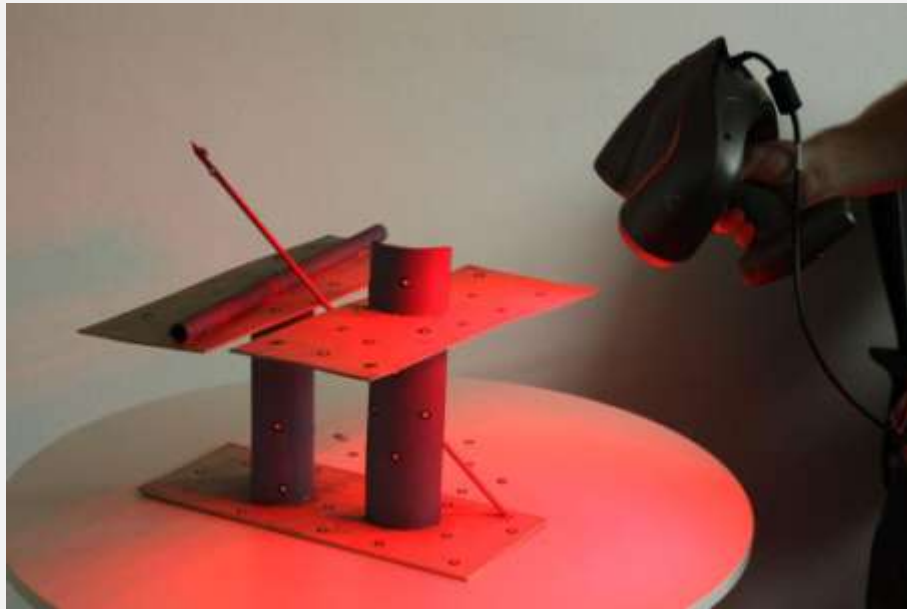


# ARTWORK 3D SCANNING AND DOCUMENTATION PRODUCTION PROCESS

**CSA Systems s.r.o.**  
**June - September 2013**



Ing. Dalibor Husty, Sales Director

# PROJECT TO BE SCANNED

- Modern artwork created by the renown Czech sculptor and painter Karel Malich
- The entire project consists of 60 pieces
- Originally, most of these sculptures were created very simply, working with paper and wood
- The average age of these pieces is about 40 years

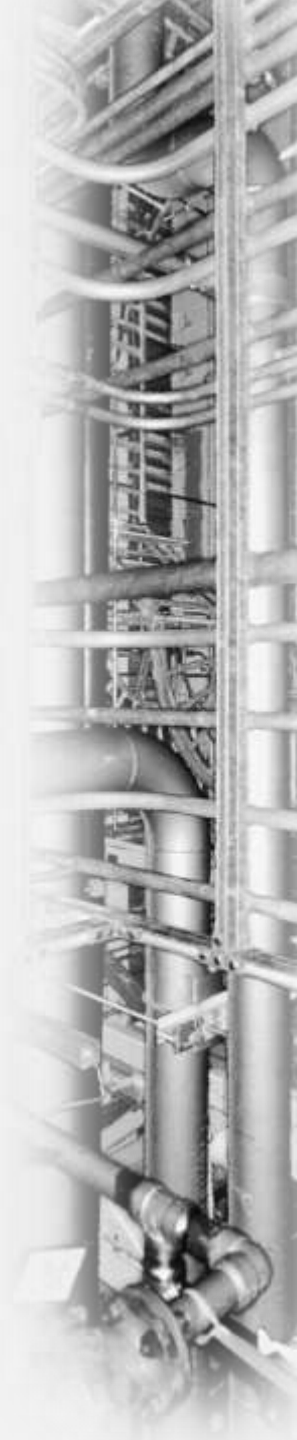


# PROJECT PARTNERS

**Galerie Zdeněk Sklenář,**  
Prague, Czech Republic as Client

**CSA Systems s.r.o.,**  
Prievidza, Slovak Republic as Contractor

**CSA**



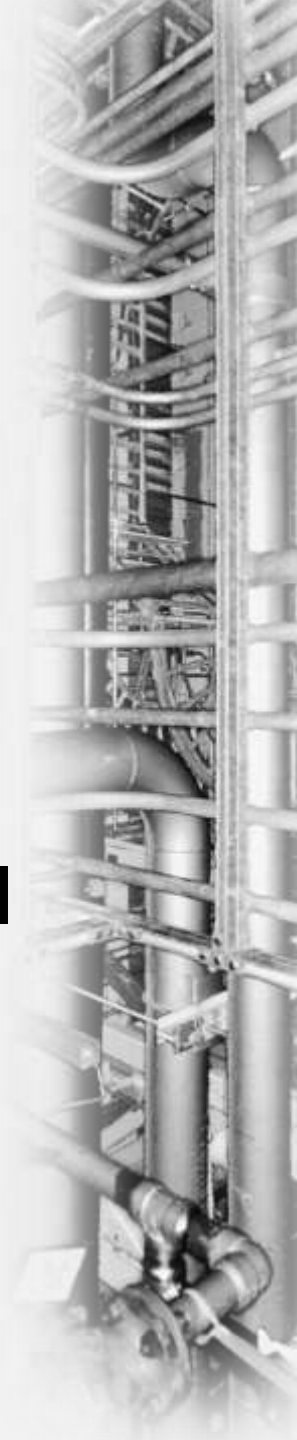
# PROJECT OBJECTIVES

- To create sufficient materials for reproducing and manufacturing of each model in significantly larger dimensions
- To create attractive and useful presentation documents
- To protect this artist's work for posterity, against potential physical degradation and loss



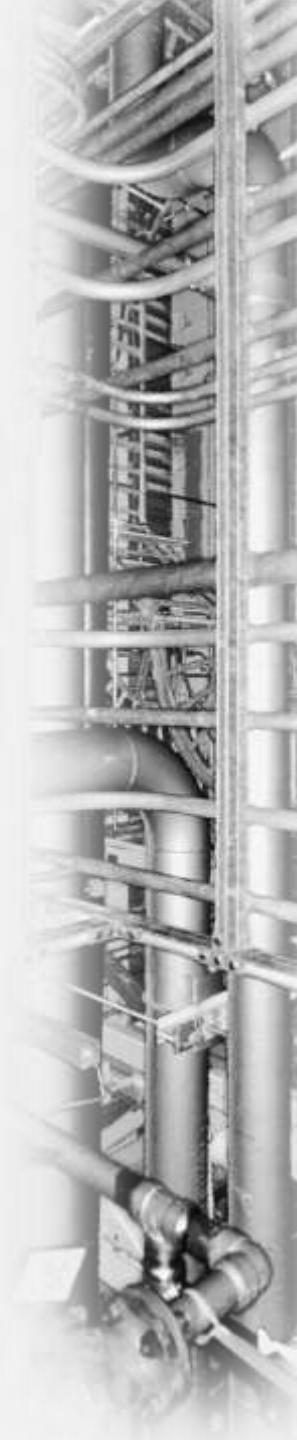
# MAIN TASKS OF PROJECT

- 3D scanning of each piece
- Creation of 3D models
- Creation of 2D drawings including detailed production drawings
- Creation of video files showing 3D model
- Creation of static previews of 3D model



# THE 3D SCANNING

- Scanning was provided by using the CREAFORM's 3D portable scanner HANDYSCAN MAXscan
- During the scanning each object was registered by special CREAFORM targets
- The entire scanning project took two people a total of five days
- Each piece required about 45 minutes to scan.



