3D Building Project

Recently, SATPALDA has completed a prestigious project for our esteemed client based on 3D digitization of urban buildings for an area covering about 200 sq. km. The study area consisted of the core and busiest part of the city surrounding the International Airport and the beach on the other side of the airport.

All types of buildings such as villas, multistorey buildings, slums and single storey buildings were covered in this project. We used high resolution stereo satellite data for feature extraction in a 3D environment. Building polygons were provided with their mean sea level elevation and their height above ground. All the main structures and superstructures of the multistoried building were shown as individual polygons.

Photogrammetry workstations were used for manual digitization and attributes such as *"building height"* and *"building elevation"* were provided for each building and superstructures.

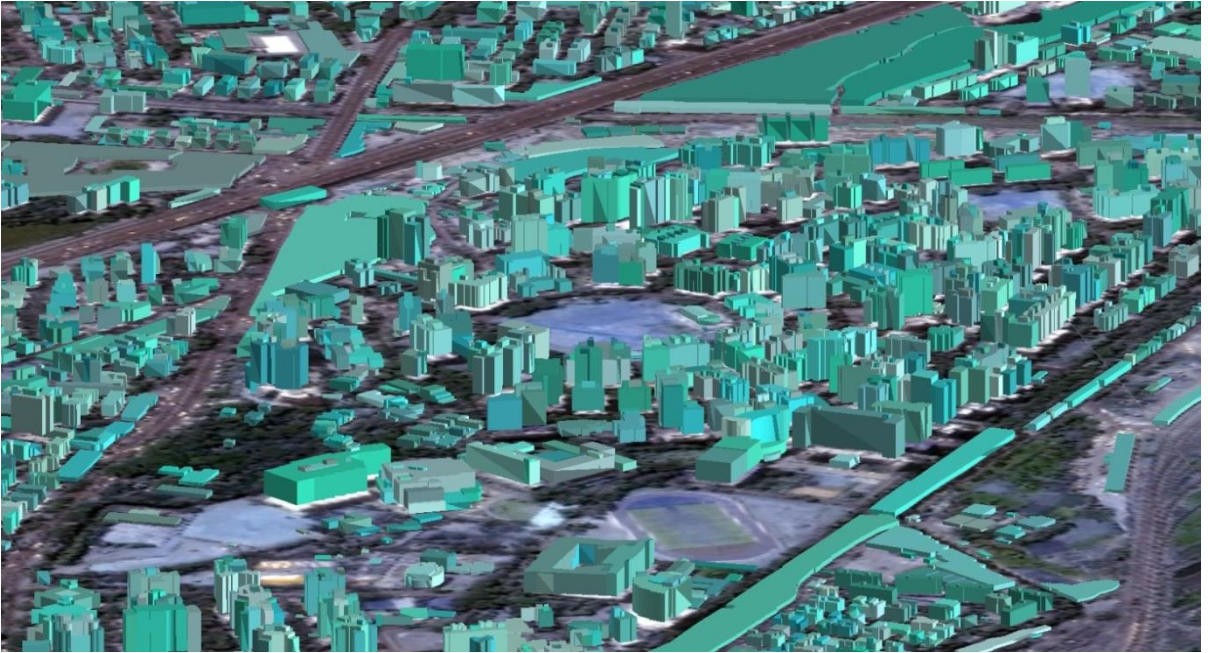Figure 1. Satellite image for feature extraction

Figure 2. 3D View of the City

Further, we marked all the updates that took place in the city over a period of time such as the construction of new buildings or modification of existing buildings. This helped our client to better understand the changes that took place in a particular time period. 3D visualization and geospatial quality of this product was very high and enabled the client to implement it in further project planning with a high level of confidence.

Aerial Triangulation on satellite stereo data was performed. It is a process of contiguous densifying and extending ground controls through computational means. This operation includes establishing ground control points, performing interior orientation, measuring and transferring all tie points, check points and control points appearing on all photographs manually and performing least squares block adjustment. This process ultimately provides exterior orientation parameters for photographs and three-dimensional co-ordinates for measured object points. Stereo compilation of each building was done to create 3D polygons for each building. Manual digitization of DEM was done by adding breaklines and mass points on the stereo pair.

