

CADtoEarth

For Rhinoceros 5.0

User's Guide

August 7, 2014

Contents

Chapter 1: Getting Started	3
What is CADtoEarth	3
Sign Up for a free CADtoEarth account	4
Chapter 2: CADtoEarth Plug-in	6
Introduction	6
Access	6
Login command	7
CADtoEarth pane command	8
Get Surface command	9
Get Drawing command	11
Export Model command	13
Export Image command	15
About command	17
Chapter 3: CADtoEarth Web Application	18
Introduction	18
CADtoEarth web services	18
Access	18
Chapter 4: Google Earth Tools	19
3D Models tab & Storages	19
Control Models tab	21
Surface & Drawings tab	23
Options tab	25
Upload Model tab	26
Convert to 3D PDF	27
Chapter 5: Google Maps Tools	29
Images tab & Storages	29
Control Images tab	30
Drawings tab	31
Upload Image tab	33
Appendix A: Contact Us	34

Getting Started

This guidance document describes the formal steps of how to use CADtoEarth plug-in for Rhinoceros with CADtoEarth web application. It provides a help material which is intended to assist you in usage of all application functions.

What is CADtoEarth

CADtoEarth is a family of innovative add-in applications for the most popular CAD packages, linking modeling environments with Google Earth and Google Maps.

CADtoEarth for Rhinoceros offers some very exciting capabilities.
Here is the partial list of what you can expect:

- Import a section of a surface from Google Earth into a Rhino modeling session.
- Import a pre-drawn sketch from Google Earth into a Rhino modeling session.
Import the information about building layer from Google Earth.
- Place your 3D objects on the imported surface within a Rhino modeling session and then upload them back to Google Earth.
- Perform the similar operations with 2D objects between Rhino and Google Maps.

Manage your 3D models in CADtoEarth web application:

- Change altitude, scale, rotate and move your 3D structures.
- Choose 3D structures for auto-placement.
- Share your 3D structures with other users.
- Upload *.kmz models into your personal storage.

Sign Up for a free CADtoEarth account

It is required to sign up for a CADtoEarth account to be able to link up your CAD environment with Google Earth and Google Maps services.

Note: To simplify the creation of the account you are not required to provide any personal information. However if you tell us your email, it will be possible to recover your account in case of lost or forgotten credentials.

The account is completely free, and you can register one in a few easy steps:

- To register, you will need a web browser and an Internet connection.
In the browser address bar type: <http://www.cadtoearth.amcbridge.com>
- You should now have the Login page displayed in your browser.
Click on the [Register](#) link.

The screenshot shows the CADtoEarth Login page. At the top right, a dark grey banner says "Hello, Guest". The main content area has a light blue background with a subtle grid pattern. On the left, there is a "Log In" section. It contains two text input fields labeled "User Name" and "Password". Below these fields are two links: "Change Password" and "Forgot password?". Below the links is a checkbox labeled "Remember Me". At the bottom of the login section is a "Log In" button. To the right of the login section, there is a "Register" link. Three lines with arrows point from text labels below the page to the links: "Click to change your password" points to "Change Password", "Click to recover your password" points to "Forgot password?", and "Click to begin registration" points to "Register".

Log In

Register

User Name

Password

[Change Password](#) [Forgot password?](#)

☐ Remember Me

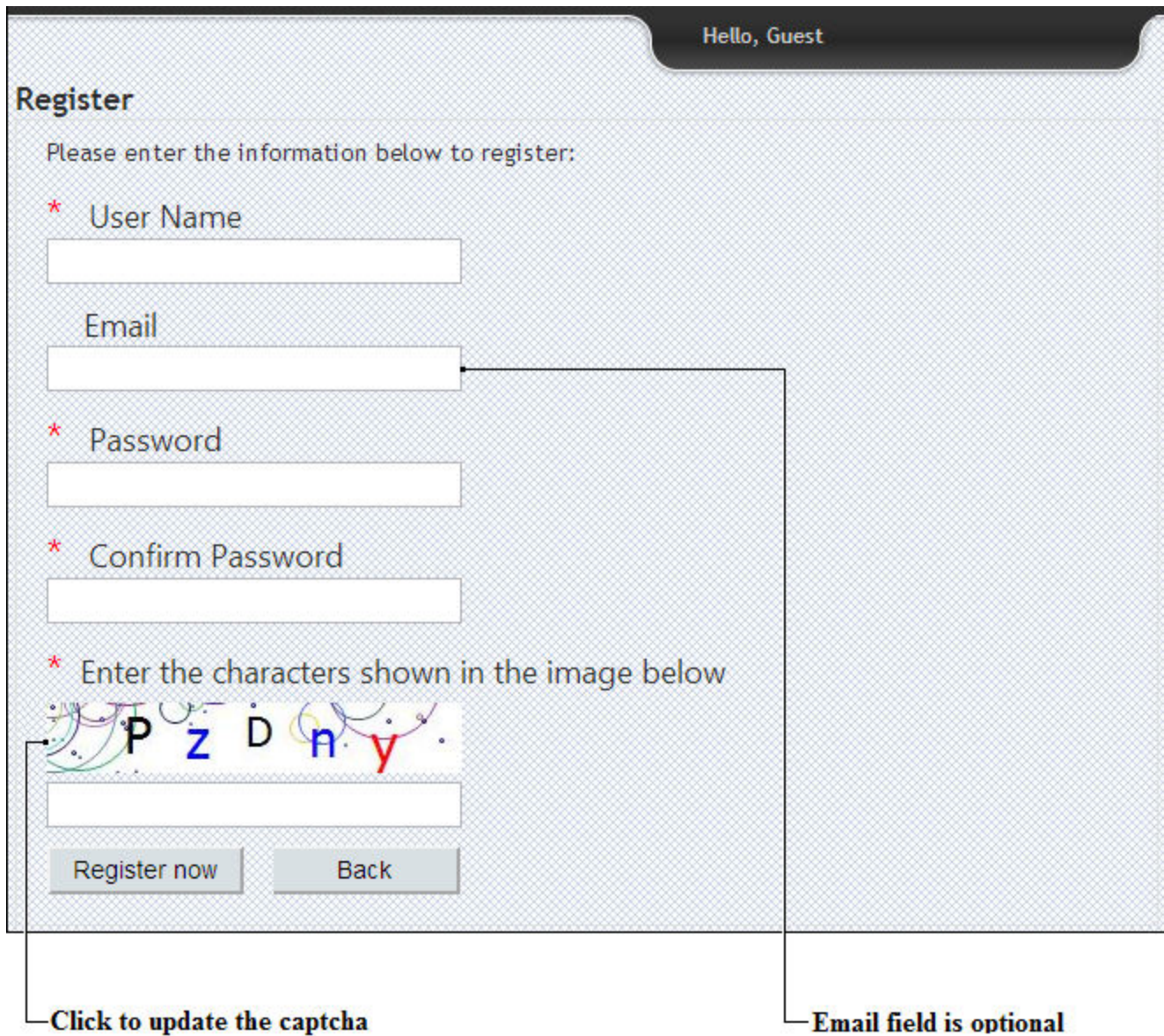
Log In

Click to change your password

Click to recover your password

Click to begin registration

- This is a sample of what you will see on your screen after the Registration page is opened:



The screenshot shows a web registration form titled "Register" with a "Hello, Guest" greeting in the top right. The form contains five input fields: "User Name", "Email", "Password", "Confirm Password", and a CAPTCHA field. The "Email" field is marked as optional. Below the CAPTCHA field are two buttons: "Register now" and "Back".

Annotations with arrows point to the following elements:

- A line from the bottom left points to the CAPTCHA image with the text: **Click to update the captcha**
- A line from the bottom right points to the "Email" field with the text: **Email field is optional**

- Enter your [User Name](#) and [Password](#) into the form and click on [Register now](#) button when you are ready.

That's all you need to get started. Now get on the CADtoEarth plug-in and have fun!

CADtoEarth Plug-in

Introduction



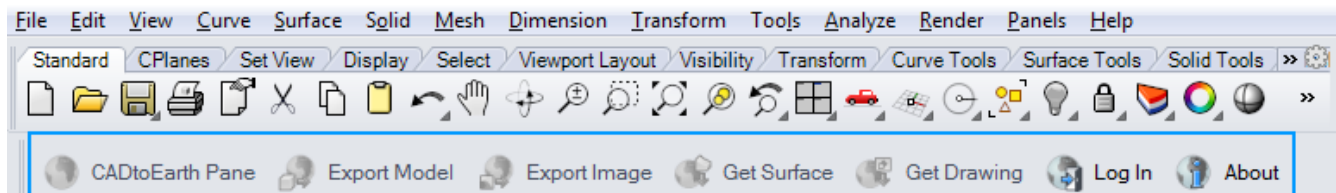
The CADtoEarth plug-in extends the functionality of Rhinoceros and establishes a bi-directional connection between CAD environment and such virtual globe and map services like Google Earth and Google Maps.

Plug-in features the following functions:

- Export of 3D model to Google Earth.
- Export of 3D model view and subsequent placement of it onto Google Maps.
- Import of the Earth surface from Google Earth, which may be useful for architecture design purposes if rough data on ground elevations is needed.
- Import of the sketched curves from Google Earth and Google Maps, which may be useful for the object outlines capturing.

Access

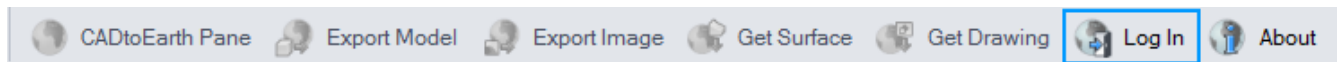
When CADtoEarth plug-in is installed, the CADtoEarth dock bar will appear under the Rhino toolbar panel:



The CADtoEarth toolbar exposes a set of commands that you can run:

- Log In/Log Out command
- Get Drawing command
- Get Surface command
- Export Image command
- Export Model command
- CADtoEarth Pane command
- About command

Log In command



CADtoEarth implements a client-server system, where the plug-in is a client that sends a request to the server that returns a response. To communicate, you will need to log in to the plug-in with your account credentials.

To do this, simply click on the [Log In](#) command and Login dialog will appear:

A screenshot of the 'Login' dialog box. The dialog has a title bar that says 'Login'. Inside, there are two input fields: 'USERNAME' with a placeholder 'Username...' and 'PASSWORD' with a placeholder 'Password...'. Below the password field, there is a checkbox labeled 'Remember me' and a blue hyperlink labeled 'Don't have an account?'. At the bottom, there are two buttons: 'OK' and 'Cancel'.

- Click on the [Don't have an account?](#) link to sign up for a one. (See: [Sign Up for a free CADtoEarth account](#))
- Enter your user name and password if you already have an account.
- Check the [Remember me](#) option if you would like to automatically log in to the CADtoEarth plug-in every time you open Rhinoceros.
- When you finish, click the [OK](#) button.

