

# DEVELOPING A MULTI - PURPOSE CADASTRE IN SABAH

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Lands and Surveys Department  
Sabah, Malaysia



# Presentation Outlines

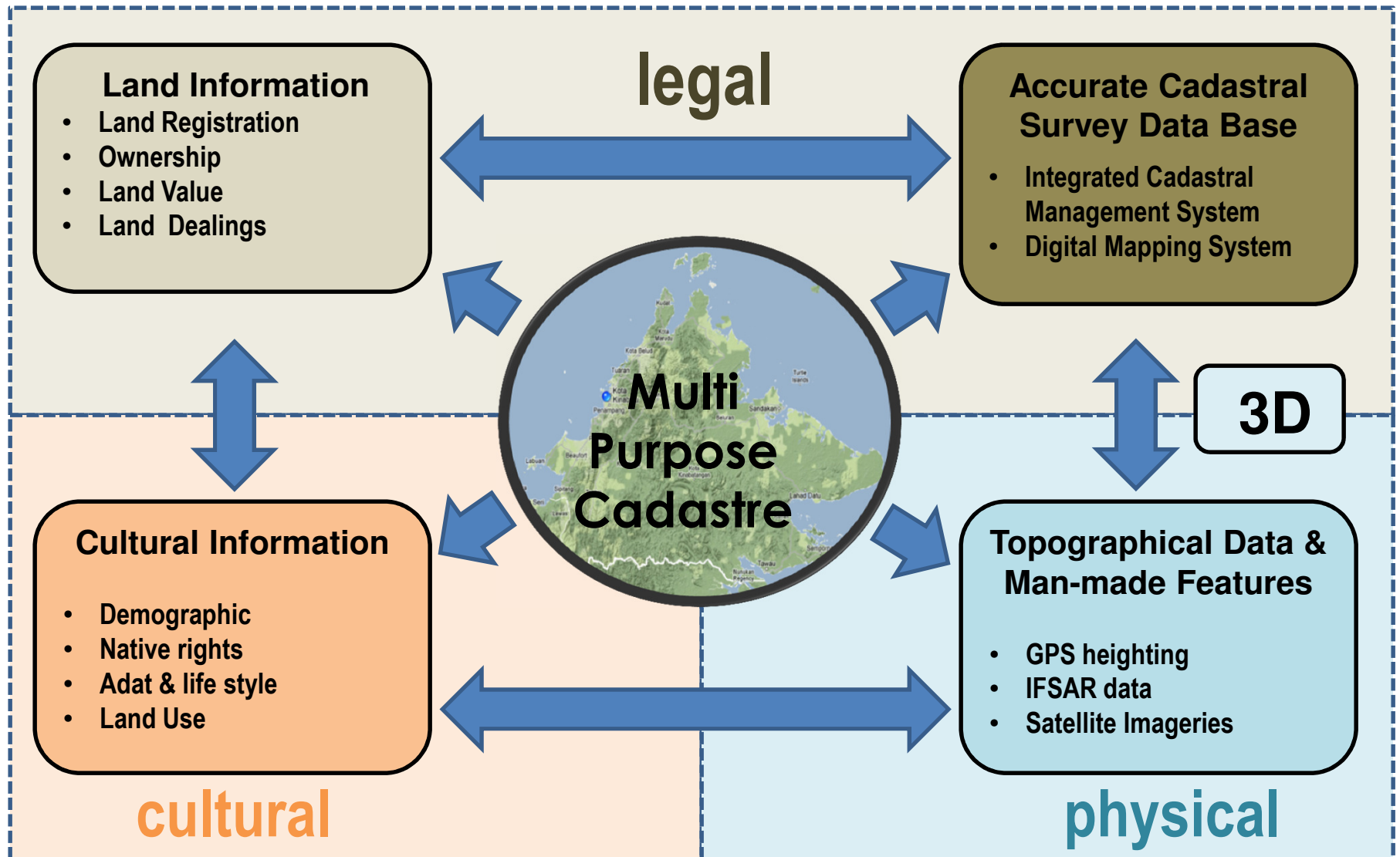
1. Definition of MPC
2. LSD multi-purpose cadastre model
3. Sabah Cadastral Map – Mobile Apps
4. Pre-defined Geospatial Analysis
5. Land Parcel integrated with various land information
6. Topography & man-made Features
7. 3D city model
8. Seamless Land Parcel on 3D model
9. Parcel profile
10. 3D Cadastre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

ArcGIS app for iOS

ArcGIS app for Android

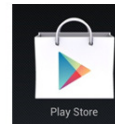


App Store



ArcGIS

Search for  
ArcGIS



Play Store

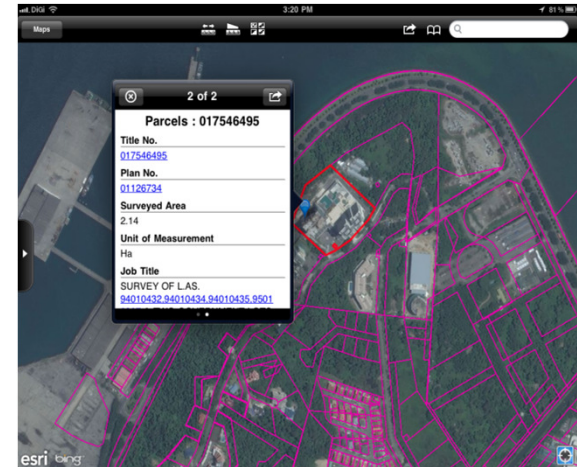


ArcGIS

Download  
and Install  
ArcGIS

- Click ArcGIS icon
- Search JTUWMA(beta)
- zoom Bing image

Register and open an Esri Global Account ( free ) with Esri ArcGIS Online at :  
<https://webaccounts.esri.com/CAS/index.cfm?fuseaction=Registration.ShowForm>



2

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

<http://218.111.213.197:8080/share/page>



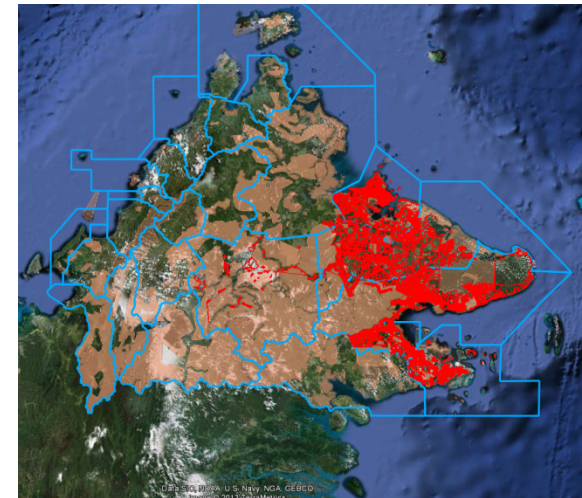
Alfresco™

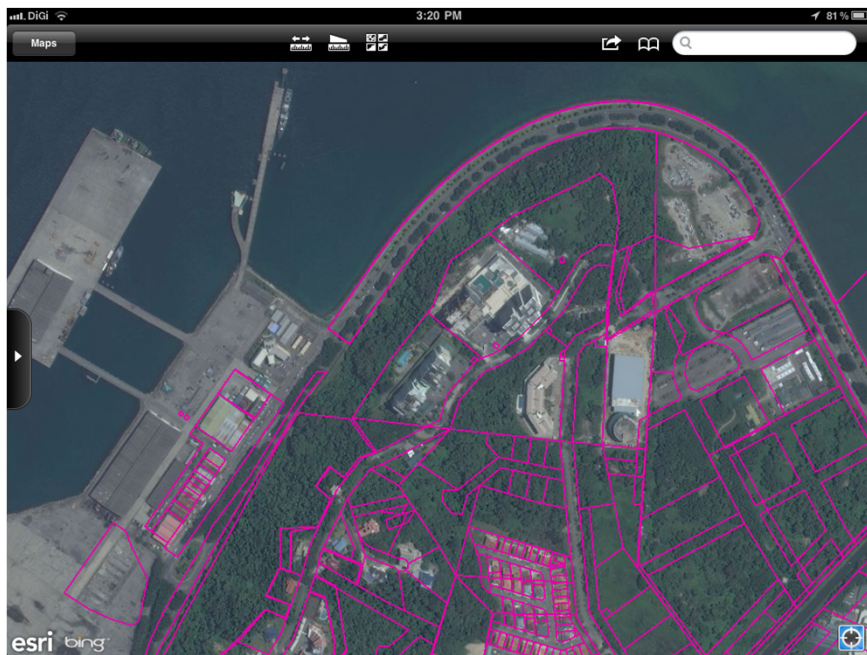
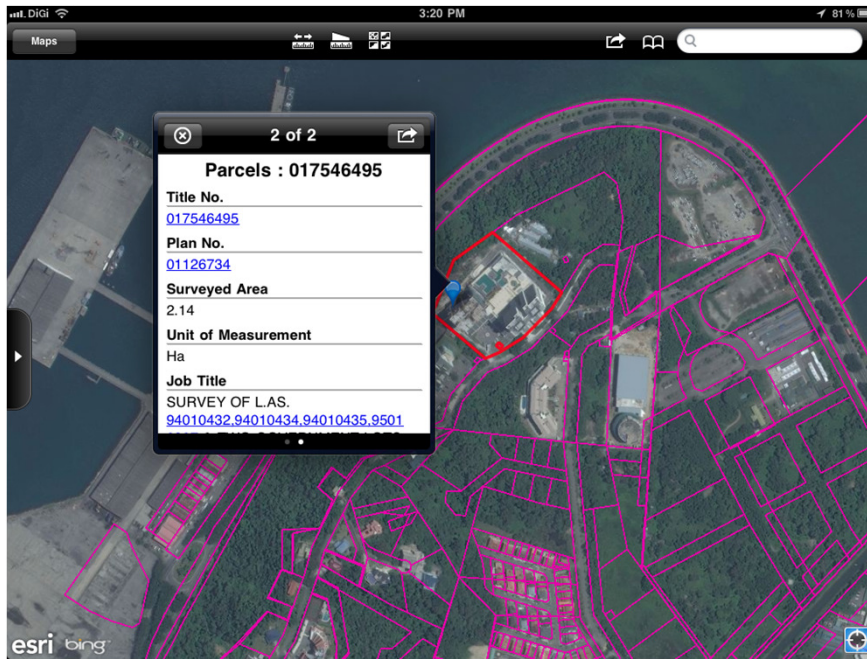
User Name:

safaruntong

Password:

