



The slide features a 3D graphic of green blocks with software boxes (Autodesk Infrastructure Design Suite Ultimate 2014 and SDMS) and two construction workers reviewing plans. Text elements include 'Innovation in Process People Platform', 'BIM', 'interactive parametric dynamic', and the title 'BIM FOR GEOTECHNICAL ENGINEERS'.

Innovation  
in Process  
People Platform

BIM

interactive  
parametric  
dynamic

## BIM FOR GEOTECHNICAL ENGINEERS

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Project Manager

 **AUTODESK.**  
Architecture, Engineering & Construction  
Consulting Specialized  
Authorized Developer  
Authorized Training Center

 **Spatial Technology Limited**

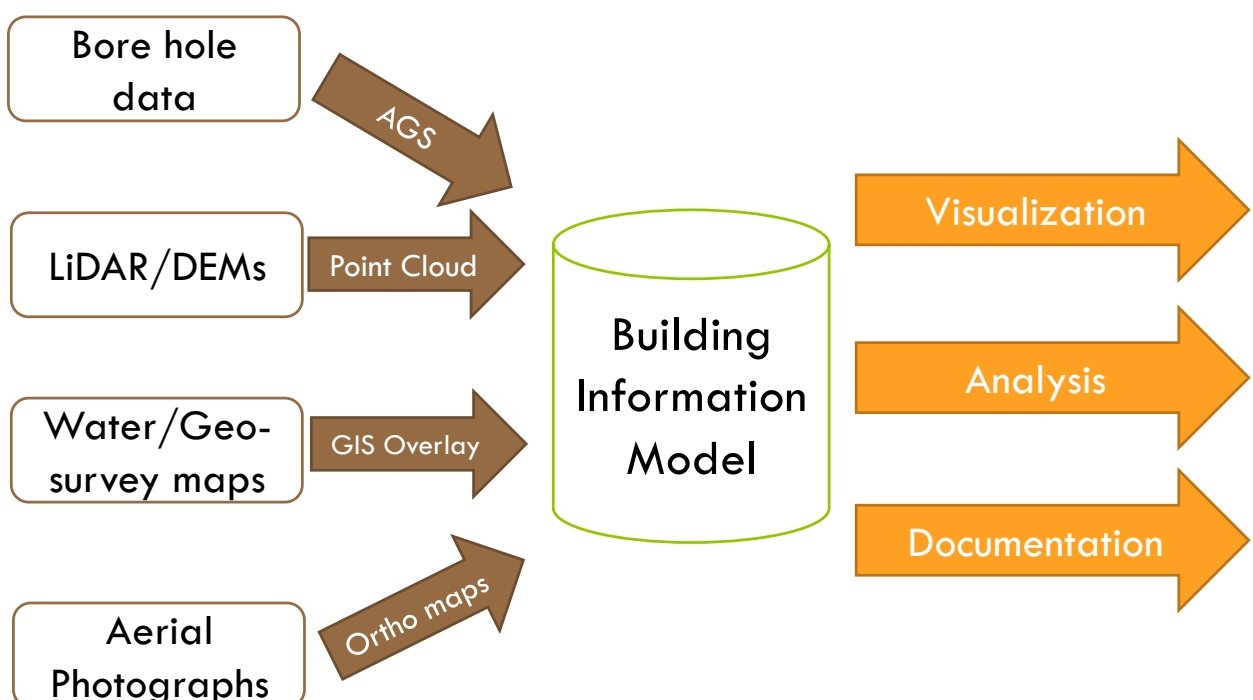
37% overrun in building project  
is due to ground problem  
(NEDO, UK)

70% delay Civil infra project is  
due to ground problem  
(National Audit Office, UK)

# Complicated ground data

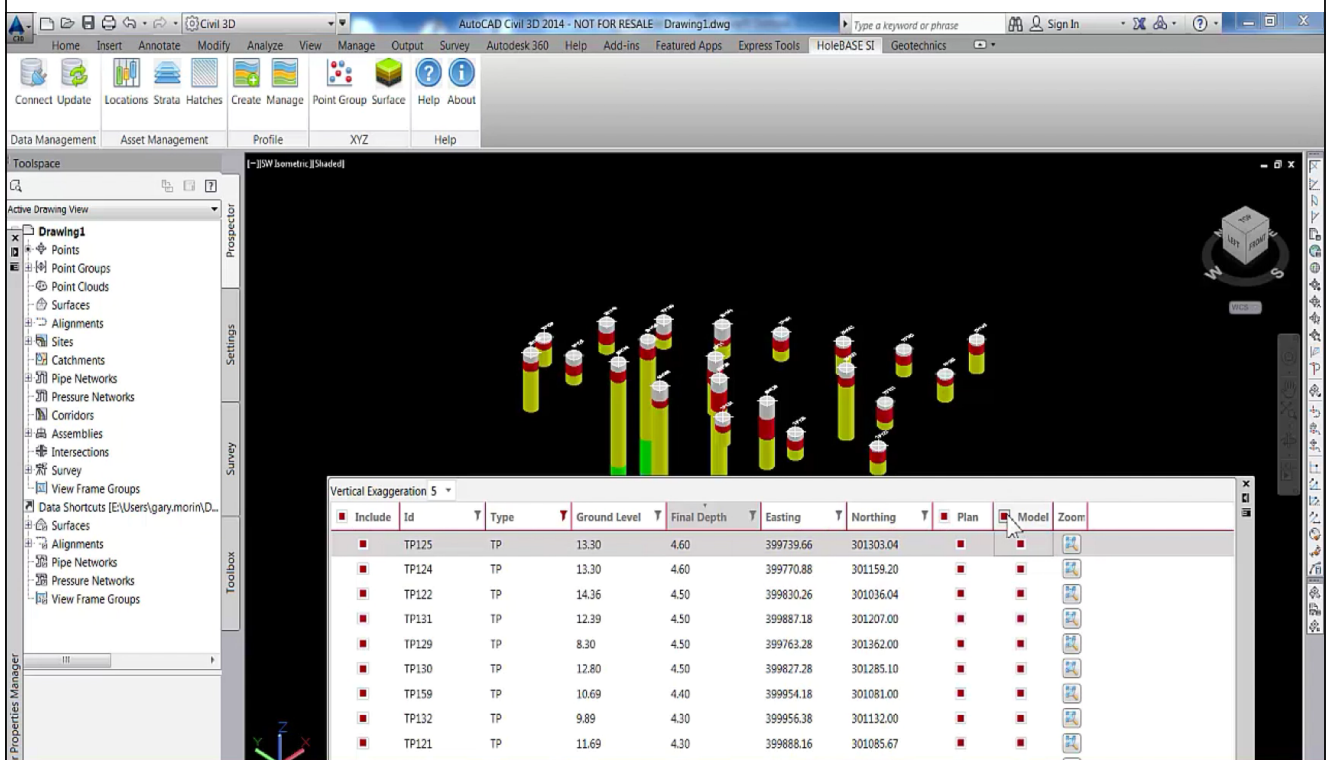
- Scatter source of information
  - Borehole data
  - Scanned Report Archives
  - Earthwork condition reports
  - Maintenance requirements
  - Drainage networks
  - Aerial photos and maps
  - LiDAR/DEMs
- Limited budget for Ground Investigation

