

Intelligent Digital Transformation

For Utilities, Telecom & Infrastructure

Re-Engineering Utility GIS: AI, Automation, and Rapid Deployment



Vision & Mission



Lead digital transformation
in Utilities, Telecom
& Infrastructure.



Deliver future-ready
solutions that enhance
efficiency, reliability, and
business impact.



Be the trusted global
partner enabling
modernization at scale.



To leverage GIS, data engineering, automation, and intelligent platforms to help enterprises build resilient, scalable, and high-performance digital networks.

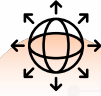
Our Heritage & Evolution



9+ years of innovation
in Utilities & Telecom



Strong foundation
in ESRI GIS & Utility
Network



Expansion across Asia,
Middle East, Europe
& ANZ



Growth from system
integrator → Digital
transformation partner



Proven telecom programs
across Fiber, FTTx, OSS /
BSS & field modernization



Deep partnerships with
ESRI, Suntech, and leading
telecom vendors



Inovaantage Global Footprint

- Redland, USA
- Reading, UK
- Hyderabad & BBSR India
- Kuala Lumpur, Malaysia
- Singapore
- Danang, Vietnam
- Manila, Philippines
- Adelaide, Australia

UK GIS – ESRI / Utility Network

CEM Macau – OMS

TNB Malaysia – Billing

TNB Malaysia – AMI

TNB Malaysia – Grid Project and Portfolio Management

Tower Management System

Singapore Power Group – GIS – Utility Network

Singapore Power Group – WWMS



ADMS – Power On Advantage

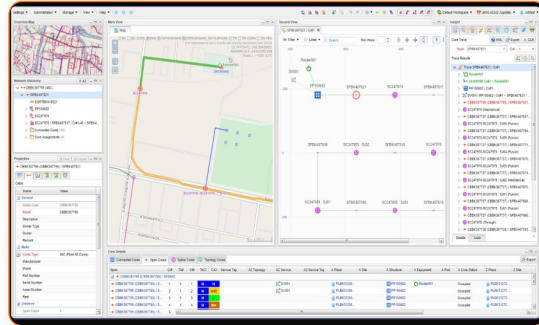
ADMS - Perth Australia

Australia Road Network upgrade

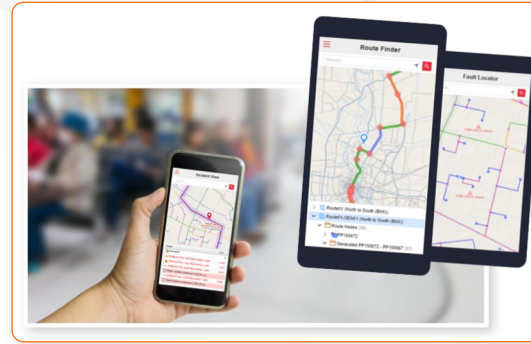
Telecom Capability



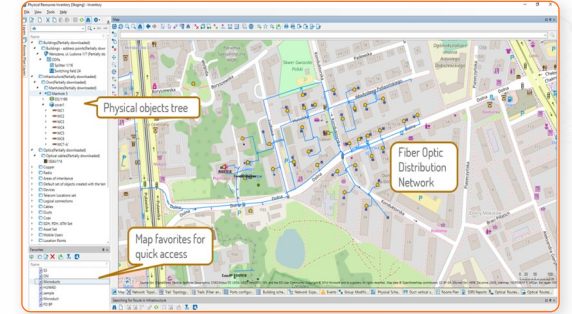
Tower Management System



Fibre Management System



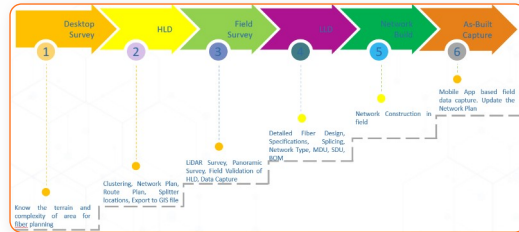
Field Operation



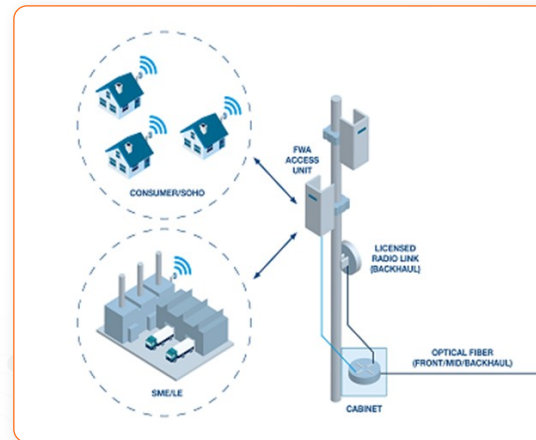
OSS & BSS



Data Cleansing & Recording



Fibre Plan & Design



5G & FWA



Survey & Mapping

Utility Capability



Zero Data Loss

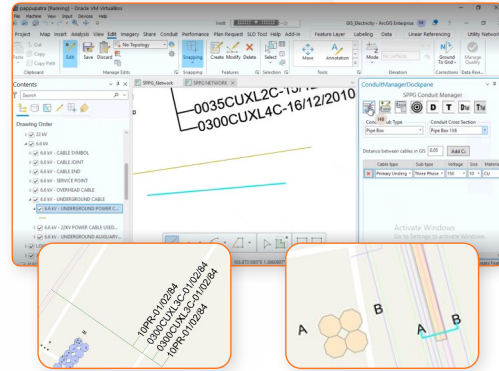
99%

Data auto-loaded

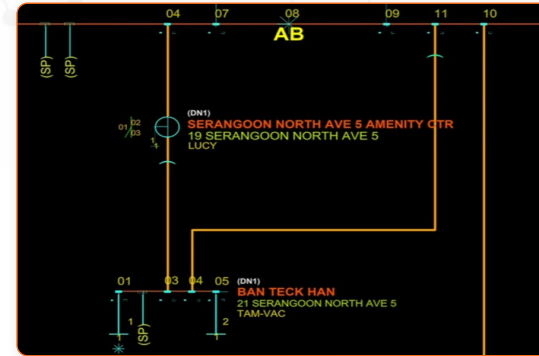
91%

Errors Auto-fixed

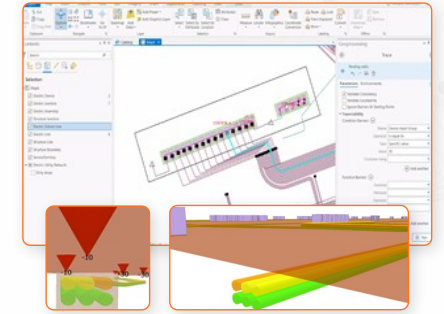
Inovaantage GIS Migration Platform



Conduit Pro

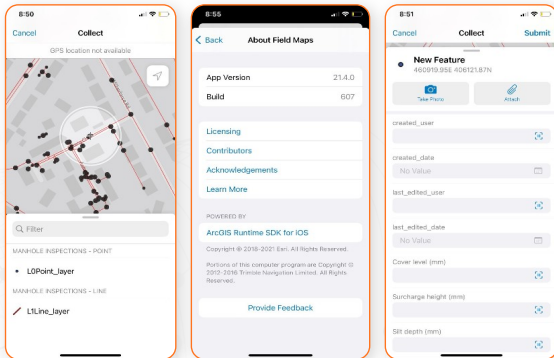


SLD Pro

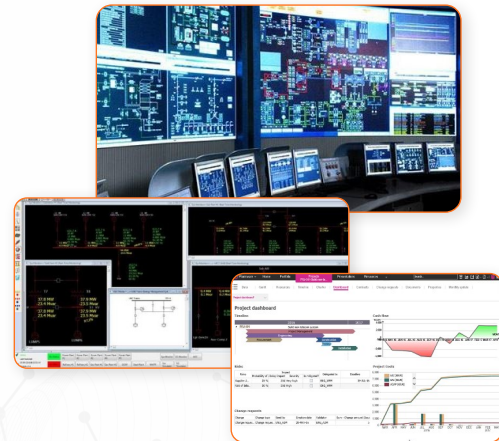


Migration / Upgrade

- ESRI Geometric to Utility Network
- GE SW 4.x to 5.x



Mobile GIS & Field Data Management



Project & Portfolio Management ADMS



Work Force Management - Fueerza



Smart Meter - SI

Intelligent Digital Transformation - Why This Matter



Utilities today face:

