Pictometry GIS Uploader and Google Earth Overlays examples in Airport Studies (LAX)

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Engineering & Facilities Management Division (LAWA - EFMD)
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Los Angeles World Airports

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The GIS section of Los Angeles World Airports (LAWA) Engineering and Facilities Management Division (EFMD) is experimenting with the use of **Pictometry Online (POL)** and **Google Earth Overlays** in Airport GIS studies.

This presentation will feature some aspects of the GIS functionality in both applications.

Because of time constraint, I will not be getting into technical details on “how to” procedures, but if you are interested, I will be glad to show you after the presentation.

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Part One: Pictometry and GIS Uploader

As part of the **LAR-IAC** (**L**os **A**ngeles **R**egion **I**magery **A**cquisition **C**onsortium) Program, **LAWA** is currently experimenting with the new oblique imagery (Pictometry) defined by the company as follow:

Intelligent Imagery

Pictometry captures two types of imagery for every square foot of an area, **oblique** and **vertical**.

The innovative oblique images -- captured at an angle -- reveal the world from a more natural perspective, so objects are easier to recognize and interpret. With resolutions set as high as **3-inch** Ground Sample Distance (GSD), you can see all in amazing detail and view every feature, structure and parcel from **North**, **South**, **East**, **West** or in **Ortho** and even create a **3D Roof Model** as well as **extract** any part of an **image**.

When you layer GIS information on top of such meticulous imagery, you turn data into knowledge.

Easier to understand than traditional aerial and satellite images

Every pixel is **geo-referenced**

Meets a rigorous quality-control check

Provides greater detail with higher resolution and **360-degree** views

This part will focus on the use of the **Pictometry GIS Uploader** as a means to display accurate oblique views of Airport **GIS layers** and their rendering, and on the use of the built-in **Query Tool** and **Search Tool**. We will briefly mention the **Pictometry plugin** for **ArcGIS Desktop**

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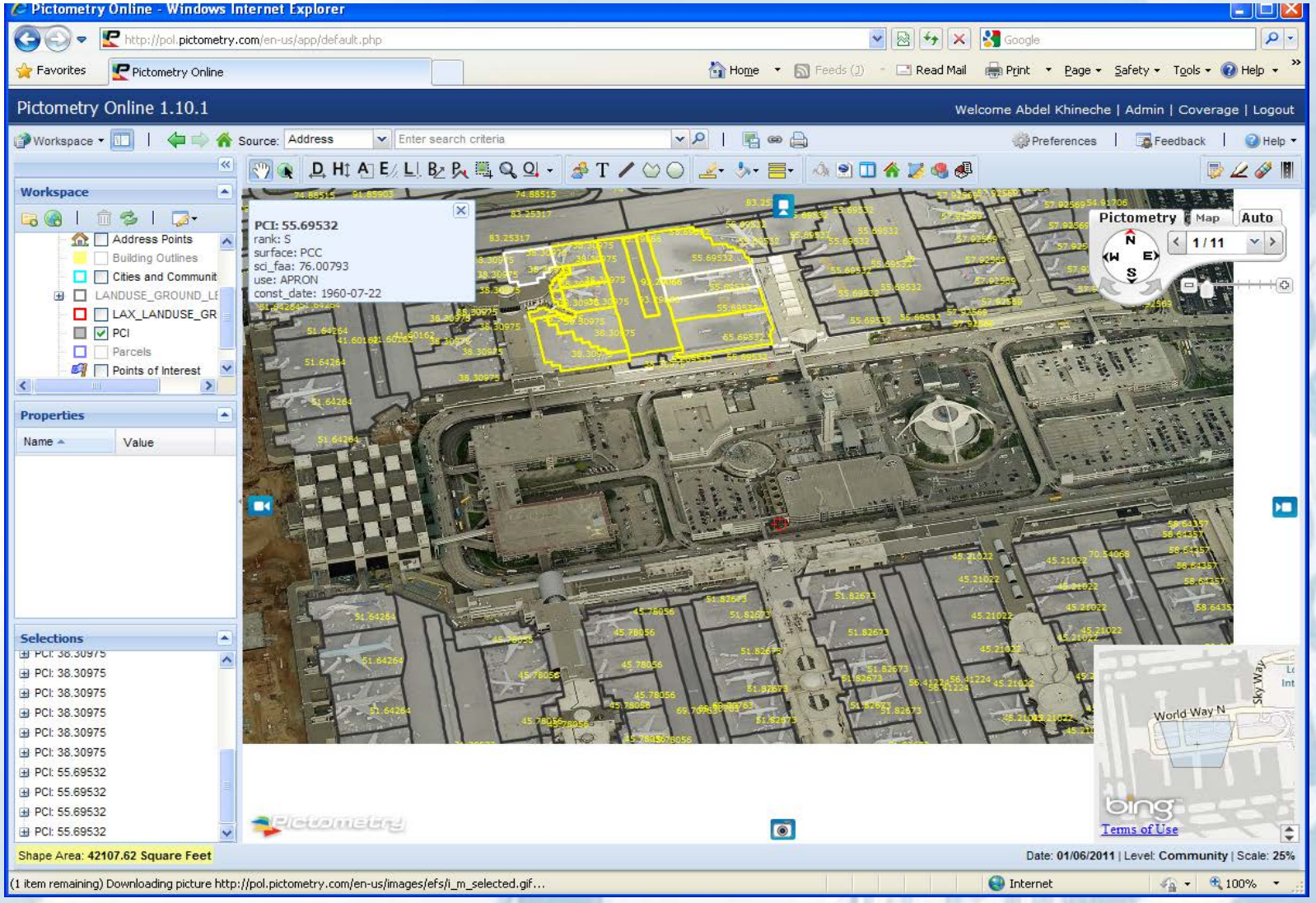
Pictometry: overview - GIS overlay of PCI (Section Pavement Condition Index) value in Central Terminal Apron area


Pictometry Online - Windows Internet Explorer
http://pol.pictometry.com/en-us/app/default.php
Pictometry Online 1.10.1
Welcome Abdel Khineche | Admin | Coverage | Logout
Workspace
Source: Address
Enter search criteria
Preferences
Feedback
Help
Workspace
Address Points
Building Outlines
Cities and Communit
LANDUSE_GROUND_LE
LAX_LANDUSE_GR
PCI
Parcels
Points of Interest
Properties
Name
Value
Selections
PCI: 38.30975
PCI: 55.69532
PCI: 55.69532
PCI: 55.69532

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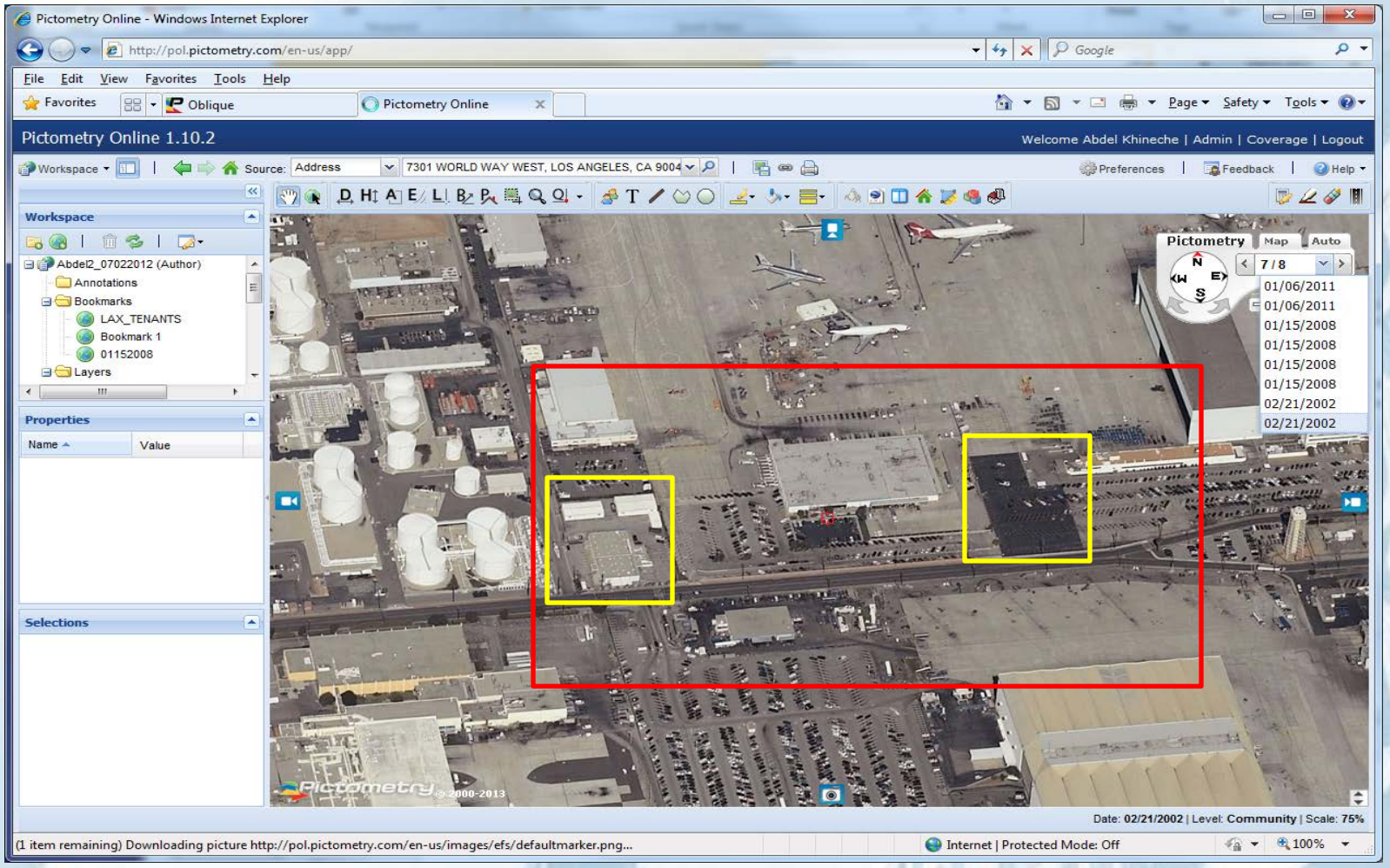
Pictometry: Historical Oblique Imagery - Monitoring Changes in Airports

One of the most valuable features of Pictometry is the ability to monitor changes in Airports through historical imagery (**LAX 02/21/2002 - World Way West straight**).