## BIM as a collaborative database



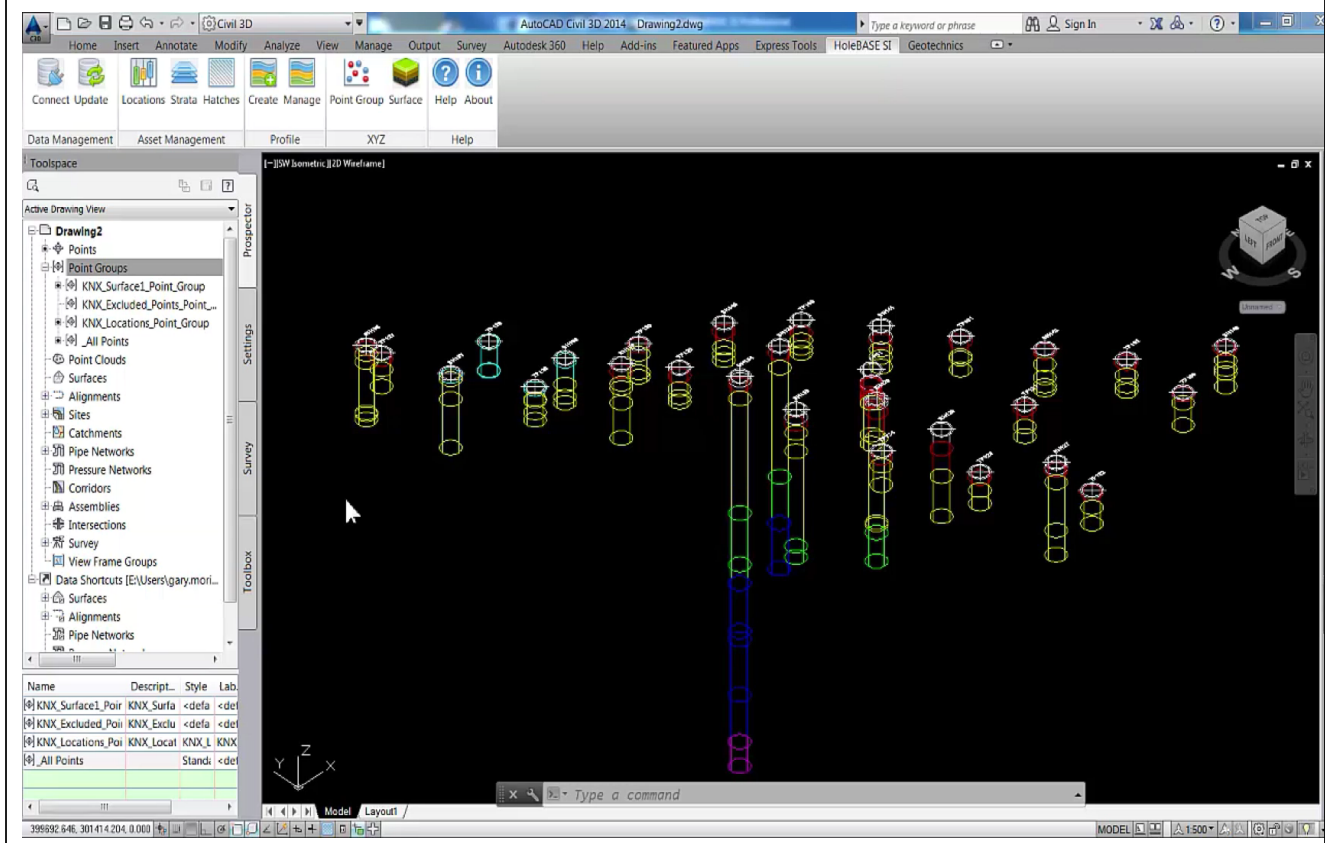
# Bore hole Data

## Bore hole Data with AGS

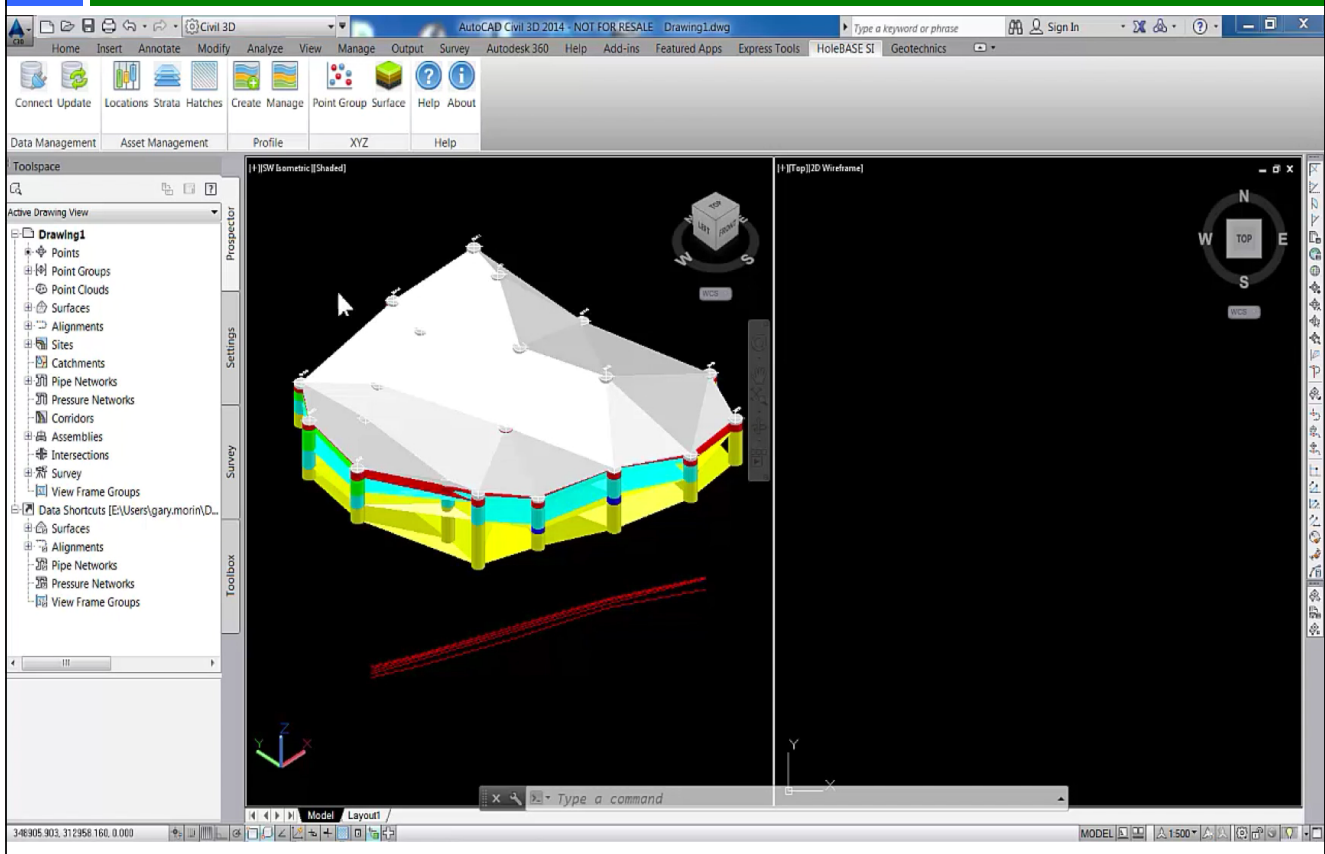


Manage the boreholes to display

# Interactive Filtering

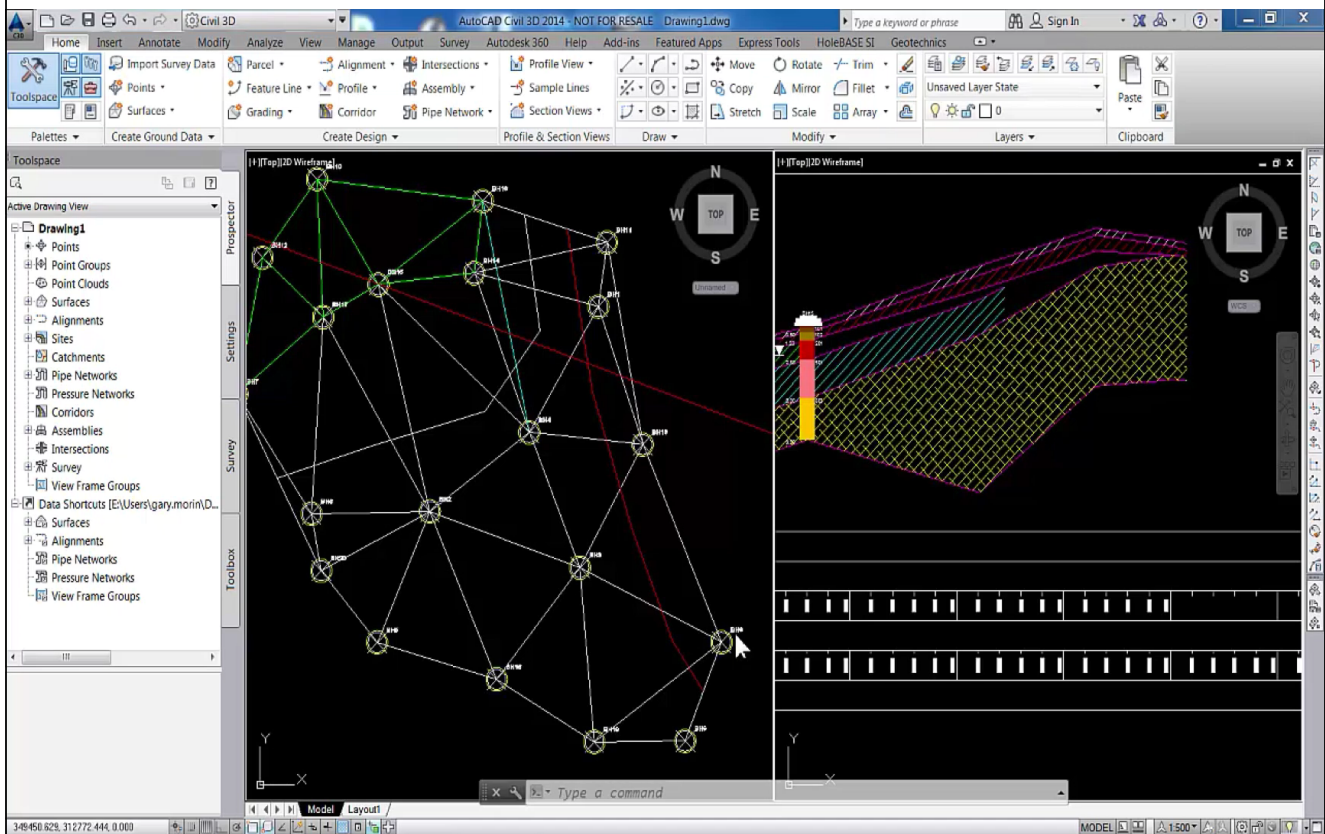


# Interactive Profiles





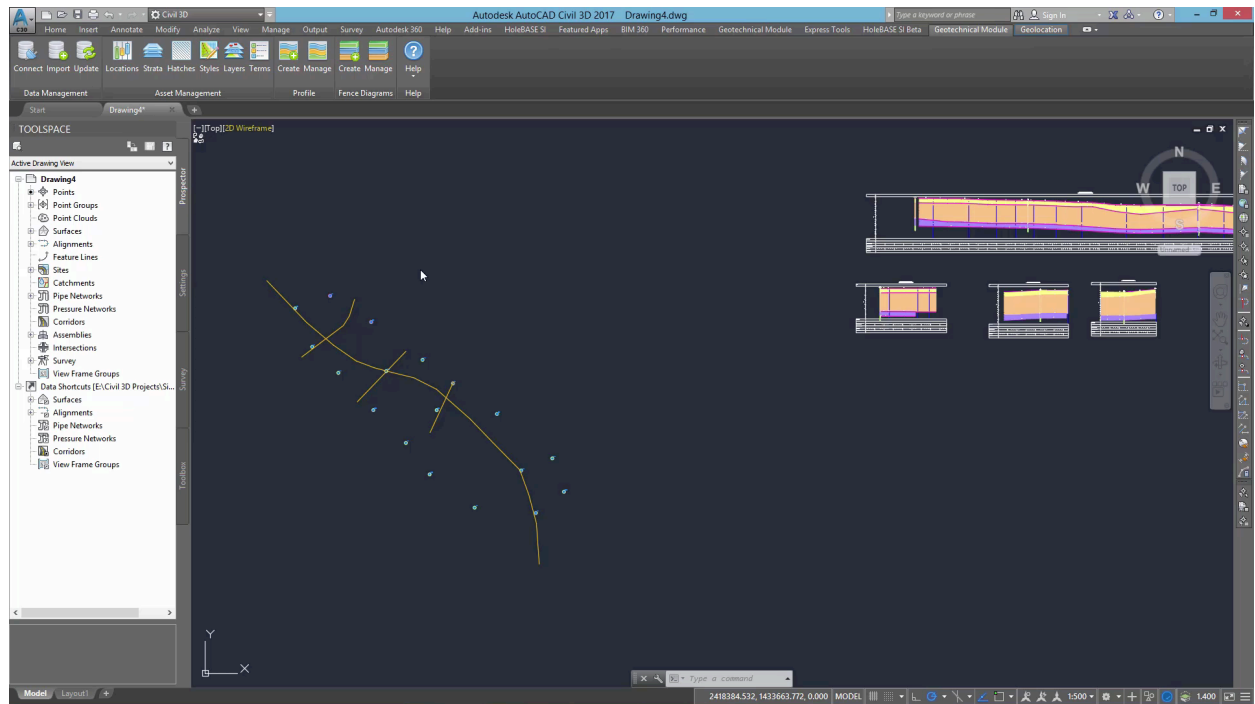
# Strata modeling



# Bore Log

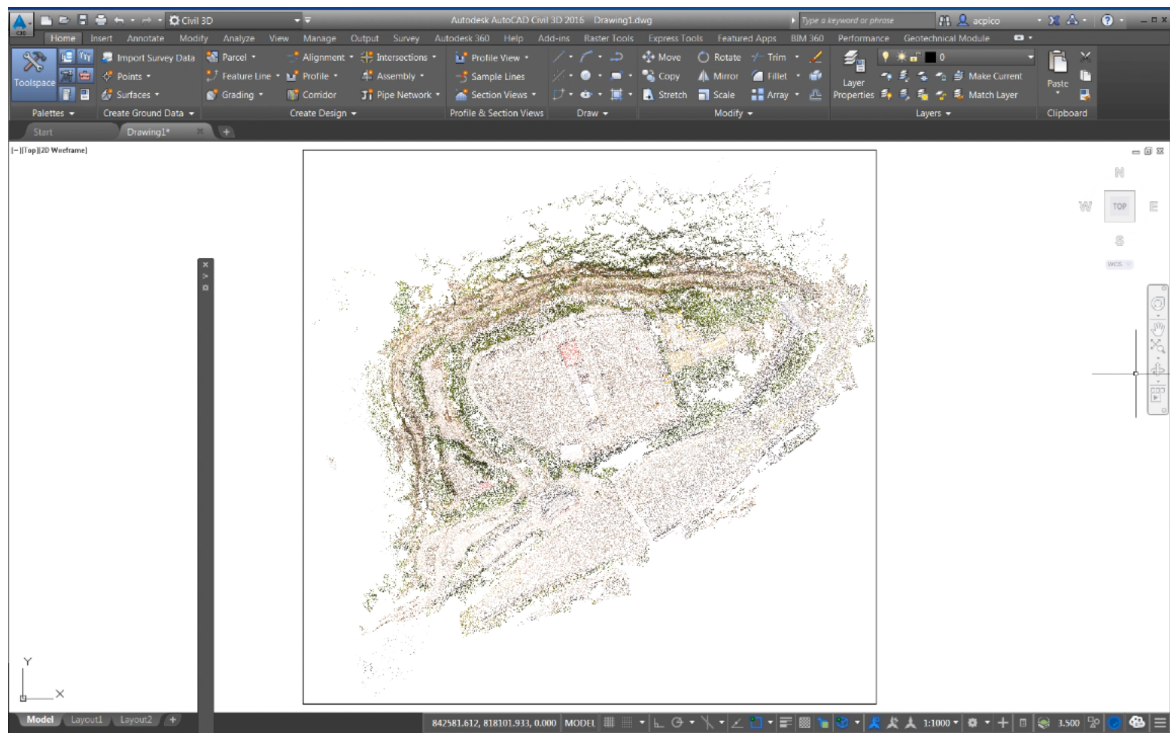
Project Data Preferences Configuration Help Grid Tools						
<div> <div>Manage Columns</div> <div>Reload Data</div> <div>Add/Edit Data</div> <div>Delete Selected</div> <div>Clear Groups</div> </div> <div> <div>Clear Sorts</div> <div>Clear Filters</div> <div>Clear Groups</div> </div> <div> <div>CSV Export</div> <div>Quick Log</div> <div>Log Report</div> <div>Log Production</div> </div> <div> <div>View All</div> <div>View Selected</div> <div>Upload</div> </div>						
<div> <div>All Data</div> <div>Location Details</div> <div>Field Geological Descriptions</div> </div>						
<div> <div>Summary</div> <div>Location Details (28)</div> <div>Samples and Lab Tests (4042)</div> <div>Monitoring (21)</div> <div>Hole Construction (148)</div> <div>Insitu Tests (753)</div> <div>Geological Information (139)</div> <div>Discontinuity Data (0)</div> <div>Field Geological Descriptions (131)</div> <div>Fracture Spacing (5)</div> <div>Stratum Detail Descriptions (3)</div> <div>Weathering (0)</div> <div>Reports</div> <div>Statistics</div> <div>Summary</div> <div>Validation</div> </div>						
