



Creation of 3D Building from surveying data

Assignment

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Version

Version 2.0

Date: 2025-04-29

Learning outcomes

At the end of this assignment, the learner is expected to be able to

- Describe and explain creation of 3D buildings from surveying data
- Apply commercial CAD software to produce a 3D building with a medium level of detail (LOD 2) based on surveying data



Expected competences when entering the assignment

- Basic knowledge in 3D Data Acquisition.
- Basic knowledge in 3D Data Tools and Applications.
- Basic knowledge in AutoCAD and or AutoCAD Map.

Summary

The assignment explains creation of 3D building model from surveying data. For the assignment AutoCAD Map 3D software is needed.

Expected Workload

18 slides with assignment learning content, 2 hours

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Revision History:

Revision	Date	Author(s)	Status	Description
0.1	2024-03-11	V. Cetl	Final Draft	Assignment ready for review
1.0	2024-03-24	V. Cetl	Final	Revised version
2.0	2025-04-29	V. Cetl	Final	Updated EU logo and disclaimer. Edited by T. Näslund

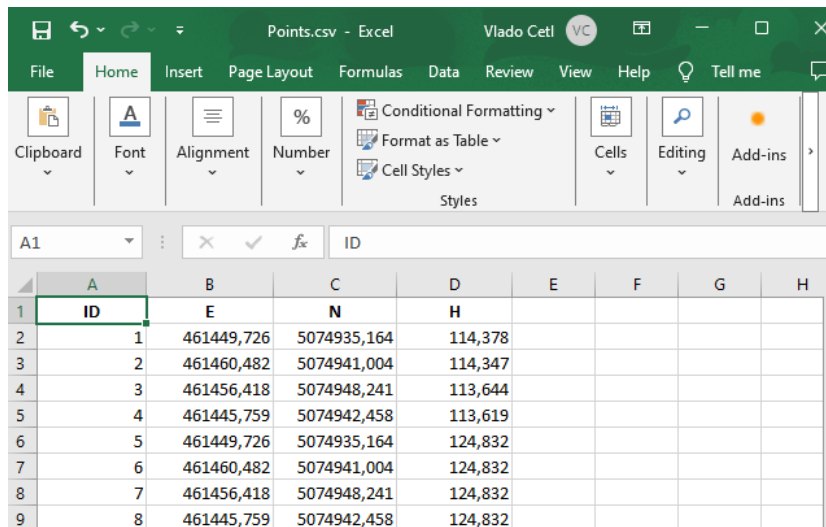
Assignment task

The task of the assignment is to create (draw) 3D model of the house in CAD software by using 3D surveying data.

Preparation

1) Data

3D surveying data collected with different sensors and instruments are usually available as a set of points with coordinates.



ID	E	N	H
1	461449,726	5074935,164	114,378
2	461460,482	5074941,004	114,347
3	461456,418	5074948,241	113,644
4	461445,759	5074942,458	113,619
5	461449,726	5074935,164	124,832
6	461460,482	5074941,004	124,832
7	461456,418	5074948,241	124,832
8	461445,759	5074942,458	124,832

In this assignment we will use 8 points with 3D coordinates (E-East, N-North, and H-Height) The coordinates are in the Coordinate Reference System (CRS) EPSG:3765 - HTRS96 / Croatia TM. It is a projected coordinate system for Croatia and is supported with most CAD and GIS software.

2) Software

In this assignment AutoCAD Map 3D is used since FOSS CAD software is very limited for use with 3D geodetic points. AutoCAD Map 3D can be used as a free trial available at: <https://www.autodesk.com/free-trials>

AutoCAD Map 3D is an Autodesk product used to create, maintain, and communicate mapping and GIS information within the AutoCAD drawing environment. AutoCAD Map incorporates GIS topology with AutoCAD. This software contains all AutoCAD functionality and adds features specifically designed for the mapping professional.



