

# Transmission, Distribution, Power Generation Infrastructures

*Powered with Digital Innovation*



June 2026

**Bentley**<sup>®</sup>

# A Globally Recognized Software Partner

## PROVEN

**40+**

years in operation

**>\$1,5B**

annual revenue

**5,500**

colleagues in 40 countries

**BSY**

NASDAQ listed

## TRUSTED

**93%**

of ENR Top 250  
Engineering Firms

**72%**

of Bentley Infrastructure  
Top 500 Owners

**42,000**

accounts in 194 countries

**98%**

account retention rate

## INNOVATIVE

**\$753M**

in R&D in past 3 years

**320**

patents granted  
or pending

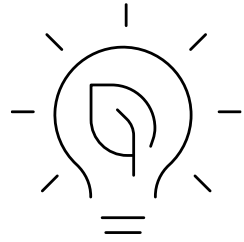
**1,400**

colleagues with doctoral and  
master's degrees

**ES(D)G**

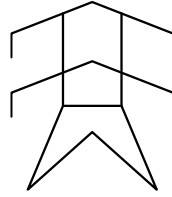
empowering sustainable  
development goals

# Historic Changes/Challenges for Electric Utilities



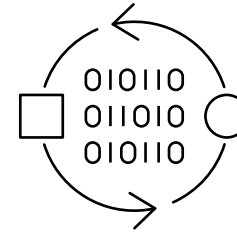
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**Growing demand  
& investment**



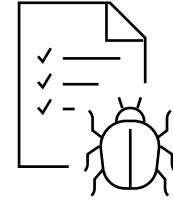
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**Increasing  
complexity,  
cost, & risk**



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**Rising data  
& workflow  
fragmentation**



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**Aging  
Infrastructure &  
reliability issue**



# Indonesia Power Sector Landscape

RUPTL 2025–2034 Roadmap

**+69.5 GW**

New Generation  
Capacity

76% from  
Renewable Energy

**~48,000 km**

New Transmission  
Lines

Super Grid  
Interconnection

**~108,000 MVA**

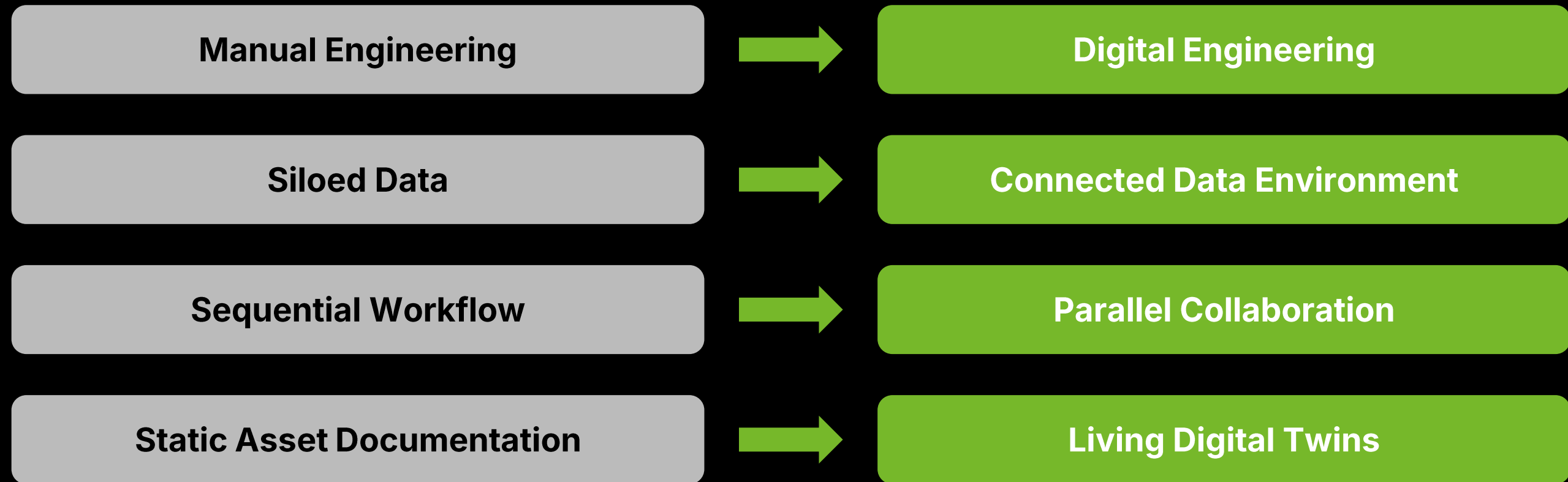
New Substation  
Capacity

Smart Grid  
Ready

## Strategic Context with PLN Enjiniring

- PLN Digital Transformation & Smart Grid roadmap
- Massive infrastructure investment requires digital acceleration
- Net Zero Emission target: 2060
- PLN Enjiniring as core think-tank engineering team of PLN Group

# The Shift to Digital Transformation Infrastructure



**"From fragmented processes to an integrated digital ecosystem"**

# BENTLEY Planning, Design, Construction and Operation Tools for **ELECTRIC UTILITIES INDUSTRIES**



## Digital Twin Platform with Bentley Infrastructure Cloud

### ***Transmission System***

- PLS (Power Line Systems)

### ***Electricity Substation***

- OpenUtilities Substation
- Bentley Raceway and Cable Management
- EasyPower

### ***Distribution Networks***

- OpenUtilities Designer
- PLS/SPIDA

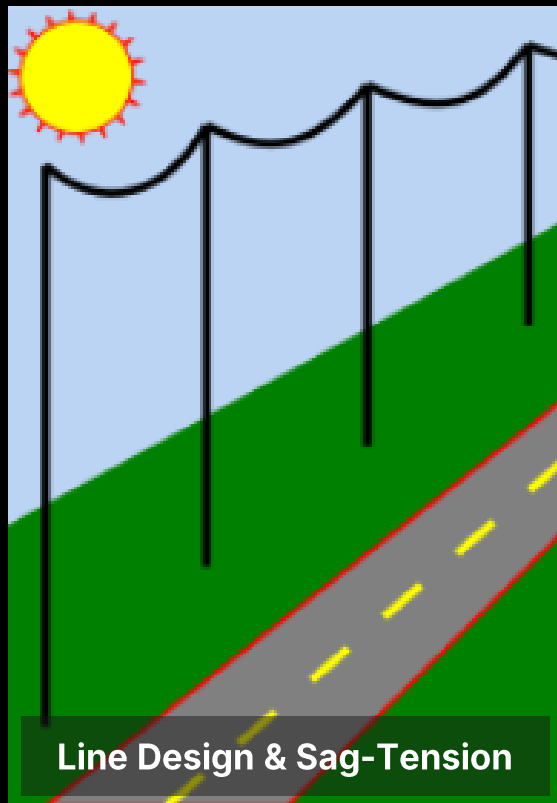
### ***Power Generation***

- OpenGround
- Leapfrog
- Plaxis
- OpenPlant
- Open WindPower

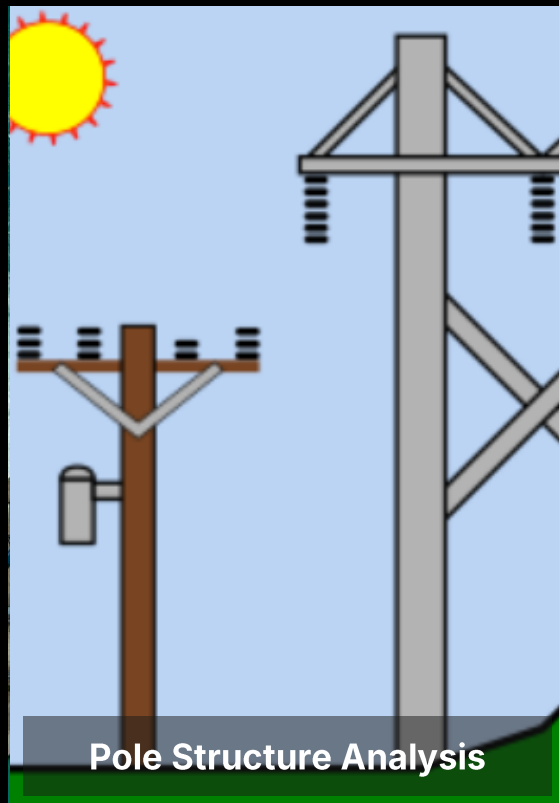
# Transmission Design

Power Line Systems (PLS) develops, sells and supports software for the design of overhead electric power transmission, distribution, and communication lines and their structures.