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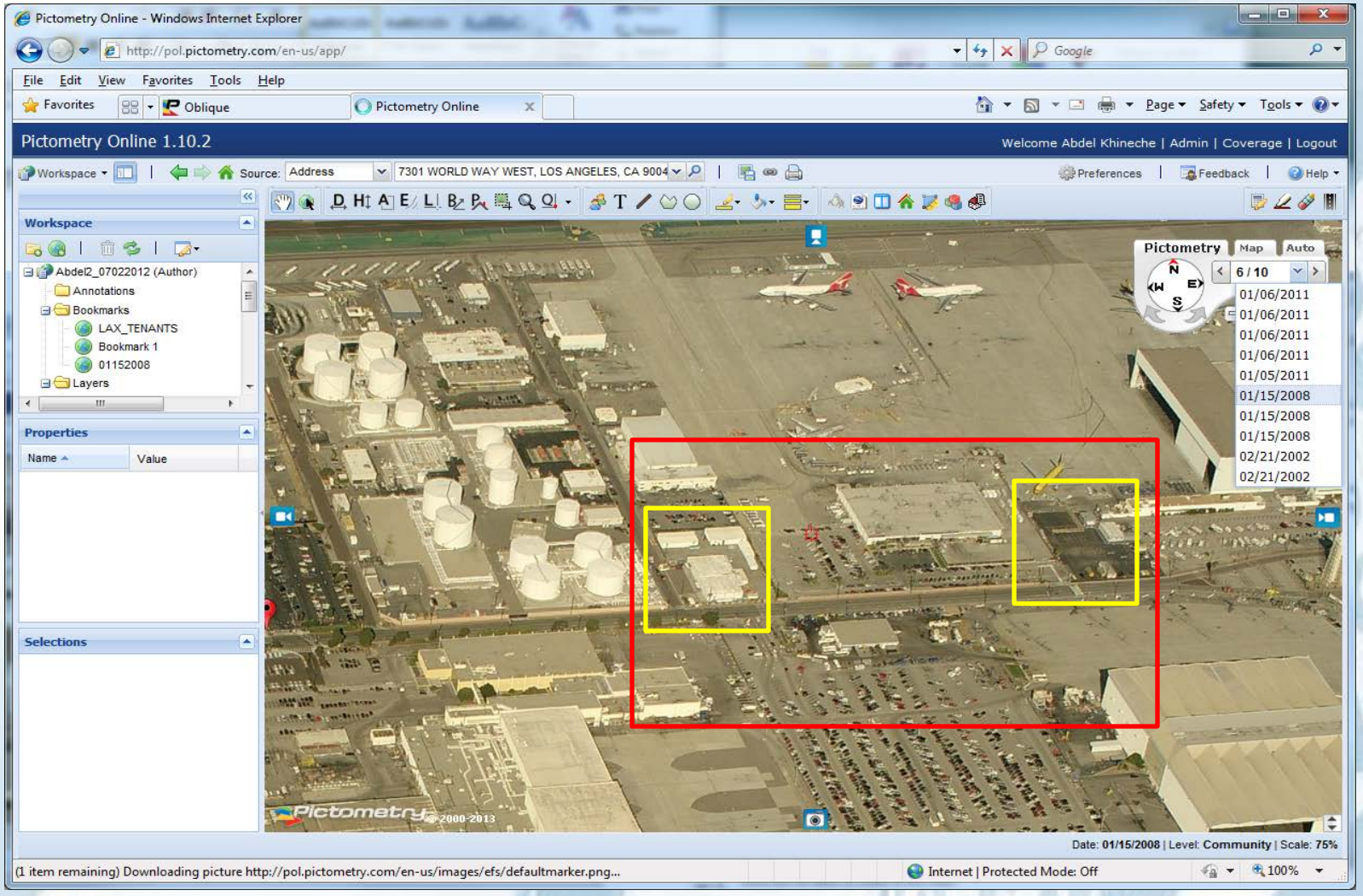
Pictometry: Historical Oblique Imagery - Monitoring Changes in Airports

(**LAX 01/15/2008 – New building structures**).



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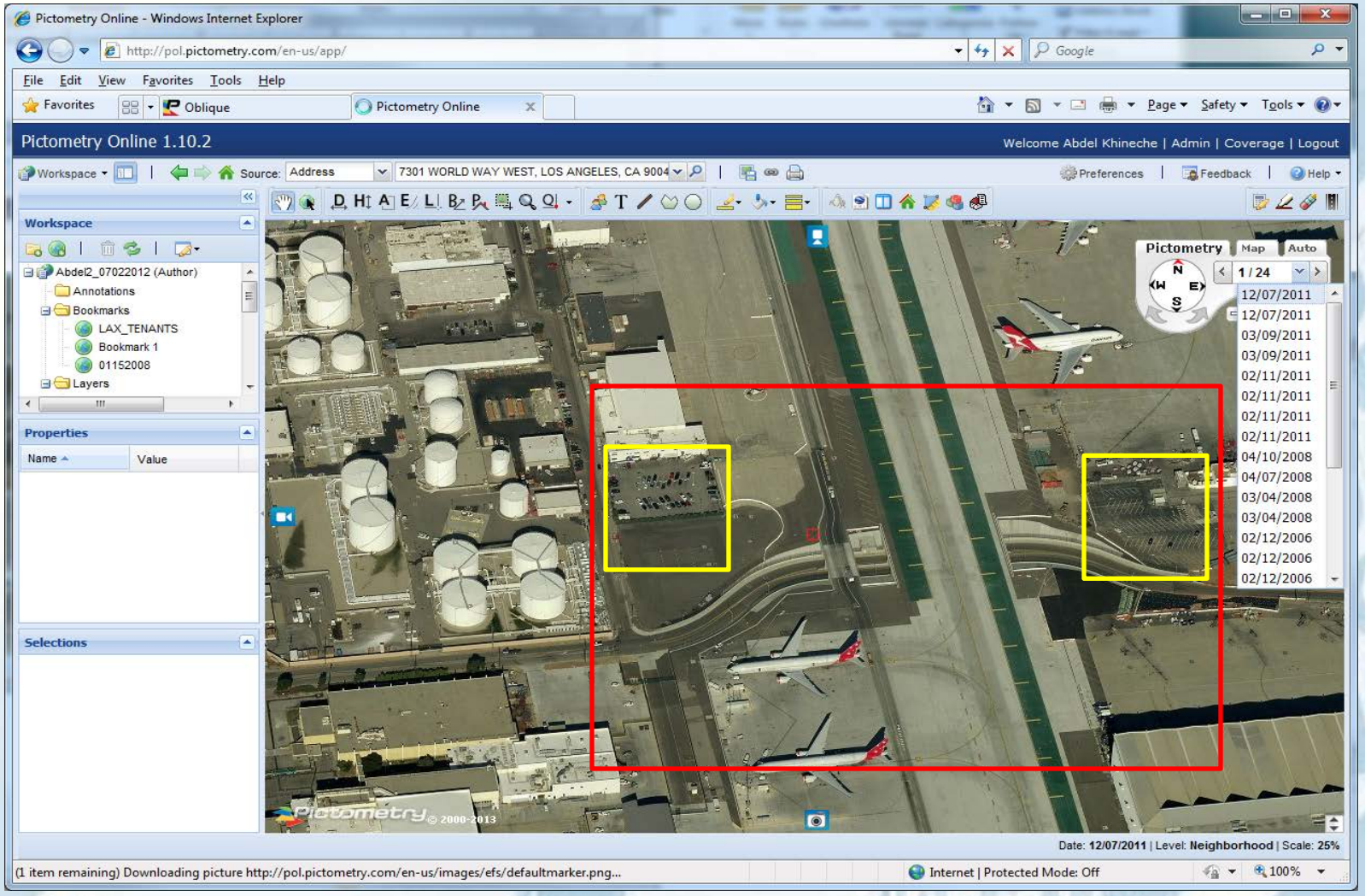
Pictometry: Historical Oblique Imagery - Monitoring Changes in Airports

LAX 12/07/2011 – New Crossfield Taxiway R over World Way West.