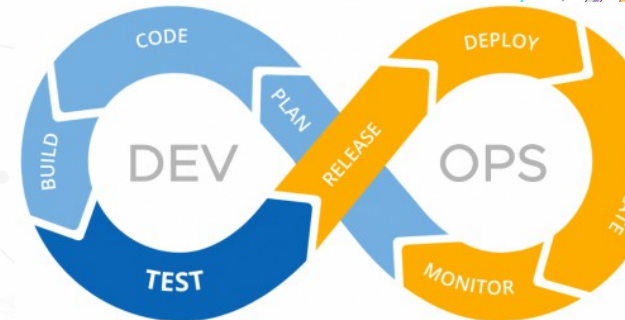
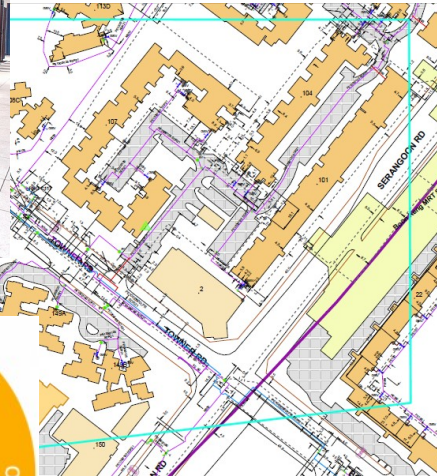
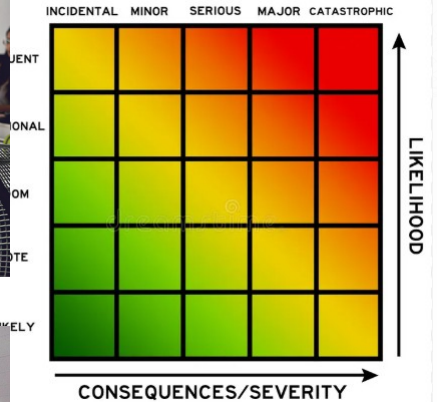
- Regulatory pressure
- Cybersecurity threats
- Climate resilience challenges
- Exploding customer expectations



You cannot meet tomorrow's challenges with yesterday's tools and last decade's delivery models.

Problems

- Systems running utilities are often trapped in the past.
- For decades, GIS upgrades in utilities have followed a painful pattern
- Manual data migration
- Years of parallel systems
- Hundreds of people fixing data
- Endless testing cycles
- High risk, high cost, and frequent failure
- Migrating millions of assets
- Complex feeder and circuit connectivity
- Strict safety and regulatory rules



The Inovaantage Promise

At Inovaantage, we don't ask:

“How do we migrate GIS?”

We ask:

“How do we future-proof the utility network for the next 30 years?”

And we do it

- **Faster**
- **Safer**
- **Smarter**

And at a scale never done before

What if this entire model is wrong?

The screenshot displays a GIS software interface with a central map showing an electrical project area. The map includes labels for roads like 'TELOK BLANGAH RD', 'PASIR PANJANG VIADUCT', and 'TK BLANGAH ST 31'. A green dashed line represents a conduit path. The interface includes a top toolbar with menus like Project, Map, Insert, Analysis, View, Edit, Imagery, Share, Conduit, Help, and Add-In. On the left, there is a 'Contents' panel with a search bar and a 'Drawing Order' list. On the right, a 'ConduitManagerDockpane' is open, showing 'SPPG Conduit Manager' settings. It includes dropdowns for 'Conduit Sub Type' (T_Pipe Box) and 'Conduit Cross Section' (T_Channel Iron 1X12), a 'Distance between cables in GIS' field (0.05), and a table of cable specifications.

Cable type	Sub type	Voltage	Size
Transmission Un	Three Phase	480	1000
Transmission Un	Auxiliary Cable	480	1000

A five-year program was considered normal.
Four hundred people on a project was considered necessary.

Not a GIS Upgrade. A Network Re-Engineering

**What we deliver is not just a GIS implementation.
We re-engineer the entire utility network intelligence**

**from physical assets in the ground
to logical networks in the system
to business operations that depend on them.**

- Legend
- Cable Marking Plot
 - Cable Marking Plot
 - HV Power Cable
 - HV Auxiliary Cable
 - HV Abandoned Cable
 - LV Cable
 - LV Abandoned Cable

The plan & information herein are strictly confidential and solely for the use of the requester to whom these Documents have been issued. These Documents shall in no event, for any purpose whatsoever be reproduced, republished, uploaded, posted, transmitted or otherwise distributed in any way.

"HDD" pipes for underground cables are installed using Horizontal Directional Drilling method without cable identification markers and pipes may vary in depth. Contact SP Power Grid Ltd if the earthworks come within the vicinity of "HDD" pipes.

This cable route drawing serves only as a guide for locating underground cables. There may be departures from the sources shown and services of which no record is held. Contractors are required to engage Licensed Cable Detection Workers to carry out the requisite cable detection works and dig adequate and appropriate number of trial holes manually to positively identify and locate all cables prior to earthworks.

Note: The drawing is issued for the use of this project only and is to be destroyed after use. This drawings is only valid for three months from the date of purchase.

APPLICATION NO: ASPR-2345654321

ISSUED TO:

SCALE: NOT TO SCALE

PLOT BY: admrajeev

DATE OF PLOT: 11/05/2025

Zone: DN1

From Physical to Logical — Network Rules That Actually Work

We establish end-to-end network rules:

- Physical connectivity
- Logical connectivity
- Flow behavior
- Asset lifecycle rules

