

## Background

Pictometry approved partners are uniquely qualified to produce and deliver 3D models for a wide variety of applications. We create three levels of 3D models, Platinum, Silver and Bronze.

### Platinum Building Geometry

The patent pending extraction process produces clean 3D polygonal boundary representation models (sometimes called “wireframes”). Significant rooftop shapes (slopes, ridges, peaks, domes, etc.) and features (parapets, elevators, large HVAC units, etc.) are accurately represented. Objects resting on other objects stop at the boundary of the lower object, to minimize any interior geometry. Very infrequently, a small amount of interior geometry can occur, at the intersection of two complex structures.

The geometry is divided into “buildings.” A building is an isolated structure that does not touch neighboring structures. When very large contiguous structures occur, they may be further subdivided for quality and performance reasons. The geometry attempts to minimize the number of vertices and polygons. Where a feature sits on a rooftop, the rooftop will be a single flat polygon, not a polygon with a hole where it is concealed by the feature. Even though that part of the surface is never visible, adding a hole would increase the complexity of the geometry.

### Platinum Building Textures

Geo-specific, photo-accurate texture maps are created from the source aerial photography and applied to the building geometry to add detail without increasing geometric complexity, and to add a remarkable sense of realism. Texture maps are created at “full resolution” wherever possible. Care is taken to preserve the quality of the original imagery as much as possible. Unavoidably, some pixels may be “stretched” by being rectified onto a surface that was angled obliquely to the camera; but this is minimized to the degree possible by careful selection of texture pixels from multiple source images.

A proprietary occlusion removal process is used to generate clean textures, free from obstruction artifacts caused by neighboring buildings.

Texture map data is never fabricated by our process. If a portion of a building was not photographed by any image, that portion of the building will receive a default color.

### Ground Geometry

Ground geometry represents the ground elevation surface. Ground geometry is represented as a triangular mesh. The ground may be derived from customer-supplied DEMs, modeled from the source aerial photography, or a combination of the two. The ground may be formatted as a single large mesh, or be subdivided into rectangular tiles, with each tile being a triangular mesh.

### Ground Textures

The ground texture map is a “true orthomosaic,” created by rectifying the aerial photography onto the full 3D ground and building model. This process removes all building lean from the orthomosaic, leaving the streets clearly visible.

The orthomosaic may be delivered as a single large image, or subdivided into image tiles that correspond to the ground geometry tiles. The customer may specify the desired output resolution (GSD) for the orthomosaic.



## **Accuracy**

Accuracy is heavily influenced by the nature and quality of the source aerial photography, the input DEMs, and customer provided ground truth information. Horizontal position accuracies are achieved in proportion to the accuracy of the source ground control data, including any elevation models. Vertical positioning is controlled to either customer provided elevation models or 3D ground control reference.

## **Delivery Formats**

The customer has a wide variety of choices for data delivery formats. In almost all cases, Pictometry can deliver the data in a format that meets the customer's needs. In cases where the standard formats do not suffice, it may be possible to customize the output to meet specific needs.

### **Naming**

Each building is given a unique name. Buildings are usually numbered sequentially. It is also possible to request names based on a spatial encoding, such as MGRS.

### **Grouping**

The customer has a choice of receiving all buildings in a single file, or each building in a separate file.

### **File Formats**

The customer may request the geometry and textures in any of several common 3D interchange formats, including: 3DS, OpenFlight, KML, ESRI Shapefile, OBJ, X3D, VRML for geometry, and JPEG, TIFF, GeoTIFF, BMP, or DDS for the texture maps.

### **Coordinate Systems**

The customer may request that the models be exported in a coordinate system of the customer's choosing. The choices include geocentric, geodetic, UTM, and a plethora of map projections.

## **Silver Level Models**

Silver models are a lower resolution model than what is described above. The polygons are reduced significantly and the texture maps created at a lower resolution. The buildings are modeled using the following criteria:

- Main building outline and main roof peaks are modeled.
- Dormer, sheds, fences, parapets, pipes, poles, overhangs, spheres and awnings are not modeled.
- Bridges or elevated highway or overpasses are not modeled.

## **Silver Building Textures**

Buildings textures are generated at 50cm resolution. Buildings textures resolution can be generated at higher resolutions in 10cm increments for an additional fee.

## **Bronze Level Models**

Bronze models are Silver level models (as described above) less all texture maps.