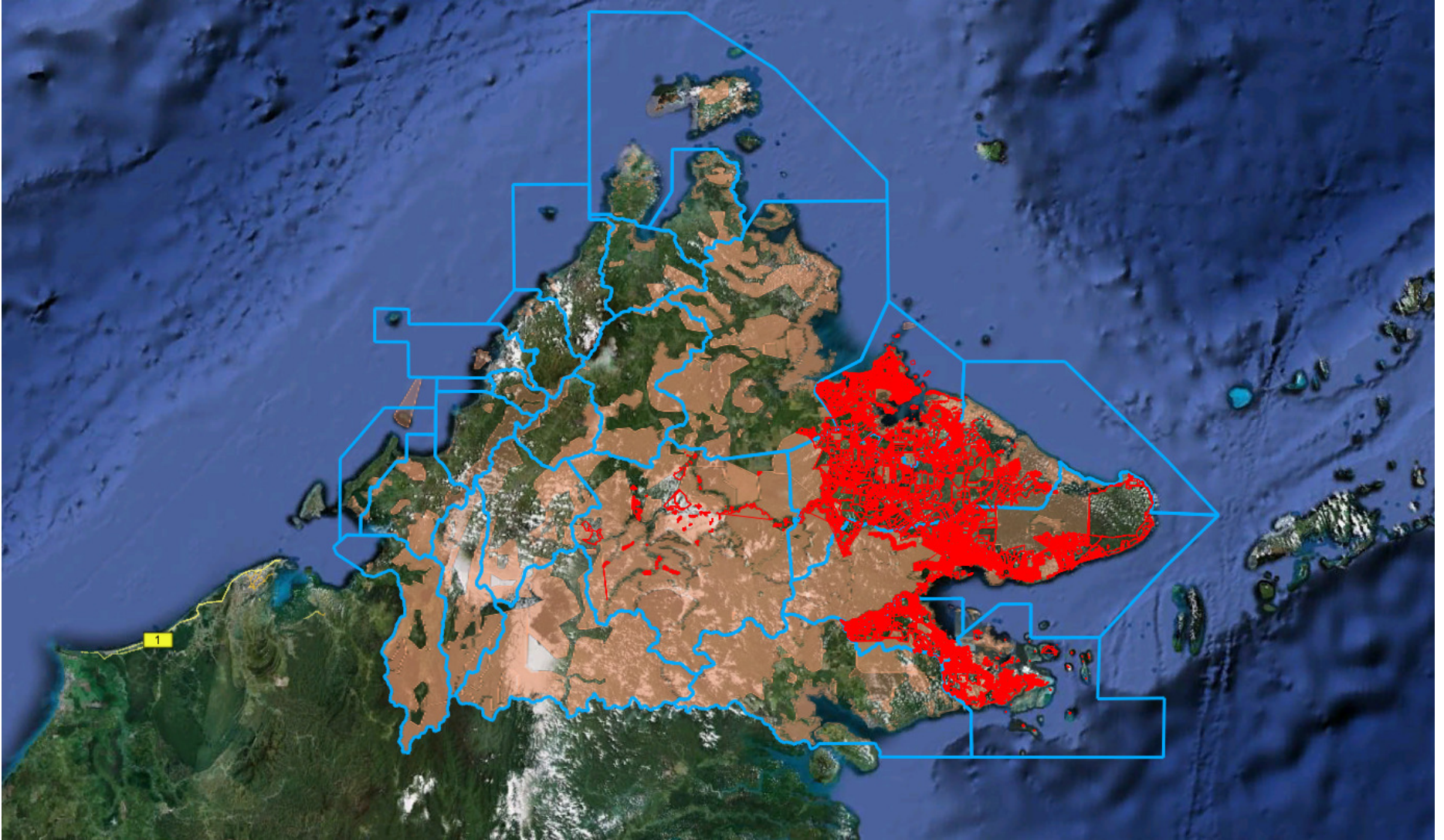
Login





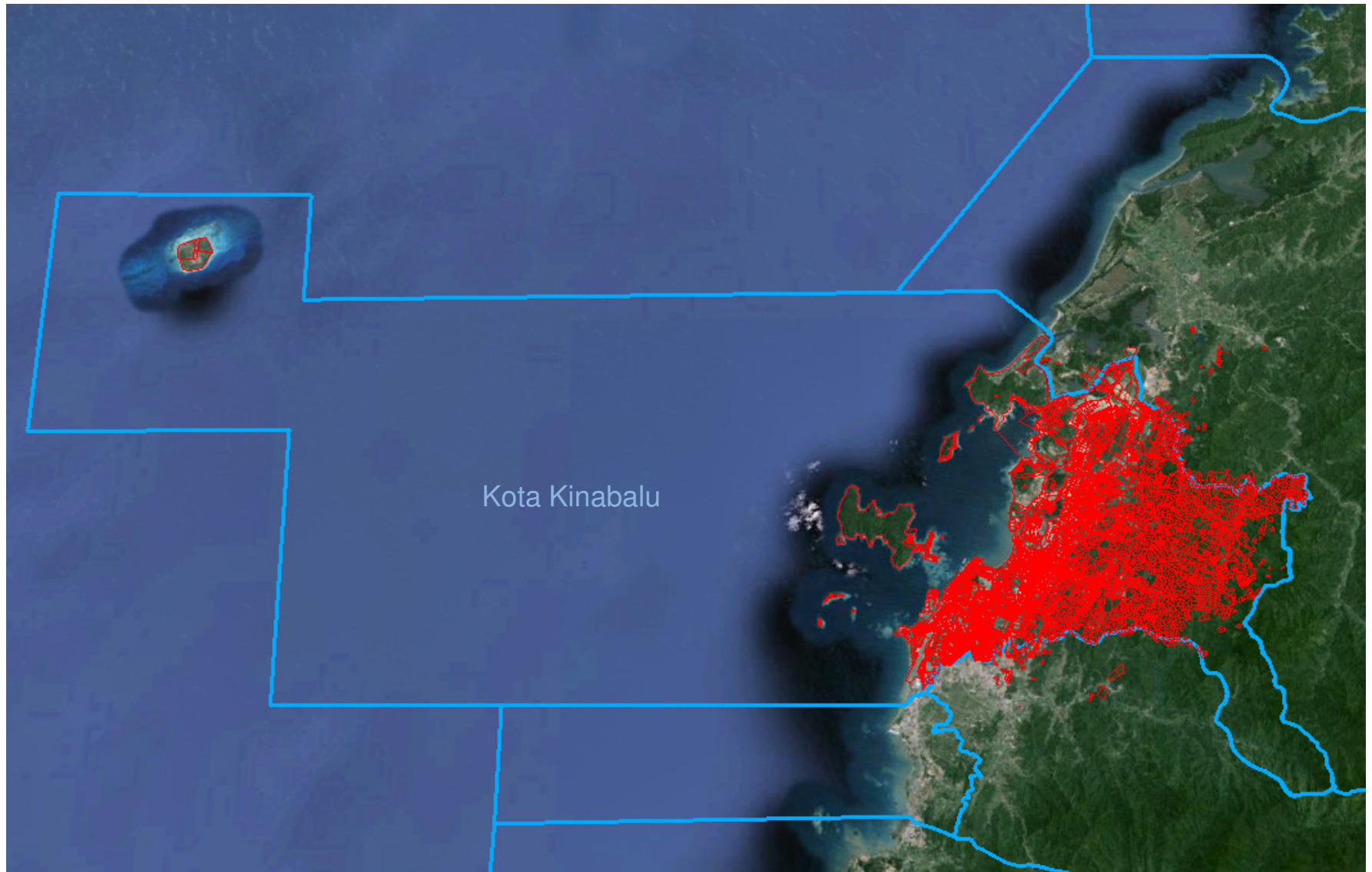


# Seamless 2D Digital Cadastral Data Base





## District of Kota Kinabalu



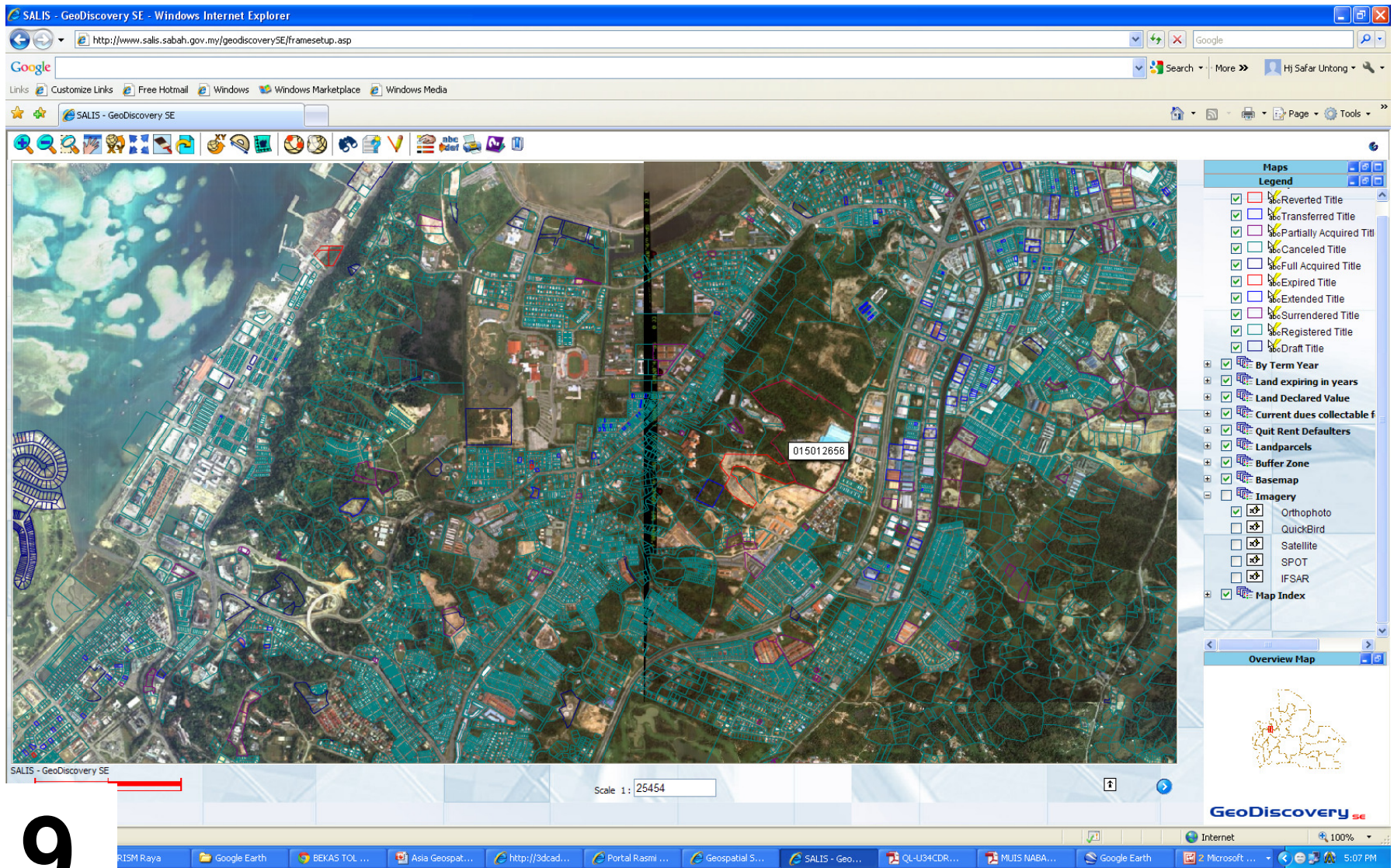


# Kota Kinabalu City



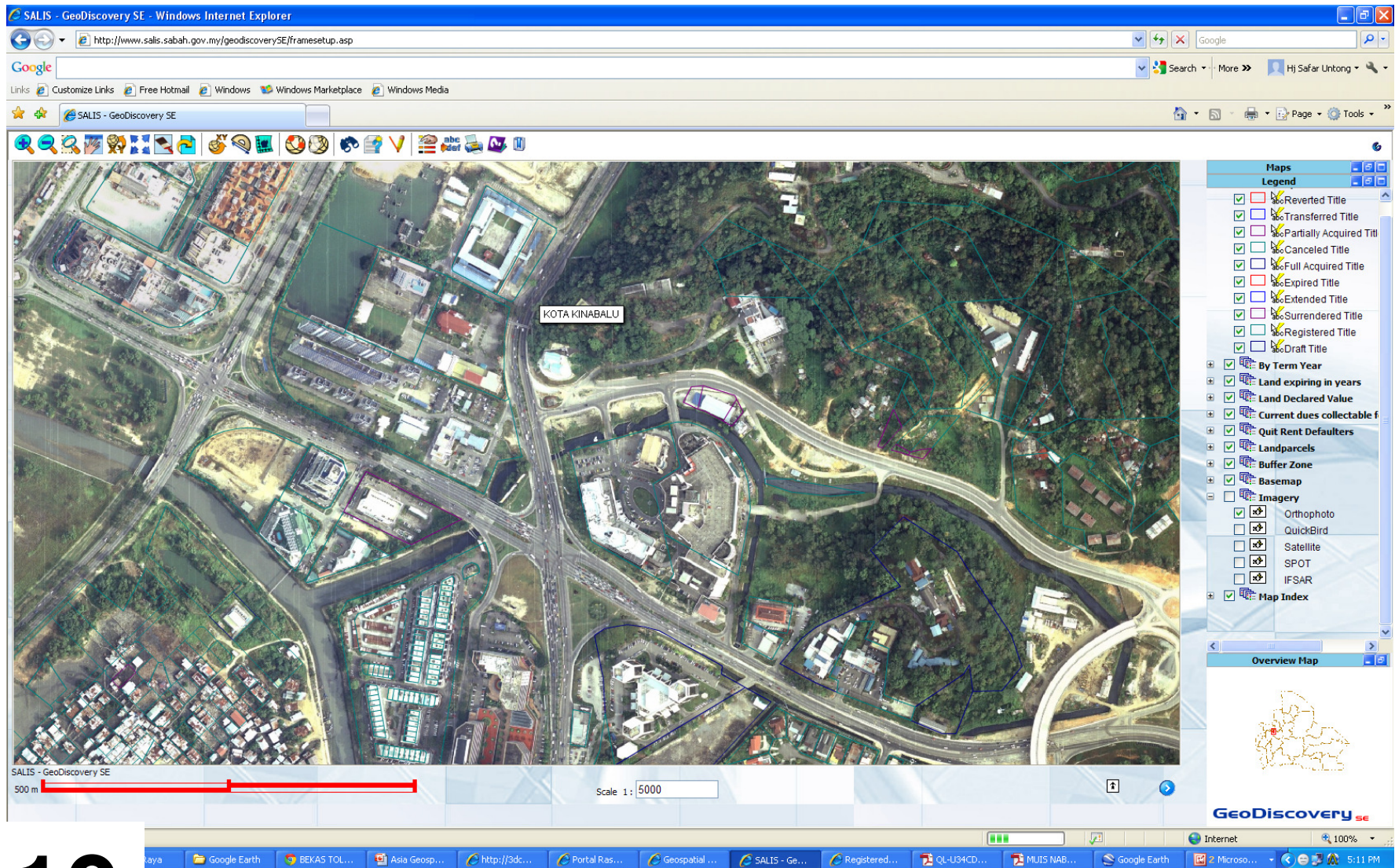


# Pre-defined Geospatial Analysis





# Pre-defined Geospatial Analysis





# Land Parcel integrated with Owner Information

**SALIS GeoCadastral**

Home | Services

Master Info | Owner Info | Map | Survey Plan | Dealings Info

### Land Title Search System

- Title Number
- Plan Number
- Standard Sheet Number
- Location
- Identification Number
- Ownership Name

017544884

Result. Total Record(s) found : 1

No	Title No.		
1	017544884		<a href="#">View</a>

TITLE NUMBER : 017544884

### Land Title Owner Information

Land Title Number: 017544884  
Number of Owner(s): 1

### List of Owners

No	Owners	Share	
1	EASTWORTH SOURCE SDN BHD	0.99999	

[More Info](#)

### EASTWORTH SOURCE SDN BHD

1	SEQUENCE NUMBER	950240816
2	OCCUPATION	--
3	NAME	EASTWORTH SOURCE SDN BHD
4	OLD IC	--
5	NEW IC	--
6	OTHER IC	--
7	GENDER	Tiada - Untuk Persatuan / Kesatuan / Syarikat
8	DATE OF BIRTH	--
9	RACE	--
10	HOME ADDRESS (1)	--
11	HOME ADDRESS (2)	--
12	HOME ADDRESS (3)	--
13	HOME ADDRESS (4)	--
14	POST ADDRESS 1	PPHT KOTA KINABALU
15	POST ADDRESS 2	--
16	POST ADDRESS 3	--
17	POST ADDRESS 4	--
18	INDUSTRY	--
19	STATUS	Y
20	TELEPHONE	--
21	CITIZEN TYPE	--
22	TELEPHONE (2)	--
23	FAX	--
24	GIVEN TITLE	--
25	OLD SEQUENCE NUMBER	--
26	NEW SEQUENCE NUMBER	--
27	MARITAL STATUS	--

Spouse Info

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# Land Parcel integrated with Title info & Survey Info.

[Home](#) | [Services](#)

[Master Info](#) | [Owner Info](#) | [Map](#) | [Survey Plan](#) | [Dealings Info](#)

## Land Title Search System

☒ Title Number  
☐ Plan Number  
☐ Standard Sheet Number  
☐ Location  
☐ Identification Number  
☐ Ownership Name

Result. Total Record(s) found : 1

No	Title No.		
1	017544884		<a href="#">View</a>

### Title Information

Land Title Number	017544884
Title Code	Registered Title
Title Status	Active Titles
LS File Ref	L.S.102.1.438
MNR Ref	316/2/30/100
Standard Sheet No	67JB41
Location	SEMBULAN
Area	4.567
Unit of Measurement	Hectare
District	Kota Kinabalu
Survey Plan No	01126678

Date Made	1993/10/22
Date Registered	1994/03/21
Date Commenced	1993/01/01
Date of Expiry	2091/12/31
Tenure	99

Premium	RM 1,980,000.00
---------	-----------------

### Rent Information

Year	1996	1999	--	--
Rent	RM 46,900.00	RM 54,285.00	RM 0.00	0.00

### Enhance Rent Information

Enhance Rent	Year Start	Year End	Amount
1	0	0	0.000
2	0	0	0.000
3	0	0	0.000
4	--	--	--

### Quit Rent Information

Accumulated Quit Rent Until:31-12-2011  
 Accumulated Quit Rent: RM 847405.00  
 Current Year:2012  
 Current Quit Rent: RM 54285.00  
 Total Quit Rent: RM 901690.00  
 Payment Until:31-12-2011  
 Total Payment: RM 738835.00  
 Arrears: RM 162855.00

### Survey Information

UPI Number	017544884
LA Number	93010261
Grid Type	M
Grid Number	67-JB-41
Survey Reference	
SP RSP Number	
Survey Plan Number	01126678
Surveyor Name	
Survey Date	
Survey Area	4.567
Survey Approved Date	
District Surveyor	
PPHT Reference	
Former Title	
Remark	

Survey Information Record(s) found: 1

[First](#) [previous](#) [next](#) [Last](#)



# Land Parcel integrated with Revenue Info.

## SALIS GeoCadastrre

Home | Services

Master Info | Owner Info | Map | Survey Plan | Dealings Info

### Land Title Search System

- Title Number
- Plan Number
- Standard Sheet Number
- Location
- Identification Number
- Ownership Name

017544884

Result. Total Record(s) found : 1

No	Title No.		
1	017544884		<a href="#">View</a>

TITLE NUMBER : 017544884

<b>Premium</b>		RM 1,980,000.00	
<b>Rent Information</b>			
<b>Year</b>	<b>1996</b>	<b>1999</b>	--
<b>Rent</b>	RM 46,900.00	RM 54,285.00	RM 0.00
<b>Enhance Rent Information</b>			
<b>Enhance Rent</b>	<b>Year Start</b>	<b>Year End</b>	<b>Amount</b>
1	0	0	0.000
2	0	0	0.000
3	0	0	0.000
4	--	--	--
<b>Quit Rent Information</b>			
Accumulated Quit Rent Until:31-12-2011			
Accumulated Quit Rent: RM 847405.00			
Current Year:2012			
Current Quit Rent: RM 54285.00			
Total Quit Rent: RM 901690.00			
Payment Until:31-12-2011			
Total Payment: RM 738835.00			
Arrears: RM 162855.00			
1. Receipt Number:14598563			
Receipt Date:02-12-1995			
Receipt Amount:1000.00			
2. Receipt Number:14738551			
Receipt Date:14-06-1996			
Receipt Amount:46900.00			
3. Receipt Number:14948133			
Receipt Date:20-05-1997			
Receipt Amount:46900.00			
4. Receipt Number:15133760			
Receipt Date:28-05-1998			
Receipt Amount:46900.00			
5. Receipt Number:15362993			
Receipt Date:27-07-1999			
Receipt Amount:54285.00			
6. Receipt Number:01200202000826			
Receipt Date:06-02-2002			
Receipt Amount:162855.00			
7. Receipt Number:01200311000757			
Receipt Date:10-11-2003			
Receipt Amount:54285.00			
8. Receipt Number:01200603500357			
Receipt Date:10-03-2006			
Receipt Amount:54285.00			
9. Receipt Number:01200605000912			
Receipt Date:10-05-2006			
Receipt Amount:54285.00			
10. Receipt Number:01200608002618			
Receipt Date:30-08-2006			
Receipt Amount:54285.00			
11. Receipt Number:01200705001410			
Receipt Date:16-05-2007			
Receipt Amount:54285.00			
12. Receipt Number:01200908000617			
Receipt Date:07-08-2009			
Receipt Amount:54285.00			
13. Receipt Number:01201101000506			
Receipt Date:05-01-2011			
Receipt Amount:54285.00			
Total Receipts: 13			
Total Receipt Amount: RM 738835.00			
* Source:			
<a href="http://www.quitrent.jtu.sabah.gov.my">http://www.quitrent.jtu.sabah.gov.my</a>			

