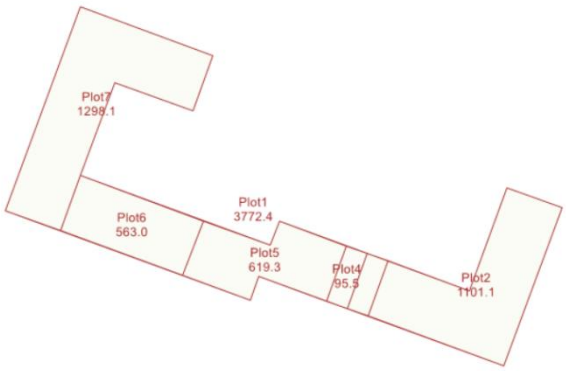
Tutorials for the Preparation and Submission of SGLX for CSMS

Background Information for this Tutorial

This tutorial will show the procedures of using *GeoCadastre v2018* to prepare the SGLX for submission to CSMS for the allocation of new lot numbers. After that, the procedures to complete the processes for the submission of Certified Plan will be described.

For this tutorial, a sample data set will be used. The parent lots are MK18-13738W and MK18-13582P, which are to be amalgamated into Plot1. Then Plot1 will be further subdivided into Plots 2 to 7. Please refer to the diagrams below.





Get Lot Number (Allocation of lot numbers)

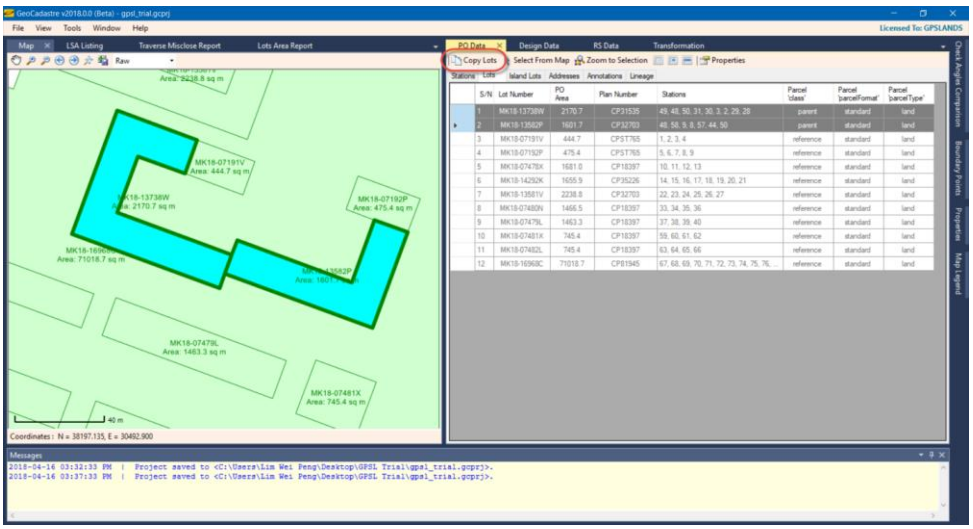
This tutorial is for the purpose of preparing and submitting a SGLX for allocation of new lot numbers.

Information required before proceeding:

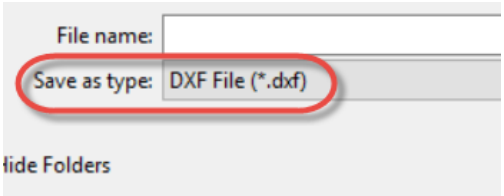
- Job number (SVY) from the Registered Surveyor's Portal (RSP)
- Any other supporting documents necessary in PDF format
- SGLX of the parent lot(s) by using the Get Lot Information function in the RSP

Steps:

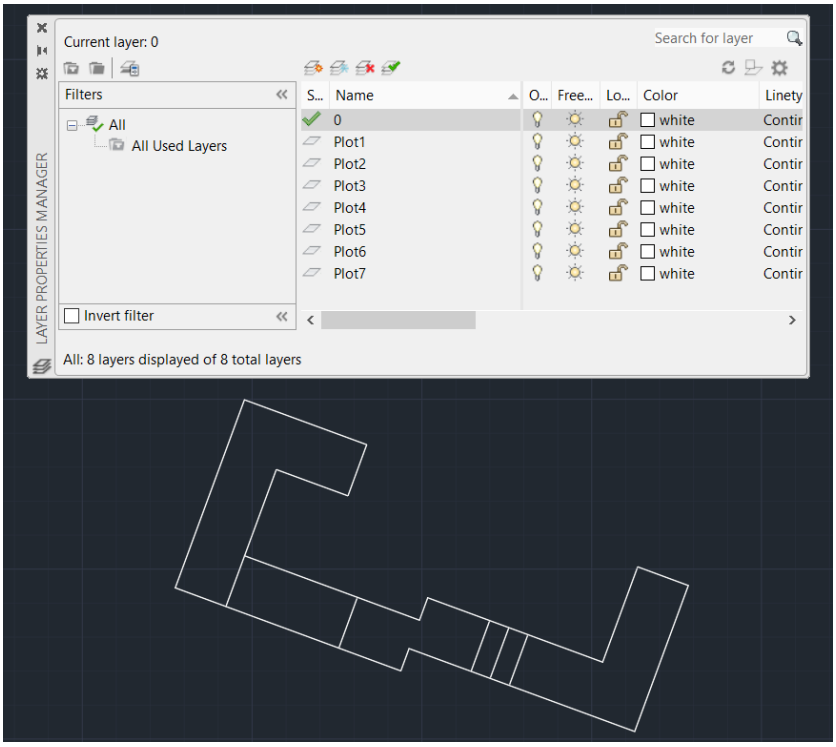
1. Launch GeoCadastre and click **File > Save Project As...** to create and save a new project.
2. From the menu, select **Tools > Import PO Data.** Select the SGLX of the parent lot and click *Open* to import it into the *PO Data* section.



