DEVELOPMENT OF MULTI – PURPOSE CADASTRE IN SABAH

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Sabah, Malaysia

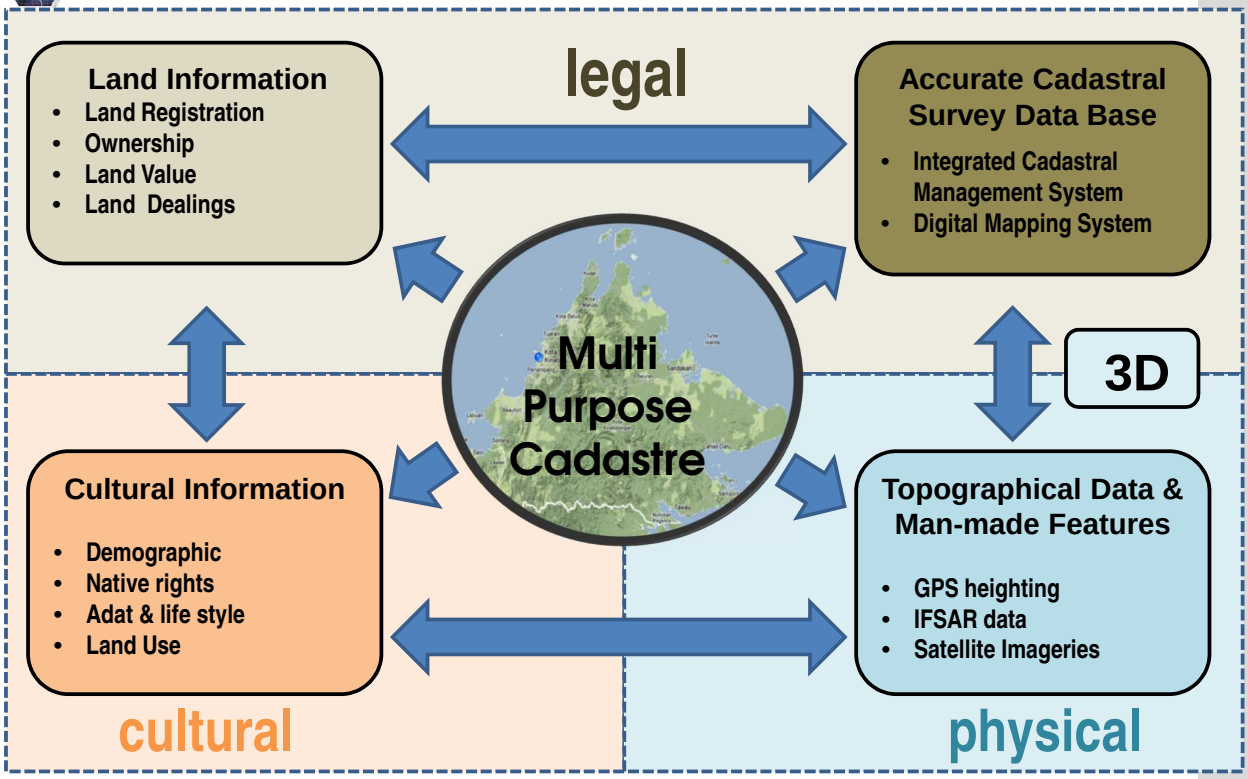
PRESENTATION OUTLINE

1. Definition of MPC
2. LSD multi-purpose cadastre model
3. Sabah Cadastral Map – Mobile Apps
4. Pre-defined Geospatial Analysis
5. Land Parcel integrated with various land information
6. Topography & man-made Features
7. 3D city model
8. Seamless Land Parcel on 3D model
9. Parcel profile
10. 3D Cadastre for Strata Title
11. Conclusion

DEFINITION OF MULTI PURPOSE CADASTRE

Multi purpose cadastre defined as an ***integrated land information system*** containing ***legal*** (e.g., property ownership or cadastre), ***physical*** (e.g., topography, man-made features), and ***cultural*** (e.g., land use, demographics) information in ***a common and accurate reference framework.***

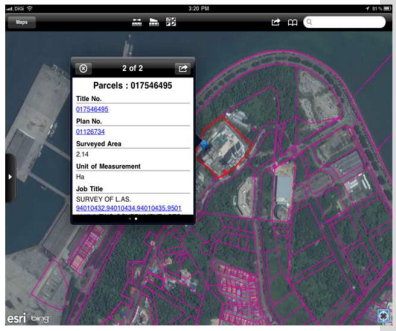
LSD MULTI-PURPOSE CADASTRE MODEL



SABAH DIGITAL CADASTRAL DATA BASE (DCDB)

1

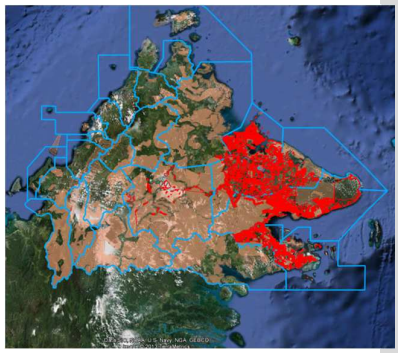
Access via Mobile Device(Smartphone, iPad, iPod, tab, note) - Cloud Computing Esri ArcGIS.

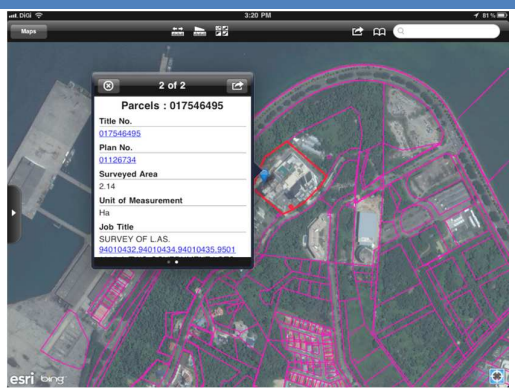


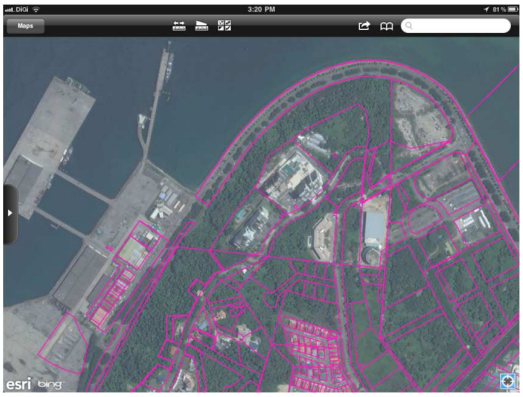
2

Access via ***Alfresco*** *and* ***GoogleEarth***

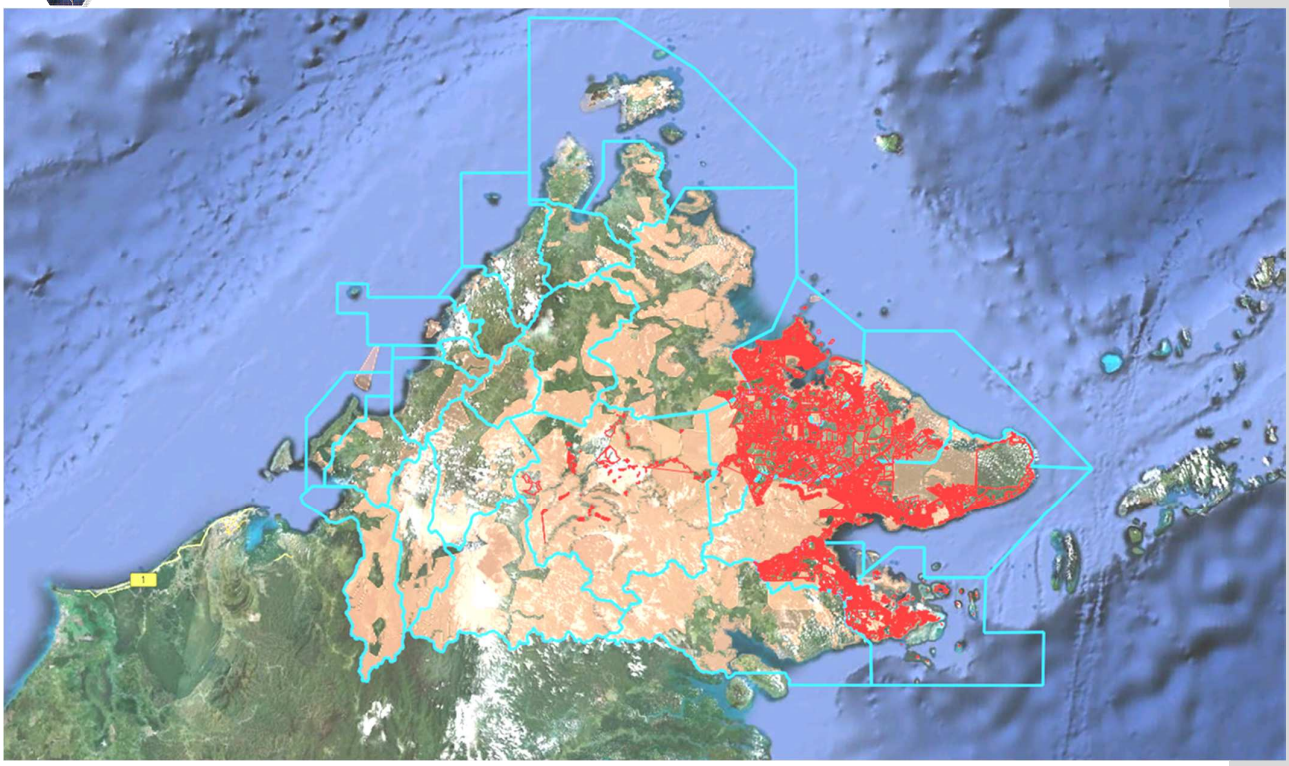
http://218.111.213.197:8080/share/page)