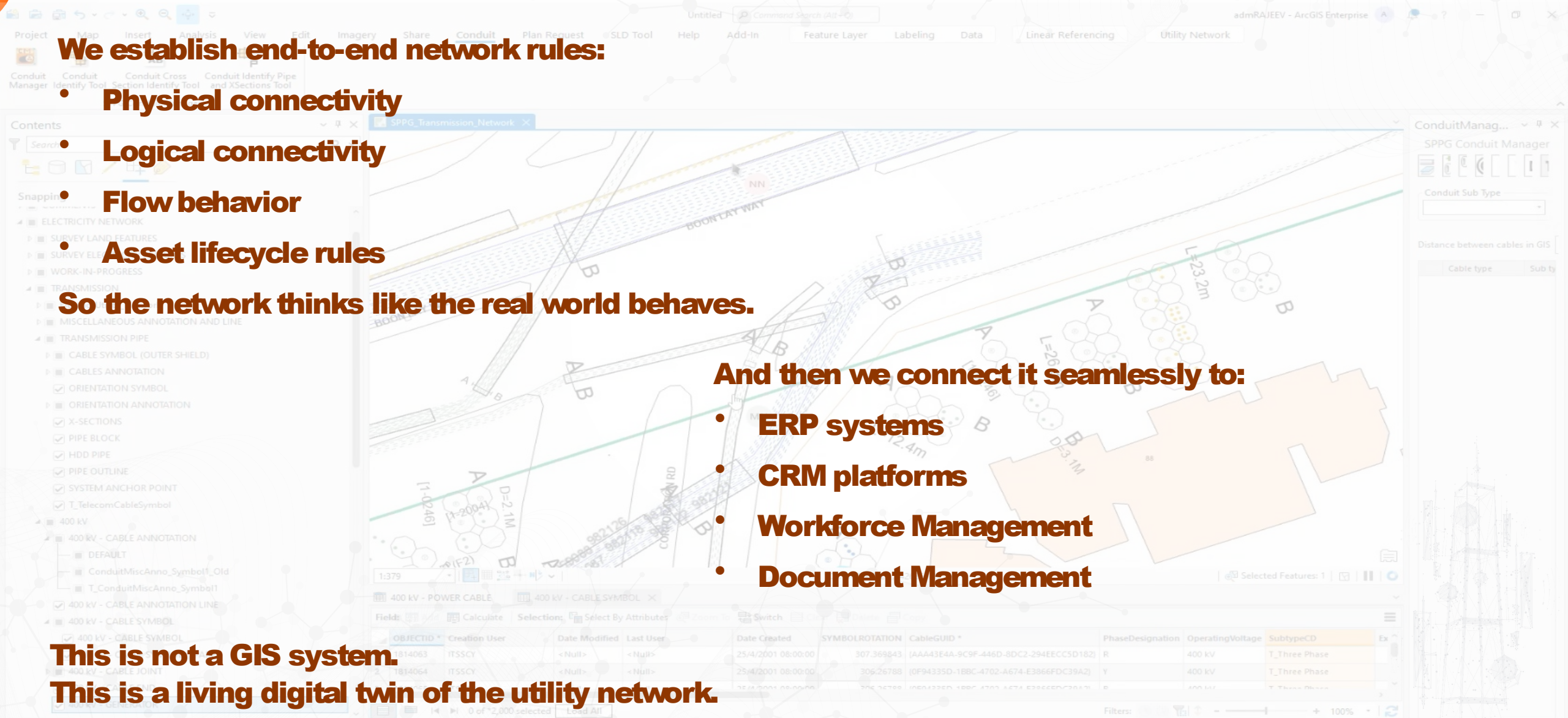
So the network thinks like the real world behaves.

And then we connect it seamlessly to:

- ERP systems
- CRM platforms
- Workforce Management
- Document Management

This is not a GIS system.

This is a living digital twin of the utility network.



AI: Not a Buzzword — A Workforce Multiplier

But by using **AI-driven automation** to:

- Detect anomalies
- Predict data issues before they occur
- Auto-resolve migration conflicts
- Continuously validate network integrity

AI doesn't replace engineers.
It **frees engineers to solve real problems.**



Legend	
	Cable Marking Pit
	Cable Marking Pit
	HV Power Cable
	HV Auxiliary Cable
	LV Cable
	LV Abandoned Cable

The plan & information herein are strictly confidential and solely for the use of the requester to whom these Documents have been issued. These Documents shall in no event, for any purpose whatsoever be reproduced, republished, uploaded, posted, transmitted or otherwise distributed in any way.

"HDD" pipes for underground cables are installed using Horizontal Directional Drilling method without cable identification markers and pipes may vary in depth. Contact SP Power Grid Ltd if the earthworks come within the vicinity of "HDD" pipes.

This cable route drawing serves only as a guide for locating underground cables. There may be departures from the sources shown and services of which no record is held. Contractors are required to engage Licensed Cable Detection Workers to carry out the requisite cable detection works and dig adequate and appropriate number of trial holes manually to positively identify and locate all cables prior to earthworks.

Note: The drawing is issued for the use of this project only and is to be destroyed after use. This drawings is only valid for three months from the date of purchase.

APPLICATION NO: ASPR-2345654321

ISSUED TO:

SCALE: NOT TO SCALE

PLOT BY: admrajeev

DATE OF PLOT: 11/05/2025

Zone: DN1

The Result That Changed the Industry

Here is the result — and this is why this is a world first:

- **5-year migration programs → 6 months**
- **400-person teams → 8 specialists**
- **Manual correction → 99.99% automated accuracy**
- **High-risk cutovers → zero-downtime transitions**

This is not incremental improvement.

This is **industrial-scale transformation.**



Legend	
	Cable Marking Plot
	Cable Marking Plot
	HV Power Cable
	HV Auxiliary Cable
	HV Abandoned Cable
	LV Cable
	LV Abandoned Cable

The plan & information herein are strictly confidential and solely for the use of the requester to whom these Documents have been issued. These Documents shall in no event, for any purpose whatsoever be reproduced, republished, uploaded, posted, transmitted or otherwise distributed in any way.

"HDD" pipes for underground cables are installed using Horizontal Directional Drilling method without cable identification markers and pipes may vary in depth. Contact SP Power Grid Ltd if the earthworks come within the vicinity of "HDD" pipes.

This cable route drawing serves only as a guide for locating underground cables. There may be departures from the sources shown and services of which no record is held. Contractors are required to engage Licensed Cable Detection Workers to carry out the requisite cable detection works and dig adequate and appropriate number of trial holes manually to positively identify and locate all cables prior to earthworks.

Note: The drawing is issued for the use of this project only and is to be destroyed after use. This drawing is only valid for three months from the date of purchase.

APPLICATION NO: ASPR-2345654321

ISSUED TO:

SCALE: NOT TO SCALE

PLOT BY: admrajeev

DATE OF PLOT: 11/05/2025

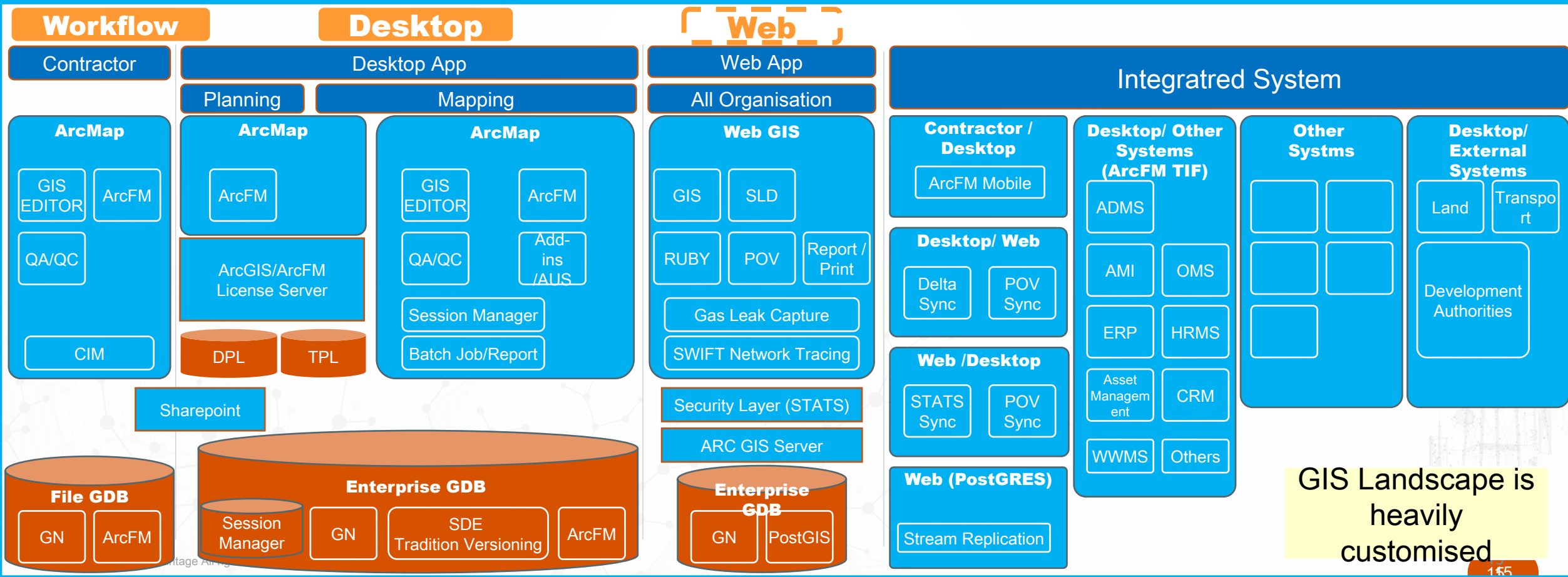
Zone: DN1

Geometric Network State

Current State key points

- 1 Enterprise GIS not available for Planning
- 2 GIS implemented with ArcFM
- 3 Electric and Gas networks managed as Geometric Network
- 4. Inefficient work flow for
 - 4a CIM (Contractor Input Model)
 - 4b POV (Project Officer Verification)
- 5 Security layer implemented for web only
- 6 ArcFM and ESRI ArcMap end of life
- 7 GIS application are extensively integrated to support business processes
- 8 Inefficient report extract process
- 9 Versioned data has limited audit function and slow performance
- 10 Geometry data stored in binary SDE data type which impacts the ability to query data and efficiently write reports