3. In the *PO Data, Lots* section, select the parent lots and click **Copy Lots.** This will copy the two parent lots into the *RS Data* section. You will be prompted to enter a starting station number. The default is 2001. Click **OK** to accept the starting number.
4. Next we will export the parent lots into a CAD software to prepare the proposed lots.
5. Click on the *RS Data, Lots* section. Select the two parent lots.
6. From the menu, click **Tools > Export RS Lots.** Change the *Save as type:* to DXF, enter a filename and click **Save** to save a DXF file of the parent lots.

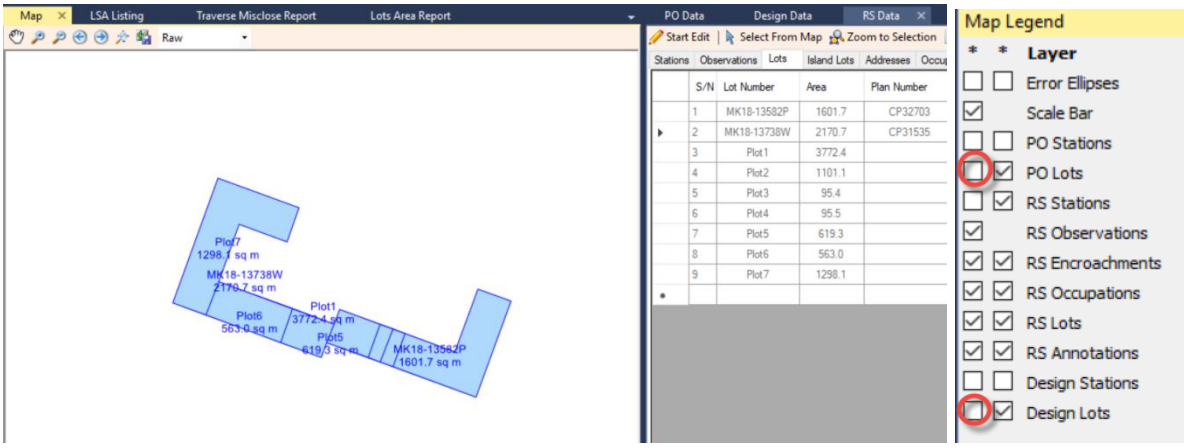


7. Open the DXF file in CAD and construct the boundaries of Plots 1 to 7. Note that each plot has its own layer and each plot is constructed as a closed polygon. Save this new DXF file. This is how it should looked like in CAD:



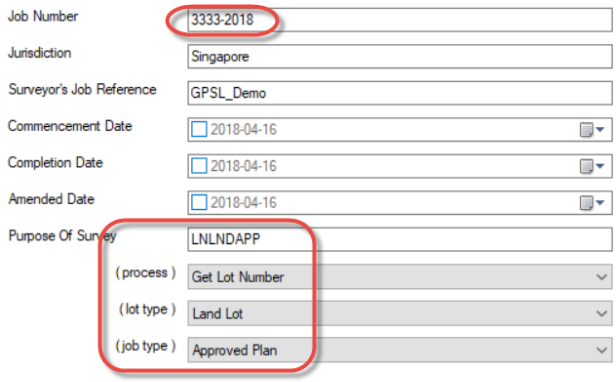
Screen capture showing the proposed lots as constructed in CAD with the layers

8. Import the proposed lots DXF file into GeoCadastre by selecting from the menu, **Tools > Import Design Data**.
9. Select the *Design Data, Lots* section. Select Plots 1 to 7, then click **Copy Lots** to copy the plots to the *RS Data* section. When prompted for the starting station number, click **OK** to accept the default.
10. In the *Map Legend*, uncheck PO Lots and Design Lots to hide them. This should be what you are seeing.

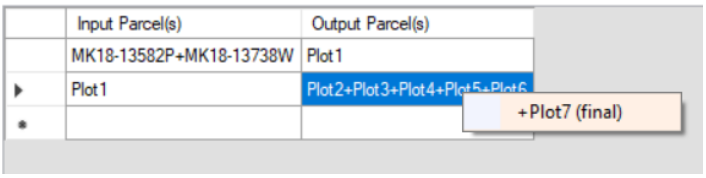


Tip: The left-most boxes control the display of the geometries while the right-most boxes control the display of the labels for those geometries

11. In the *RS Data, Lots* section, right-click in the **Parcel Class** box for Plot1 and change the value from "final" to "interim" as Plot1 is a dummy lot.
12. From the menu, select **File > Project Information...**
13. Enter the Job Information as needed. Select **Get Lot Number** from the (*process)* drop-down list, select **Land Lot** from the *(lot type)* drop-down list and the appropriate job type as needed. The *Purpose of Survey* code will be automatically generated.



14. Click **Surveyor Information** and enter the necessary information as needed.
15. Click on **Lineage** to fill in the history of subdivision. The lot numbers can be filled in by right-clicking in the boxes and selecting the lot numbers from the drop-down list.



16. Click on **Physical Relation** to fill in the necessary information. The lot numbers can be filled in by right-clicking in the boxes and selecting the lot numbers from the drop-down list.

Final Parcel	Source Parcel(s)
Plot2	MK18-13582P
Plot3	MK18-13582P
Plot4	MK18-13582P
Plot5	MK18-13582P+MK18-13738W
Plot6	MK18-13738W
Plot7	MK18-13738W

17. Click **OK** after filling in all the necessary information and close the *Project Information* dialog box.
18. In the *RS Data, Stations* section, amended the **CgPoint 'desc'** to **allocation** by selecting the whole column, right-clicking and then selecting **allocation** from the drop-down list. You may have to enable editing by clicking on **Start Edit** if the editing mode is disabled.