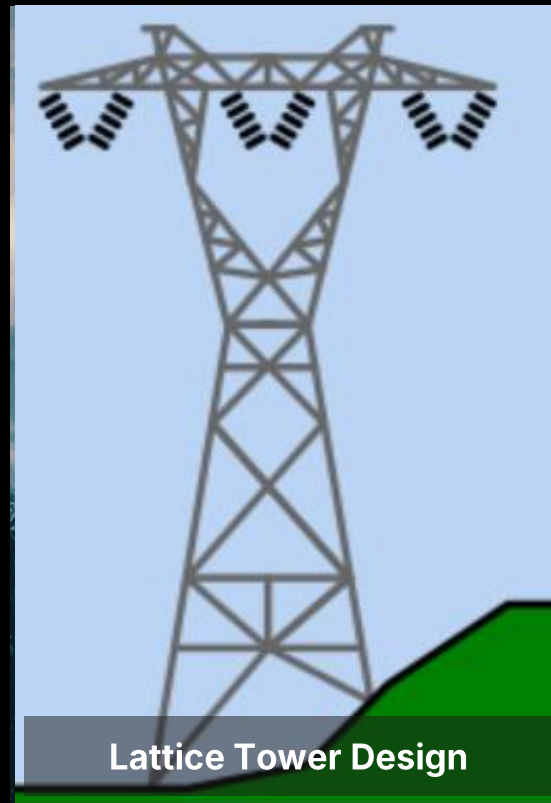
## PLS-CADD



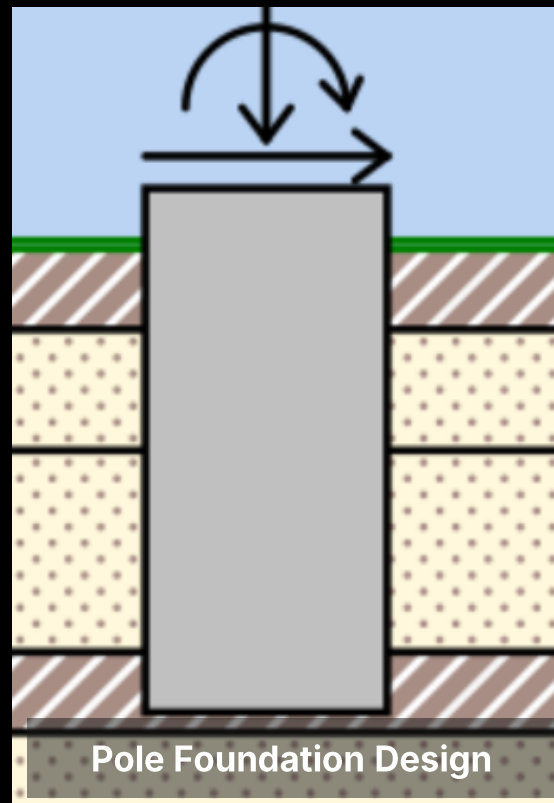
## PLS-POLE



## TOWER

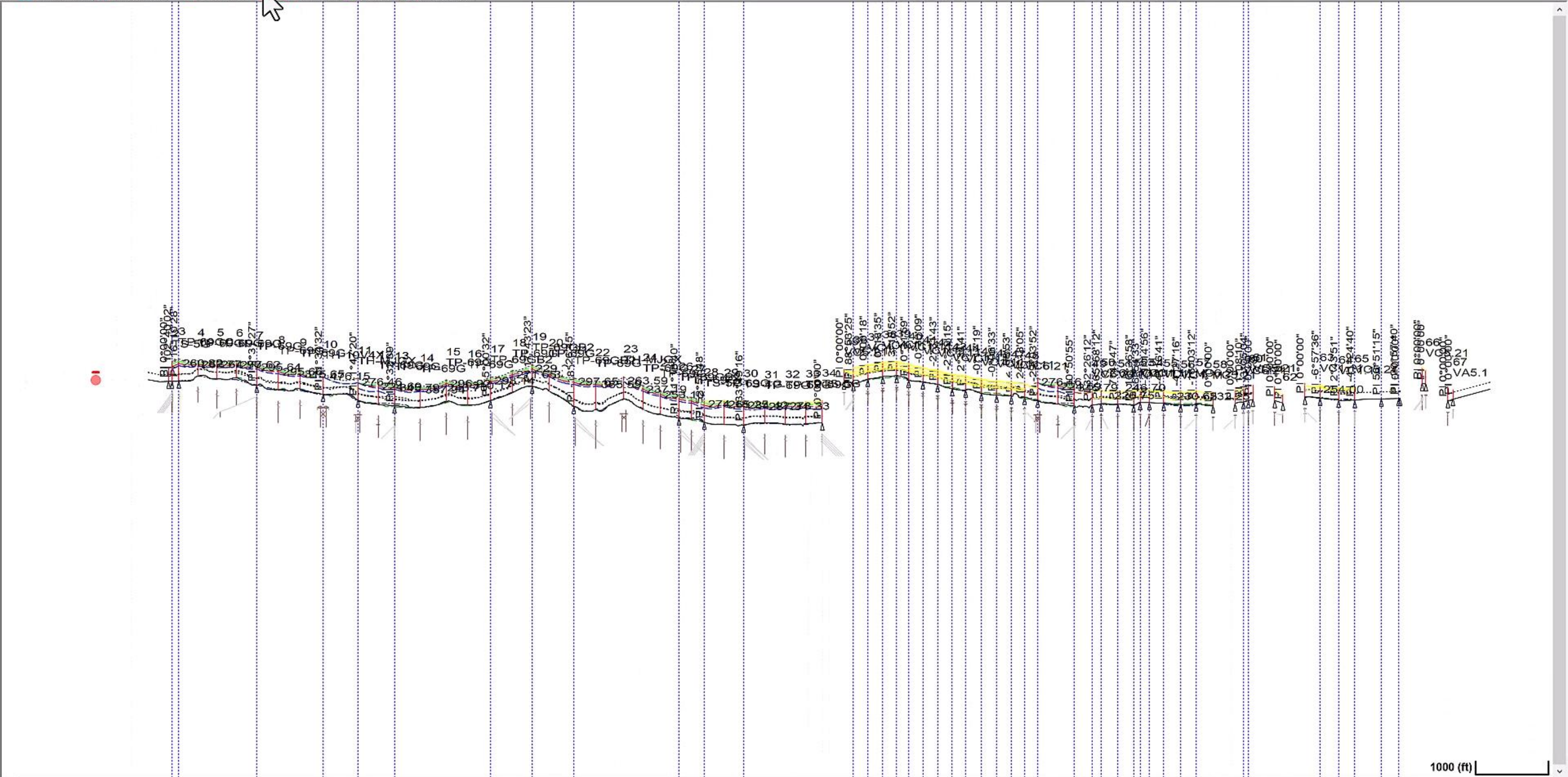


## CAISSON

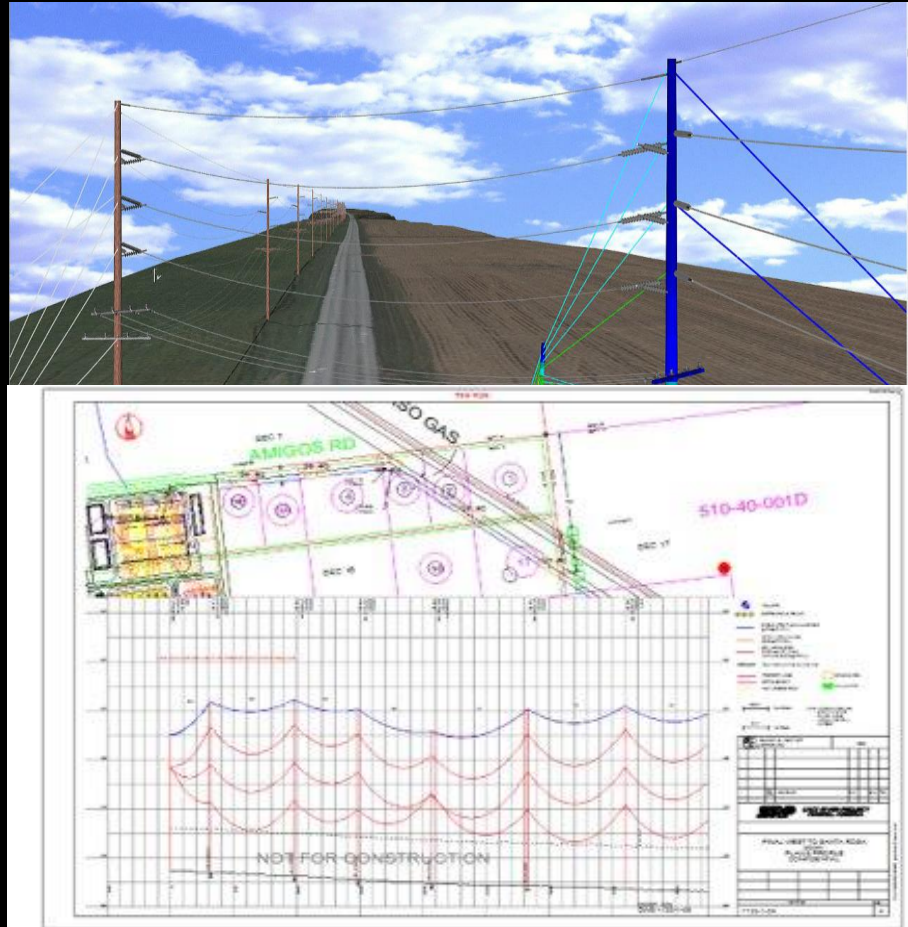


## PLS-GRID

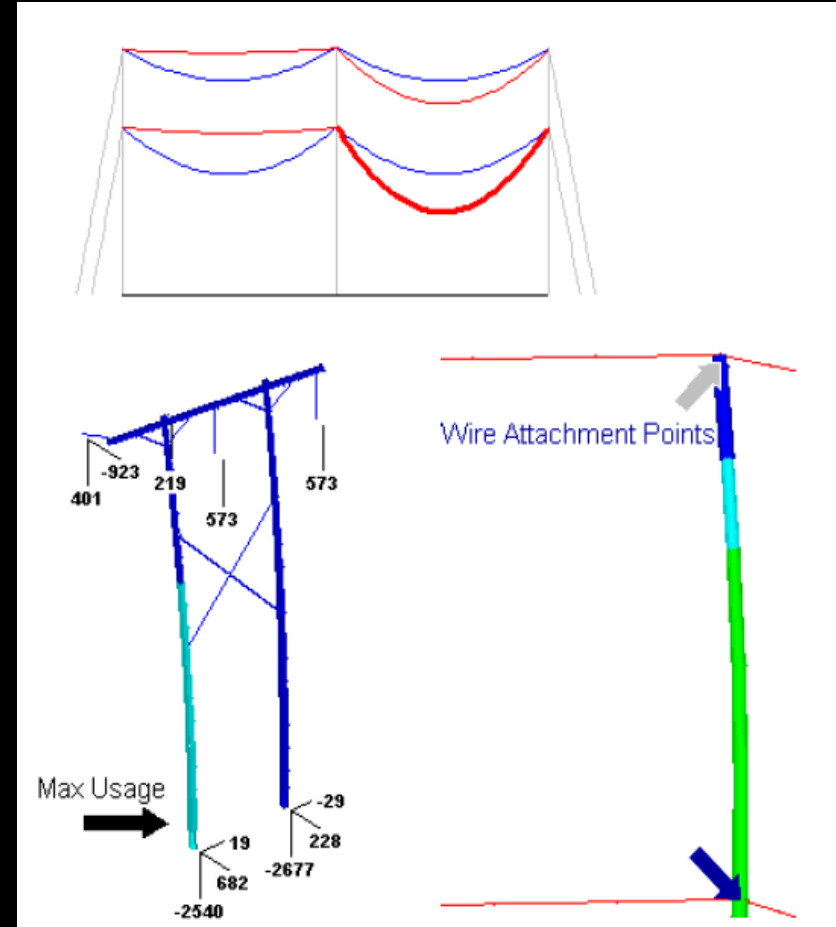




# Power Line Systems (PLS)

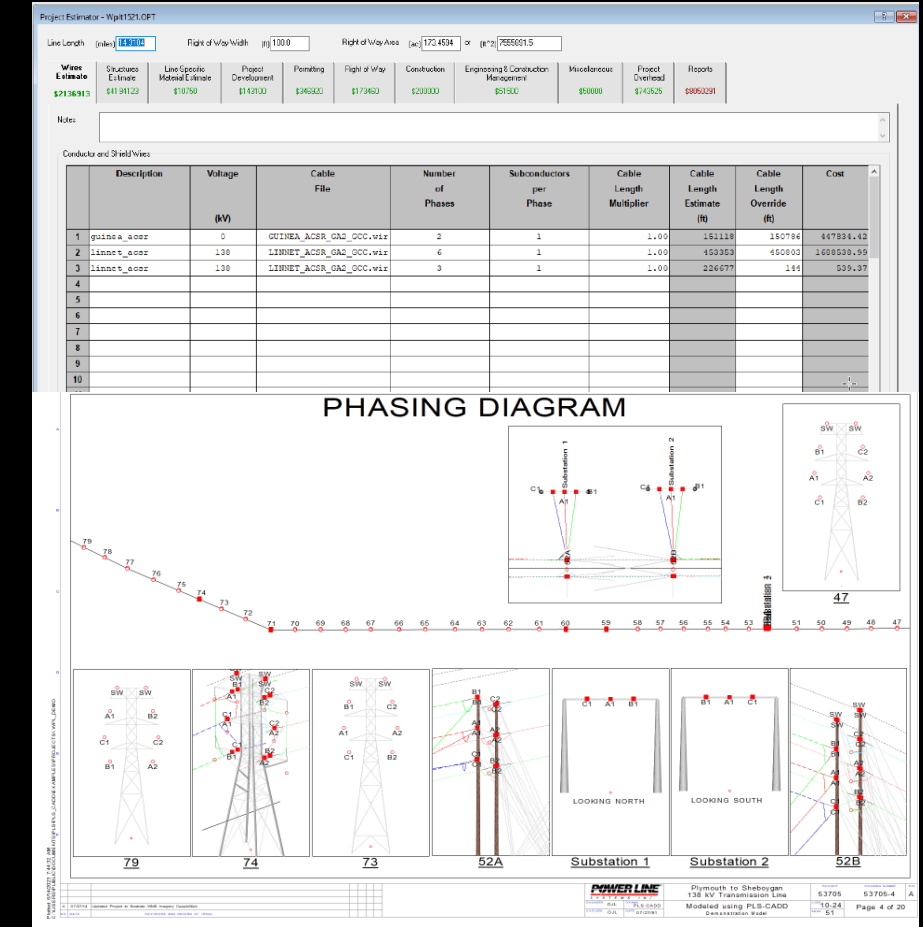


Integrated Complete 3D BIM Model of Overhead Transmission, Distribution with Drafting and GIS information