Geometric Network Landscape



GIS Landscape is heavily customised

Utility Network State

Target State key points

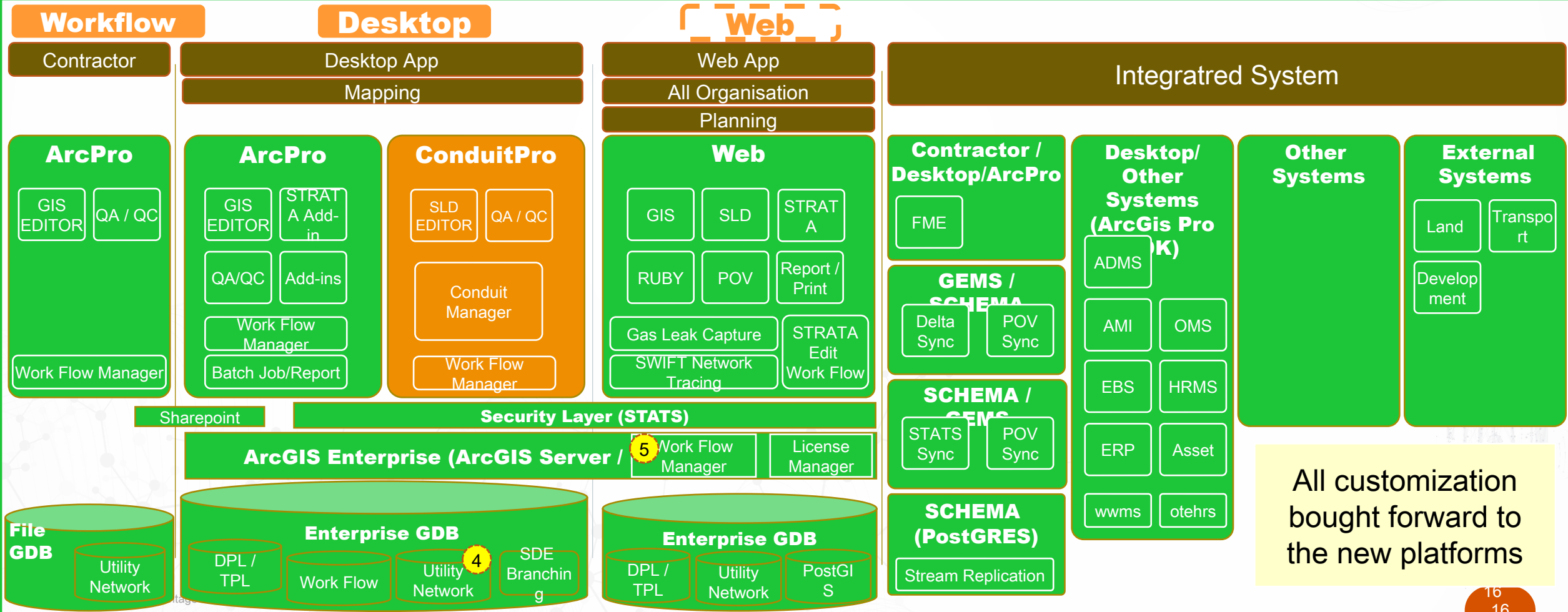
Inovaantage Product

12 State of the Arc Conduit Manager + Single Line Diagram

- 1 Integrated Planning System
- 2 ArcGIS Pro GIS editor with 3d visualization
- 3 ArcGIS Enterprise platform implemented
- 4 Electric and Gas networks migrated to ESRI Utility Network data model
- 5 Centralised Work flow configuration

- 6 Security layer implemented for desktop and web
- 7 FME implemented to support Contractor Input Model
- 8 Efficient report extract process (includes enhanced tracing reports)
- 9 SDE Branching version with, web editing, enhanced audit function and improved performance
- 10 SQL Native geometry type supports spatial SQL queries
- 11 ArcGIS Pro SDK is used for integration to other systems

Target Application Landscape



All customization bought forward to the new platforms

Inovaantage Data Migration Tool (rUNr)



rUNr, by Inovaantage, automatically migrates Utility Network data from existing systems to Esri's Utility Network Model.

rUNr automatically transforms, validates and loads data into a production ready Utility Network architecture, with fully configurable Business Rules that allow for the automated correction and editing of data prior to loading.

Geometry checks

Topology checks

Attribute checks

Zero Data Loss

99%

data
auto-loaded

91%

errors
Auto-fixed

Zero Data loss and 100% quality of connectivity, spatial location, and attribution.

Integration and customizations for complex data transformations and auto-fixing of errors

- 91% of errors are automatically fixed.
- Only 9% of errors require manual fix.

Quick turnaround for upgrades and ad-hoc data model changes.

Various Pre- and post-migration quality checks help to improve data quality.

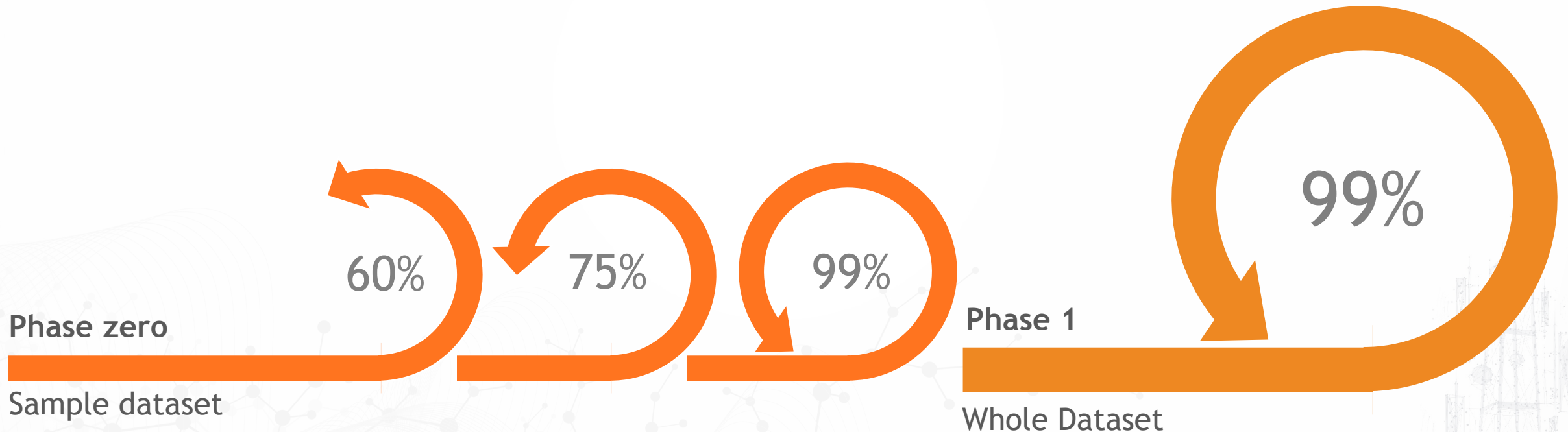


Our Proven Migration Approach



Our proven migration approach...