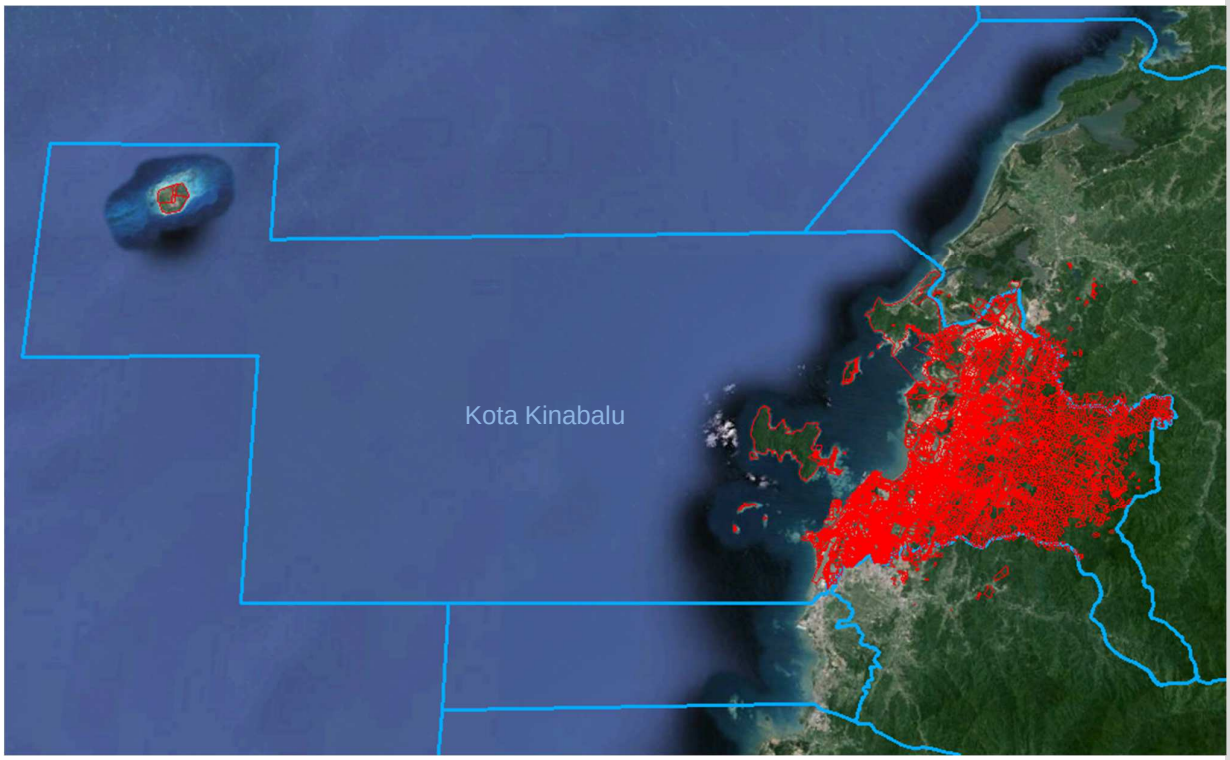




SEAMLESS 2D DIGITAL CADASTRAL DATA BASE

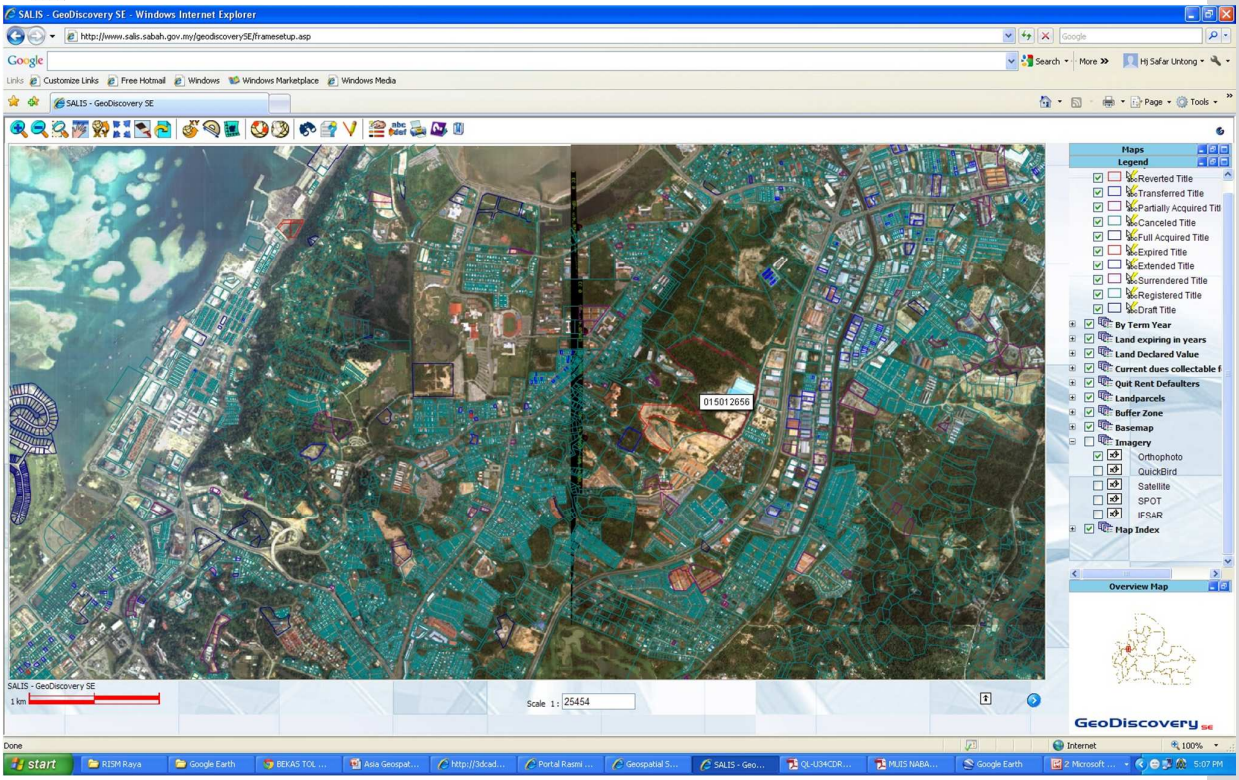


DISTRICT OF KOTA KINABALU

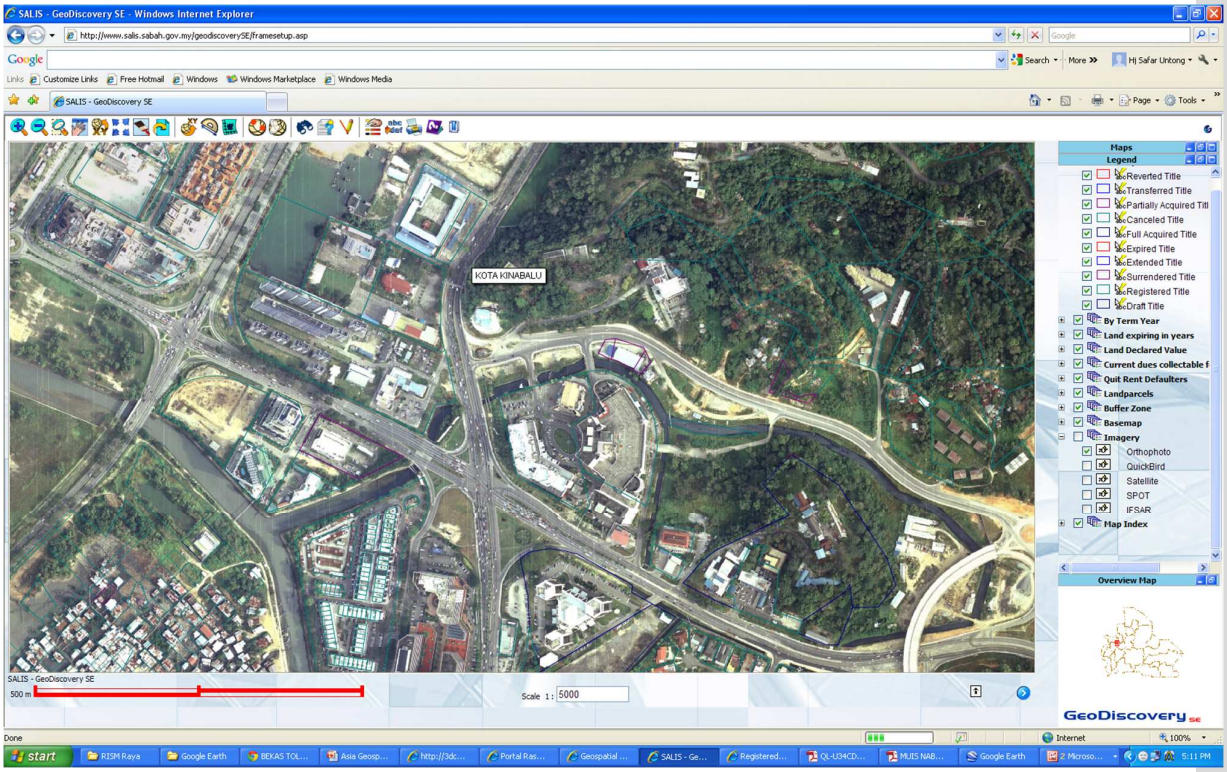


KOTA KINABALU CITY

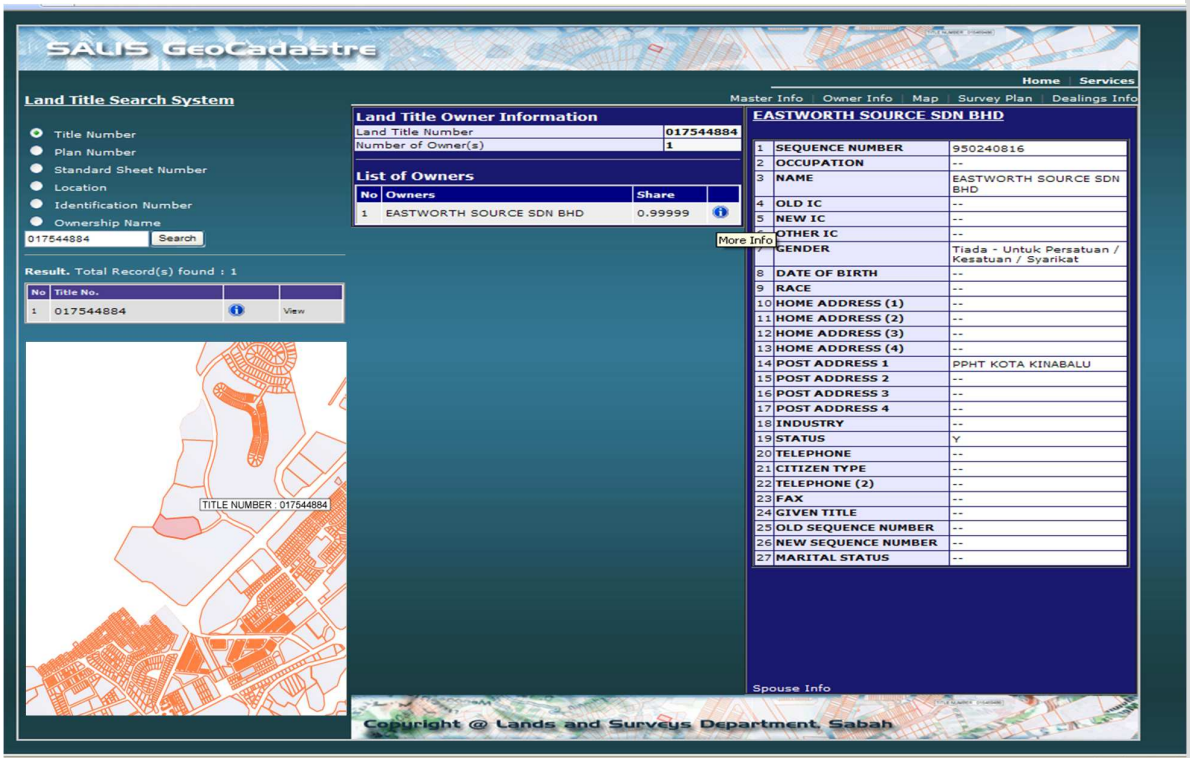
Pre-defined Geospatial Analysis



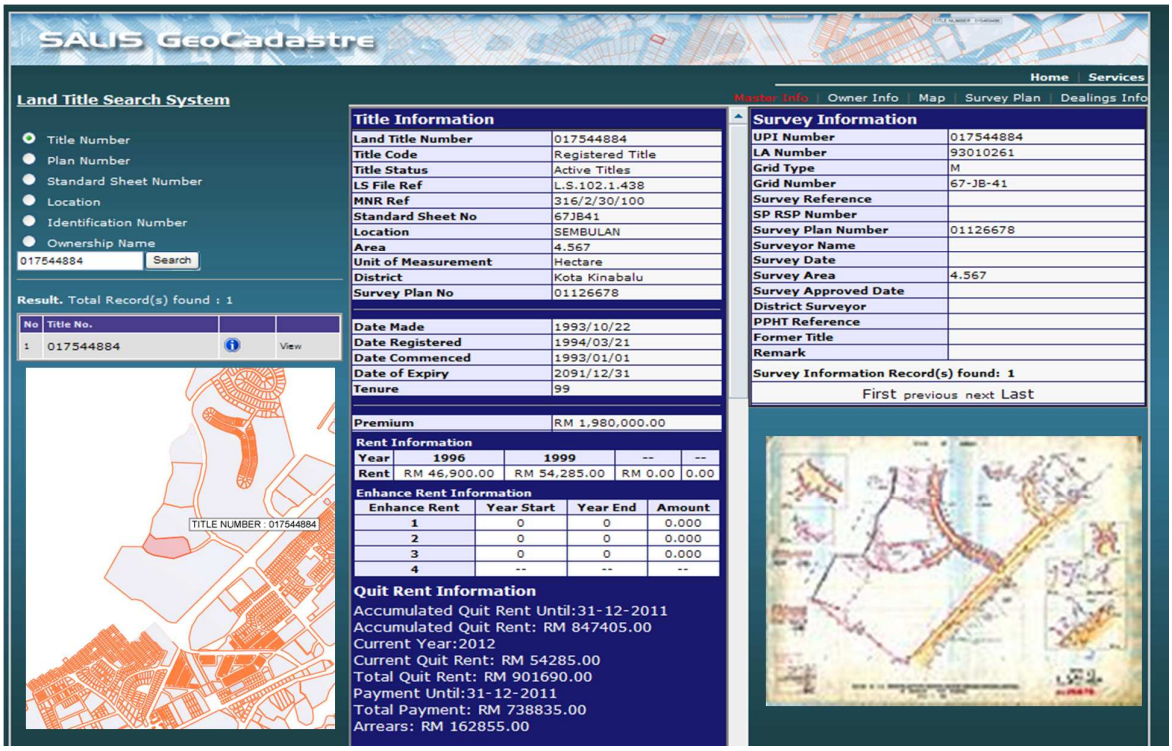
Pre-defined Geospatial Analysis



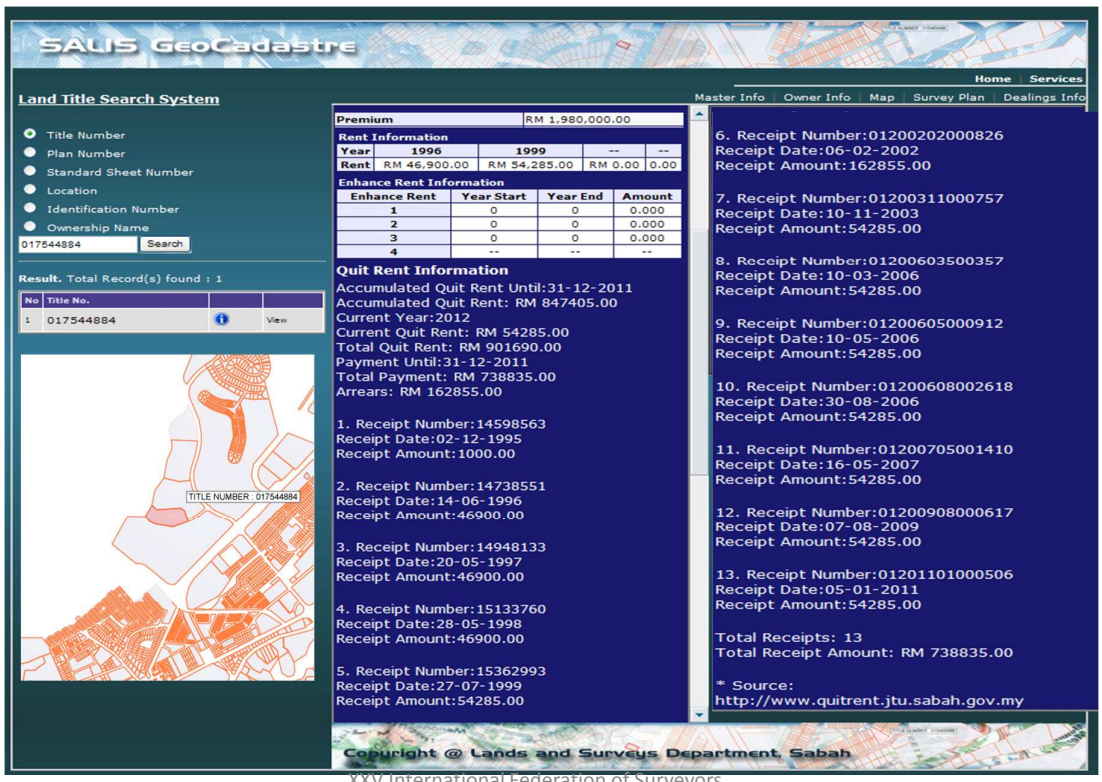
Land Parcel integrated with Owner Information



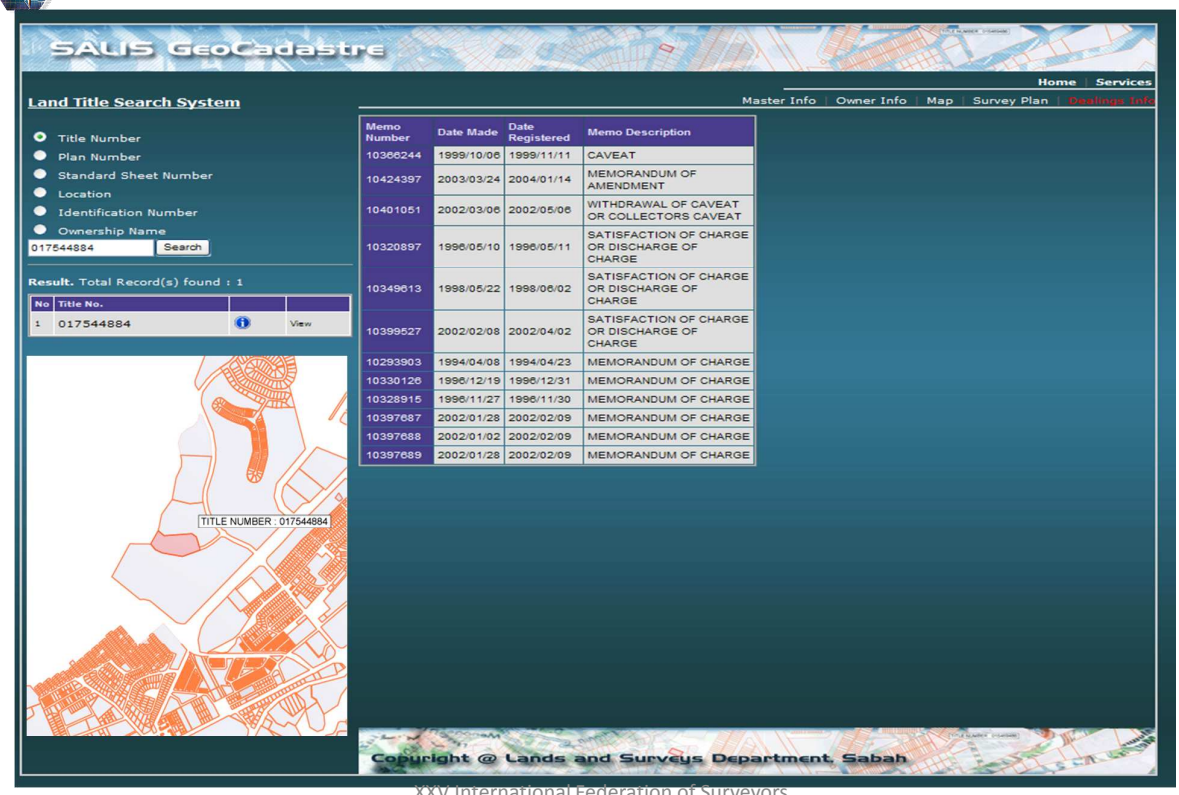
Land Parcel integrated with Title info & Survey Info