# HANDYSCAN MAXscan





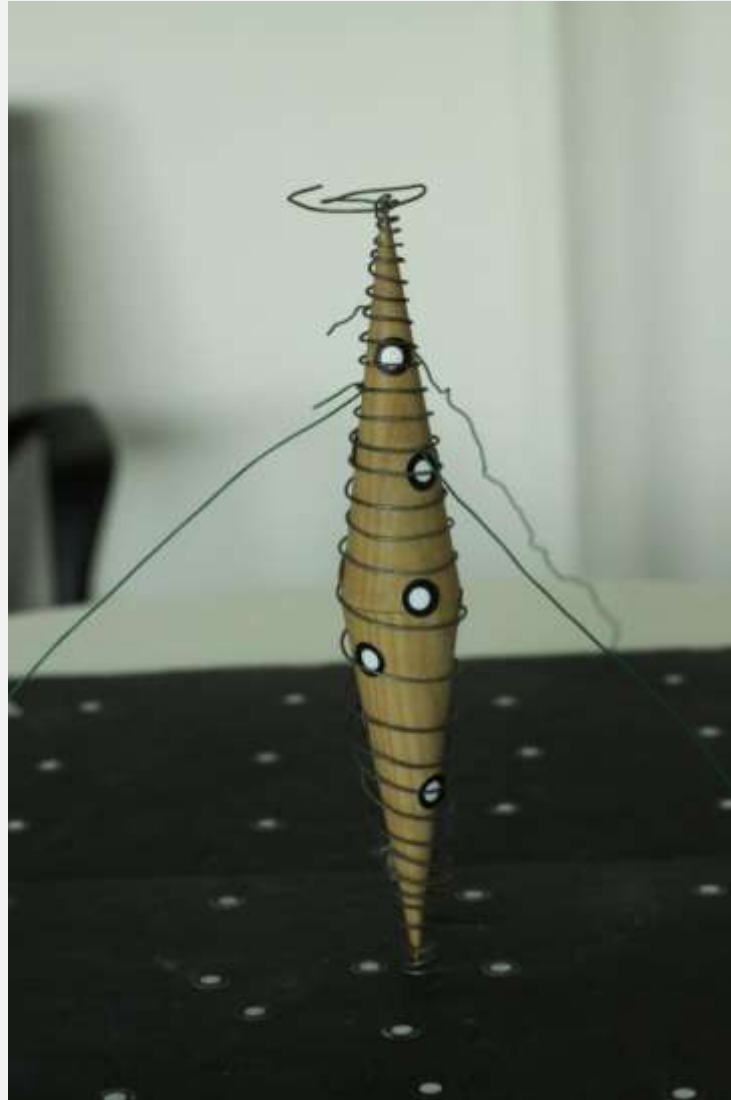
# HANDYSCAN MAXscan

<b>Weight</b>	1.27 kg
<b>Dimensions</b>	172 x 260 x 216 mm
<b>Measurement Rate</b>	18,000 measures/s
<b>Laser Class</b>	II. (eye safe)
<b>Resolution</b>	0.100 mm
<b>Accuracy</b>	Up to 0.050 mm
<b>Stand-Off Distance</b>	300 mm
<b>Depth of Field</b>	± 150 mm
<b>Laser Cross Area</b>	210 mm x 210 mm
<b>Software</b>	Vxelements