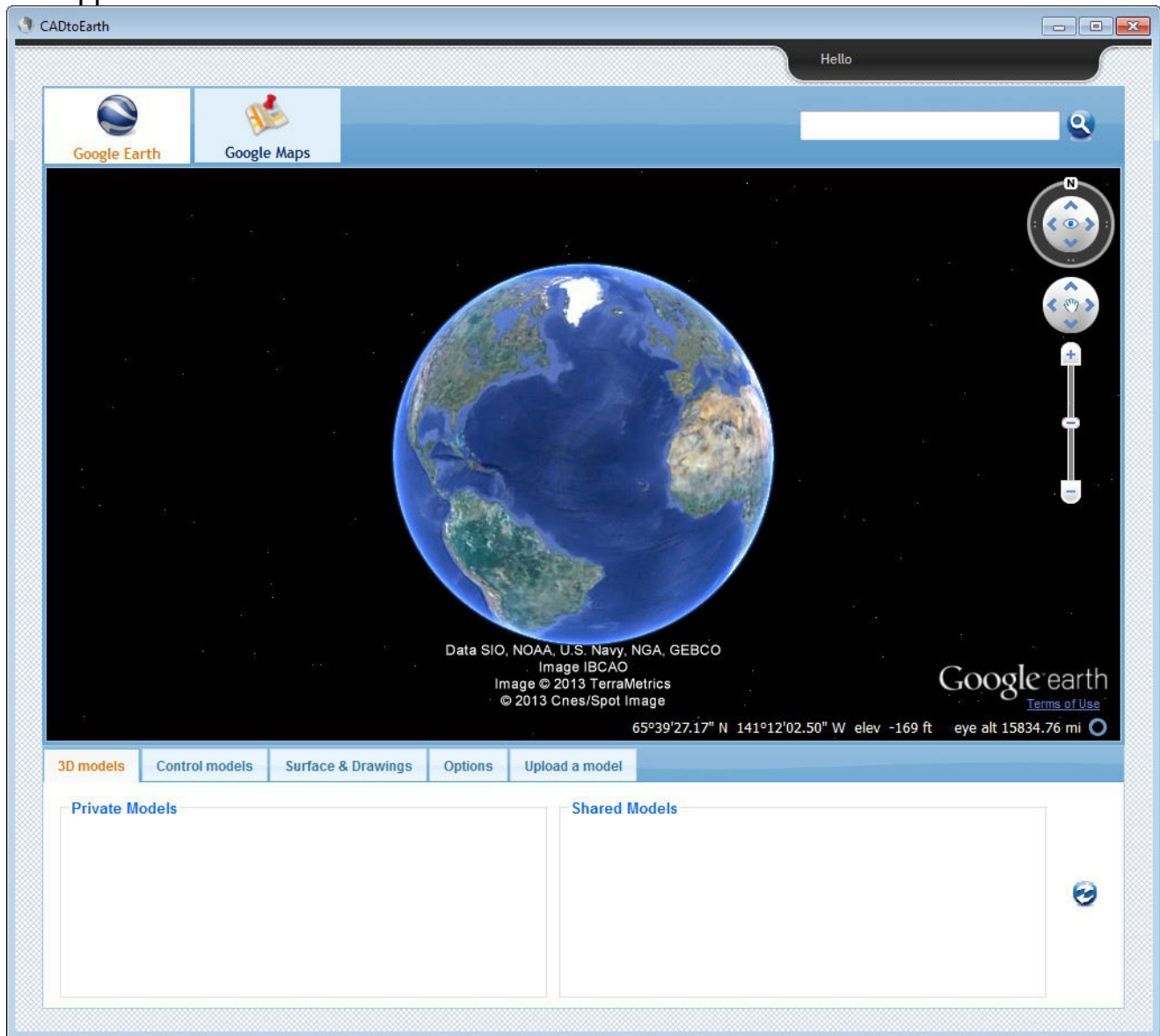
Once you have logged in, the CADtoEarth commands will be enabled and you will have the full access to the CADtoEarth features:



CADtoEarth Pane command



Run this command to open the CADtoEarth pane. It will simply display the CADtoEarth web application in the internal web-browser:



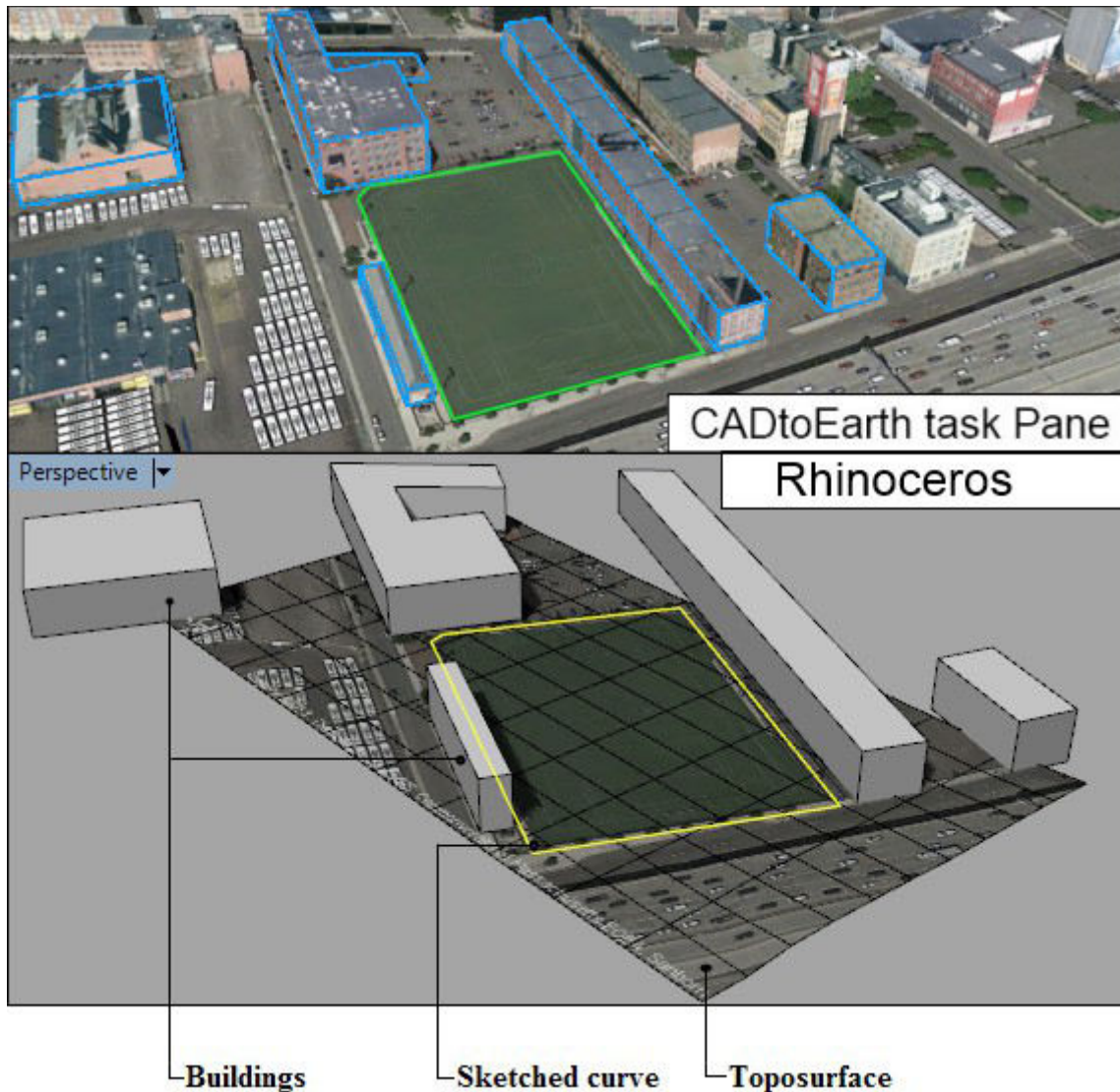
Find more information about how to start work with the CADtoEarth task pane at the chapter 3: [CADtoEarth Web Application](#)

Get Surface command



One of the unique features of CADtoEarth is the ability to import certain part of the Earth surface into CAD application. In order to do this the [Get Surface](#) command should be launched from the CADtoEarth dock bar.

Here is a sample of what you can expect:



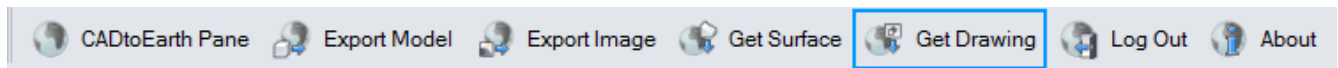
Once the command is launched a part of Earth surface captured using the CADtoEarth task pane tools will be imported into the currently opened Rhino modeling session as the Mesh object. (See: [How to capture a surface with CADtoEarth task pane](#))

If some curves were sketched on the Google Earth prior to surface capturing those curves will be brought in along with the surface, which may be useful for example in order to bring the outlines of buildings along with the surfaces they are located on.

Also you can bring in the information about the buildings that are located on the imported part of a surface into the currently opened Rhino modeling session as a set of Extrusion objects.

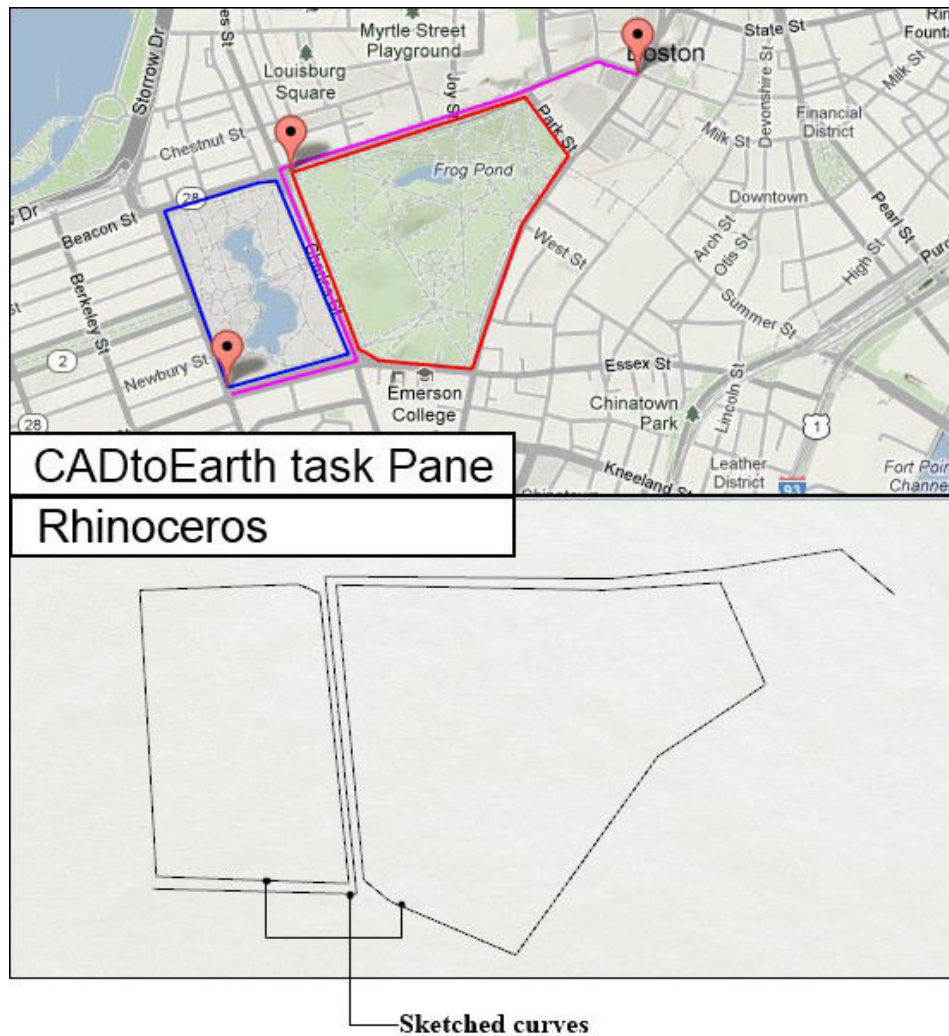
Information on geographical binding will be imported into the currently opened Rhino project also, so if it is published back to Google Earth it will appear at the same geographical location.