Location ID	Depth Top (m)	Depth Base (m)	Description	Legend Code	Geology Code	
BH127	0.00	0.75	TOPSOIL	101	FILL	
BH127	0.75	1.10	Sandy grey brown soil with many f...	102	FILL	
BH127	1.10	2.70	Dense grey-brown SAND with me...	404	GLACIAL TILL	
BH127	2.70	9.20	Firm brown very sandy CLAY with...	220	BOULDER CLAY	
BH127	9.20	12.50	Brown CLAY with a little well roun...	205	BOULDER CLAY	
BH128	0.00	2.60	TOPSOIL	101	FILL	
BH128	2.60	6.30	Dense grey-brown SAND with me...	404	GLACIAL TILL	
BH128	6.30	11.75	Firm brown very sandy CLAY with...	220	BOULDER CLAY	
BH129	0.00	0.50	TOPSOIL	101	FILL	
BH129	0.50	1.80	Sandy grey brown soil with many f...	102	FILL	
BH129	1.80	5.30	Dense grey-brown SAND with me...	404	GLACIAL TILL	
BH129	5.30	16.70	Firm brown very sandy CLAY with...	220	BOULDER CLAY	
BH129	16.70	17.00	Brown CLAY with a little well roun...	205	BOULDER CLAY	
BH129	17.00	18.10	Brown CLAY with a little well roun...	206	BOULDER CLAY	
BH129	18.10	21.95	Limestone bedrock	804	LIMESTONE	
BH130	0.00	1.10	TOPSOIL	101	FILL	
BH130	1.10	2.00	Sandy grey brown soil with many f...	102	FILL	
BH130	2.00	3.20	Dense grey-brown SAND with me...	404	GLACIAL TILL	
BH130	3.20	5.70	Firm brown very sandy CLAY with...	220	BOULDER CLAY	
BH130	5.70	18.50	Brown CLAY with a little well roun...	205	BOULDER CLAY	