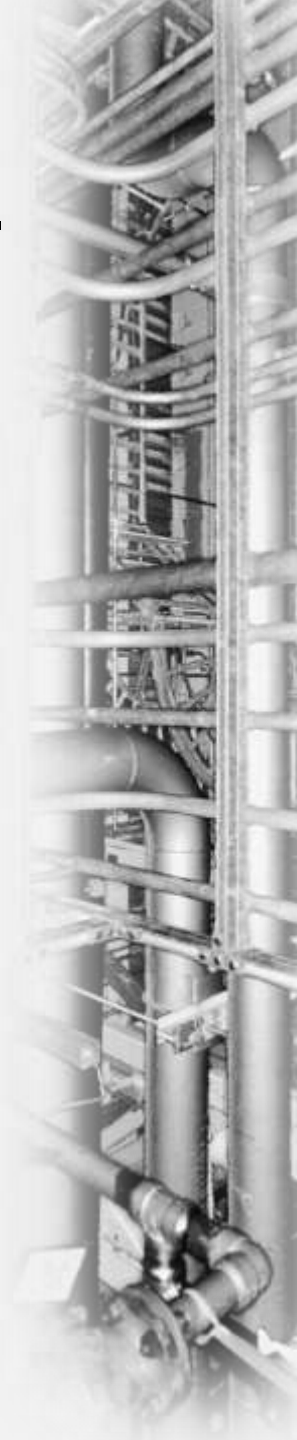


# OBJECT TARGETING

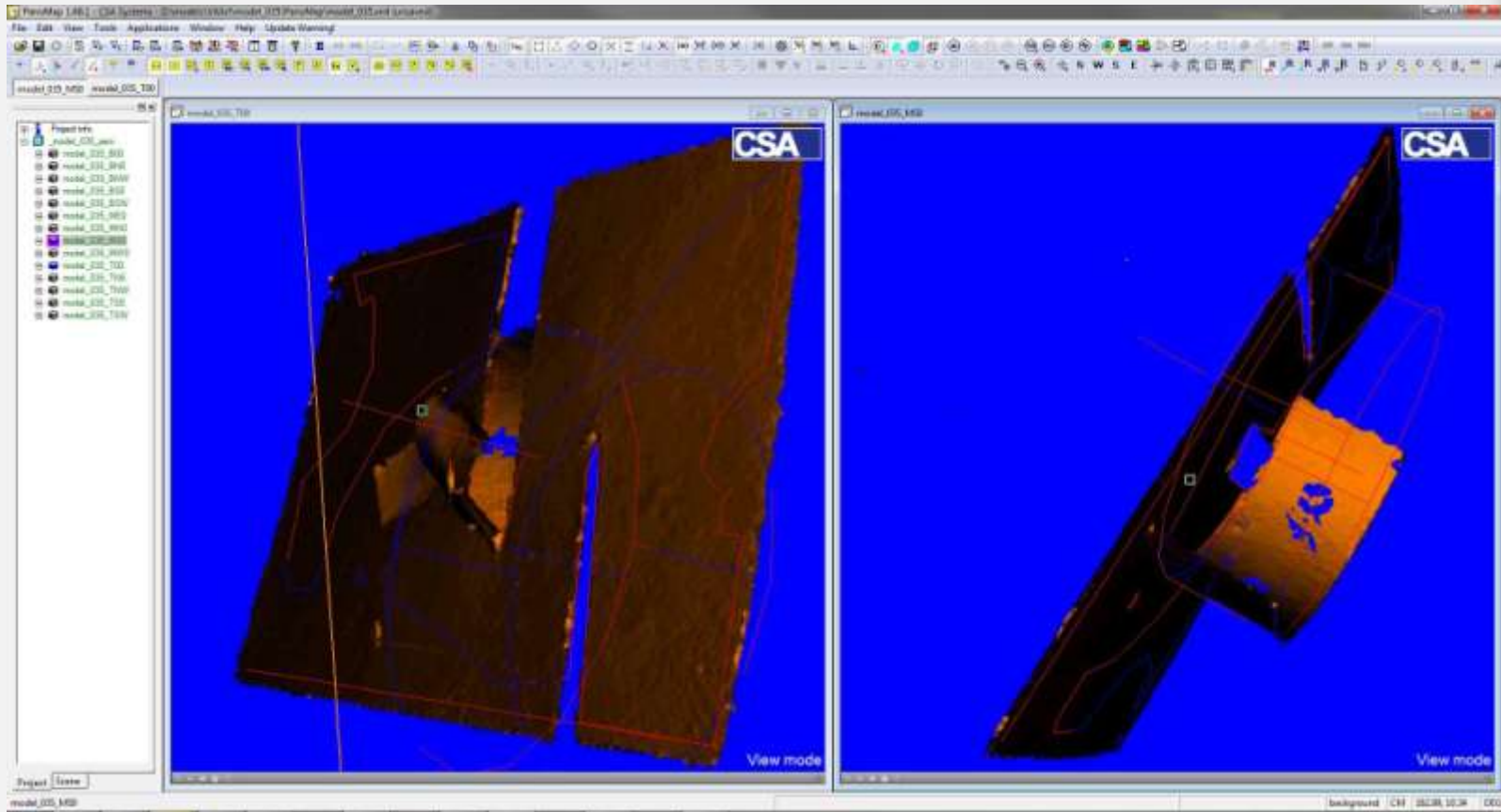


# 3D MODEL CREATION & VERIFICATION

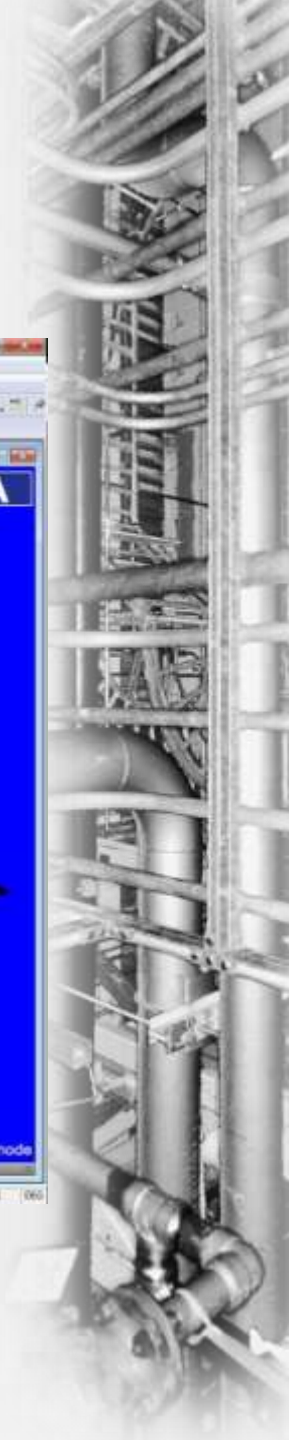
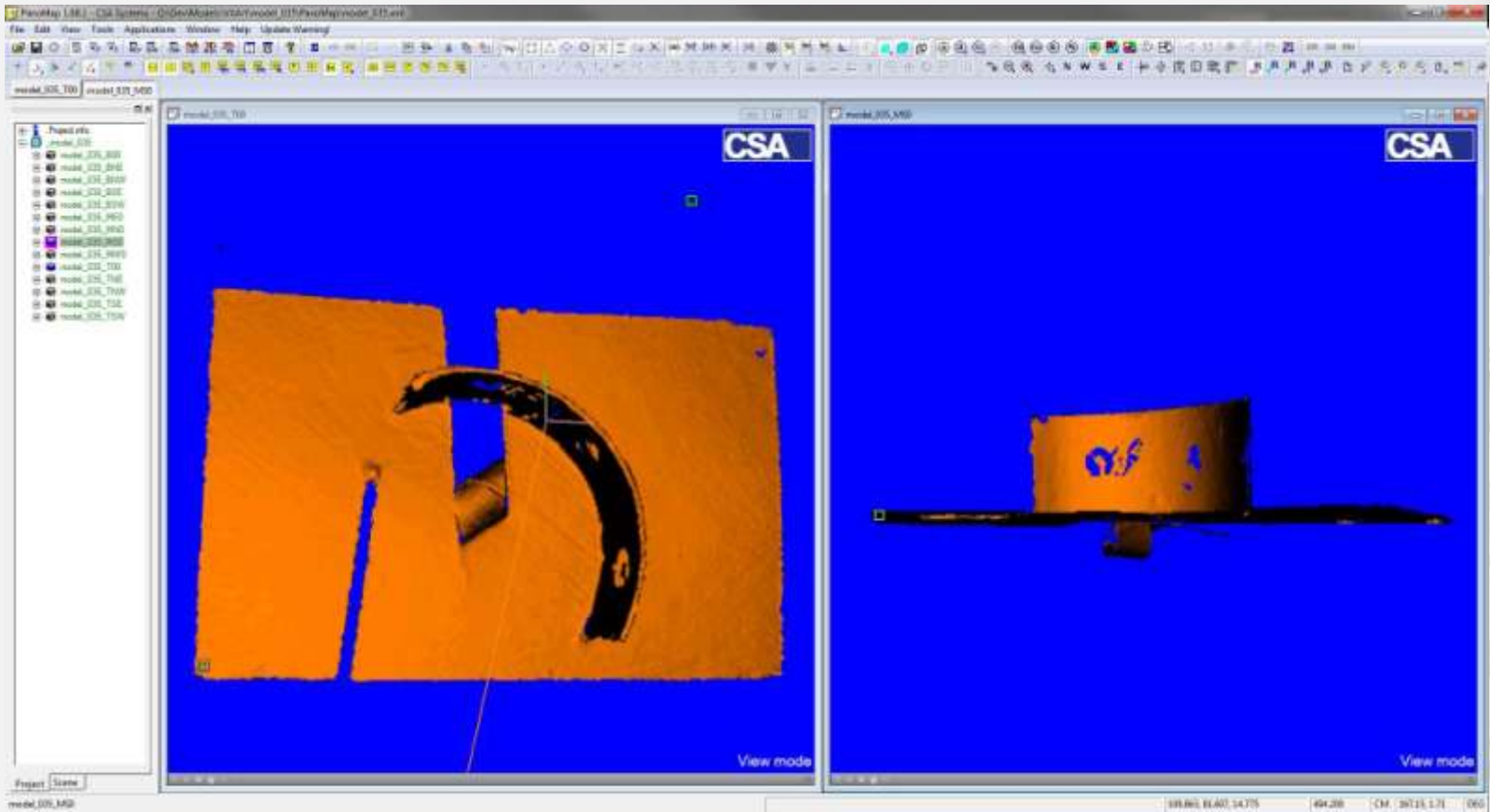
- Captured point cloud information processed by CSA's PanoMap® application
- 3D model created in Autodesk's AutoCAD
- New 3D model merged against the original point cloud using the CSA's PlinView software to check interferences and accuracy