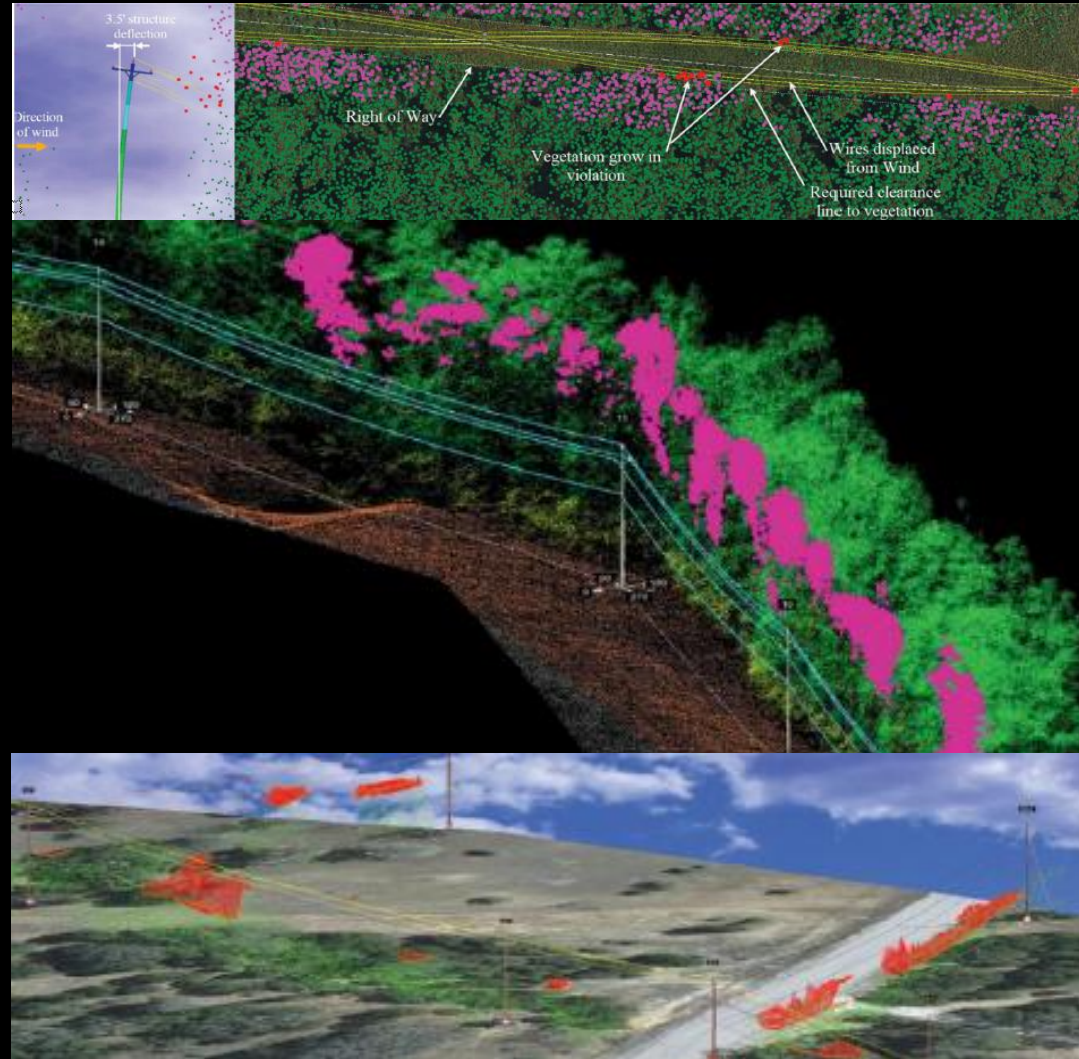
Engineering Standards and Codes based

- ASCE, IEEE, CIGRE, etc.
- NESC, GO95, CSA, CENELEC, IEC

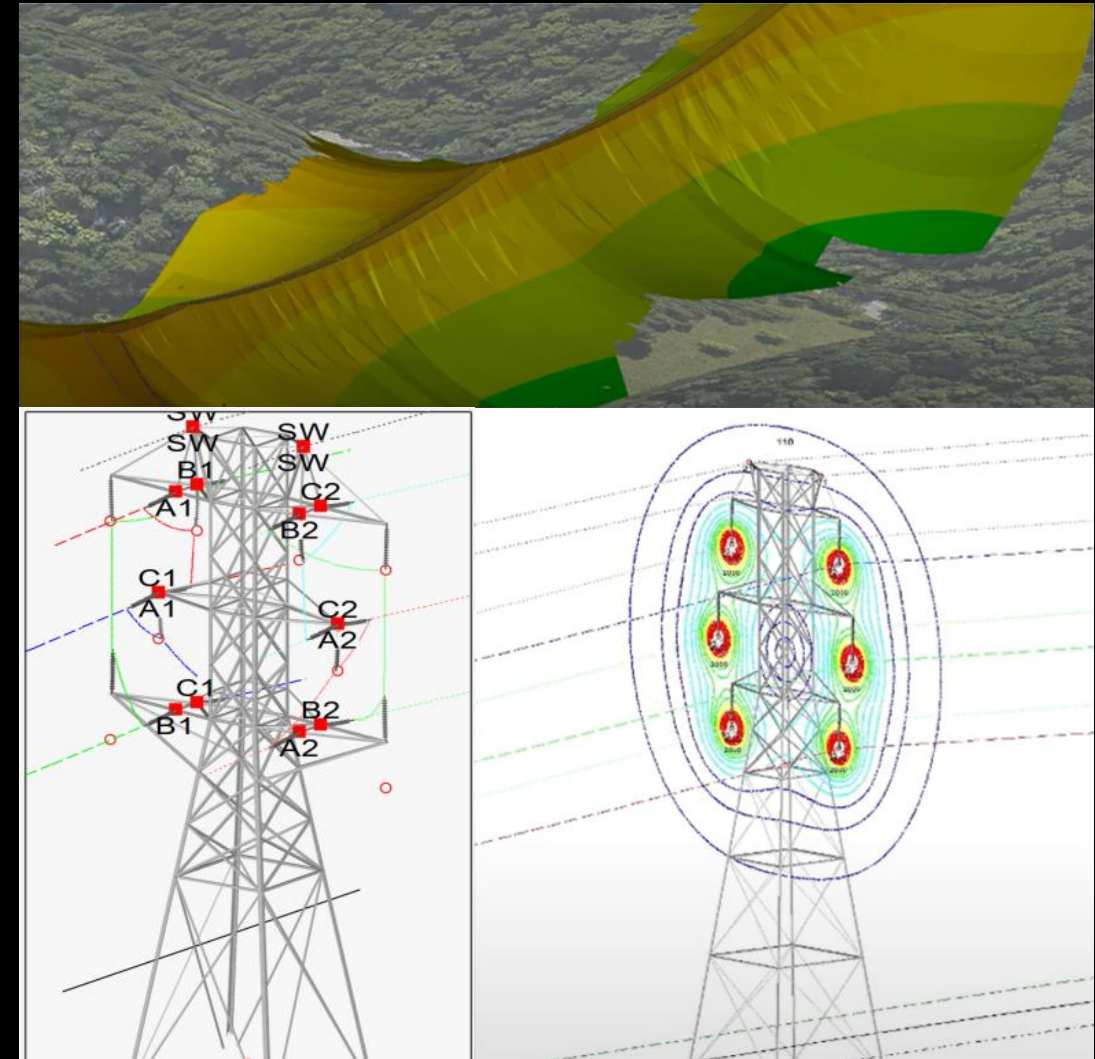


Material management & Construction Documentation

# Power Line Systems (PLS)



Vegetation Analysis, Thermal Rating Analysis



Lightning Protection Analysis, Electromagnetic Field (EMF) Calculation

# Digital Engineering for Substation Design

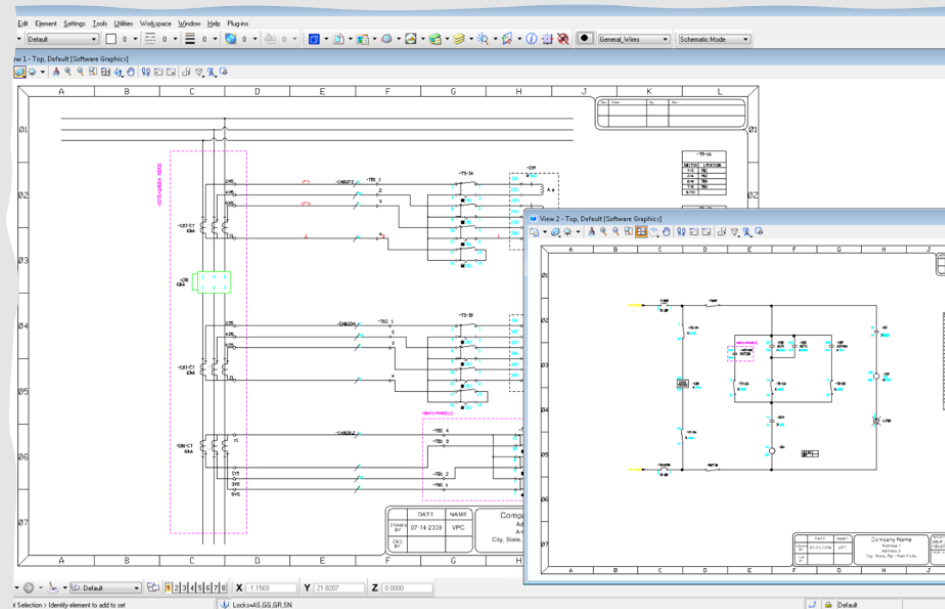
## Electrical design



Electrical  
Schematic Design

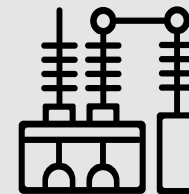


Construction  
Deliverables

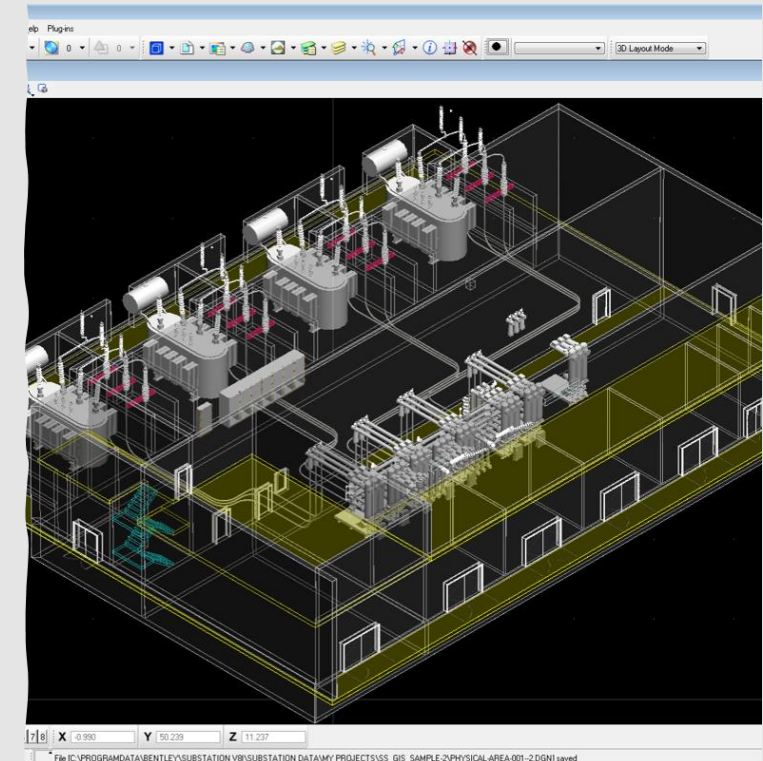


- Protection: design of safeguards to protect equipment against overloads and damage
- Control: design of switches and breakers to direct and optimize the flow of electricity