# Handling of uncertainties

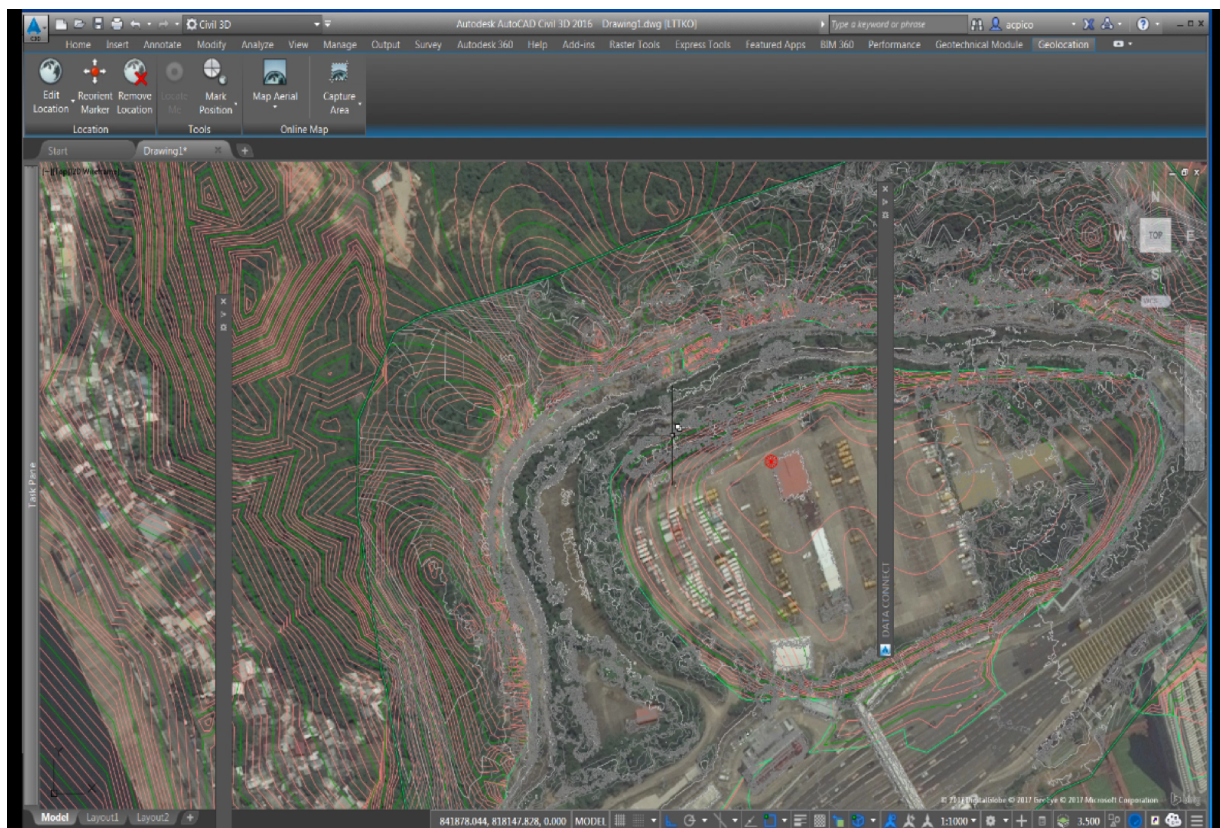


LiDAR/GIS/Aerial photos

# Terrain model from LiDAR data



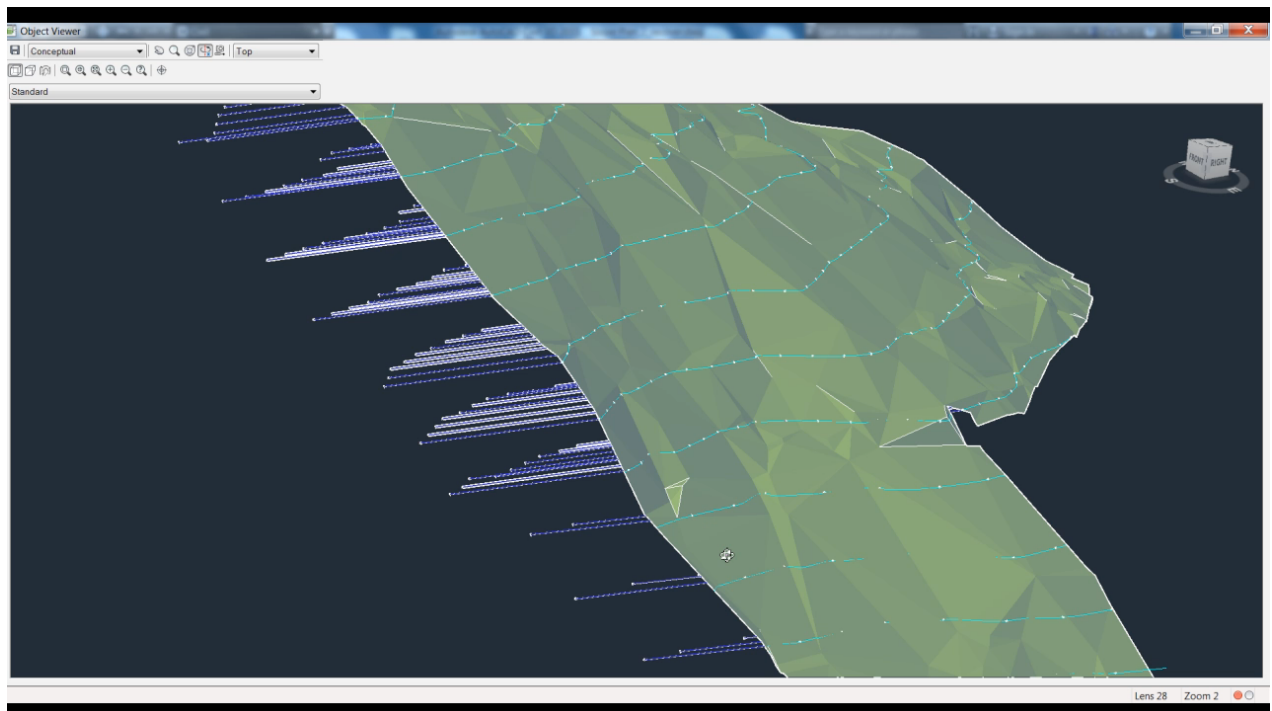
# Overlay of GIS Data



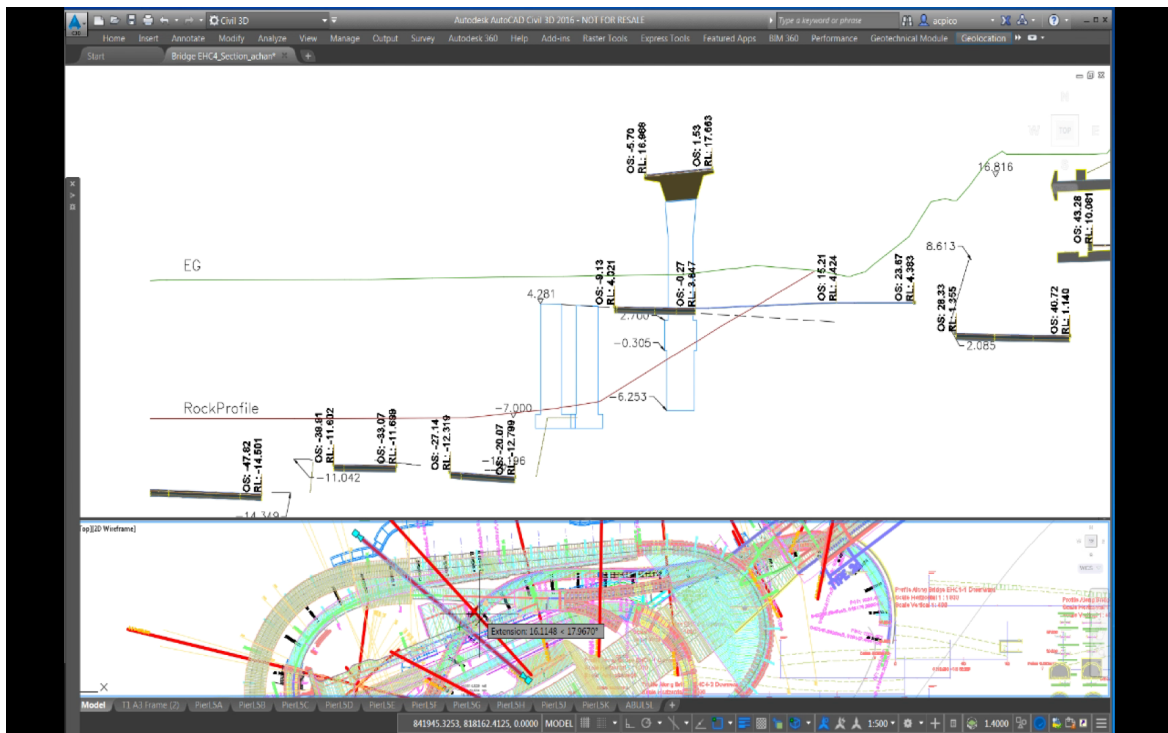


# Integrated with Design model

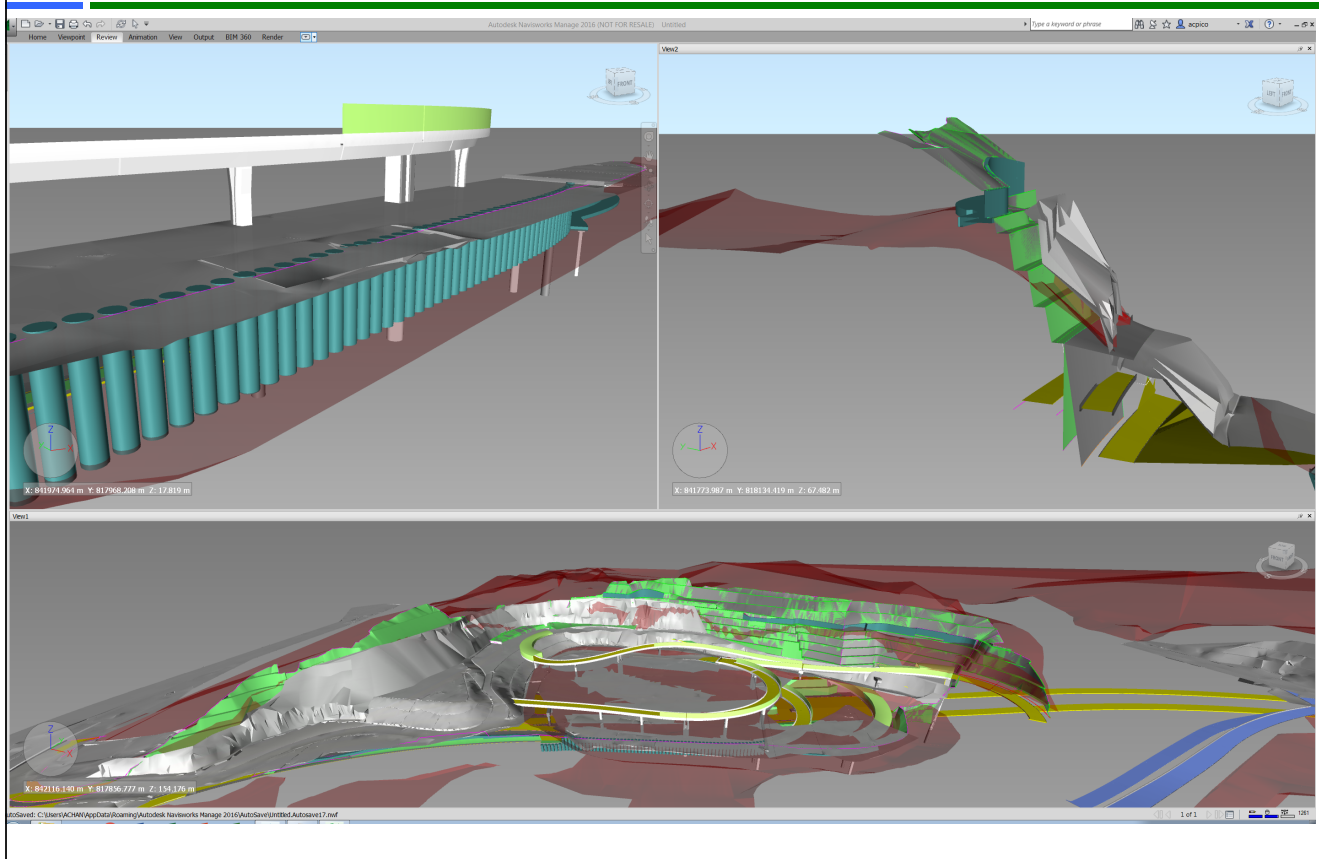