# POINT CLOUD REGISTRATION - PanoMap<sup>®</sup> - before

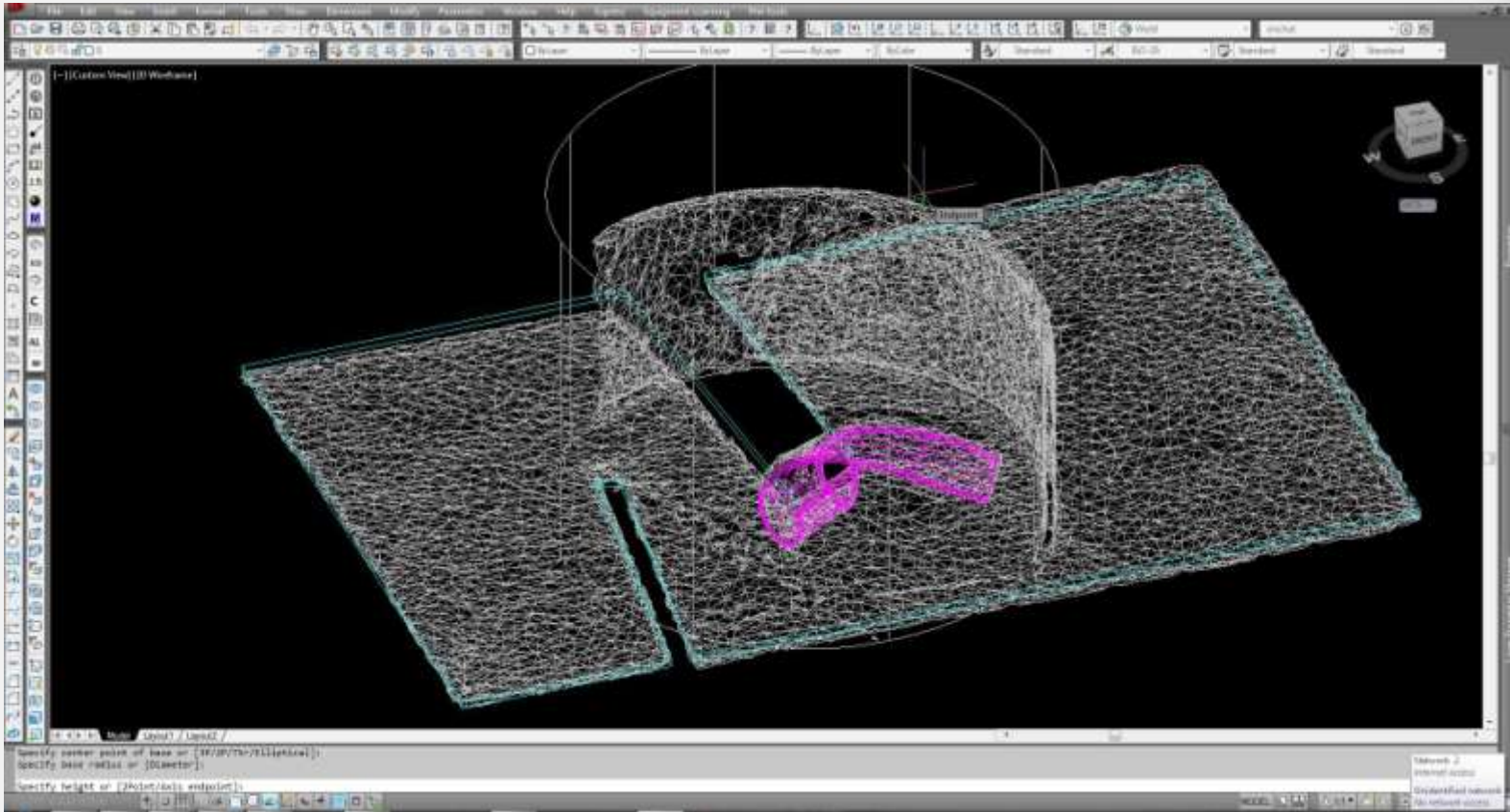


# THE POINT CLOUD REGISTRATION - PanoMAP - after