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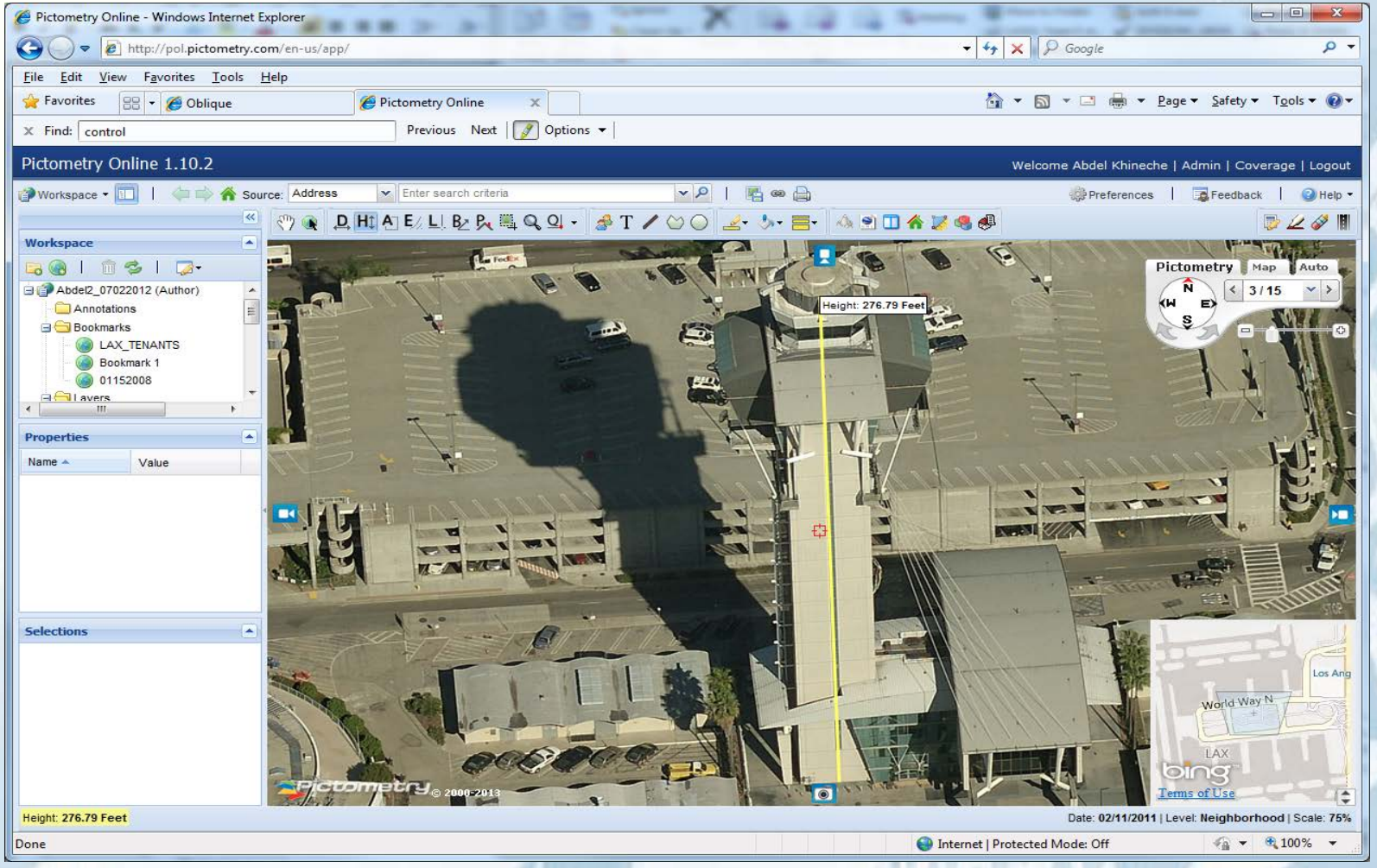
Pictometry: overview - Height Tool

Another valuable features of **Pictometry** is the ability to measure the **Height** or the **Elevation** of structures (Ex: **LAX Control Tower)**



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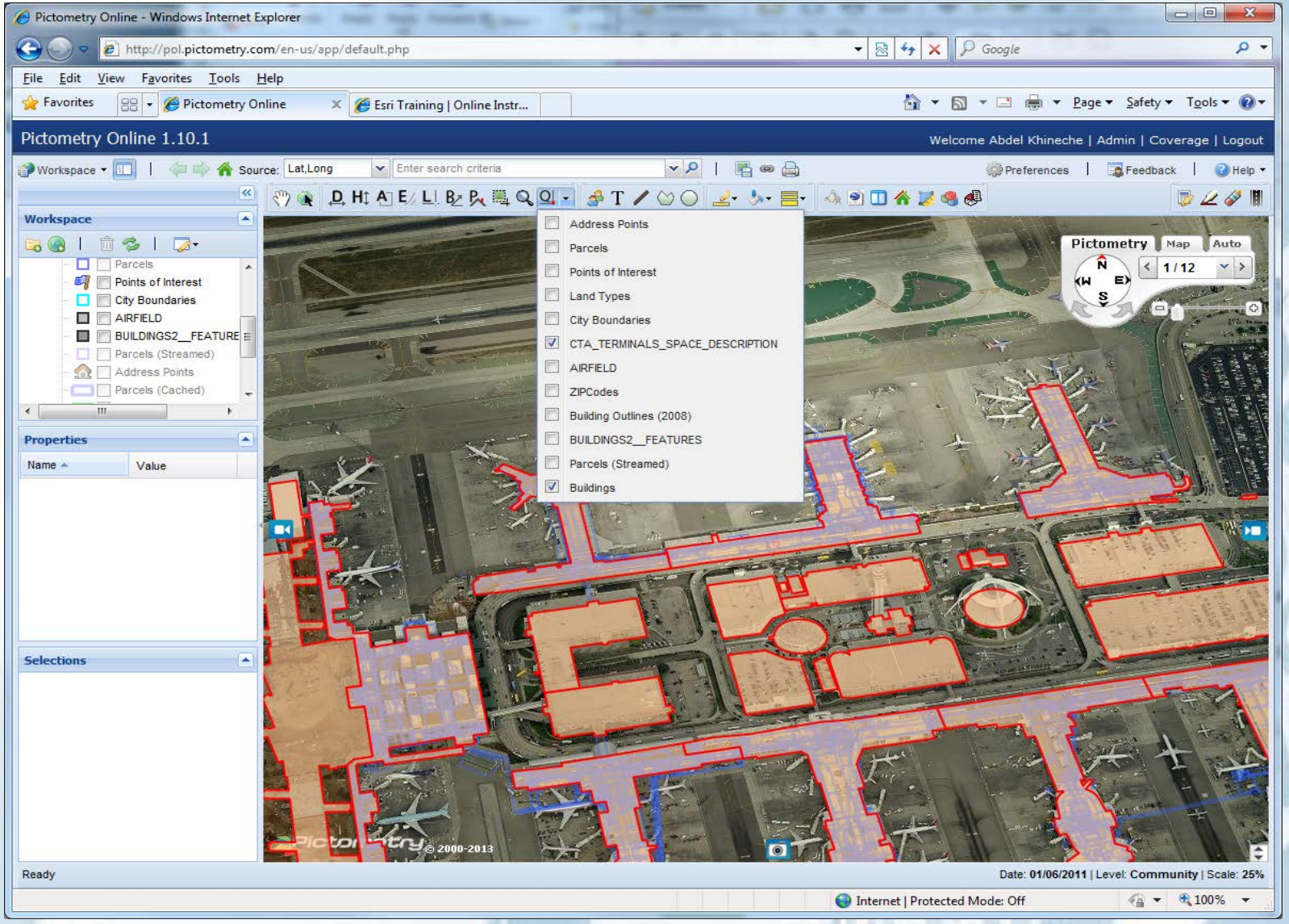
Pictometry: Online GIS Uploader– Using the Query Tool



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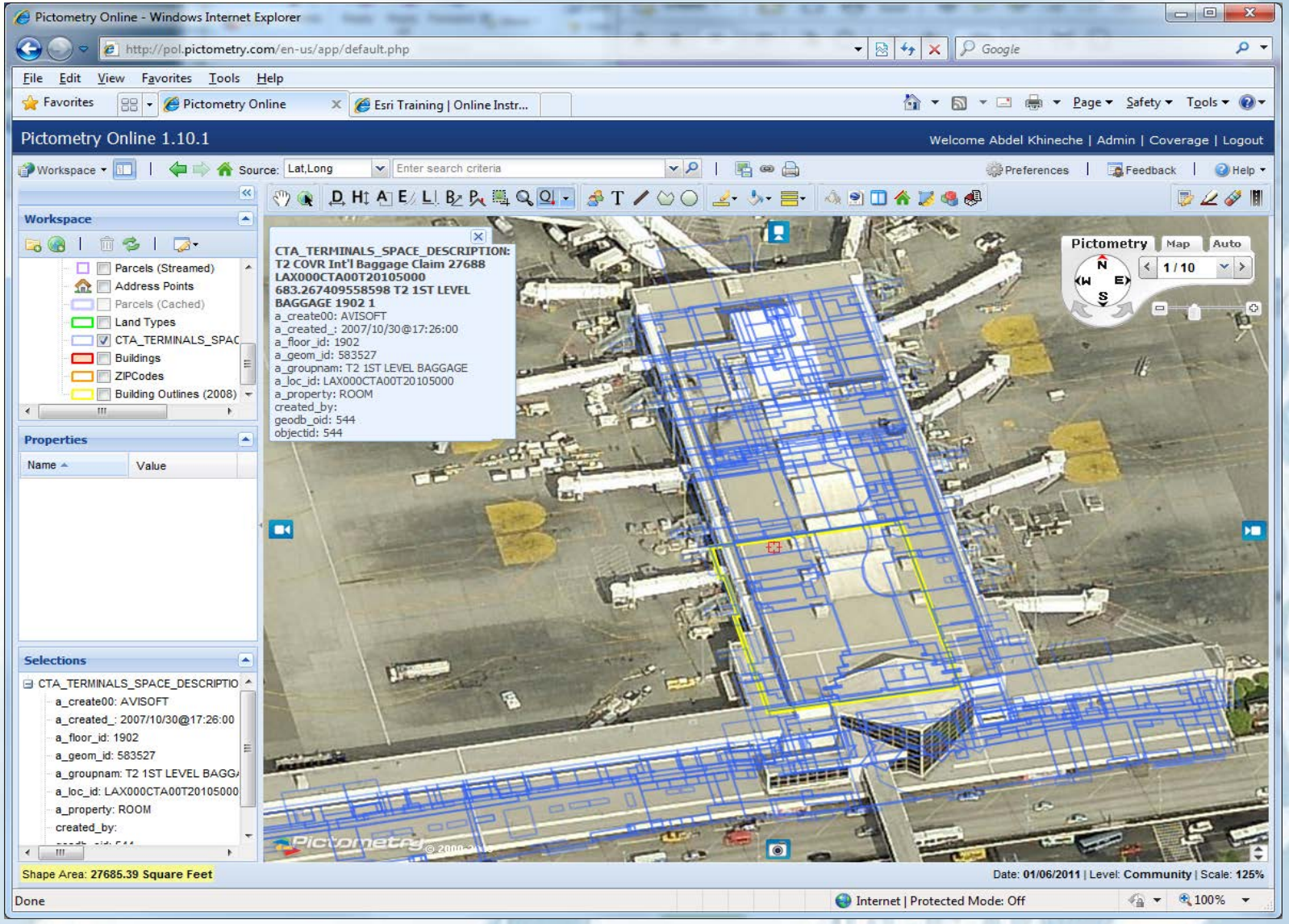
Pictometry: Online GIS Uploader– Using the Query Tool (T2 Baggage Claims)