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# Land Parcel integrated with Land Dealings Info

[Home](#) | [Services](#)

## Land Title Search System

- ☒ Title Number
- ☐ Plan Number
- ☐ Standard Sheet Number
- ☐ Location
- ☐ Identification Number
- ☐ Ownership Name

Result. Total Record(s) found : 1

No	Title No.		
1	017544884		<a href="#">View</a>

TITLE NUMBER : 017544884

Memo Number	Date Made	Date Registered	Memo Description
10386244	1999/10/06	1999/11/11	CAVEAT
10424397	2003/03/24	2004/01/14	MEMORANDUM OF AMENDMENT
10401051	2002/03/06	2002/05/06	WITHDRAWAL OF CAVEAT OR COLLECTORS CAVEAT
10320897	1996/05/10	1996/05/11	SATISFACTION OF CHARGE OR DISCHARGE OF CHARGE
10349613	1998/05/22	1998/06/02	SATISFACTION OF CHARGE OR DISCHARGE OF CHARGE
10399527	2002/02/08	2002/04/02	SATISFACTION OF CHARGE OR DISCHARGE OF CHARGE
10293903	1994/04/08	1994/04/23	MEMORANDUM OF CHARGE
10330126	1996/12/19	1996/12/31	MEMORANDUM OF CHARGE
10328915	1996/11/27	1996/11/30	MEMORANDUM OF CHARGE
10397687	2002/01/28	2002/02/09	MEMORANDUM OF CHARGE
10397688	2002/01/02	2002/02/09	MEMORANDUM OF CHARGE
10397689	2002/01/28	2002/02/09	MEMORANDUM OF CHARGE

Master Info

Owner Info

Map

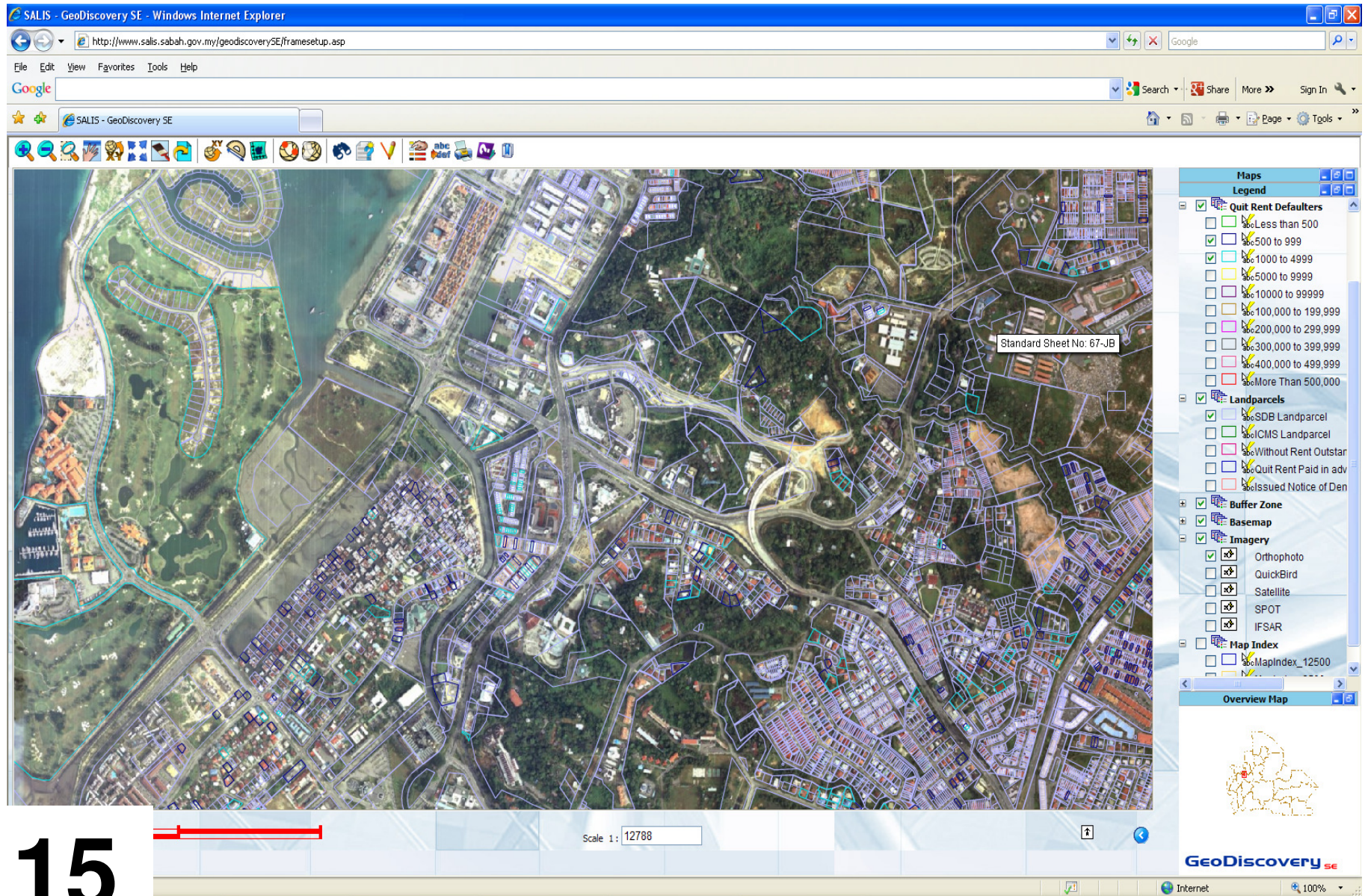
Survey Plan

Dealings Info

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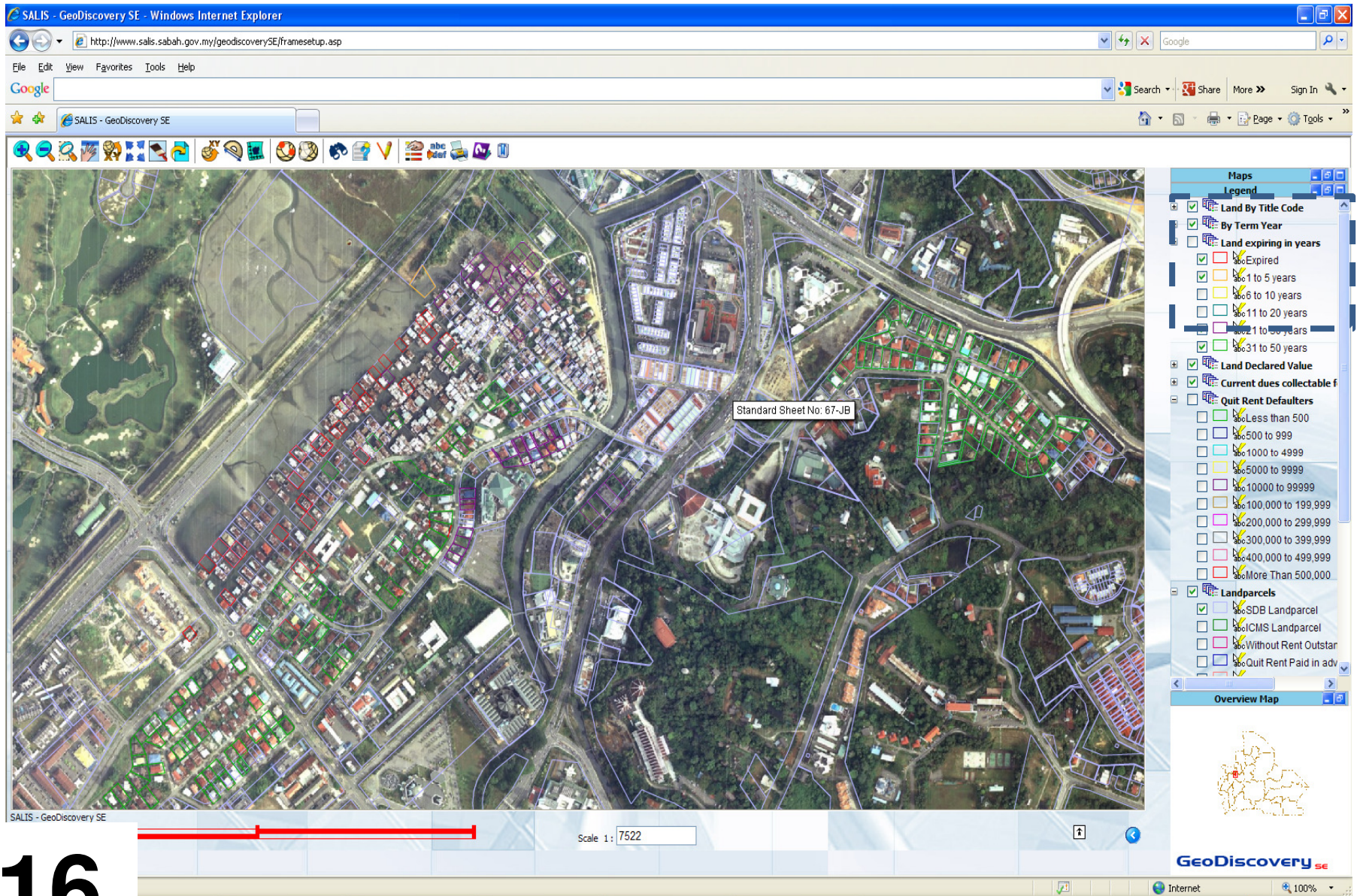