Get Drawing command



Another unique feature of CADtoEarth is ability to import curves sketched on Google Maps into the CAD environment. In order to do so the [Get Drawing](#) command should be launched from the CADtoEarth dock bar.

Here is a sample of what you can expect:



Once the command is launched the curves captured using the CADtoEarth task pane tools will be imported into the currently opened Rhino modeling session as a Closed Curve object. (See: [How to create a drawing using CADtoEarth task pane](#))

The curves will be imported along with the information on geographical binding, so if the model that was built using the imported curves is published back to the Earth it would appear at the same location and would be oriented the same way.

Export Model command



The [Export Model](#) command should be used to export the currently opened model in Rhino to Google Earth and upload the resulting file to the CADtoEarth cloud service. Once the command is launched a form with several options appears:

A screenshot of a dialog box titled 'Export the model to the Earth.' The dialog contains several options: a 'Triangulation Level' group with radio buttons for 'High' (selected), 'Medium', and 'Low'; an unchecked checkbox for 'Export surface'; a checked checkbox for 'Upload the model on server after export.'; a 'Model Name' field with the placeholder text 'Enter a model name here...'; and a 'Position' section with two text fields: 'LONGITUDE' containing '-71.0549609406964' and 'LATITUDE' containing '42.3605957158377'. At the bottom are buttons for '?', 'OK', and 'Cancel'.

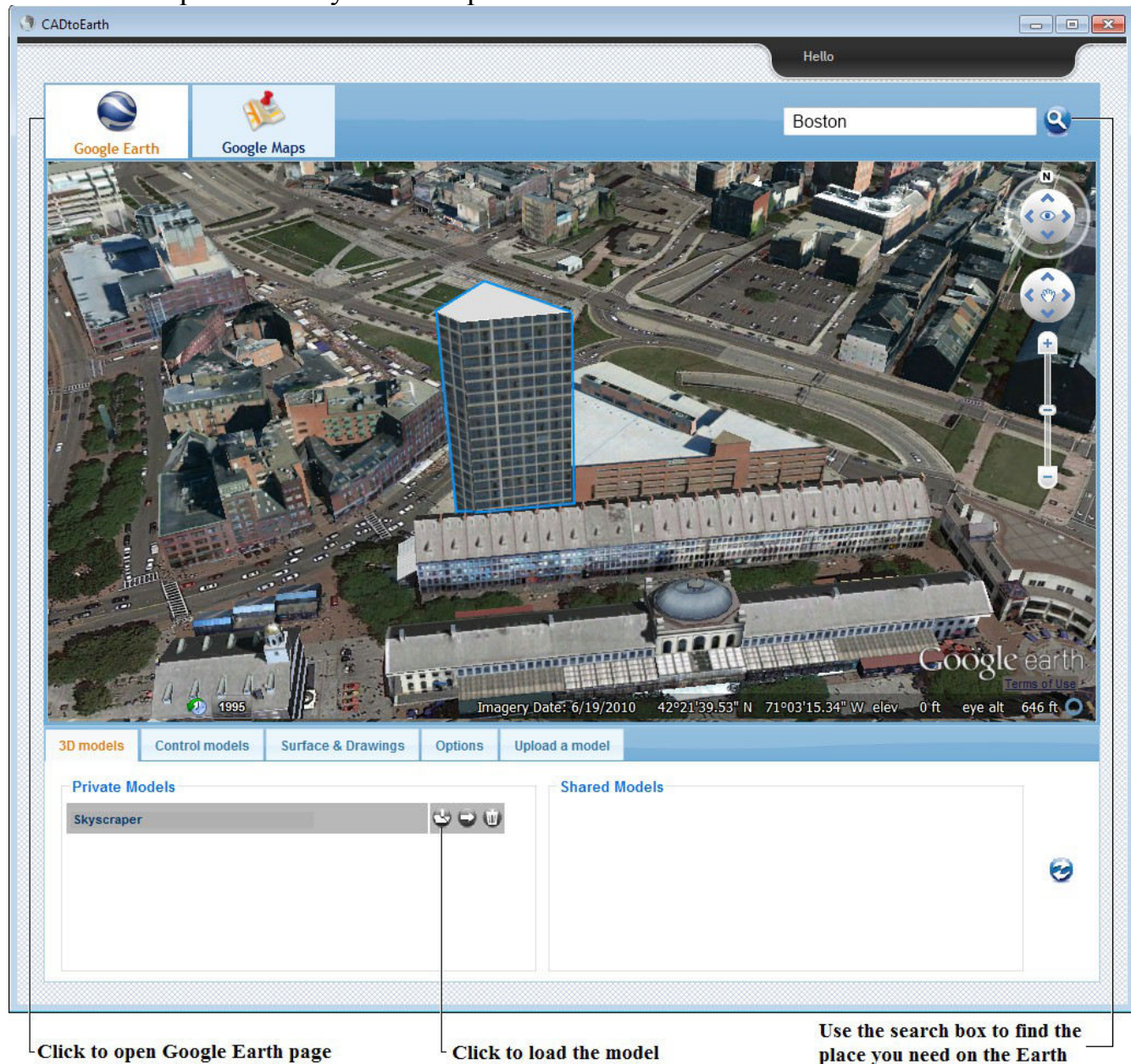
- [Triangulation level](#) group of options provides the ability to specify which detalization level will be used during the export.
- [Latitude](#) and [Longitude](#) fields can be used to bind origin of the model to some geographical location. If location of the model is not known then these fields may be left empty.
- Check the [Export surface](#) option if you would like to export the surface object back to the Earth.
- Check the [Upload a model on server after export](#) option if you would like to automatically upload the generated file directly to the CADtoEarth cloud service, where it can then be manually placed to any location on Earth.
- Enter the model name and click the [OK](#) button.
- Leave the [Upload a model on server after export](#) option unchecked if you would

like to save the resulting *.kmz file on your computer without uploading it to the CADtoEarth cloud service.

Note: You can upload the resulting *.kmz file later via CADtoEarth web application. (See: [Upload Model tab](#))

Once the model has been uploaded to the server it can be simply placed on the Earth surface using the [Load model](#) button to the right of the model's name. (See: [3D Models tab & Storages](#))

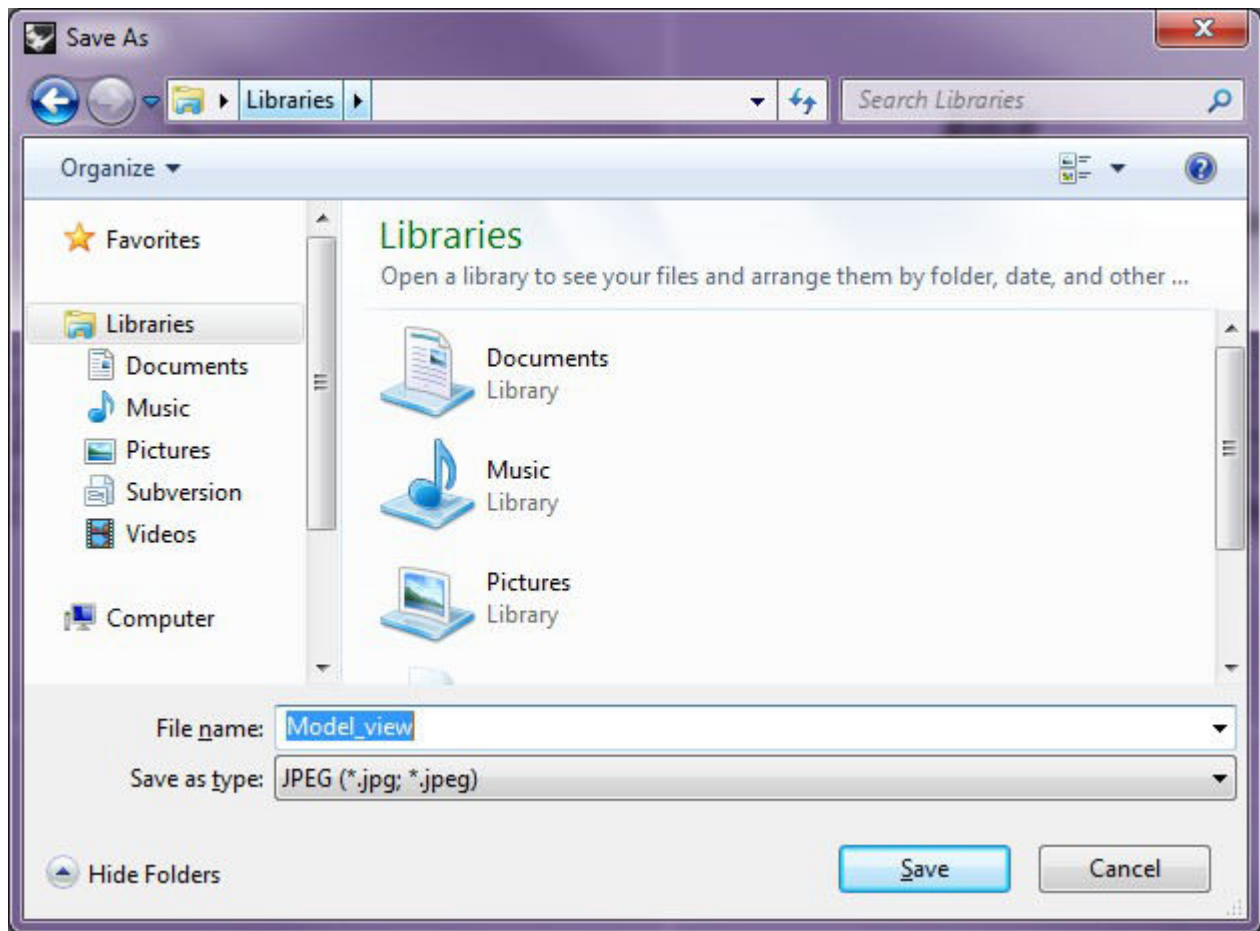
Here is a sample of what you can expect:



Export Image command



The [Export Image](#) command should be used to save the current model view as an image and upload it to the CADtoEarth cloud service where it can be placed onto the maps. Once the command is launched the [Save As](#) dialog would appear:

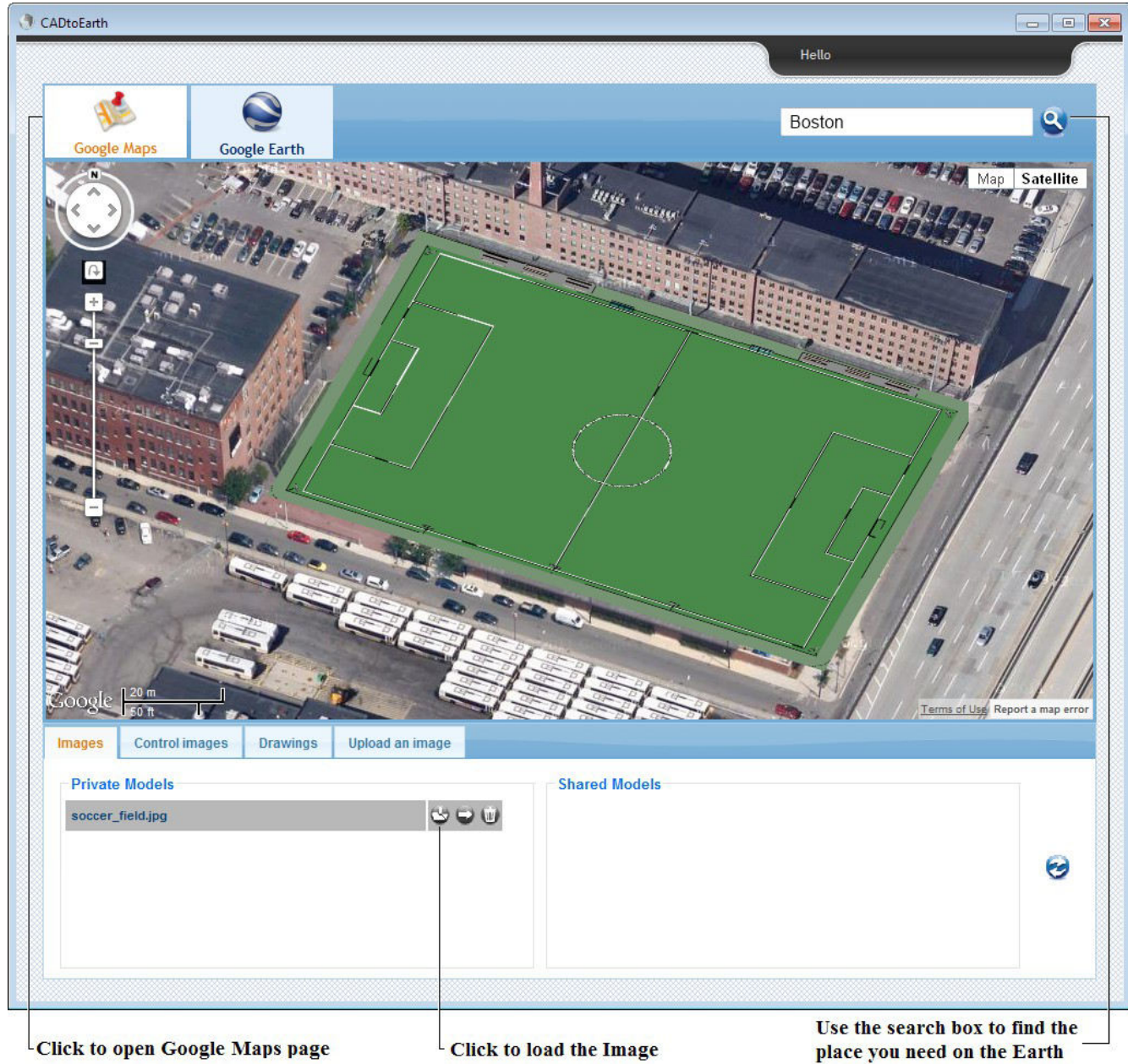


- Enter the name for an exported image into the [File name](#) text box.
- The image will be saved in the folder you have chosen and automatically sent to the server.

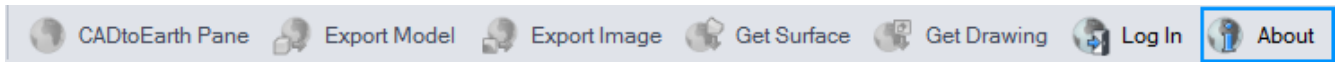
Once the image has been uploaded to the server it can be simply placed on the maps using the [Load image](#) button to the right of the picture's name.

(See: [Images tab & Storages](#))

Here is a sample of what you can expect:



About command



Run this command to open the CADtoEarth plug-in About dialog.



CADtoEarth Web Application

Introduction

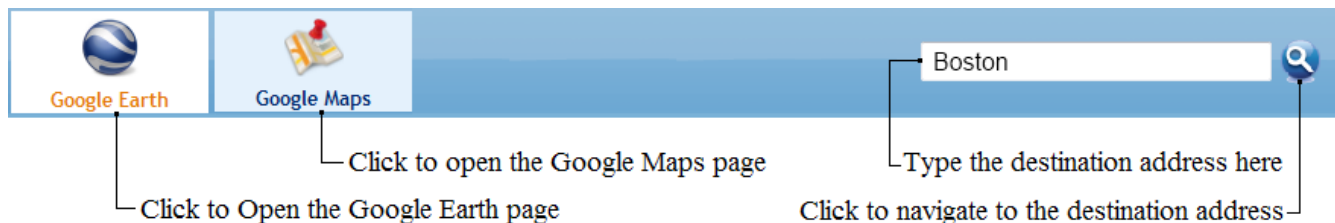
The CADtoEarth web application exposes some exciting capabilities, including the abilities to:

- Capturing of the certain part of Earth surface from the Google Earth.
- Sketching in Google Earth and Google Maps environments.
- Provides a personal storage for every CADtoEarth account, where the 3D models and Images will be placed.
- Provides a set of tools that will help you manage your 3D models. You can move, rotate and scale your 3D structures in order to fit the surrounding area.
- Share your 3D models with other CADtoEarth users.
- Choose the models to be placed at startup. It can be useful when you work with a set of 3D models.

CADtoEarth web services

The we application provides an access to Google Earth and Google Maps services. Easily switch between the web services using the [Google Earth](#) and [Google Maps](#) buttons at the top of the startup web page.

Use the Search box to quickly find the destination place you are looking for.



Access

You can access the CADtoEarth web application using the following link:

<http://www.cadtoearth.amcbridge.com>

Right now, CADtoEarth supports the following web browsers:

- Internet Explorer 9.0 or newer (32-bit only)
- Mozilla Firefox 21.0 or newer (32-bit only)
- Google Chrome 27.0 or newer

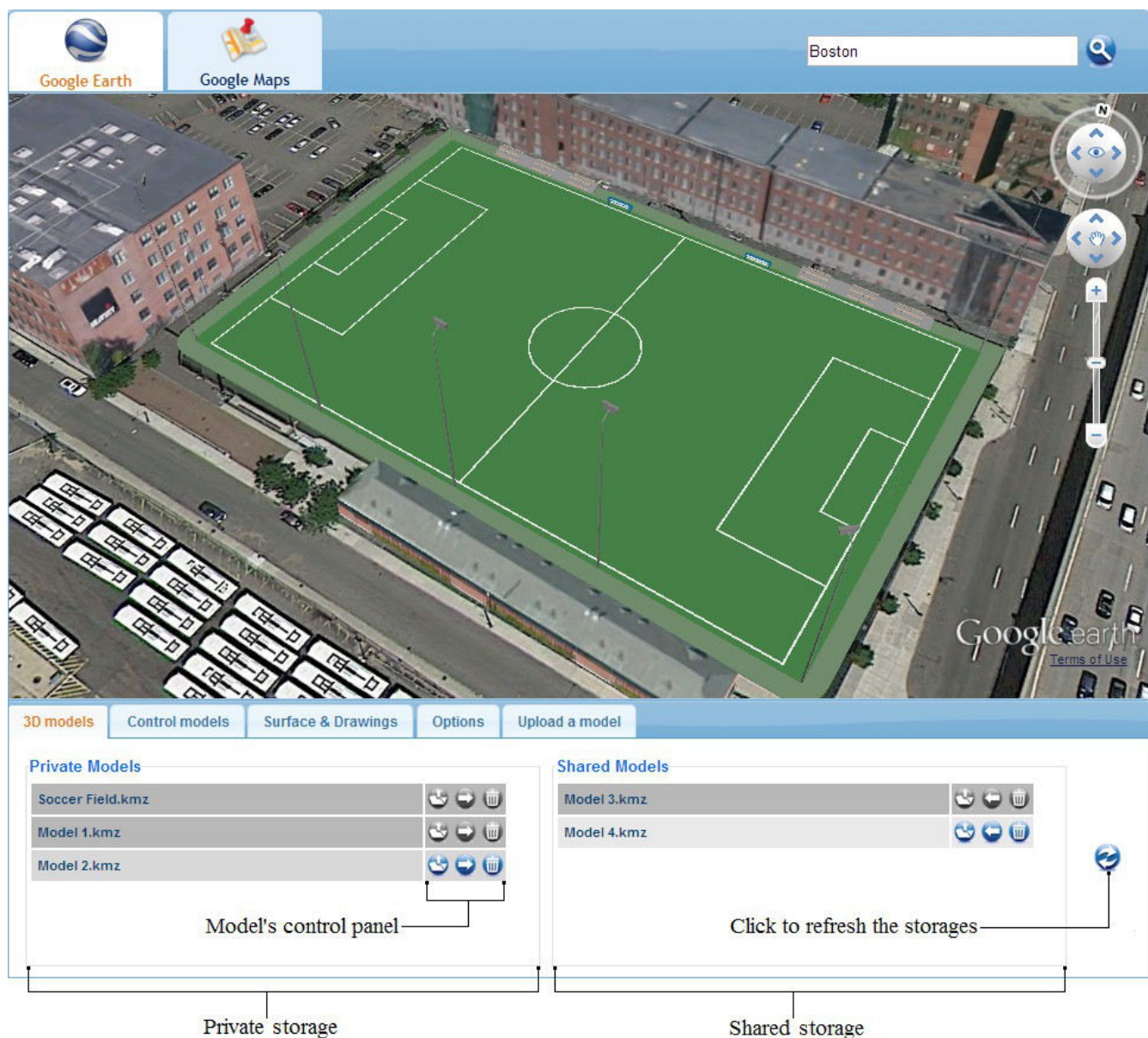
Google Earth Tools

3D Models tab & Storages

After exporting, the 3D structures will be uploaded directly to the CADtoEarth server. To review the uploaded models:





- Open the CADtoEarth task pane.
- Switch to **3D Models** tab under the Google Earth page.