- **Phase zero:** Sample data pushed through a dummy migration, with iterative improvements to Business and Transformation Rules.
- **Phase 1:** The whole dataset is taken through a live or mock (test) migration, with potential for further iterations if new business rules or automated fixes are required.



Data Quality Summary (Live Project)



Total Feature count	2.16m
No issues - Transferred to UNM automatically	91%
<i>Features that failed business rules (require editing)</i>	26,000

Of the ~26,000 (9%) records that required editing, **91%** of them were edited automatically.

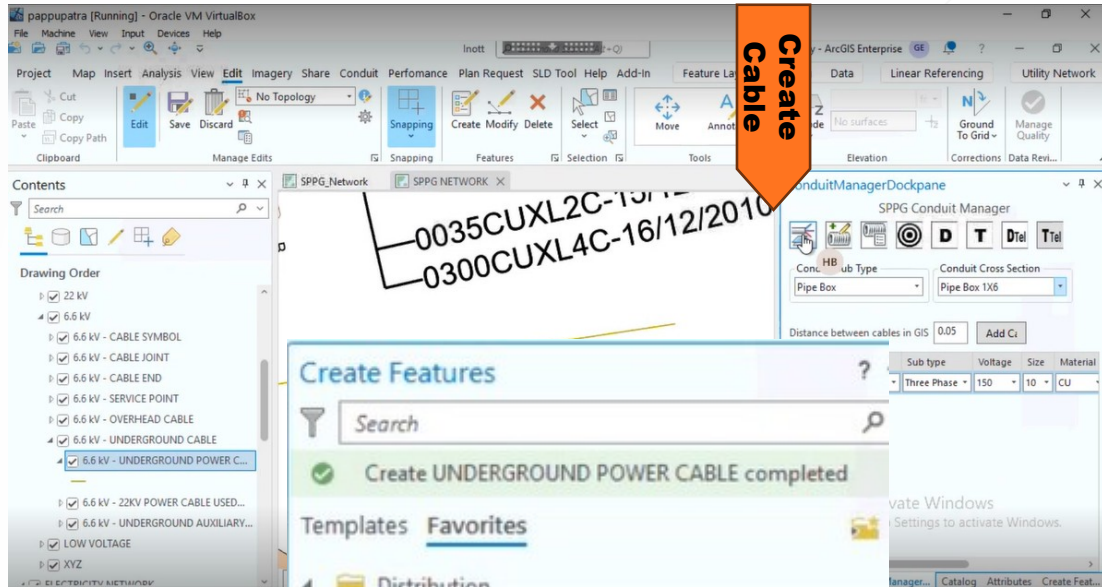
Of 2.16 million records, only about **2,370** required manual editing.

Category	Issue	Sample		Live	
		Issues	Auto Fixed	Issues	Auto Fixed
Invalid Connectivity	No junction edge rule	28%	77%	25%	99%
	More than one junction edge rule applicable	23%	65%	23%	99%
	The edges are different subtypes and cannot connect	23%	96%	23%	99%
	Edge Connectivity Policy for feature or object does not support Any Vertex	14%	56%	12%	93%
Geometry	Duplicate vertices	10%	100%	11%	100%
	Duplicate features	1.5%	95%	3.6%	99%
	Self-intersecting line	1.5%	100%	1.5%	100%
	Multi-Parts	0.1%	100%	0.2%	100%

