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MICROCENTER GROUP

MicroCenter

Group

YOUR PARTNER IN PRECISION AND EXCELLENCE

FOUNDED IN 1983, MICROCENTER GROUP IS A PIONEER IN PROVIDING INFORMATION TECHNOLOGY SOLUTIONS IN BAHRAIN. INITIALLY IT WAS STARTED WITH THE AIM OF PROVIDING CUSTOMIZED IT SOLUTIONS TO SMALL AND MEDIUM ORGANIZATIONS BUT TODAY WITH OVER 100 CUSTOMERS, BOTH IN THE GOVERNMENT AND PRIVATE SECTOR IT HAS ATTAINED A LEADERSHIP POSITION IN THE INDUSTRY WITHIN THE COUNTRY. WITH FOUR GROUP COMPANIES AND AN OFFICE IN SAUDI ARABIA, TODAY IT HAS DIVERSIFIED INTO VARIOUS OTHER BUSINESSES THAT INCLUDE TRAINING AND ENGINEERING SOLUTIONS.

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120+
Employees in Bahrain with over 30% Bahrainis

1983
Founded with 100% Bahraini Ownership

Business Units

- MicroCenter WLL
- MicroPromo WLL
- MicroCenter Engineering WLL
- MicroCenter Training
- MicroCenter Professional Services WLL

Partners

- Sole distributor for Esri Inc, USA
- Gold Partner for Oracle
- Silver partner for Microsoft
- Digital Globe (Satellite Imagery)
- Avinion
- Geographic Technology Group
- Genesys
- Tech Mahindra
- EverestDX

Solutions

- Geographical Information Systems (GIS)
- Surveying 3D BIM Modeling & Engineering Services
- Oracle Web Based ERP Solutions (MCA-eBiz ERP)
- Visitor Management Systems (eVMS)
- Plastic/Smart Card Solutions
- Specialized GIS & ERP Training
- Professional Services

2
Branches across Bahrain

60%
Annual Customer Growth

CURRENTLY, IT SPECIALIZES IN BUSINESS SOLUTIONS, GEOGRAPHICAL INFORMATION SYSTEMS (GIS), AND UTILITY ENGINEERING SERVICES. IT IS ALSO AN ORACLE GOLD PARTNER AND THE SOLE DISTRIBUTOR OF ESRI, TELVENT, AND TRIMBLE IN BAHRAIN. IT HAS AROUND 100 EMPLOYEES IN ALL ITS DIVISIONS IN BAHRAIN.

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ORGANIZATIONAL STRUCTURE MICROCENTER GROUP

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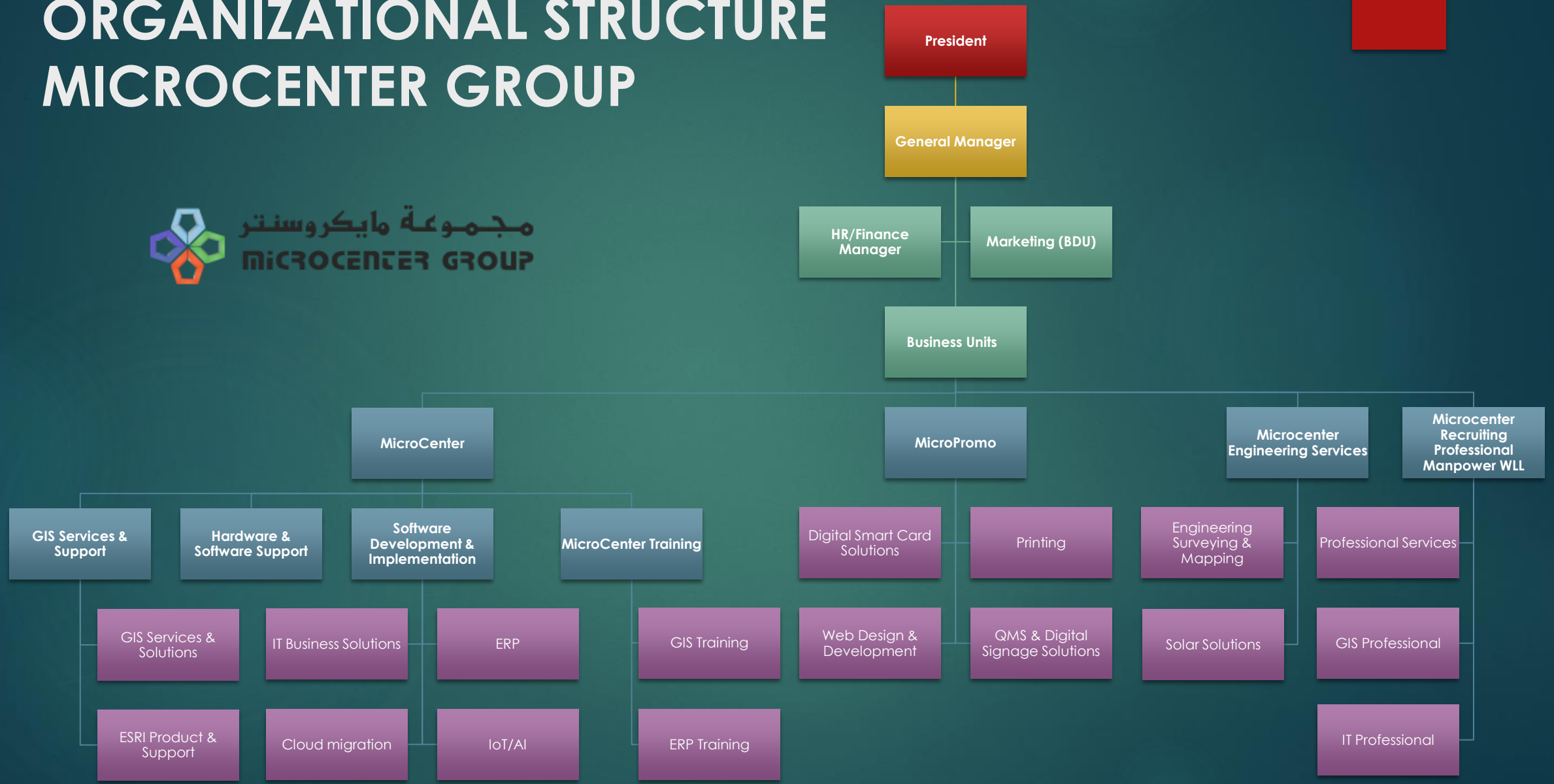

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MICROCENTER GROUP

MicroCenter

Engineering

Services

YOUR PARTNER IN PRECISION AND EXCELLENCE

ABOUT

MICROCENTER ENGINEERING SERVICES IS A LEADING SURVEYING AND MAPPING COMPANY WITH 19 YEARS OF SUCCESS OF IN THE KINGDOM OF BAHRAIN. OUR KNOWLEDGE AND EXPERIENCE SPANS VARIOUS FIELDS OF SURVEYING INCLUDING GNSS & GIS SYSTEMS, TOPOGRAPHICAL AND UNDERGROUND UTILITY SURVEYING. WE HAVE CONTINUALLY UPGRADE OURSELVES BY ADAPTING TO NEW AGE SOPHISTICATED TECHNOLOGY INTERVENTIONS SUCH AS LIDAR AND GPR.

Our Services

Underground Utility Survey Service

Ground Penetrating Radar

Radio Detection

Manhole Investigation

Topographical Survey Services

Topography Survey

Control Points

Live and open trench utility Survey

LiDAR Services

Terrestial Scanning

Mobile LiDAR

Scan to BIM

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Survey Equipment Used by Microcenter Engineering Services

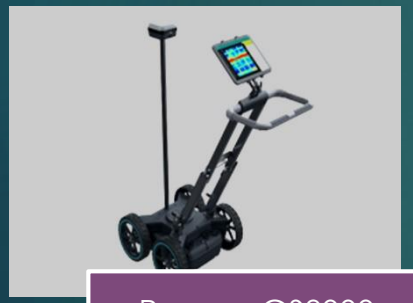
Leica GS18 I GNSS RTK Rover with CS20

Leica Nova TS60 Robotic Total Station

FARO FOCUS 150 S

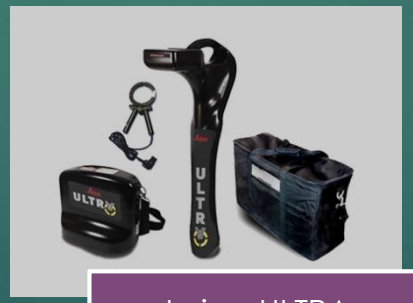
Leica BLK360

Leica Pegasus



Proceq GS8000

GSSI SIR-4000



Leica ULTRA

RD8000 Radio Detection

GSSI StructureScan Mini XT

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Live and open trench utility (Electrical and Water) Survey

- Microcenter Engineering Services leads the way in live and open trench utility surveys, specializing in electrical and water utilities. We provide precise mapping and documentation of underground utilities during construction or maintenance, ensuring safe and efficient infrastructure development.
- Using advanced surveying techniques, we accurately record the location, depth, and condition of exposed utilities. This data helps prevent conflicts, facilitates future planning, and enhances project safety.
- Maintaining accurate utility records in an Enterprise GIS system is crucial for improved network planning and customer support. We physically verify and record utility network assets, including attributes such as size, material, and condition, keeping GIS data current and reliable.
- Our services include:
  - New house connections (electricity and water)
  - Above-ground features (substations, manholes, etc.)
  - Emergency alterations in utility networks
  - LV and HV reinforcement projects (11KV, 33/66/220KV)
  - Substation and transformer upgrades
  - Cable and pipe diversions
  - Water distribution and irrigation network projects
- With over 14 years of experience working with EWA, we've developed the expertise to manage large-scale projects. By utilizing cutting-edge data transfer technology, our on-site teams can instantly send survey data to our office for processing, boosting productivity and minimizing paperwork.

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Topography Survey

- A topographical survey plays a crucial role in construction engineering by providing a detailed and precise 3D depiction of a site, including all natural and man-made features, property boundaries, and land details.
- Utilizing advanced equipment such as total stations, GPS, and laser scanners, the survey captures accurate data on the land's elevation, contours, and the positioning of various features.
- This information is then processed to generate comprehensive topographical maps and 3D models.
- At Microcenter Engineering Services, we employ cutting-edge GNSS technology, along with manual and robotic total stations, reflectorless devices, and laser scanners, supported by specialized data processing software.

Control Points Surveying Services:

- Establishing control points is a vital step in any surveying project, laying the groundwork for precise mapping and construction. Our service ensures that your projects begin with a reliable reference framework through accurate placement and documentation of fixed points across the site.
- Key benefits of control points include:

  Construction Projects: Ensuring accurate structure alignment and layout.

  Mapping and GIS Guaranteeing precision for large-scale mapping and geographic systems.

  Infrastructure Development: Supporting roads, bridges, and utility projects.

  Land Development: Aiding in site preparation and detailed planning.
- We utilize advanced GPS and total station technologies like the Leica GS16, GS18, and Flexline TS06 PLUS for establishing control networks. Bahrain's Permanent Reference Network (PRN) supports diverse GNSS applications, and we leverage space-based GNSS correction (Omni Star) in areas without RTK access, including parts of Saudi Arabia.
- Microcenter uses Leica Inifinity software suite to manage, process, analyze and quality check all field survey measure data, including total stations, digital levels and GNSS data. It can also be used for data processing from Unmanned Aerial Vehicles (UAVs).

Control point surveying

Processing data using Leica infinity software

Surveying Monuments

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LiDAR Services

At Microcenter Engineering Services, we use advanced laser scanning technology to offer three primary services:

- Terrestrial Scanning: This method uses ground-based laser scanners to capture detailed 3D data of structures and landscapes. The captured data is processed into accurate 3D models, useful for construction planning, infrastructure monitoring, and topographic mapping.
- Mobile LiDAR: By mounting laser scanners on vehicles, this technology collects high-resolution spatial data rapidly across various environments. It's ideal for large-area mapping, infrastructure assessment, and urban planning.
- Scan to BIM: This technology converts laser scan data into accurate 3D models, supporting renovation projects, facility management, and heritage preservation. It ensures precision in comparing existing conditions with planned designs.

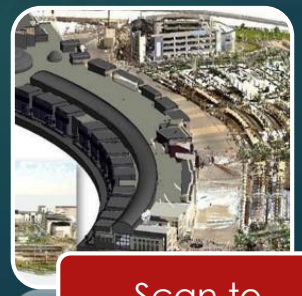
Since 2018, Microcenter Engineering has pioneered the use of LiDAR technology in Bahrain, utilizing Faro and Leica scanners to deliver highly accurate and efficient surveying services. Our experienced team ensures top-quality data, tailored to meet the unique needs of every project, from urban development to heritage preservation.