Now you can see two file storages with uploaded 3D models. In the **Private storage** you will find the list of models that were exported or uploaded by you. In the **Shared storage** you will see the list of public models that were shared by other CADtoEarth users.



Note: By default the models exported from the CAD environment will be stored to the Private storage.

Below you can see the complete set of actions supported for every 3D model:

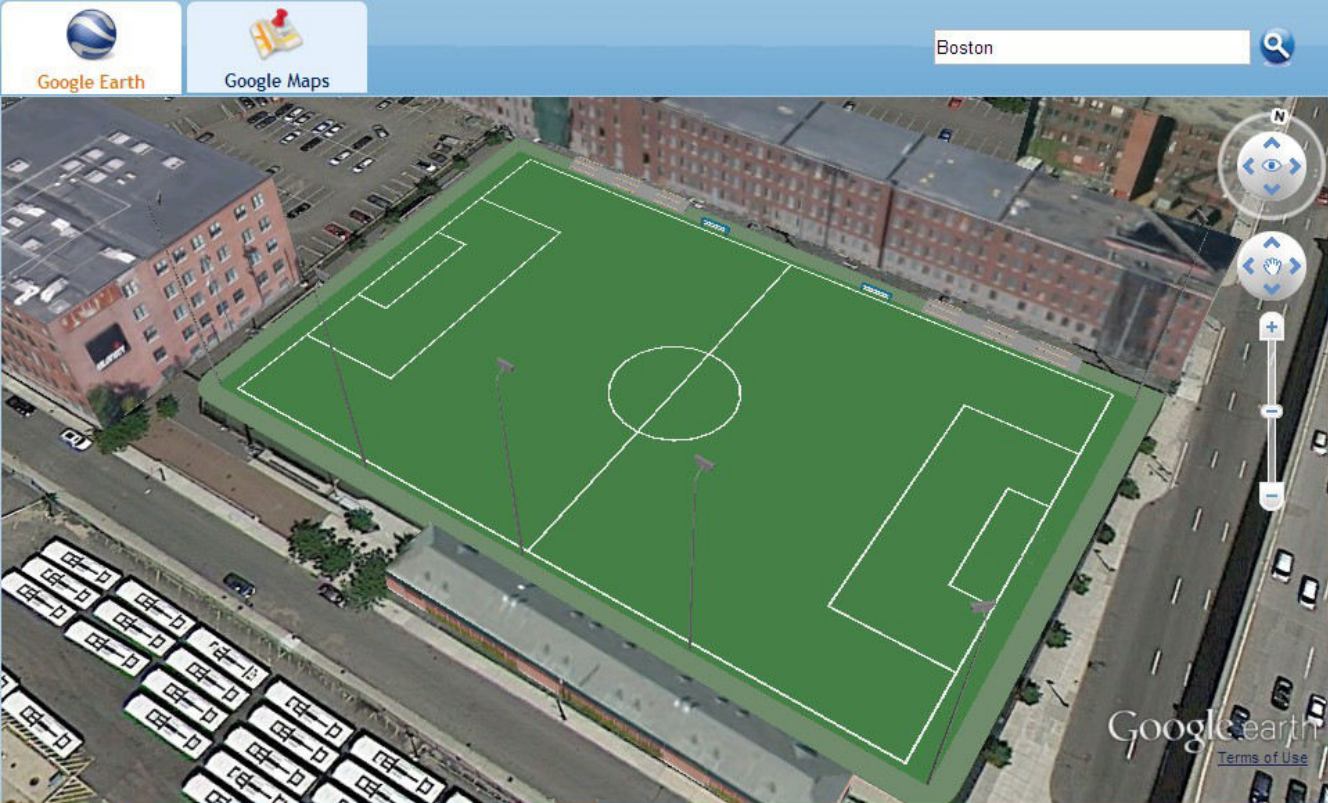
-  Load model - the command places selected 3D model onto the Earth surface. If there are built-in coordinates for the model, you will be offered to use them.
-  Move to Shared Storage - the command moves selected 3D model to the Shared Models list.
Note: The models in Shared storage are visible to everyone.
Note: You can share only up to 5 models.
-  Move to Private Storage - the command moves the selected 3D model to the Private Models list.
Note: You can perform this operation only for your models.
-  Remove File - the command removes the selected 3D model from the CADtoEarth cloud service.
Note: You can perform this operation only for your models.



Note: You cannot remove the model that is already placed on the Earth from the list. In order to do this you need to unload the model from the Earth.
(See: [Control Models tab](#))

Control Models tab

The **Control Models** tab allows you to manage the 3D structures that have been already placed on Earth. Use the Control Panel to scale, rotate and move your model in order to fit the surrounding area:



The screenshot shows the Google Earth interface with a soccer field model placed on a city street in Boston. The model is a green rectangular field with white lines for the pitch and goal areas. The interface includes a search bar at the top right with the text "Boston". Below the map, there are tabs for "3D models", "Control models", "Surface & Drawings", "Options", and "Upload a model". The "Control models" tab is active, displaying a table of models and a control panel.

Models on the Earth	Place on startup	Unload a model
Soccer Field.kmz	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Model 1.kmz	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Model 3.kmz	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Control Panel




Check this option to autoplace the model
Click to unload selected model

Control Panel settings:





- Scale: x1
- Rotation: 1°
- Translation: -2 meter
- Buttons: Save, Reset
- Navigation: Move, Rotate, Scale, Reset

Control Panel allows you changing the settings for the selected model and saving of the resulting configuration.

Below you can see the complete set of actions supported by Control Panel:

-  Scale Slider – allows you to scale the selected 3D model. The range interval is from x0.1 to x6.
-  Orientation Slider – allows you to rotate the selected 3D model. The range interval in degrees is from -180° to 180°.
-  Altitude Slider – allows you to control the altitude of the selected model. The range interval in meters from -965 to 965.

Move panel will help you change the location of the model to fit the surrounding area:

-  Right Button – the command moves the selected 3D model to the West.
-  Up Button – the command moves the selected 3D model to the North.
-  Left Button – the command moves the selected 3D model to the East.
-  Down Button – the command moves the selected 3D model to the South.

Click the [Save](#) button to save the resulting configuration for the selected 3D model.

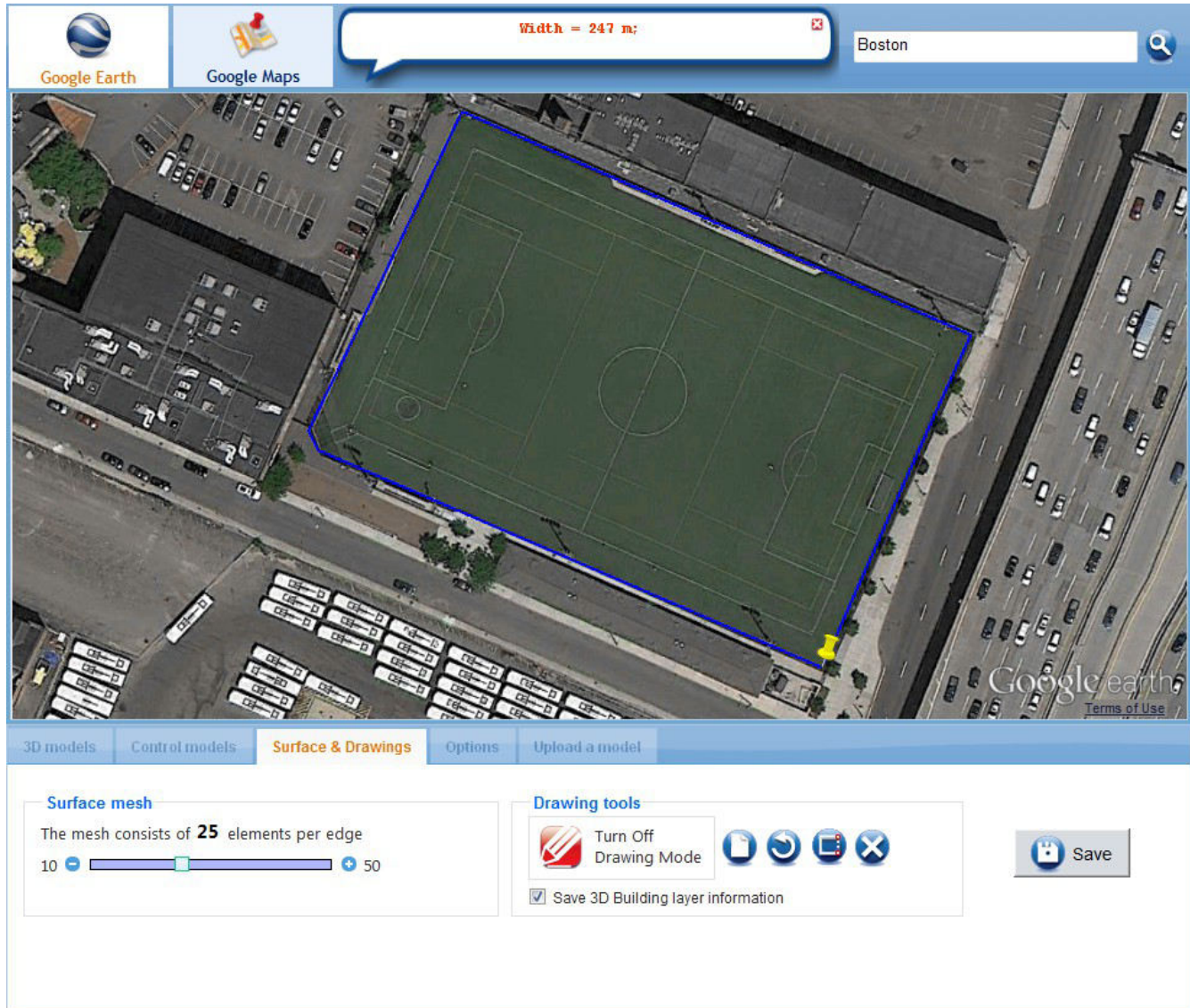
Click the [Reset](#) button to restore to the default configuration of the selected 3D model.

Check the [Place on startup](#) option if you would like the 3D model to be auto-placed every time CADtoEarth is opened


 Unload Button – the command removes the selected 3D model from the Earth.

Surface & Drawings tab


At the [Surface & Drawings](#) tab you can easily set up the parameters of the exported surface and sketch some curves, which may be useful if rough data on ground elevations is needed or if you need to capture some object outlines:




Below you can see the complete set of supported actions:

10  50 Mesh slider – controls the accuracy of the captured surface.

Check [Save 3D Building layer information](#) option if you would like to get the building layer in 3D representation along with the surface.

Drawing Mode is a specific mode that allows you create some curves that can be obtained along with the surface. To be able sketch a curve you have to turn the Drawing Mode on. In order to do this click the  button under the 'Drawing tools' group.