# Land Parcel showing Quit Rent Defaulters





# Land Parcel showing Lease Expiring in years



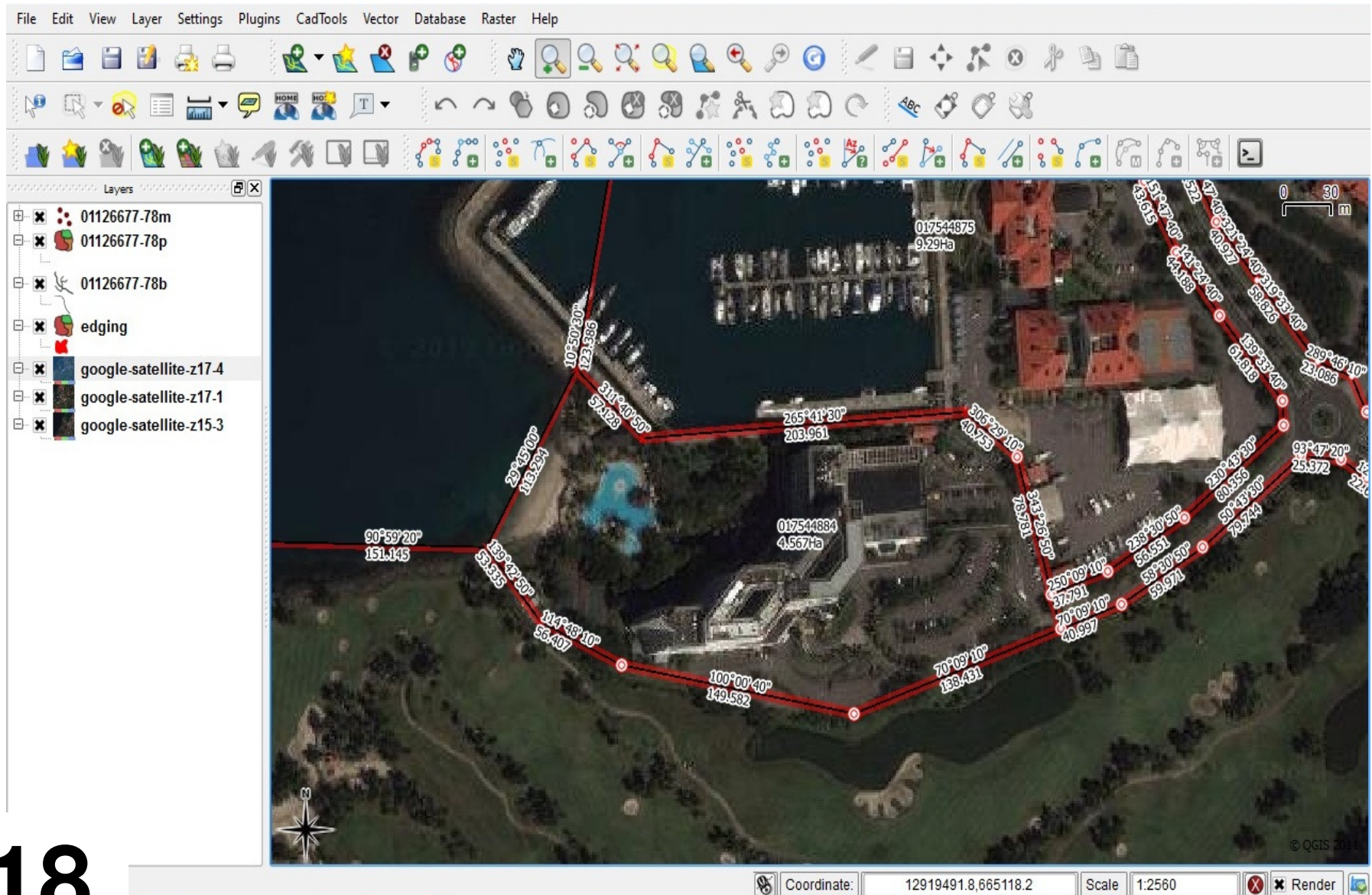


## 17





## Retrieving Bearings & Distances of the Parcel Boundary Lines



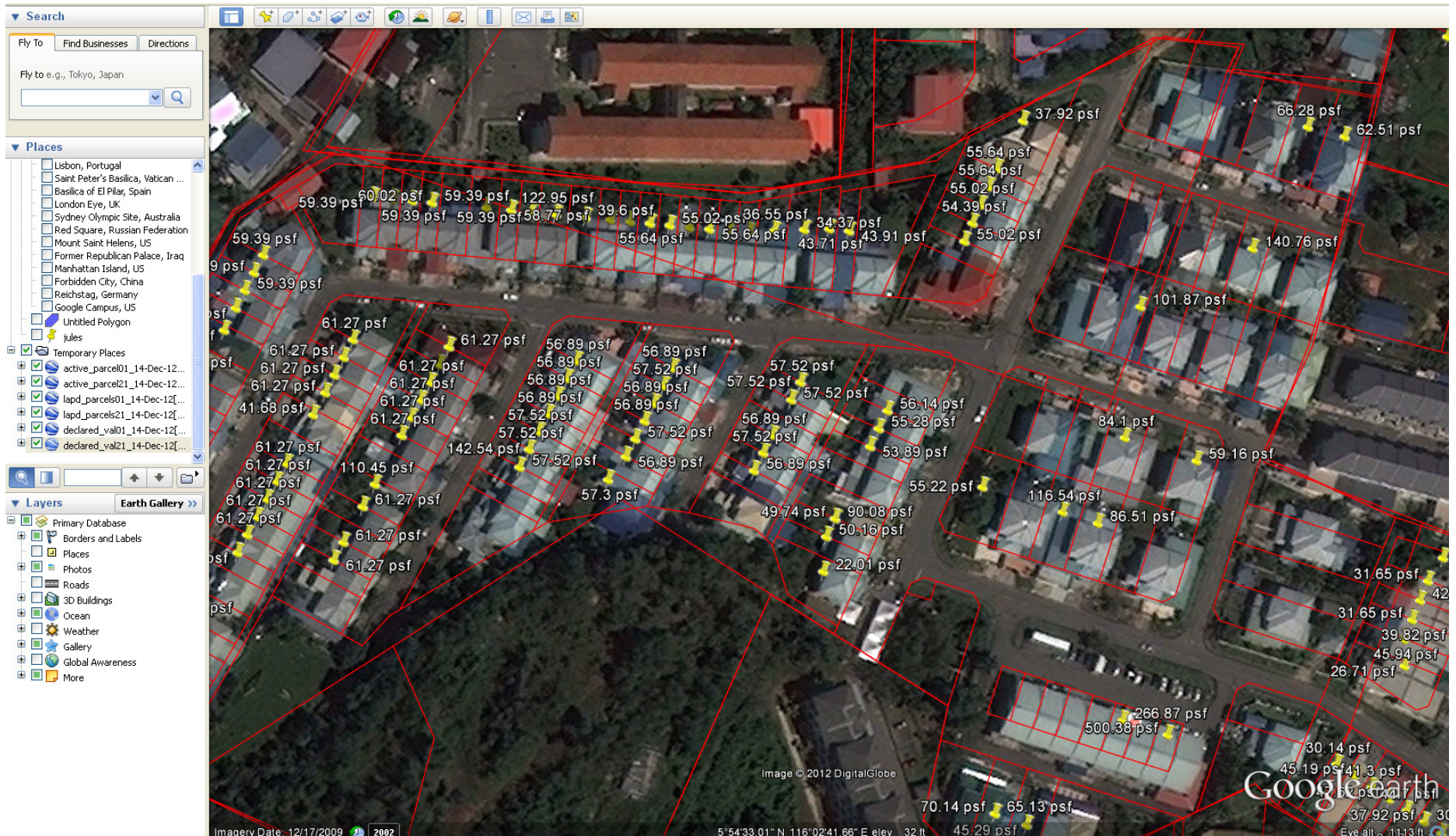


# Integration with Land Value





# Integration with Land Value





# Integration with Acquired Land

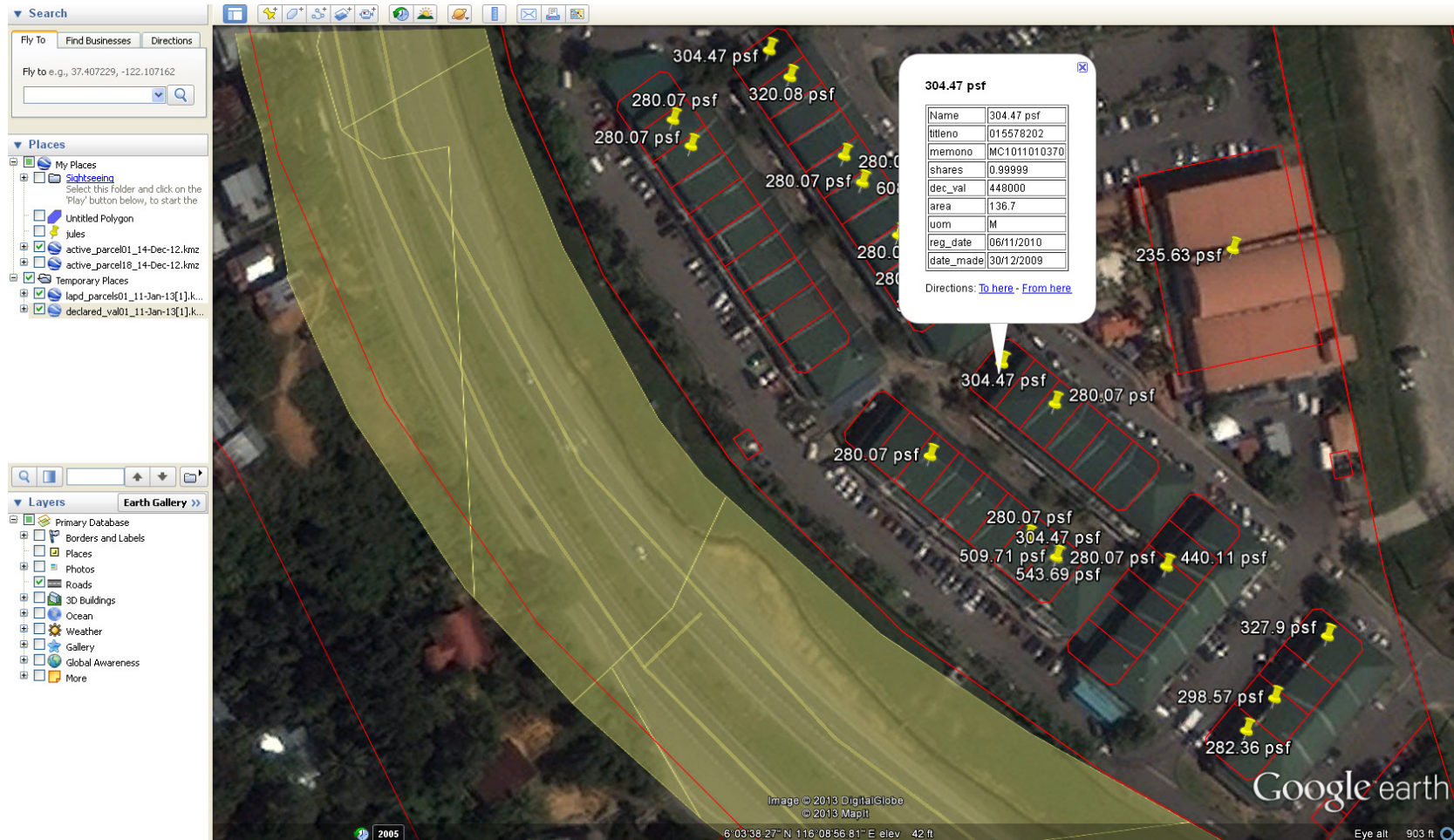
The screenshot displays the Google Earth interface with a satellite map of a coastal area. Red outlines delineate various land parcels. A data table is overlaid on the right side of the map, providing details for a specific land acquisition. The table includes fields such as gid, ls\_ref, proj\_name, proj\_desc, dwg\_ref, prep\_by, parcel\_id, ori\_area, ori\_uom, acq\_area, acq\_uom, category, parcel\_tpy, entry\_by, entry\_date, and district. The left sidebar shows the 'Places' and 'Layers' panels, with 'Places' containing a list of locations and 'Layers' showing various map data layers. The bottom status bar indicates the current coordinates and elevation.

gid	21433
ls_ref	LS_104_3_15 (S)_4
proj_name	PENGAMBILAN TANAH UNTUK KAWASAN PENTERNAKAN KHINZIR ( PIG FARMING AREA) DI KAMPUNG TIMBOK, TELIPOK DAERAH KOTA KINABALU
proj_desc	PENGAMBILAN TANAH
dwg_ref	01125688
prep_by	JABATAN TANAH DAN UKUR
parcel_id	015047113
ori_area	17.975
ori_uom	Ha
acq_area	17.975
acq_uom	Ha
category	SECTION 3
parcel_tpy	Gazette
entry_by	dela
entry_date	28/09/2012
district	01

Image © 2012 TerraMetrics  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
Image © 2012 DigitalGlobe  
6°04'37.28"N 116°10'06.81"E elev. 113 ft  
Google earth  
Eye alt 39983 ft

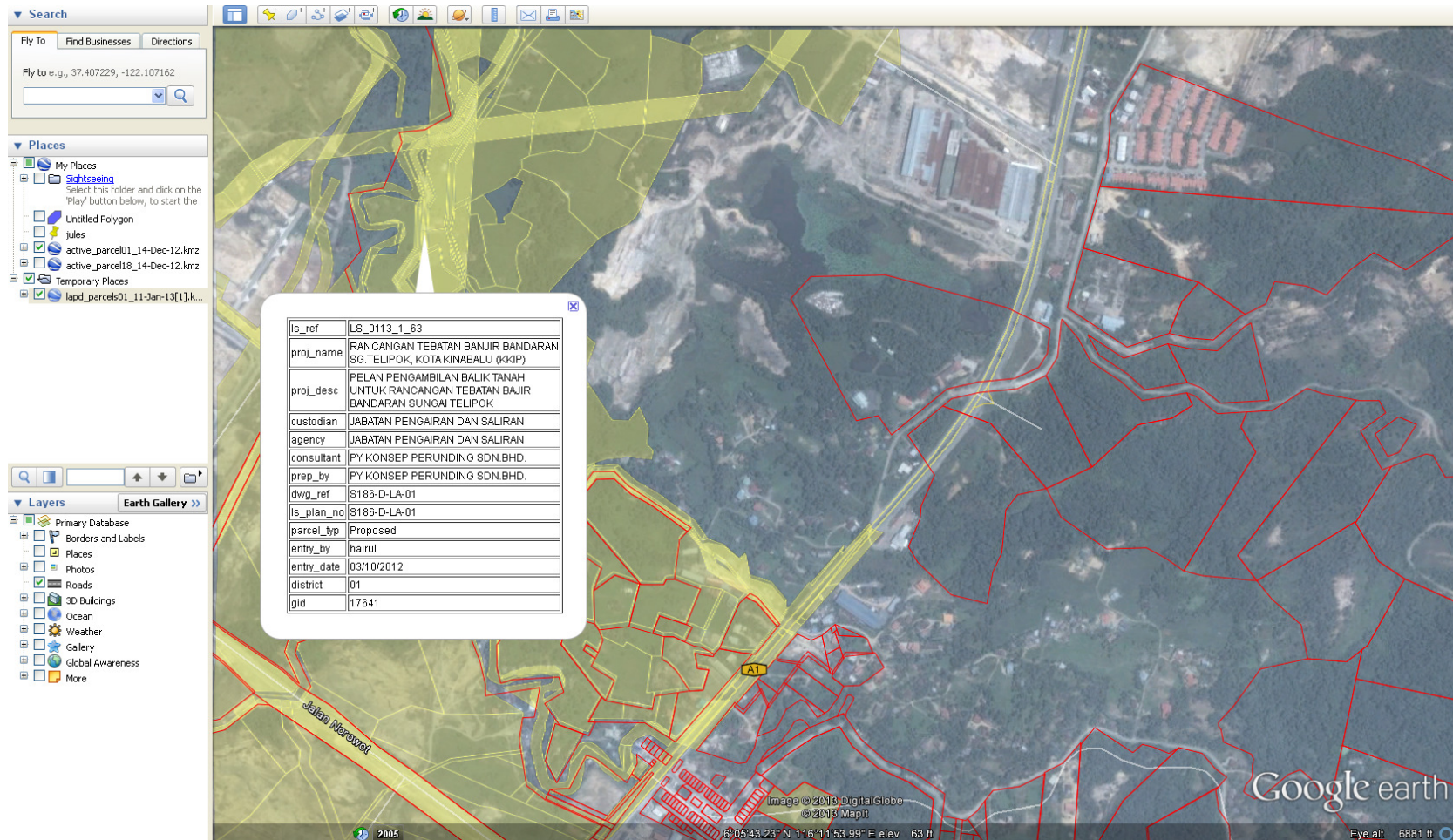


## Integration with Acquired Land





# Integration with Acquired Land





# Integration with Road Acquisition

The screenshot shows the Google Earth interface with a map of a city area. The map is overlaid with red and yellow lines and polygons, representing land acquisition boundaries. A data popup is visible over a yellow area, displaying a table of acquisition data.

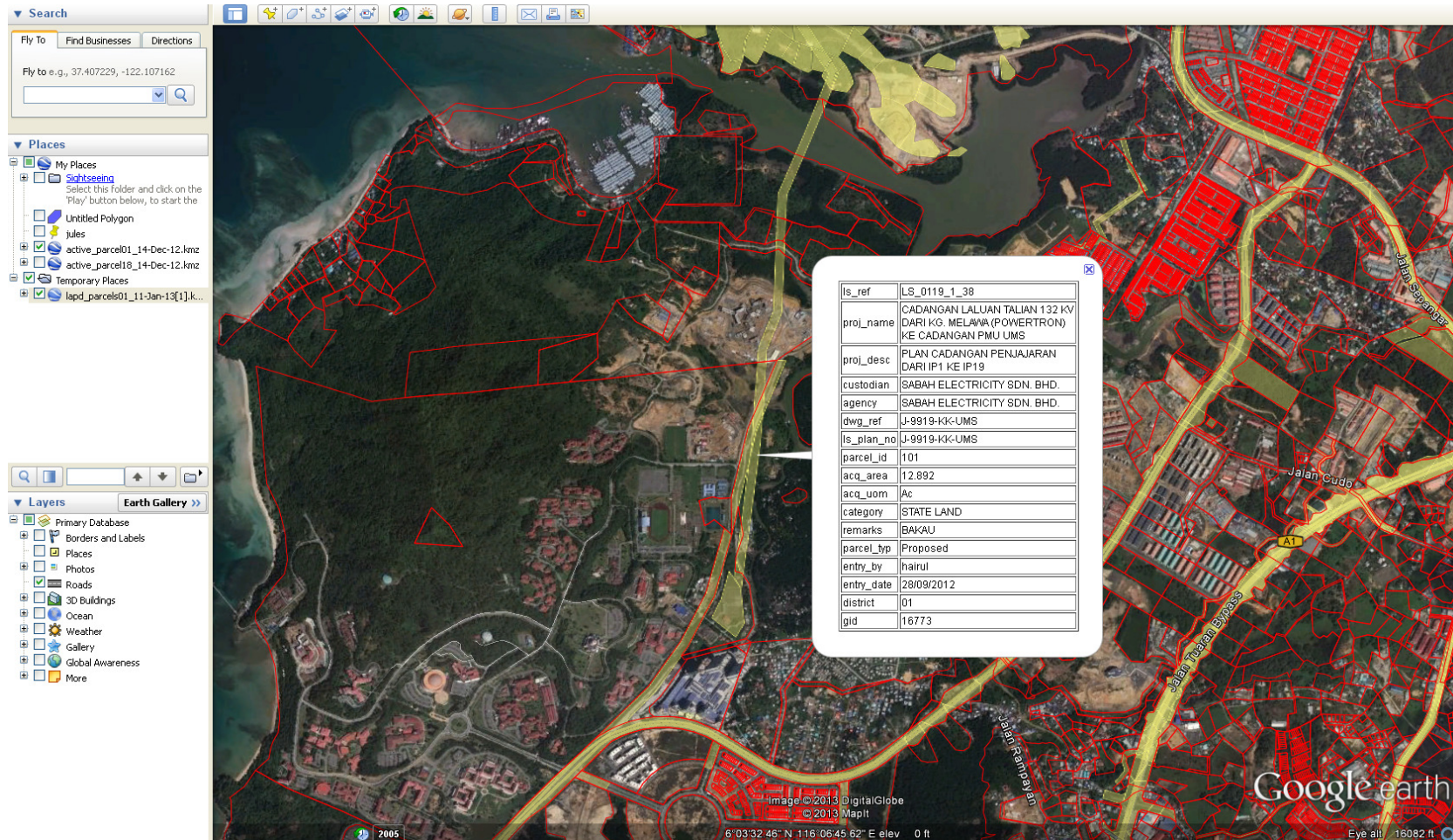
gid	5835
ls_ref	LS_2113_1_27
proj_name	LAND ACQUISITION FOR ROAD BETWEEN KAMPONGS NOSOBAND LUNGAB
dwg_ref	21123928
prep_by	JABATAN TANAH DAN UKUR
parcel_id	213078678
ori_area	2.75
ori_uom	Ac
acq_area	0.27
acq_uom	Ac
category	SECTION 4 & 5
parcel_typ	Gazette
entry_by	hairul
entry_date	06/08/2012
district	21

