# Accurate 3D Building Modeling for Assessment

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# Overview

* Problem Statement
* Technology : LiDAR
* Instrument: Laser Scanner
* Instruments Summary
* Data Collection
* 3D Modeling :Data Processing and Deliverables
* Outputs
* Applications

# Problem Statement

* Assessment of 3D Buildings for expansion
* Visualization in 3D

# LiDAR Advantages

*Field reality "as is" at your desktop!*

## *Faster*

- *Rapid data collection in near-real time*
- *Limited lane/rail closure (low impact to operations)*

## *Accurate*

- *High density point cloud data with detailed scans*
- *All physical features are captured with calibrated 360 degree panoramic images*

## *Cost Effective*

- *Reduced labour and time, eliminates frequent, time-consuming site revisits and provides quality control*

## *Flexible*

- *Operates day and night and under extreme temperatures*

## *Safe*

- *No hindrance due to regular traffic, field engineers or public*
- *No health hazard*

# LiDAR Outputs

* *3D point cloud data combined with 360 degree panoramic images*
* *3D models – DEM, DTM, DSM*
* *Contour maps – at client specific contour intervals*
* *Topographic maps – features as per specifications*
* *Engineering drawings – plans, cross section, L- sections*
* *Change detection maps – in case of repeated survey*
* *Interface with industry standard engineering software*

# Laser Scanner

- **Scanner: HDS 6100 Leica**
- Accuracy of single measurement
- Position 5 mm, 1m to 25 m range
  9 mm to 50 m range
- Field-of-view
  Horizontal 360° (maximum)
  Vertical 310° (maximum)