## Physical design

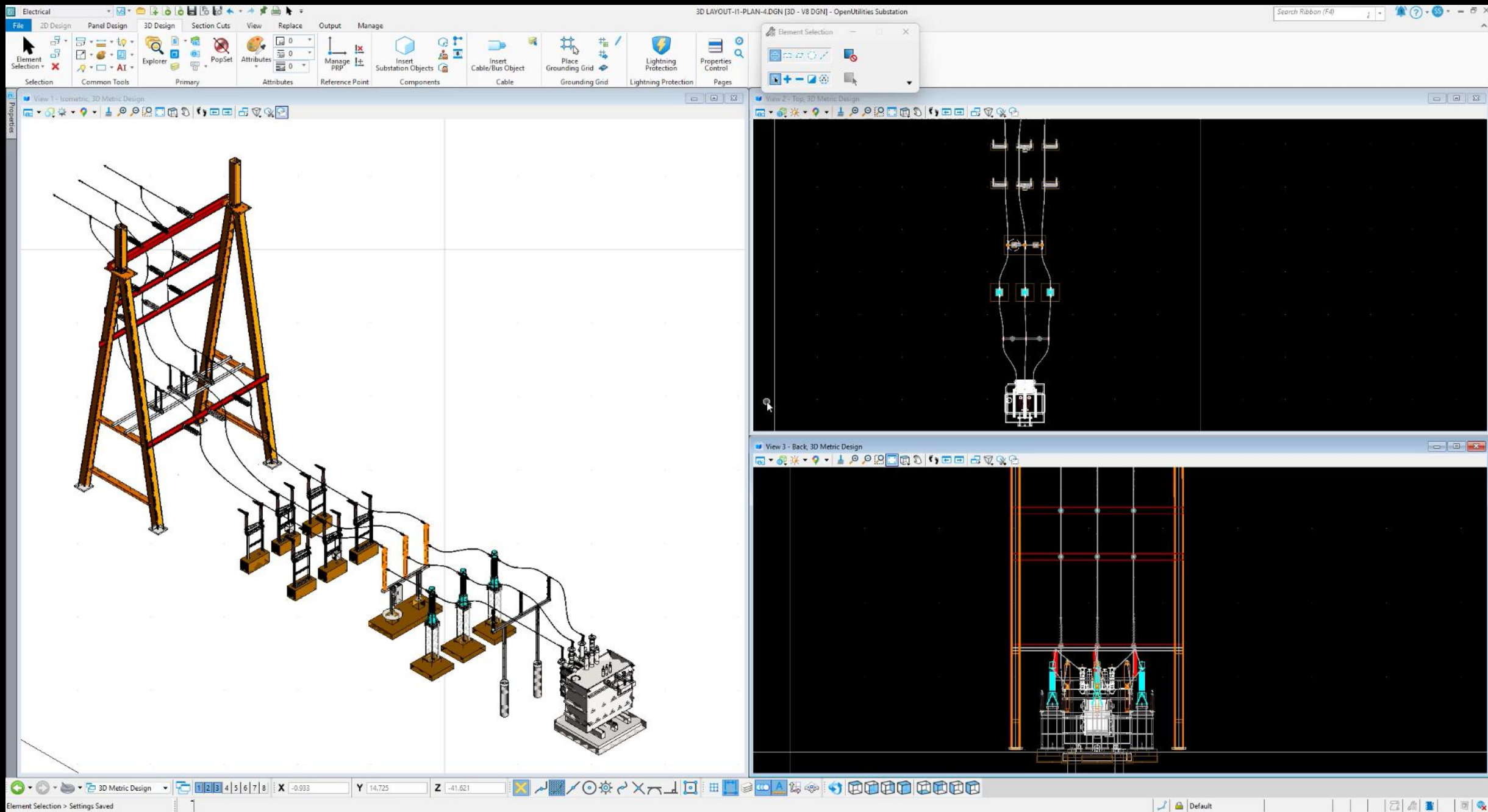


3D Substation  
Design

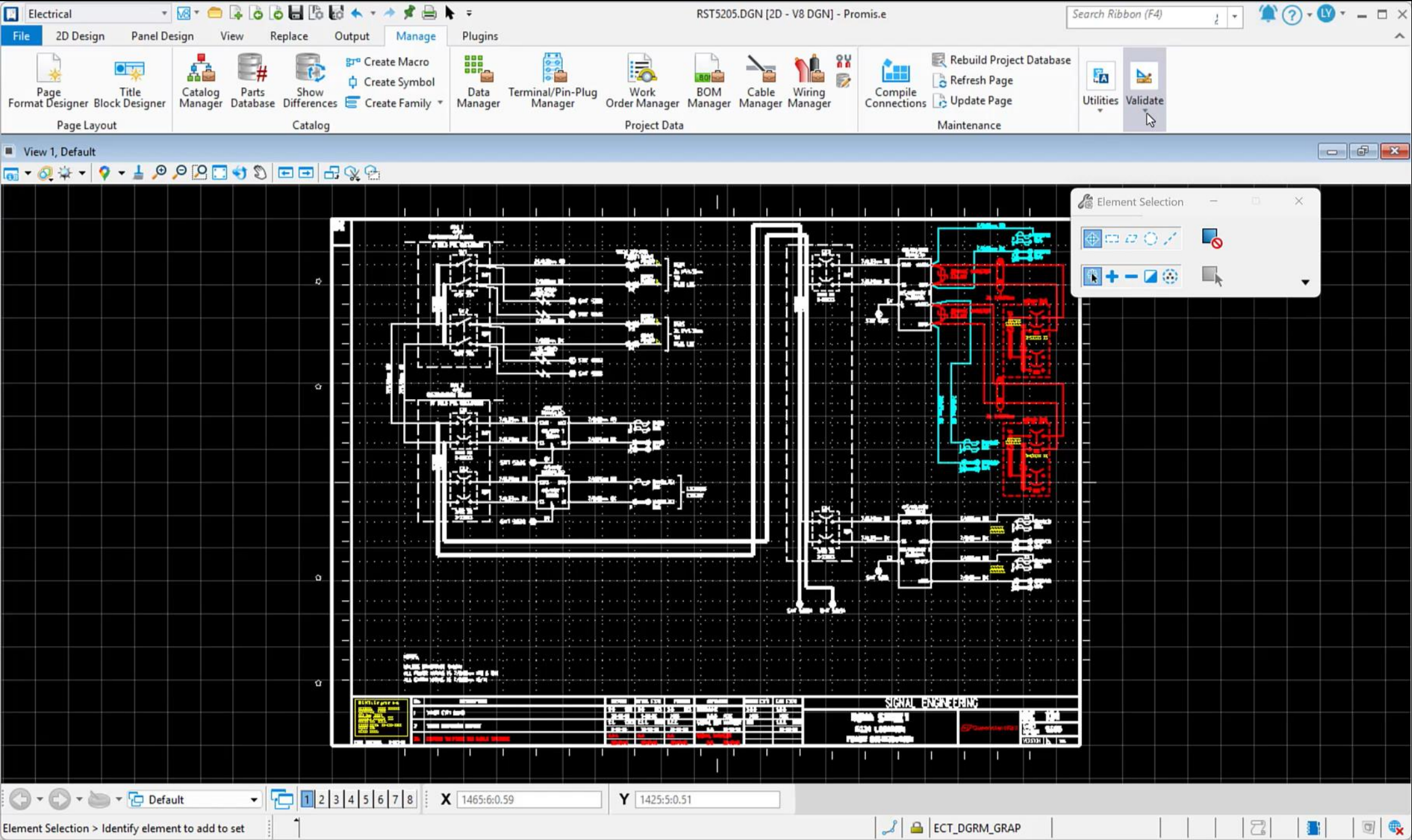


3D Layout of equipment and connections

# Intelligent 3D BIM Substation Modeling



# Substation Model Error Design Checking



# Substation designed powered by AI (Early Access)

Substation+ for Developers (QA)

Substation+ Build 13 test-1762528984365-Mike-Antonishen

Catalog Brow...

All Catalogs

SampleCat 2

Auxiliary Equipmen

Cable Supports

Clamp

Conductor

Connector

Electrical Building

Equipment Foundat

Grounding Equipme

Lightning Protection

Miscellaneous

Overhead Structure

Raceway

Equipment Br...

Name

3D\_TR\_PWR\_230KVP\_38K VS\_3PH\_250MVA

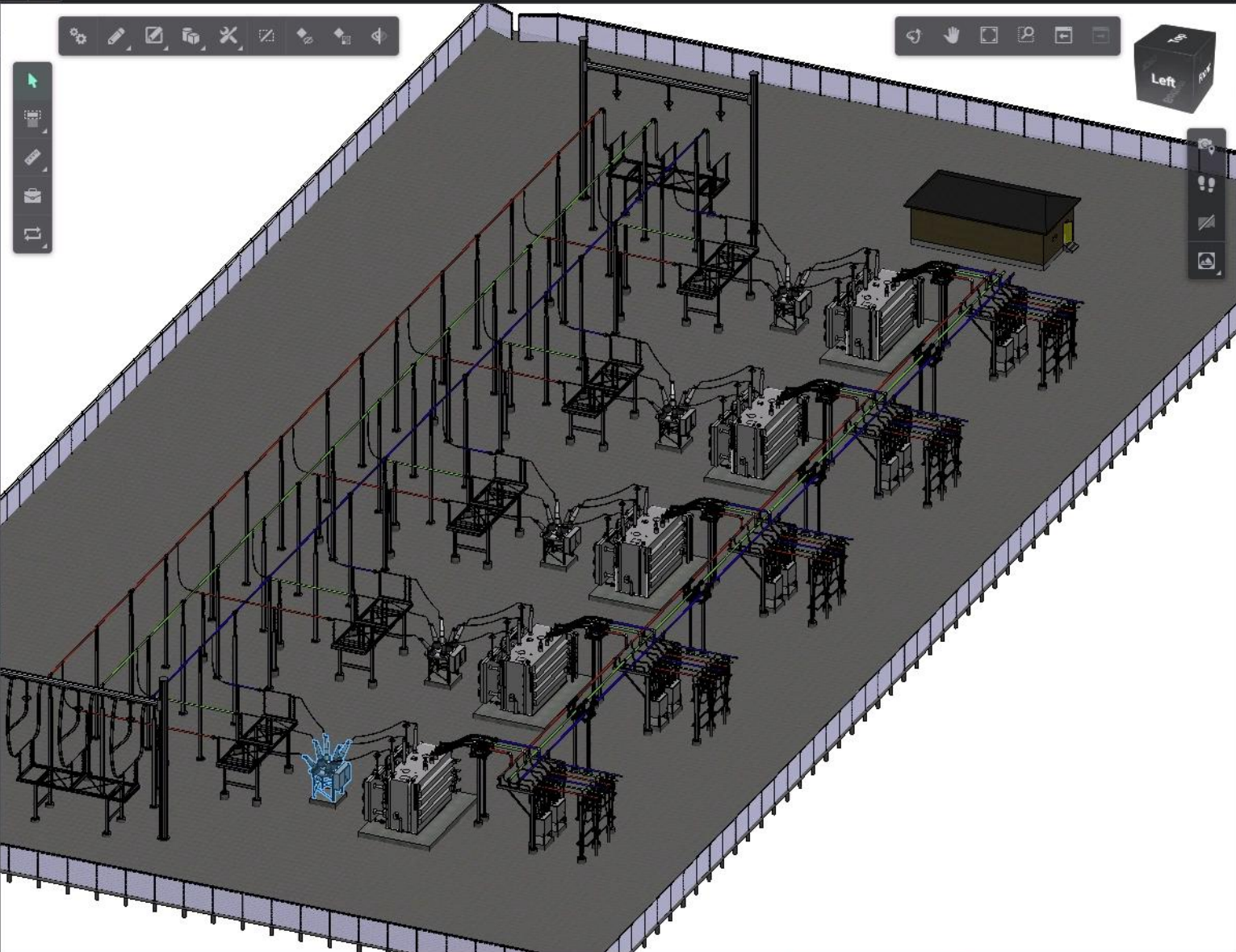
TRANSF\_PWR\_115-12KV\_45MVA\_3PH

TRANSF\_PWR\_67-12KV\_20MVA\_3PH

TRANSF\_PWR\_69-12KV\_7MVA\_3PH

Left

Right



Property Editor

Show Plan Details

|                       |                   |                |
|-----------------------|-------------------|----------------|
| Number of Phases      | 3                 | 3              |
| Operating Temp. Range | -30°C to +40°C    | -40°C to +40°C |
| Altitude              | 3,300 ft          | 1,783 ft       |
| Applicable Standards  | IEEE C37.04/06/09 | IEEE C37.04/1  |

- The continuous current rating of the breaker (2,000 A) is less than the required 3,000 A, which is a conflict.
- Interrupting time is not specified for the breaker, so compliance cannot be verified.
- The altitude of the breaker (3,300 ft) exceeds the design criteria reference (1,783 ft). Per IEEE, derating may be required above 1,000 m (3,281 ft).