Google Earth interface elements visible:

- Search bar: Fly To, Find Businesses, Directions. Fly to e.g., 37 25' 19.1"N, 122 05' 06"W
- Places panel: My Places, Sightseeing, Untitled Polygon, Jules, active\_parcel01\_14-Dec-12.kmz, active\_parcel18\_14-Dec-12.kmz, Temporary Places, lapd\_parcel01\_20-Dec-12.kmz, lapd\_parcel21\_20-Dec-12.kmz, active\_parcel21\_20-Dec-12.kmz
- Layers panel: Primary Database, Borders and Labels, Places, Photos, Roads, 3D Buildings, Ocean, Weather, Gallery, Global Awareness, More
- Earth Gallery button
- Image copyright: 2012 DigitalGlobe
- Coordinates: 5°56'26.43" N 116°05'21.71" E elev 29 ft
- Eye alt: 15035 ft



# Integration with Land Acquisition Parcels



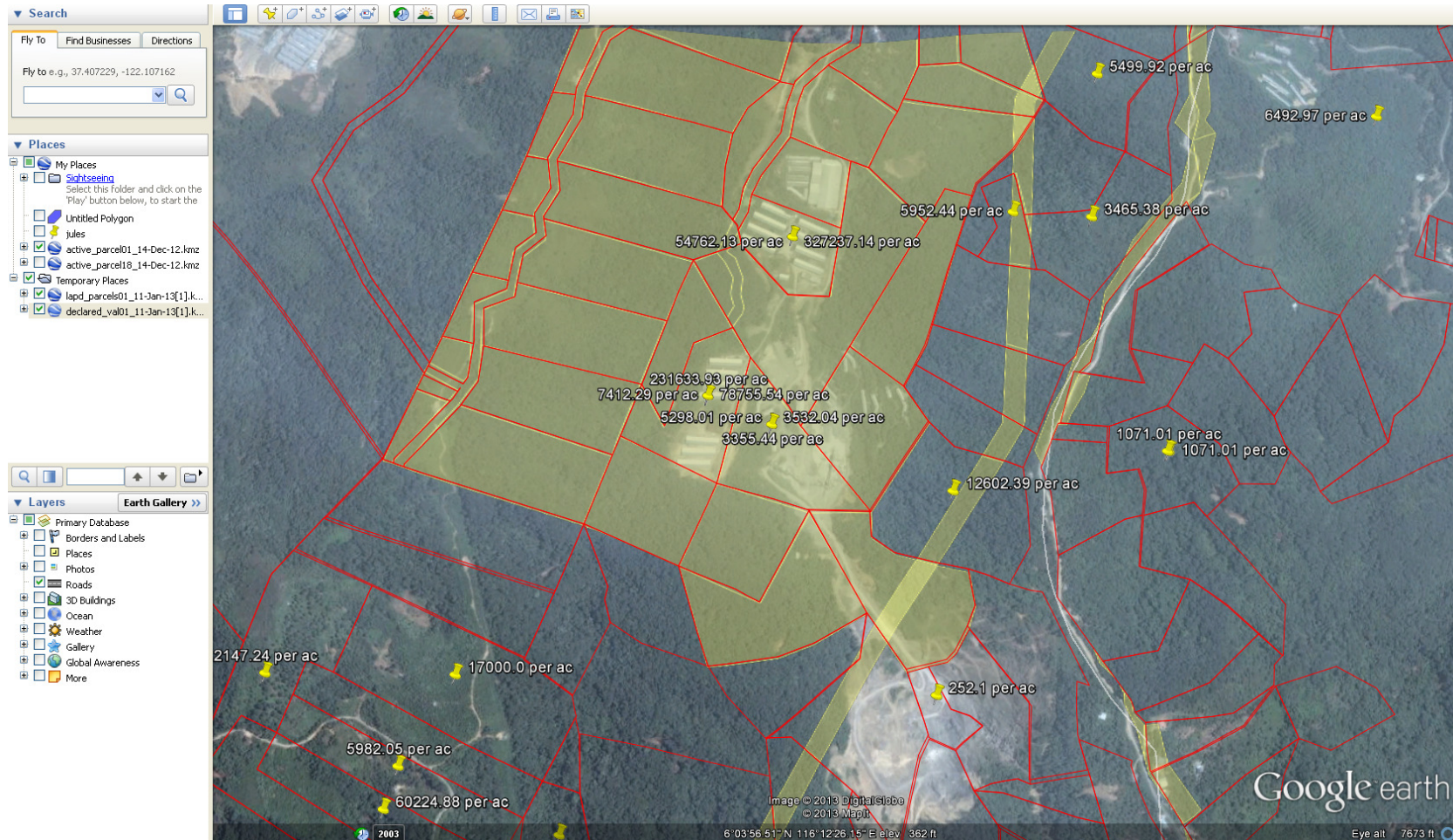
The screenshot shows a Google Earth interface with a satellite map of a coastal area. Red outlines represent land acquisition parcels. A data popup window is open, displaying the following information:

ls_ref	LS_0119_1_38
proj_name	CADANGAN LALUAN TALIAN 132 KV DARI KG. MELAWA (POWERTRON) KE CADANGAN PMU UMS
proj_desc	PLAN CADANGAN PENJAJARAN DARI IP1 KE IP19
custodian	SABAH ELECTRICITY SDN. BHD.
agency	SABAH ELECTRICITY SDN. BHD.
dwg_ref	J-9919-KK-UMS
ls_plan_no	J-9919-KK-UMS
parcel_id	101
acq_area	12.892
acq_uom	Ac
category	STATE LAND
remarks	BAKAU
parcel_typ	Proposed
entry_by	hairul
entry_date	28/09/2012
district	01
gid	16773

The map interface includes a search bar at the top left, a 'Places' panel on the left, and a 'Layers' panel at the bottom left. The 'Layers' panel shows a 'Primary Database' layer selected. The map shows a coastal area with a road labeled 'Jalan Cudo' and a river labeled 'Jalan Tuaran Express'. The Google Earth logo is visible in the bottom right corner.