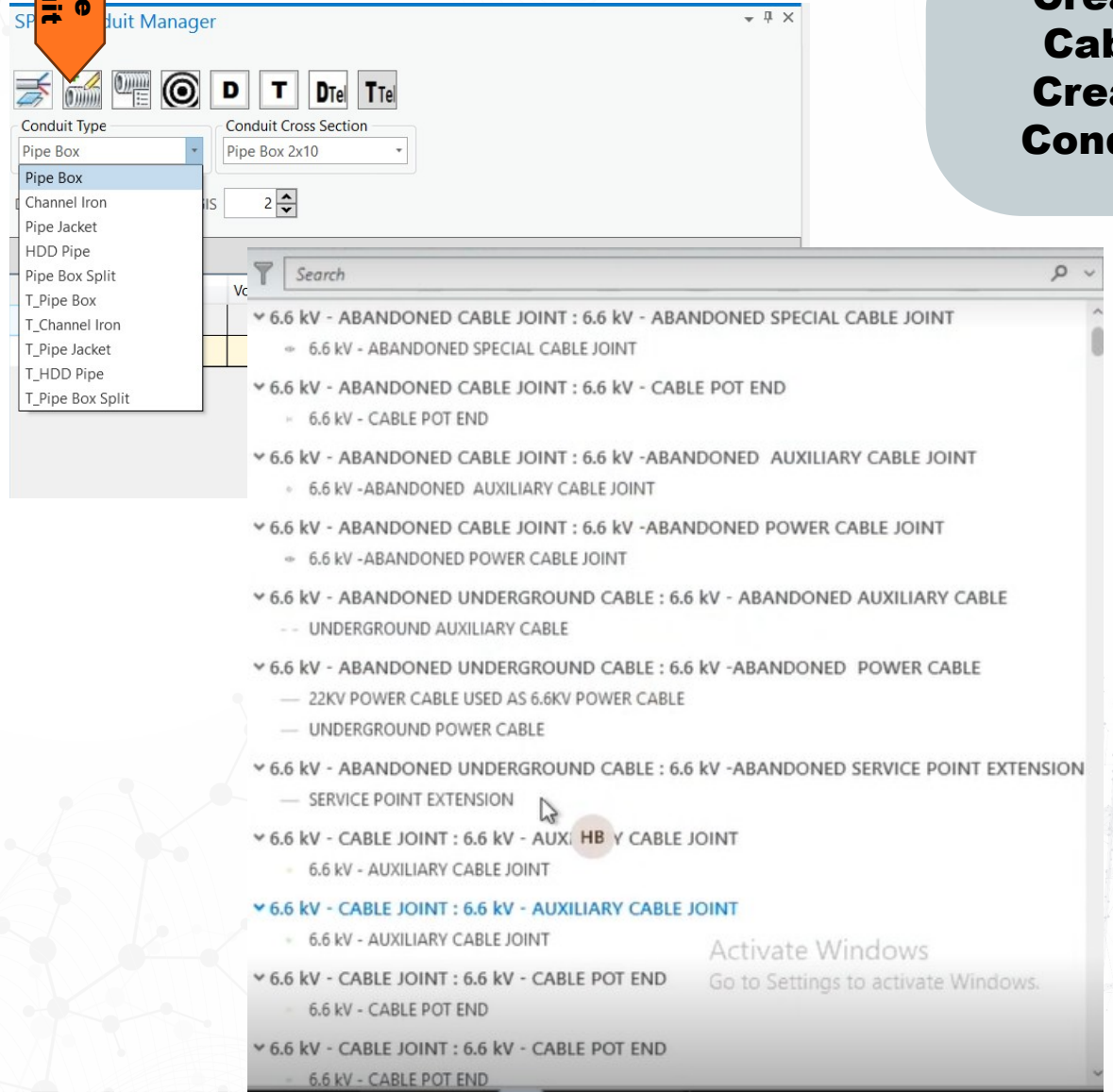


ConduitPro

ConduitPro – A complete Conduit Management Solution

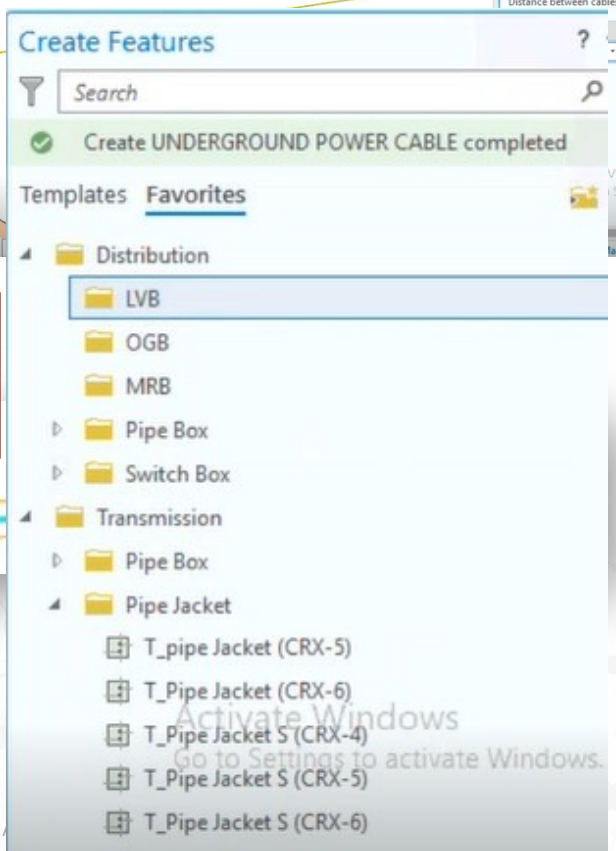


Create Conduit



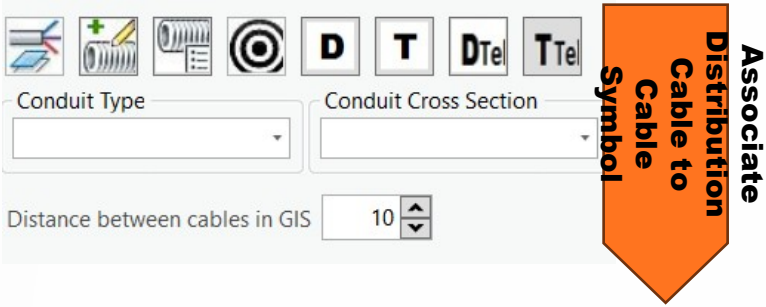
**Create Cable
Create Conduit**

Pipe Outline



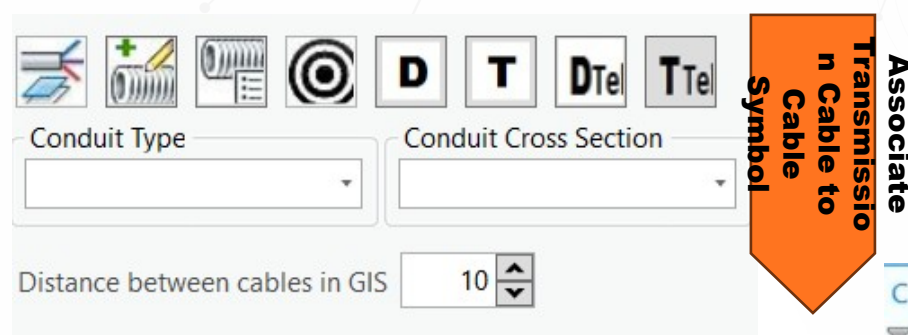
ConduitPro – A complete Conduit Management Solution

Associate cable symbols to cables



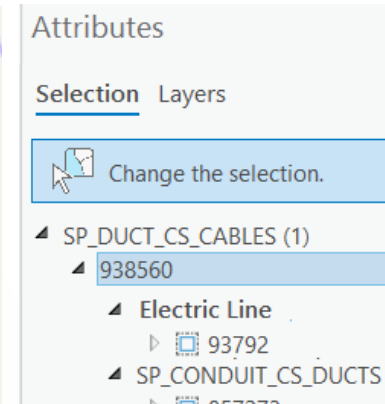
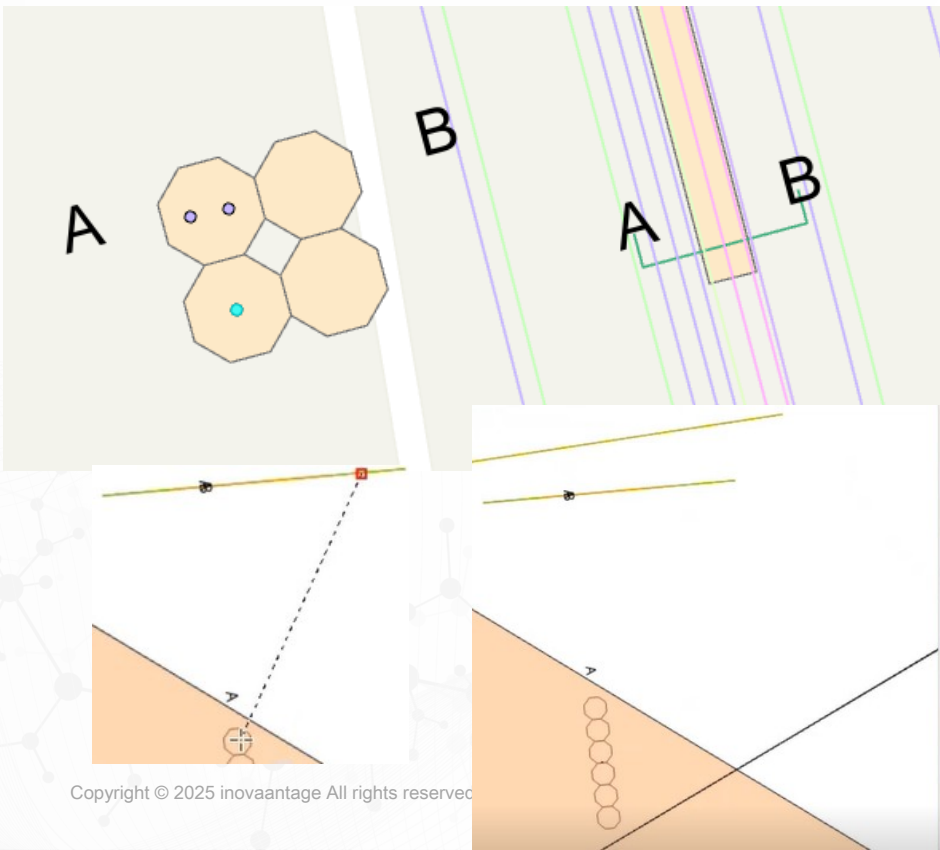
Conduit Type: [Dropdown]
Conduit Cross Section: [Dropdown]
Distance between cables in GIS: 10

Associate Distribution Cable to Cable Symbol



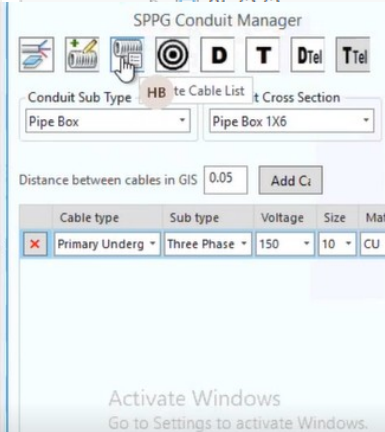
Conduit Type: [Dropdown]
Conduit Cross Section: [Dropdown]
Distance between cables in GIS: 10

Associate Transmission Cable to Cable Symbol



Attributes Selection Layers

- Change the selection.
- SP_DUCT_CS_CABLES (1)
 - 938560
 - Electric Line
 - 93792
 - SP_CONDUIT_CS_DUCTS