S/N	Station	Northing (m)	Easting (m)	CgPoint 'desc'	CgPoint 'pntSurv'
1	2001	38226.621	30396.214	allocation	boundary
2	2002	38202.209	30462.654	allocation	boundary
3	2003	38245.175	30478.458	allocation	boundary
4	2004	38250.675	30463.539	allocati	
5	2005	38222.623	30453.219	allocati	
6	2006	38241.570	30401.714	allocati	
7	2007	38234.966	30399.284	allocati	
8	2008	38220.045	30393.794	allocati	
9	2009	38253.921	30347.782	allocati	
10	2010	38279.204	30357.124	allocation	boundary

allocation
activation
RT
final
dead

19. From the menu, select **Tools > Export Data for Submission** to export the SGLX for submission in the RSP.

Certified Plan Submission

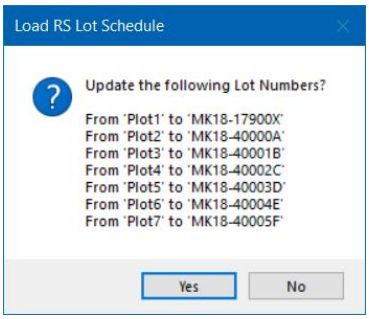
After the lot numbers have been allocated, an EXCEL sheet containing the lot numbers and their corresponding Plot numbers will be returned. A sample is as shown below:

	A	B	C	D
1	**Lot No.**	**On Plan**	**Amalgamated As Lot**	**Allotted As/Subdivided into Lots**
2	MK18-13582P	CP32703		
3	MK18-13738W	CP31535	MK18-17900X (Plot1)	
4				MK18-40000A (Plot2)
5				MK18-40001B (Plot3)
6				MK18-40002C (Plot4)
7				MK18-40003D (Plot5)
8				MK18-40004E (Plot6)
9	MK18-17900X			MK18-40005F (Plot7)
10				

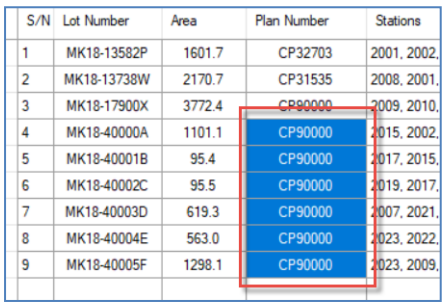
Before proceeding, obtain the CP number from the RSP.

Continuing from the previous steps, we will import this EXCEL sheet into GeoCadastre and update the lot numbers.

1. From the menu, select **Tools > Import RS Lot Schedule**. Select the EXCEL file and click **Open**. A *Load RS Lot Schedule* dialog box appears, click **Yes** to update the lot numbers.

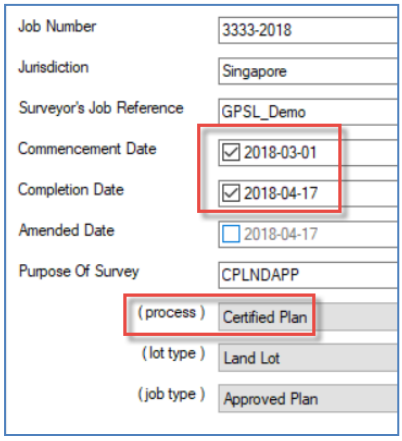


2. Select *RS Data, Lots* section to see that the lot numbers have been updated. Enable editing by clicking on **Start Edit** and enter the CP number as obtained from the RSP.

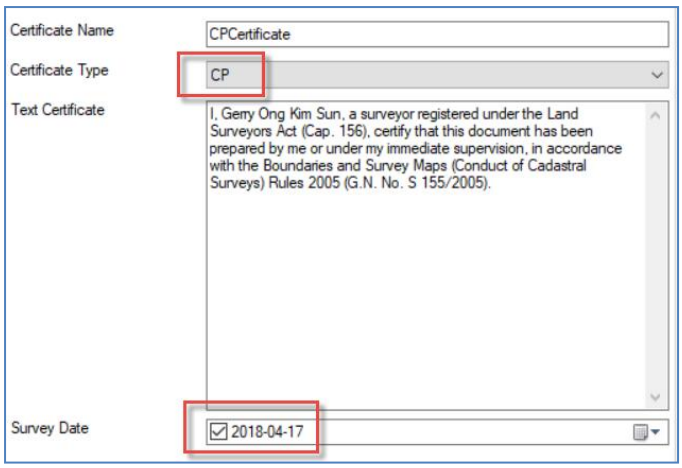


S/N	Lot Number	Area	Plan Number	Stations
1	MK18-13582P	1601.7	CP32703	2001, 2002,
2	MK18-13738W	2170.7	CP31535	2008, 2001,
3	MK18-17900X	3772.4	CP90000	2009, 2010,
4	MK18-40000A	1101.1	CP90000	2015, 2002,
5	MK18-40001B	95.4	CP90000	2017, 2015,
6	MK18-40002C	95.5	CP90000	2019, 2017,
7	MK18-40003D	619.3	CP90000	2007, 2021,
8	MK18-40004E	563.0	CP90000	2023, 2022,
9	MK18-40005F	1298.1	CP90000	2023, 2009,

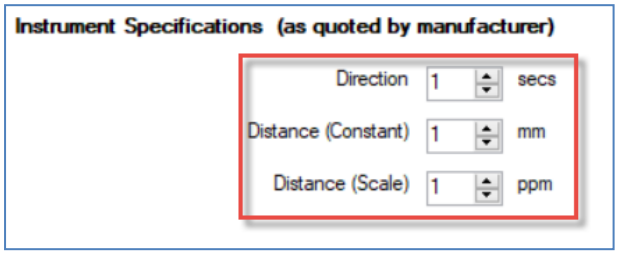
3. From the menu, select **File > Project Information...**
4. Select **Job Information** from the *Project Information* dialog box. Fill in the commencement date and the completion date. For the *Purpose of Survey*, change the *(process)* to **Certified Plan**.