On the basis of resulted DEM, contour of different intervals were generated and delivered to the client. In the contour map, widely spaced contours indicate flat surface, closely spaced contour indicate steep surface and equally spaced contour indicate uniform slope.
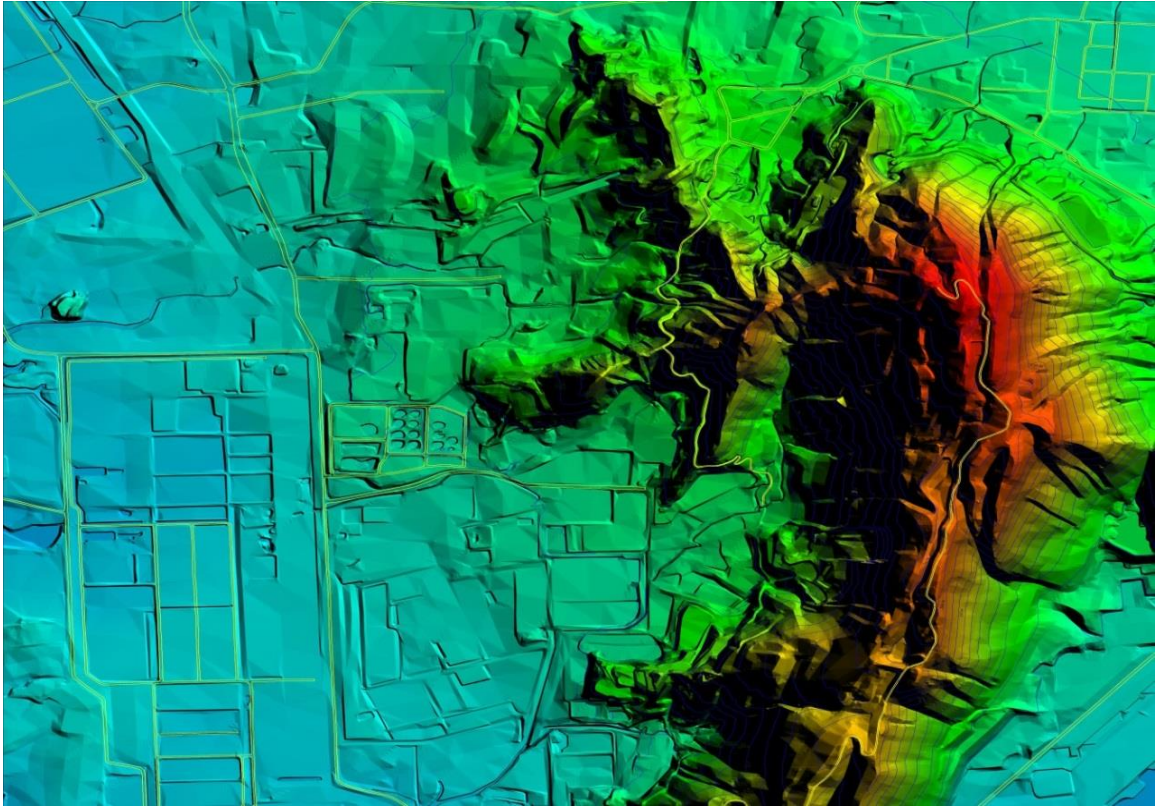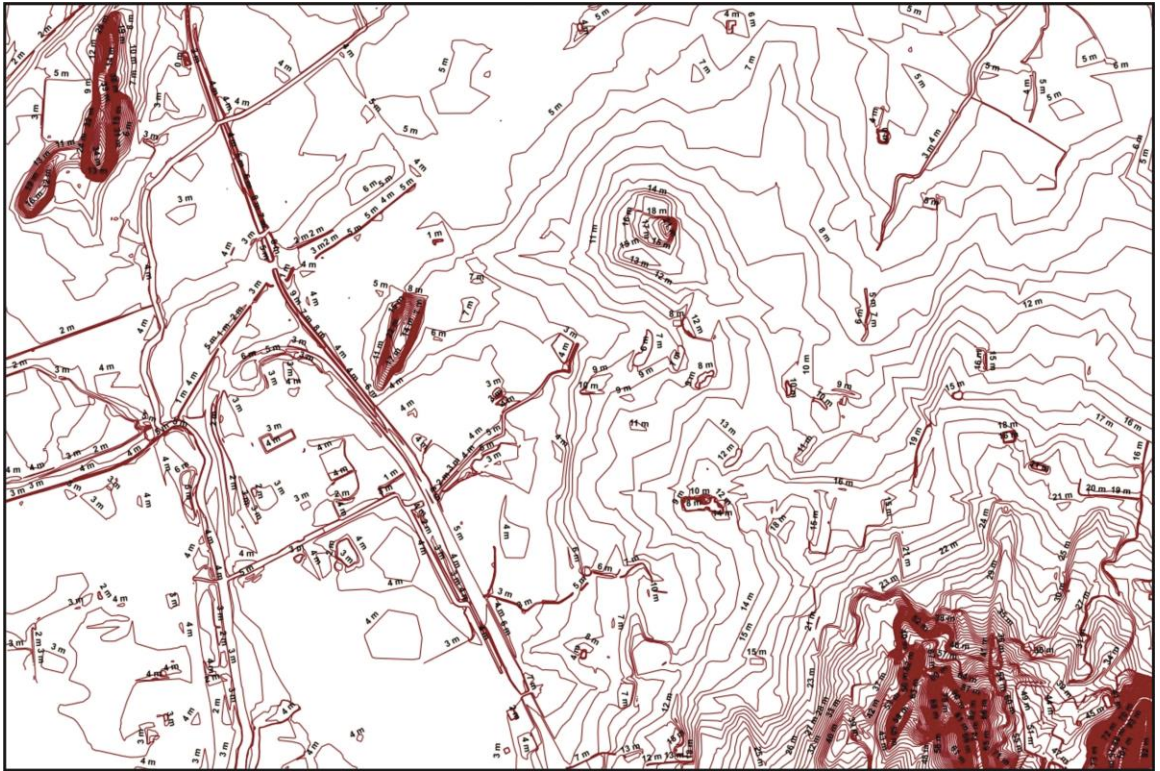
Fig.3 Extracted DEM of an area.

Fig. 4 Contour map