Terrestrial Scanning

+

Mobile Lidar

+

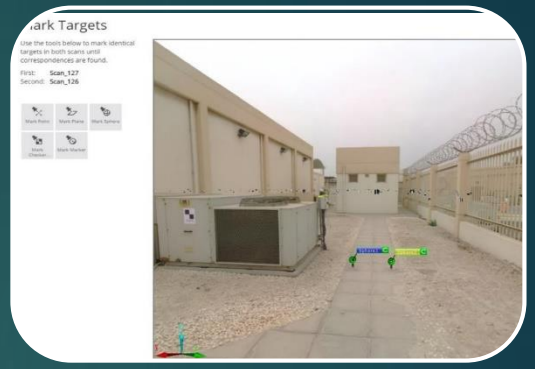


Scan to BIM/3D Model

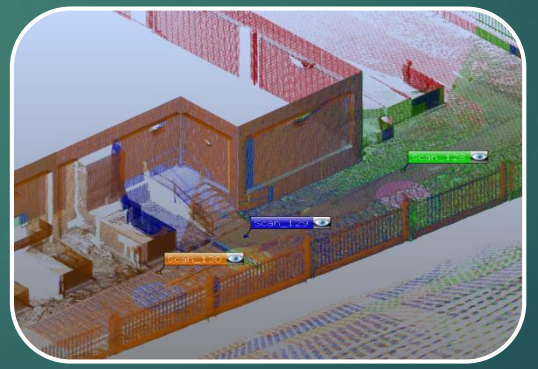
Terrestrial Scanning Survey

- Terrestrial scanning is a modern method that uses ground-based laser scanners to capture highly accurate 3D data of structures and landscapes. The scanners send laser beams to targets, measure the time it takes for the beams to return, and collect this data to create a point cloud.
- At Microcenter Engineering Services, we use Faro Scene software to process the point cloud and create detailed 3D models and maps. To ensure accurate registration, we use sphere targets on-site for manual alignment in the software. This method allows us to quickly capture millions of data points and deliver precise results for various applications, such as:
  - Construction: Providing exact as-built documentation for planning and design.
  - Infrastructure: Monitoring the condition of bridges, tunnels, and other key structures.
  - Mapping: Producing topographic maps for urban development.
  - Archaeology: Accurately documenting historical sites and artifacts.
- Since 2018, Microcenter Engineering Services has led the way in Bahrain, using advanced Faro and Leica laser scanners to provide reliable and accurate survey data, ensuring project success.

LiDAR Scanning



Registering the Point Cloud



Processing + Generating Point Cloud

Generating 2D/3D As-Built

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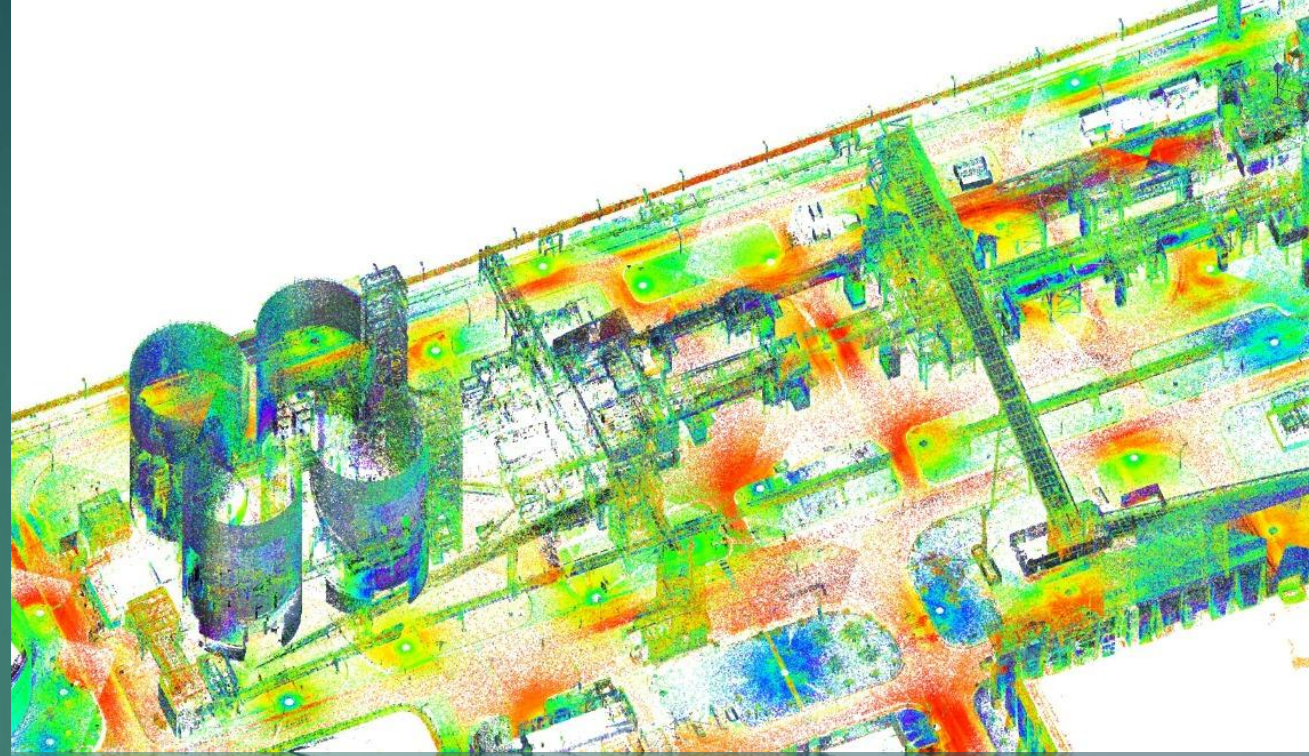
Mobile Lidar



- Mobile LiDAR (Light Detection and Ranging) is an advanced technology that enables the fast and precise collection of spatial data through laser scanners mounted on a moving vehicle. Its adaptability allows it to survey a wide variety of environments, such as cities, forests, and industrial zones, at a rapid pace. Mobile LiDAR collects highly accurate 3D data of its surroundings, producing detailed 2D as-built drawings and 3D models. A key advantage of this technology is its ability to cover large areas swiftly while delivering high-resolution and accurate data.
- Mobile LiDAR is utilized in various applications, including:
  - Topographic Mapping: Producing detailed maps for design and planning.
  - Infrastructure Assessment: Evaluating roads, bridges, machinery, and structures for maintenance and planning.
  - Urban Planning: Supporting city development and planning projects.
- At Microcenter Engineering Services, we use the latest mobile LiDAR technology, the Leica Pegasus, to offer superior survey services tailored to our clients' specific requirements.

Scanning Executing

Processing The Pointcloud

Generating Pointcloud + As-Built Drawing 2D/3D

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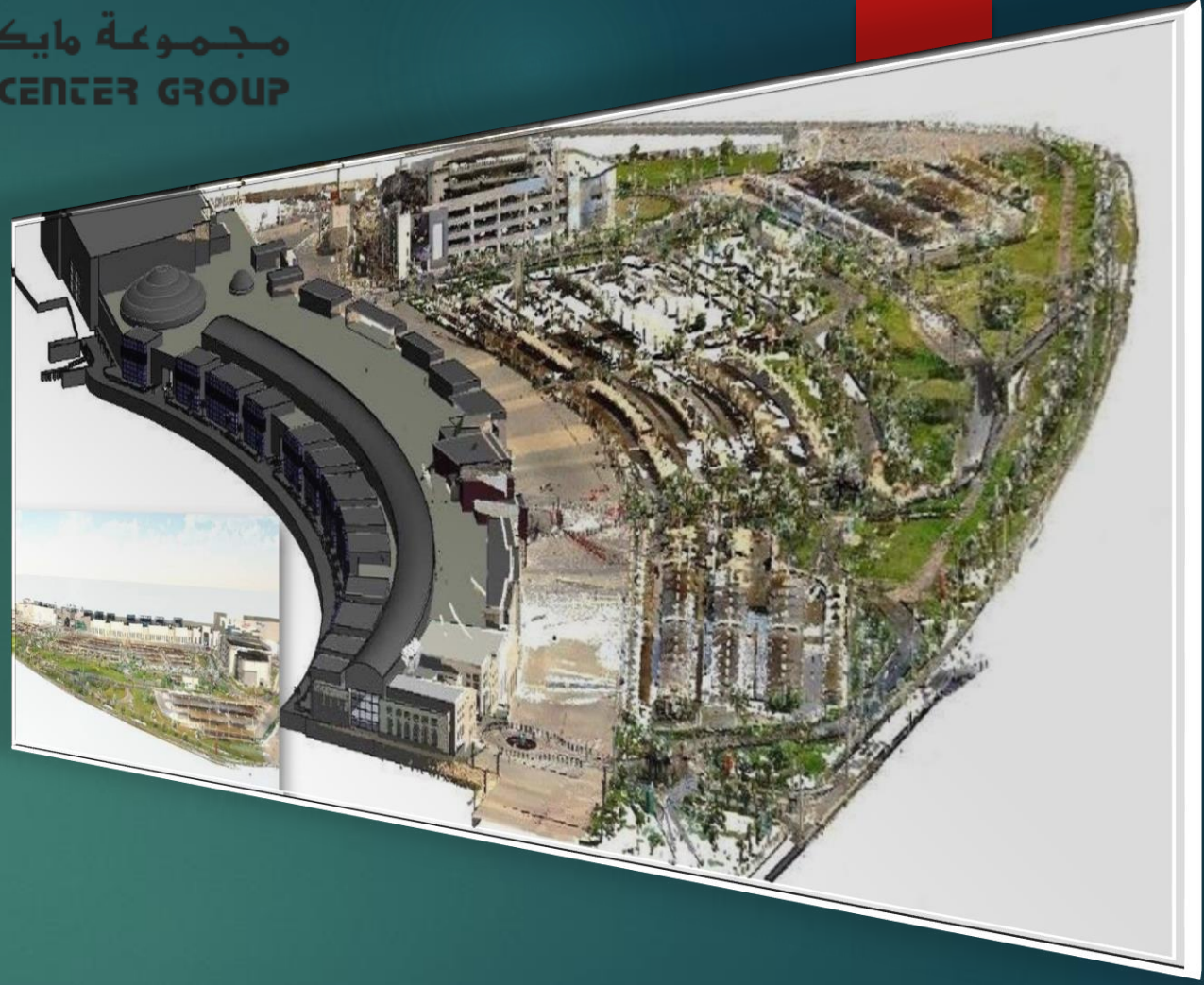
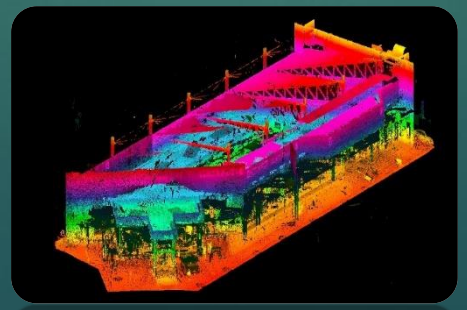
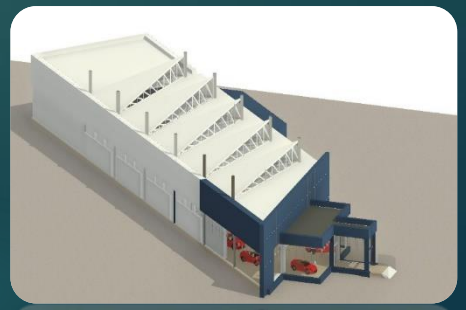
Scan to BIM



- Scan to BIM (Building Information Modeling) is an advanced technology that converts laser scan data into accurate and detailed 3D models. This service bridges the gap between physical structures and digital representations, providing precise as-built models for various applications including:
- **Renovation and maintenance projects:** Creating accurate as-built models to plan and execute renovations.
- **Facility Management:** Providing detailed models for ongoing maintenance and management of buildings.
- **Quality Control and Quantity Estimation:** Ensuring construction accuracy by comparing the BIM model with actual site conditions.
- **Heritage Preservation:** Documenting and preserving historical buildings.
- The execution of Scan to BIM start with laser scanning, the laser scanner captures the required detailed spatial data of a building or site. The laser scanner creates a point cloud, we then process the point cloud and use it a reference in the specialized software, then convert it into a complete BIM model.