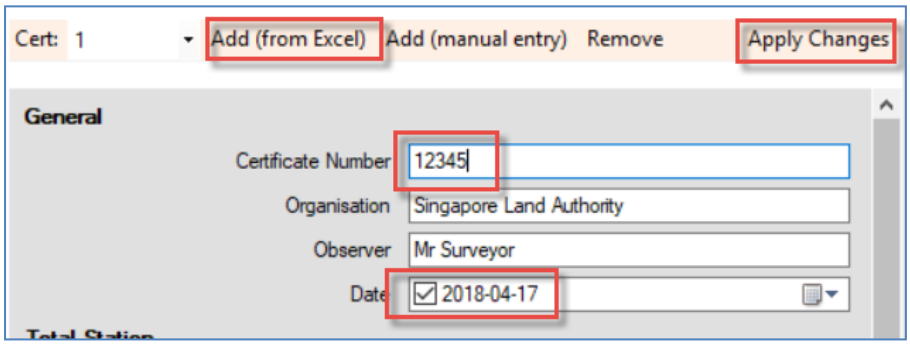
5. In the *Project Information* dialog box, select **Surveyor Certificate**. Select **CP** from the *Certificate Type* drop-down list.
6. Fill in the **Survey Date**.



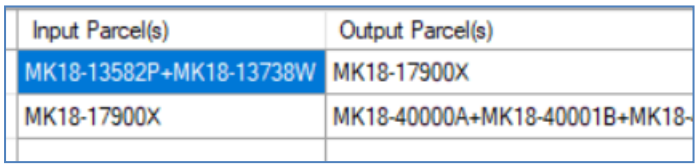
7. Select **Instrument Configuration**. Fill in the instrument specifications as necessary.



8. Select **EDM Calibration**. Click **Add (from Excel)**. Browse and select the Excel file for the EDM calibration. Fill in the **Certificate Number** and the **Date**. Click **Apply Changes**.



9. Select **Lineage**. Check and make sure that the plots now have the correct lot numbers.

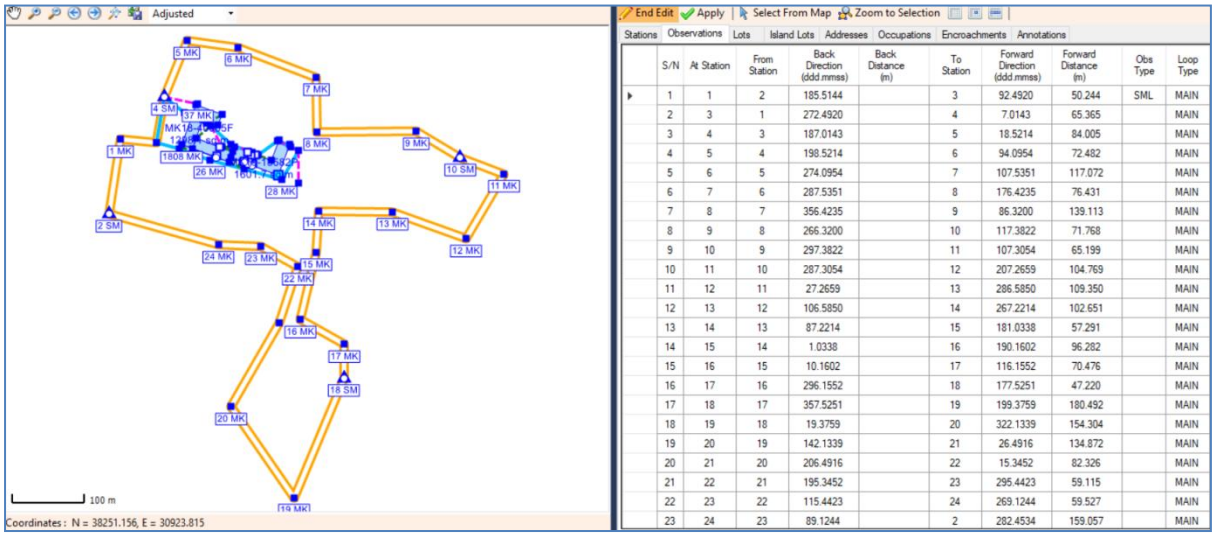


Input Parcel(s)	Output Parcel(s)
MK18-13582P+MK18-13738W	MK18-17900X
MK18-17900X	MK18-40000A+MK18-40001B+MK18-

10. Select **Physical Relation**. Check and make sure that the lot numbers are correctly entered.

Final Parcel	Source Parcel(s)
MK18-40000A	MK18-13582P
MK18-40001B	MK18-13582P
MK18-40002C	MK18-13582P
MK18-40003D	MK18-13582P+MK18-13738W
MK18-40004E	MK18-13738W
MK18-40005F	MK18-13738W

11. Click **OK** to close the *Project Information* dialog box.
12. From the menu, select **Tools > Import RS Data**. Browse and select the .csv file for the traverse observations. Click **Open** to import the traverse data into GeoCadastre.



S/N	At Station	From Station	Back Direction (ddd.mmss)	Back Distance (m)	To Station	Forward Direction (ddd.mmss)	Forward Distance (m)	Obs Type	Loop Type
1	1	2	185.5144		3	92.4920	50.244	SML	MAIN
2	3	1	272.4920		4	7.0143	65.365		MAIN
3	4	3	187.0143		5	18.5214	84.005		MAIN
4	5	4	198.5214		6	94.0954	72.482		MAIN
5	6	5	274.0954		7	107.5351	117.072		MAIN
6	7	6	287.5351		8	176.4235	76.431		MAIN
7	8	7	356.4235		9	86.3200	139.113		MAIN
8	9	8	266.3200		10	117.3822	71.768		MAIN
9	10	9	297.3822		11	107.3054	65.199		MAIN
10	11	10	287.3054		12	207.2659	104.769		MAIN
11	12	11	27.2659		13	286.5850	109.350		MAIN
12	13	12	106.5850		14	267.2214	102.651		MAIN
13	14	13	87.2214		15	181.0338	57.291		MAIN
14	15	14	1.0338		16	190.1602	96.282		MAIN
15	16	15	10.1602		17	116.1552	70.476		MAIN
16	17	16	296.1552		18	177.5251	47.220		MAIN
17	18	17	357.5251		19	199.3759	180.492		MAIN
18	19	18	19.3759		20	322.1339	154.304		MAIN
19	20	19	142.1339		21	26.4916	134.872		MAIN
20	21	20	206.4916		22	15.3452	82.326		MAIN
21	22	21	195.3452		23	295.4423	59.115		MAIN
22	23	22	115.4423		24	269.1244	59.527		MAIN
23	24	23	89.1244		2	282.4534	159.057		MAIN

13. From the menu, select **Tools > Import RS Coordinates**. Browse and select the .csv file containing the coordinates for the ISN markers. Click **Open** to import them into GeoCadastre. GeoCadastre will match the station number and populate the northings and eastings automatically.