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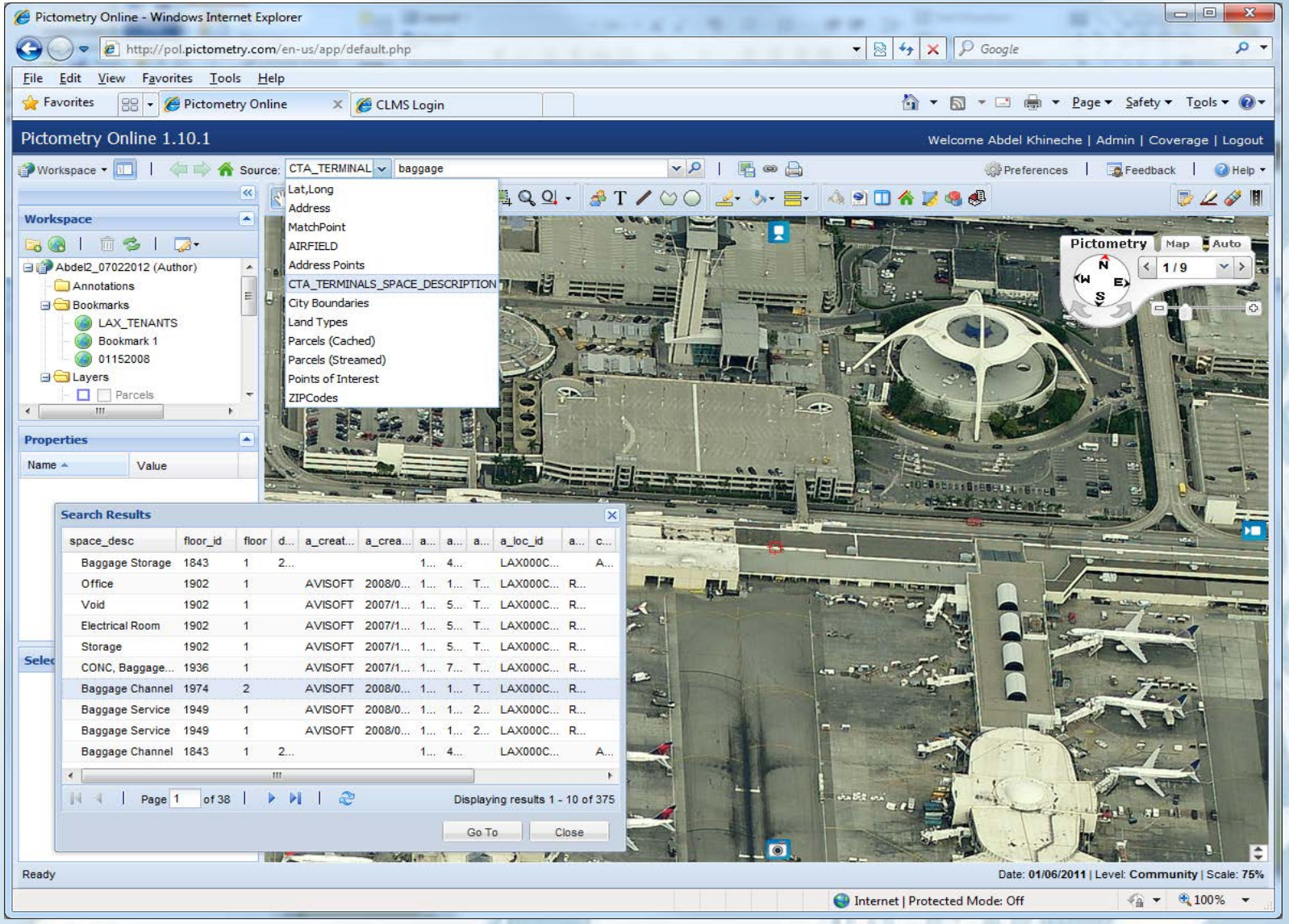
Pictometry: Online GIS Uploader– Using the Search Tool (T6 Baggage Channel)



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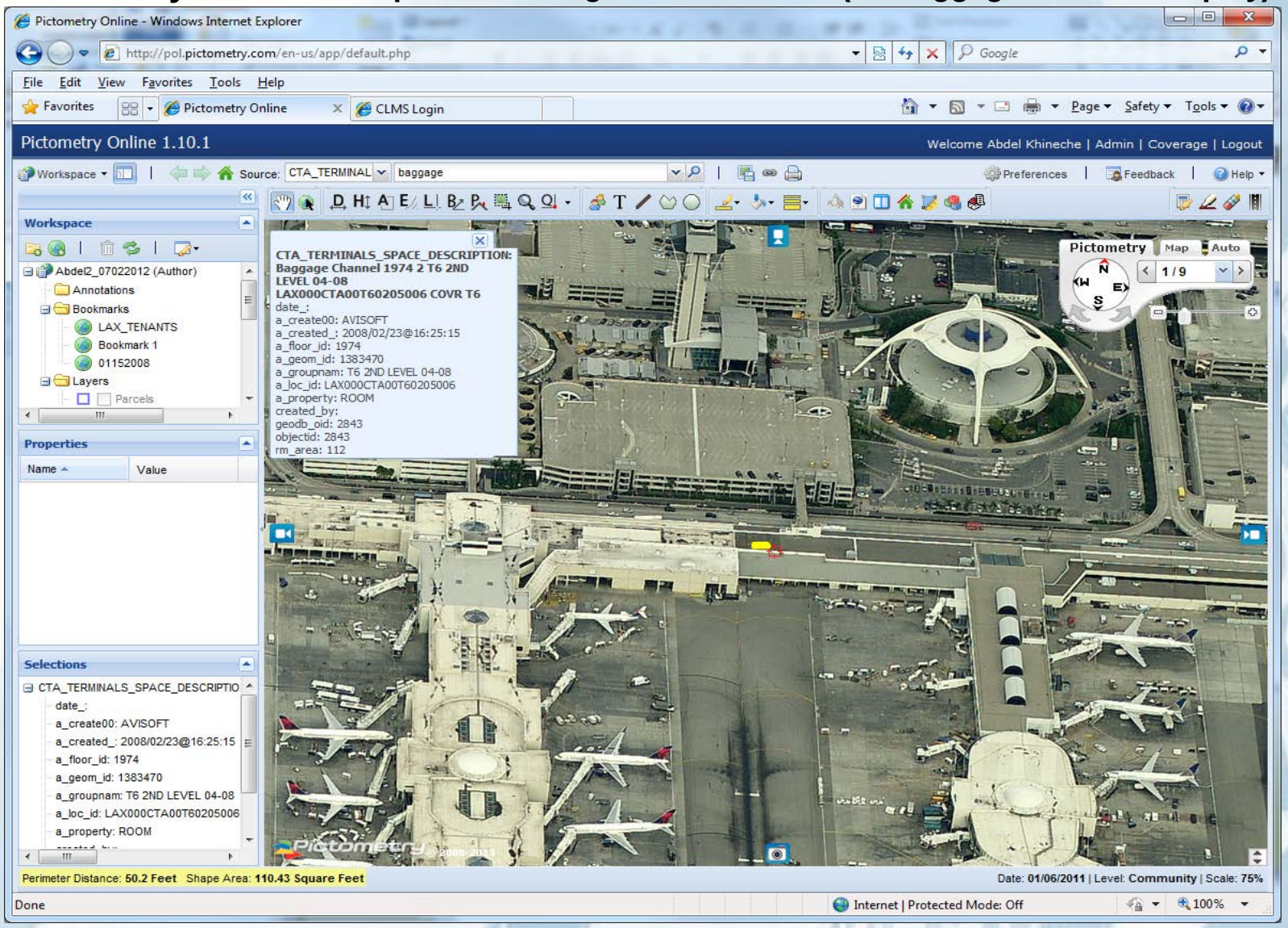
Pictometry: Online GIS Uploader–Using the Search Tool (T6 Baggage Channel Display)