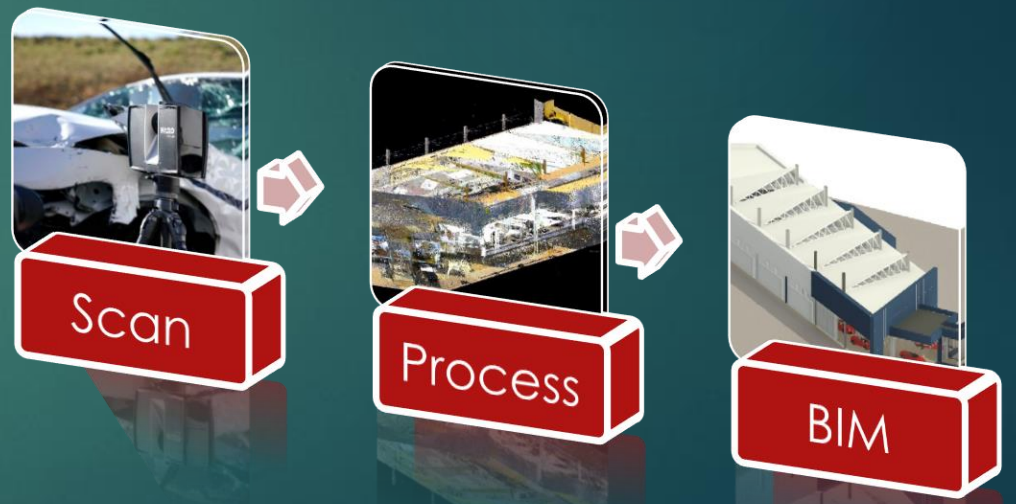




Scan to BIM Projects

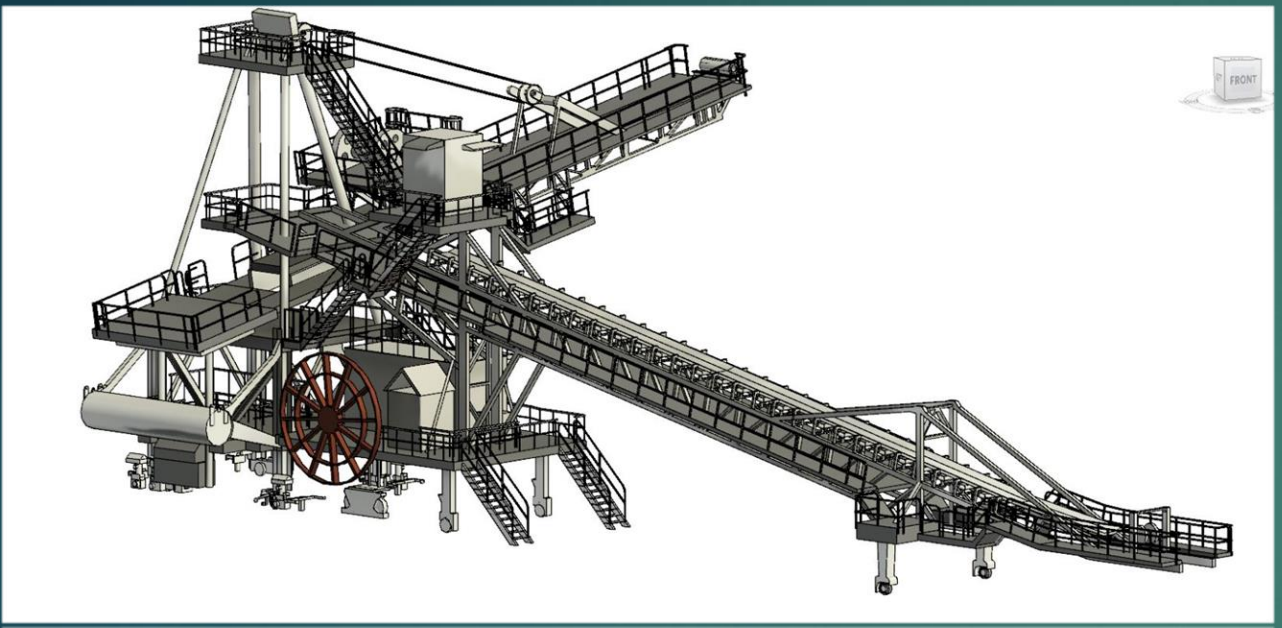
3D model /Ferrari showroom

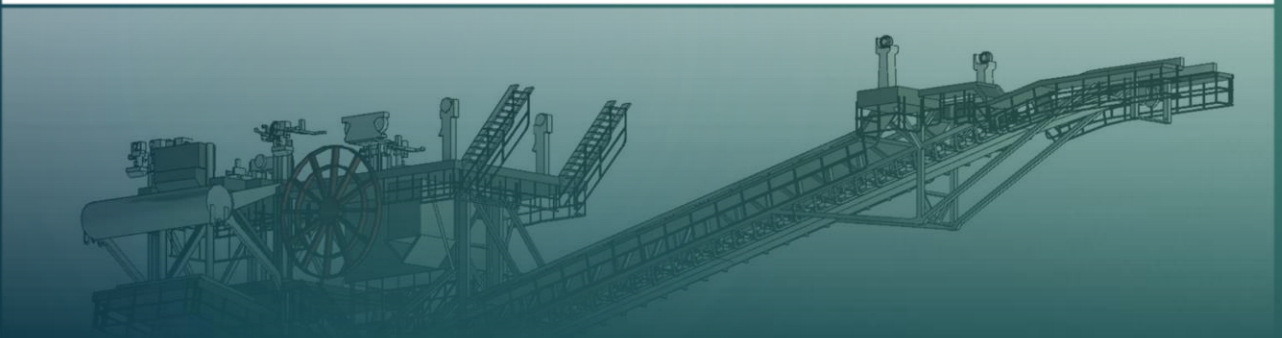
- **Summary:** In this high-octane story, a team of skilled engineers and technicians utilize cutting-edge LIDAR scanning technology to map and analyze every detail of a luxury Ferrari showroom.
- **Area covered:** 1,500m^2.
- **Location:** Sitra, Bahrain



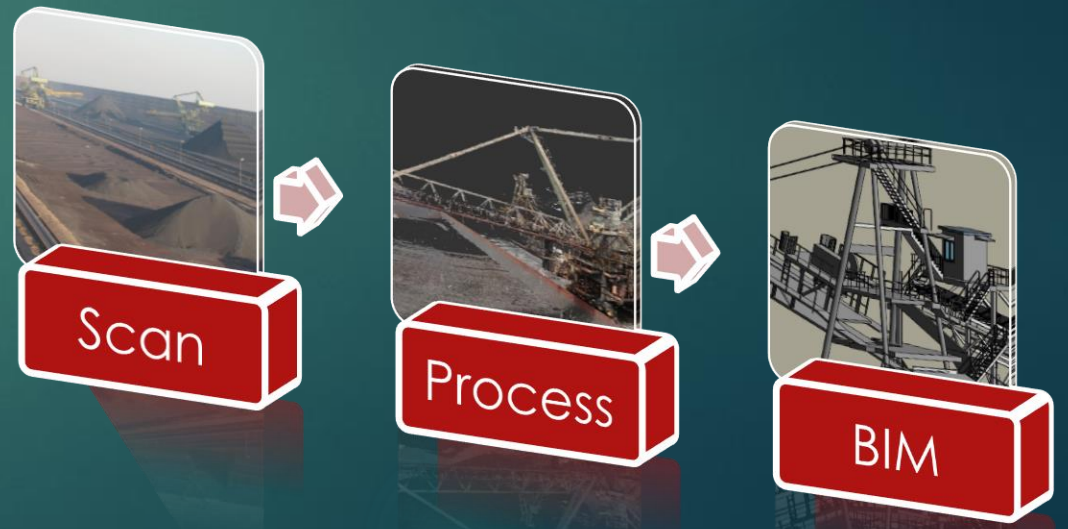
Scan to 3D Model Projects

3D Model & Mapping for Bahrain Steel



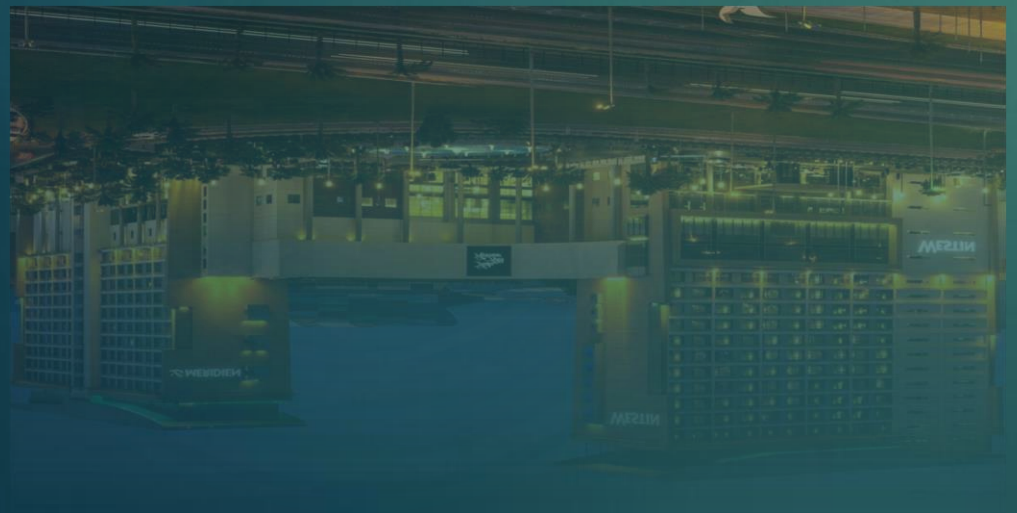


- **Summary:** In the bustling steel plant of Bahrain, a team of skilled professionals embark on a revolutionary project of creating accurate as-built mapping and intricate 3D Building Information Modeling (BIM) designs. As they navigate the complex infrastructure of the plant, they encounter challenges and triumphs, striving to accurately document every detail and optimize the efficiency of the facility.
- **Area covered:** 1,62,450 m^2.
- **Location:** Salman Industrial City, Al Hidd, Bahrain.



Scan to 3D Model Projects

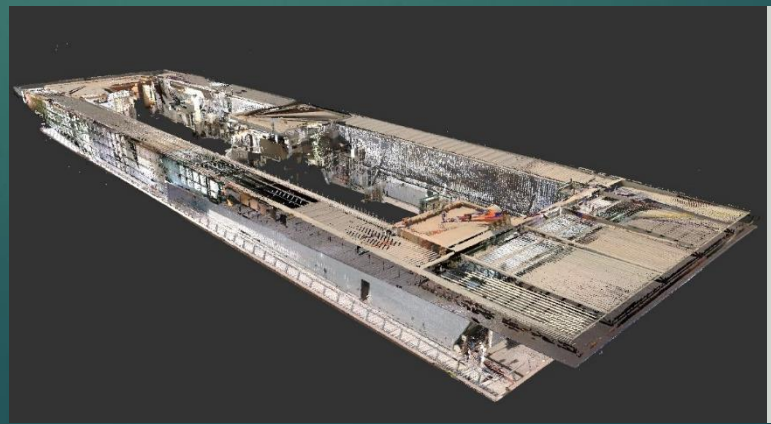
Le Méridien & Westin Hotel Structural 3D Model



- **Summary:** In the bustling city of Bahrain, two luxury hotel buildings, Le Méridien and the Westin, stand tall with their imposing ACP roof canopy cladding. A skilled geometric surveyor, is tasked with meticulously measuring and analyzing the intricate structures of the cladding to create an accurate As-Built and BIM 3D model for Renovation and Maintenance purposes.
- **Challenges:** The project of scanning and creating a 3D model of the intricate ACP roof canopy cladding at Le Méridien and The Westin hotels in Bahrain presents several challenges.

  Firstly, the vast area of 5,500m² within the bustling Seef District of Manama requires precise coordination and planning to minimize disruptions.

  he complex geometry of the cladding structures demands meticulous measurement and analysis to ensure the accuracy of the As-Built and BIM 3D models, crucial for renovation and maintenance purposes.