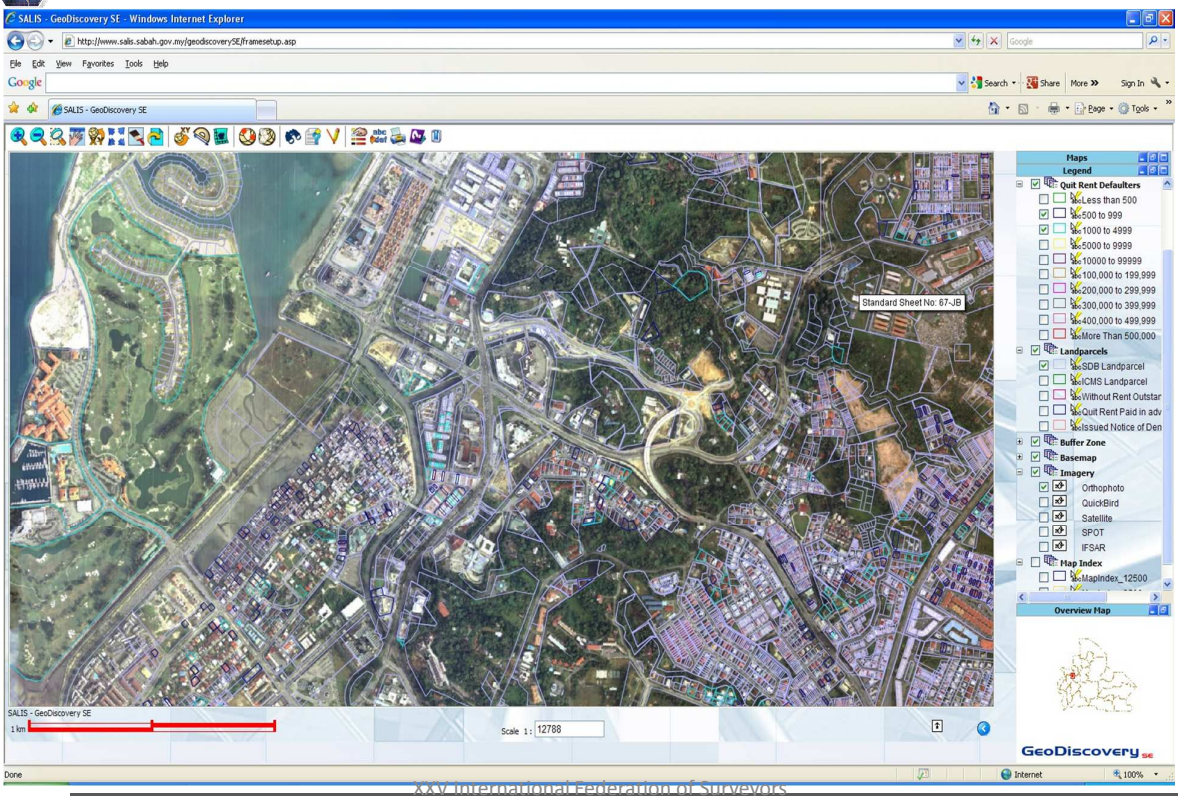
Land Parcel integrated with Title info & Survey Info



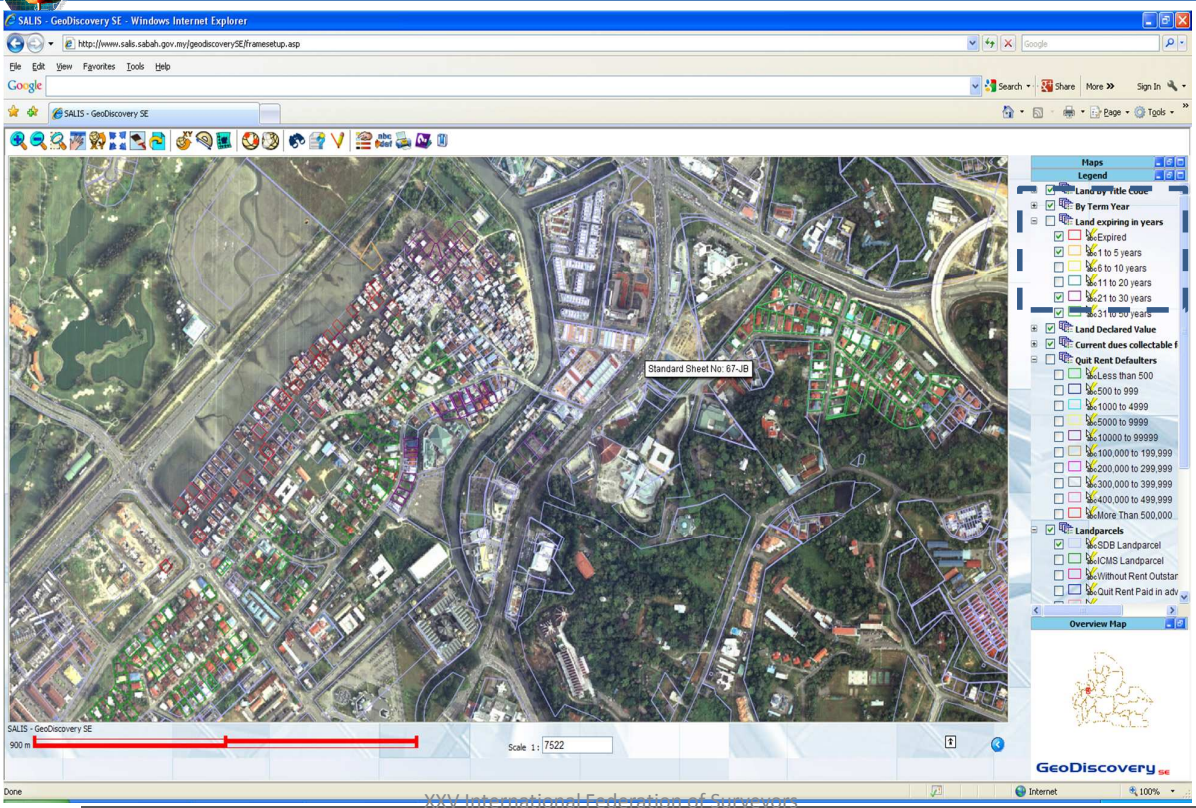
Land Parcel integrated with Title info & Survey Info



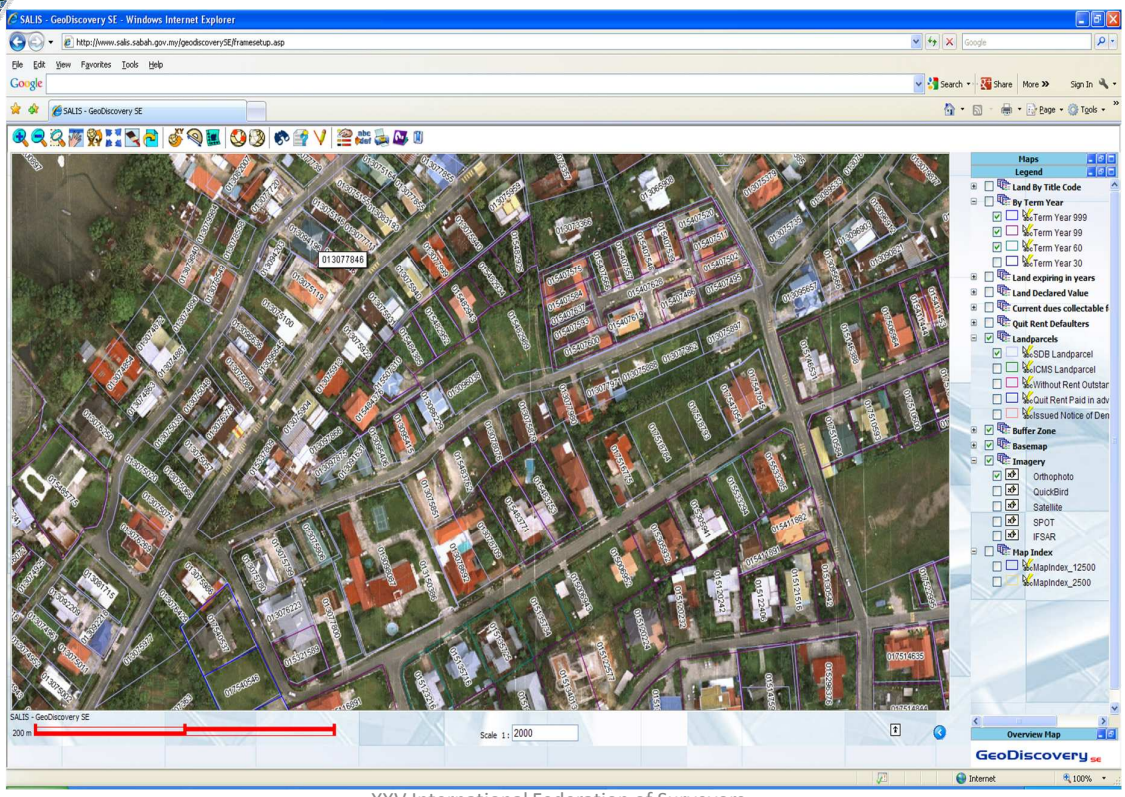
Land Parcel showing Quit Rent Defaulters



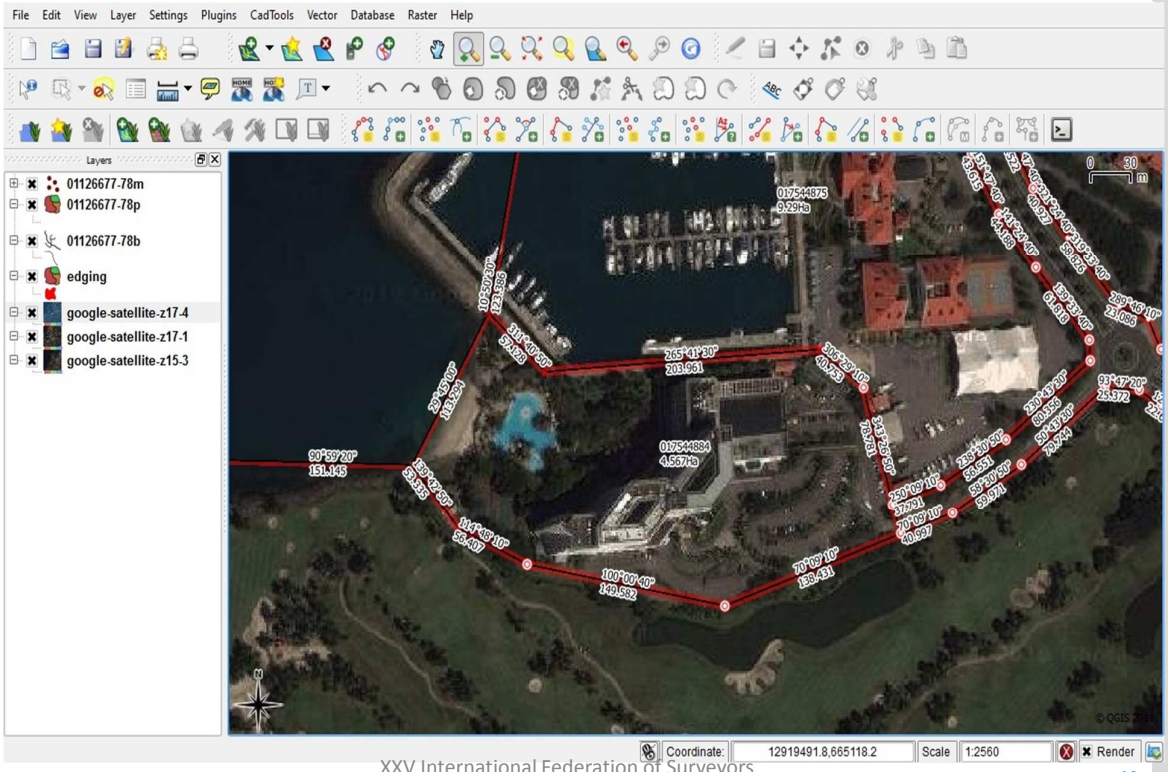
Land Parcel showing Lease Expiring in years