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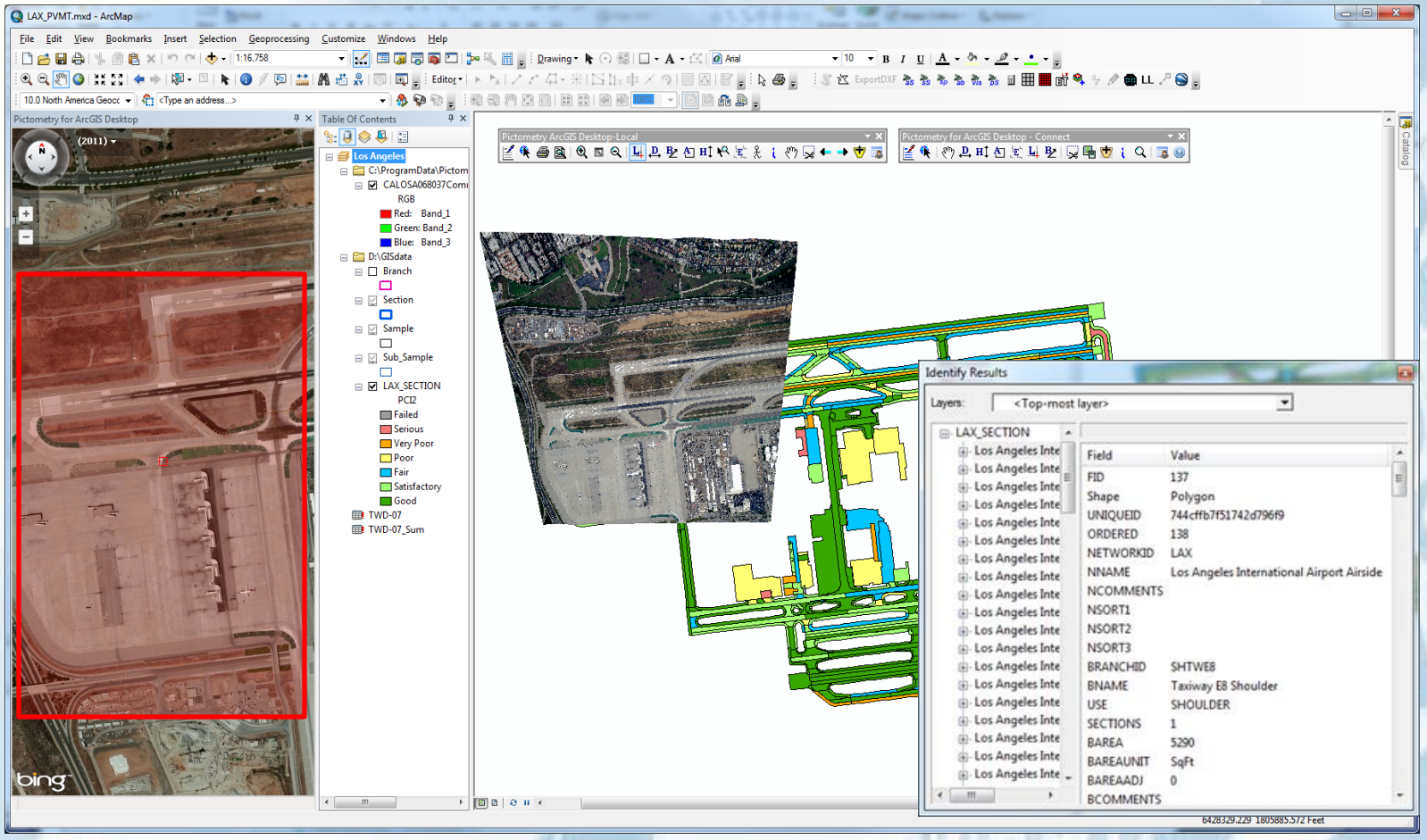
Pictometry Extension for ArcGIS Desktop

“Pictometry for ArcGIS Desktop” integrates Oblique imagery in ArcGIS products via 2 toolbars. In the example below, the “Pictometry Search Image” and Identify tools are used to click a point in ArcMap. This causes the extension to open a Pictometry image for the location picked. Search can be done by street address too (centerline or parcel centroid).



Pictometry: Online GIS Uploader - The road ahead

As an enhancement to its GIS Uploader functionality, Pictometry will be releasing an ArcMap addition that will allows the direct publishing of thematically rendered data (symbology, icons, markers etcetera . .. as created in ArcMap) to POL.

The Beta version should be available in mid April.

Pictometry and Online GIS Uploader - Conclusion

Pictometry and its GIS Uploader constitute a revolutionary tool:

- It enables GIS layers to overlay with great accuracy on Oblique imagery allowing for multi-dimensional measurements
- Its historical imagery can be used to monitor changes in Airport landscapes over the years.
- 4 inch resolution in California State Plane Coordinate System, Zone V, NAD 83, and U.S. Survey Feet allows for great overlay accuracy and measurements. All-view averaged coordinates tested 2.47 ft vertical accuracy at 95% confidence level.
- Oblique imagery software from Pictometry also includes:
  - Electronic Field Study (EFS)
  - Configuration Editor
  - Change Analysis
  - ArcGIS Extension
  - ArcMap Script
  - Network Image Warehouse (NIW)
  - ActiveX control - for integrating with other applications (available upon request)

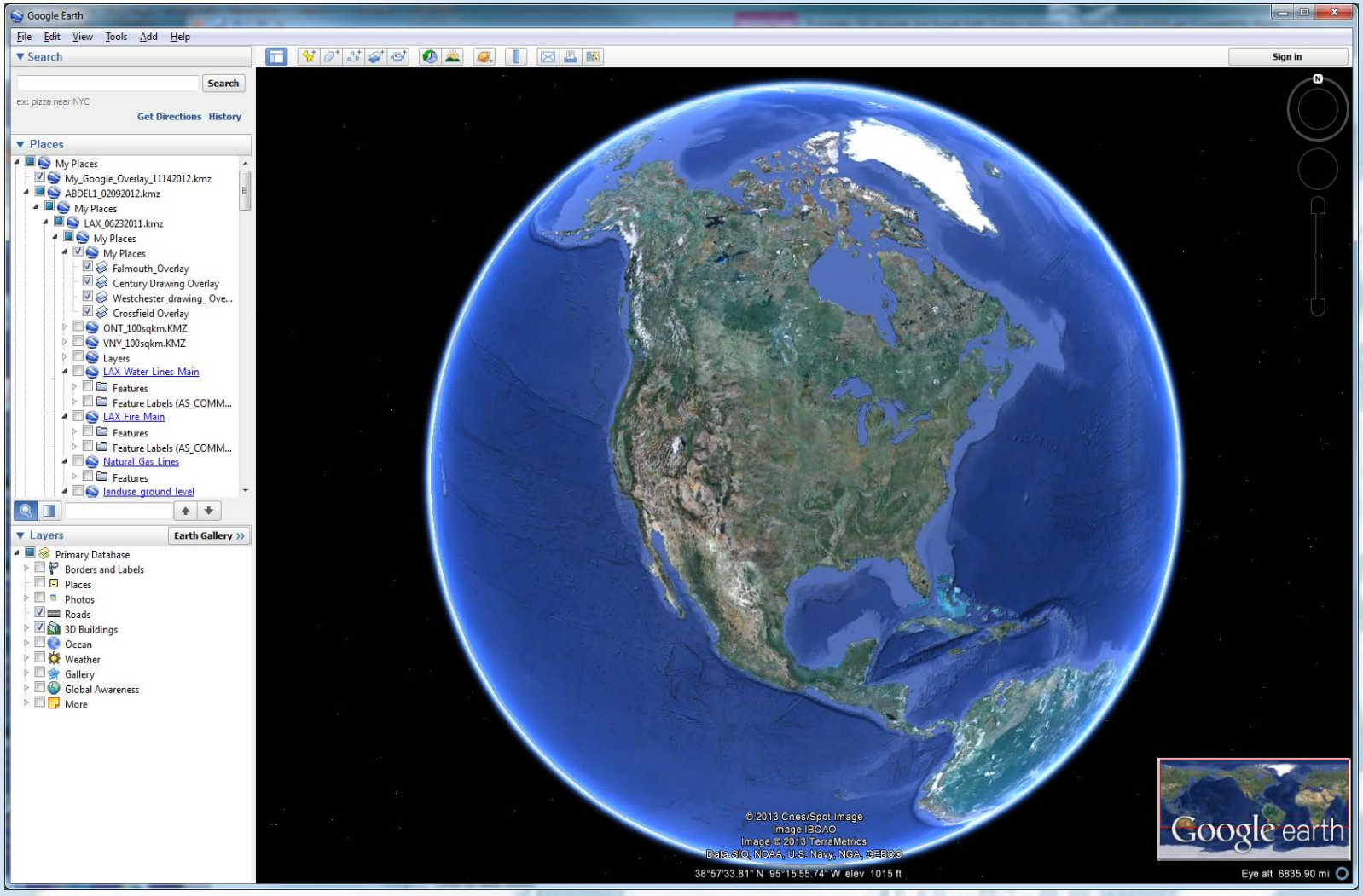
<u>Part Two</u>: Google Earth Overlays

This part will focus on the use of the **Google Earth** as a means to display **Airport GIS layers** and **overlays** of **As-Built documents** in a **3D** environment.

In the first step, **Airport data** is uploaded to the application through the conversion of Geo-Referenced **ArcGIS MXD** format to the Google Earth native format, **KML / KMZ**.
A 3D view of the data is possible if a **Z** value is provided.
The **symbology** of the MXD is preserved through the process and it is interesting to switch to the Google Earth **Street view** mode with the **thematic overlay**.
The second step is to use "**Image Overlay**" of a detailed drawing (**TIF** format) clamped to Ground (0 level) and use "**Rubber Sheeting**" to simulate **Geo-Referencing**.
The Drawing then espouses the earth **morphology** which can still be seen by tweaking the drawing's **transparency**.