Microcenter can generate the following data from point cloud

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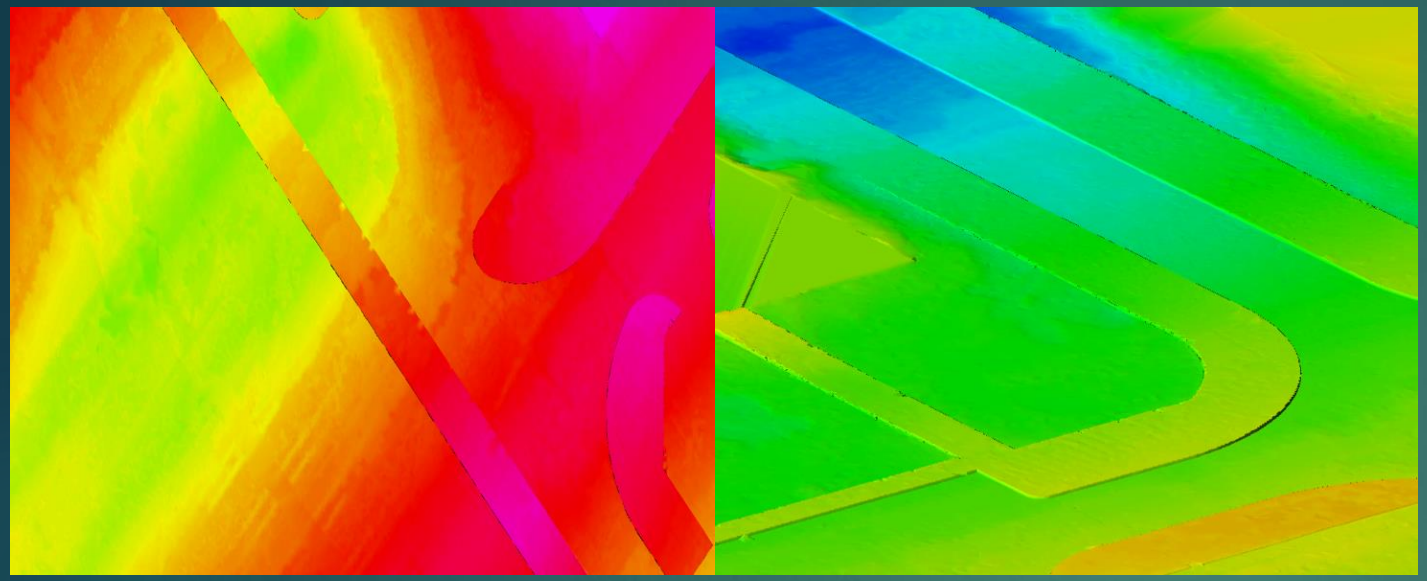

DIGITAL TERRAIN MODEL (DTM)

Digital Terrain Models (DTM) can be defined as a 3D representation of the terrain elevation found on the earth surface that is extracted from a topographic software.

Digital terrain models consist of elevation data of the terrain in a digital format such as *.XYZ, *.ASCII, *.GEOTIFF and etc.

Physical objects above the surface will be removed such as buildings, vegetation's and movable objects, however, DTM includes vector features of all natural terrain such as rivers, ridges, pond and lake.

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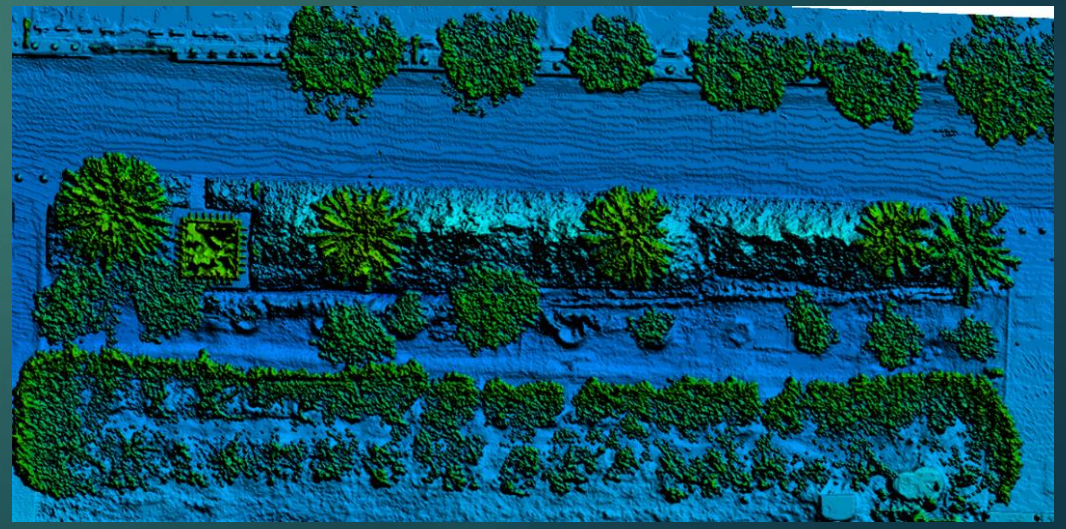

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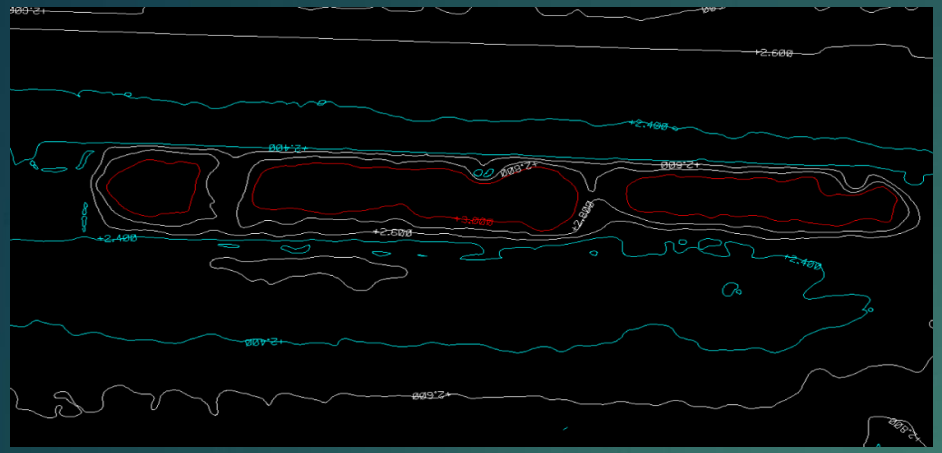
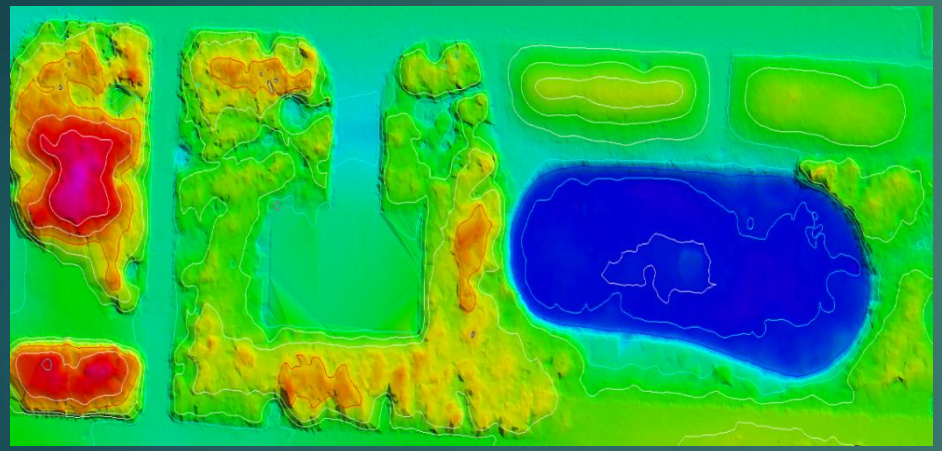




CONTOUR MAP

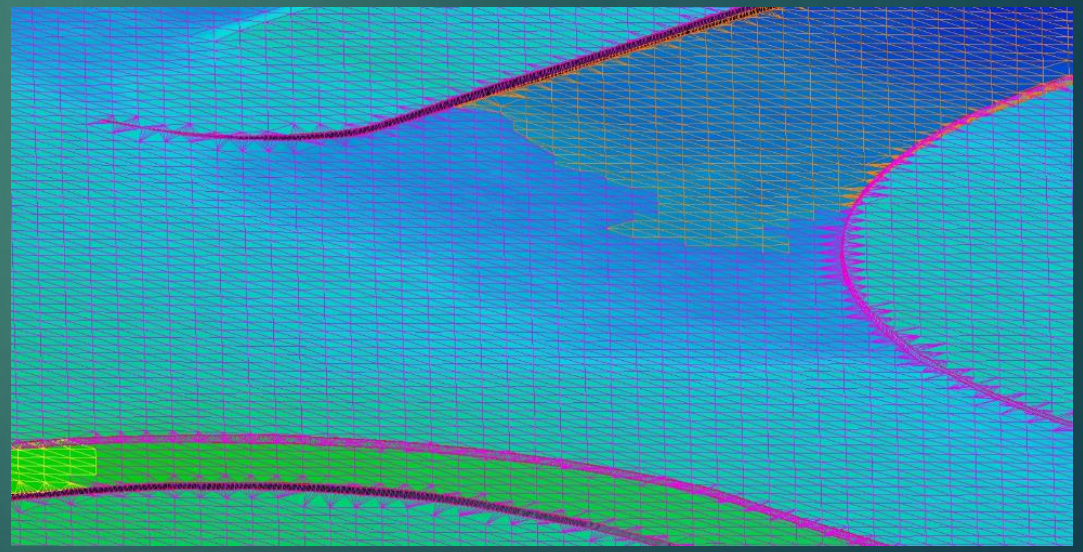
Contour can be defined as the shape of the land surface shown by contour lines, the relative spacing of the lines signifies the relative elevation and slope of the surface.

TRIANGULATED IRREGULAR NETWORK (TIN)

Triangular Irregular Networks (TIN) can be defined as a form of vector-based digital geographic data that are constructed by triangulating a set of points.

TIN Model represents a surface as a set of contiguous, non-overlapping triangles.

Within each triangle the surface is represented by a plane. The triangles are made from a set of points named mass points.



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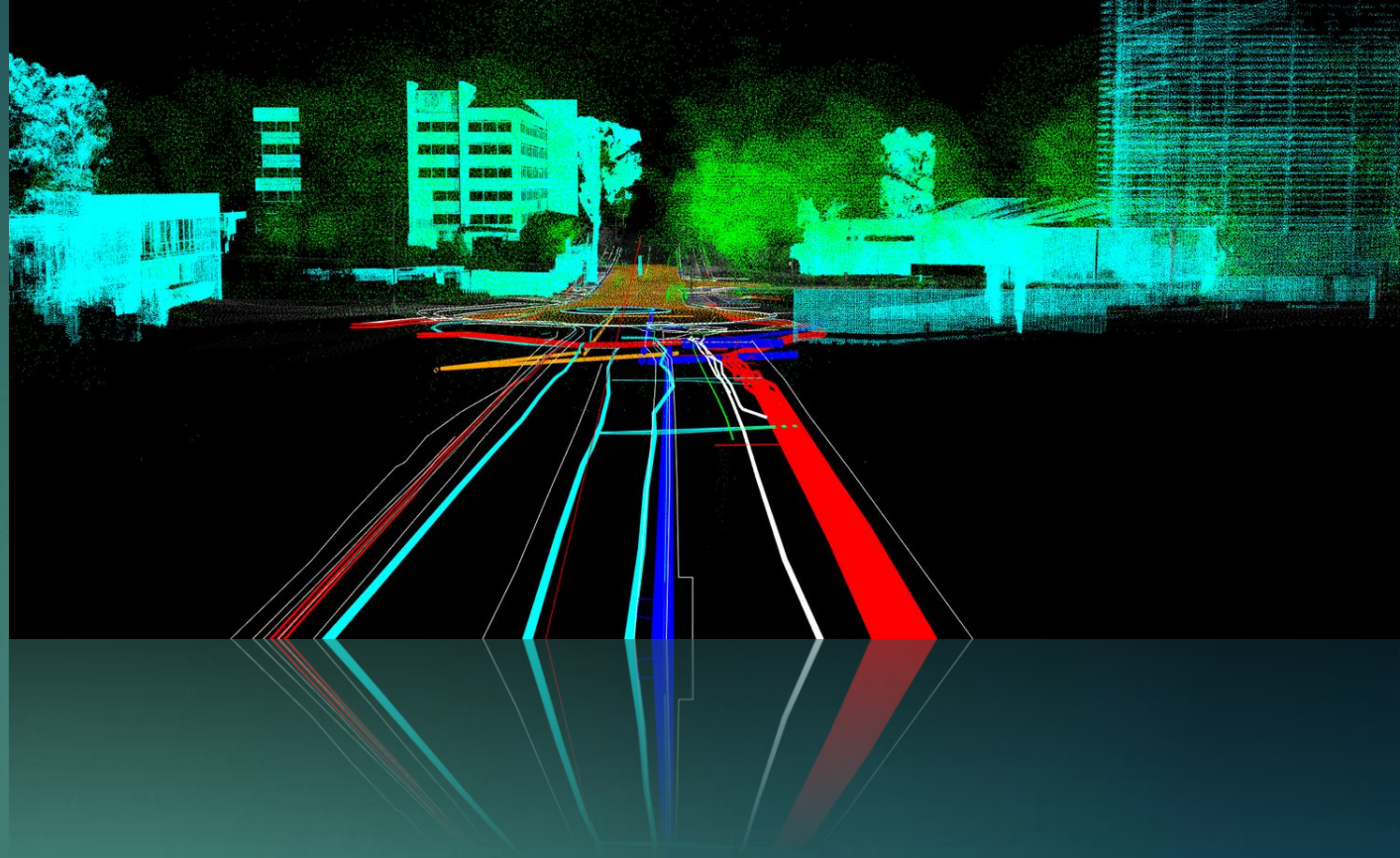
Underground Utility Survey



- Radio detection leverages electromagnetic fields to pinpoint the location and depth of buried metallic utilities like cables and pipes. This method is complemented by Ground Penetrating Radar (GPR), which uses radar pulses to image both metallic and non-metallic subsurface features, including utilities, voids, and other anomalies.
- When used together, these technologies provide a comprehensive and accurate picture of underground conditions. Additionally, manhole investigation surveys enhance the effectiveness of GPR by offering detailed assessments of underground utility systems.
- At Microcenter, we combine GPR with manhole investigations, utilizing butterfly diagrams and advanced diagnostic tools to determine the type, condition, and state of underground utilities, ensuring a thorough and precise survey.