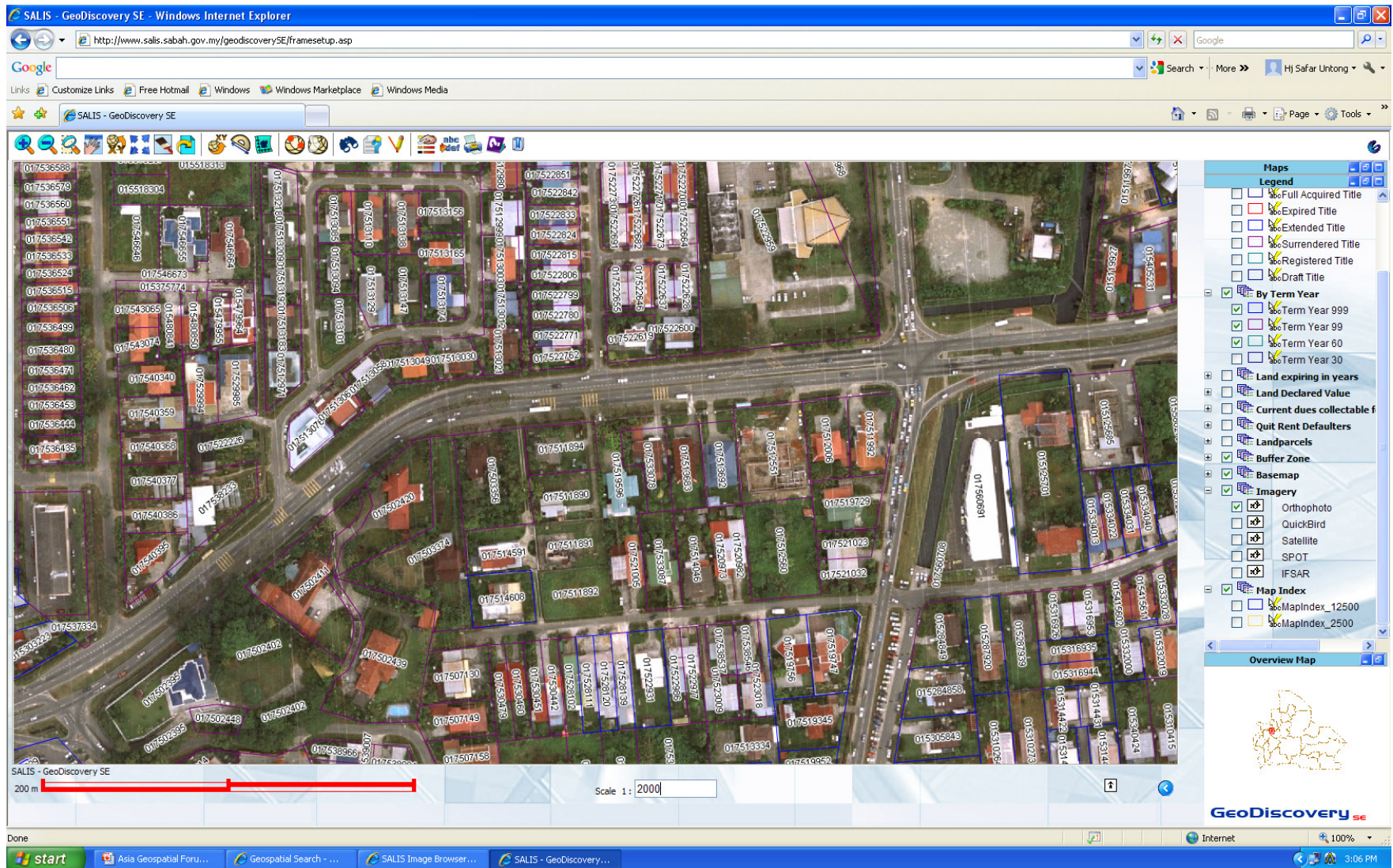


# Integration with Land Acquisition Parcels



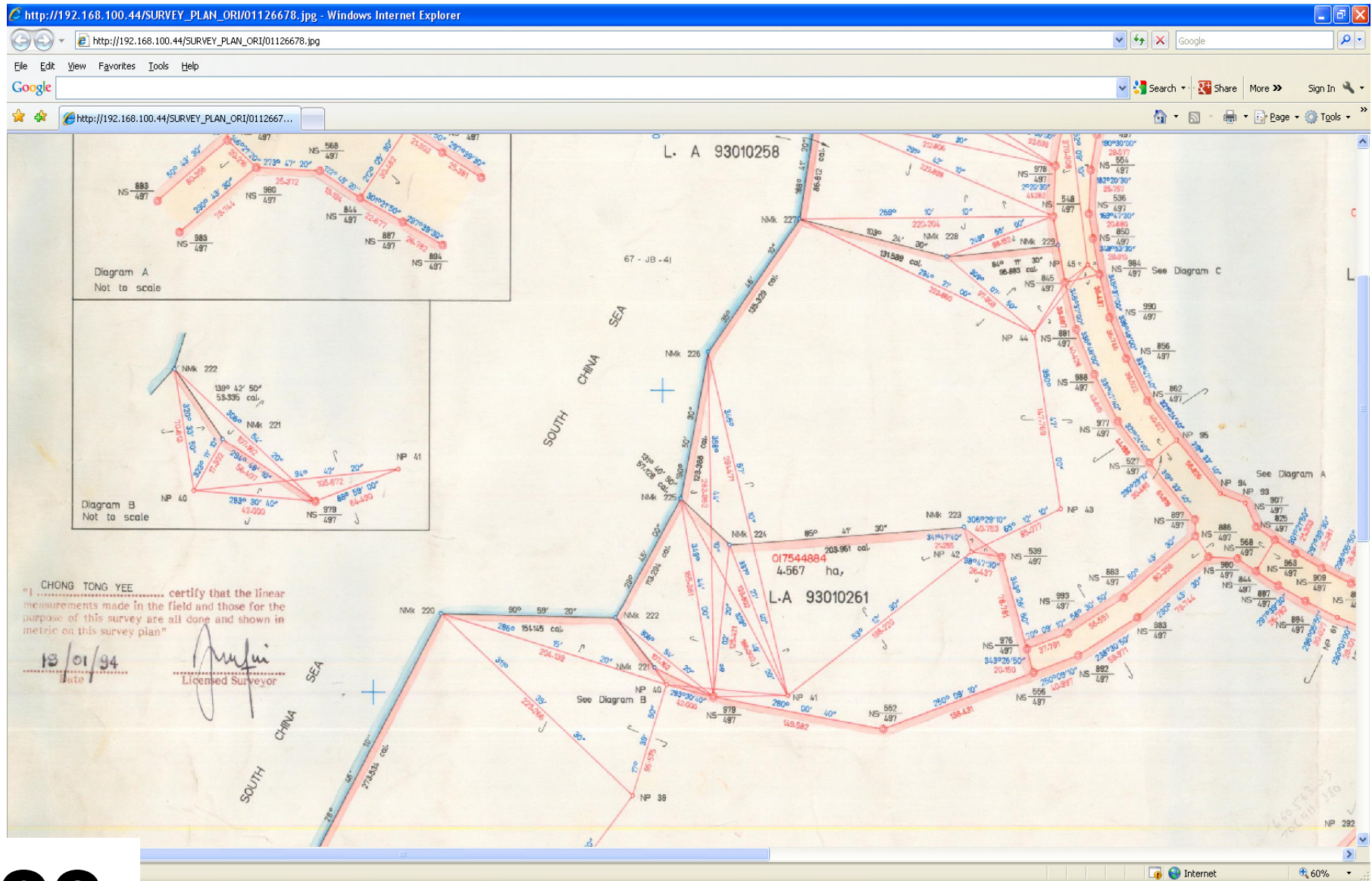


# Land Parcel showing Lease Period in years





# Retrieving Scan Image of The Survey Plans

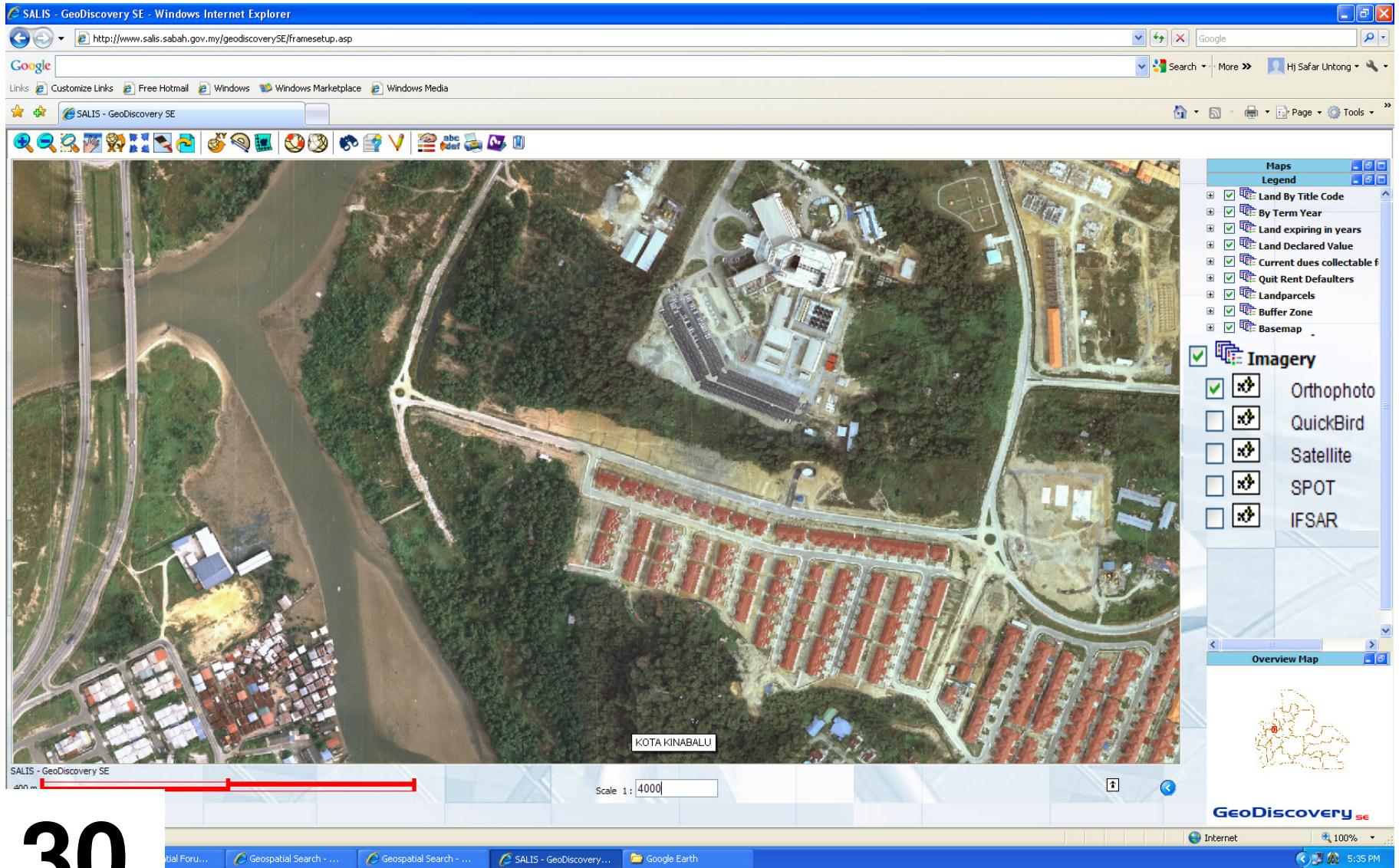




# Sources of Data for Topography & Man Made Features

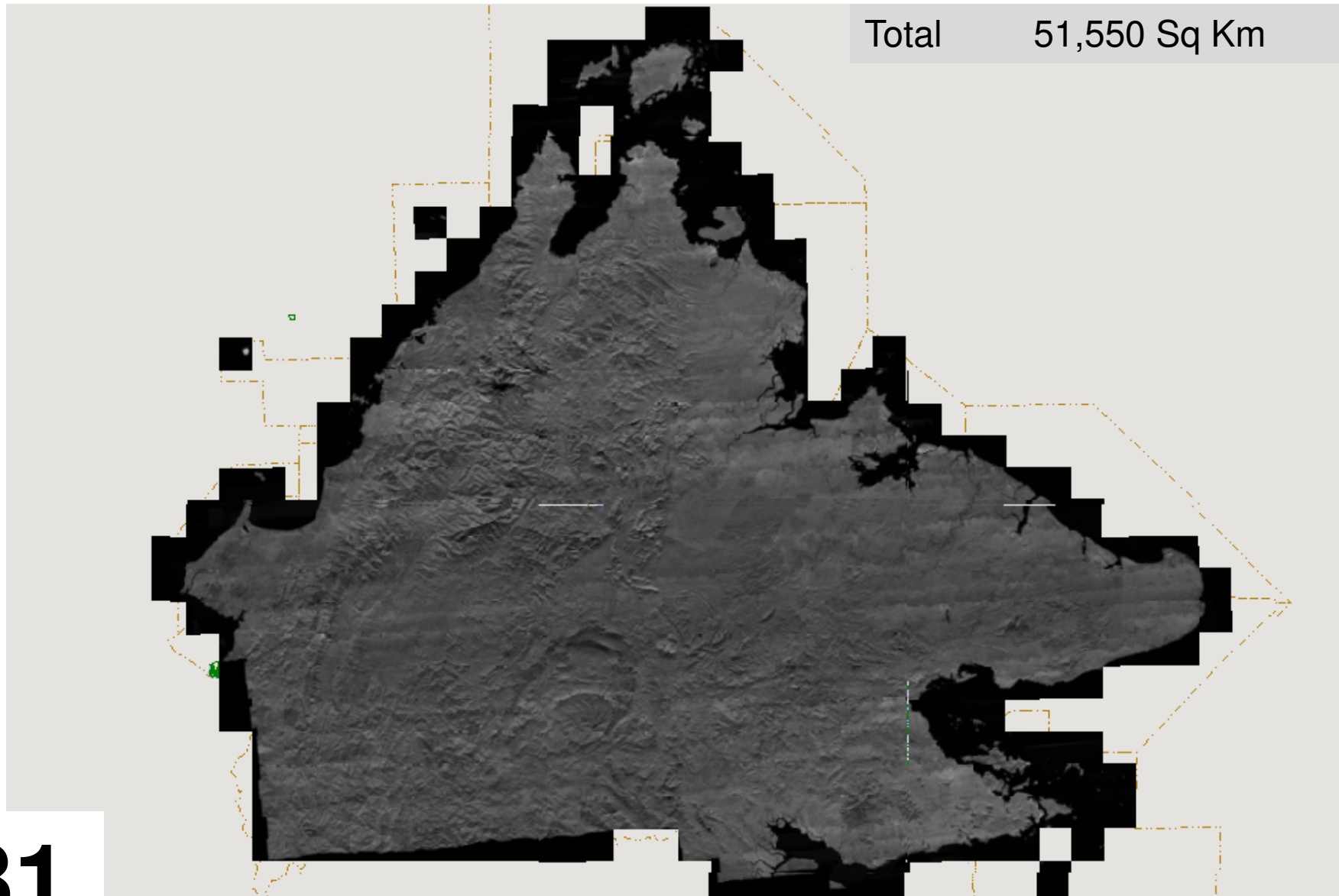


# Orthophoto





## DIGITAL SABAH PROJECT COVERAGE 2013



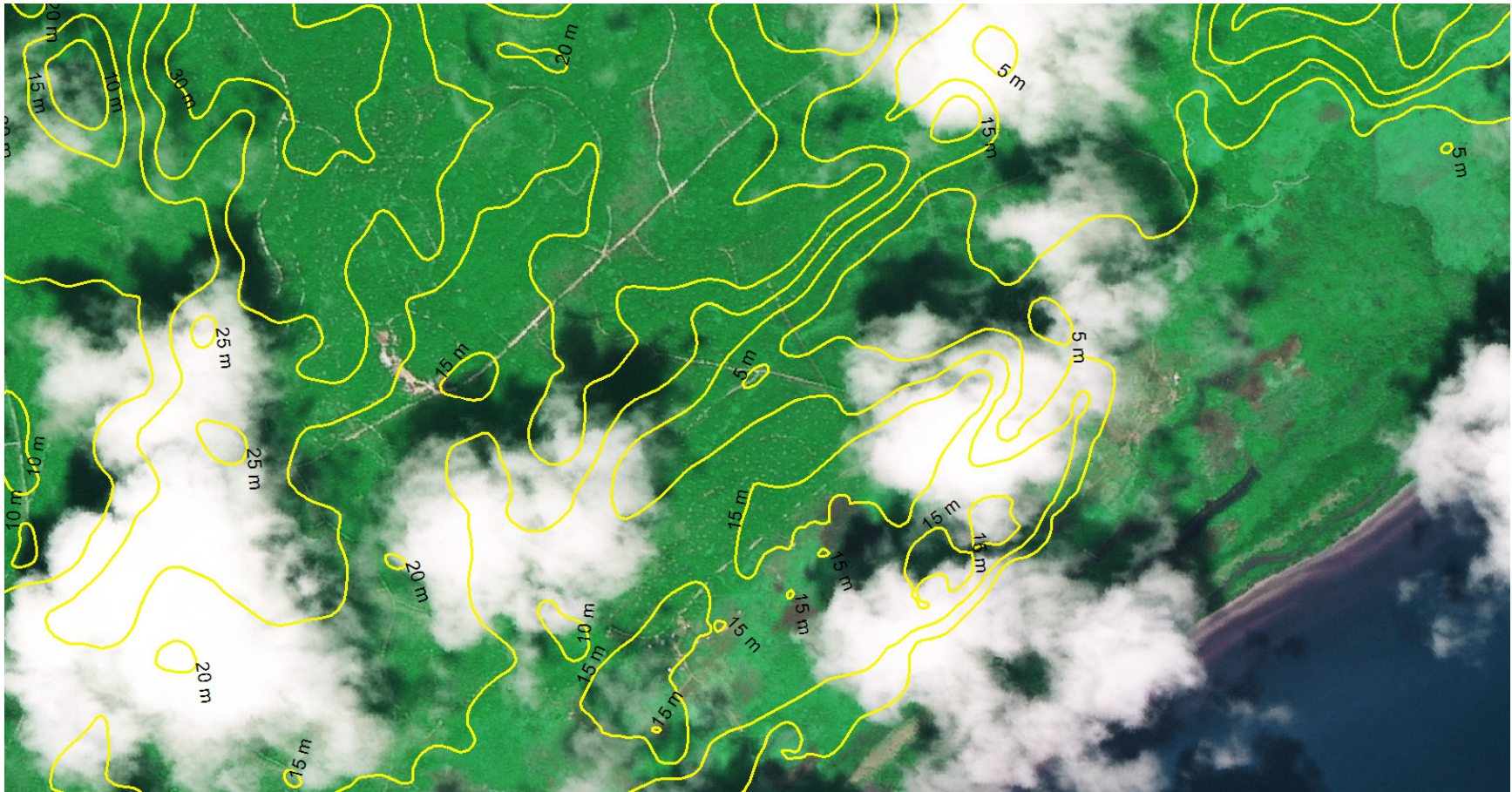


## Worldview 2 High Resolution Image





## 5 m Contour from SPOT 5 (2011)





# Development of Multi Purpose Cadastre

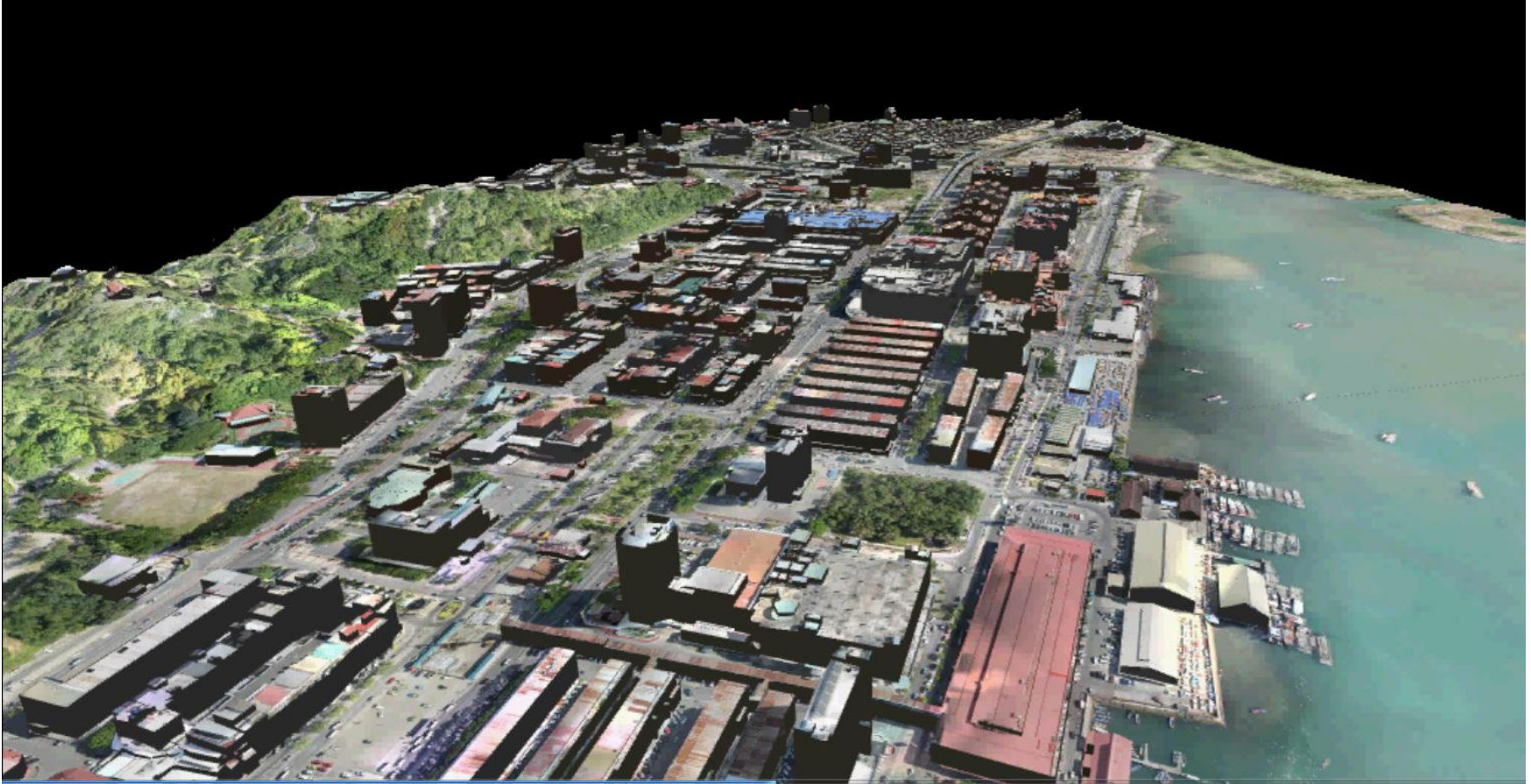


# 3D City Model Kota Kinabalu



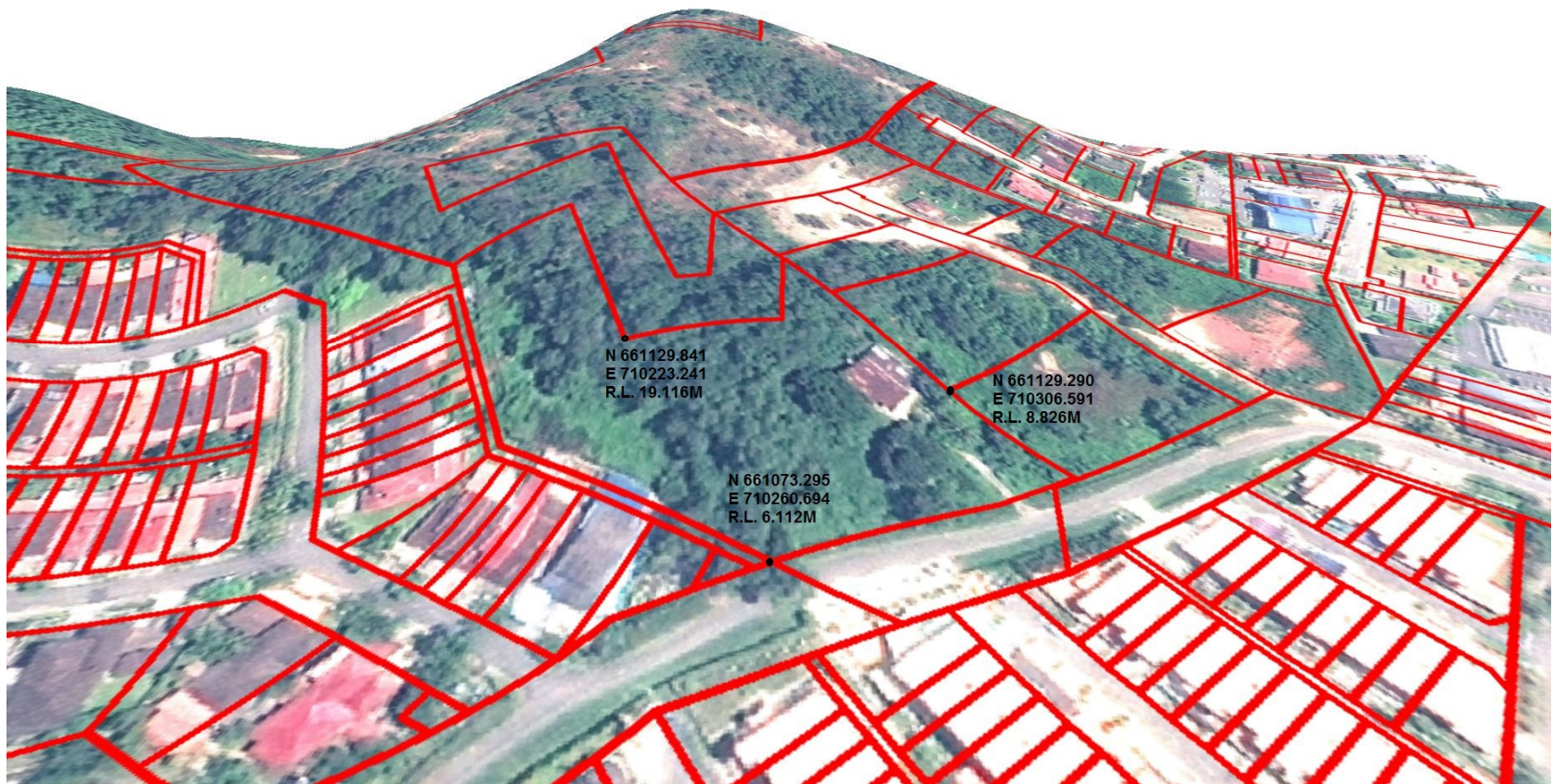


# Kota Kinabalu City 3D Fly Through





# Seamless 3D model





# Land Parcel on 3D model



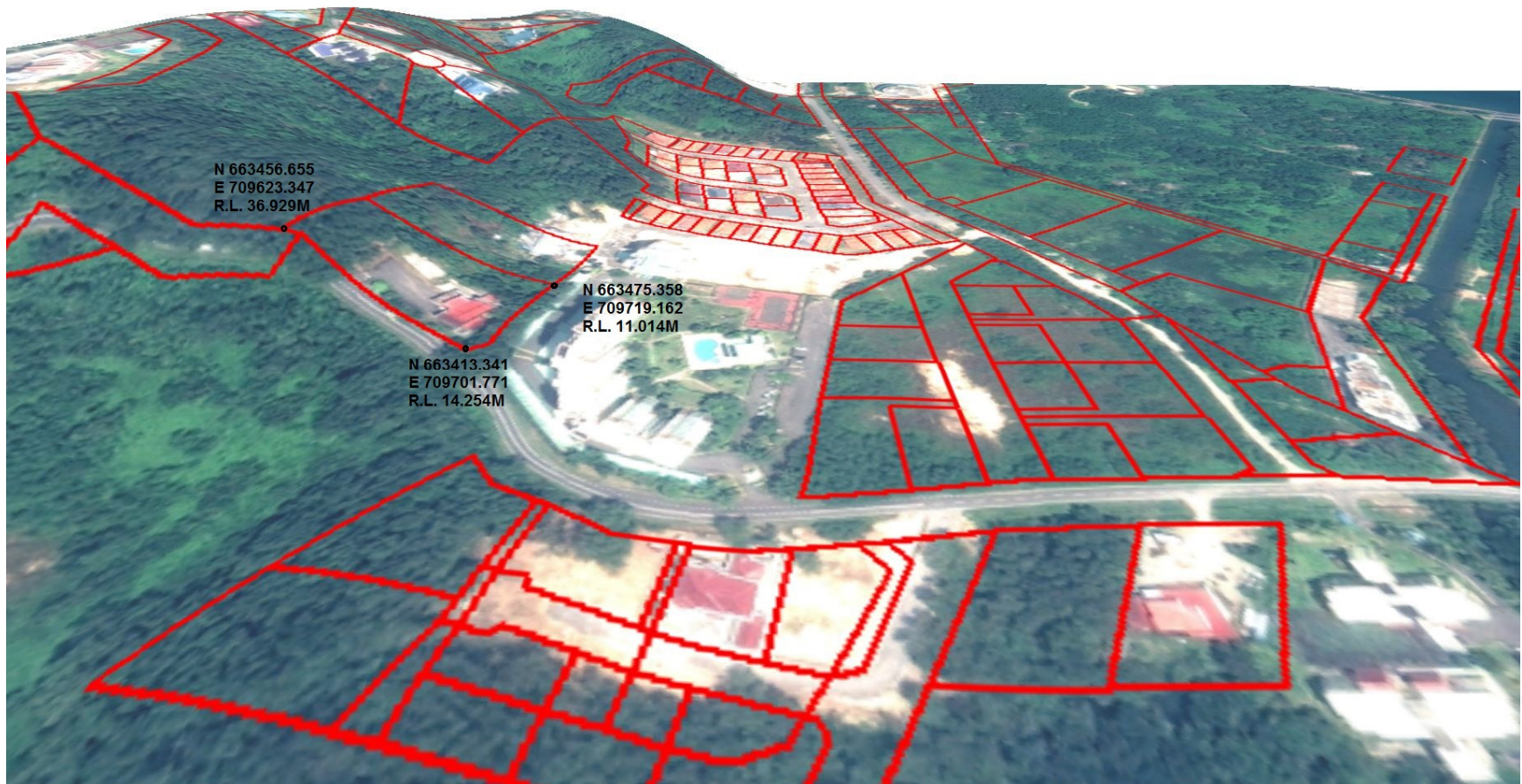