Other properties (creepage, seismic, close latch current, etc.) are not specified in the design criteria document and should be confirmed with the manufacturer.

**Conclusion:**  
The main conflict is the continuous current rating (2,000 A vs. required 3,000 A). Interrupting time and altitude derating should also be reviewed.

For details, see: [Data Center Substation Design Criteria.pdf, page 8](#), [Data Center Substation Design Criteria.pdf, page 9](#).

Would you like to review or update the breaker's continuous current rating?

AI-generated content may be incorrect

Type your message here...

Messages

Identify element

Snap Mode

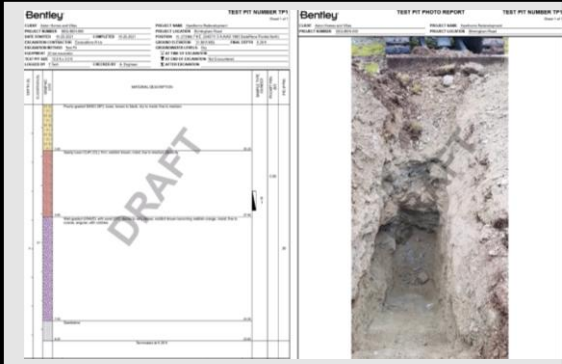
AccuSnap

AccuDraw

Scope: Top assembly

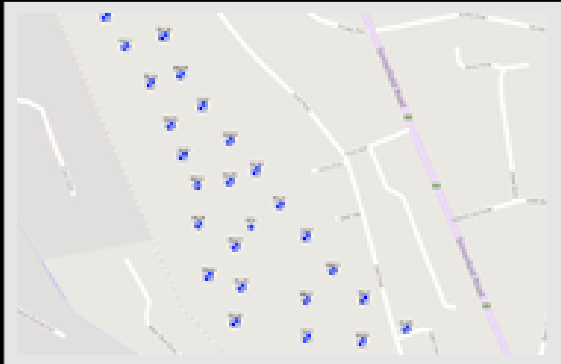
23

# Connected Subsurface Modeling To Computational Analysis



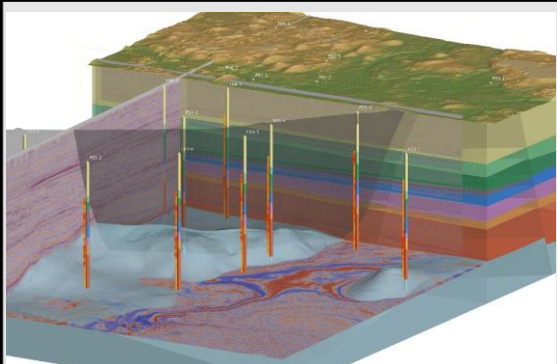
 OpenGround  
Collector

Geotechnical  
data capture



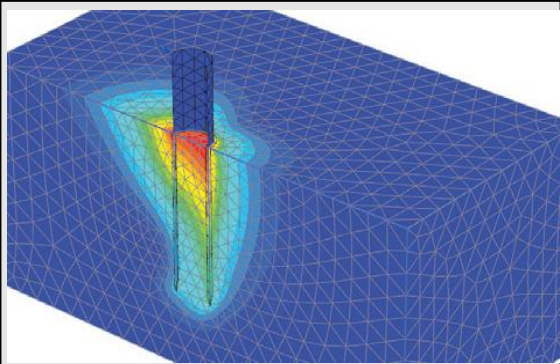
 OpenGround

Geotechnical  
data management



 Leapfrog

3D geological  
modeling

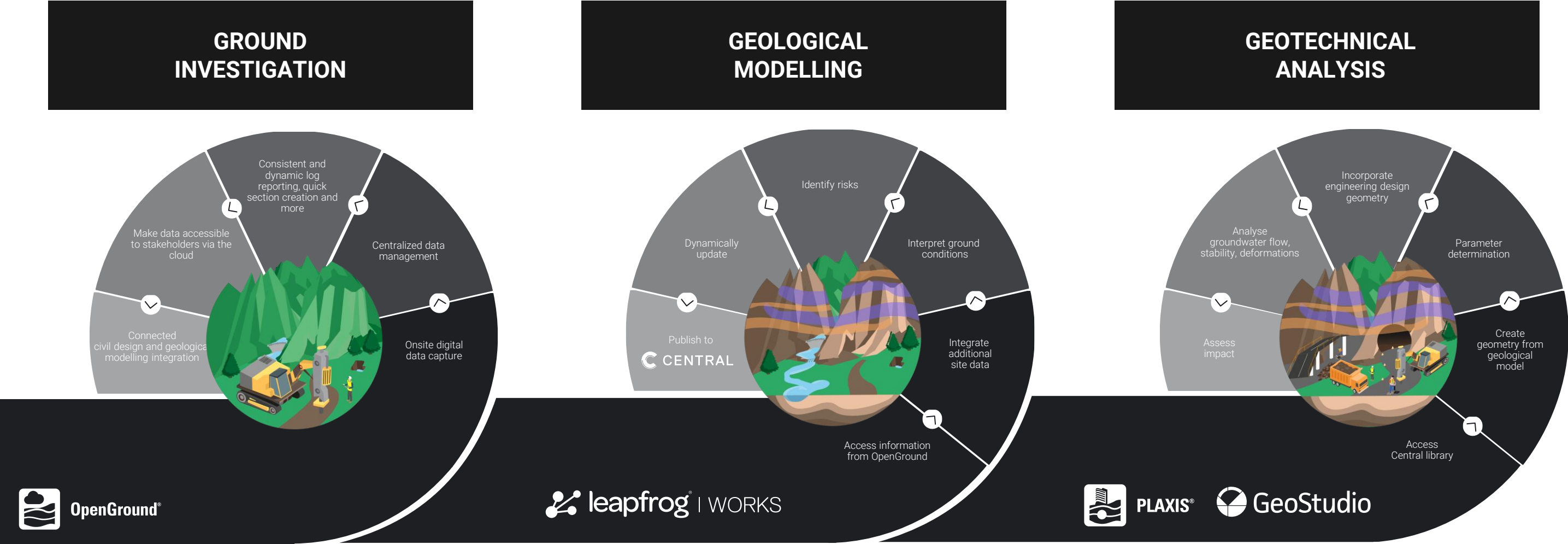


 PLAXIS

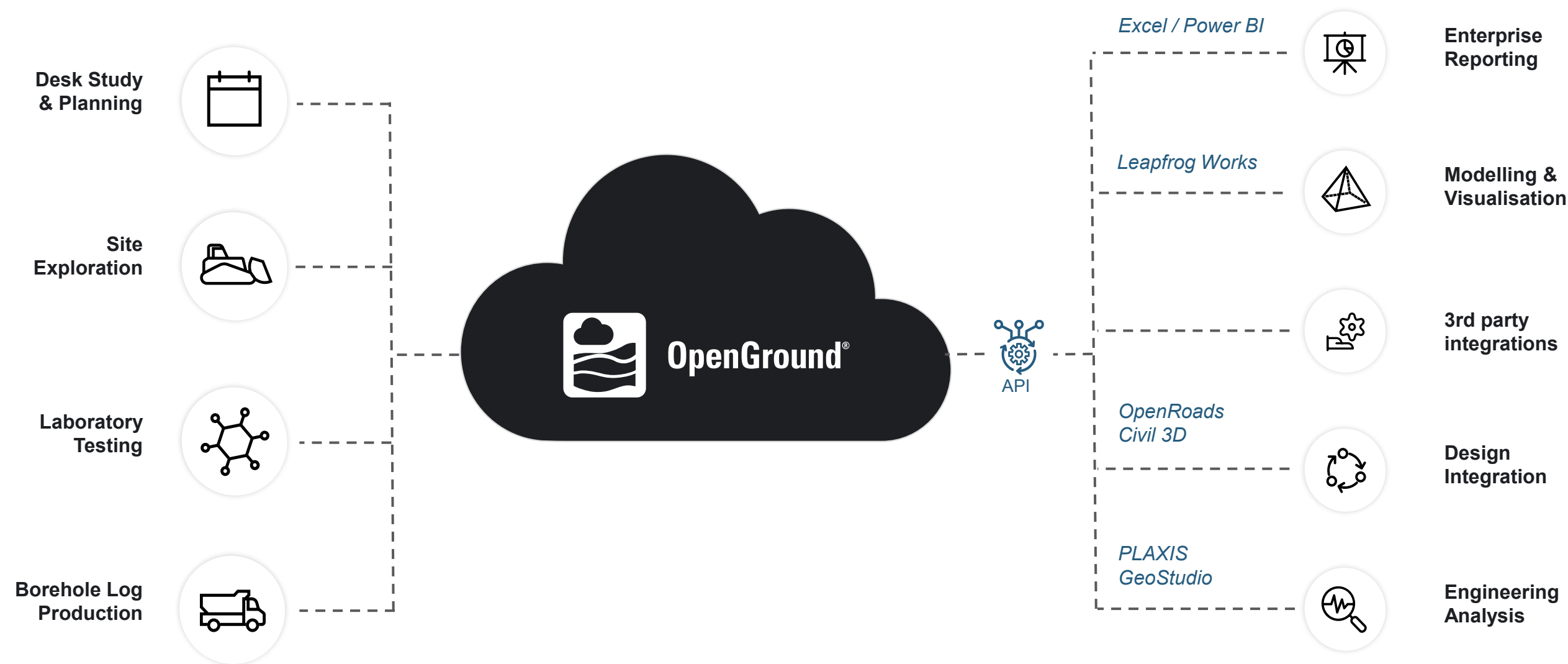
2D/3D geotechnical  
engineering and rock  
mechanics, including  
wind turbine monopiles