## Soil Nail Layout



# Interactive Sections

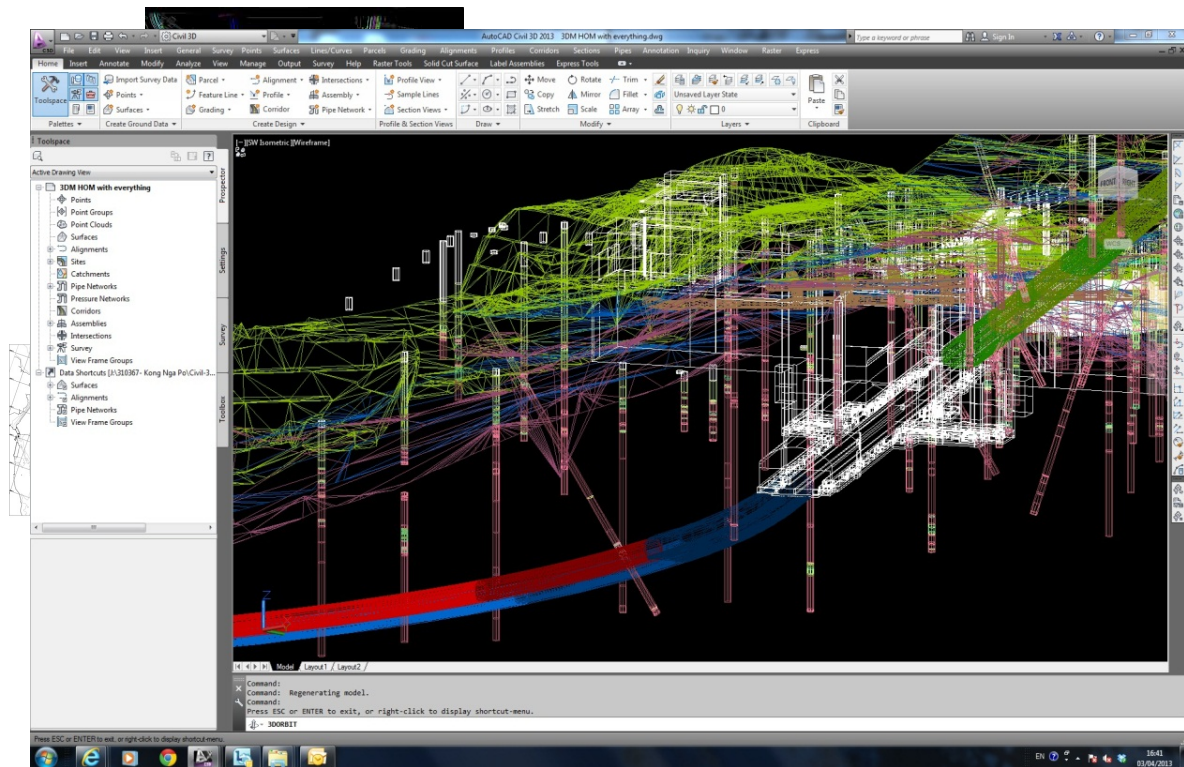


# Integrated Visualization



# CASE Sharing

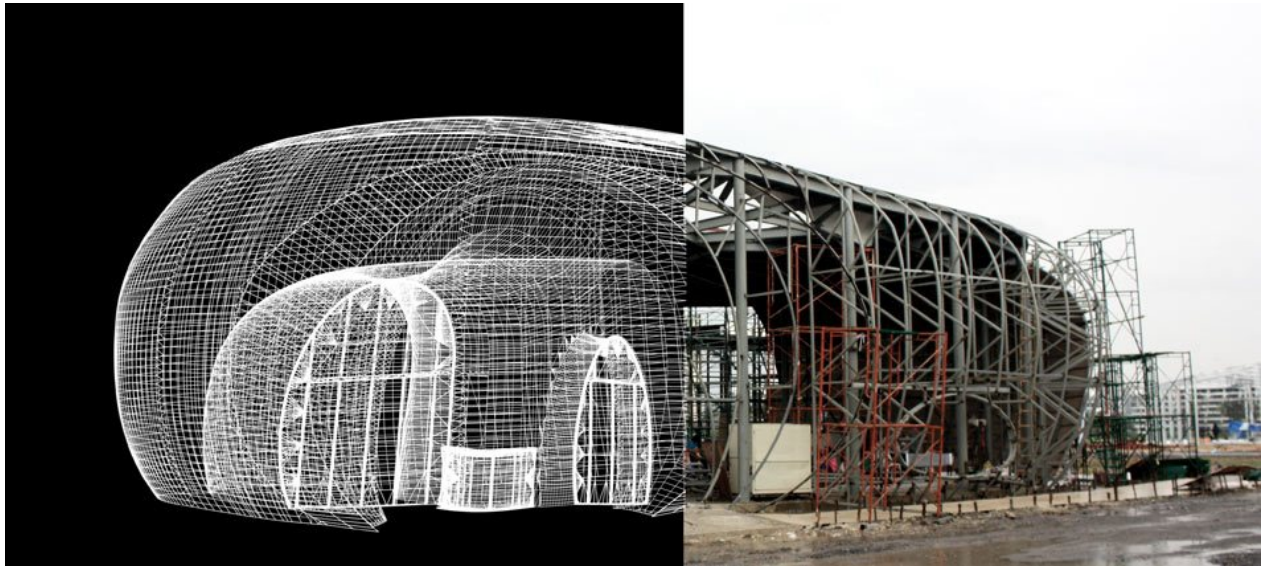
## CKR Conceptual Design



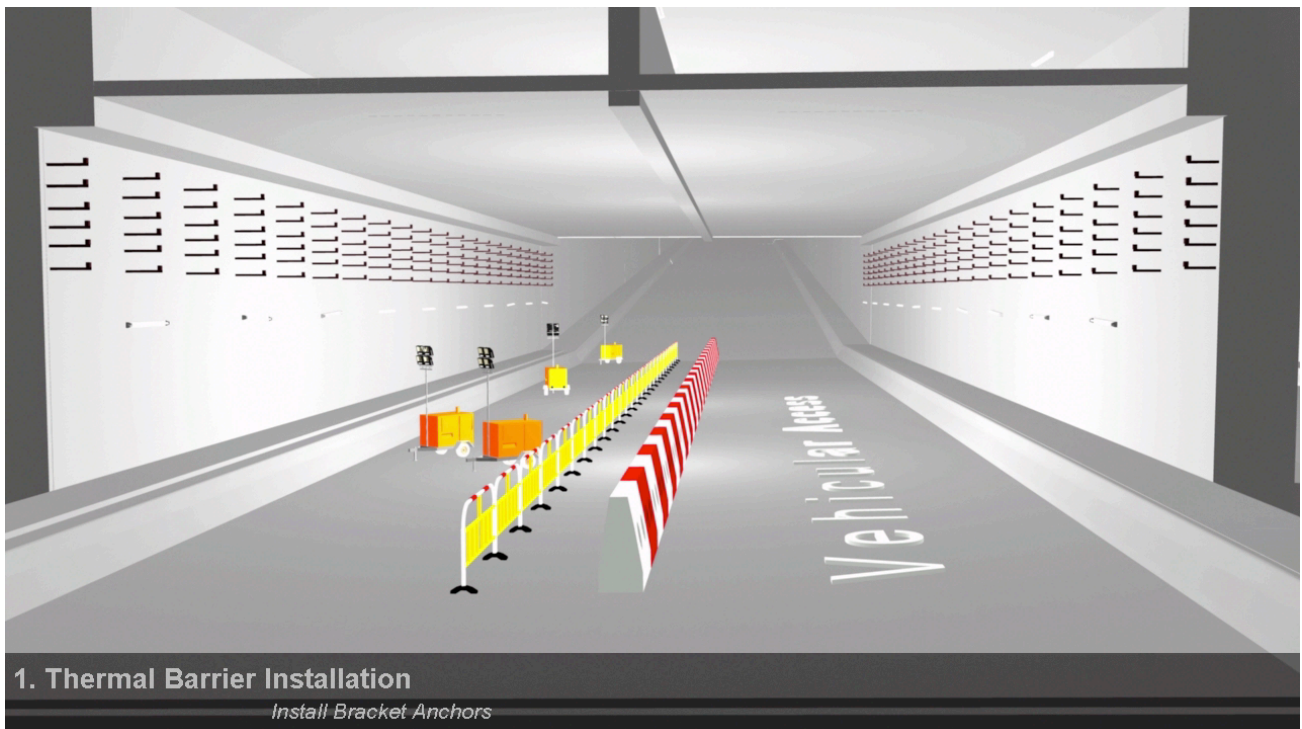
BIM is more than Visualization



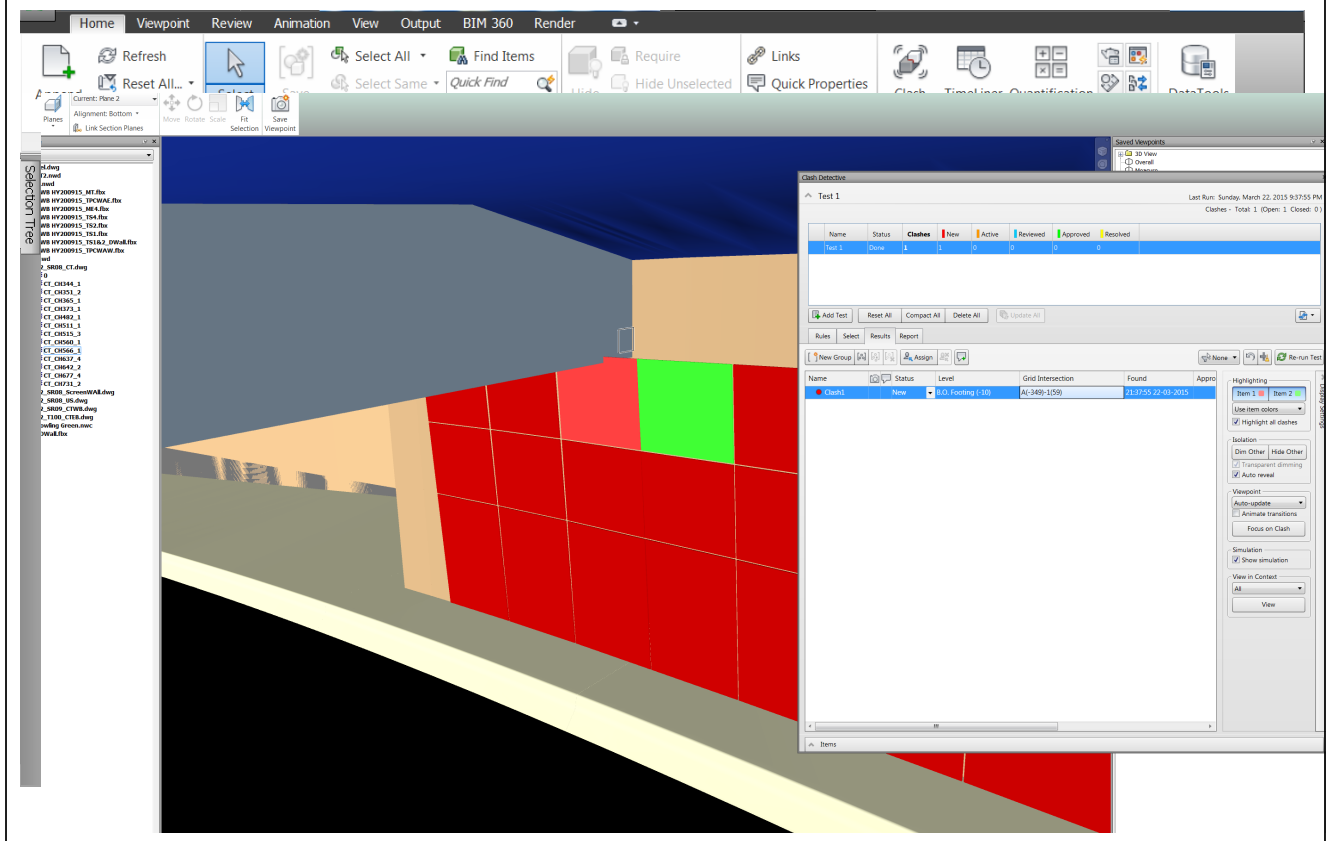