Ground Penetrating Radar (GPR)

+

Radio Detection

+

Manhole Investigation

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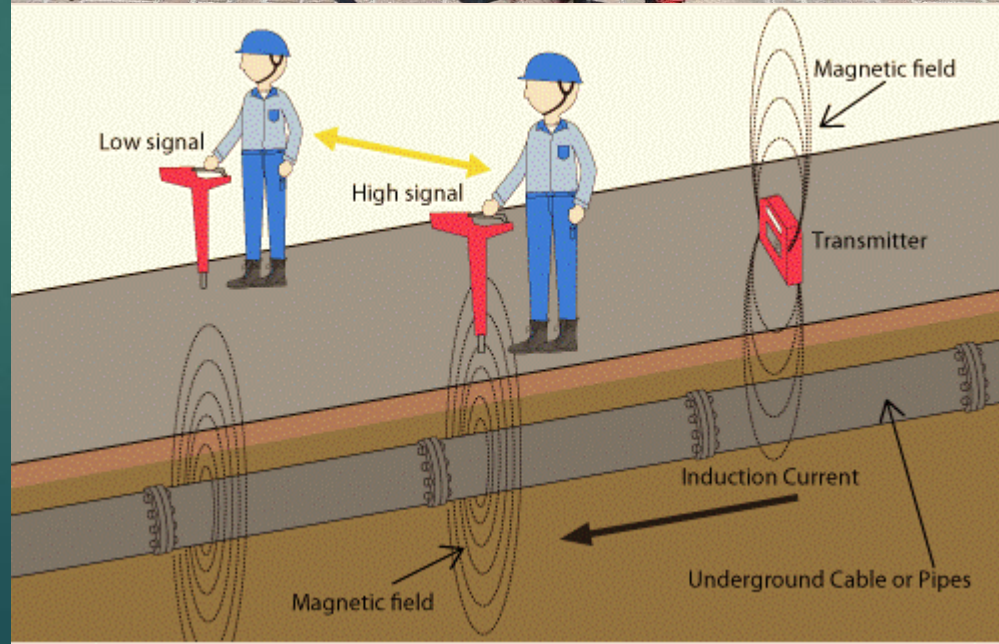
Radio Detection

- Radio detection utilizes electromagnetic fields to identify buried metallic utilities like cables and pipes. By sending a signal through these utilities, the equipment can precisely determine their location and depth.
- All underground service surveys are conducted according to the current Standard Specification for the Survey of Utilities using Radio detection RD-8000.
- It's important to recognize that Radio detection methods cannot detect non-metallic buried services, such as plastic water, gas pipes, and drainage systems.
- To address this limitation, we integrate Radio detection with Ground Penetrating Radar (GPR).



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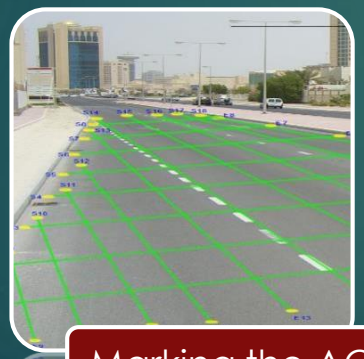
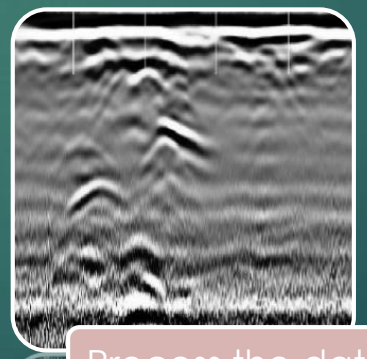
Ground Penetrating Radar (GPR)

- Ground Penetrating Radar (GPR) works with radio detection to image underground features, detecting utilities, voids, and anomalies. This ensures accurate underground surveys.
- Identified services are marked, surveyed with Total Station/GPS, processed with RADAN software, and presented in 2D or 3D on a base map. The Utilities Search Report details underground features like cables, pipelines, and structures.
- Utility locations are verified with detection tools and safe digging practices. We can further investigate underground services using GPR and radio detection methods.



Marking the AOI for surveying

Execute the GPR work

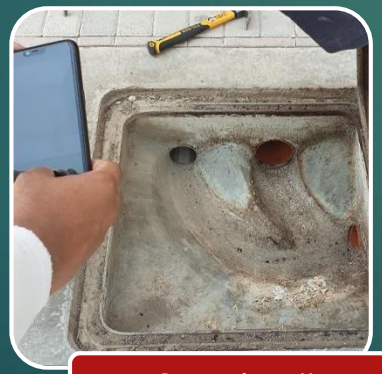


Process the data using RADAN

Generating utility 2D/3D Output

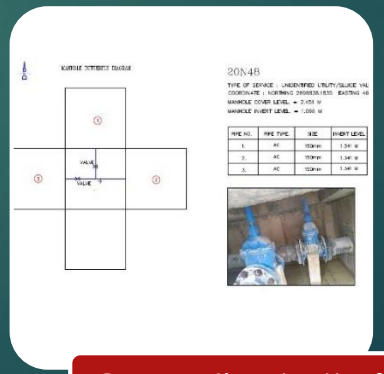
Manhole Investigation

- Manhole investigation surveys work well with GPR survey services. At Microcenter, we offer manhole investigation services that include butterfly diagrams and GPR surveys. This combined method gives a clear picture of the type and condition of underground utilities.
- Our manhole surveys involve careful inspections using advanced tools. The butterfly diagram is a visual tool that helps to understand how manholes and underground utilities are connected. It makes it easier to map and see the underground network, helping in better decision-making and planning.
- Manhole investigations are used for:
  - Checking sewer systems, including sewer lines and manholes.
  - Helping with the design and planning of new projects by providing accurate underground data.
  - Creating detailed maps of underground utilities for maintenance and development.



Opening the manhole cover

Investigating the utility network



Generating butterfly diagram

Underground Utility Survey Projects

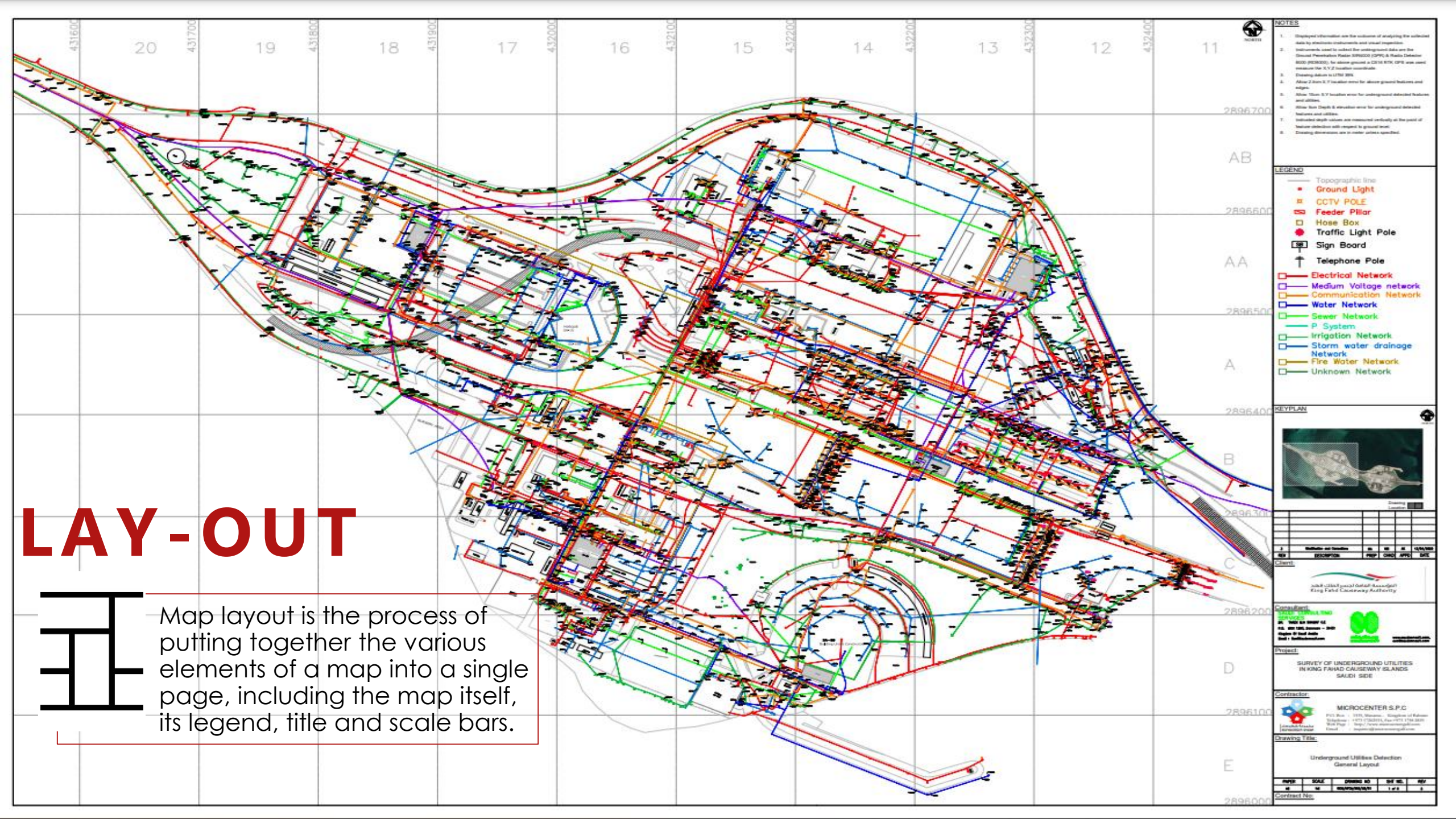
King Fahad Causeway Authority - Saudi Arabia & Bahrain

Project: Survey of underground utilities in both border island - Bahrain & Saudi Arabia side.

Challenges:

- During the underground utility survey of a large and complex area spanning 685,740 square meters across the border island between Bahrain and Saudi Arabia, several challenges were encountered.
- The project demanded precise detection and mapping of utilities beneath the surface, requiring advanced equipment and Asphalt surfaces posed a particular difficulty due to their dense and impermeable nature, which impacted the accuracy of subsurface readings.
- Additionally, the cross-border nature of the survey introduced logistical challenges, including the coordination of regulations and standards between two countries.
- The expansive area also posed difficulties in ensuring thorough coverage and maintaining data accuracy over such a broad and diverse landscape.
- These challenges necessitated meticulous planning and adaptive problem-solving throughout the project.

Area covered: 685740m^2.



LAY-OUT

Map layout is the process of putting together the various elements of a map into a single page, including the map itself, its legend, title and scale bars.