Google Earth: overview

Globe view



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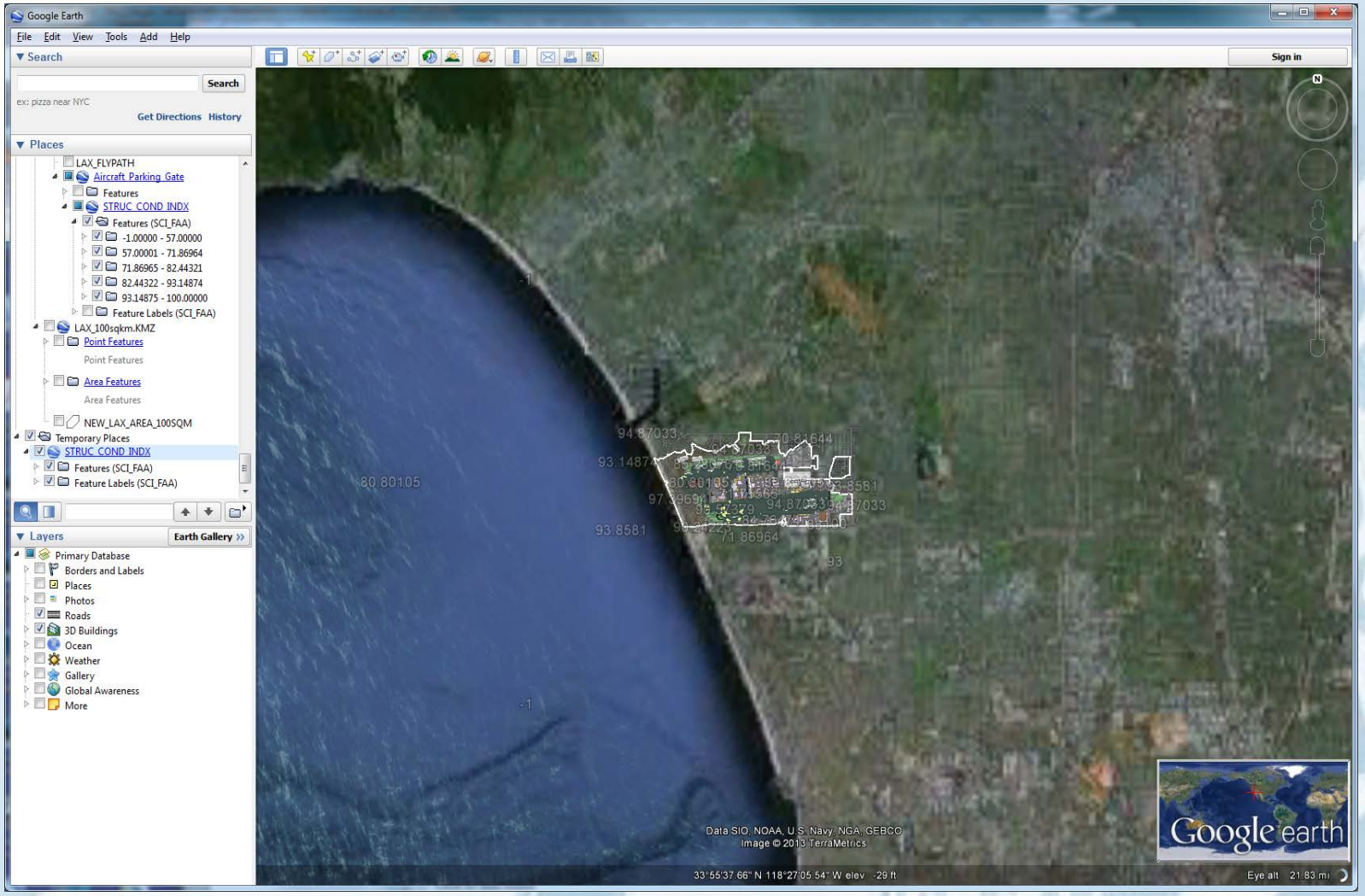
Google Earth: overview - LAX GIS layers overlay

Ortho North view of LAX with GIS data overlay



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Google Earth: overview - LAX GIS layers overlay

3D oblique North view of LAX with GIS data overlay

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Google Earth: overview - LAX GIS layers overlay

3D oblique East view of LAX with GIS data overlay

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Google Earth: Image overlay

Ortho North view of the intersection of Pershing and Westchester Pkwy: Drawing overlay

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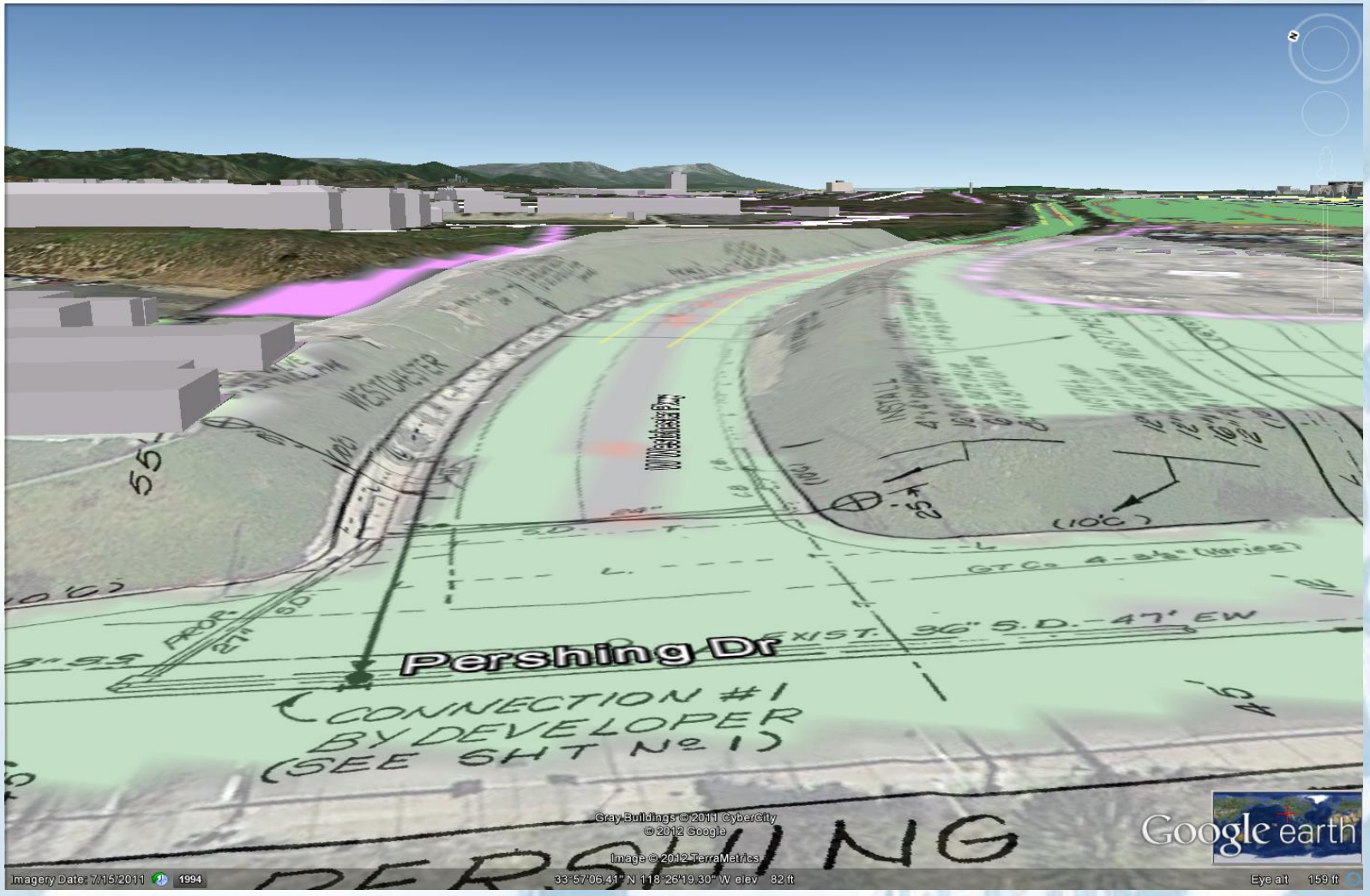
Google Earth: Image overlay

3D East view of the intersection of Pershing Drive and Westchester Pkwy: Drawing overlay



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Google Earth: Image overlay

3D East view of the intersection of Pershing Drive and Westchester Pkwy: Drawing overlay