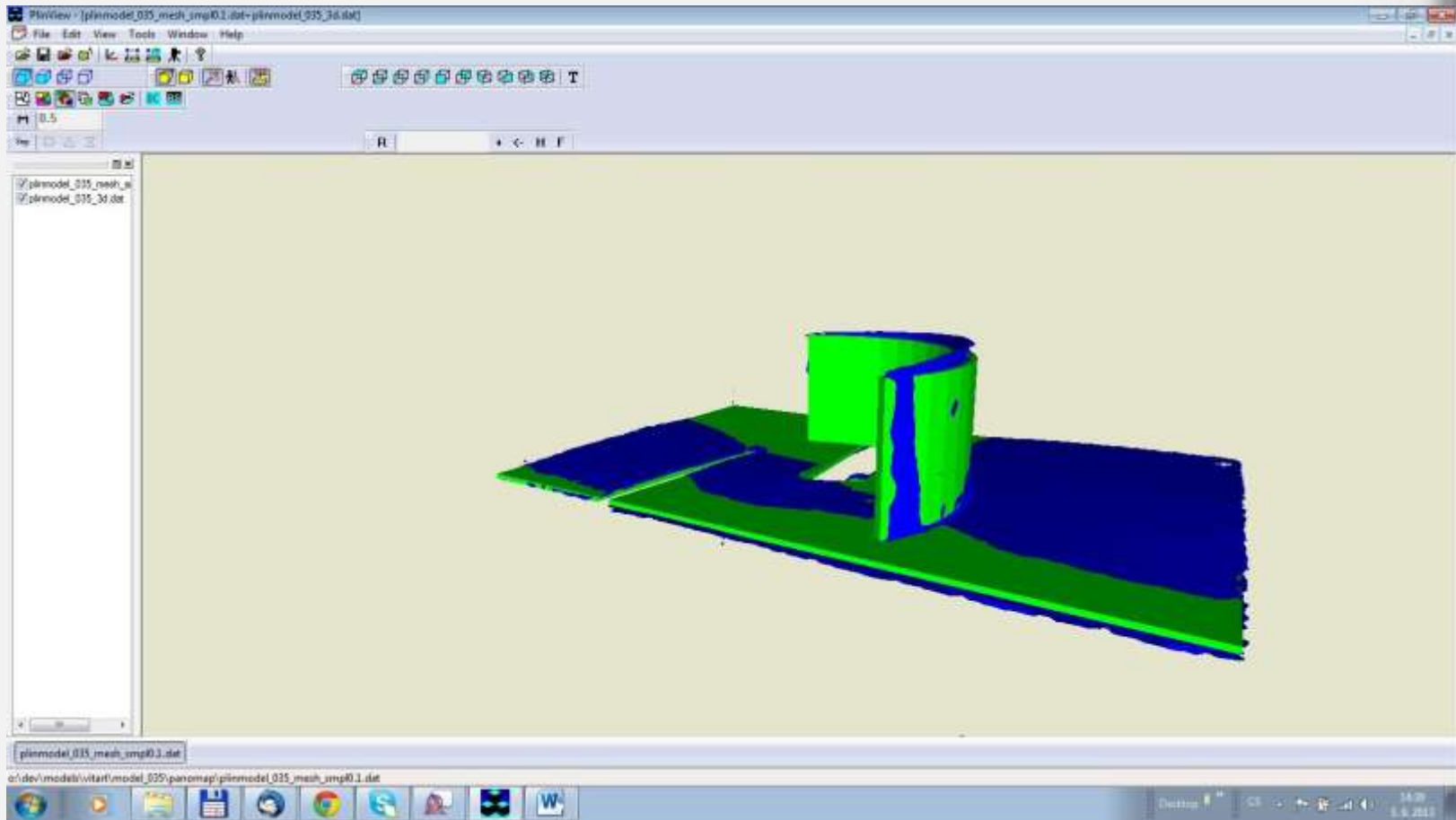




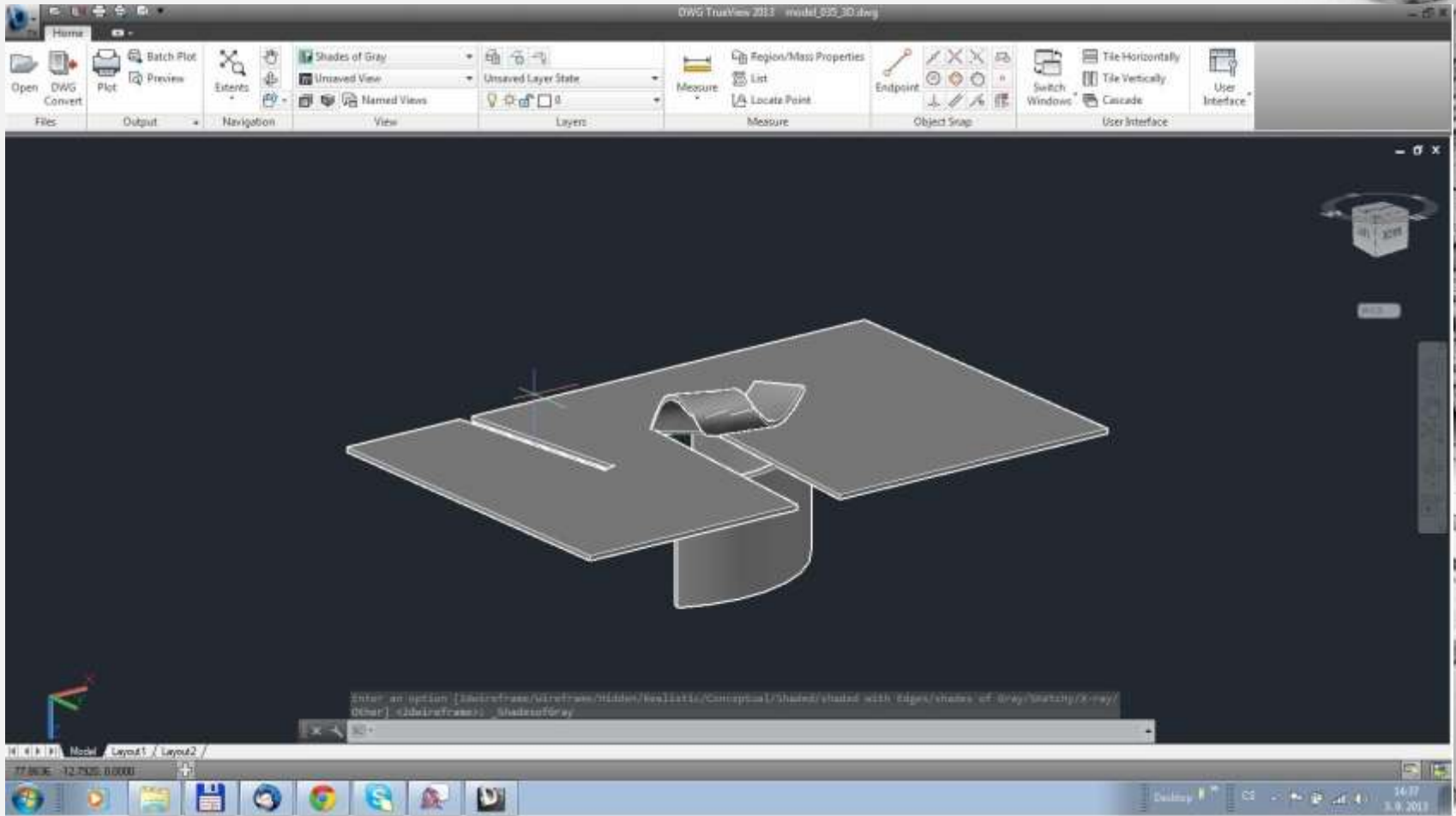
# CREATION OF 3D MODEL - AutoCAD



# MERGING POINT CLOUD AND 3D MODEL – Displayed in PlinView