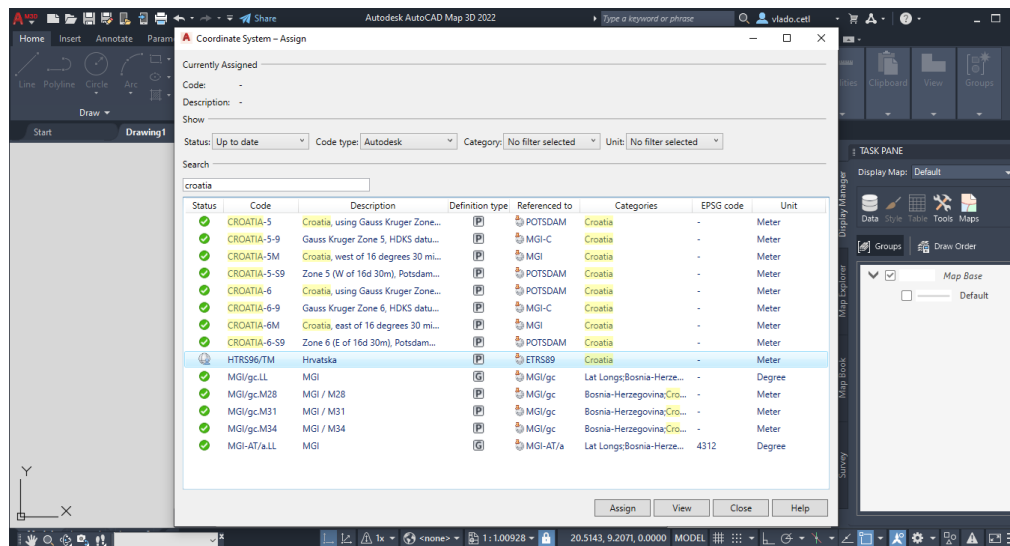
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Importing data into AutoCAD Map

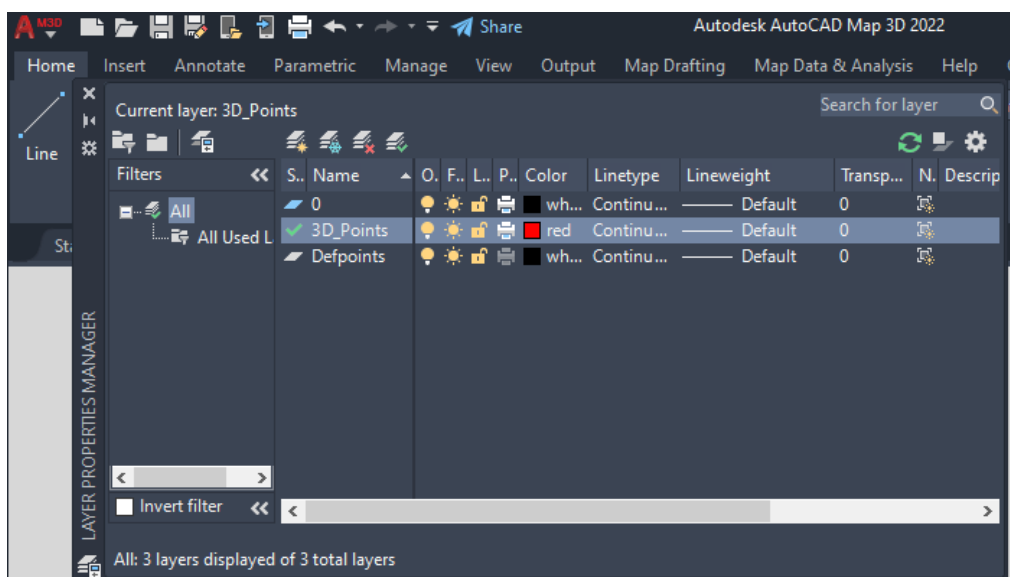
Before importing data into AutoCAD Map 3D it is necessary to set up:

- Drawing Units (i.e. meters and precision 0.00)
- CRS (HTRS96 / Croatia TM)