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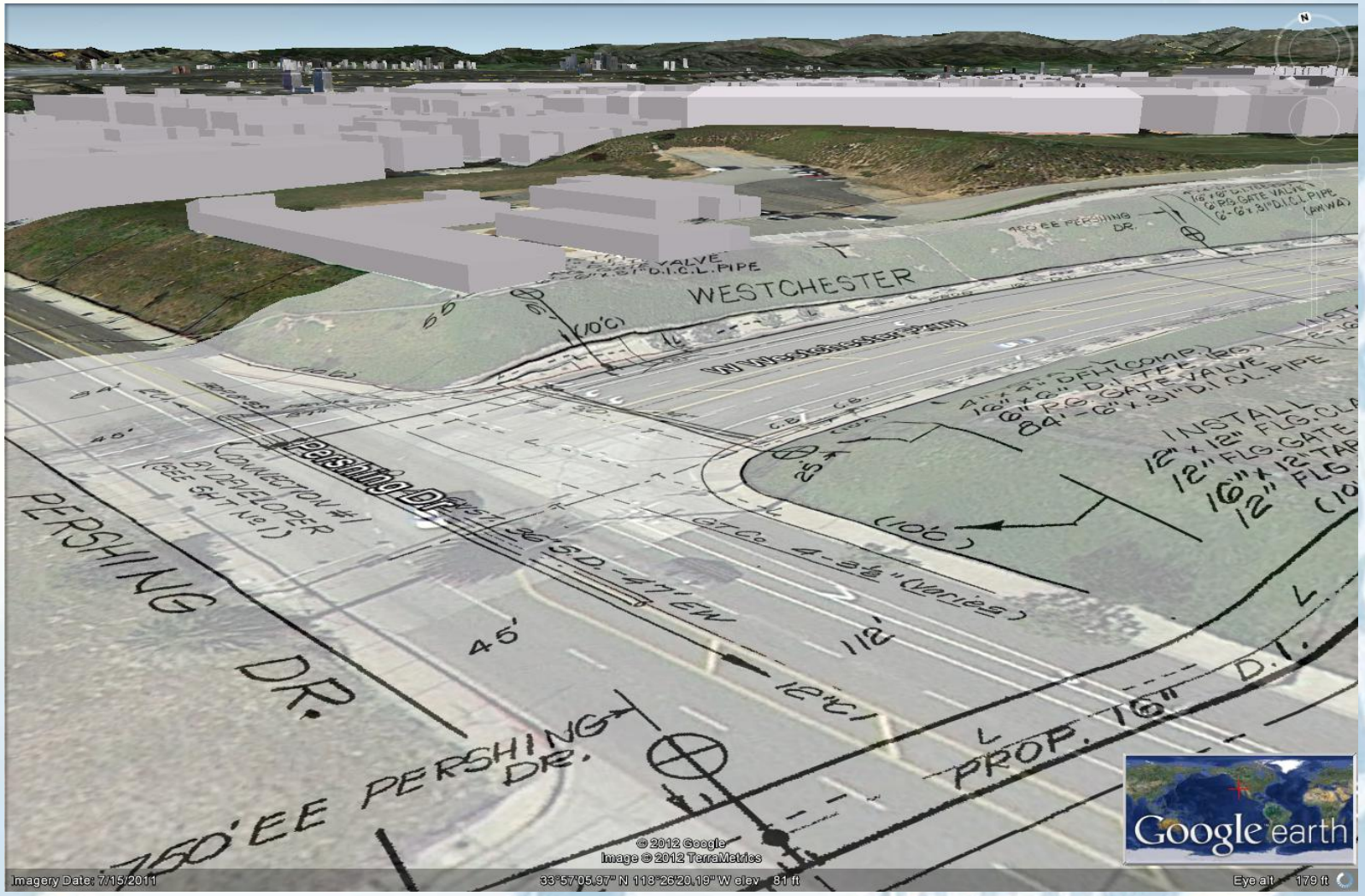
Google Earth: Image overlay

3D North view of the intersection of Pershing Drive and Westchester Pkwy: Drawing overlay



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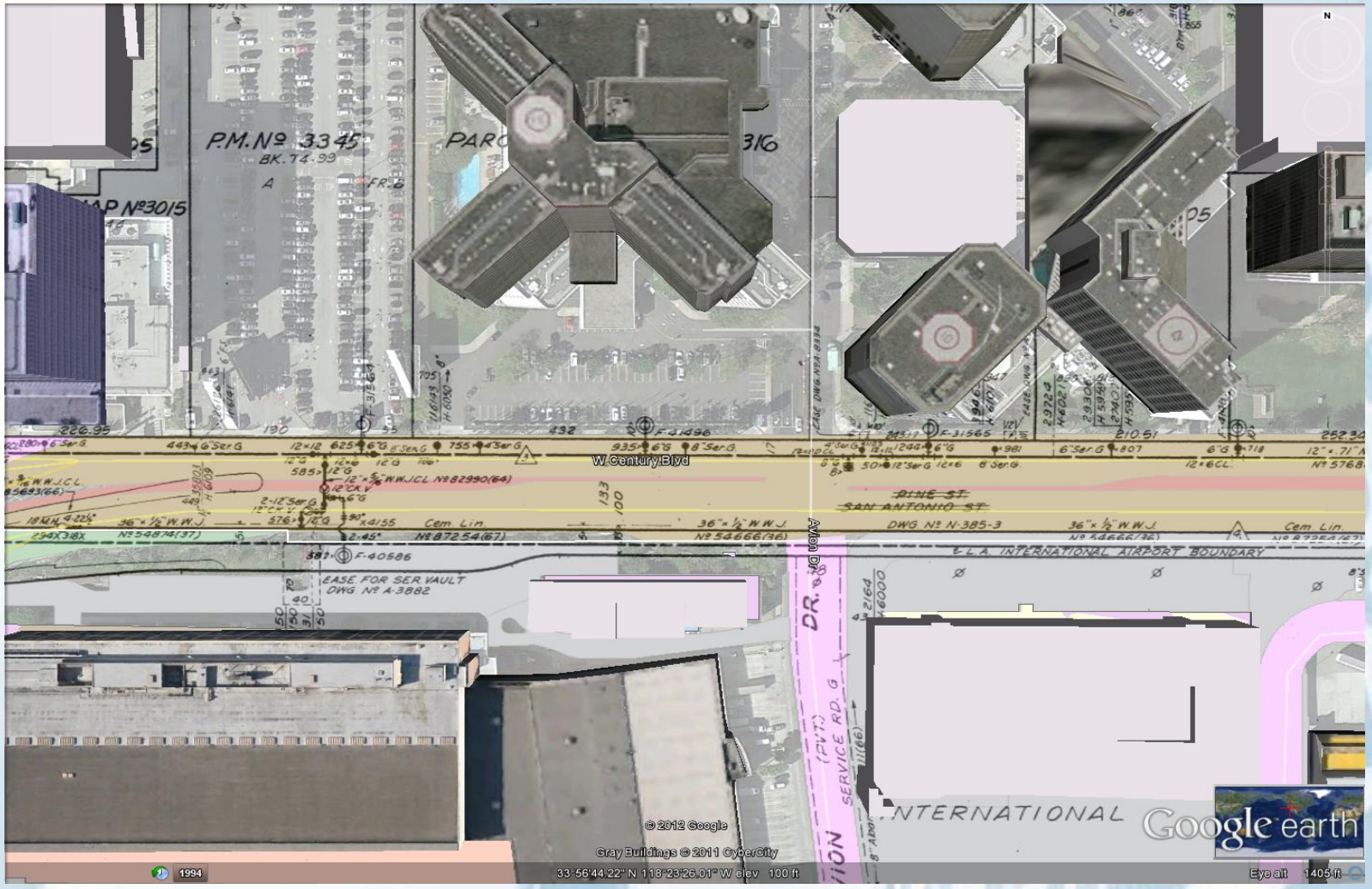
Google Earth: Image overlay

Ortho North view of Century Blvd: Drawing overlay



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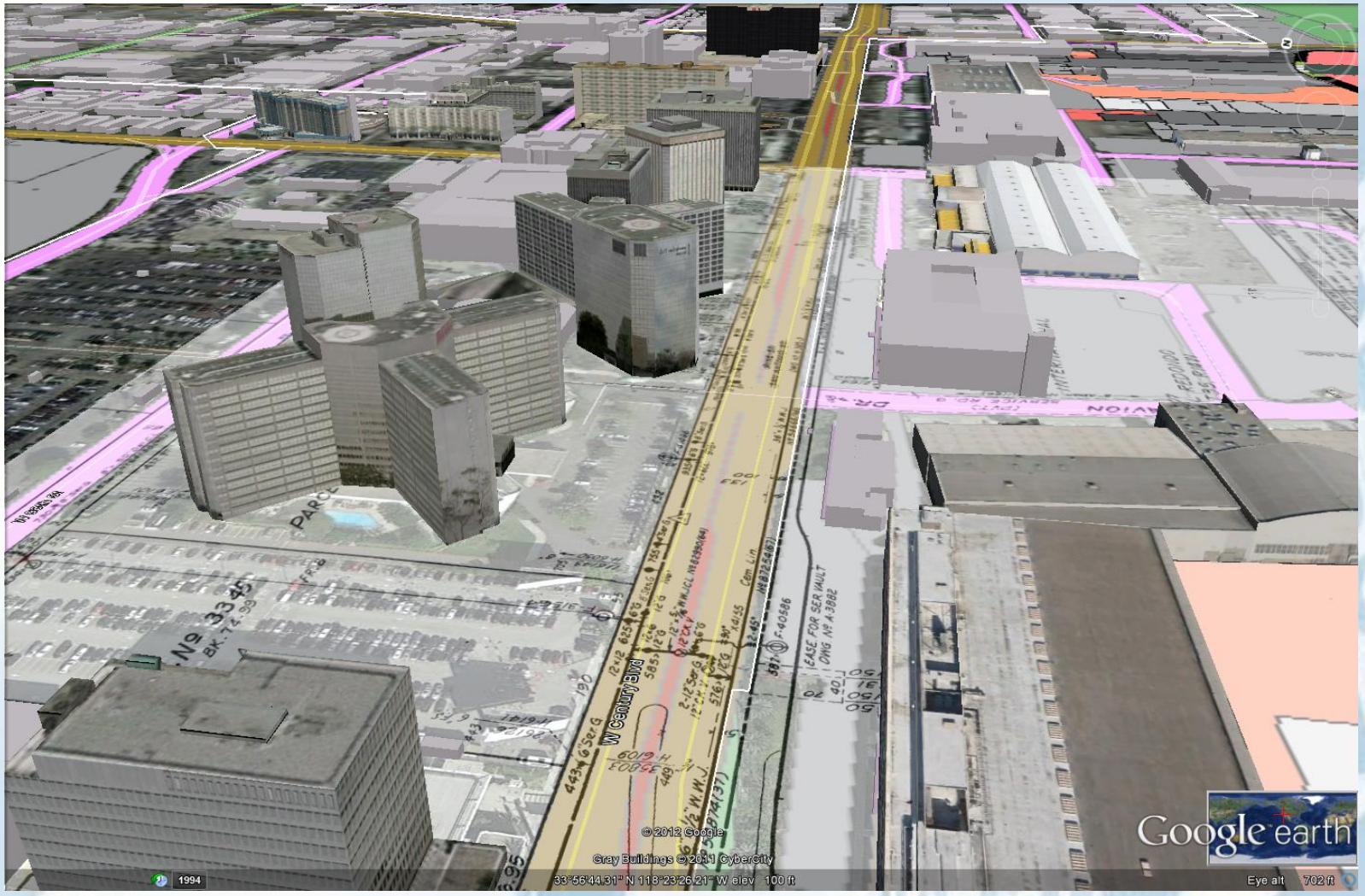
Google Earth: Image overlay