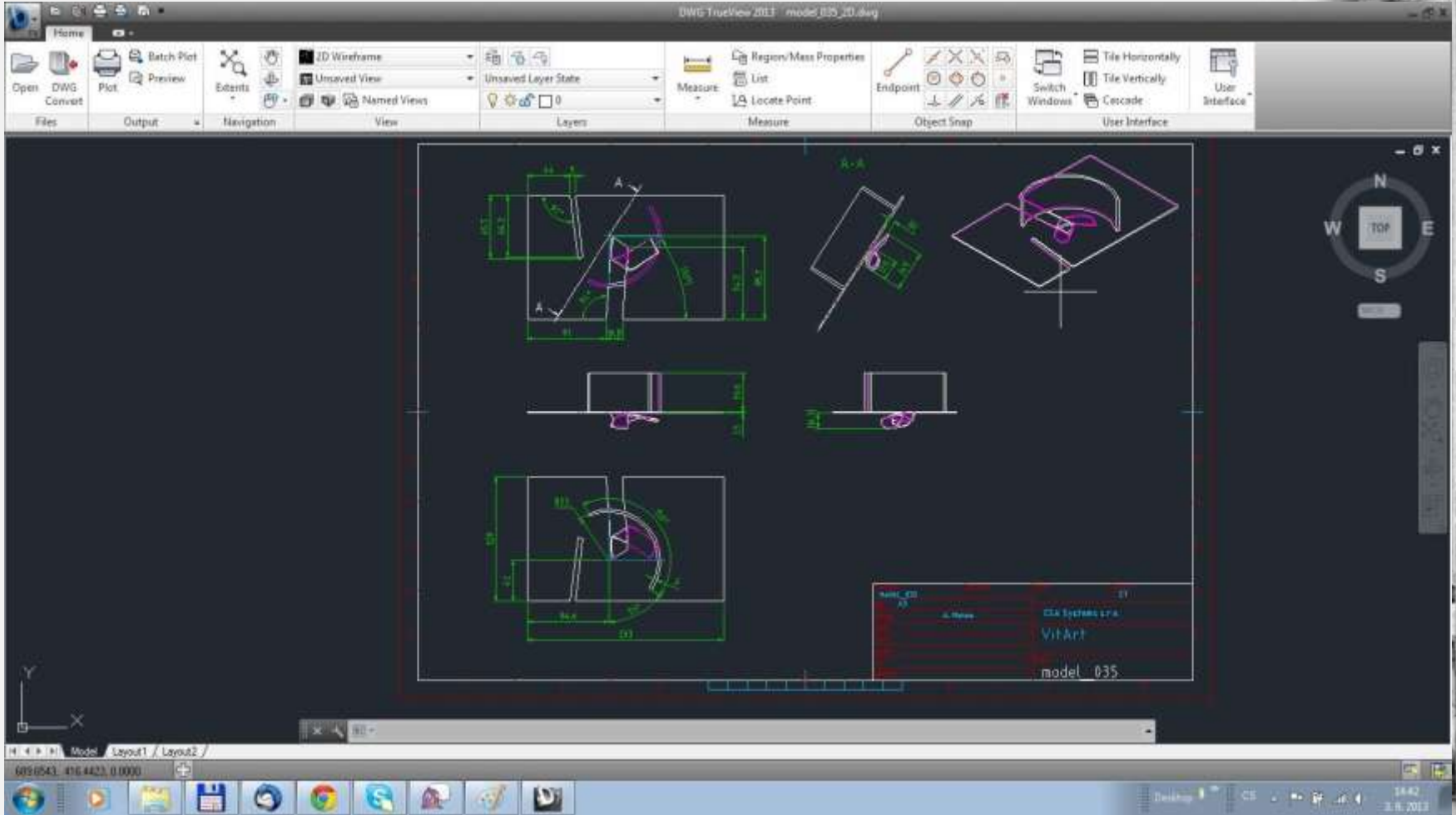


# THE COMPLETED 3D MODEL - AutoCAD

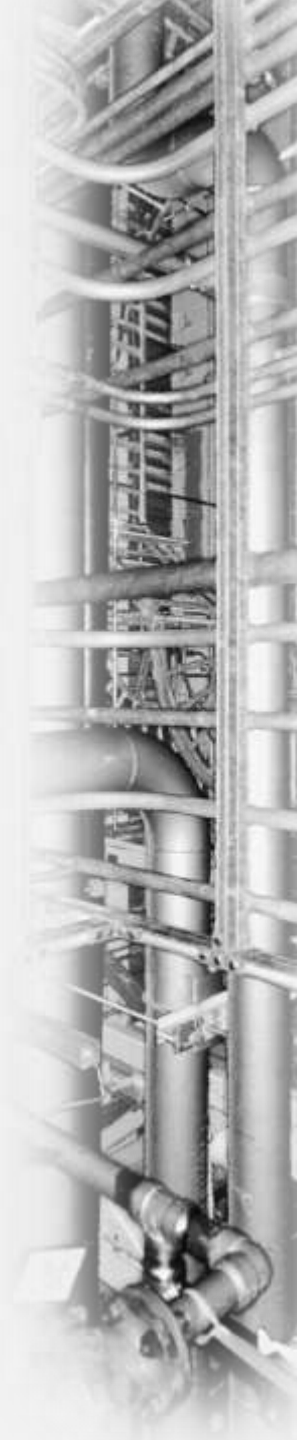
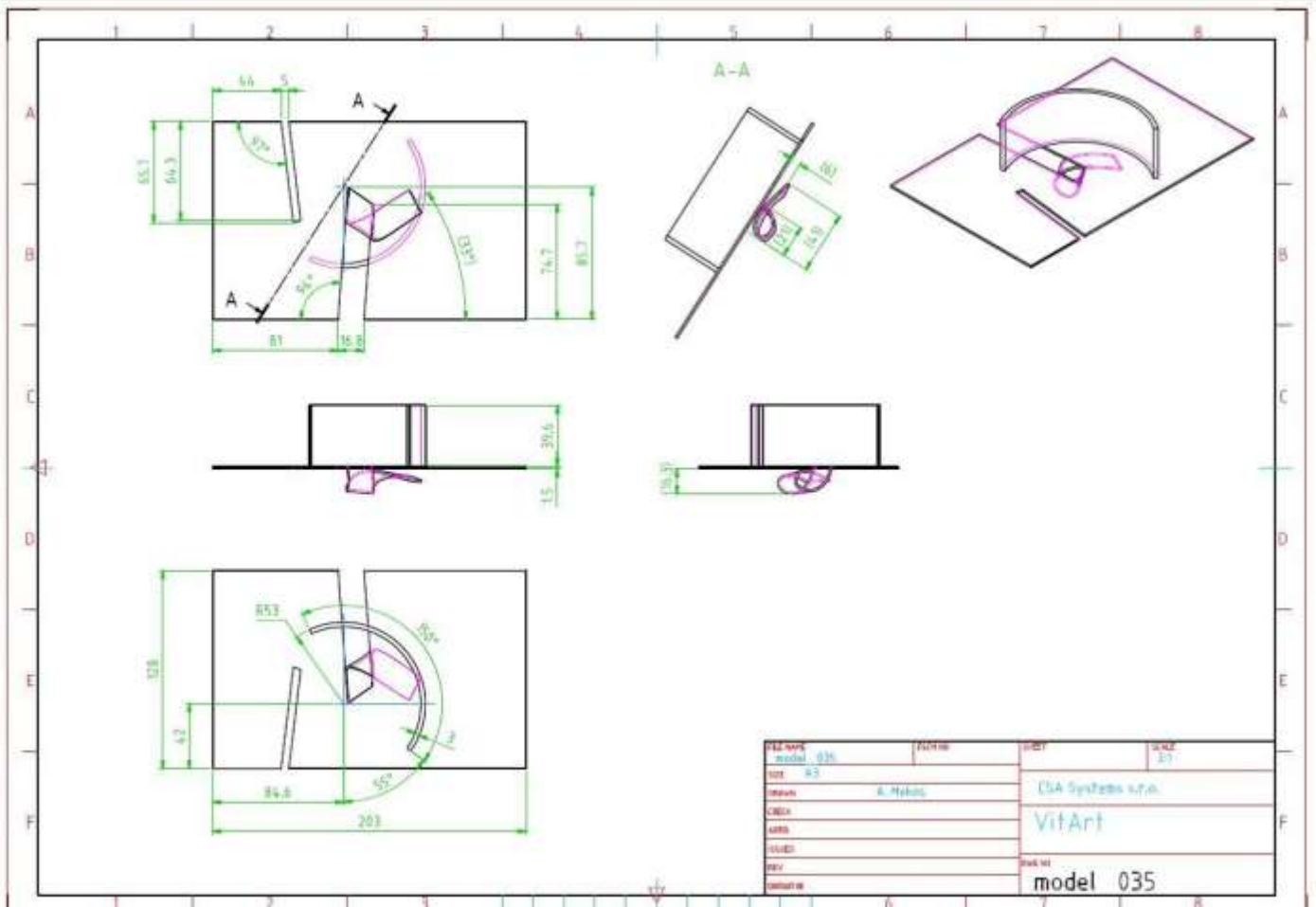