# Land Parcel on 3D model



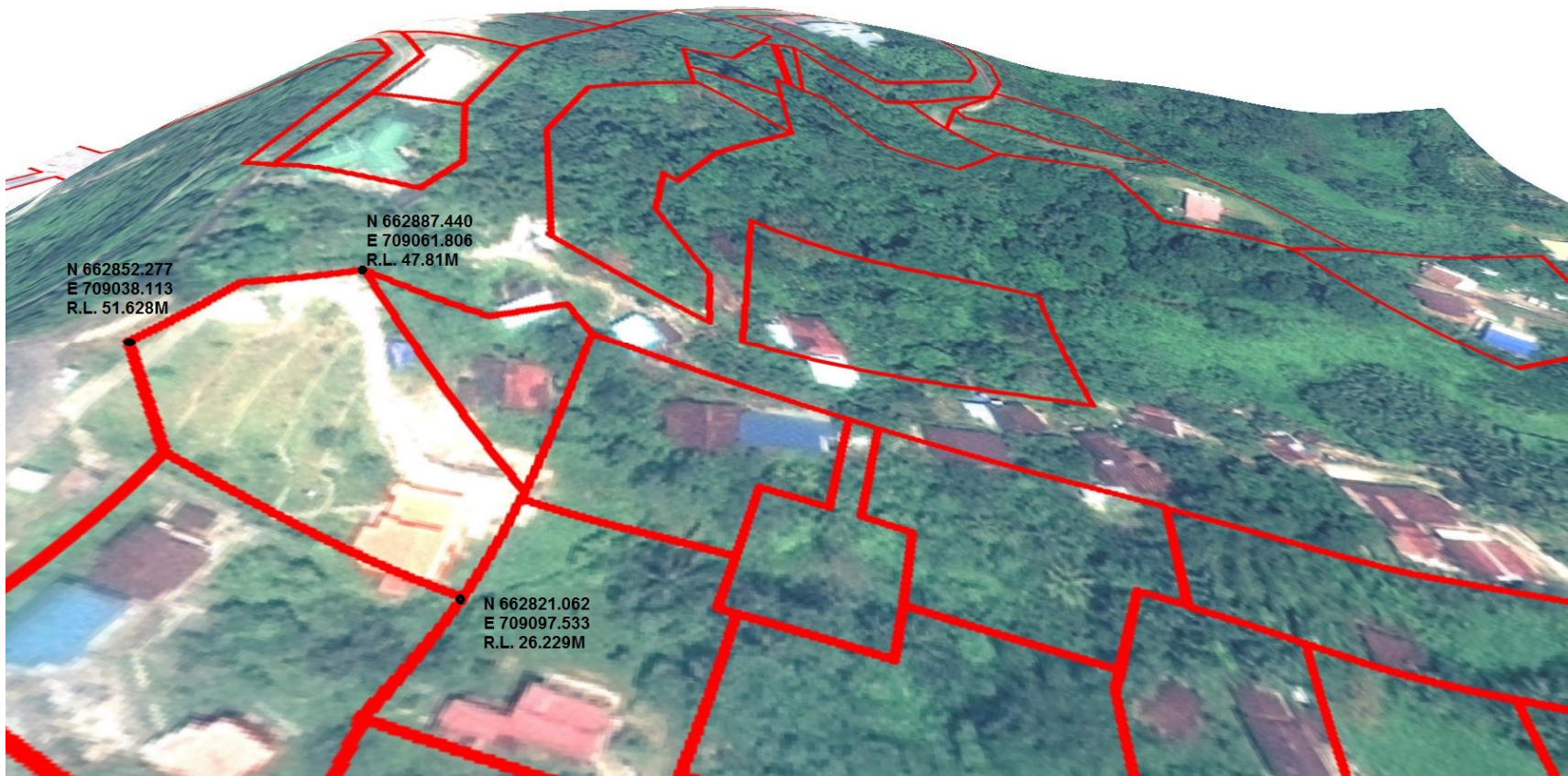


# Land Parcel on 3D model





# Land Parcel on 3D model



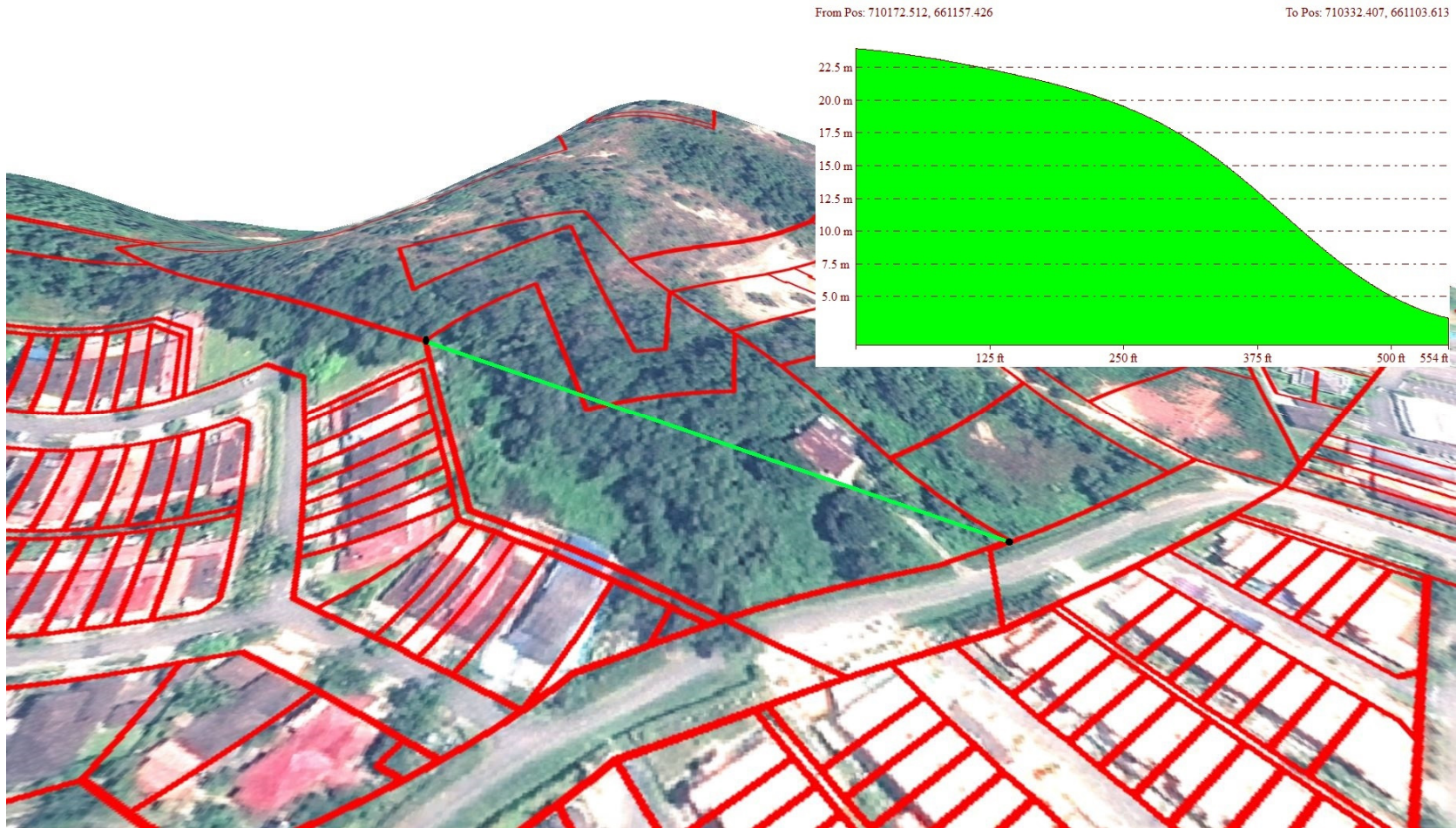


# Cross Section - Parcel Profile



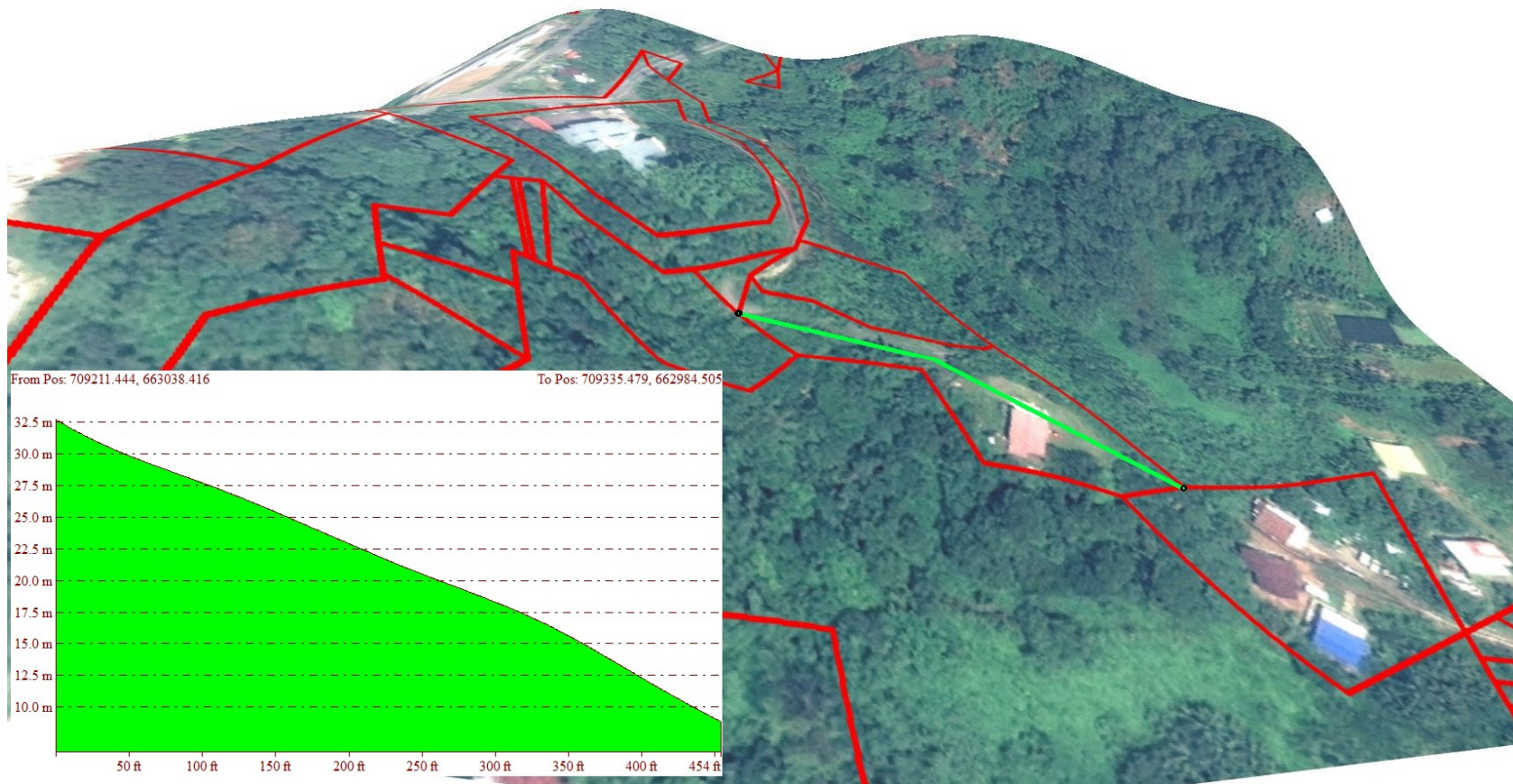


# Cross Section - Parcel Profile



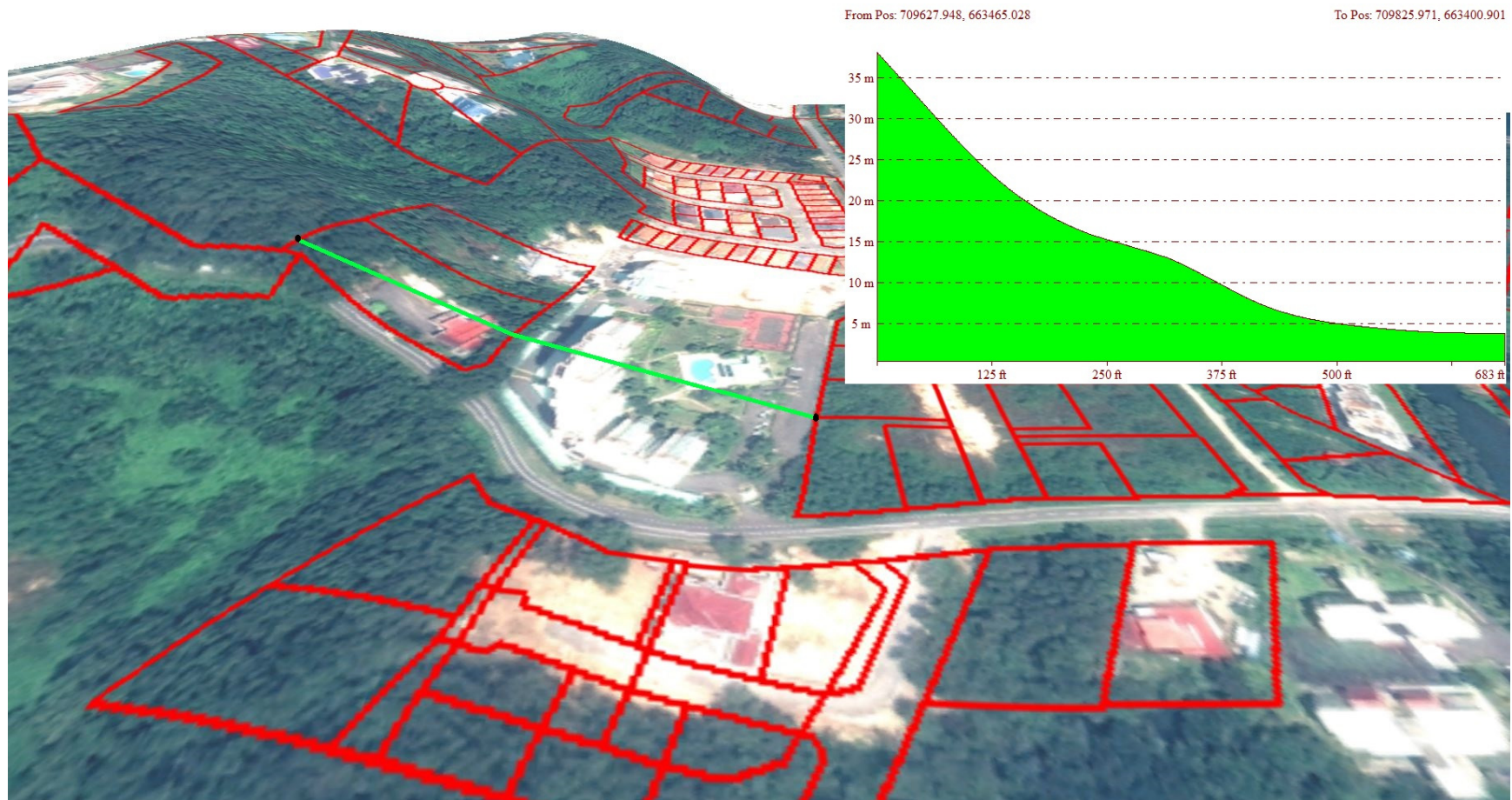


# Cross Section - Parcel Profile



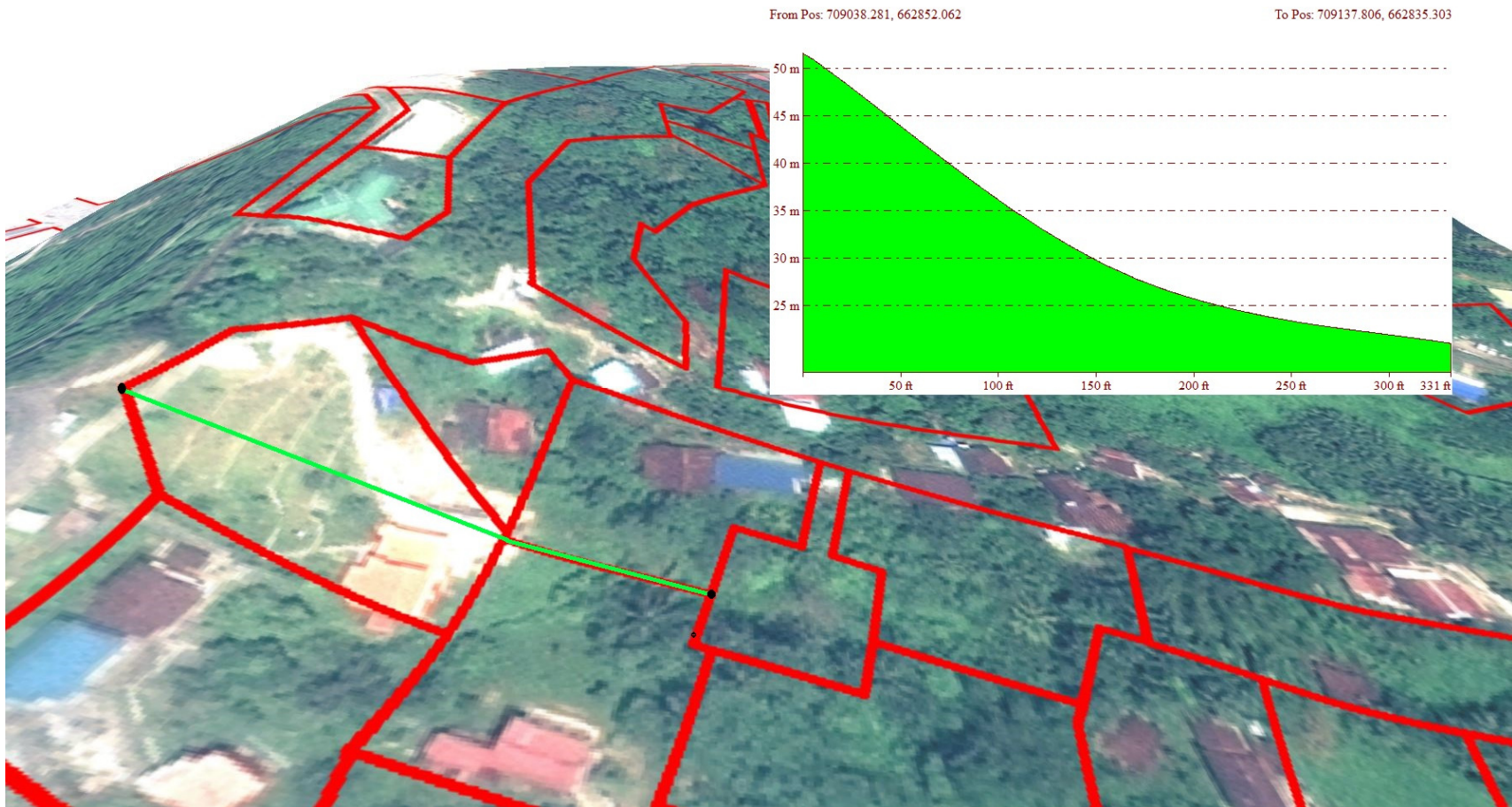


# Cross Section - Parcel Profile





# Cross Section - Parcel Profile





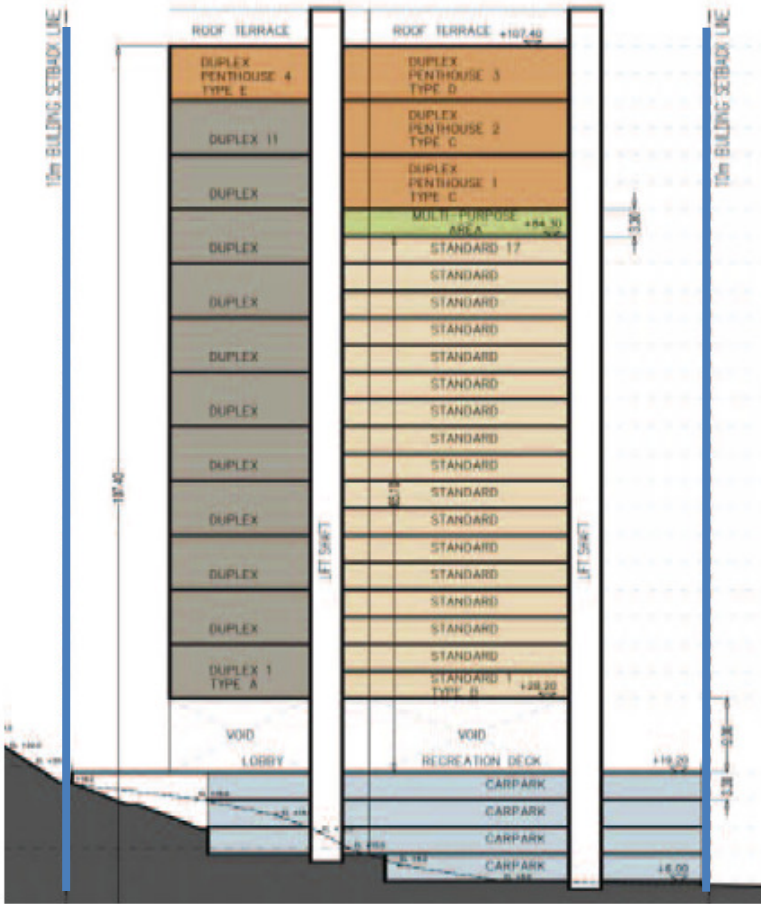
## Artist Impression – Northern & Southern Facade



*All artist impressions and concept images are for illustrative purposes only and may subject to changes*



# Building Cross Section



**TOTAL GFA 3.572ft<sup>2</sup>**





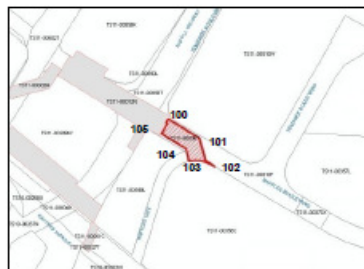
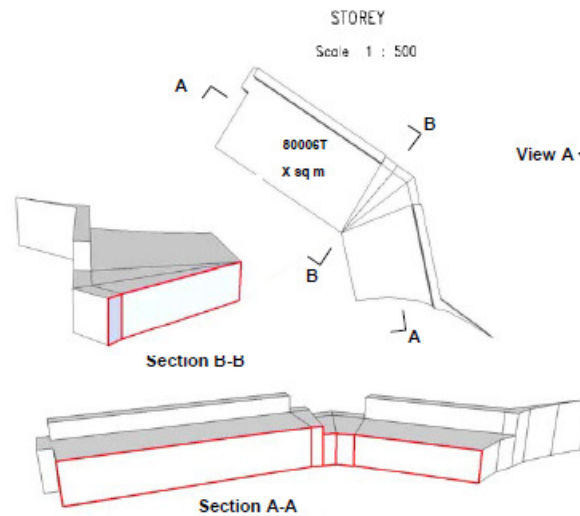
Type B	Living	Balcony
Level 1	2,450ft <sup>2</sup>	900ft <sup>2</sup>