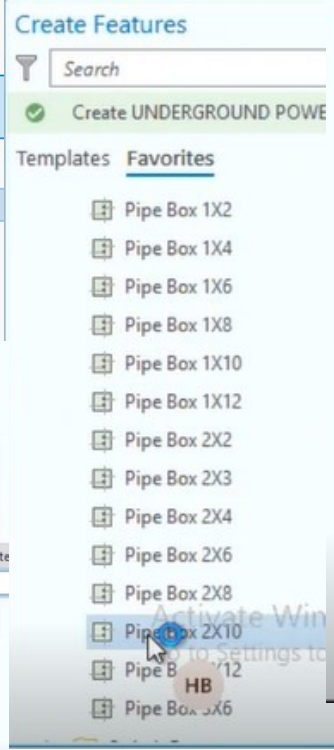


SPPG Conduit Manager

Conduit Sub Type: HB to Cable List
Pipe Box: [Dropdown]
Pipe Box Cross Section: [Dropdown]

Distance between cables in GIS: 0.05

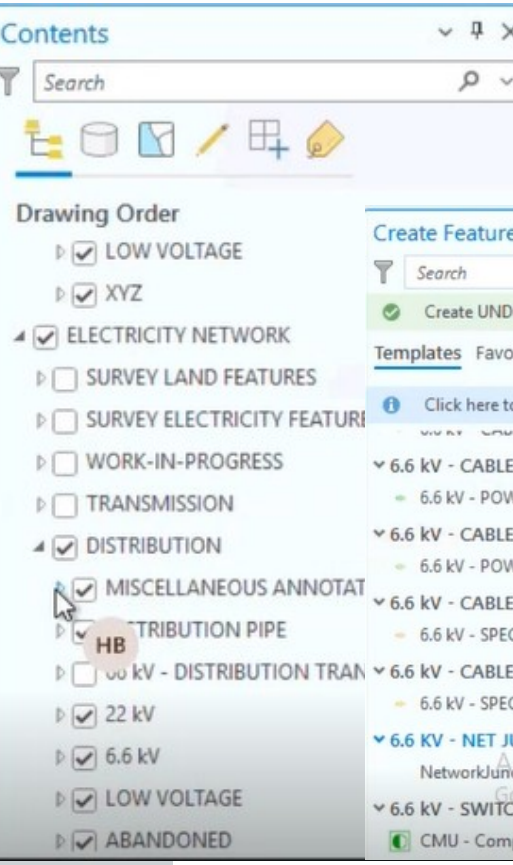
Cable type	Sub type	Voltage	Size	Mat
Primary Underg	Three Phase	150	10	CU



Create Features

Templates Favorites

- Pipe Box 1X2
- Pipe Box 1X4
- Pipe Box 1X6
- Pipe Box 1X8
- Pipe Box 1X10
- Pipe Box 1X12
- Pipe Box 2X2
- Pipe Box 2X3
- Pipe Box 2X4
- Pipe Box 2X6
- Pipe Box 2X8
- Pipe Box 2X10
- Pipe Box 2X12
- Pipe Box 3X6

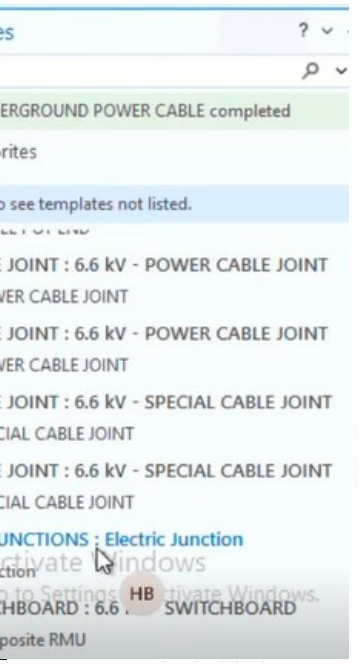


Contents

Search

Drawing Order

- LOW VOLTAGE
- XYZ
- ELECTRICITY NETWORK
- SURVEY LAND FEATURES
- SURVEY ELECTRICITY FEATURES
- WORK-IN-PROGRESS
- TRANSMISSION
- DISTRIBUTION
 - MISCELLANEOUS ANNOTATIONS
 - DISTRIBUTION PIPE
 - 6.6 kV - DISTRIBUTION TRANSMISSION
 - 22 kV
 - 6.6 kV
 - LOW VOLTAGE
 - ABANDONED



Create Features

Search

Create UNDERGROUND POWER CABLE completed

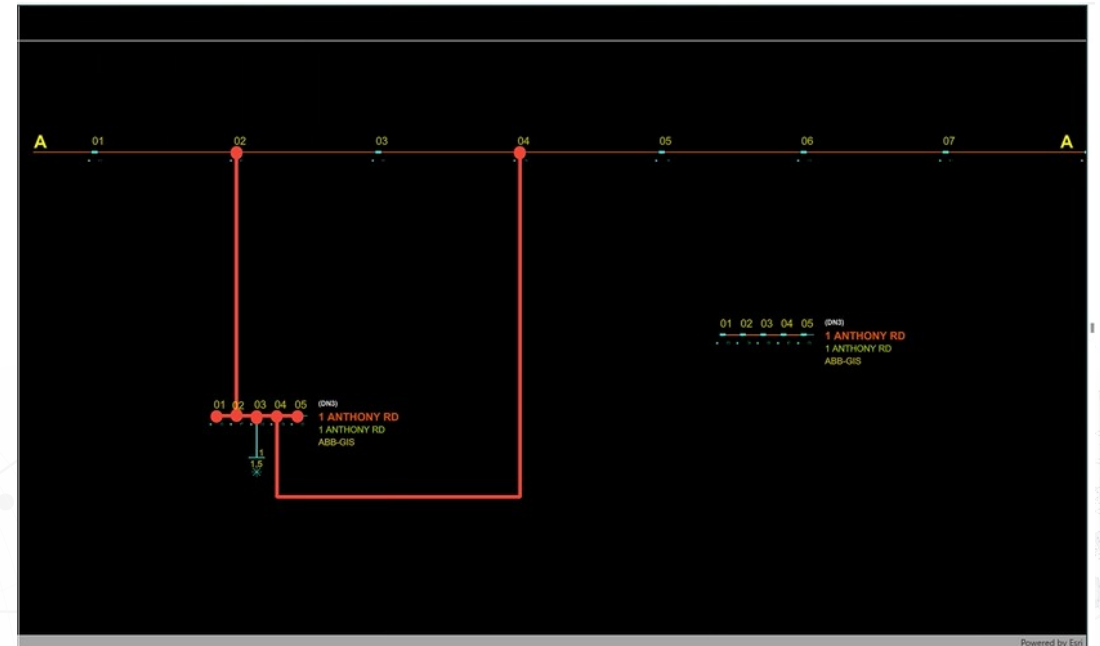
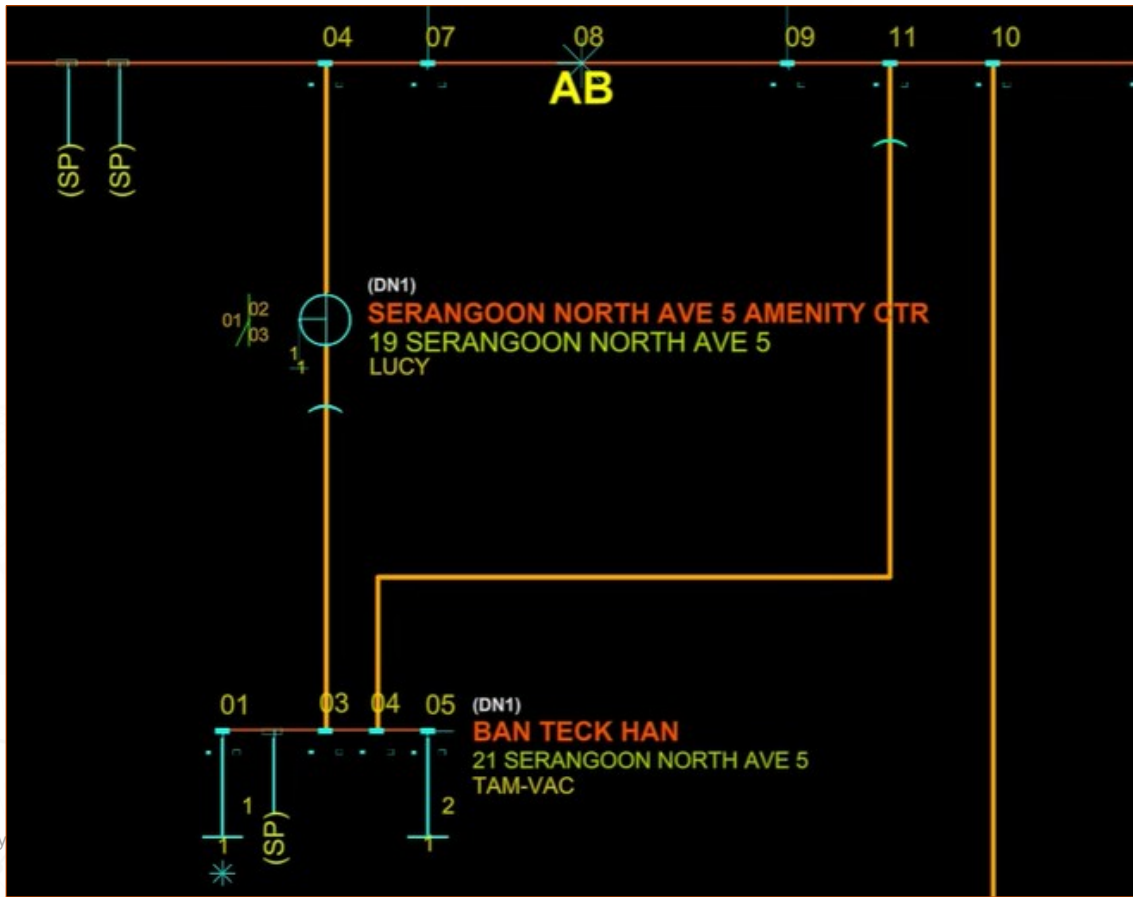
Templates Favorites