# BIM Fundamental : Digital Prototyping



## BIM is not Visualization



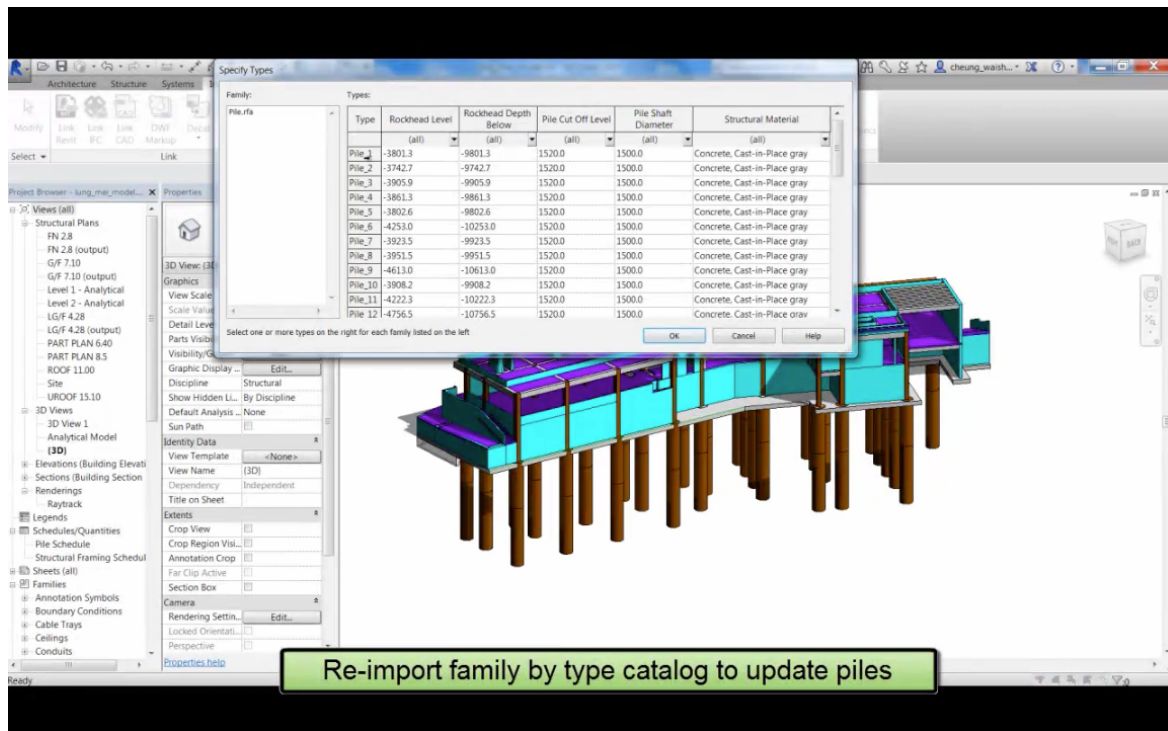
# BIM: Reliable database for decision



BIM enabled  
Geotechnical Analytics

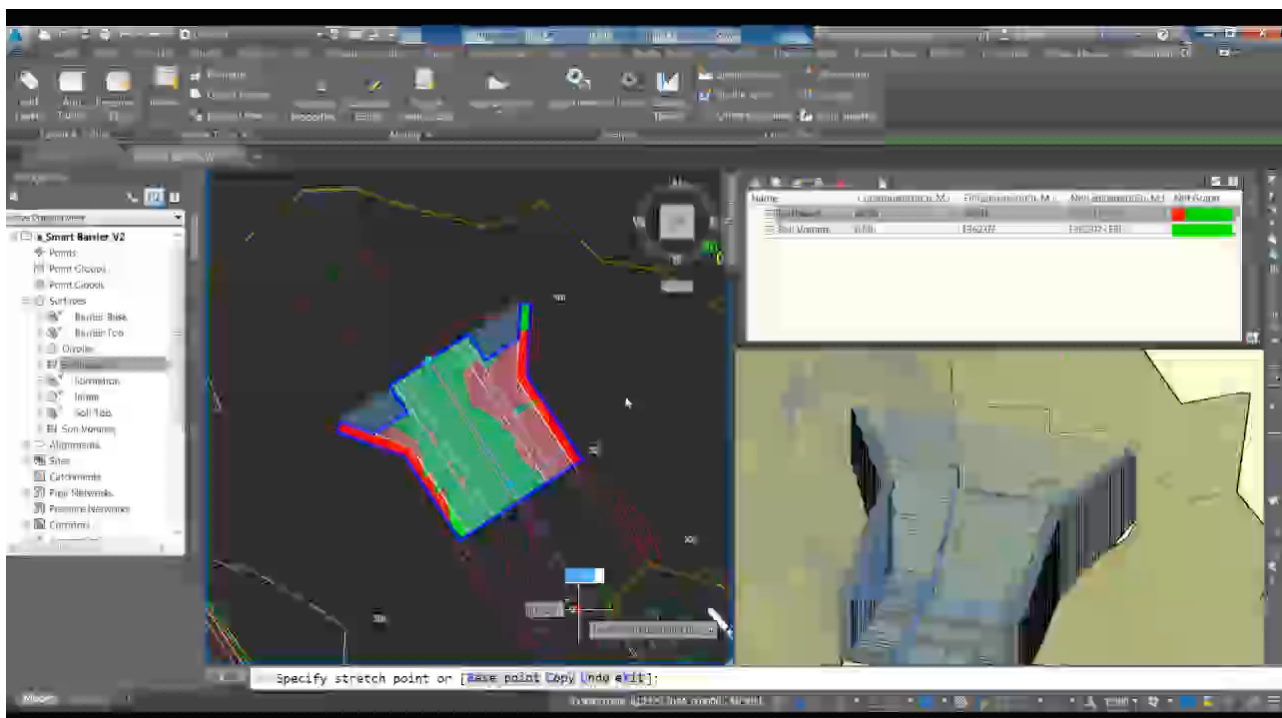
# Pile Depth calculation

## Pilot project



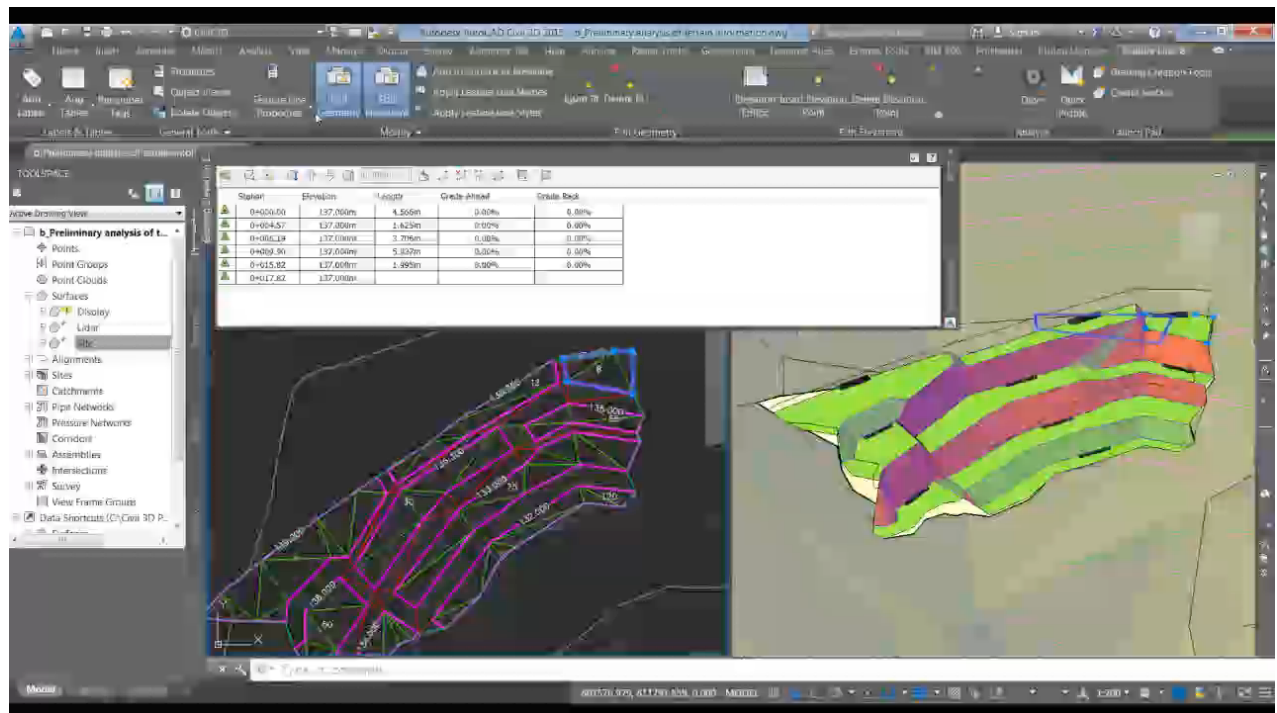