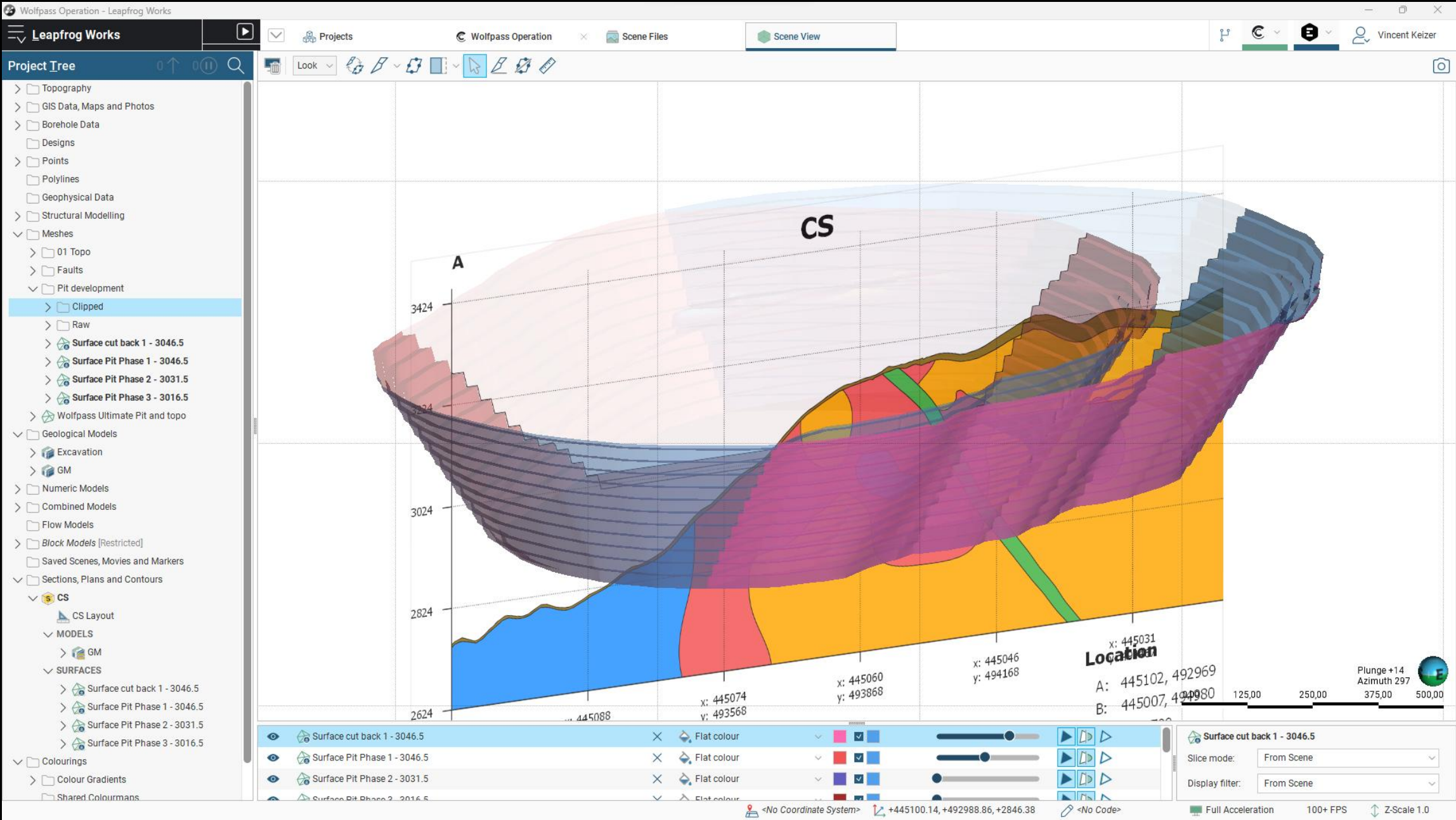
# Connected Subsurface Modeling To Computational Analysis