TOTAL GFA		3,350ft <sup>2</sup>



# Survey Plan

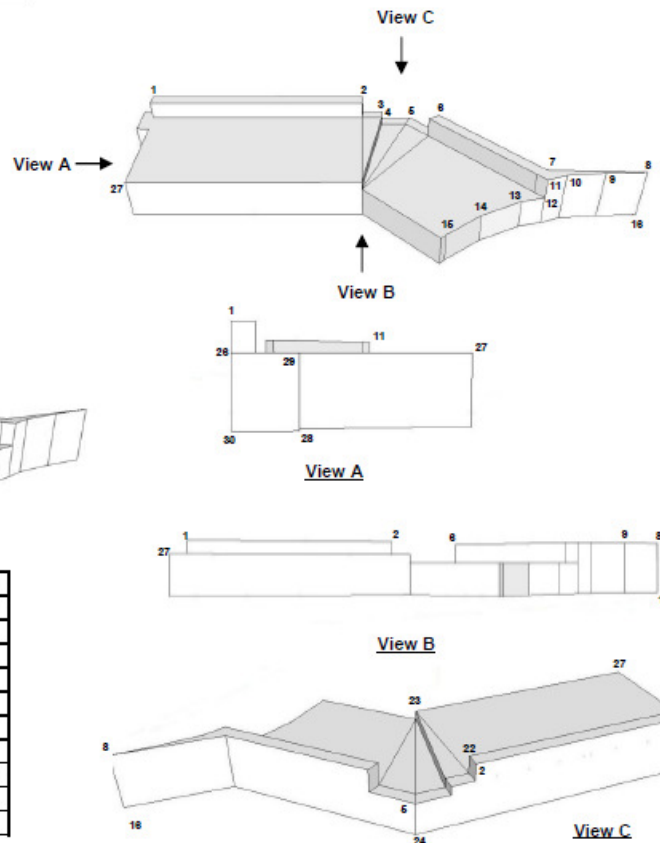
Lot No.	On Plan	Remarks
80000T		Allotted For Subterranean Lot

Building No.	On Lot	Storey	Area (sq m)	Volume (cubic m)
	80000T	Pedestrian Underpass	1603.0	XYZ



Ground information

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



	Northin	Eastin	RL
1	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

RL is based on Survey Department Height Datum



## Concluding Remarks

- **Seamless 2D Cadastre – Completed!**
- **Integration spatial data (land parcels) with land title information's – Completed!**
- Upgrading Z value: from 2.5m SPOT5 images to at least 1m or sub metre images (using digital aerial photo, high resolution satellite images, UAV).
- Progressing into seamless web-based 3D Cadastre
- Multi-purpose cadastre by end of 2014

? & A

THANK YOU