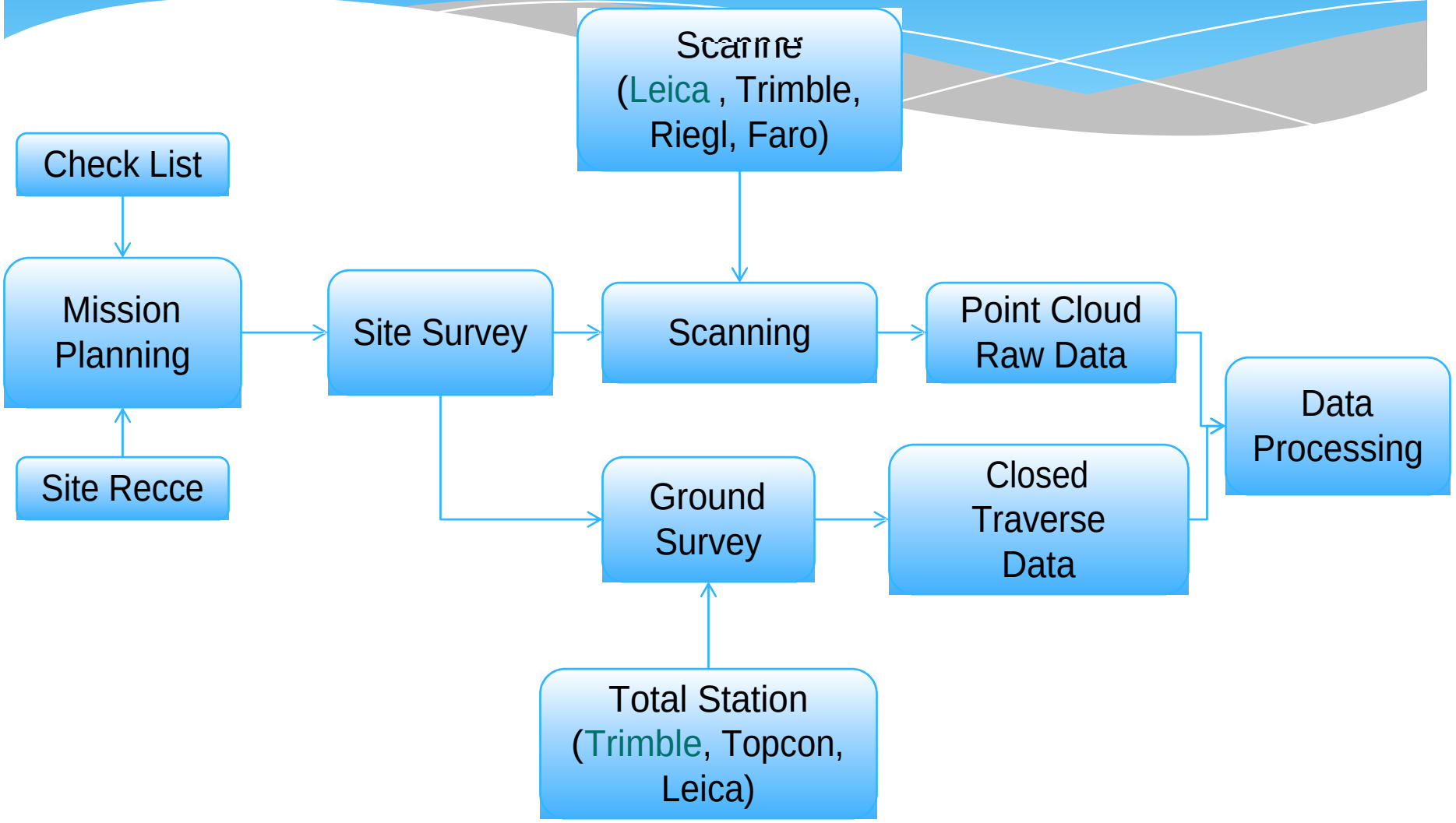

Fig. 6 HDS 6100 Leica

Source: http://www.leica-geosystems.com/en/Leica-HDS6100_64228.htm

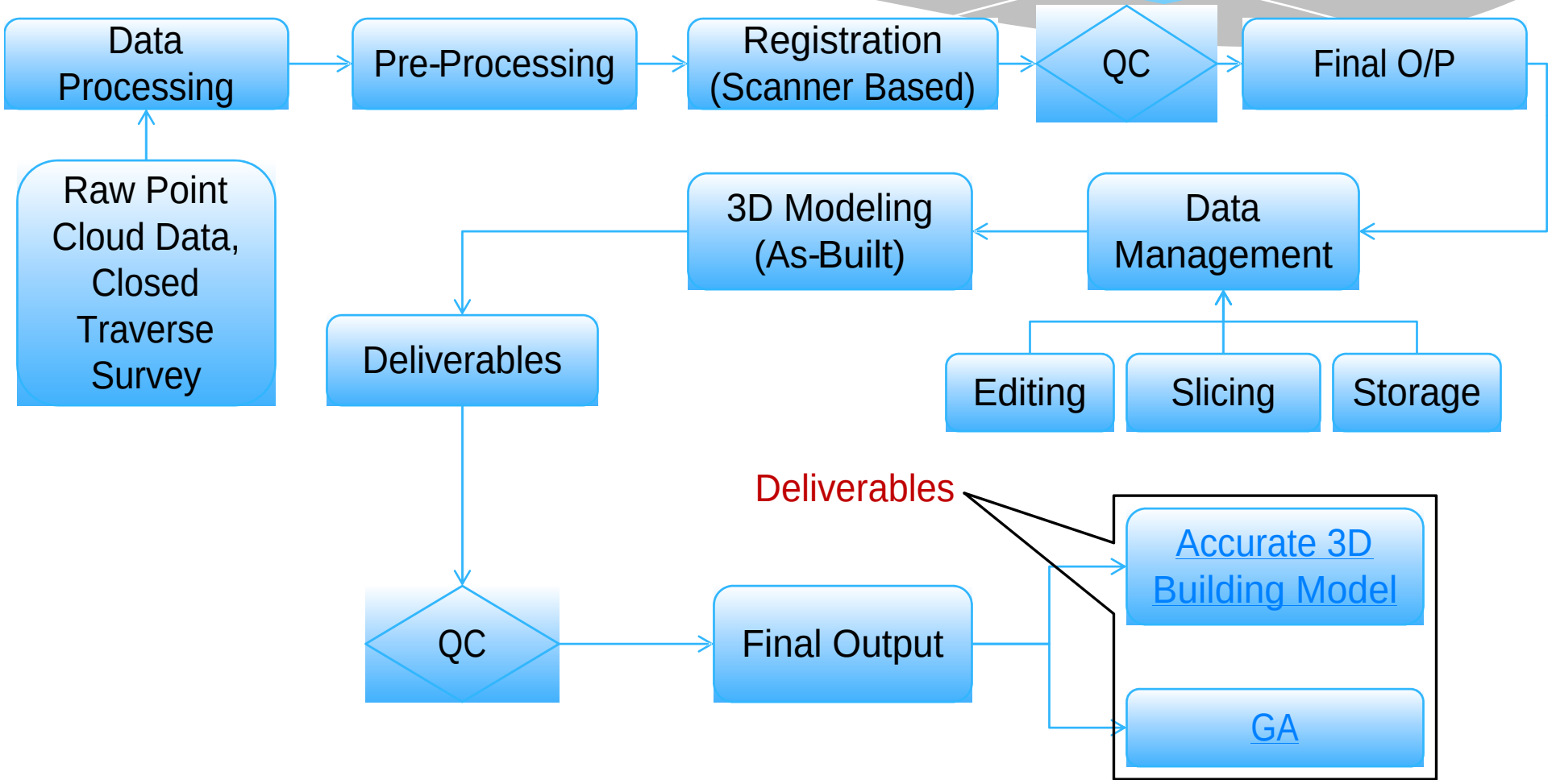
# Instruments Summary

| Data | Instrument | Amount Of Data | Accuracy |
|---|---|---|---|
| Laser Scanner | HDS 6100 Leica | 25 million points all | 5 mm, 1m to 25 m |
| | | around the building | 9 mm to 50 m range |
| Total Station & GPS | Trimble M3 3” DR | 100 points (1 day); Eastern façade (windows), Doors | 2"Prism ±(2+2 ppm × D) mm<br>2"Reflectorless ±(3+2 ppm x D) mm<br>3",5" Prism ±(3+2 ppm × D) mm<br>3",5" Reflectorless±(3+2 ppm × D) mm |
| | Leica GPS 1200+ | 30 Control Points | 6/7 mm in E,N and 15 mm in h |