Stations | Observations | Lots | Island Lots | Addresses | Occupations | Encroachments | Annotations

S/N	Station	Northing (m)	Easting (m)	CgPoint 'desc'	CgPoint 'pntSurv'	CgPoint 'code'	Monument 'name'	Monument 'type'	Monument 'state'	Fixed
7	2	38148.206	30225.732	final	control	L01	SM80002	SM	new	☑
9	4	38311.396	30303.307	final	control	L01	SM80001	SM	new	☑
15	10	38226.645	30717.122	final	control	L01	SM11652	SM	new	☑
23	18	37918.991	30554.223	final	control	L01	SM11031	SM	new	☑
14	9			final	traverse	L01	9	MK	new	

14. In the *RS Data, Stations* section, make sure that sheet is enabled for edit. Click **Apply**.
15. From the menu, select **Tools > 2D Transformation**. This will perform a minimally constrained adjustment and compute the transformation parameters as well as the residues for each ISN marker.

Transformation Parameters

a =	0.998604	Tx =	-1305.144838 m
b =	-0.052965	Ty =	9883.013985 m
Scale =	1.000008	Rotation =	-6.0420 (ddd.mmss)

Fixed	RS Station	Northing Residual (m)	Easting Residual (m)	2D Residual (m)
☑	2	-0.001	-0.008	0.008
☑	4	-0.003	0.002	0.003
☑	10	-0.005	0.004	0.006
☑	18	0.009	0.002	0.009

16. From the menu, select **Tools > Fully Constrained Least Squares Adjustment**. The adjustment report will be displayed.
17. From the menu, select **View > Traverse Misclose**. The *Traverse Misclose* dialog box appears. Click **Refresh** to compute and display the traverse misclose report for all the loops.

Map | LSA Listing | Traverse Misclose Report | Lots

Refresh

```
 2 -    1          5.4915          105.179

Angular misclose        =  -34 sec in 24 stations
Allowable misclose      =  48 sec
Misclose in Latitude    =  -0.015 m
Misclose in Departure   =  0.002 m
Linear Misclose         =  0.015 m
Total Distance          =  2264.590 m
FLM                     =  1:151698

SUB Loop 1

      At -    To    Bearing (DMS)     Distance (m)
      --      --    -------------     ------------
       3 -     4          6.5949
       3 -    25        100.3545           33.252
      25 -    26        107.3908           45.165
```

Tip: Green texts indicate the results are within tolerance, red are out of tolerances. Blue texts indicate the current tolerances as stated in the C.S. directive.

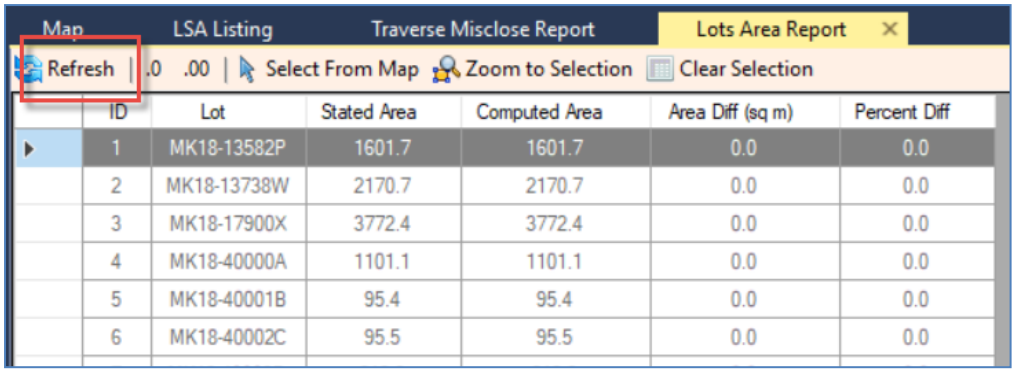
18. From the menu, select **View > Check Angles Comparison**. In the *Check Angles Comparison* dialog box, click **Refresh** to compute and display the results.

Check Angles Comparison

Refresh | mm | Select From Map | Zoom to Selection | Clear Selection

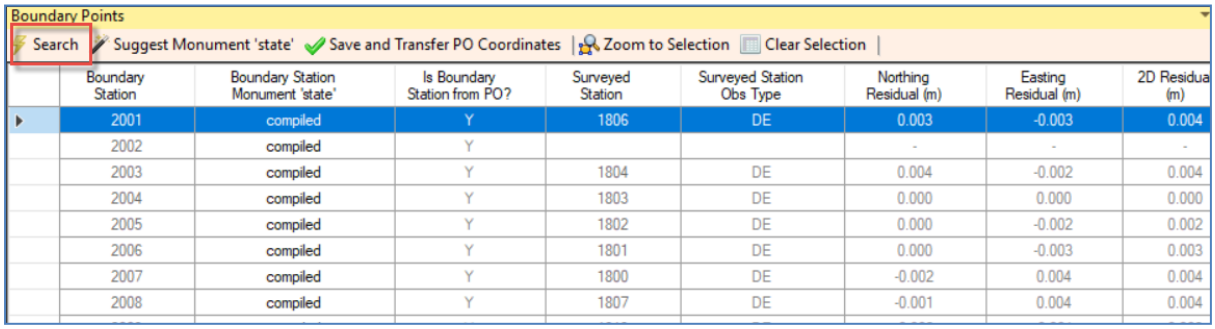
Check Station	Northing (m)	Easting (m)	Demarcated Station	Northing (m)	Easting (m)	Northing Residual (m)	Easting Residual (m)	2D Residual (m)
37A	38301.725	30350.002	37	38301.731	30350.003	-0.006	-0.001	0.006
1102A	38222.295	30415.351	1102	38222.295	30415.350	0.000	0.001	0.001
36A	38240.815	30384.732	36	38240.815	30384.731	0.000	0.001	0.001

19. From the menu, select **View > Lots**. In the *Lots Area Report* dialog box, click **Refresh** to compute and display the areas of all the lots.