3D East view of Century Blvd: Drawing overlay



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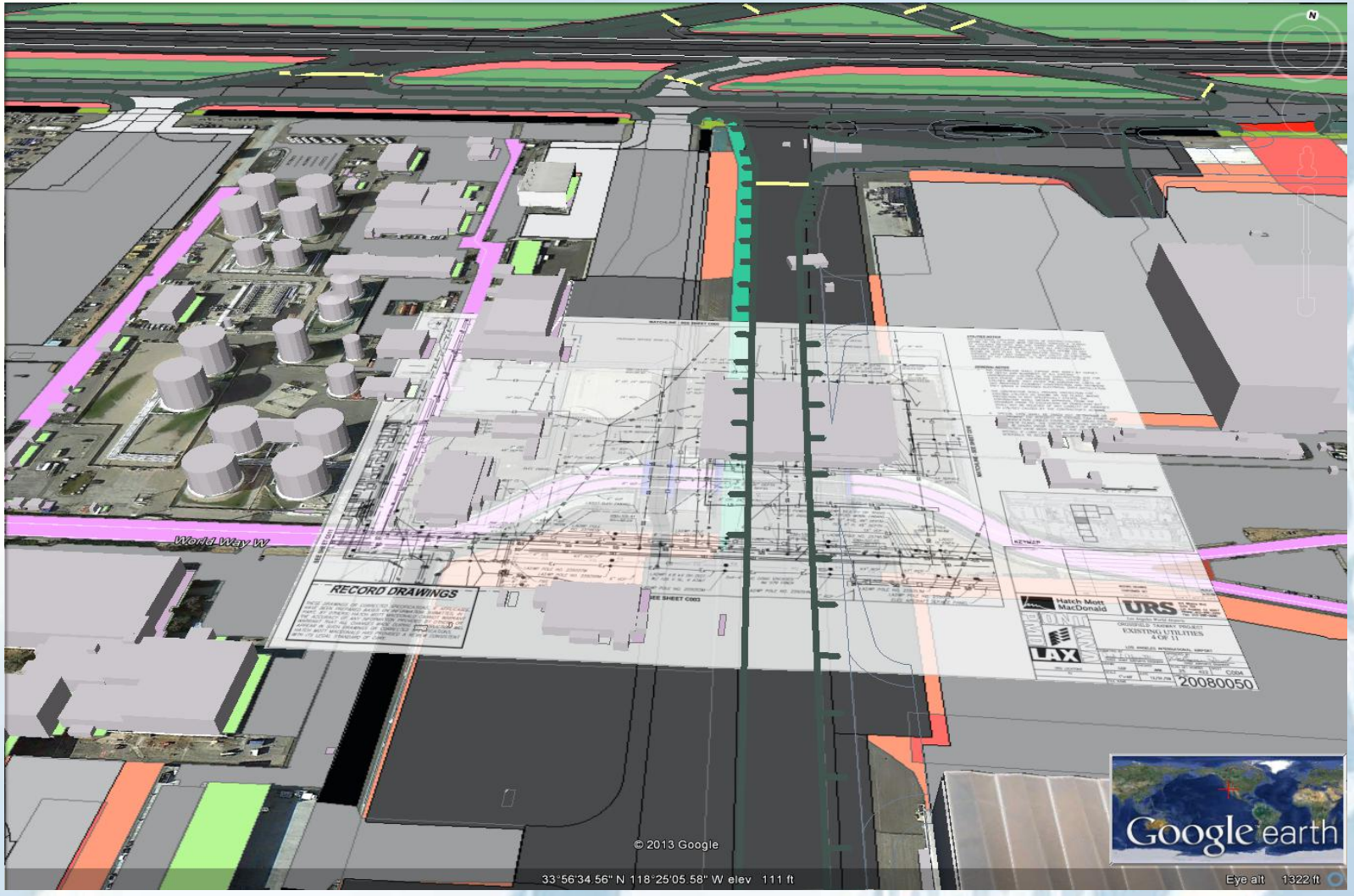
Google Earth: Image overlay

3D North view of World Way West curve intersecting Cross field Taxiway R: Drawing overlay



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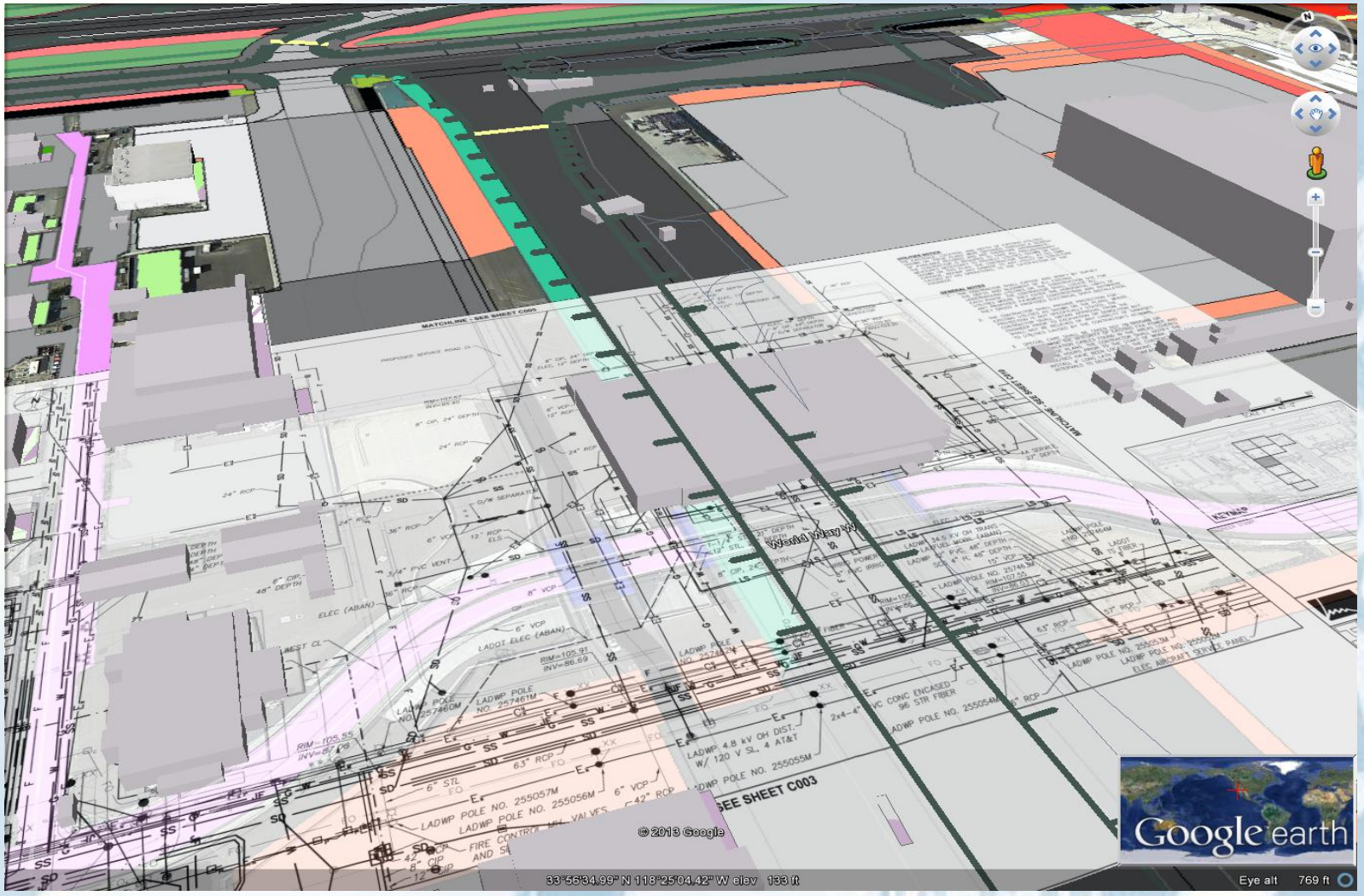
Google Earth: Image overlay

3D North view of World Way West curve intersecting Cross field Taxiway R: - Detail



Google Earth: Image overlay - Conclusion

In addition to featuring Historical Imagery and the legendary Street View, Google Earth enables Feature / Image overlay, a powerful tool allowing GIS teams to upload their own data (KML, KMZ) , and engineer to superimpose and view their As-Built in “Real Life” over the terrain’s morphology using the “Transparency” and the “Rubber Sheeting” tools.

Questions ?

Thank you !