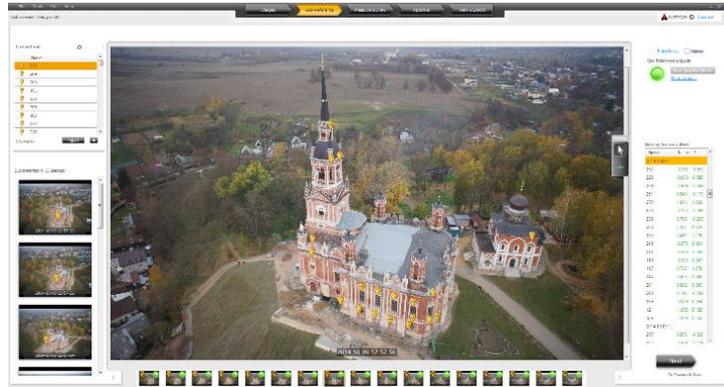


Case Study: Surveying the Novo Nikolsky Cathedral, Russia

Date: May 2015

Location: Novo Nikolsky Cathedral, Mozhaysk, Moscow, Russia



The Survey

The task involved the survey of the Novo Nikolsky Cathedral in Mozhaysk, Moscow with an accuracy within the range of 1 to 3 centimeters (9 hundredths of a foot).

Original Effort Estimate

The original effort estimate for a survey of the four facades of the church using conventional surveying techniques involved 7 days: 4 days in the field, with a crew of two people, using prism-less Total Station measurements. This would be followed by 3 days in the office to create a CAD model of the church, utilizing the Total Station measurements, and then the creation of a detailed model of the church. Fieldwork, using conventional surveying techniques, entailed several major challenges:

- The church is located on a hill top and it was difficult to obtain a good view and measuring angle using the prism-less Total Station.
- The complex architectural facades demanded a high-level a field sketching capabilities.

Actual Required Time Using DatGram™3D

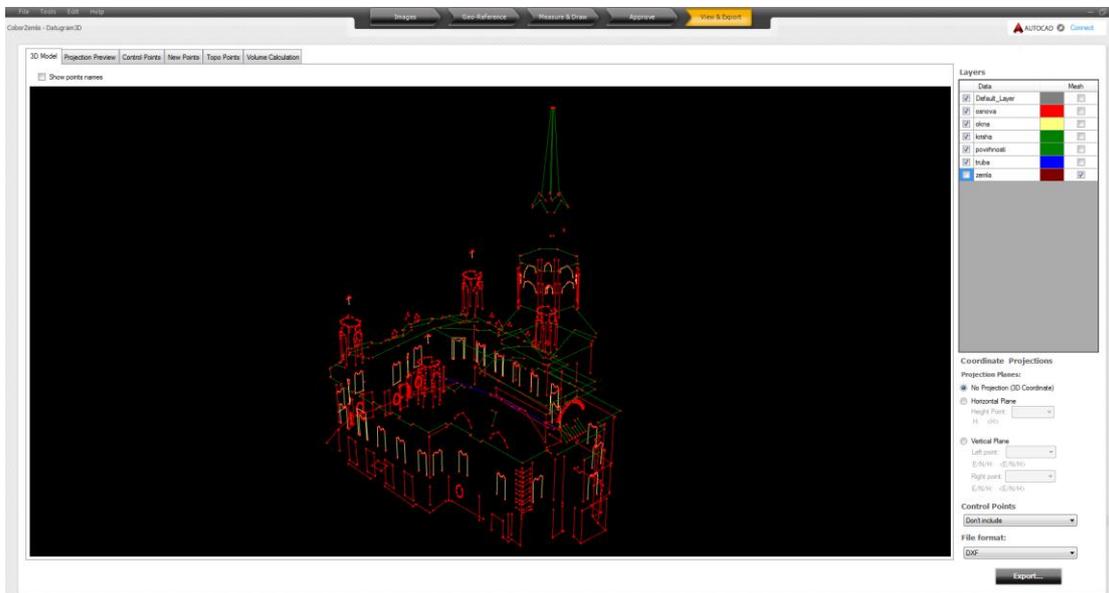
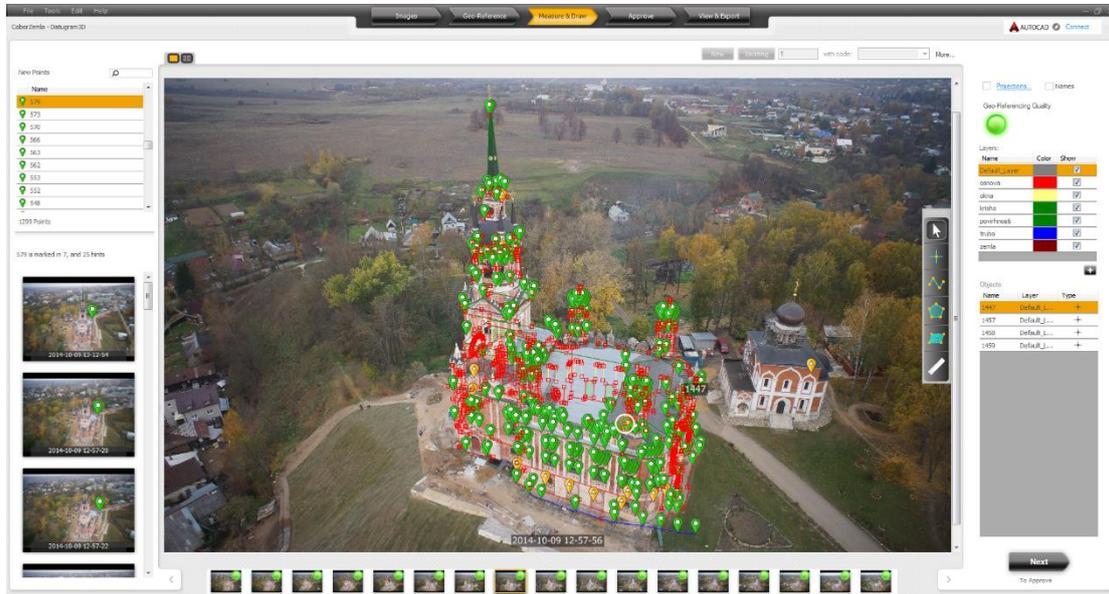
The actual time to survey and create an accurate 3D CAD model of the Church was only 2 days.

Fieldwork took only 2 hour: 1.5 hours to measure control points on and around the church structure, and 30 minutes to photograph the church. A regular Sony NEX7 camera (24-megapixel resolution) equipped with a 16-mm wide-angle lens was used. The camera was mounted on a small remotely controlled quadcopter. A total of 32 images of the church were taken, from the perimeter of the church towards its center, from an elevation of about 60 meters (180 feet) above ground level.



Control points were measured around the church using a prism-less Total Station device.

The actual time spent in the office to geo-reference the data, create an accurate 3D CAD model of the church, and create 1300 new 3D points was 2 days.



Results

The facades of the church were digitized using polygons and polylines. In total, 1,300 new 3D points were created. The measurement accuracy of all the points was better than 2 centimeters (6 hundredths of a foot) in both position and elevation.