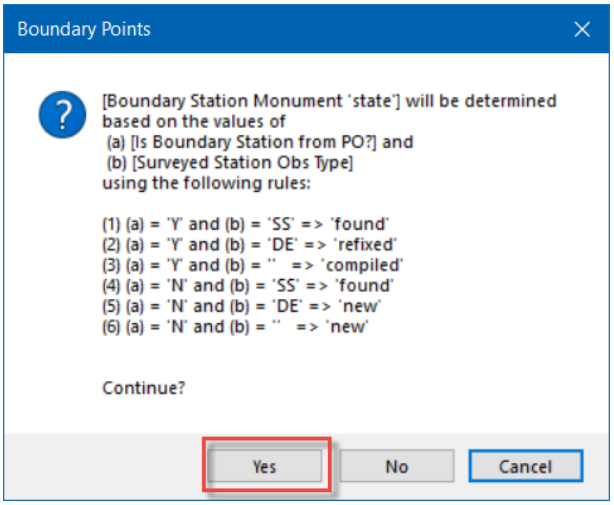
ID	Lot	Stated Area	Computed Area	Area Diff (sq m)	Percent Diff
1	MK18-13582P	1601.7	1601.7	0.0	0.0
2	MK18-13738W	2170.7	2170.7	0.0	0.0
3	MK18-17900X	3772.4	3772.4	0.0	0.0
4	MK18-40000A	1101.1	1101.1	0.0	0.0
5	MK18-40001B	95.4	95.4	0.0	0.0
6	MK18-40002C	95.5	95.5	0.0	0.0

20. From the menu, select **View > Boundary Points**. Click **Search** in the *Boundary Points* dialog box. GeoCadastre will search for all surveyed points around **30mm** of all boundary points to find a match. The results will be displayed.

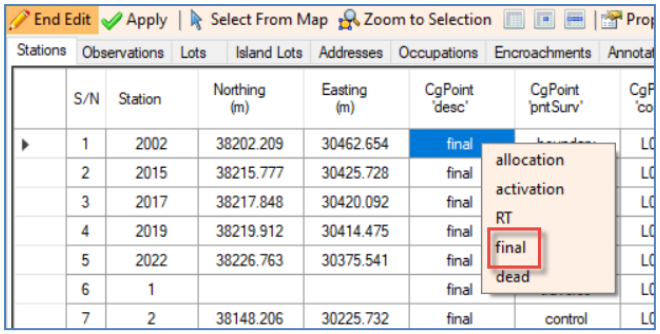


Boundary Station	Boundary Station Monument 'state'	Is Boundary Station from PO?	Surveyed Station	Surveyed Station Obs Type	Northing Residual (m)	Easting Residual (m)	2D Residua (m)
2001	compiled	Y	1806	DE	0.003	-0.003	0.004
2002	compiled	Y			-	-	-
2003	compiled	Y	1804	DE	0.004	-0.002	0.004
2004	compiled	Y	1803	DE	0.000	0.000	0.000
2005	compiled	Y	1802	DE	0.000	-0.002	0.002
2006	compiled	Y	1801	DE	0.000	-0.003	0.003
2007	compiled	Y	1800	DE	-0.002	0.004	0.004
2008	compiled	Y	1807	DE	-0.001	0.004	0.004

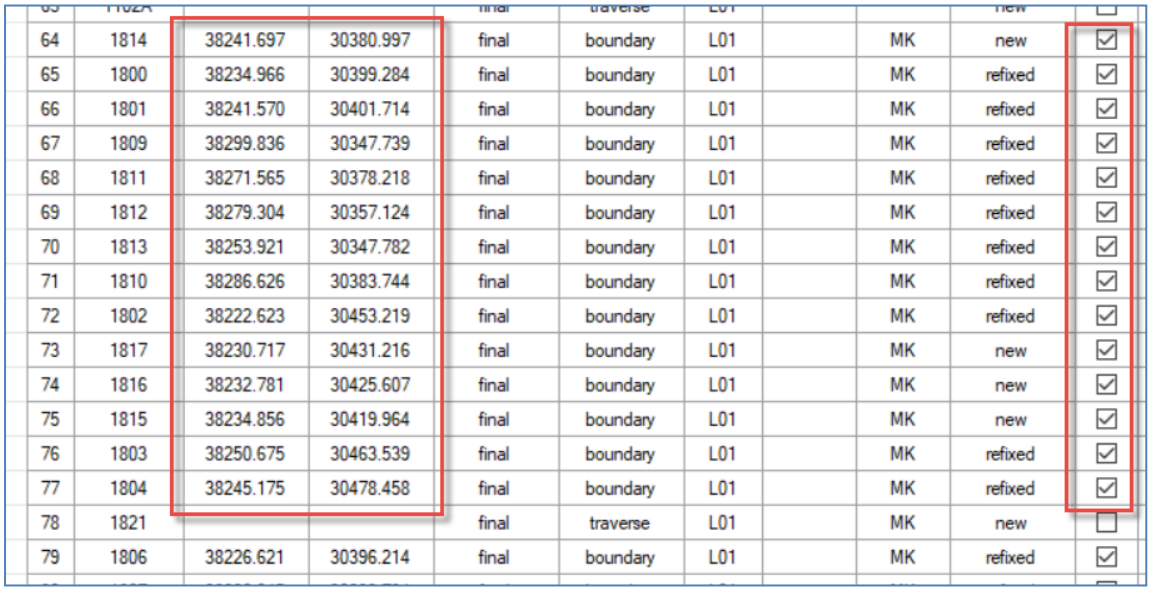
21. In the *Boundary Points* dialog box, click **Suggest Monument 'state'**. This will update the stations' state following the criteria listed below:



22. Click **Yes** to update the state.
23. In the *Boundary Points* dialog box, click **Save and Transfer PO Coordinates**. The found boundary points' coordinates will be transferred to the surveyed points and will be removed from the station list. Correspondingly, the lot definitions will be updated.
24. In the *RS Data, Stations* section, make sure edit is enabled, change the **CgPoint 'desc'** to **final**.