Land Parcel showing Lease Period in years

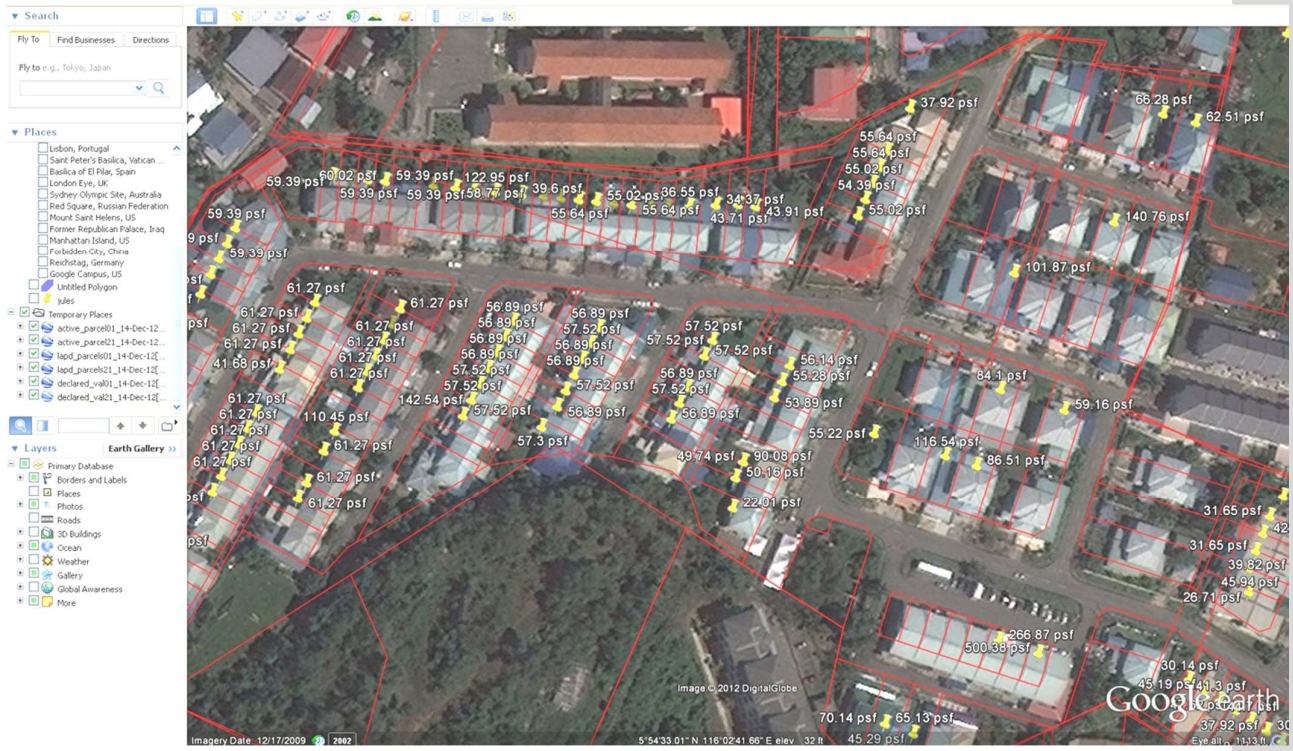


Retrieving Bearings & Distances of the Parcel Boundary Lines

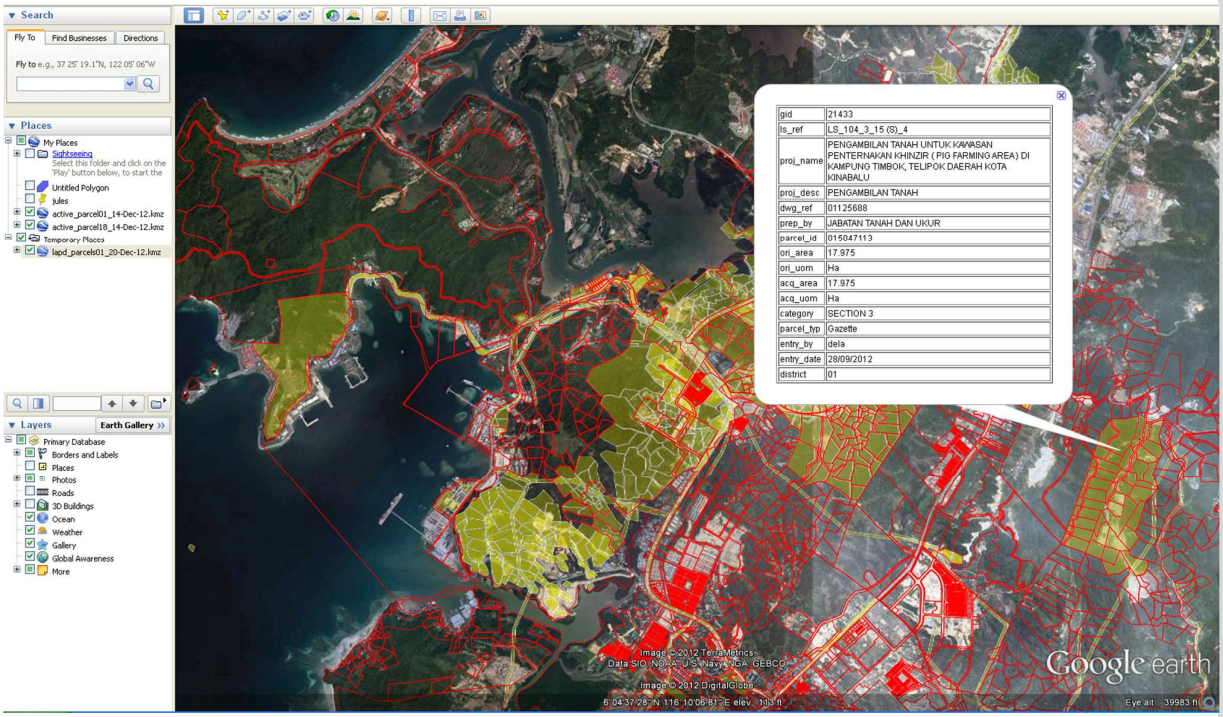


Integration with Land Value

Integration with Land Value



Integration with Acquired Land



Integration with Acquired Land

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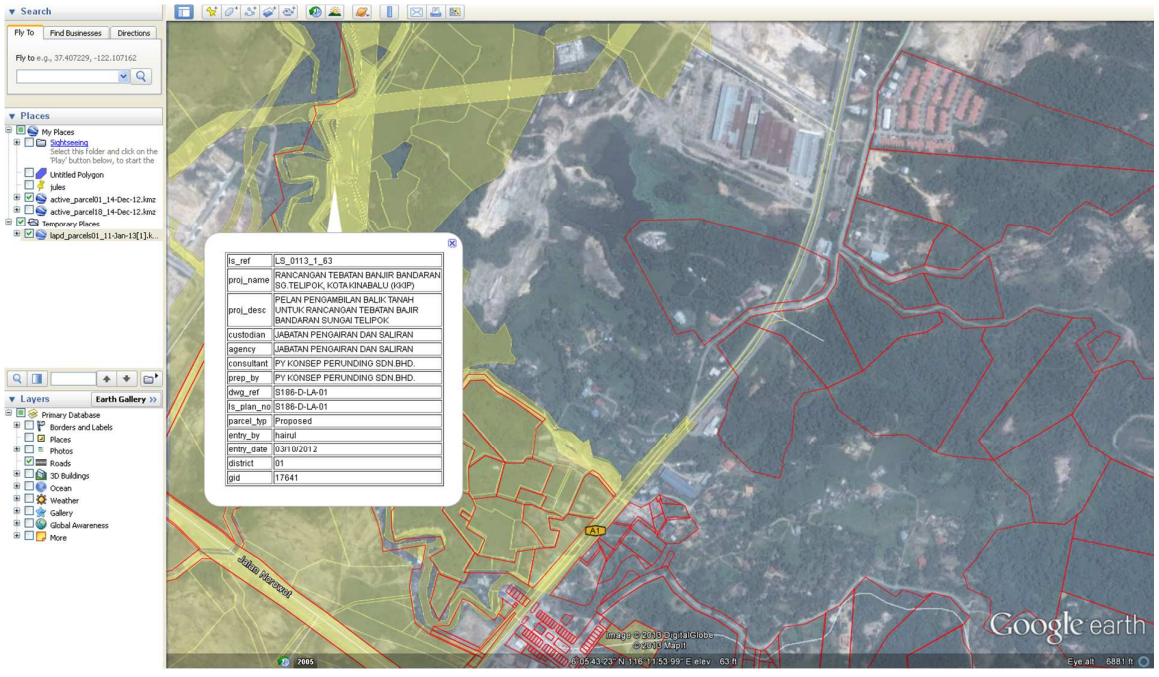
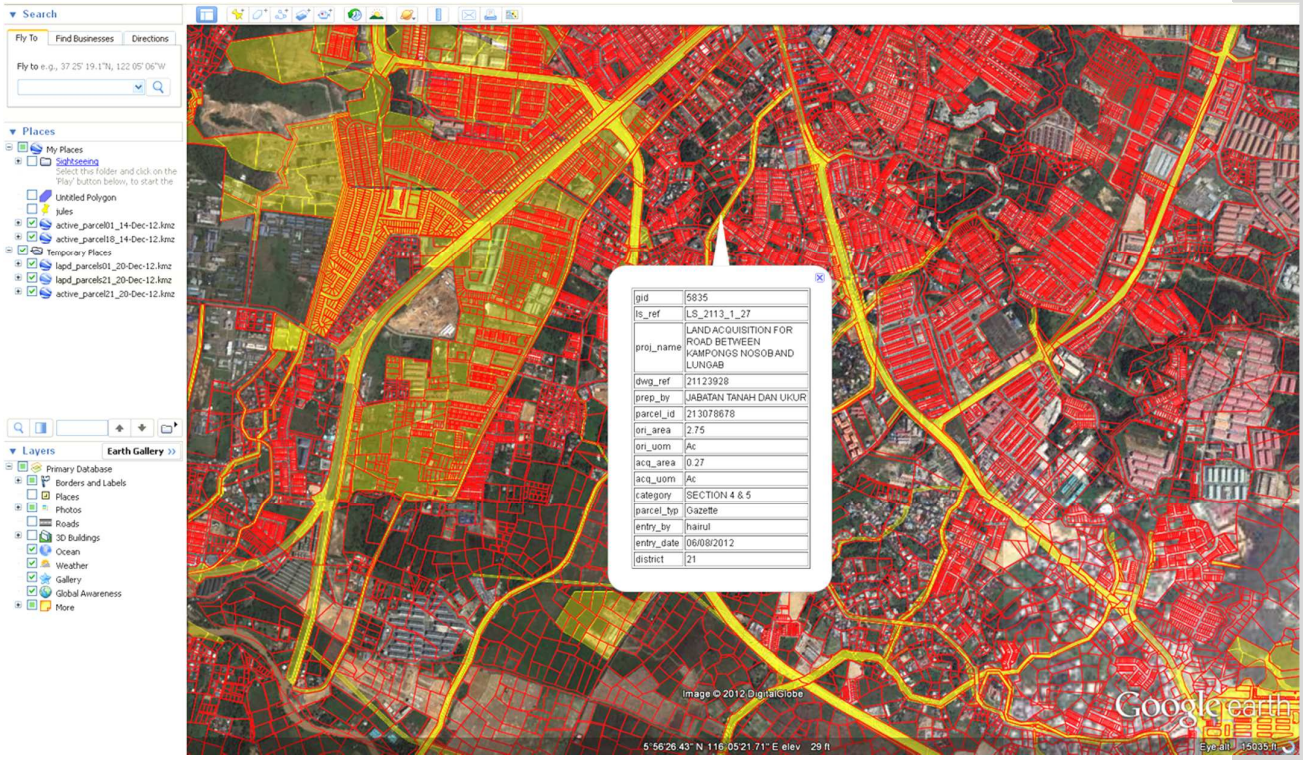
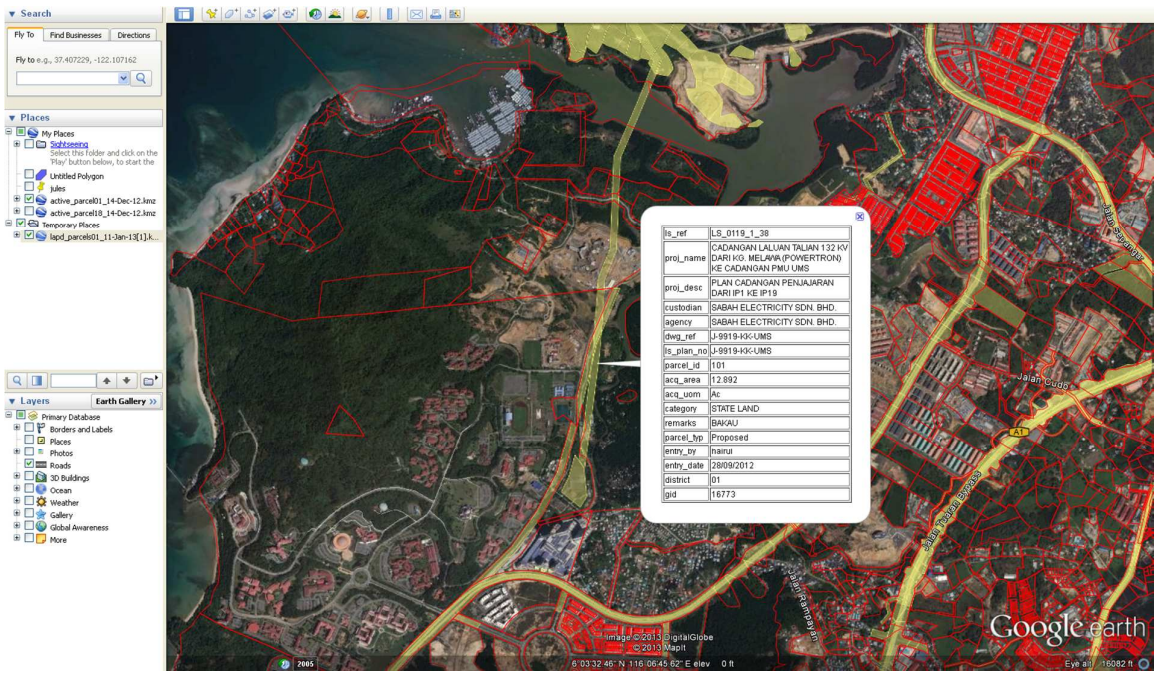


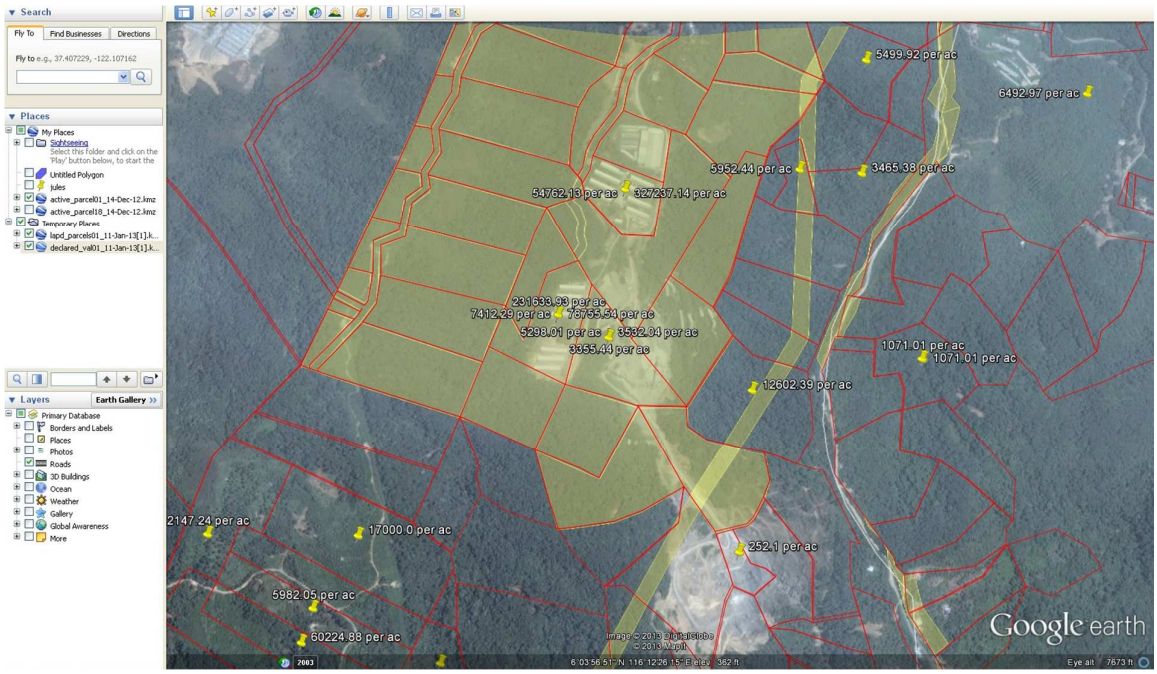
Integration with Road Acquisition



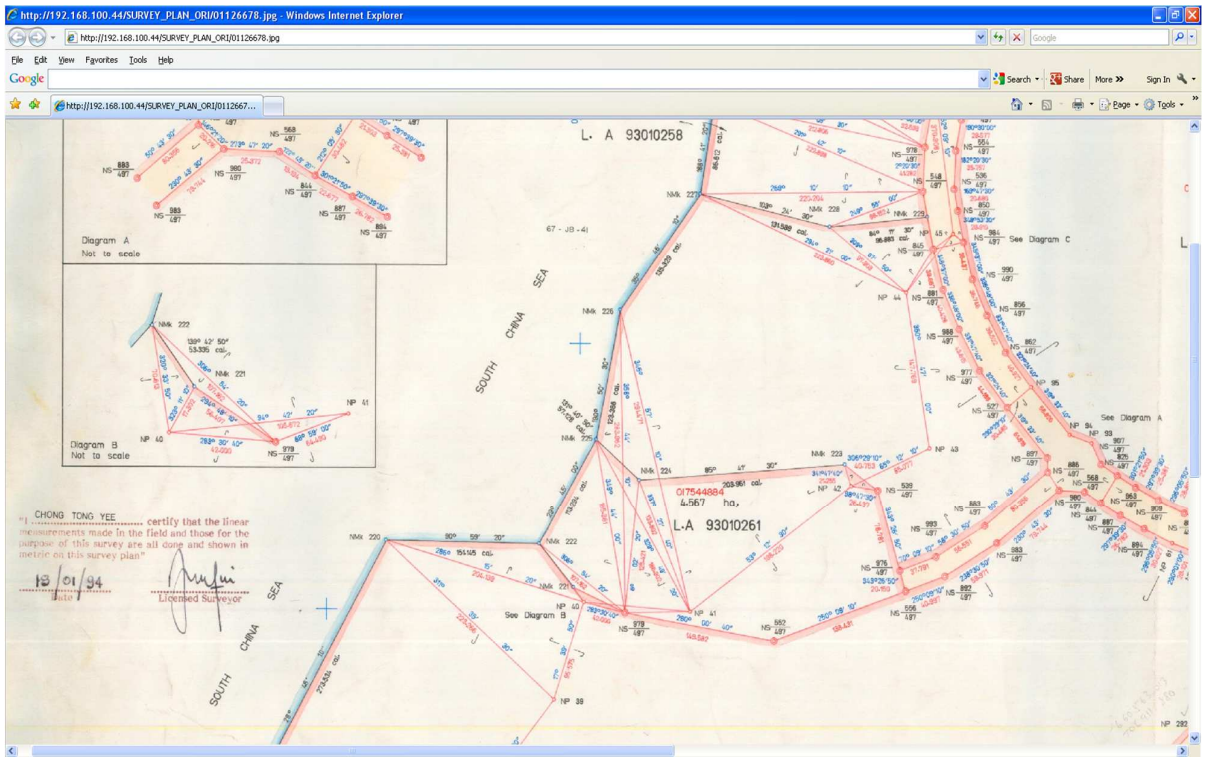
Integration with Land Acquisition Parcels