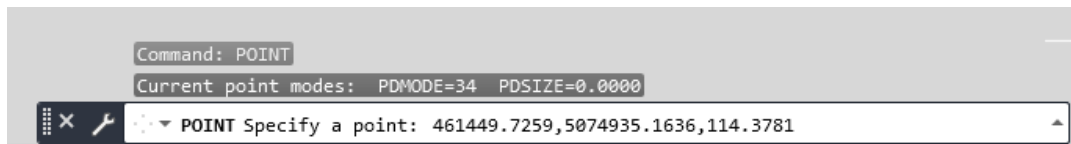
Creation of 3D model

Add the new layer 3D_Points where the points will be created

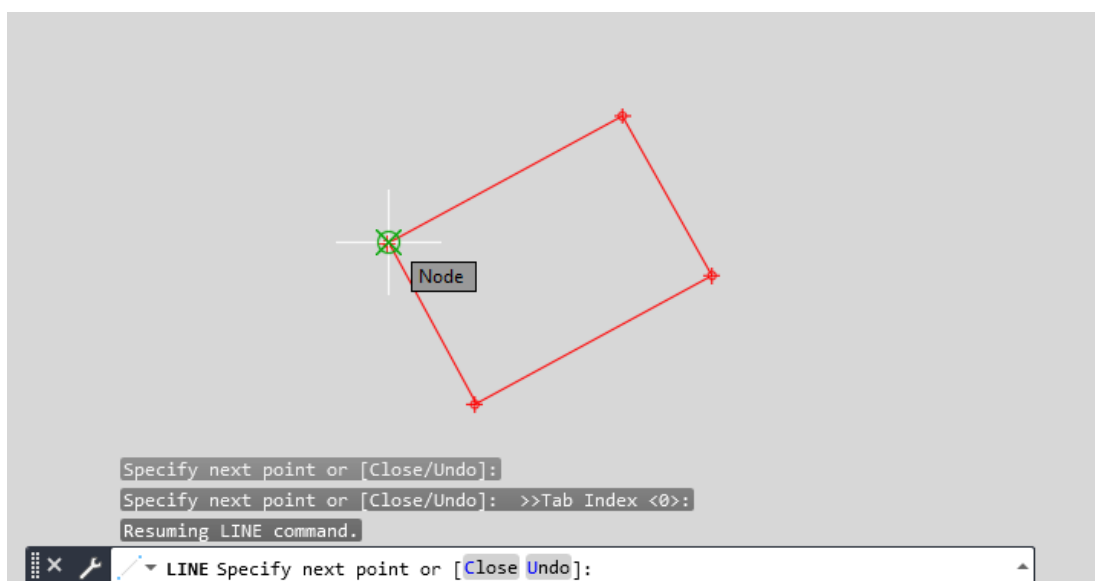




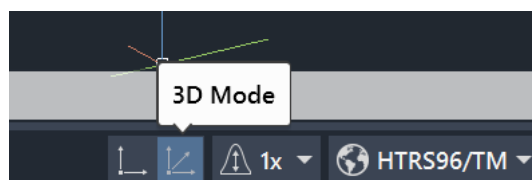
Each point is entered by using command: **POINT** and entering the E,N,H coordinates. The points should be added one by one.

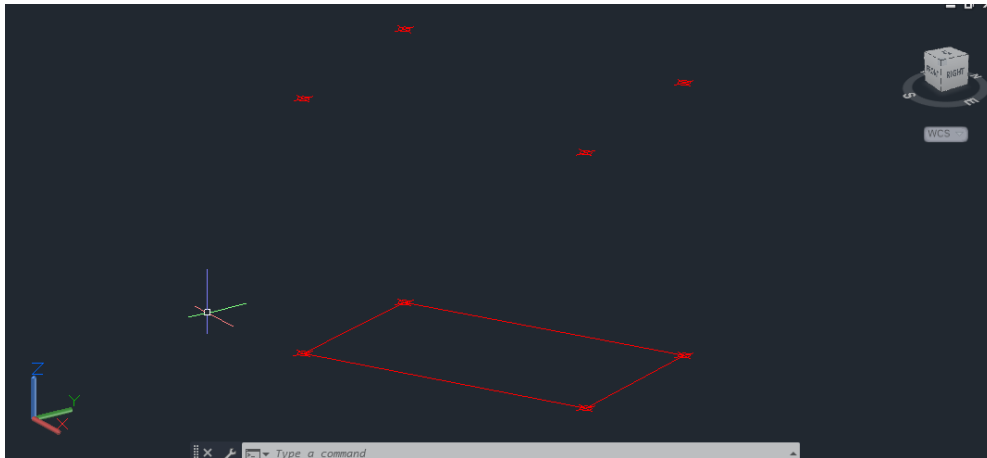


Points are connected with lines in a new layer 3D_Building that should be also added. When drawing the lines be sure that the snap to the point is on.