25. In the *RS Data, Stations* section, make sure that all the "fixed" points have coordinates and the fixed column is checked. These will be the coordinates that will be written out to the SGLX instead of the adjusted values.



64	1814	38241.697	30380.997	final	boundary	L01		MK	new	☑
65	1800	38234.966	30399.284	final	boundary	L01		MK	refixed	☑
66	1801	38241.570	30401.714	final	boundary	L01		MK	refixed	☑
67	1809	38299.836	30347.739	final	boundary	L01		MK	refixed	☑
68	1811	38271.565	30378.218	final	boundary	L01		MK	refixed	☑
69	1812	38279.304	30357.124	final	boundary	L01		MK	refixed	☑
70	1813	38253.921	30347.782	final	boundary	L01		MK	refixed	☑
71	1810	38286.626	30383.744	final	boundary	L01		MK	refixed	☑
72	1802	38222.623	30453.219	final	boundary	L01		MK	refixed	☑
73	1817	38230.717	30431.216	final	boundary	L01		MK	new	☑
74	1816	38232.781	30425.607	final	boundary	L01		MK	new	☑
75	1815	38234.856	30419.964	final	boundary	L01		MK	new	☑
76	1803	38250.675	30463.539	final	boundary	L01		MK	refixed	☑
77	1804	38245.175	30478.458	final	boundary	L01		MK	refixed	☑
78	1821			final	traverse	L01		MK	new	☐
79	1806	38226.621	30396.214	final	boundary	L01		MK	refixed	☑

Preparation of DXF file for Importing into GeoCadastre

The following sections describe the procedures to prepare and import into GeoCadastre, the annotations, occupations and encroachments for the purpose of CP generation in the RSP. However, at the time of writing this tutorial, occupations and encroachments are optional and therefore, may be skipped. However, annotations are necessary.

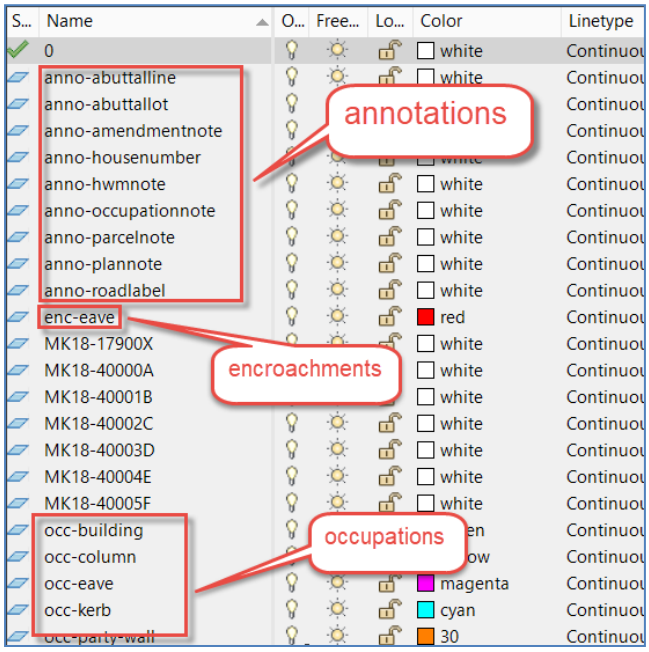
GeoCadastre will import DXF files containing any annotations, occupations and encroachments that are drawn to scale and in SVY21 coordinates system.

All linear objects like walls, fence, etc are to be drawn as polylines. If they are closed objects, then they should be constructed as such. Due to the limitations of the landxml format, circular objects are not supported. Therefore, any circular objects must be constructed by two connecting arcs instead of a full circle.

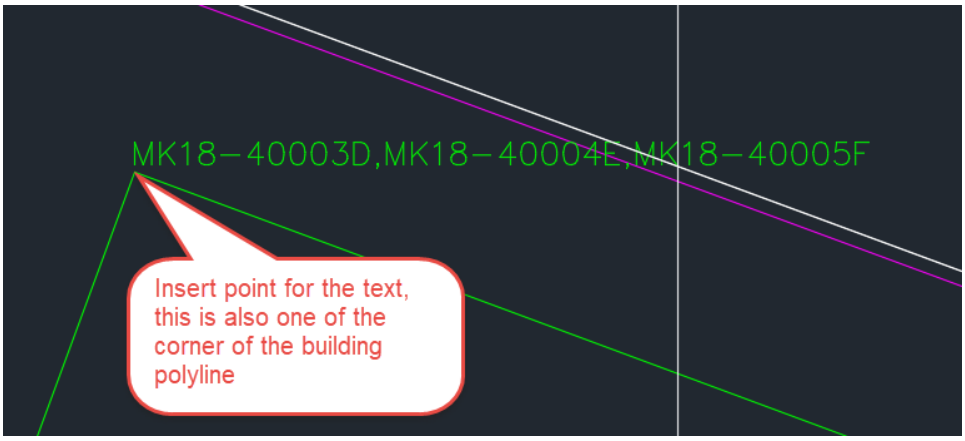
The following shows the layer naming conventions so that GeoCadastre will be able to recognise the objects to be imported.

Any layers with the prefix of *anno*, like *anno-AbuttalLine* will be imported as abuttal lines, layers with prefix of *occ*, like *occ-fence*, will be imported as fence and any layers with prefix of *enc*, like *enc-wall*, will be imported as encroachment of the wall.