# Data Collection

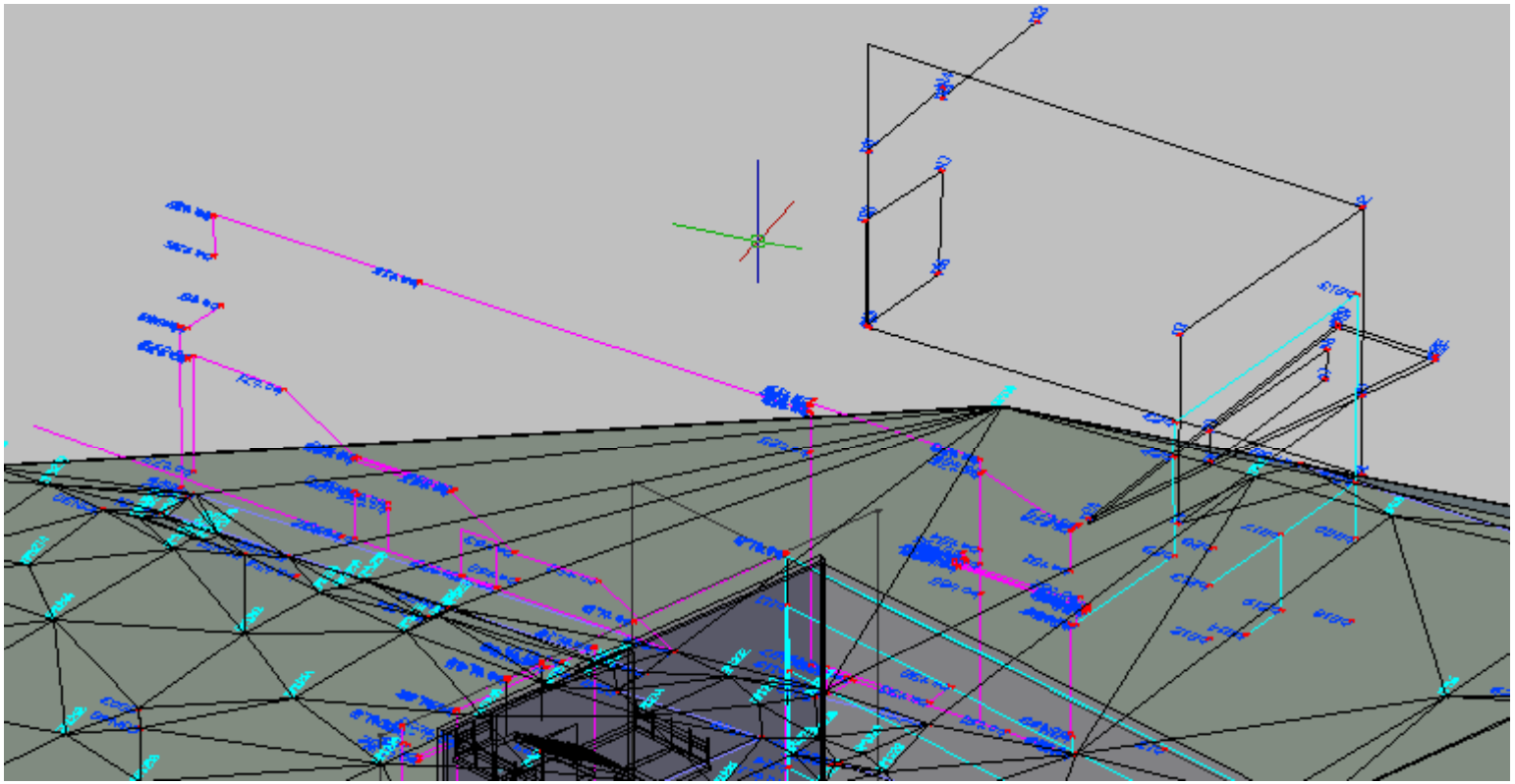


# Data Processing & Deliverables

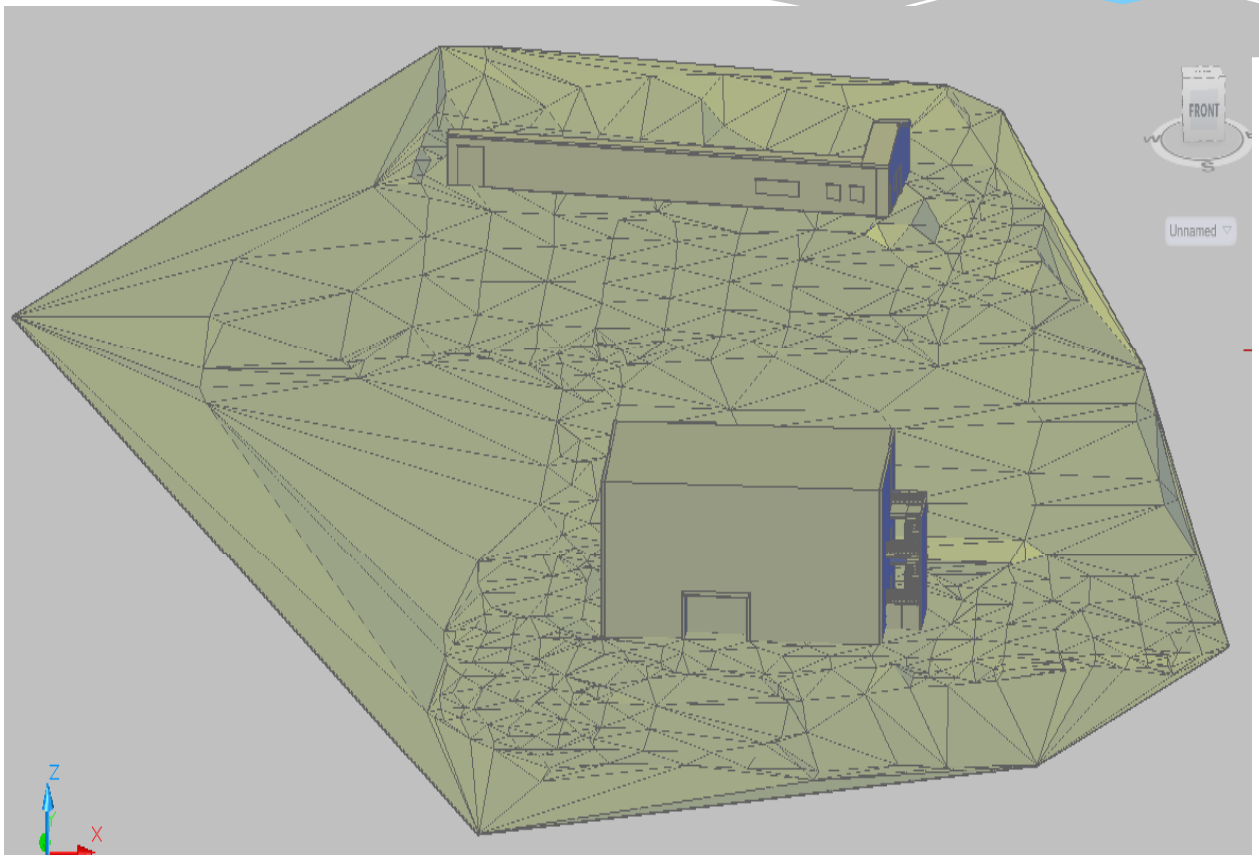


# 3D Building extracted from Scanner

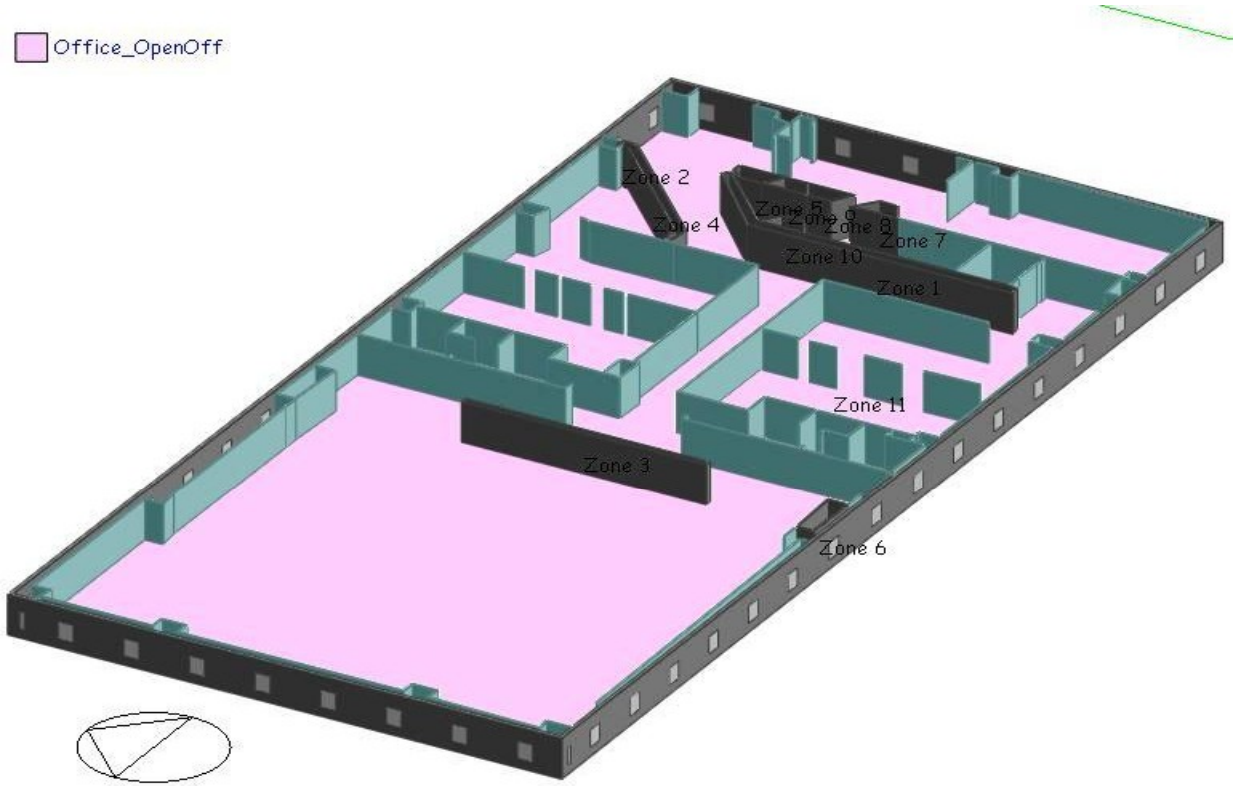
# 3D co-ordinates of the Building



# 3D Model of A Building In AutoCAD



# General Arrangement of Ground Floor of Building



# Applications

* Accurate 3D building model can be used for planning of the whole campus
* Visualization of the whole idea can be possible before building
* Efficient use of the plot for campus infrastructure
* Maximize the utilization of campus and better planning

Thank you