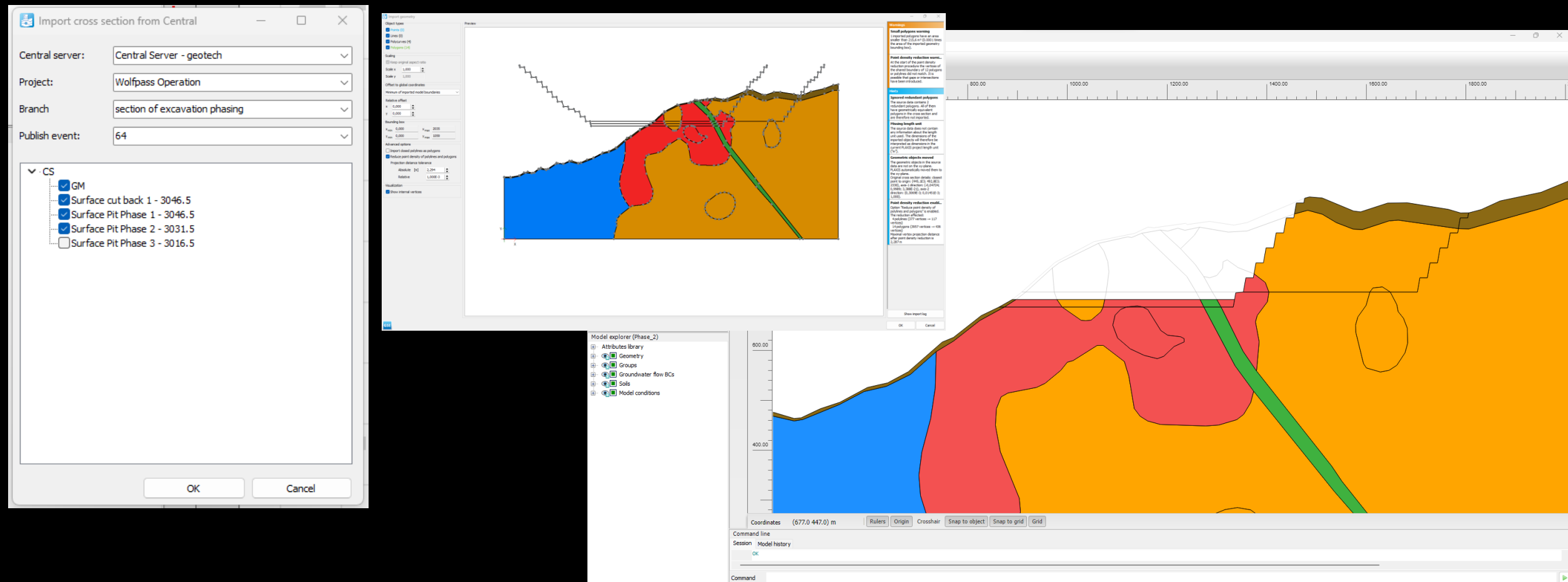
# Soil Data Capture & Management



# Connected workflow OpenGround > Leapfrog > PLAXIS

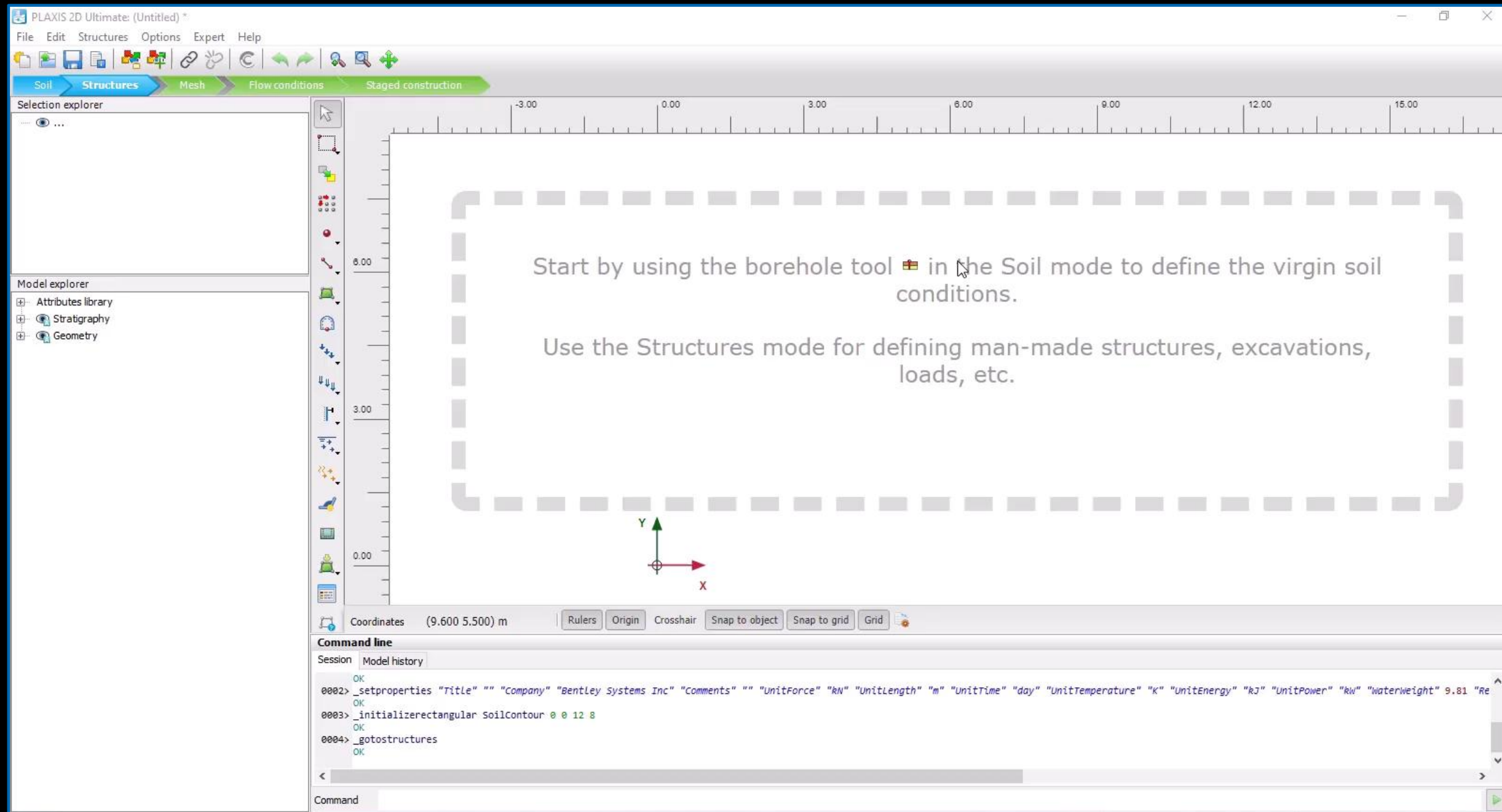


# Connected workflow OpenGround > Leapfrog > PLAXIS

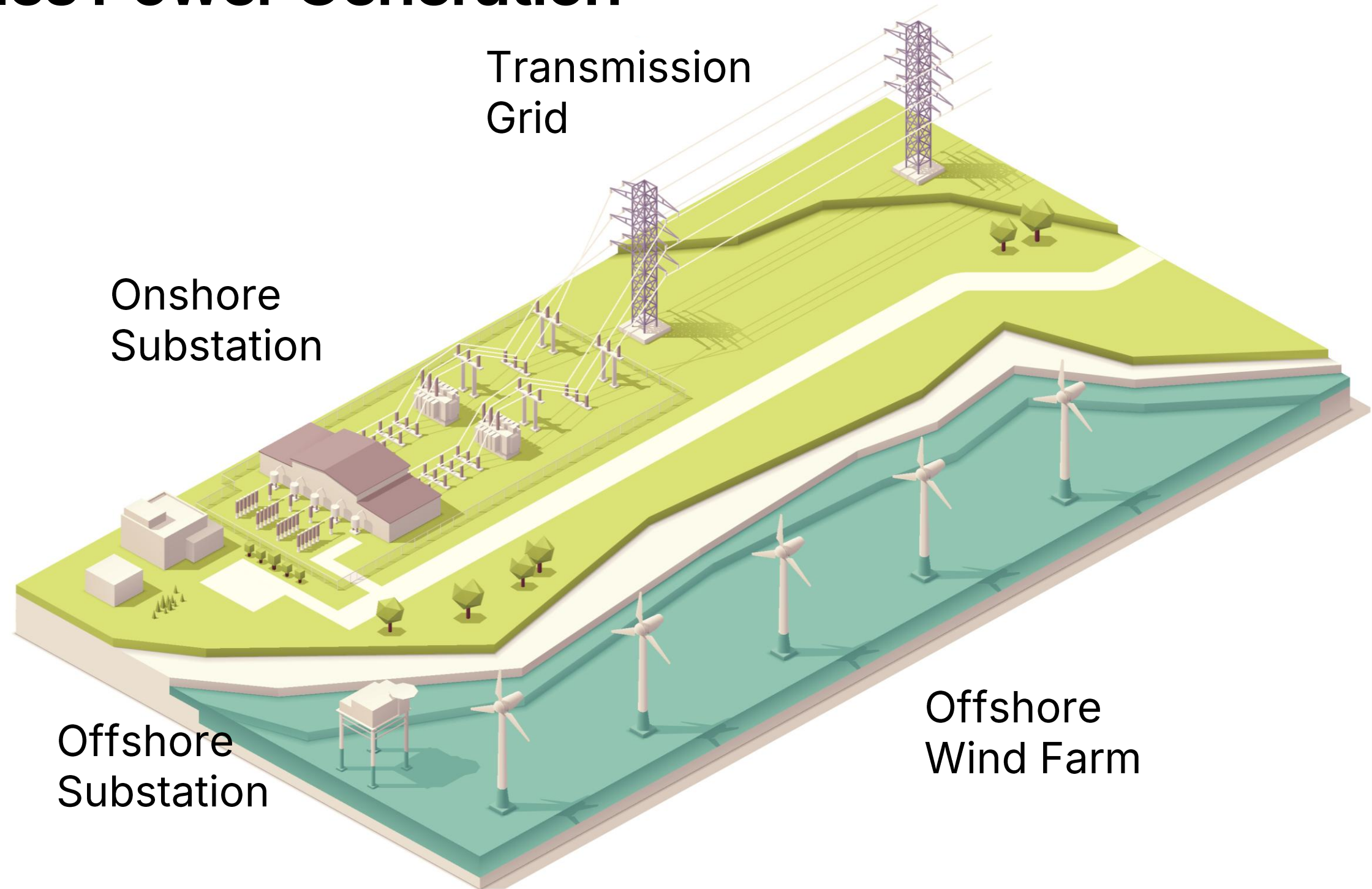


Import designs and geological models simultaneously from Leapfrog cross sections

# Connected workflow OpenGround > Leapfrog > PLAXIS



# Renewables Power Generation



# Offshore Platform Designs



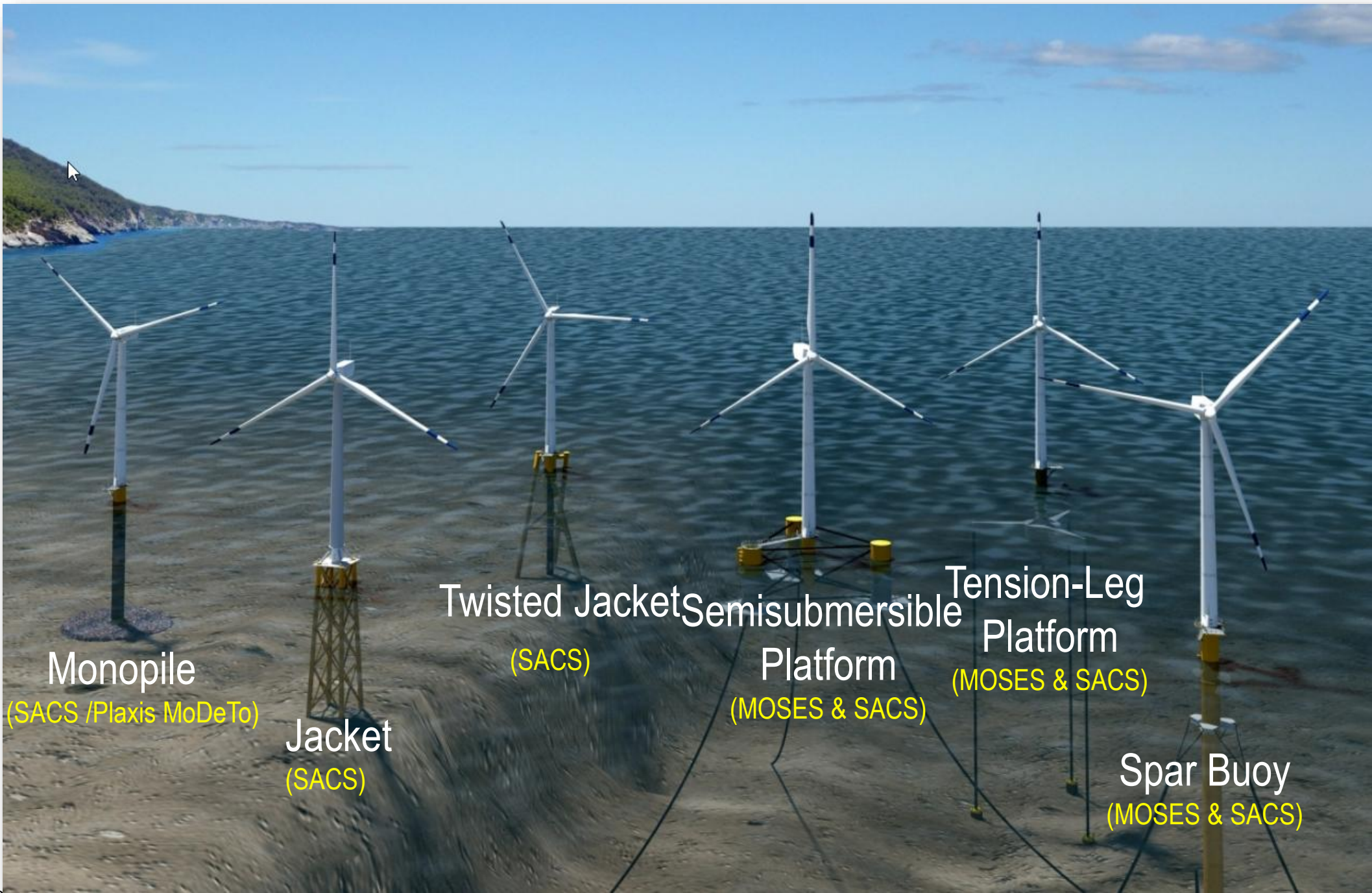
Monopile 0<40m



Jacket 40m<60m



Floating 60m+



Monopile  
(SACS /Plaxis MoDeTo)

Jacket  
(SACS)

Twisted Jacket  
(SACS)

Semisubmersible  
Platform  
(MOSES & SACS)

Tension-Leg  
Platform  
(MOSES & SACS)

Spar Buoy  
(MOSES & SACS)

# OpenWindPower - Floating

# OpenWindPower - Fixed

**MOSES & SACS**

SPAR

SEMI-SUBMERSIBLE

TENSION  
LEG  
PLATFORM

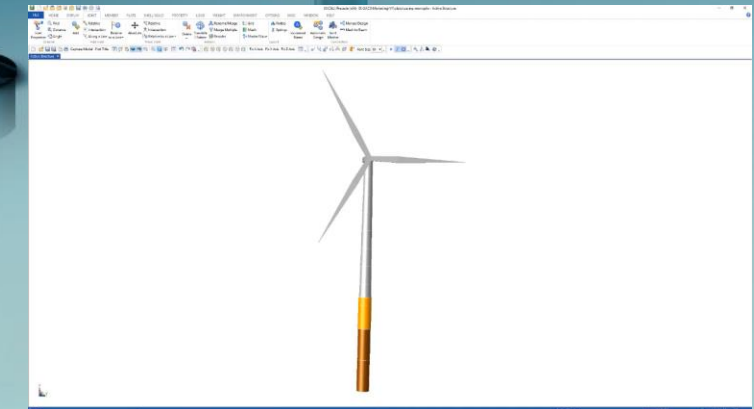
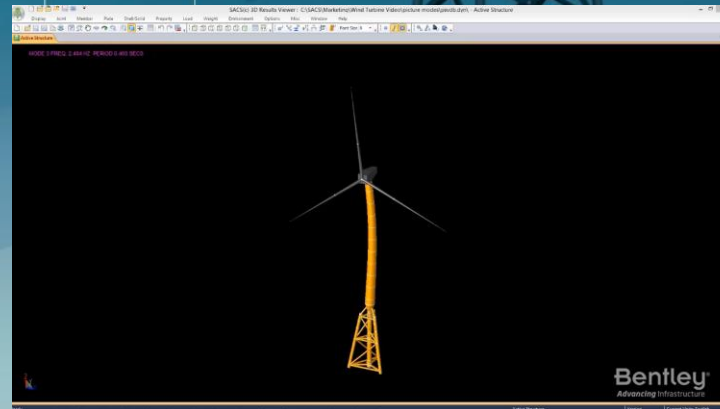
**SACS**

