AS322686 - Registering Scans with ReCap Pro

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“Laser Larry” Kleinkemper, AIA
Lanmar Services – an RnD for AEC firm

20+ years of computer modeling buildings
90’s – The Computer Rendering / Animation guy in Architecture
2000’s – The Revit guy
2007 – The holographic guy
2008+ The 3D Scan to BIM guy

An Architect, who’s main purpose in life is to help advance Architectural Practice with technology.

He is a Geek!
Who are you?

Knowing who is in the room, helps!
Ultimately, this will help him make better jokes throughout the class!
….unfortunately, they still won’t be funny.

1. How many have access to a scanner and register point clouds?
2. How many have used point clouds for their work?
3. How many do not know what is a point cloud?

The Most important part of any scanning Hardware or Software is the OPERATOR and their training.
What will we be reviewing today

BEST SCANNING PRACTICES FOR REGISTRATION
AUTO VS MANUAL REGISTRATION
TARGETS
CONTROL
INDEXING
HOW TO VERIFY YOUR WORK
IMPORTING INTO REVIT
Targets – Who needs them?

Classic Checker Boards
Spheres
What is Control?

Survey Control vs Scanning Control

Total Station

Checker Board

Prisms and Pins / Monuments / Crows Feet (X cut in Concrete)

The Poor man’s Control – Disto

measure from target to target

check measurements in the computer
Importing the Data

Generally keep it under 200 scans per Cloud registration. This will vary based on Scans size and your computer.

Exterior = 200
First Floor = 200
Roof = 200

Let’s create a NEW Project!
Auto vs Manual Registration

• Some times SPECTACULAR!
• Some times CRAPTASTIC!
• CHECK YOUR WORK!!!!
• The Most important part of any software, is the Operator and her training!
Groupies!!!
3 point selection

• Select points based on XYZ
• Spread points out to avoid unusual rotations
• Keep points under 10M or 30’
  o IF you set your scanner resolution for 5mm at 10m – 120m out your point spread is 60mm
  o IF your from the USA and set your scanner for ¼” at 30’ – at 360’ out your point spread is 3”
3 point selection - XYZ
What happens when you only select X but not Y
What happens when you only select X but not Y
What happens when you only select X but not Y
Structured Data vs Unstructured

- Structured - Terrestrial
  - Faro (on a tripod)
  - Lieca (on a tripod)
  - Z+F (on a tripod)

- Unstructured – Mobile
  - Dot Product
  - GeoSLAM
  - Paracosm
  - Leica Pegasus

NOT ACTUAL SIZE!
May Appear bigger in Mirrors!
Structured Data vs Unstructured Excavations w/ Z+F and Dot Product
Structured Data vs Unstructured Data
Museum Faro and GeoSLAM
Targets

- Classic Checkerboard – but how accurate is it really?
- Spheres – Expensive to cheap options
- Prisms
- Points on the ground
- 3 point selection - look for Fingerprints
Adding Control

- Difference between Survey Control and Scanning Control
  - How to clear the control
  - How to manually add
    - Meters vs Imperial – Bug #2
  - How to add from a csv file
What is indexing???
Color vs BW Scans

Color = XYZ + an Intensity Value + RGB

It is nearly double the file size of BW = XYZ + an Intensity Value

It won’t help you find the walls any better!

We only use Color when it is:

1. Marketing – The beauty shot!
2. Plant rooms with color coded pipes
3. The client says too and is willing to **PAY** for it!
Checking your work in plan and section
Revit – Adding point clouds
Checking your work in Revit
Creating Coordinates in Revit
Add Coordinates in Recap
Re-import to Revit Origin to Origin
Questions

• Is a point cloud from a drone – Structured or unstructured?
• What is the most important part of the Scanner?
• What is the most important part of registration software?
• Which is more accurate a sphere or checker board?
• Is a Faro scanner on a tripod – Structured or unstructured
• What is the maximum number of scans you should add to 1 registration
• When should you use Color Scanning?
MOST IMPORTANT 3 THINGS TO KNOW

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