Integration with Land Acquisition Parcels

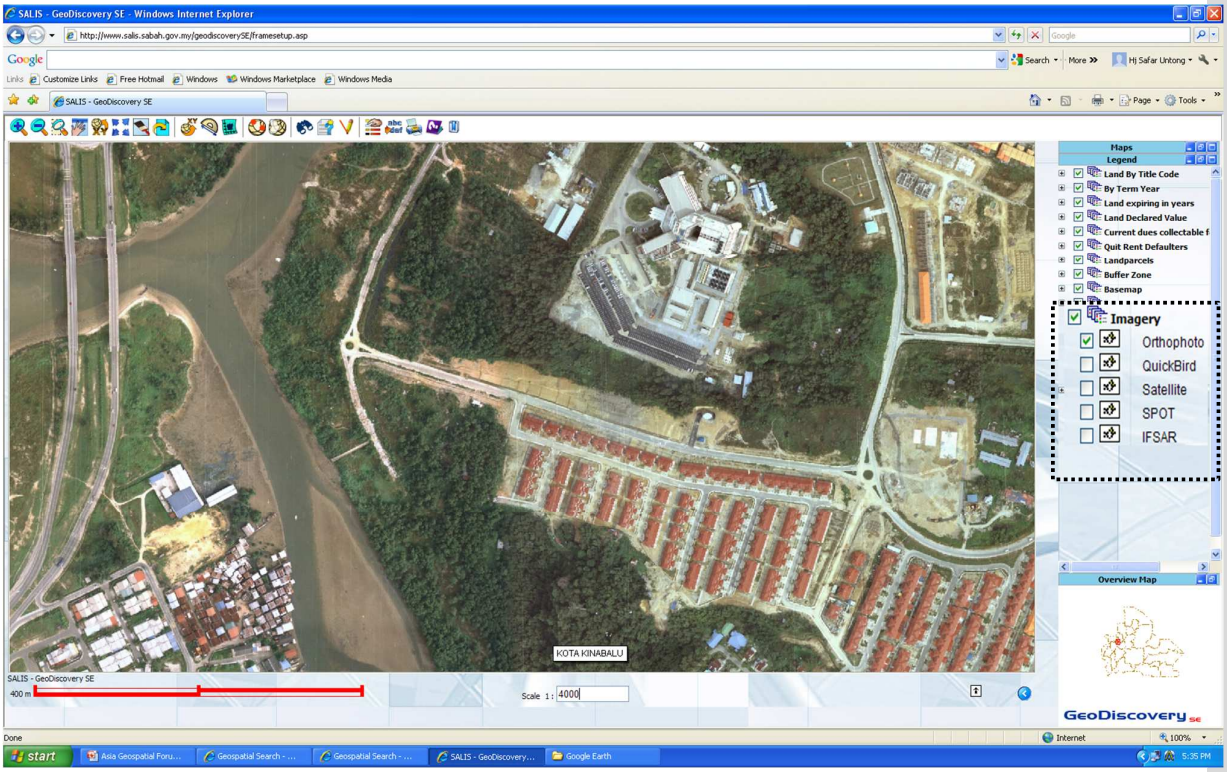


Retrieving Scan Image of The Survey Plans

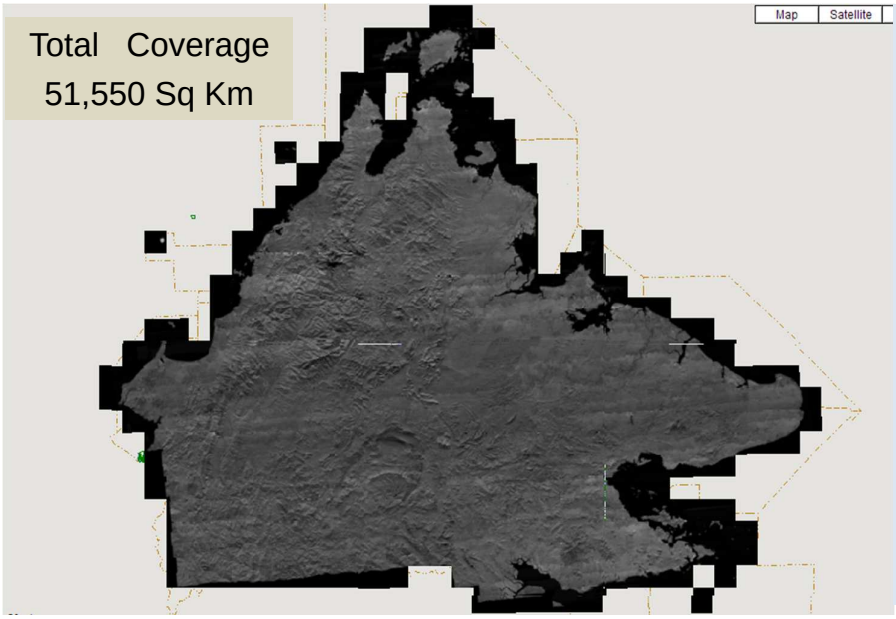


Sources of Data for Topography & Man Made Features

Orthophoto



DIGITAL SABAH PROJECT - IFSAR

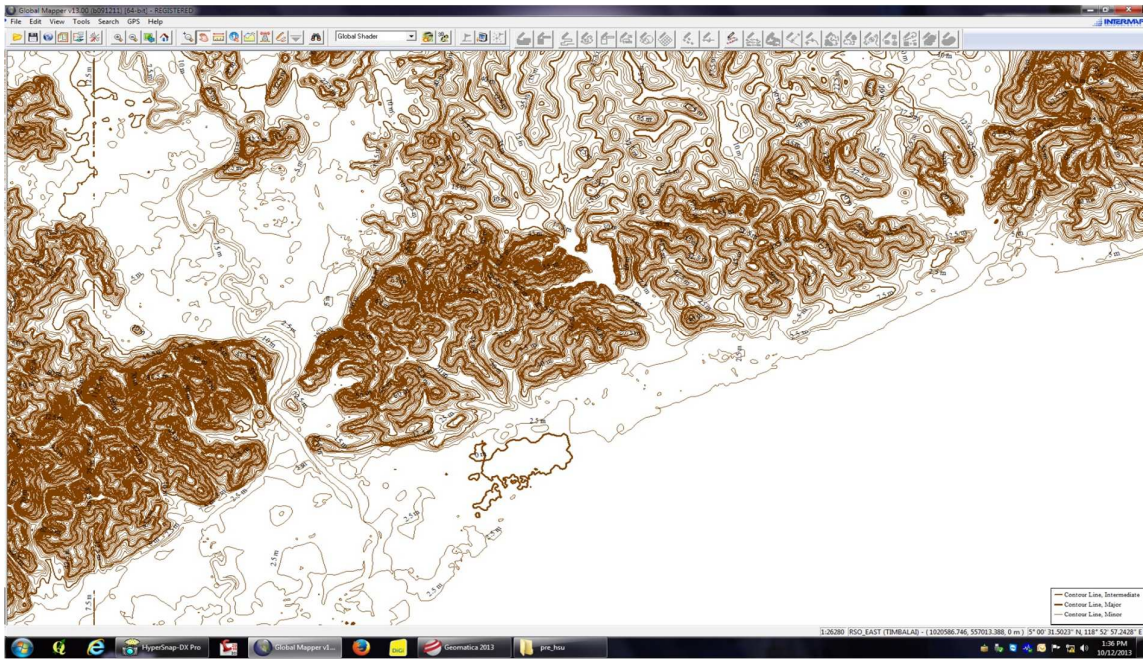


IFSAR
ORI (Ortho-rectified Image),
DSM (Digital Surface Model)
DTM (Digital Terrain Model).

Optimum Mapping Scale is 1:25,000

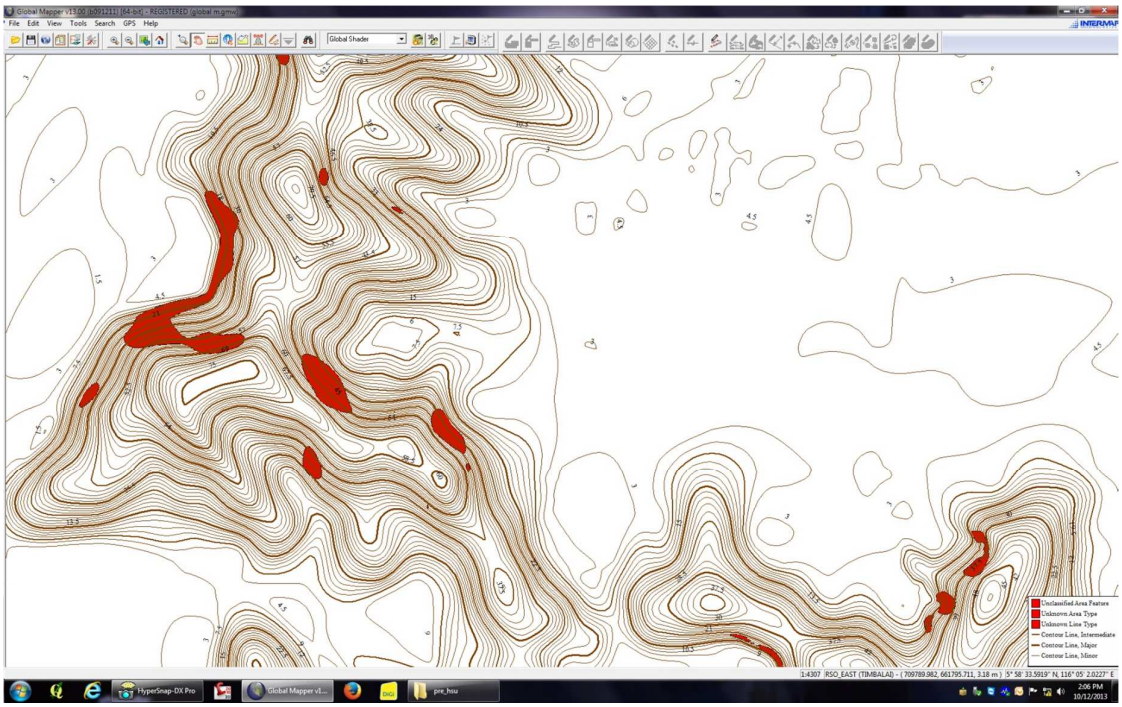
DSM & DTM accuracy is 1 m for contour less than 60 m and 5 m for contour more than 60 m

