

As – Built survey in Industrial Building Switzerland



Front view of UAG building



SBB daily schedule did not interrupt and was not interrupted



Scanning process. With the red circle is emphasized the usage of portable black and white targets in order to constrain the scans

In General

Purpose

Scan the structure of an industrial building (UAG) in order to produce architectural and mechanical drawings

Field Work (Measurement of interested area)

5 days / 8 staff members

Office Work (Digitization of the detail points)

2 months / 3 staff members

Utilised Geodetic Instrumentation

- Total Station Leica TCRP
- Laser Scanner Leica P20
- Laser Scanner Leica C10
- Laser Scanner Registration Targets
- Firmware
- Leica Cyclone 8.0.2
- Leica CloudWorx
- Leica GeoOffice
- AutoCAD 2012

Deliverables

- Architectural and Mechanical Drawings for -2, -1, 0 and 1 floor (Scale 1:100)
- Longitudinal Section with Architectural and Mechanical Information (Scale 1:100)
- Cross Sections with Architectural and Mechanical Information (Scale 1:100)
- Technical Report

Difficulties

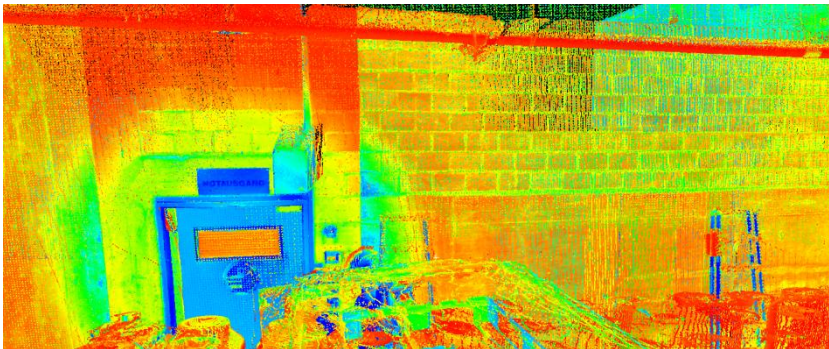
- The heavy daily and uninterrupted working schedule of the logistic station
- The areas of interest were full of packages and other objects that reduced the available visibility levels
- Some rooms or parts of them were inaccessible due to security reasons



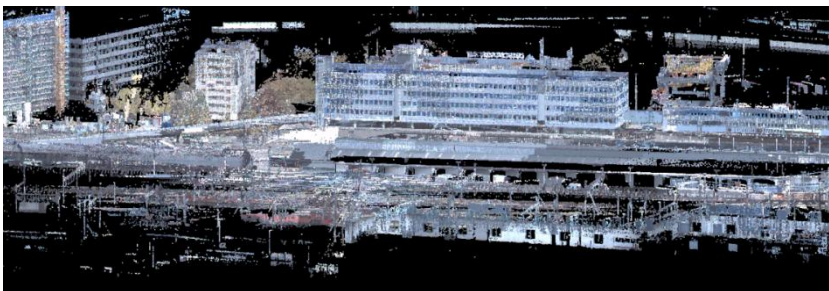
Measurement series

The first action was to place hundreds of black and white targets all over the building interior. Targets were well recognizable and they had a size of an A3 paper size. Totally 600 targets were placed. Additionally, 4 smaller targets were used in order to offer additional constraints to continuous scans. The whole building was covered through almost 800 setup positions of laser scanner with over of 7 billion of points. In order to define the common building coordinate system in which all point clouds will refer as also to enhance the final achieved accuracy, total station measurements were taken place.

After measurement series completion, all data were loaded to the appropriated software's for further processing. Geodetic data were inserted into the Leica Geo Office Software. After the calculation of traverses the initial coordinate system was transformed to the Building Coordinate System (BCS). All the scan data from each floor were inserted to Leica Cyclone 8.2 software. The data were registered by using the mathematical algorithm for the 100% of the common part between two point clouds. After the connection of all point cloud data, the information was aligned with the points that were measured with a Total Station. After the registration and alignment, the point cloud of each floor was ready to be used for mechanical and architectural drawing. The final point clouds of the floors, besides the high rate of uninterested or complex information, were not cleaned. The ability for that choice was guided by the advantages of CloudWorx environment. The users had the opportunity to adjust the exact place of slices to the whole cloud where the high degree of coverage of all the building simplified the drawing processes.



Sample of point cloud from -1



The final external faces of the building



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- when it has to be right