# Rigid Barrier/Earthwork optimization

## Pilot projects



# Site formation Design

## Pilot Projects



Summary



# BIM for Geotechnical Engineers

- ❑ Streamline workflow to integrate multiple source of data
- ❑ Massive database to lower operation cost and increase efficiency
  - ▣ HAGDMS, Aktins
- ❑ BIM is NOT 3D Visualization
  - ▣ Maximize with the analytical capability of BIM



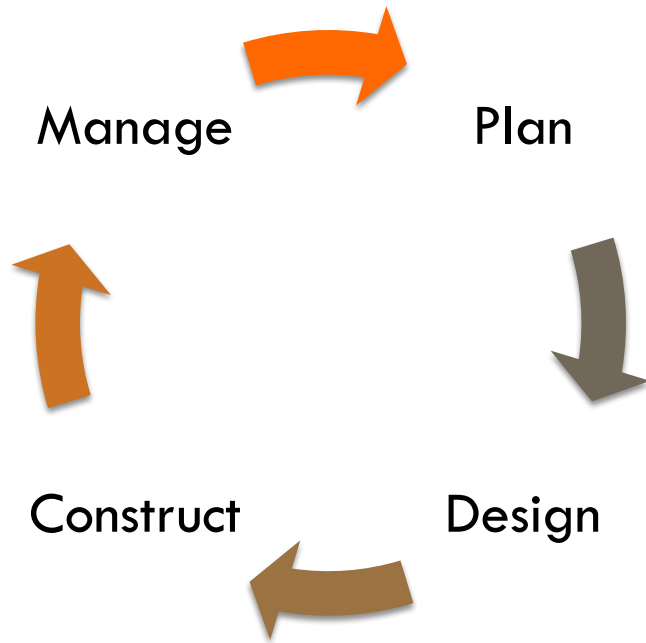
## QUESTION AND ANSWERS

Andy Chan MHKIBIM

Project Manager

# BIM for Geotechnical Engineer

## Construction Life Cycle



### Key BIM Application

Collaborate

Analysis

Documentation

Visualization