Contour generated from IFSAR data



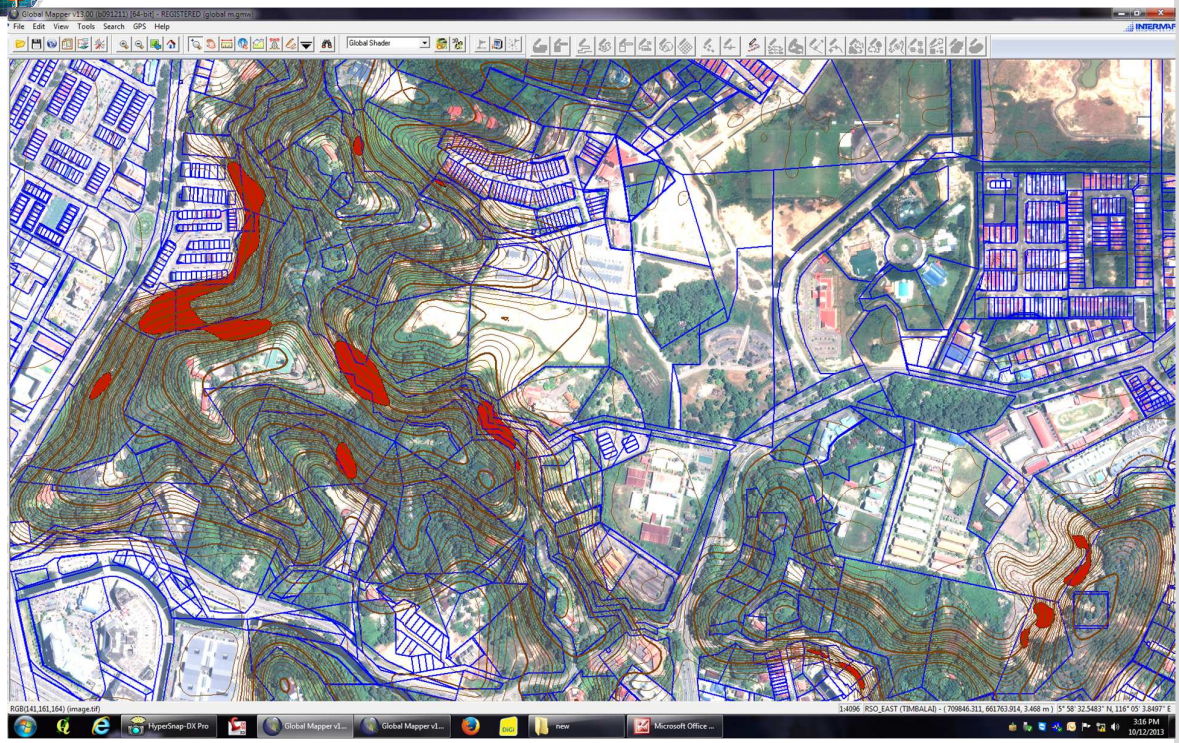
Contour generated from IFSAR data

Slope Analysis from IFSAR data



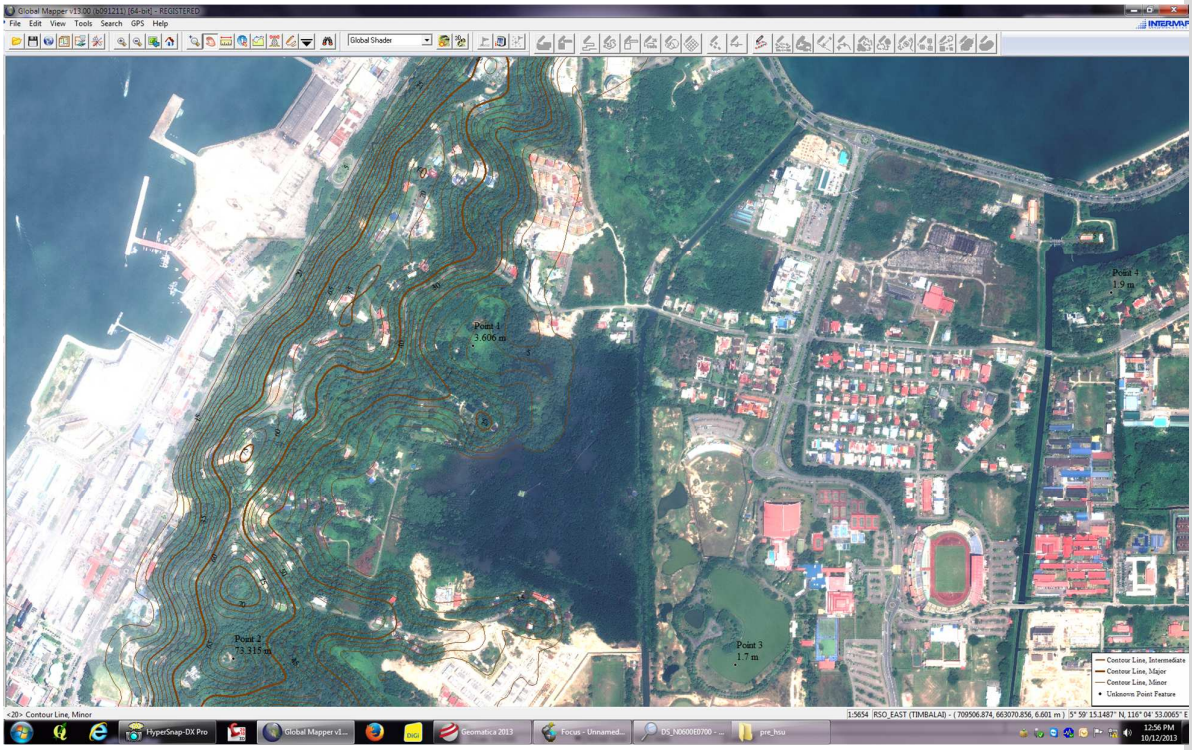
25º degree slope

Slope Analysis from IFSAR data

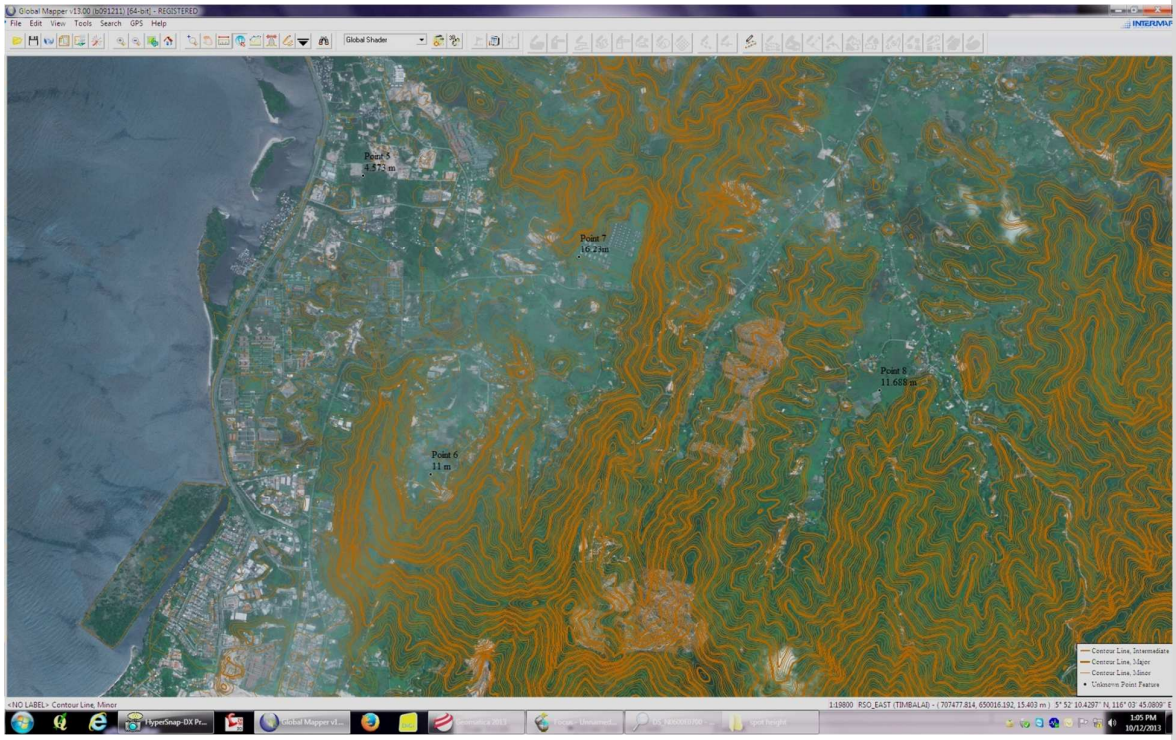


25º degree slope

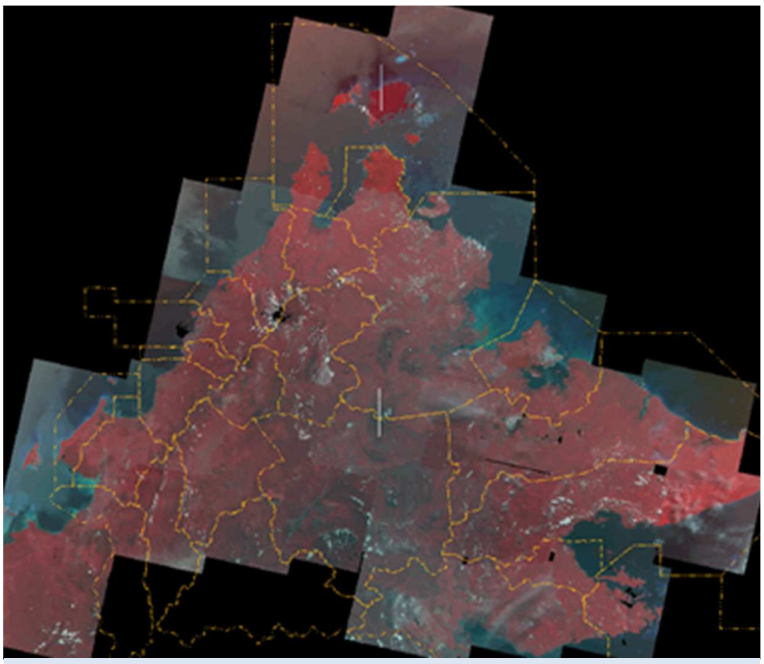
Spot Height from IFSAR data



Spot Height from IFSAR data

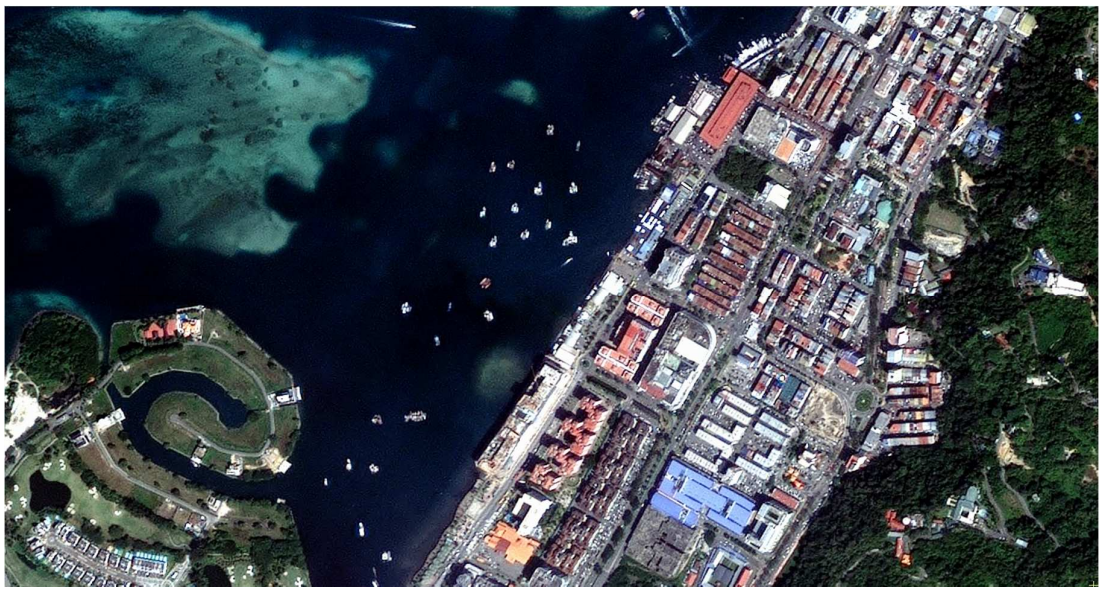


SPOT 5: Orthorectified & mosaicked



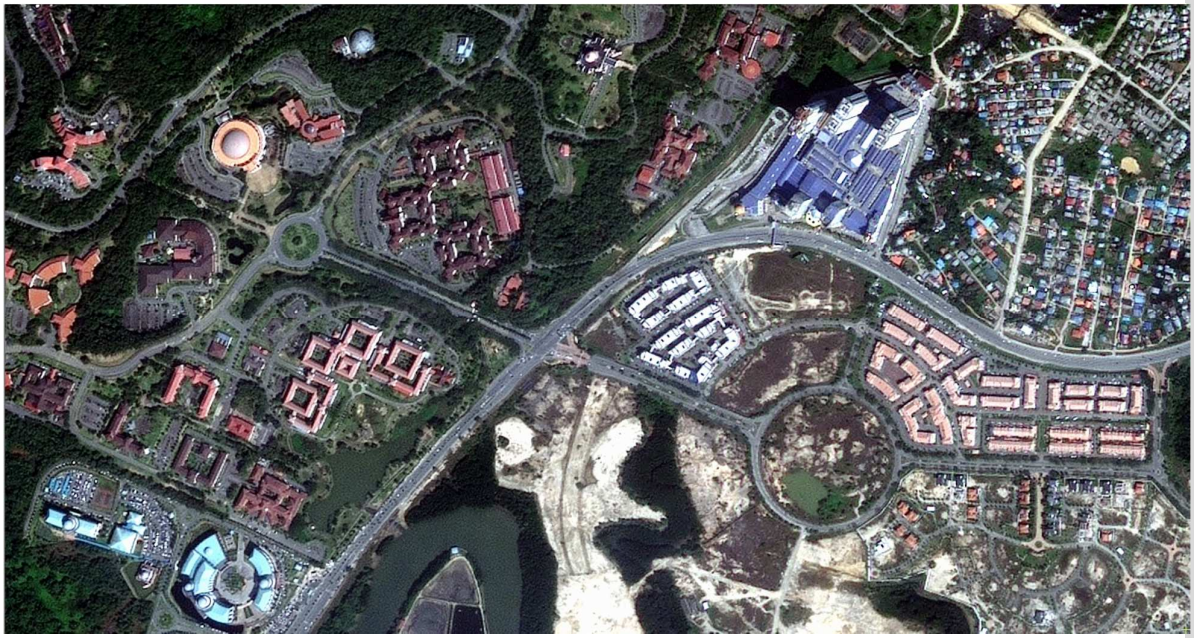
resolution 2.5m

Orthorectified & mosaicked SPOT 6



The SPOT 6 resolution is 1.5m. It has the Blue Band making it very easy to generate the natural color. The other good news is that the price of SPOT6 is the same as SPOT5 i.e about RM4800/ scene (60km x 60km)

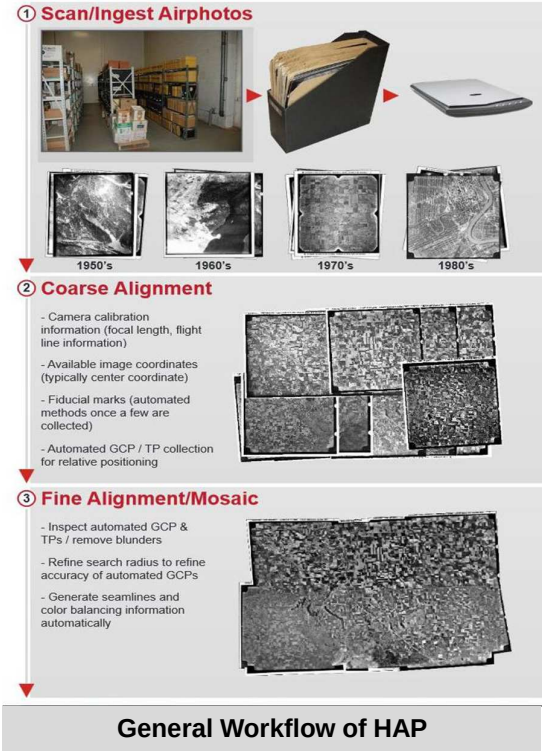
Orthorectified & mosaicked SPOT 6



Orthorectified & mosaicked SPOT 6

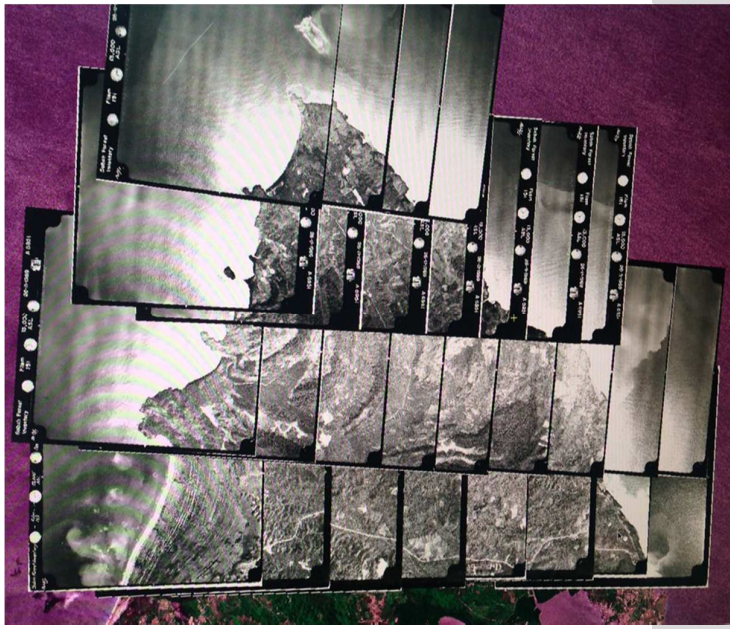
Worldview 2 High Resolution Image

HISTORICAL AERIAL PHOTO SYSTEM (HAP)



General Workflow of HAP

Orthorectified 1969 aerial photographs after corase adjustment in HAP. Overlaid with SPOT5 images for accuracy checking



DIGITAL ARCHIVE FOR AERIAL PHOTO FROM 1950 - NOW

HAP System is a customized system jointly develop by PCI & Lands & Surveys Department Sabah