Note: You won't be able to switch between the Google Earth tabs while the Drawing Mode is turned on! You can turn it off by clicking the  button under the 'Drawing tools' group.

Once the Drawing Mode is turned on, the **Drawing tools** commands will become enabled. Below you can see the set of actions supported by Drawing tools panel:



Create Button – the command begins a new polyline.



Undo Button– the command removes the last line from the current sketch.



Close Button – the command closes the current polyline.



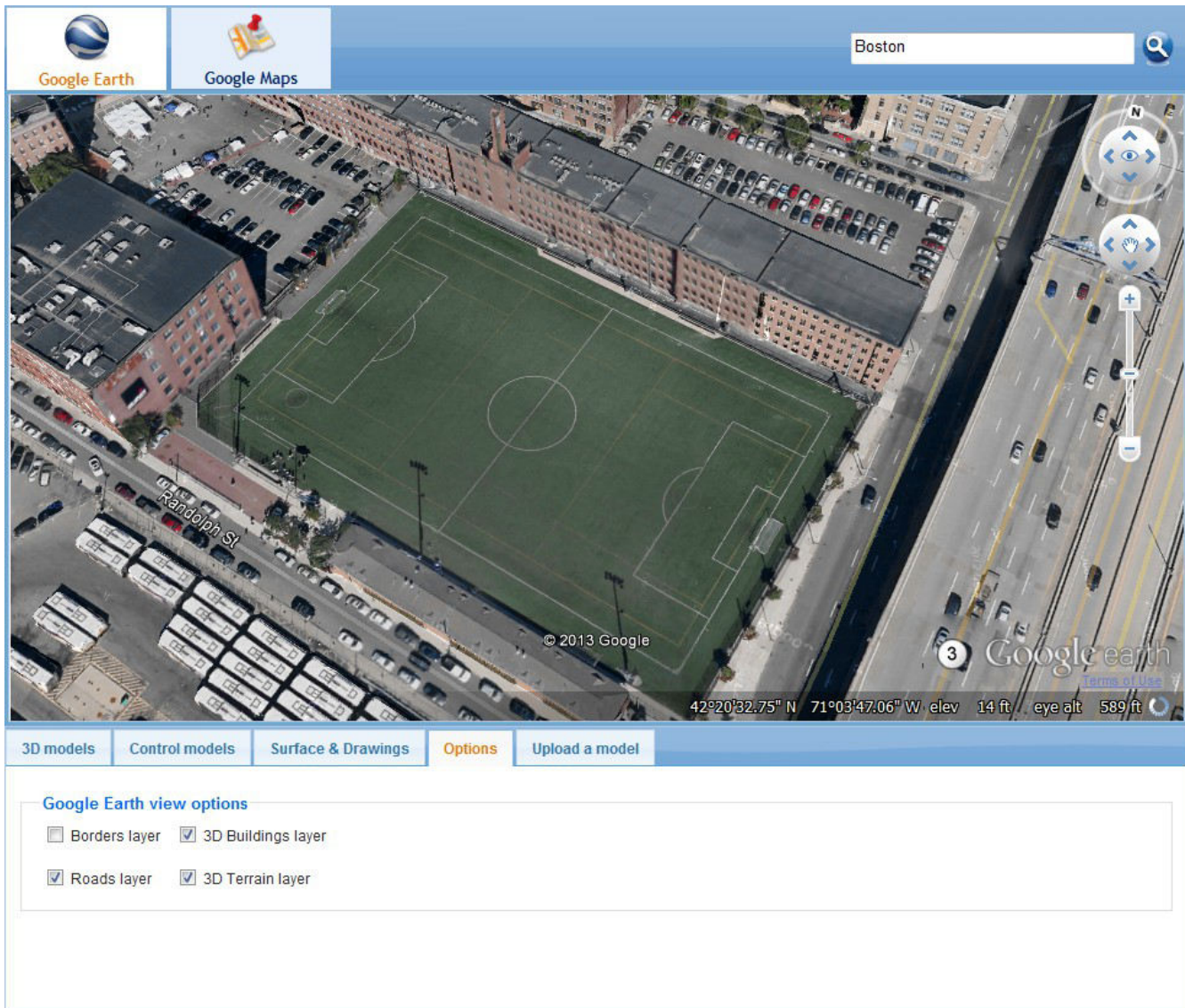
Unload Button – the command removes all the polylines.

Once you are ready to capture the surface with any additional information simply click on the **Save** button and the surface will be exported.

Now you can switch back to the CADtoEarth plug-in and import the surface.
(See: [Get Surface command](#))

Options tab

With the **Options** tab you can choose what information you would like to see on the Earth and choose the visual style (3D/2D) for the objects.



Below you can see the set of supported options:

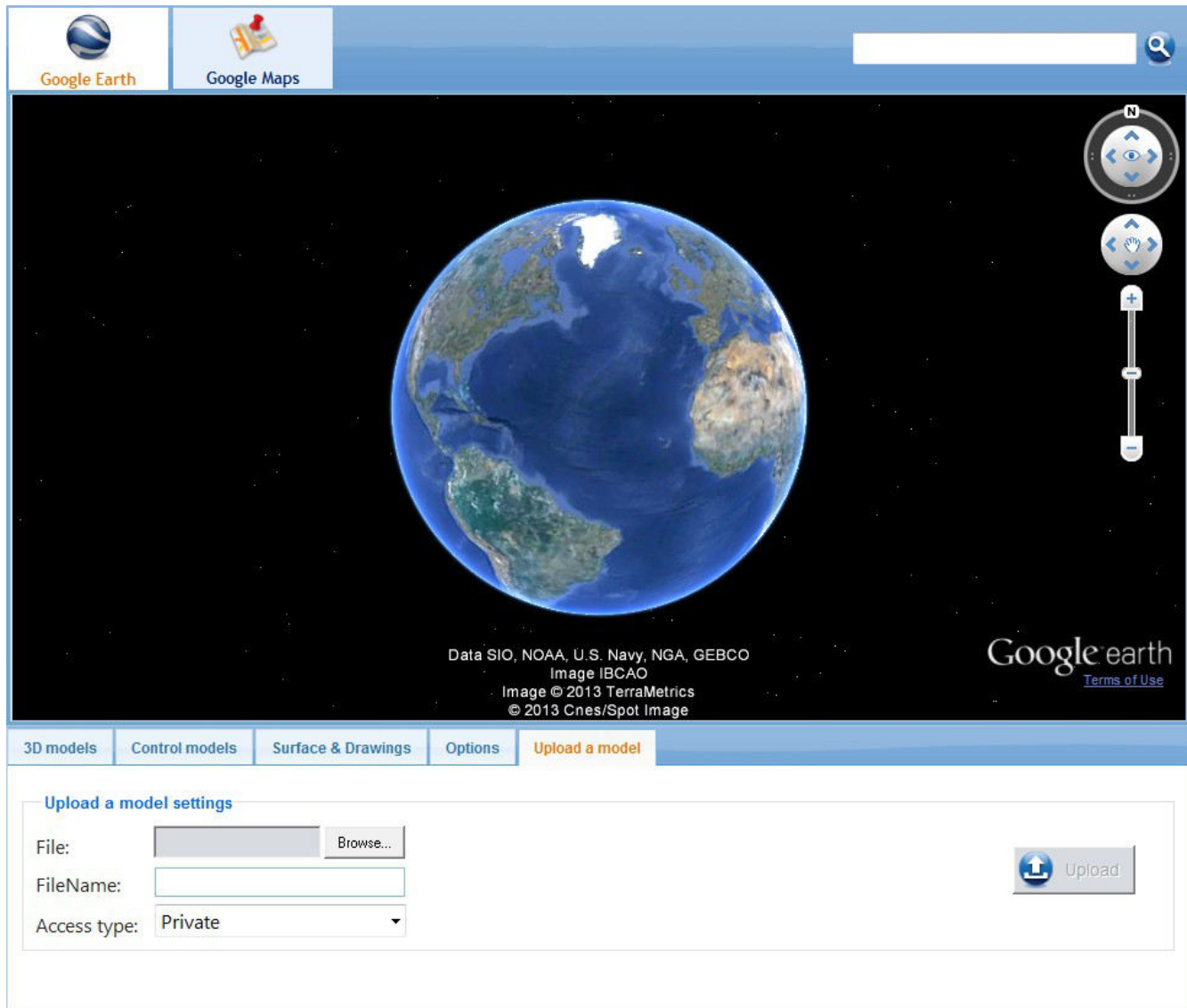
- Border layer – check this option if you would like to receive the information about political borders.
- Road layer – check this option if you would like to get information about the roads.
- 3D Building layer – check this option if you would like to see the buildings in 3D.
- 3D Terrain layer – check this option if you would like to see the terrain in 3D.

Upload Model tab

The [Upload Model](#) tab is the last tab under the Google Earth page.

With this tab you can upload the files with *.kmz format to your storages.

Note: KMZ is a file format that is supported by Google Earth. Google Earth can open such files directly and display the content. So go ahead and upload the *.kmz models you have and place them along with the models exported from Rhinoceros.



To upload a model please do the following:

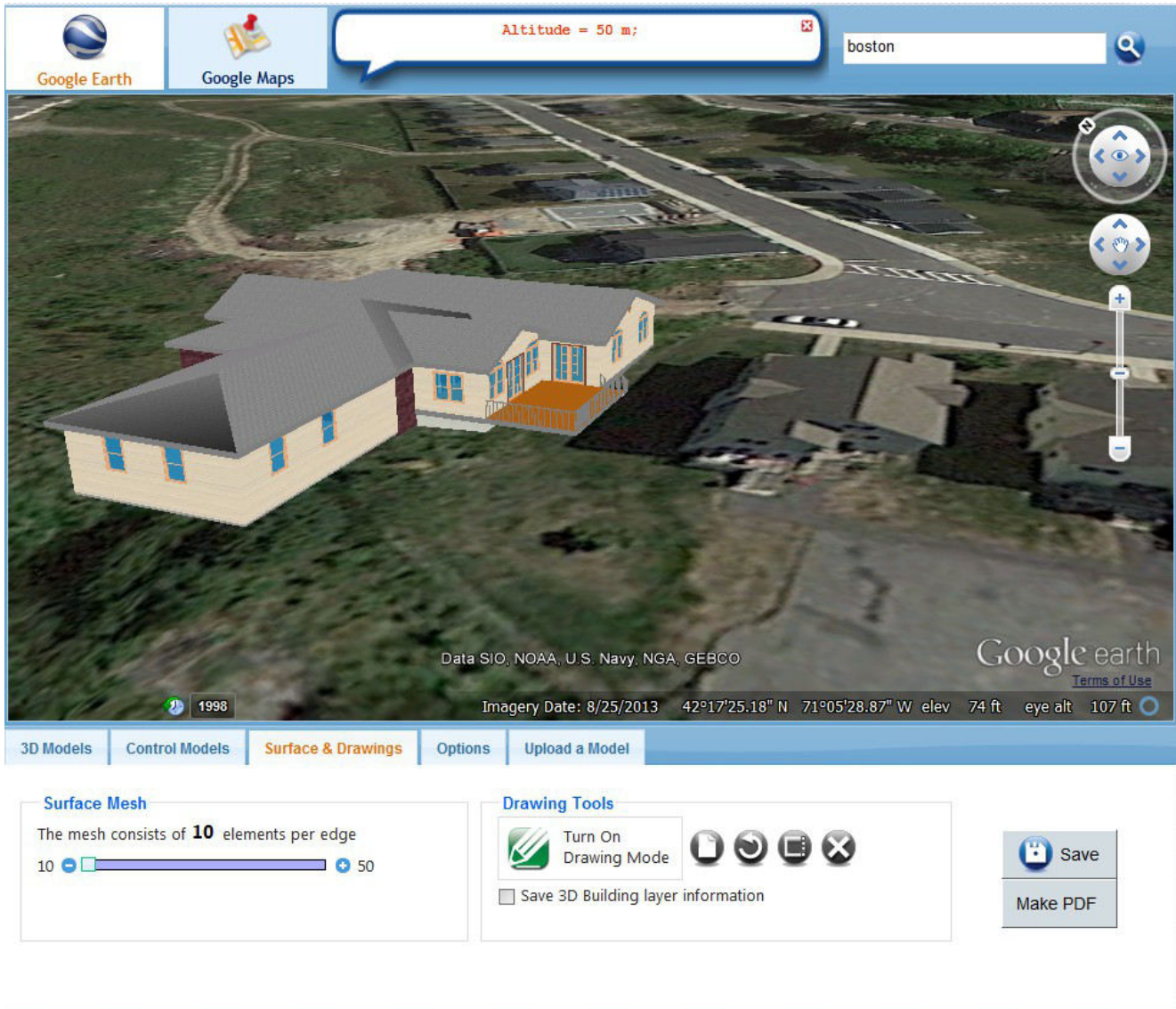
- Click on the [Browse...](#) button and select a *.kmz file from your computer.
- In the [Access type](#) drop down list choose the destination storage.
- Click the [Upload](#) button. The model will be uploaded to the chosen storage.

Now you can switch to the [3d Models](#) tab and place the uploaded model on the Earth.

(See: [3D Models tab & Storages](#))

Convert to 3D PDF

At the [Surface & Drawings](#) tab under the [Google Earth](#) page you can easily convert the resulting 3D view into 3D PDF format:



Once you are ready to capture the surface simply click on the [Make PDF](#) button and the surface with placed 3D buildings will be converted into 3D PDF format. The resulting file will be returned in a minute asking for download.


Note: Only 3D Models generated by the family of CADtoEarth Plug-ins could be converted into 3D PDF format. We do not guaranty the COLLADA files generated by other tools and uploaded using the cadtoearth.amcbridge.com web site will be visible.

Surface.pdf - Adobe Reader

File Edit View Window Help

1 / 1 96.7% Tools Sign Comment

AMC
BRIDGE
Reducing Overhead in Engineering



©2014, DataGlobe, MassGIS, Commonwealth of Massachusetts

Parameter	Value
Latitude	42.2898
Longitude	-71.0937
Area	21212.38 m ²
Model count	1

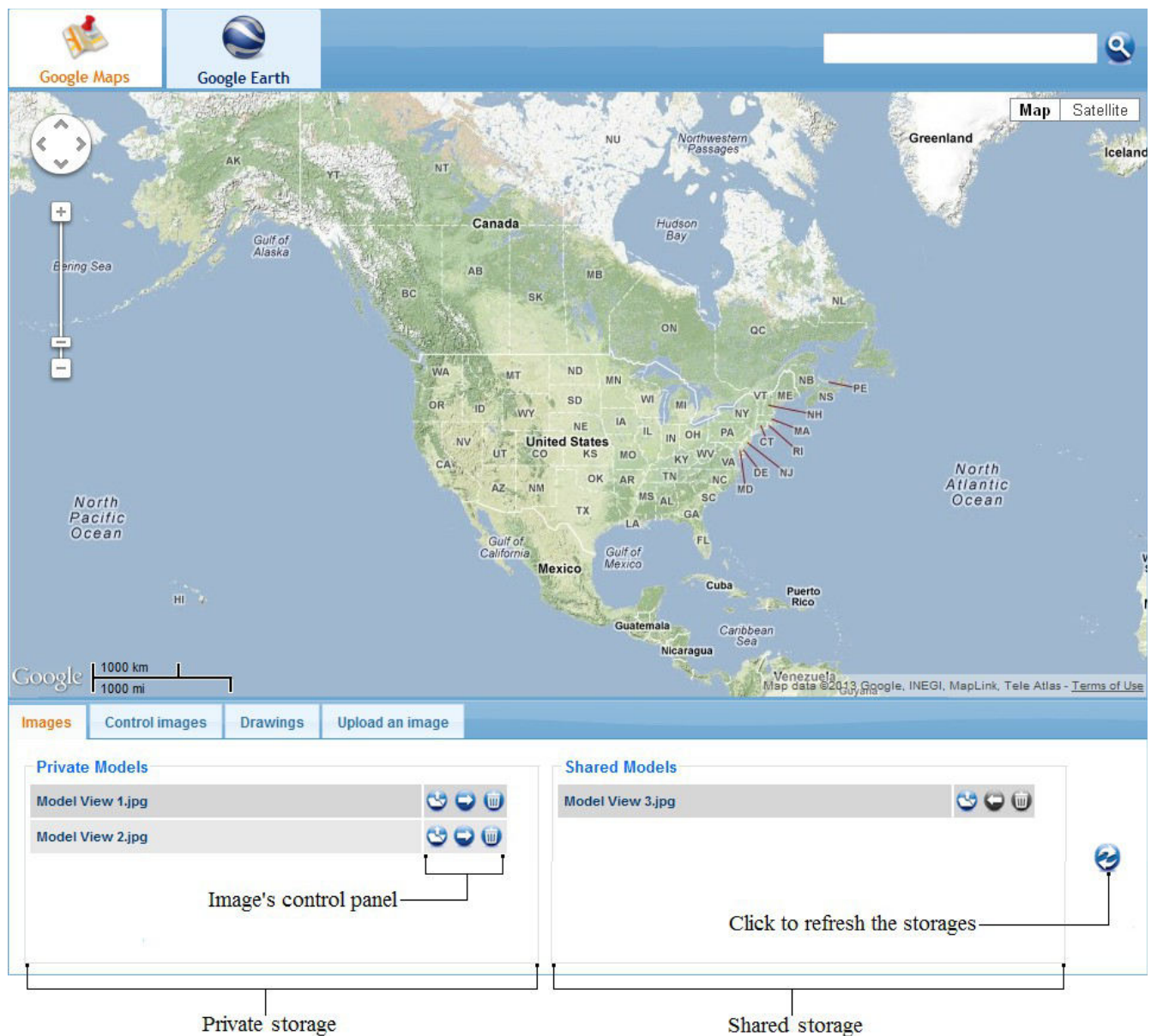
Google Maps Tools

Images tab & Storages

After exporting the images of models they will be uploaded directly to the CADtoEarth server. To review the uploaded images:

- Open the CADtoEarth task pane.
- Switch to **Images** tab under the Google Maps page.

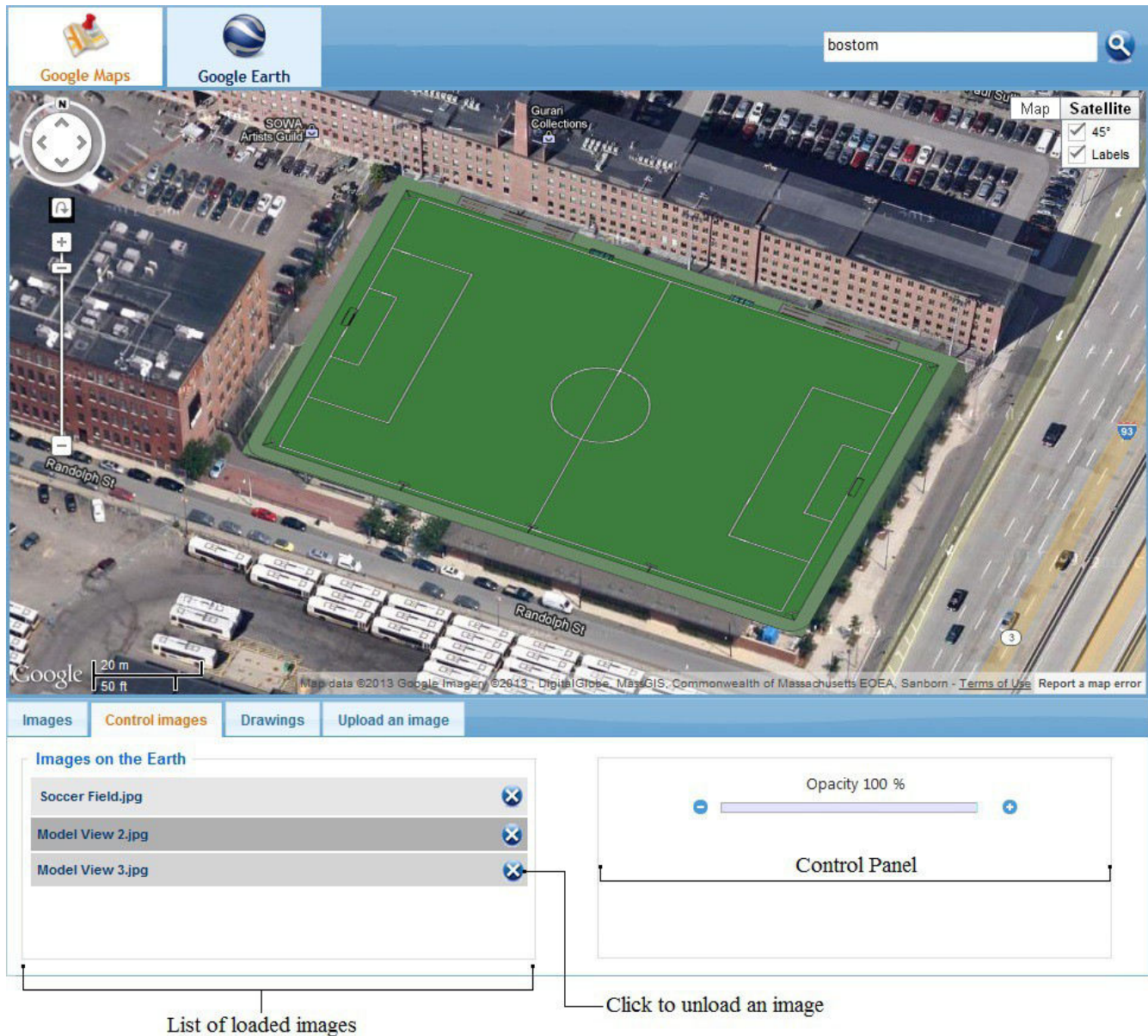
Now you can see two file storages with the uploaded Images. In the **Private storage** you will find the list of images that were exported or uploaded by you. In the **Shared storage** you will see the list of public Images that were shared by other CADtoEarth users.