# CREATION OF 2D DWGs



# 2D Dimensional DRAWING

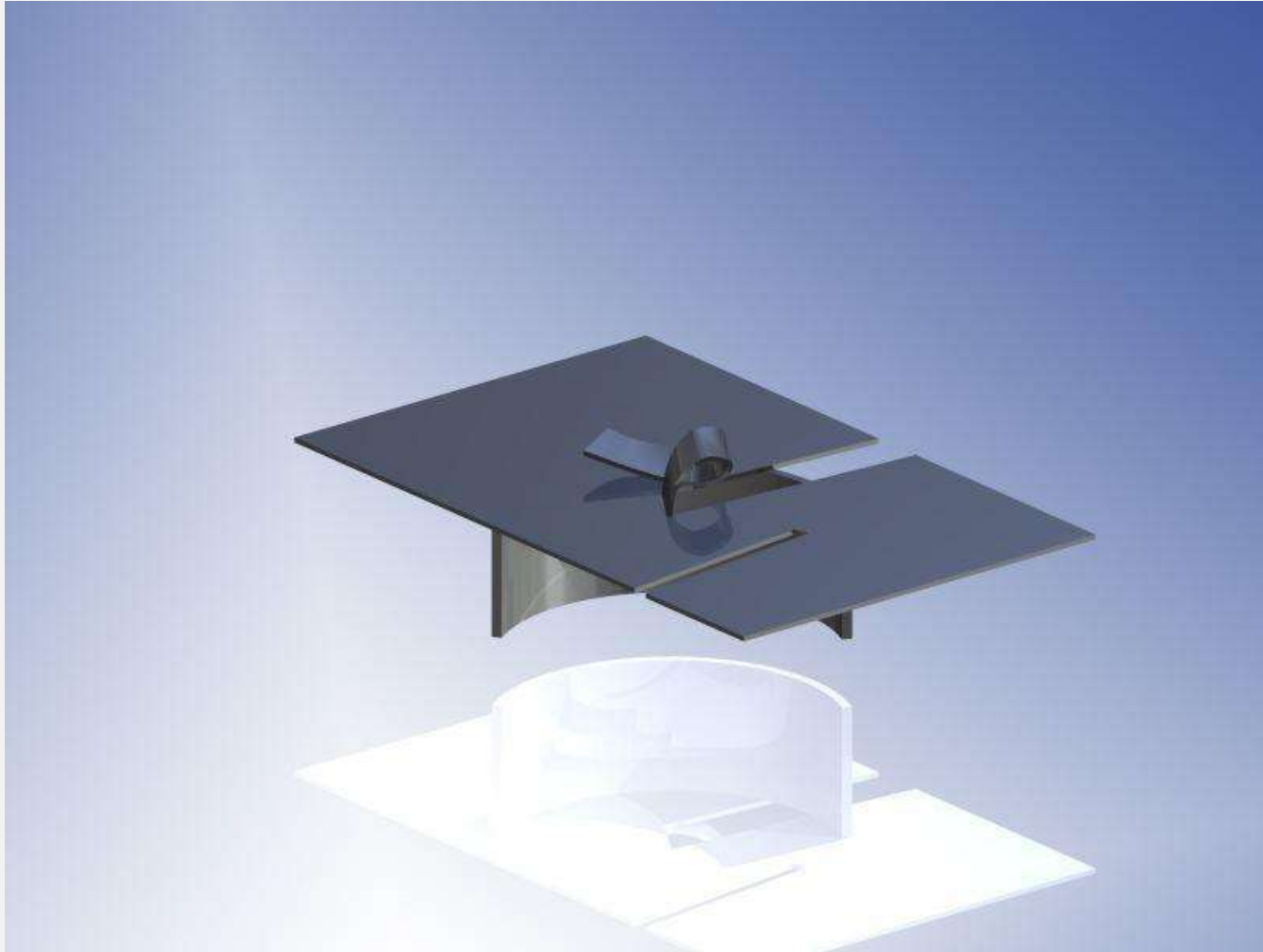


# CREATING VIDEO FILES AND PREVIEWS SHOWING THE 3D MODEL

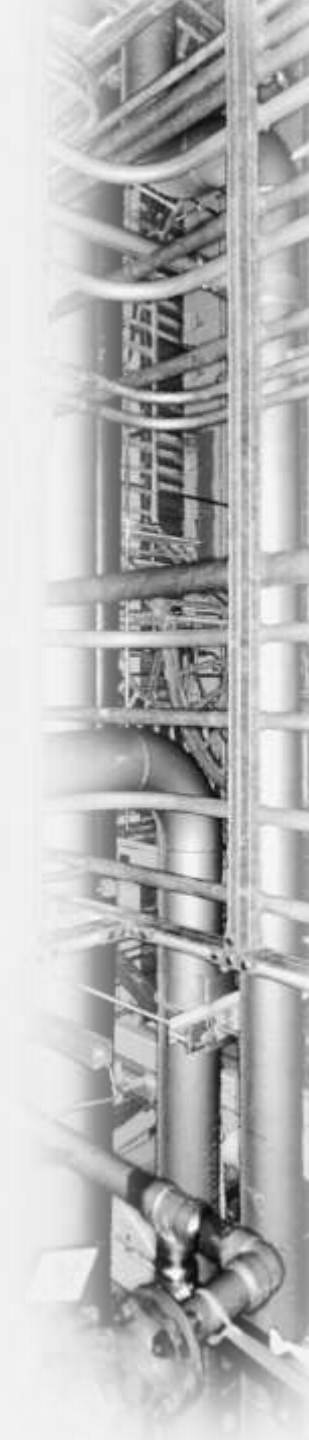
- Files were created using Autodesk's Inventor software
- Images reflected use of expected production material and structure
- Potential use as high-quality presentation materials



# STATIC PREVIEW OF 3D MODEL



**CSA**



# VIDEO PREVIEW OF 3D MODEL



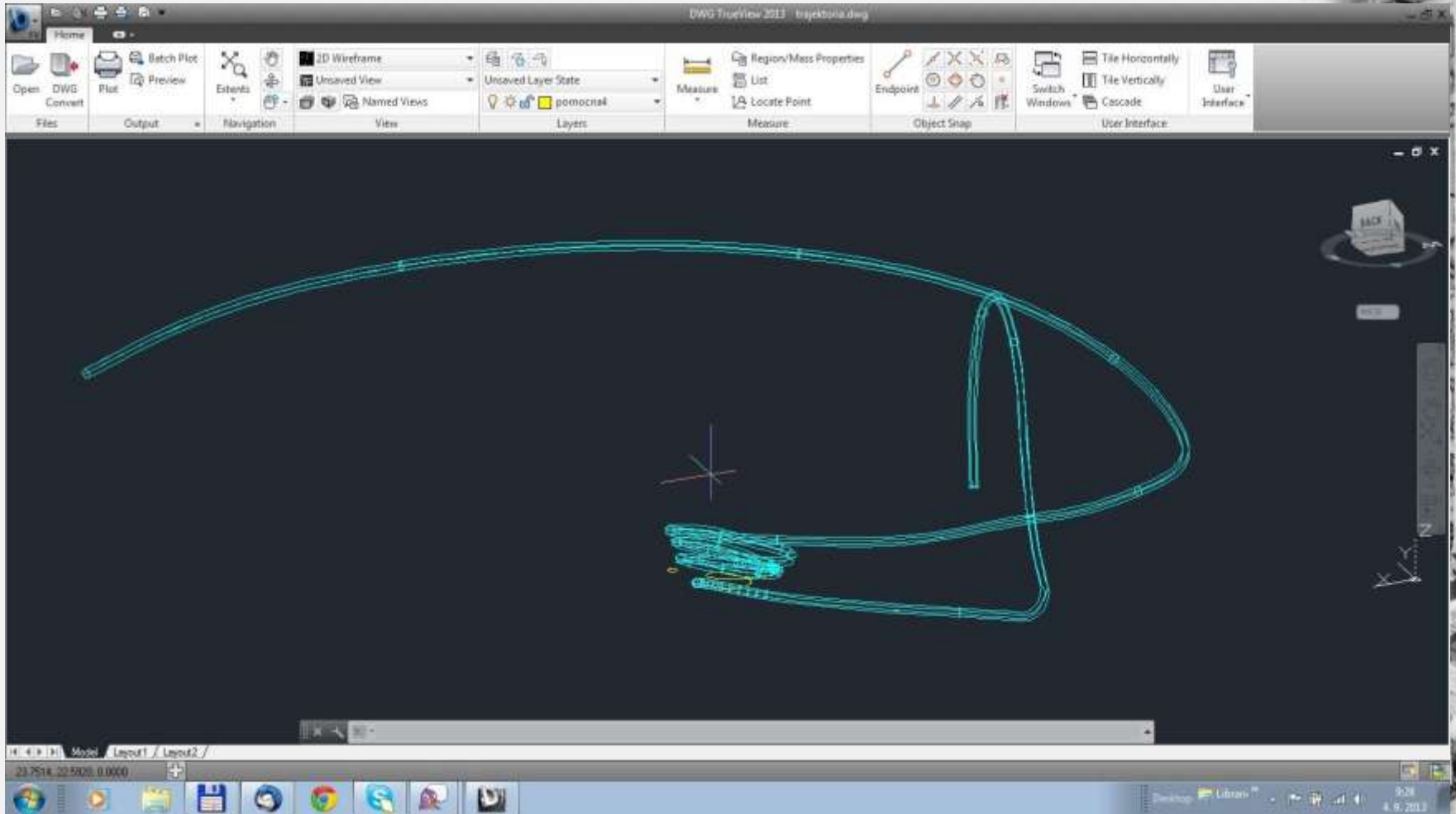
## WIRE MODELS

- Some of Karel Malich's pieces are composed entirely of wire
- This presents a challenge for the 3D scanning process to obtain sufficient quantity of points
- In some cases, we used photogrammetry to obtain additional points





# WIRE MODEL – Displayed in AutoCAD





# WIRE MODEL - STATIC PREVIEW OF 3D MODEL



**CSA**



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**CSA**