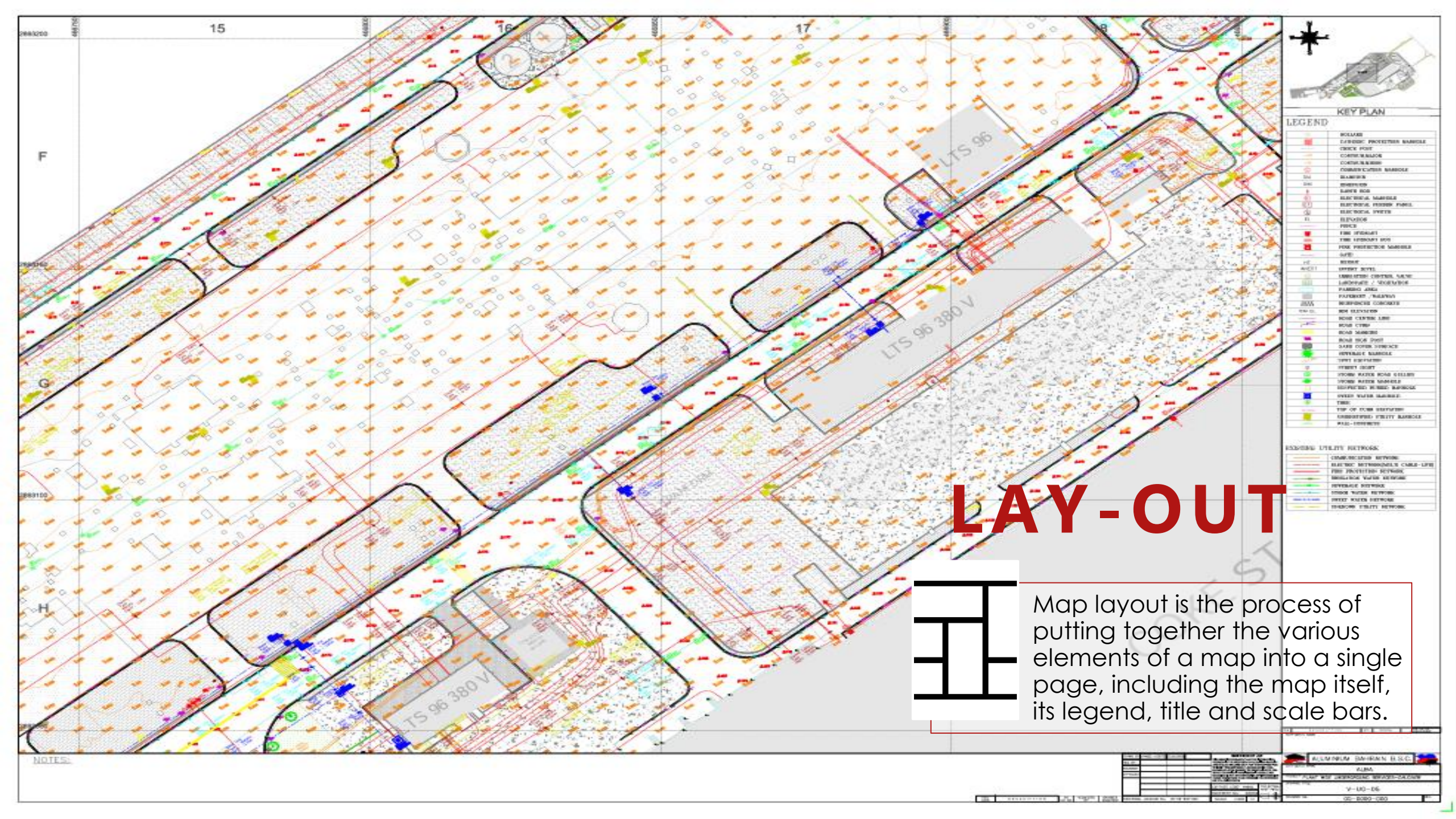
Underground Utility Survey Projects

ALBA Aluminium Bahrain - Plant wide GPR Scanning in Open Areas

Challenges:

- Conducting a plant-wide underground utility survey using ground-penetrating radar (GPR) at Alba Club, Calciner & Marine, and ALBA Smelter presented several challenges essential to ensuring the structural integrity and safety of these facilities.
- The open areas required extensive GPR scanning to detect a wide array of buried utilities, including electric and communication cables, sewer and storm drains, gas lines, compressed air mains, and various water systems such as portable, blowdown, and process water.
- The complexity of these underground networks posed significant challenges in distinguishing between the different types of utilities and accurately mapping their locations.
- Additionally, detecting buried structures, voids, and potential water leakages added another layer of complexity, as these anomalies could interfere with GPR signals, making it difficult to interpret the data correctly.
- The need for precise identification and mapping of these utilities was crucial to avoid any disruptions or hazards during facility operations, requiring careful planning, advanced equipment, and expert analysis to overcome these challenges.

Area covered: 500000 m2



LAY-OUT

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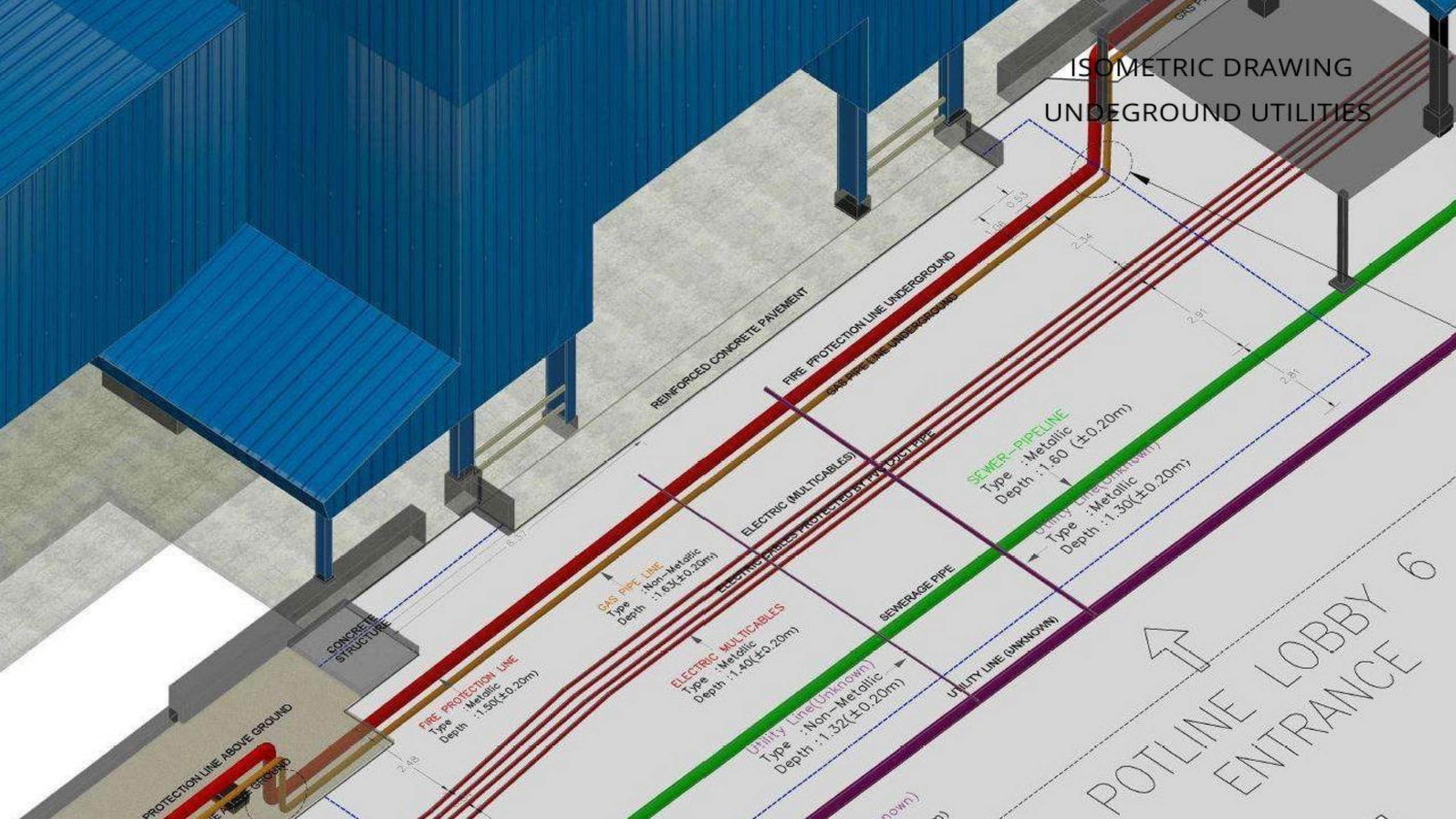
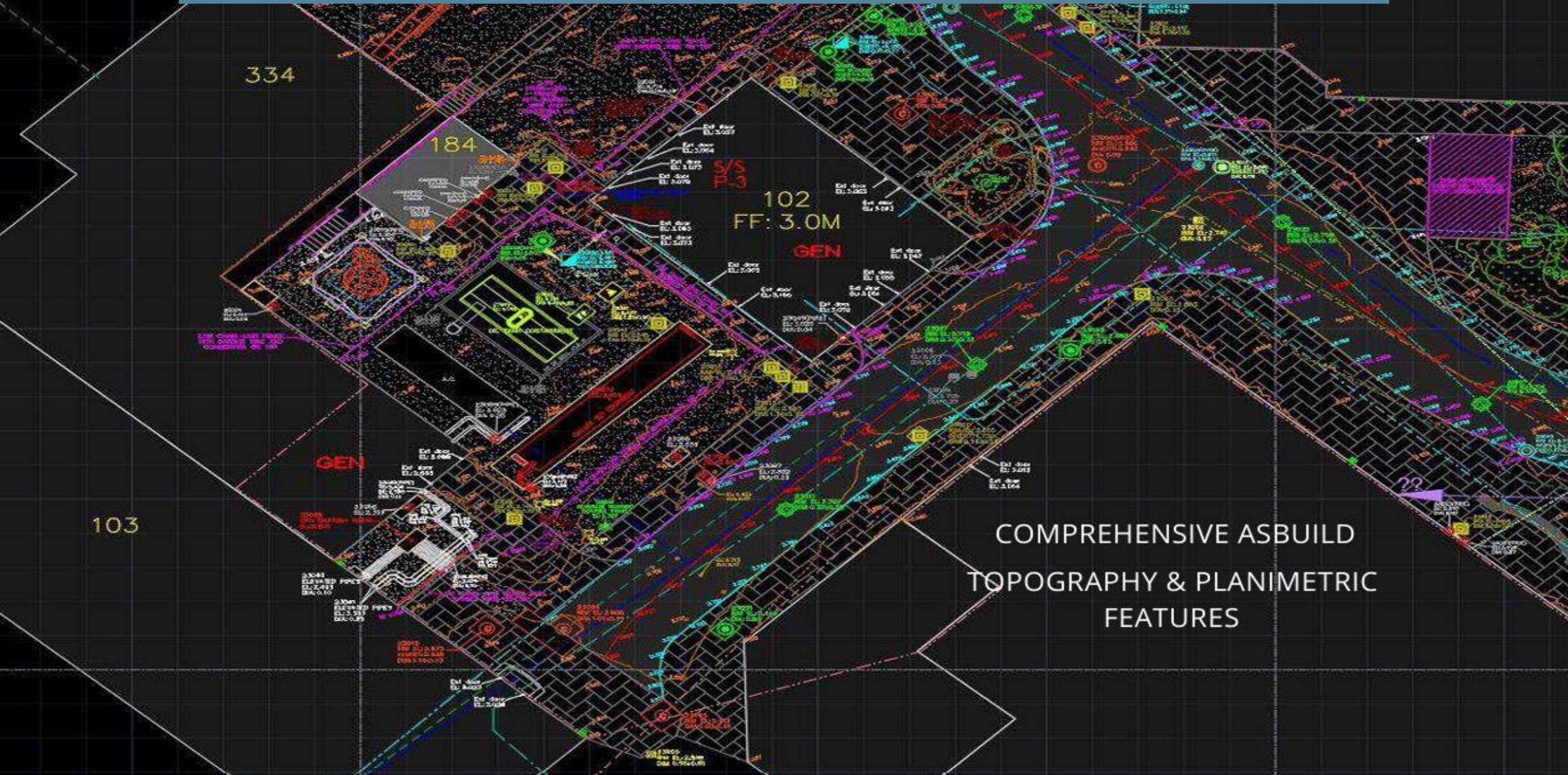
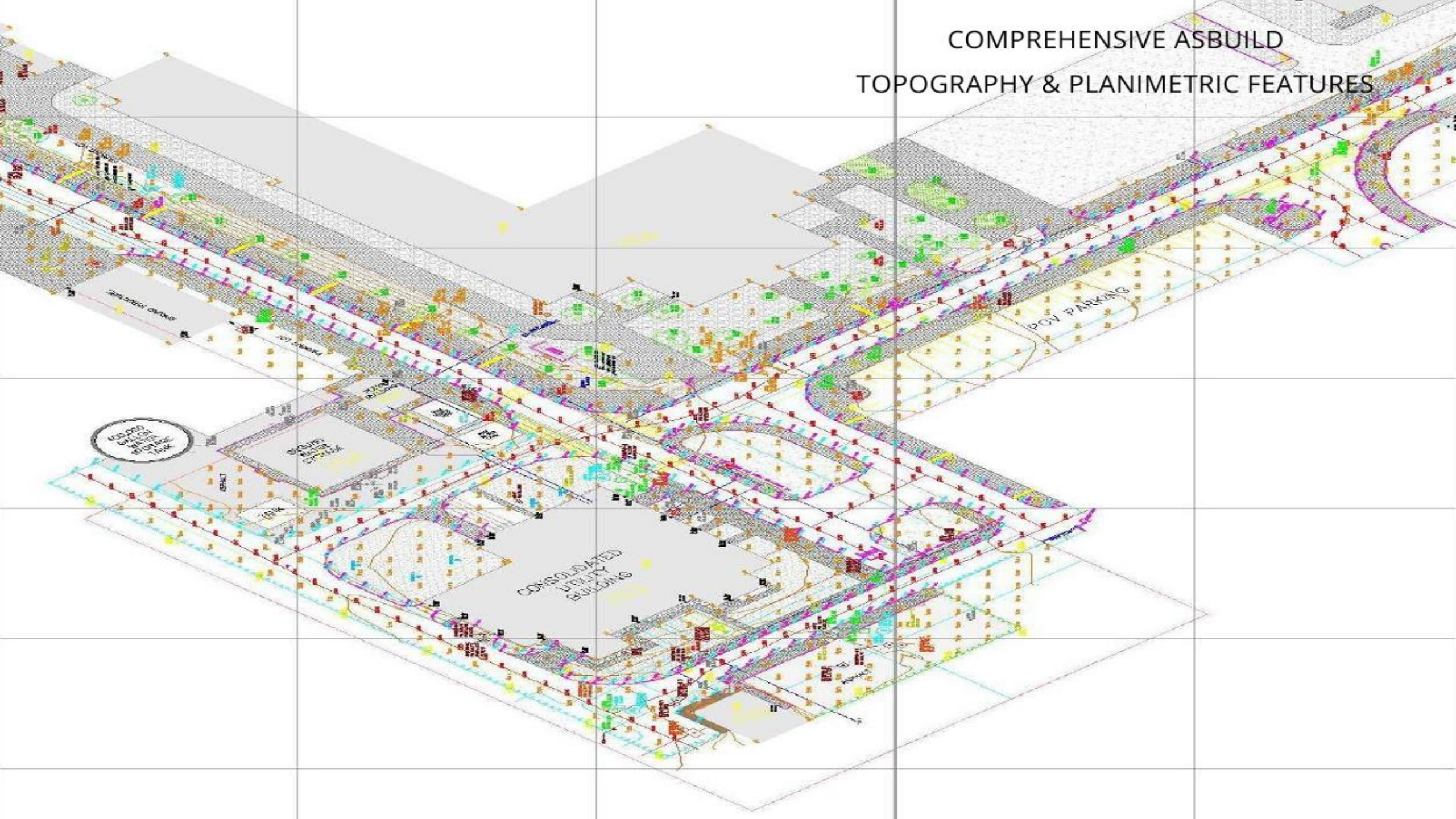