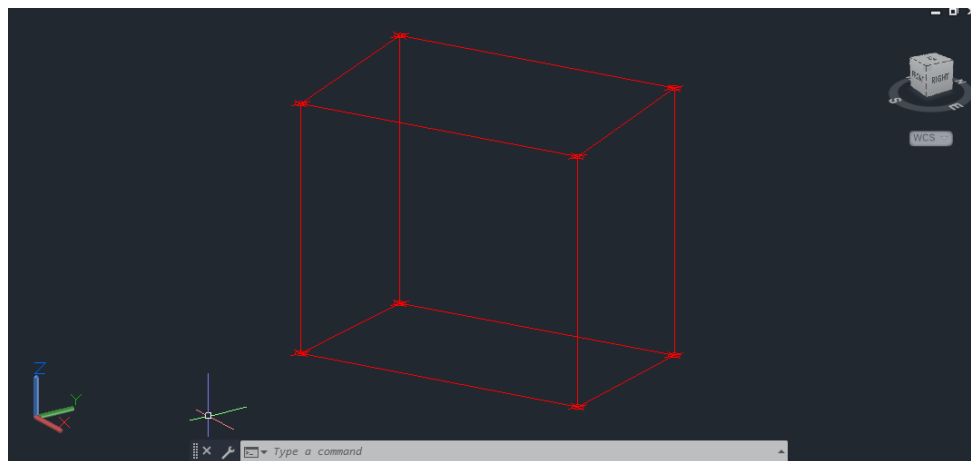


In order to see 3D view we have to switch from 2D to 3D Mode





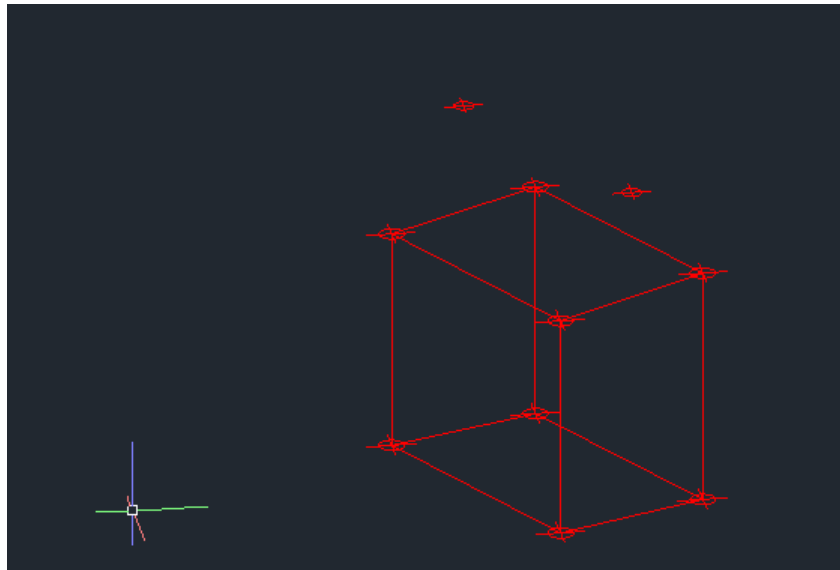
After that we can draw the whole building by connecting points 5,6,7, and 8



To draw the roof we will add 2 more points 9 and 10 with their respective coordinates:

Point ID 9 461447.7423,5074938.8110,130.0000

Point ID 10 461458.4498,5074944.6226,130.0000



Finally, the result is a 3D building in a LOD 2