The screen capture below shows the typical layers in a DXF file:

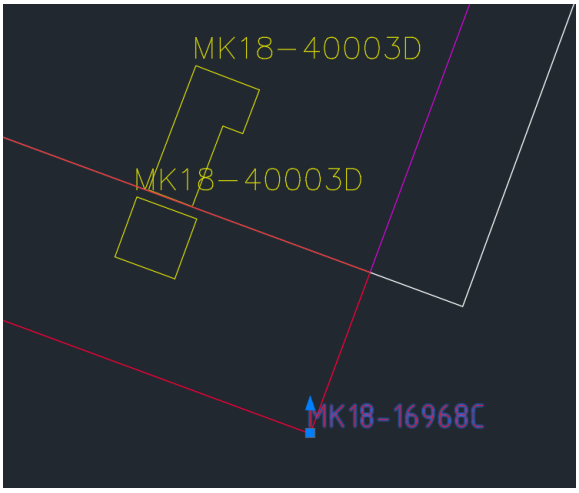


For occupations, the owning parcel's lot number is a line of text placed at one of the vertices of that particular occupation. This text has to be the same layer as the occupation.



The diagram above shows the building line (in green) with the owning lot numbers placed at one of the corner of the building polyline. In this example, this building is owned by three lots, MK18-40003D, MK18-40004E and MK18-40005F.

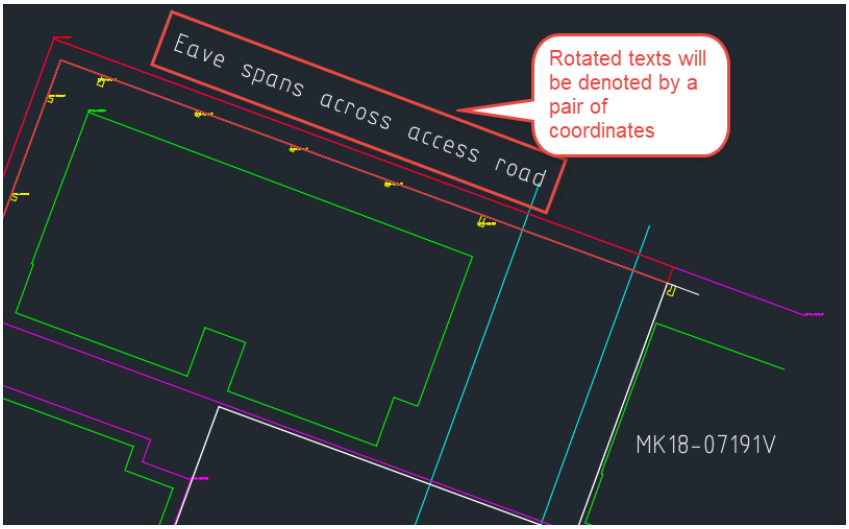
For encroachments, it is done similarly to occupations except that the lot numbers would be the lots that are affected by the encroachment and not the owning parcel.



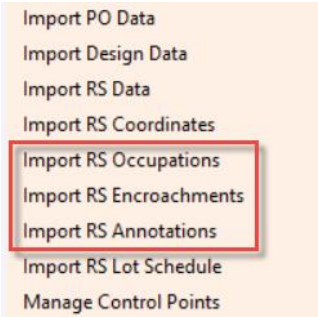
The diagram above shows the encroachment as depicted by the red polylines. The lot MK18-16968C is being encroached upon.

Note that the text style, heights and rotation is ignored by GeoCadastre during import.

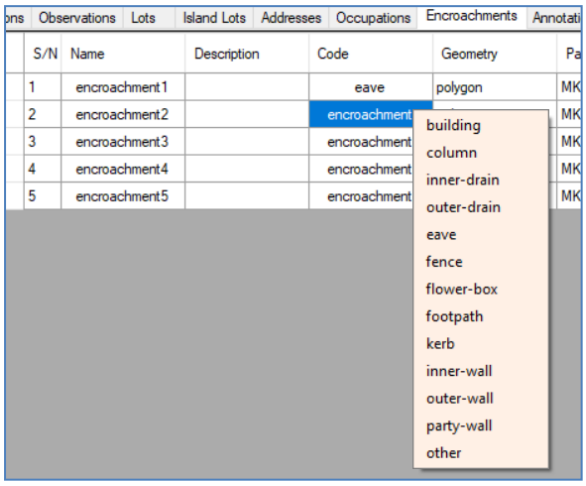
For annotations, the rotation angle for the texts is depicted by having a pair of coordinates denoting the starting and ending points for the texts. Thus the rotation angles of annotations are honoured during import into GeoCadastre.



To import the annotations, occupations and encroachments into GeoCadastre, select **Tools** from the menu and then select the appropriate actions from the menu:

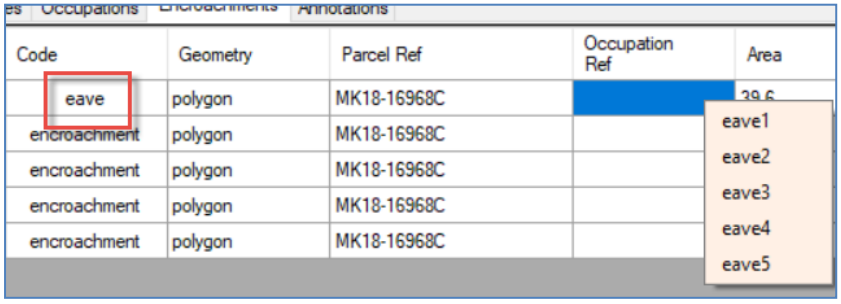


Further actions are needed when importing encroachments into GeoCadastre. You may have to select the “code” that represents the features.



Right-click in the *Code* boxes and selects the appropriate features from the drop-down list. If the feature that you want is not in the list, you can manually enter the feature in the box instead of picking from the pre-defined list.

After you have determined the code, you can now define the *Occupation Reference (occRef)* by right-clicking in the box and selecting the occupation from the drop-down list.



Once all the occupations, annotations and encroachments are imported and prepared in GeoCadastre, you can now export the completed SGLX for submission.

From the menu, select **Tools > Export Data for Submission**.

*********** *End of tutorial* **********