ISOMETRIC DRAWING
UNDERGROUND UTILITIES
REINFORCED CONCRETE PAVEMENT
FIRE PROTECTION LINE UNDERGROUND
GAS PIPE LINE UNDERGROUND
ELECTRIC (MULTICABLES)
ELECTRIC CABLES PROTECTED BY PVC DUCT PIPE
SEWERAGE PIPE
UTILITY LINE (UNKNOWN)
CONCRETE STRUCTURE
PROTECTION LINE ABOVE GROUND
GAS PIPE LINE
Type :Non-Metallic
Depth :1.63(±0.20m)
FIRE PROTECTION LINE
Type :Metallic
Depth :1.50(±0.20m)
ELECTRIC MULTICABLES
Type :Metallic
Depth :1.40(±0.20m)
Utility Line(Unknown)
Type :Non-Metallic
Depth :1.32(±0.20m)
SEWER-PIPELINE
Type :Metallic
Depth :1.60 (±0.20m)
Utility Line(Unknown)
Type :Metallic
Depth :1.30(±0.20m)
POTLINE LOBBY 6
ENTRANCE

Comprehensive work by our team



COMPREHENSIVE ASBUILD

TOPOGRAPHY & PLANIMETRIC FEATURES



COMPREHENSIVE ASBUILD UNDEGROUND UTILITIES

RE/INFORCED CONCRETE PAVEMENT
FIRE PROTECTION LINE UNDERGROUND
GAS PIPE LINE UNDERGROUND
CANOPY
CONCRETE STRUCTURE
12.32
8.40
1.06
0.65
2.34
0.81
2.91
2.81
2.48
0.84
2.44
2.79
ABOVE GROUND
E ABOVE GROUND
FIRE PROTECTION LINE
Type :Metallic
Depth :1.50(±0.20m)
GAS PIPE LINE
Type :Non-Metallic
Depth :1.63(±0.20m)
ELECTRIC (MULTICABLES)
ELECTRIC CABLES PROTECTED BY PVC DUCT PIPE
ELECTRIC MULTICABLES
Type :Metallic
Depth :1.40(±0.20m)
SEWER-PIPELINE
Type :Metallic
Depth :1.60 (±0.20m)
SEWERAGE PIPE
Utility Line(Unknown)
Type :Non-Metallic
Depth :1.32(±0.20m)
Utility Line(Unknown)
Type :Metallic
Depth :1.30(±0.20m)
UTILITY LINE (UNKNOWN)
Utility Line(Unknown)
Type :Metallic
Depth :1.90(±0.20m)


3D MODEL
Command:
Command:
Command:

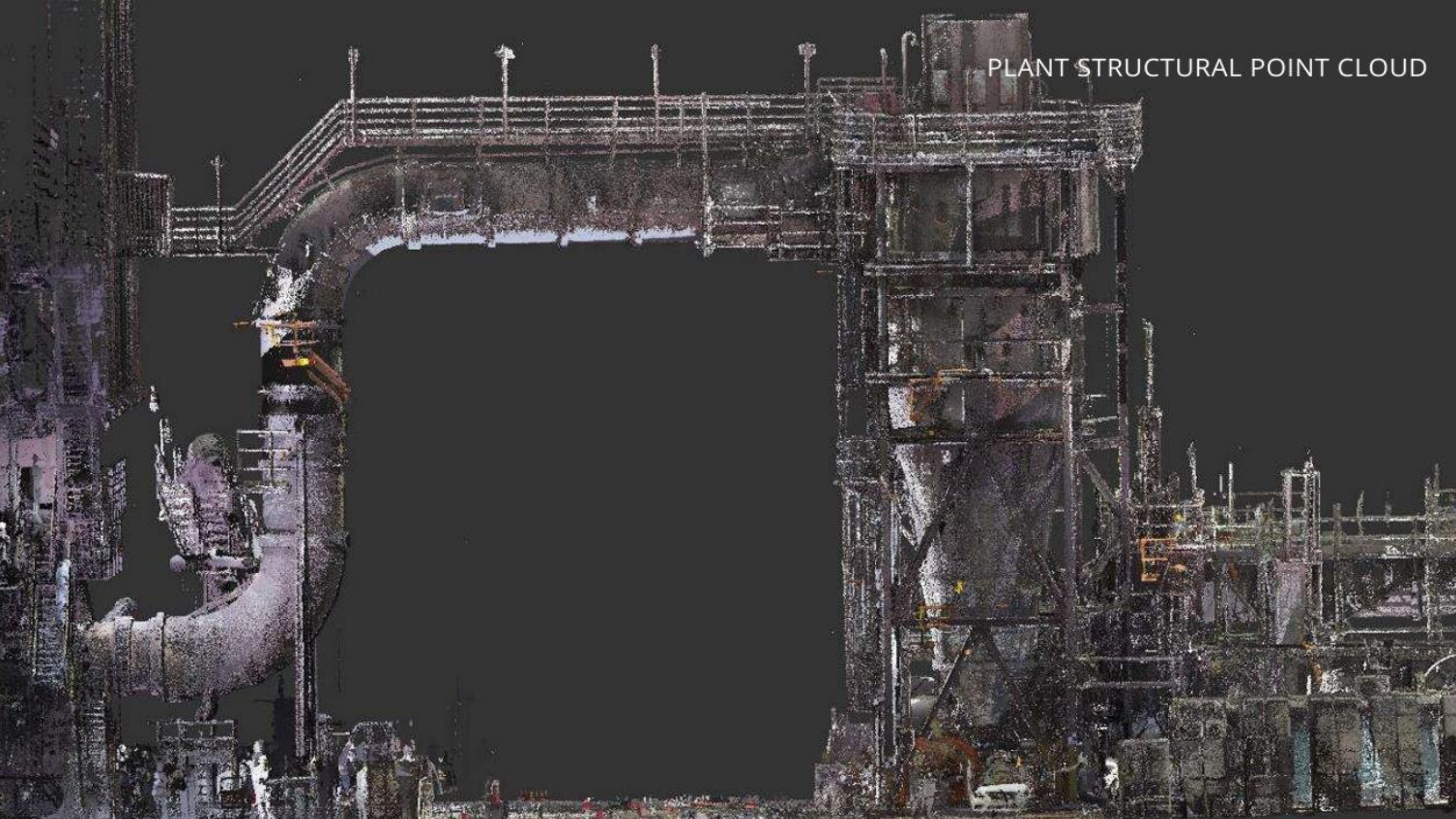

3D MODEL

3D MODEL

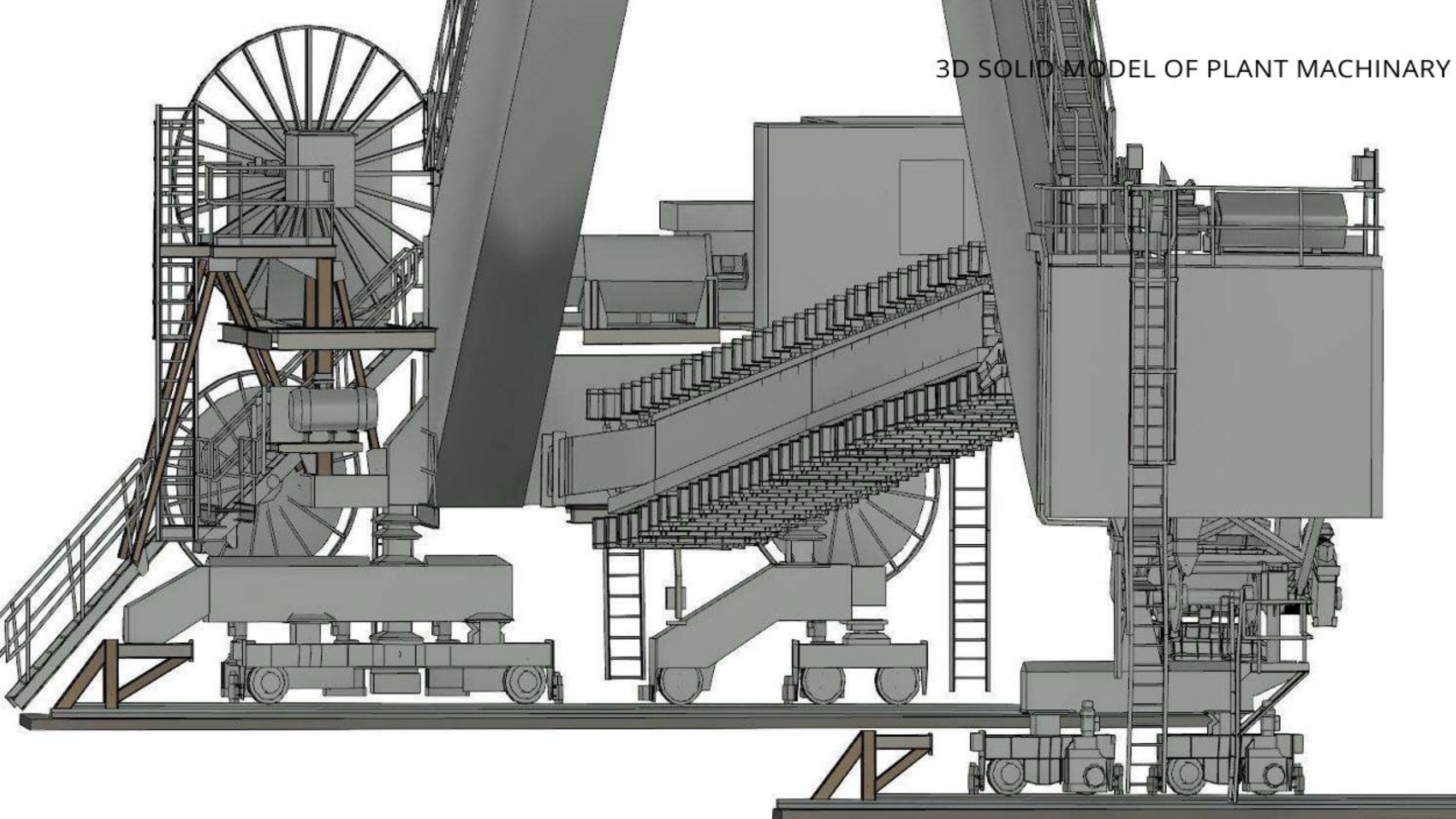
RIYADH DEVELOPMENT AUTHORITY BUILDING

3D MODEL

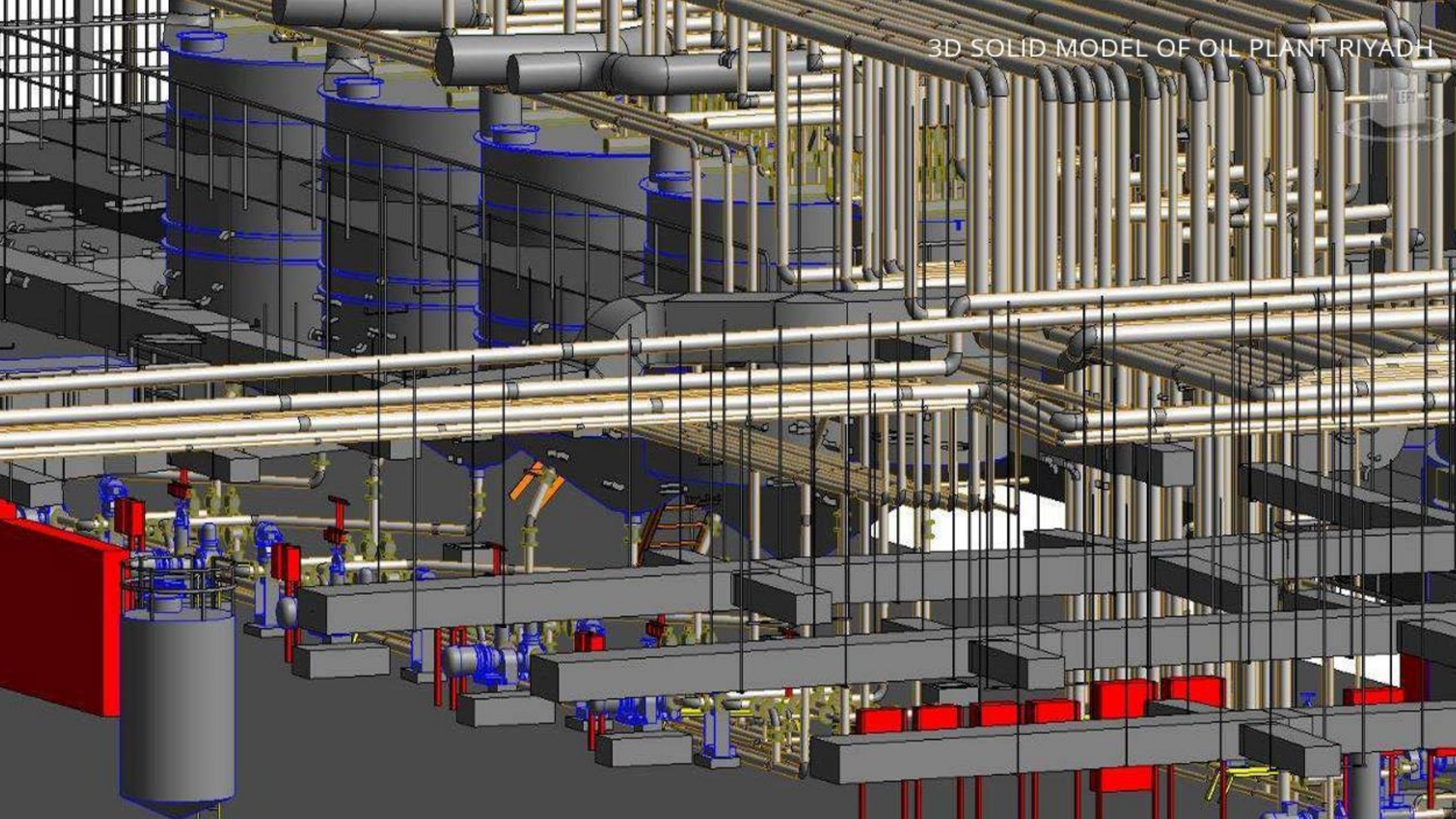
RIYADH DEVELOPMENT AUTHORITY BUILDING

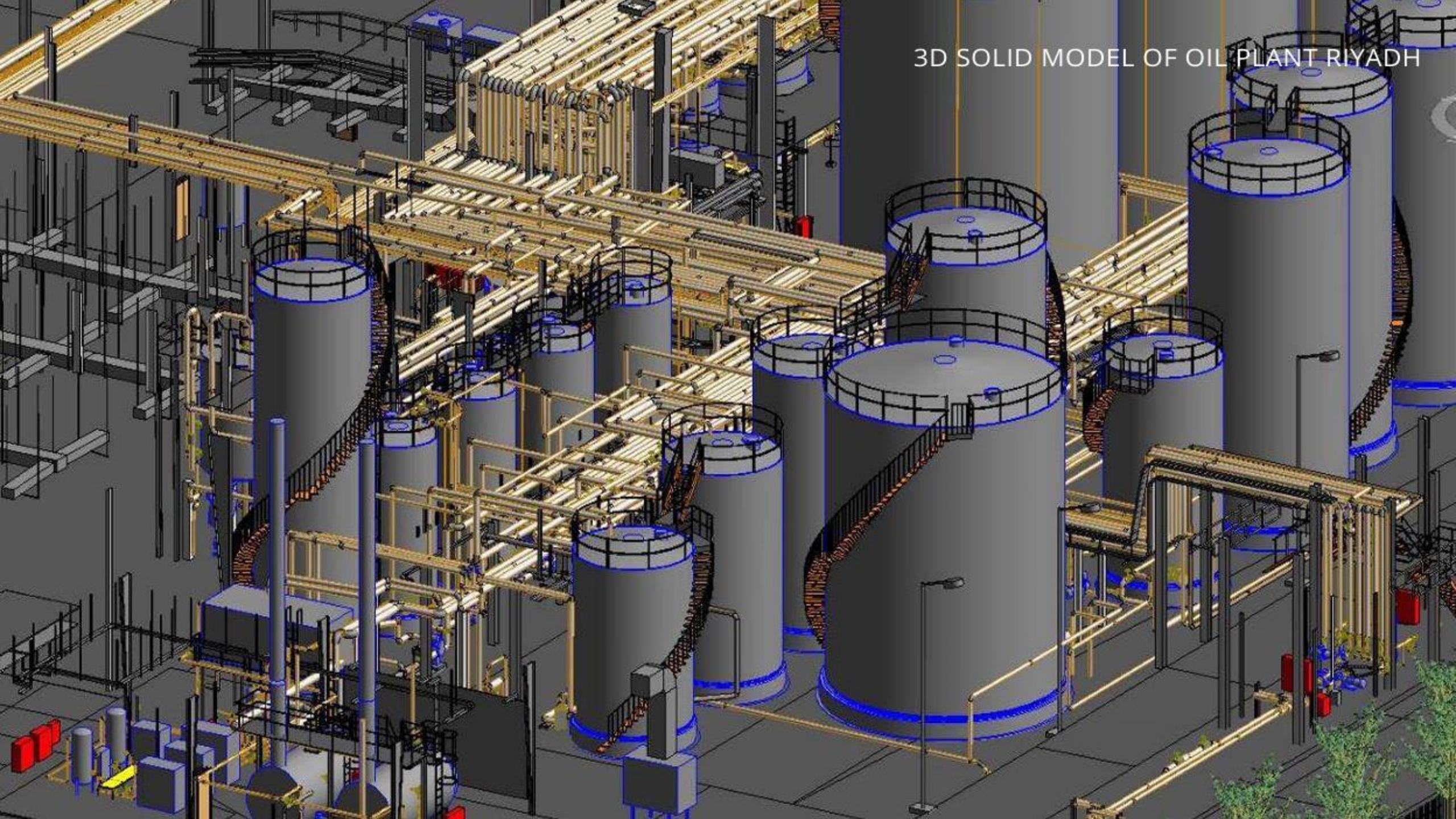

PLANT STRUCTURAL POINT CLOUD

3D SOLID MODEL OF PLANT MACHINARY

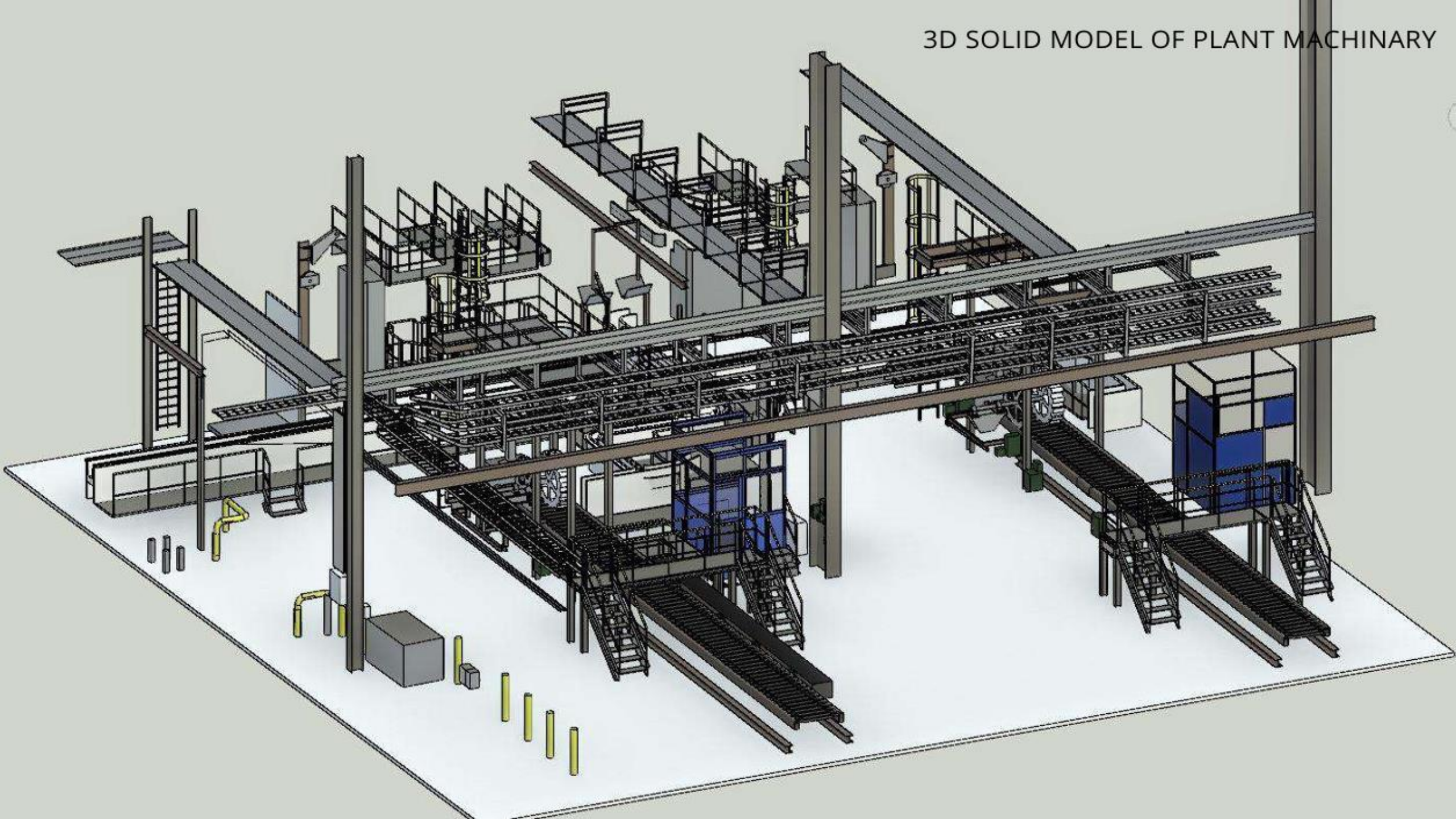



3D SOLID MODEL OF OIL PLANT RIYADH


3D SOLID MODEL OF OIL PLANT RIYADH


3D SOLID MODEL OF OIL PLANT RIYADH

3D SOLID MODEL OF PLANT MACHINARY



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