Control Images tab

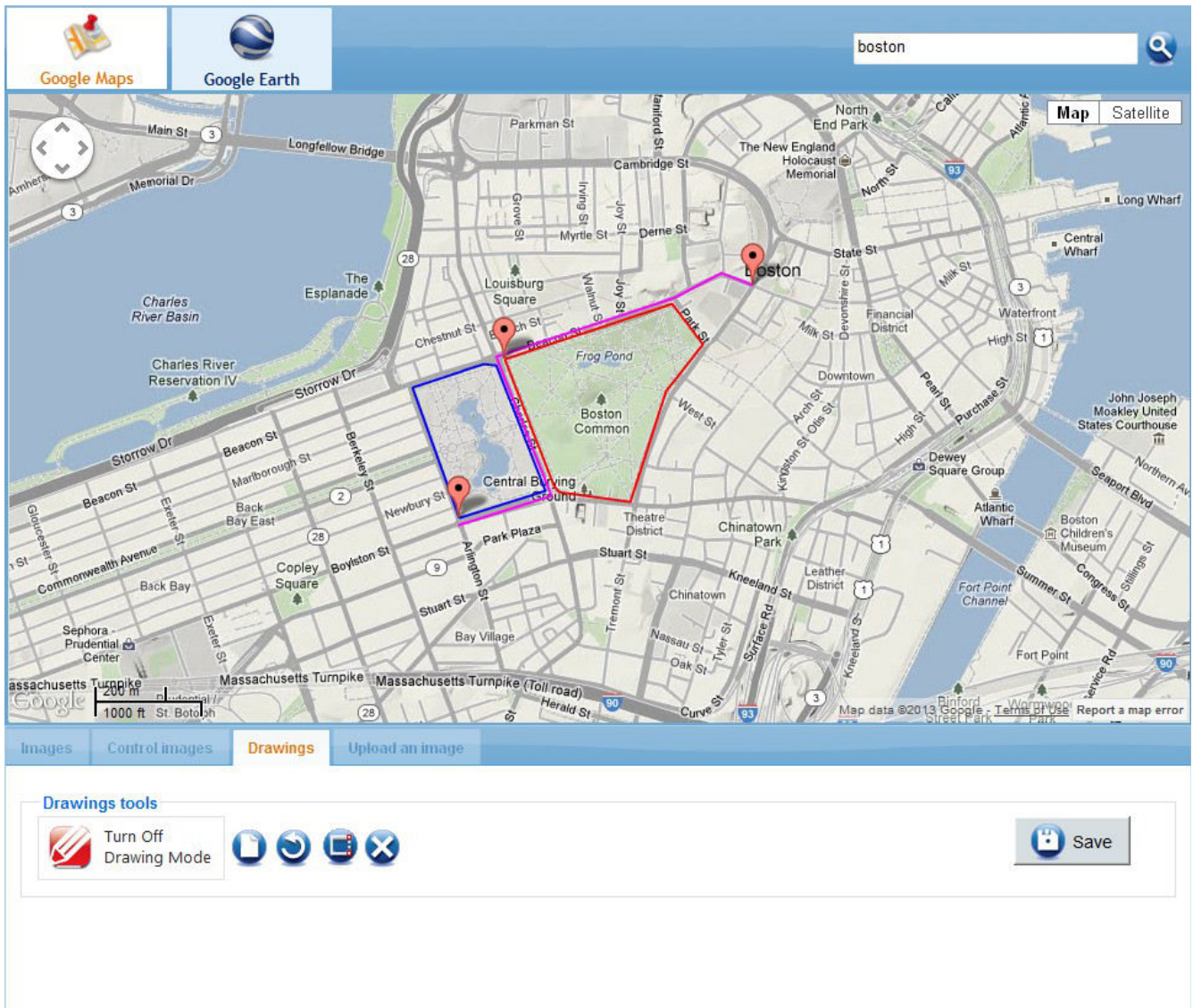
The **Control Images** tab allows management of the Images that have been already placed on Google Maps:

- Use the Control Panel box to change the opacity of the selected image.
- To change the position drag an image with the left mouse button pressed.
- To rotate hold the right button and move the mouse. Drag an image corner to resize.



Drawings tab

At the [Drawings](#) tab you can easily sketch some curves, which may be useful if you need to capture some object outlines:



[Drawing Mode](#) is a specific mode that allows you to create some curves that can be exported from Google Maps. To be able to sketch a curve you have to turn the Drawing Mode on. In order to do this click the  button under the 'Drawing tools' group.

Note: You won't be able to switch between the Google Maps tabs while the Drawing

Mode is turned on! You can turn it off by clicking the  button under the 'Drawing tools' group.

Once the Drawing Mode is turned on, the [Drawing tools](#) commands will become enabled. Below you can see the set of actions supported by Drawing tools panel:



Create Button – the command begins a new polyline.



Undo Button – the command removes the last line from the current sketch.



Close Button – the command closes the current polyline.



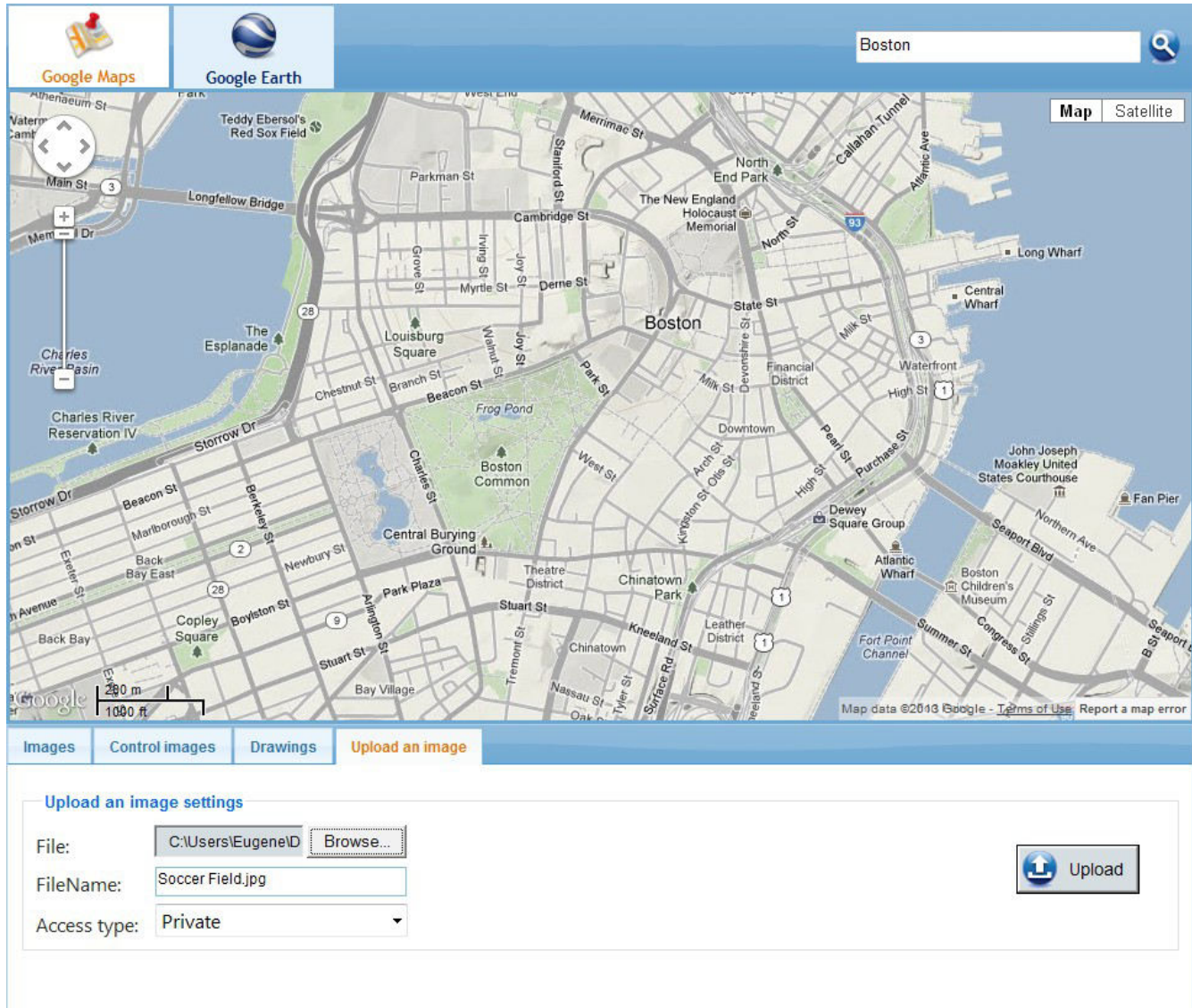
Unload Button – the command removes all the polylines.

Once you are ready, simply click on the [Save](#) button and the sketched curves will be exported.

Now you can switch back to the CADtoEarth plug-in and import the Drawing.
(See: [Get Drawing command](#))

Upload Image tab

The [Upload Image](#) tab is the last tab under the Google Maps page. With this tab you can upload *.jpeg, *.gif or *.png format images to your storages. Upload the images and place them along with the views exported from Rhinoceros.



The screenshot displays the Google Maps interface with the 'Upload Image' tab selected. The map shows a detailed view of Boston, including streets like Main St, Cambridge St, and the Charles River. The 'Upload an image settings' panel is visible at the bottom, containing the following fields and controls:

- File:** A text input field showing the local file path 'C:\Users\Eugene\...' and a 'Browse...' button.
- FileName:** A text input field containing 'Soccer Field.jpg'.
- Access type:** A dropdown menu currently set to 'Private'.
- Upload:** A blue button with an upward arrow icon to submit the image.

To upload an image please do the following:

- Click on the [Browse...](#) button and select an image from your computer.
- In the [Access type](#) drop down list choose the destination storage.
- Click the [Upload](#) button. The image will be uploaded to the chosen storage.

Now you can switch to the [Images](#) tab and place the uploaded image of the model on Maps. (See: [Images tab & Storages](#))

Appendix A: Contact Us

AMC Bridge has a global footprint with offices and development centers in North America and Ukraine. Our North American headquarters in New Jersey handles all Sales, Administrative and Business inquiries. Most of our software developers are located in our state of the art office in Dnepropetrovsk, Ukraine.

Please let us know how we can help you, and we will get in touch with you as soon as we can.

AMC Bridge North America Headquarters:

10 Lake Shore Drive S.
Randolph, NJ 07869

Phone: **+1 973-895-1724**
Fax: **+1 973-895-5376**

For all online inquiries, please contact: **contact@amcbridge.com**
Technical Support: **support@amcbridge.com**

You can contact us right now.

We look forward to hearing from you.