- Click here to see templates not listed.
- 6.6 kV - CABLE JOINT : 6.6 kV - POWER CABLE JOINT
 - 6.6 kV - POWER CABLE JOINT
- 6.6 kV - CABLE JOINT : 6.6 kV - POWER CABLE JOINT
 - 6.6 kV - POWER CABLE JOINT
- 6.6 kV - CABLE JOINT : 6.6 kV - SPECIAL CABLE JOINT
 - 6.6 kV - SPECIAL CABLE JOINT
- 6.6 kV - CABLE JOINT : 6.6 kV - SPECIAL CABLE JOINT
 - 6.6 kV - SPECIAL CABLE JOINT
- 6.6 kV - NET JUNCTIONS : Electric Junction
 - NetworkJunction
- 6.6 kV - SWITCHBOARD : 6.6 kV - SWITCHBOARD
- CMU - Composite RMU



SLD

Electrical Schematics



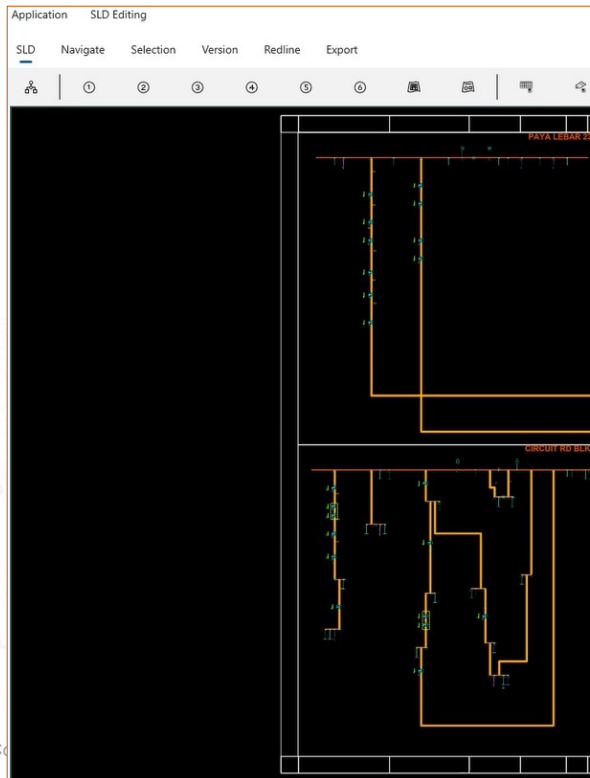
Searching the Schematic

Search for Schematic Sheet/Substation

Station Voltage

Substation Name	Voltage	Sheet Number	Segment	MRC
SUB_3211	6.6 kV	2DN408	1	14682E8472
SUB_3251	6.6 kV	2DN408	6	14687B7400
SUB_1591	6.6 kV	2DN408	2	13479E4391
SUB_3251	6.6 kV	2DN408	5	14687B7400
SUB_1555	6.6 kV	2DN408	4	13493C0004
SUB_9463	6.6 kV	2DN408	3	20042B6206
SUB_1567	6.6 kV	2DN410	1	14086F2590
SUB_1390	6.6 kV	2DN410	6	11669A7268
SUB_1226	6.6 kV	2DN410	5	09904A8481
SUB_2115	6.6 kV	2DN410	3	15296F9912
SUB_2090	6.6 kV	2DN410	4	14703B4123
SUB_9293	6.6 kV	2DN410	2	20596A5069
SUB_652	6.6 kV	2DN105	1	07418A7113

GoTo Cancel



Split View

Propagate SLD to GIS
Propagate the selected SLD features (Switchboard, Circuit breaker, Link, Transformer, Cable) to GIS

GEMS SLD - v0.141.0 - Version: SLDEDITOR.version020624 - Sheet: 2DN402

Application SLD Editing

SLD Navigate Selection Version Redline SLD Editing SLD Tools Integration SLD Reports Export

Identify

- Switchboard
 - 1 CHANGI SOUTH ST 1
- Transformer
 - 1 CHANGI SOUTH ST 1
- Busbar Geometry
 - A
- SLD Junction
 - Net Junction
 - Net Junction

Field	Value	Action
SUBSTATION MRC	16644C5111	E
SUBSTATION NAME	1 CHANGI SOUTH ST 1	E
GEAR TYPE	unset	E
GEAR MANUFACTU	unset	E
SEGMENT	2	E
LOCATIONDESC	1 CHANGI SOUTH ST 1	E
VOLTAGE	6.6 kV	E
SWITCHBOARD NU	1	E
Module		E

01 02 03 04 05 (DN2)

ANCHORAGE NO 2
370 ALEXANDRA RD
ABB-VAC

1 CHANGI SOUTH ST 1
C 6.6kV/LV SUB16644C5111B

Powered by Esri

Why Clients Choose Us

- Deep Telecom + GIS + Utility Network domain expertise
- Proven accelerators (rUNr) reducing time & risk
- Ability to deliver large-scale migrations with 99.99% automated error correction
- Strong global track record with Tier-1 Telecom and Utility operators
- Full-stack capability – GIS, OSS / BSS, data migration, mobile apps, field ops
- Highly scalable, integration-ready, platform-independent solutions
- Modernize GIS & Utility Network platforms with speed and precision
- Plan, design, build, and manage fiber & 5G networks end-to-end
- Improve operational efficiency with field mobility & workflow automation
- Gain real-time network visibility for faster decisions and fewer outages
- Reduce rollout time, optimize resources, & avoid over-investment



Thank You

Contact Us



info@inovaantage.com



www.inovaantage.com