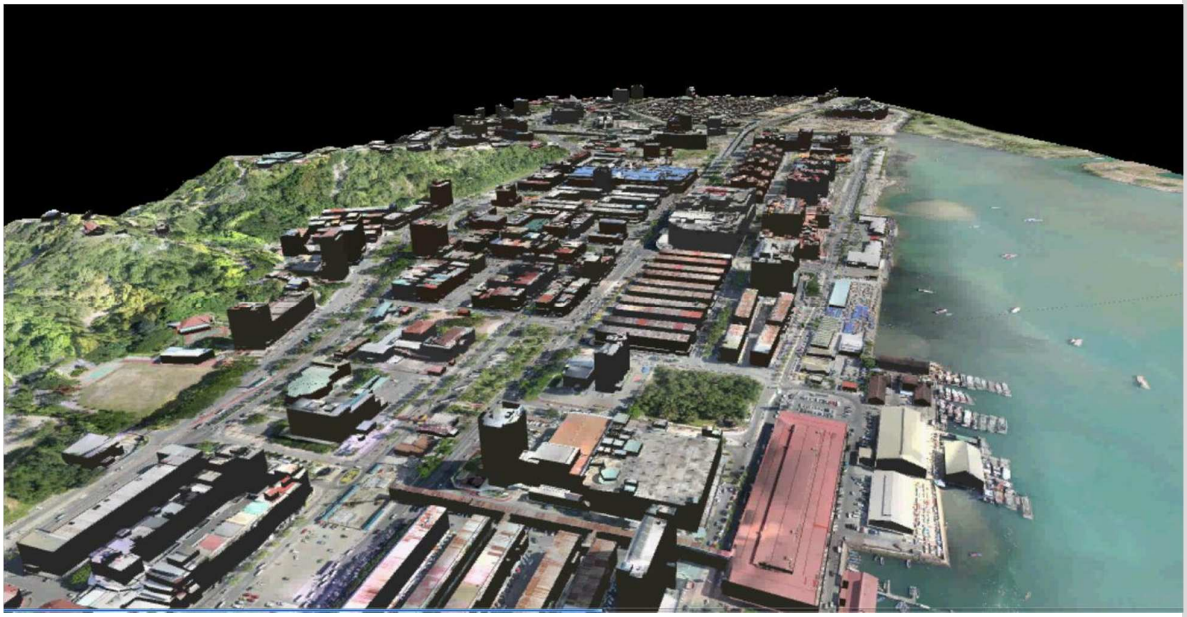
- Real-time Photo Mosaic
- Historical time series