JACKET

**SACS & PLAXIS**

SUCTION  
BUCKET

MONOPILE



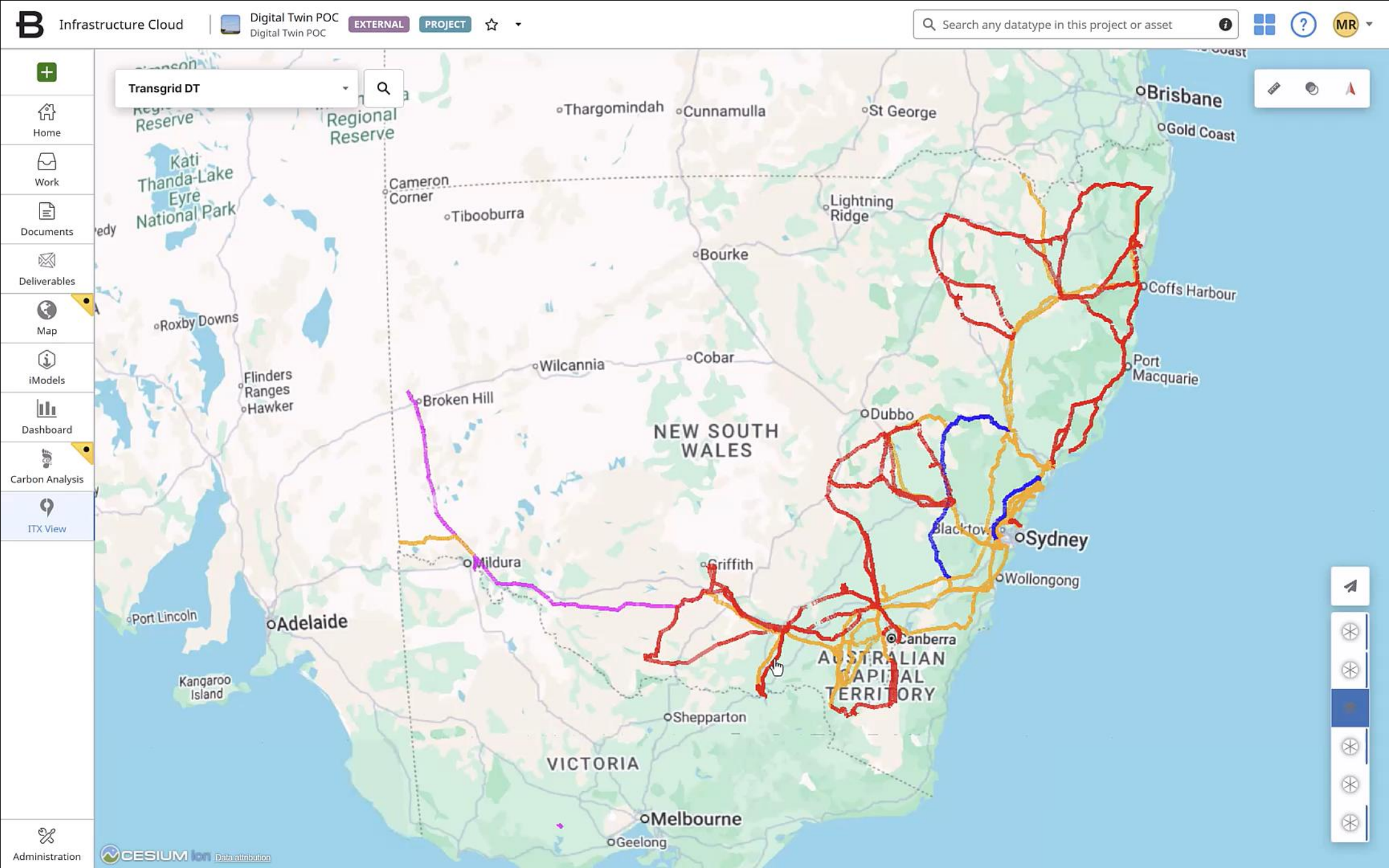


**CAD BIM Digital Twin**

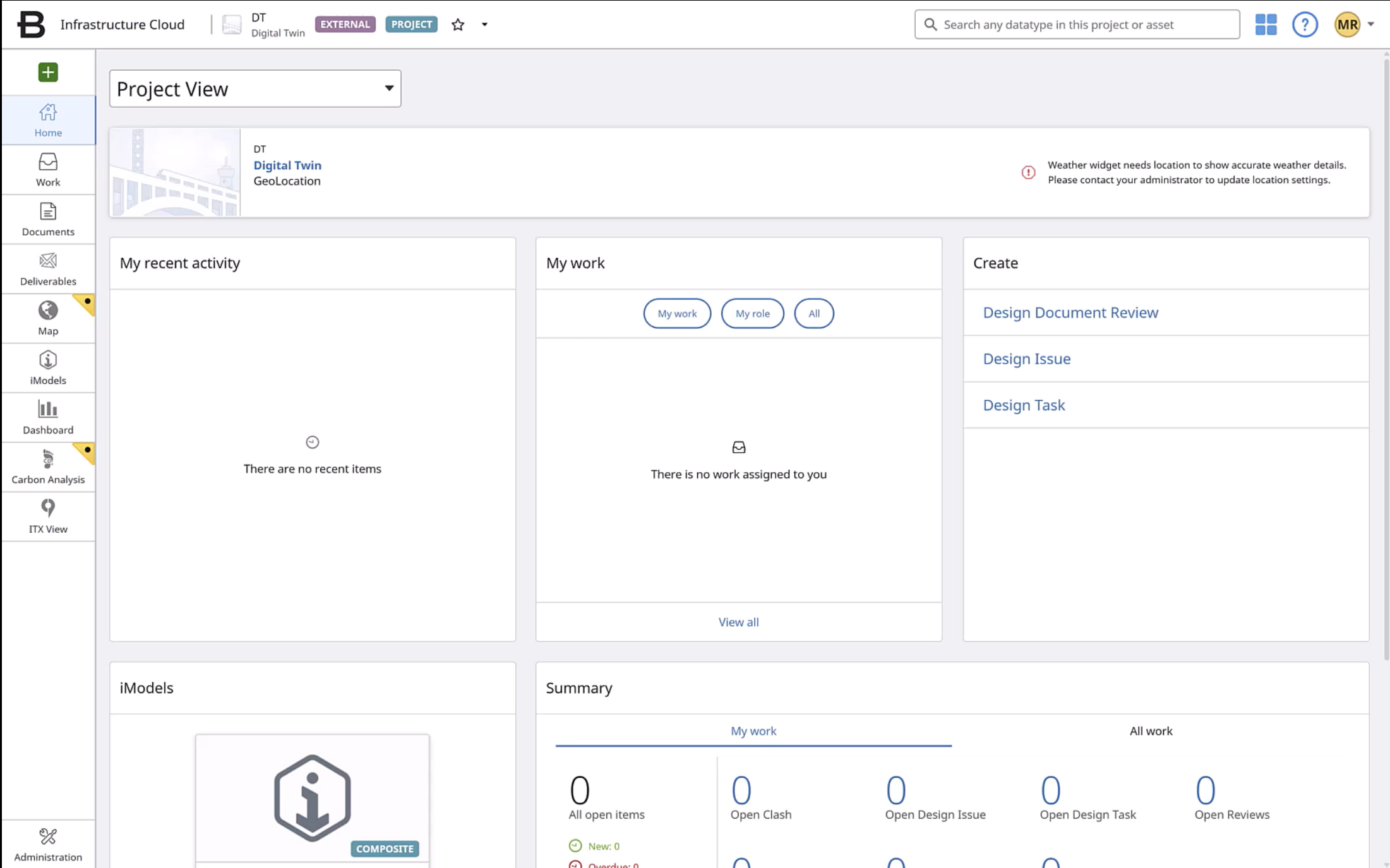
**BENTLEY INFRASTRUCTURE CLOUD**

converge engineering,  
operational, and  
information technologies

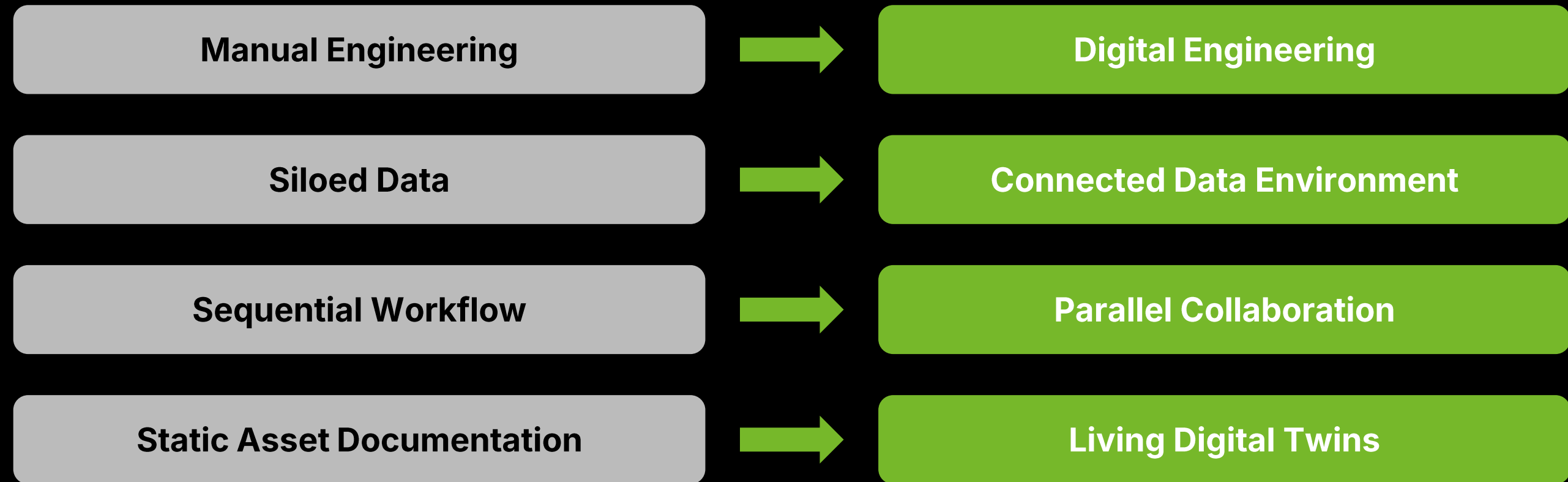
# Transmission Digital Twin Spatial View



# Transmission Digital Twin Portal



# Digital Transformation of Electric Utilities Infrastructure



**"From fragmented processes to an integrated digital ecosystem"**



# User Success Stories

# Elia - Belgium

Transition to a centralized digital platform  
and smart digital workflows

Resource hours **reduced**  
**30,000/yr**

Costs **saved**  
**€150,000**

Digital workflow enabled by:  
iTwin Capture, OpenUtilities, Power Line  
Systems, Bentley Infrastructure Cloud



ELIA



# Exo, Inc.

## Ohio Falls River Crossing Towers

In collaboration with Louisville Gas  
& Electric and Kentucky Utilities

Permitting delays  
saved

**10 years**  
Costs reduced by  
**\$80M**

Virtual assessment safely &  
accurately enabled by  
**PLS-CADD & iTwin Capture**



# Netherlands Enterprise Agency – Offshore Wind North Sea

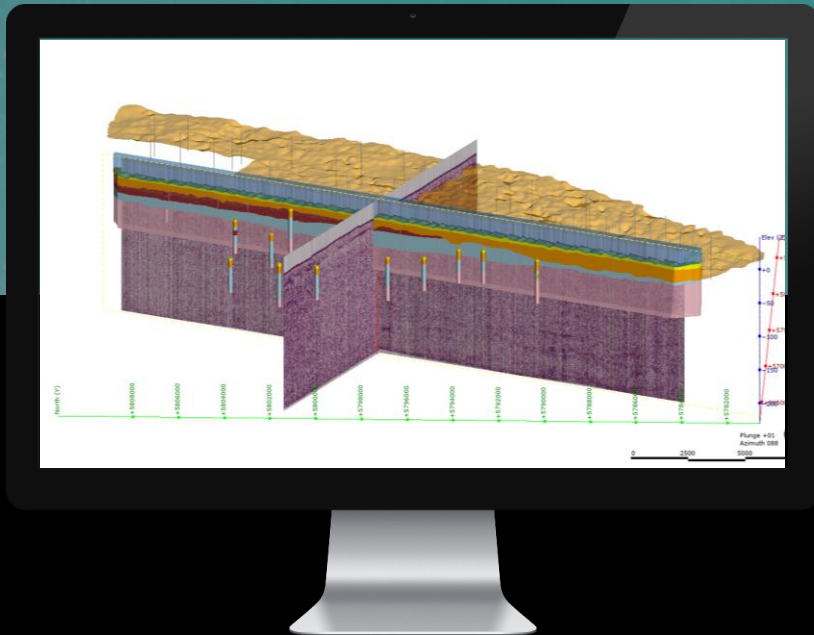
The **Hollandse Kust Wind Farm** covers 356 square kilometers and is divided into four sites, each of which can accommodate 350 megawatts.

The location of this project is Hollandse Kust Zuid.

This site is 18 kilometers off the coast, in the area between The Hague and Zandvoort.

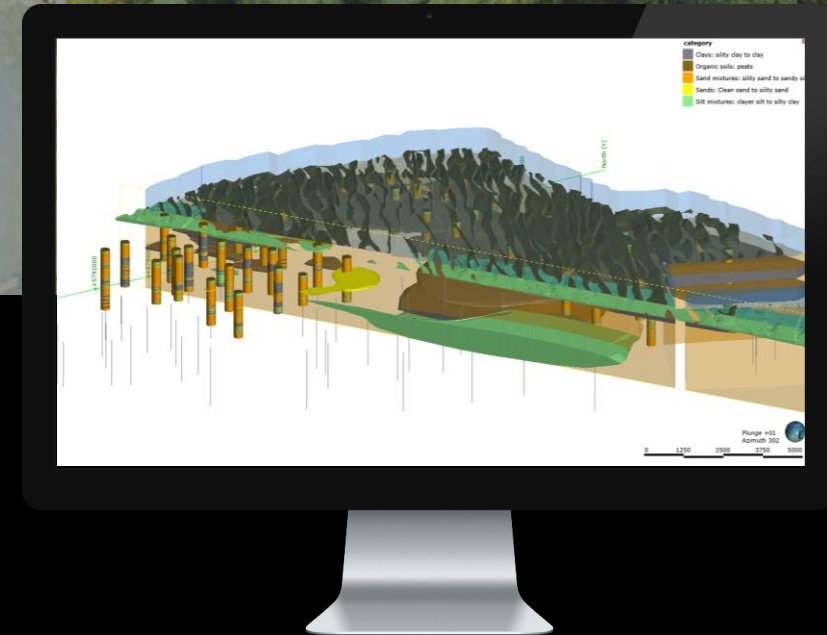


# Netherlands Enterprise Agency – Offshore Wind North Sea



## Seismic Model

- Historical wells in LAS format
- Seismic horizons from SBP, Sparker and UHR
- Sparse 2D raw interpretation points – from >500 seismic sections
- 2D surfaces interpolated and converted to a solid model in 2 steps



## Soil Behaviour Type (SBT) Model

- Boreholes imported in AGS format
- Friction ratio and normalised CPT resistance used to calculate SBT index
- Using the normalized equation by Robertson.
- Categorised soil types seen in boreholes on the above image – then created a ground model