Orthorectified & mosaicked 2010 aerial photographs after FINE adjustment in HAP

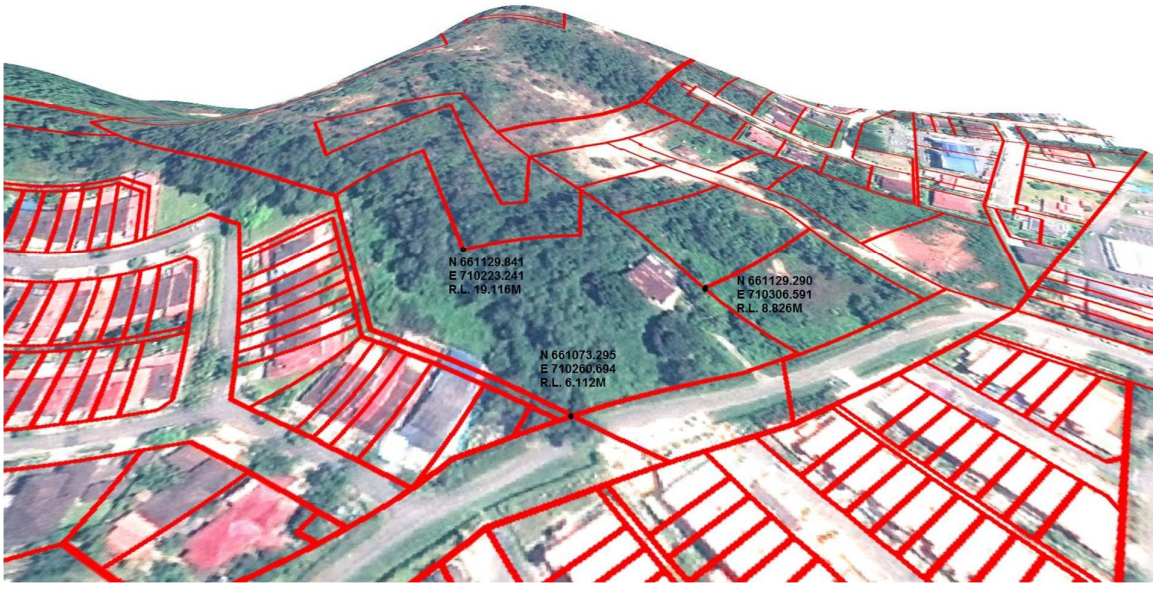
Development of Multi Purpose Cadastre

3D City Model Kota Kinabalu

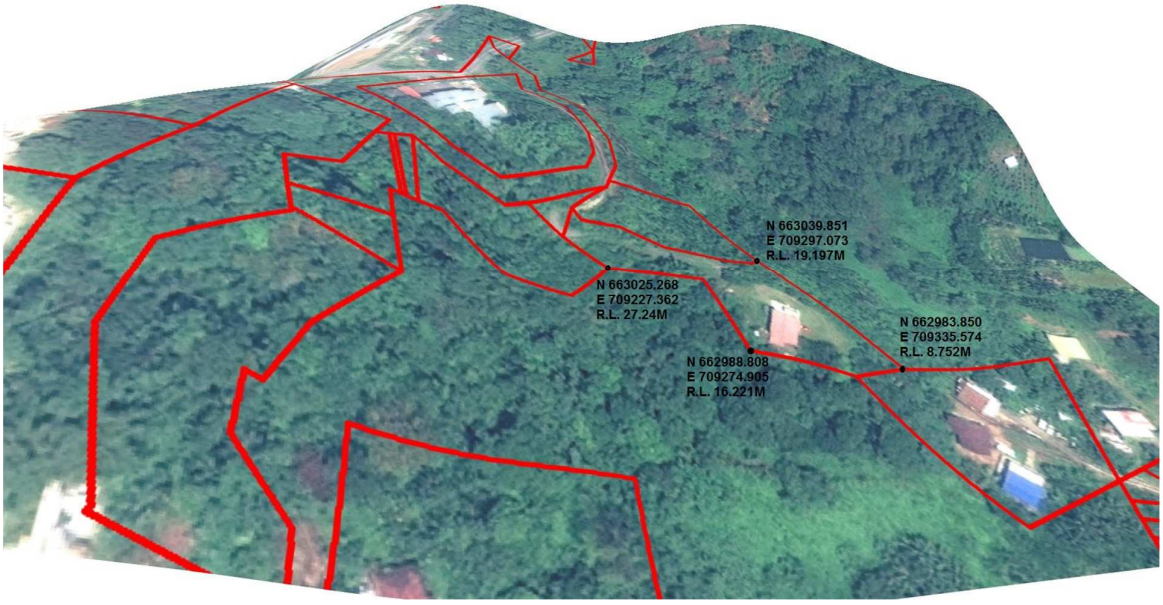
Kota Kinabalu City 3D Fly Through



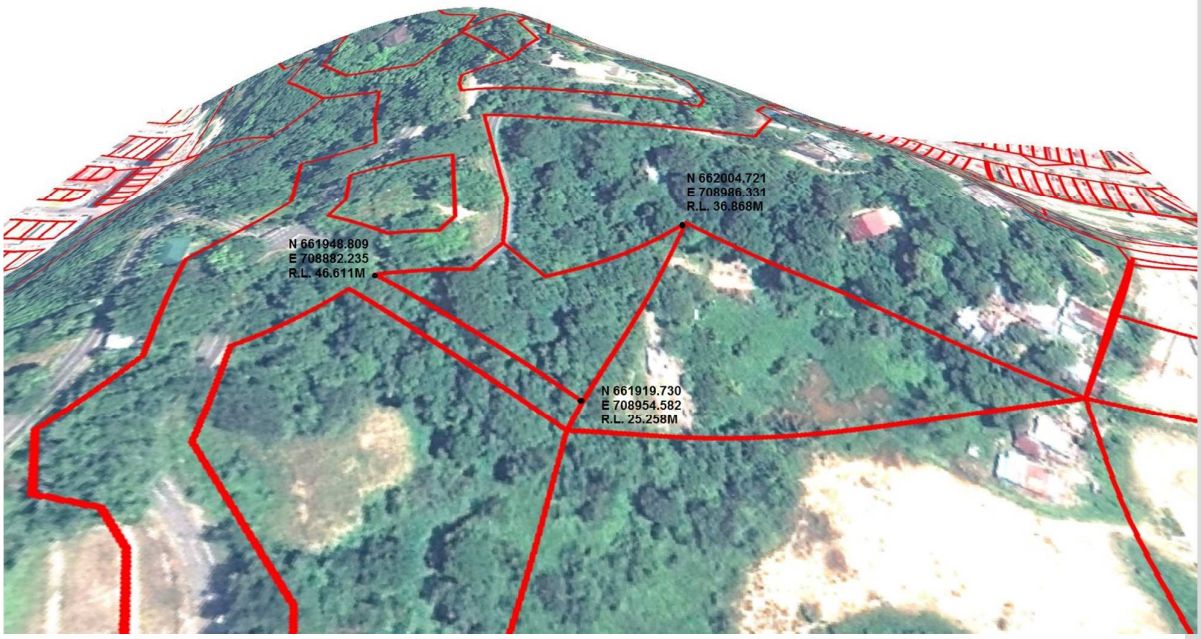
Seamless 3D model



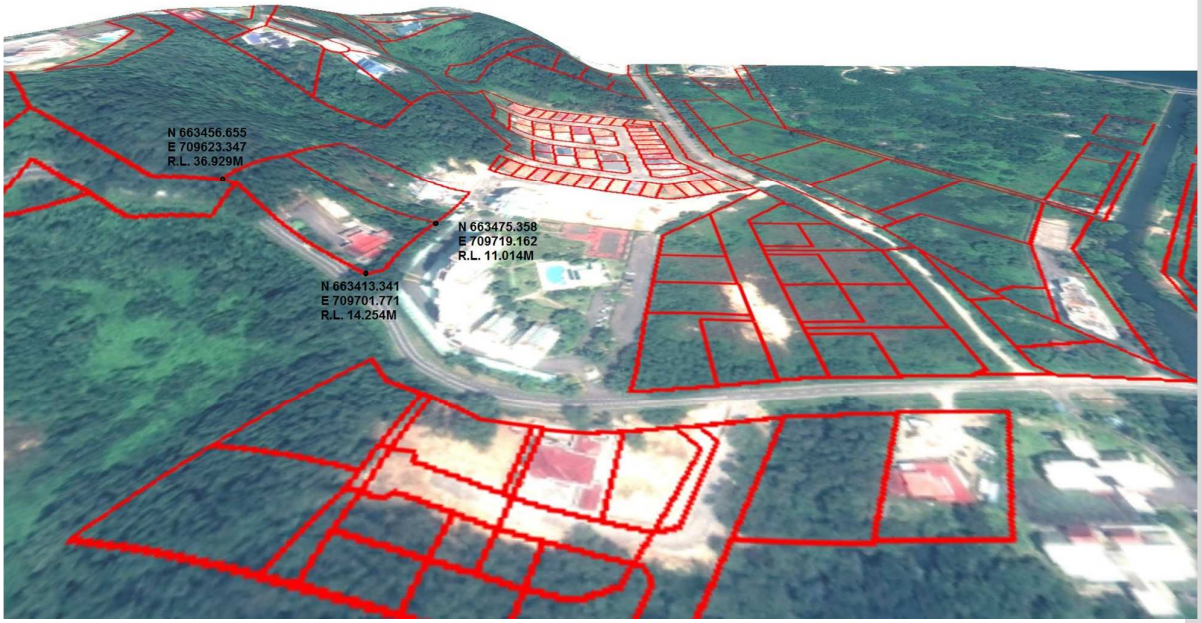
Land Parcel on 3D model



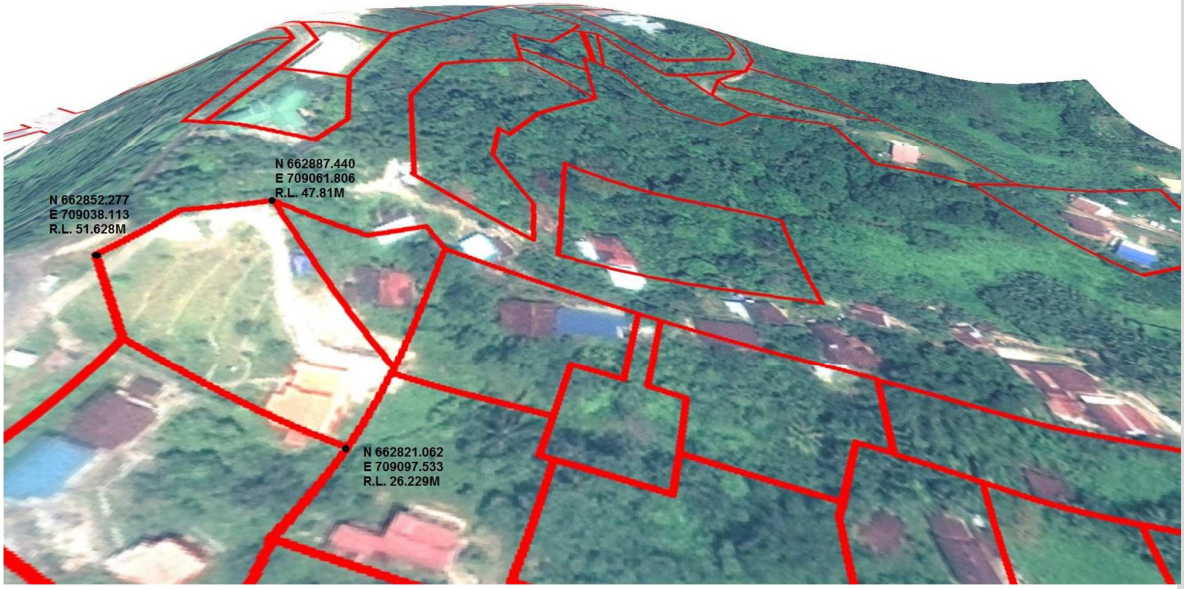
Land Parcel on 3D model



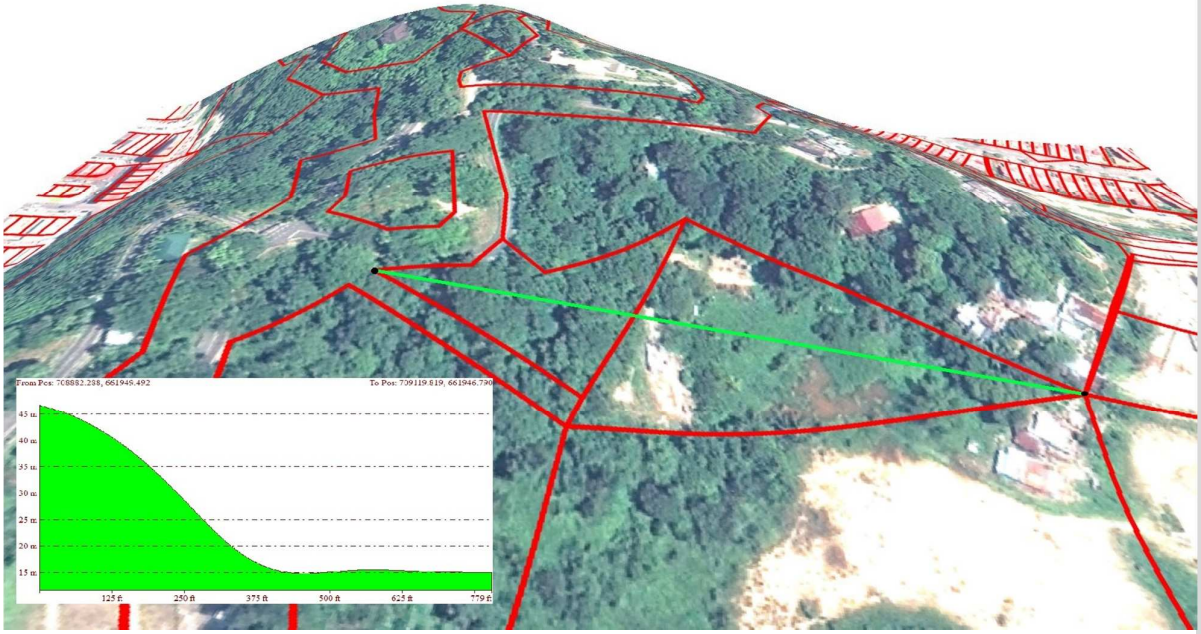
Land Parcel on 3D model



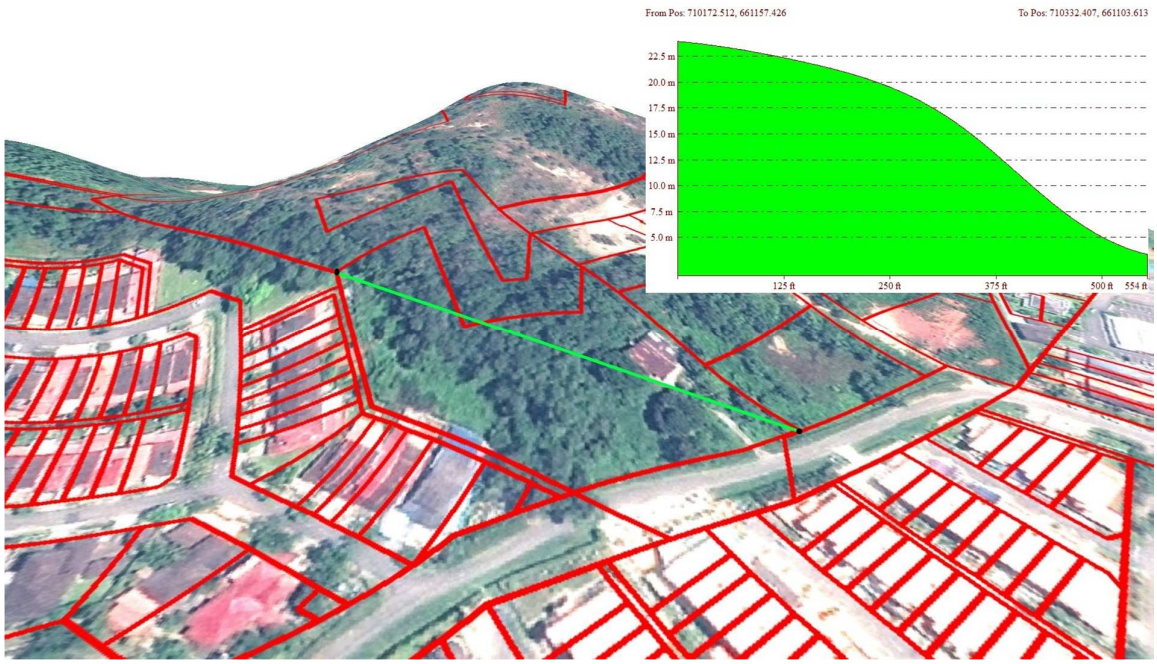
Land Parcel on 3D model



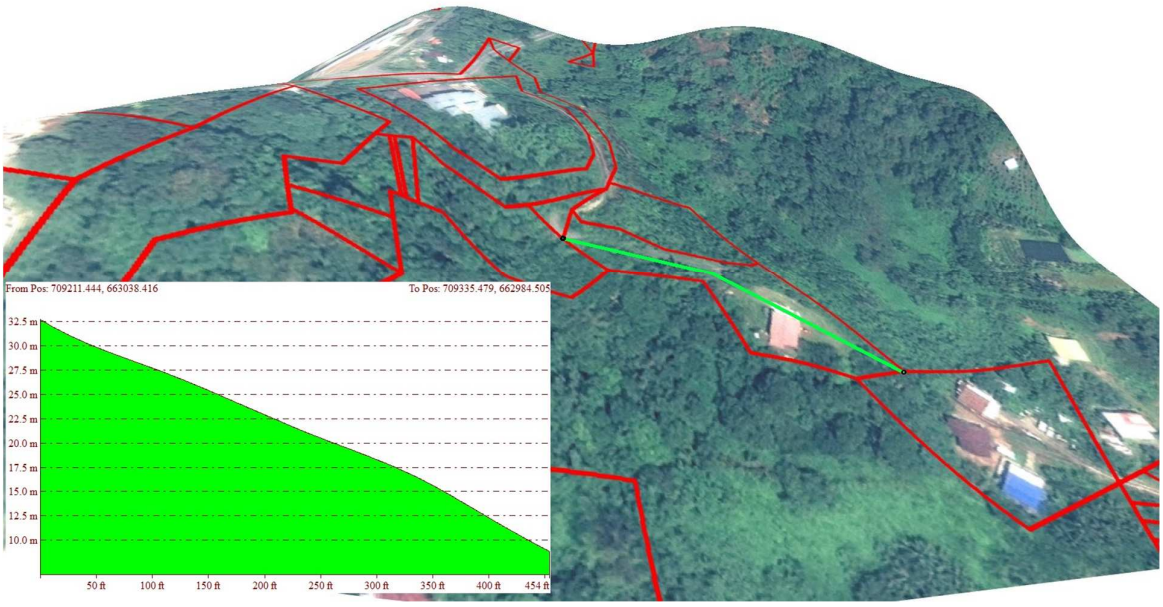
Cross Section - Parcel Profile



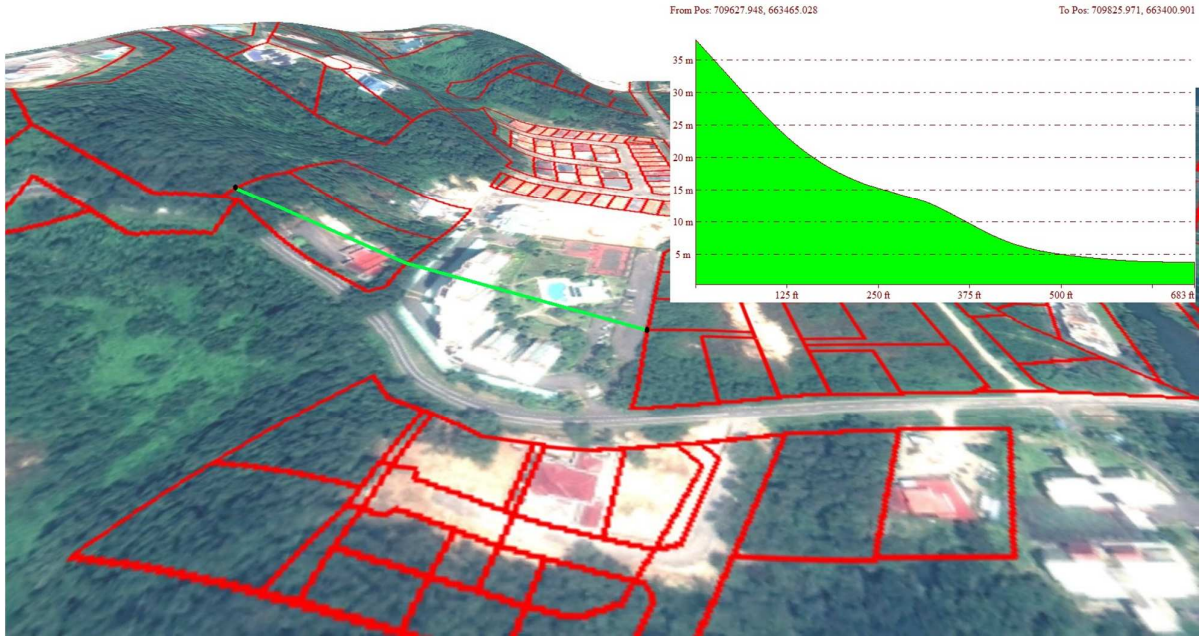
Cross Section - Parcel Profile



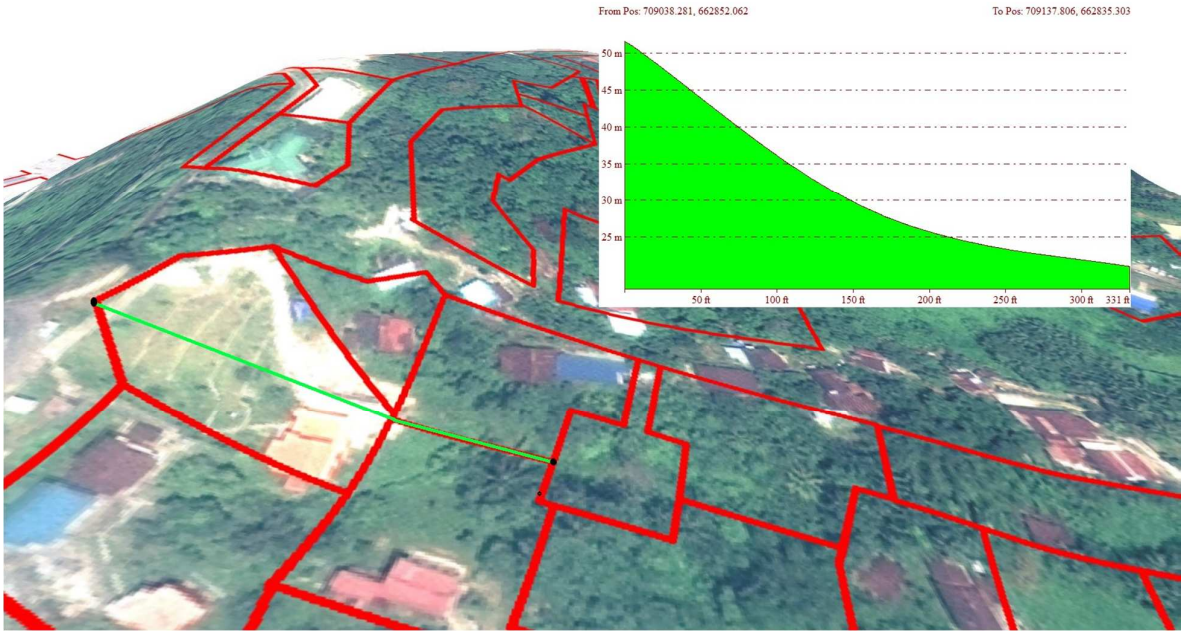
Cross Section - Parcel Profile



Cross Section - Parcel Profile

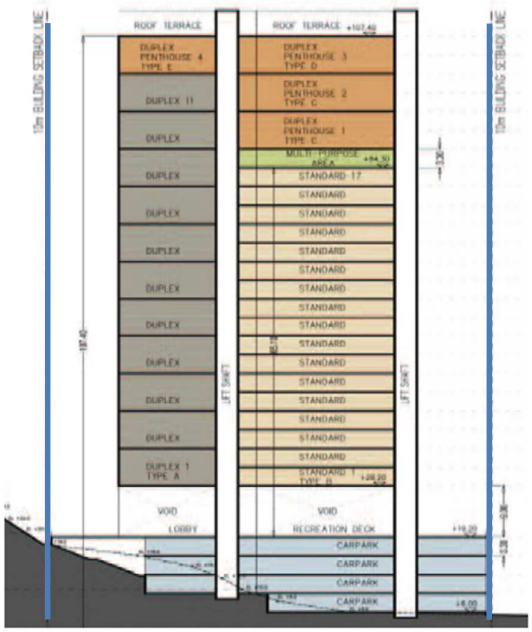


Cross Section - Parcel Profile



Artist Impression – Northern & Southern Facade

Building Cross Section



Building Floor Plan

Type A	Living	Balcony
Level 1	1,756ft²	421ft²
Level 2	1,256ft²	139ft²
Total	3,012ft²	560ft²
TOTAL GFA	**3,572ft²**	

Building Floor Plan

Type B	Living	Balcony
Level 1	2,450ft²	900ft²
TOTAL GFA	**3,350ft²**	

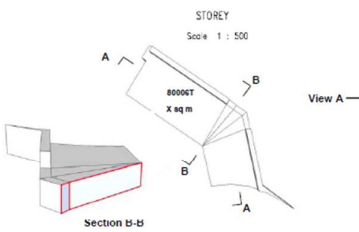
Proposed Survey Plan for Strata Titles

Survey Plan

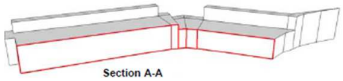
Lot No.	Or Plan	Remarks
000007		Allotted For Subdivision Lot

Building No.	On Lot	Storey	Area (sq m)	Volume (cubic m)
	000007	Pedestrian Underpass	1603.9	XYZ

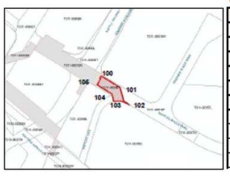
STOREY
Scale 1 : 500



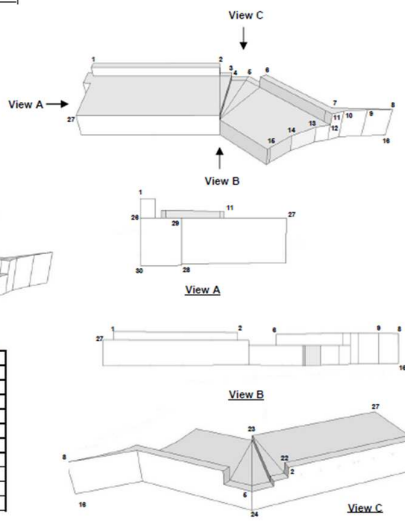
Section B-B



Section A-A



Ground information	
Pt	RL
100	Z
101	Z
102	Z
103	Z
104	Z
105	Z
106	Z
107	Z
108	Z
109	Z



	Northin	Easting	RL
1	9 Y	X	Z
2	Y	X	Z
3	Y	X	Z
4	Y	X	Z
5	Y	X	Z
6	Y	X	Z
7	Y	X	Z
8	Y	X	Z
9	Y	X	Z
10	Y	X	Z
11	Y	X	Z
12	Y	X	Z
13	Y	X	Z
14	Y	X	Z
15	Y	X	Z
16	Y	X	Z
17	Y	X	Z
18	Y	X	Z
19	Y	X	Z
20	Y	X	Z
21	Y	X	Z
22	Y	X	Z
23	Y	X	Z
24	Y	X	Z
25	Y	X	Z
26	Y	X	Z
27	Y	X	Z
28	Y	X	Z
29	Y	X	Z
30	Y	X	Z
31	Y	X	Z
32	Y	X	Z
33	Y	X	Z
34	Y	X	Z
35	Y	X	Z
36	Y	X	Z
37	Y	X	Z
38	Y	X	Z
39	Y	X	Z
40	Y	X	Z
41	Y	X	Z
42	Y	X	Z
43	Y	X	Z
44	Y	X	Z
45	Y	X	Z
46	Y	X	Z
47	Y	X	Z
48	Y	X	Z
49	Y	X	Z
50	Y	X	Z
51	Y	X	Z
52	Y	X	Z
53	Y	X	Z
54	Y	X	Z
55	Y	X	Z
56	Y	X	Z
57	Y	X	Z
58	Y	X	Z
67	Y	X	Z
68	Y	X	Z

RL is based on Survey Department Height Datum

Concluding Remarks

- We are almost done with 2D & Moving forward to 3D
- Our Limitation -
  - Lack of facilities and funding
  - Constraint in generating information (expertise, technologies, hardware & software)
  - High integrity & accurate data is still beyond reach for many of us.
  - Data currency
- Upgrading the 2.5m SPOT5 images to at least 1m or sub meter images by obtaining digital aerial photos, UAV Data & SPOT6 images.

? & A

THANK YOU