

Project Type : Mixed Use Building - U.S.A

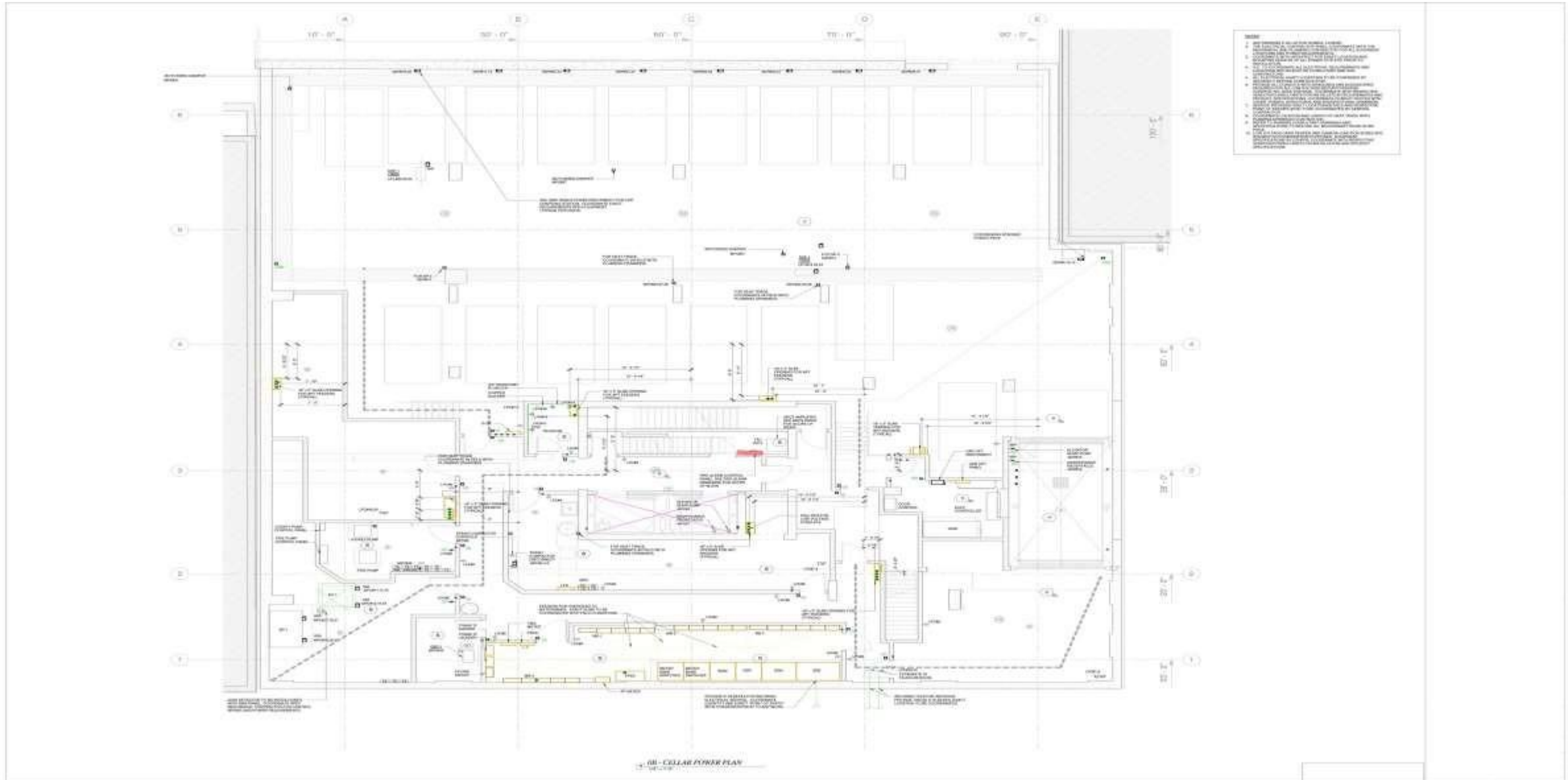
Scope of Work : LOD400 MEPF Modeling,
Coordination and Documentation

Project Year : 2021-2022

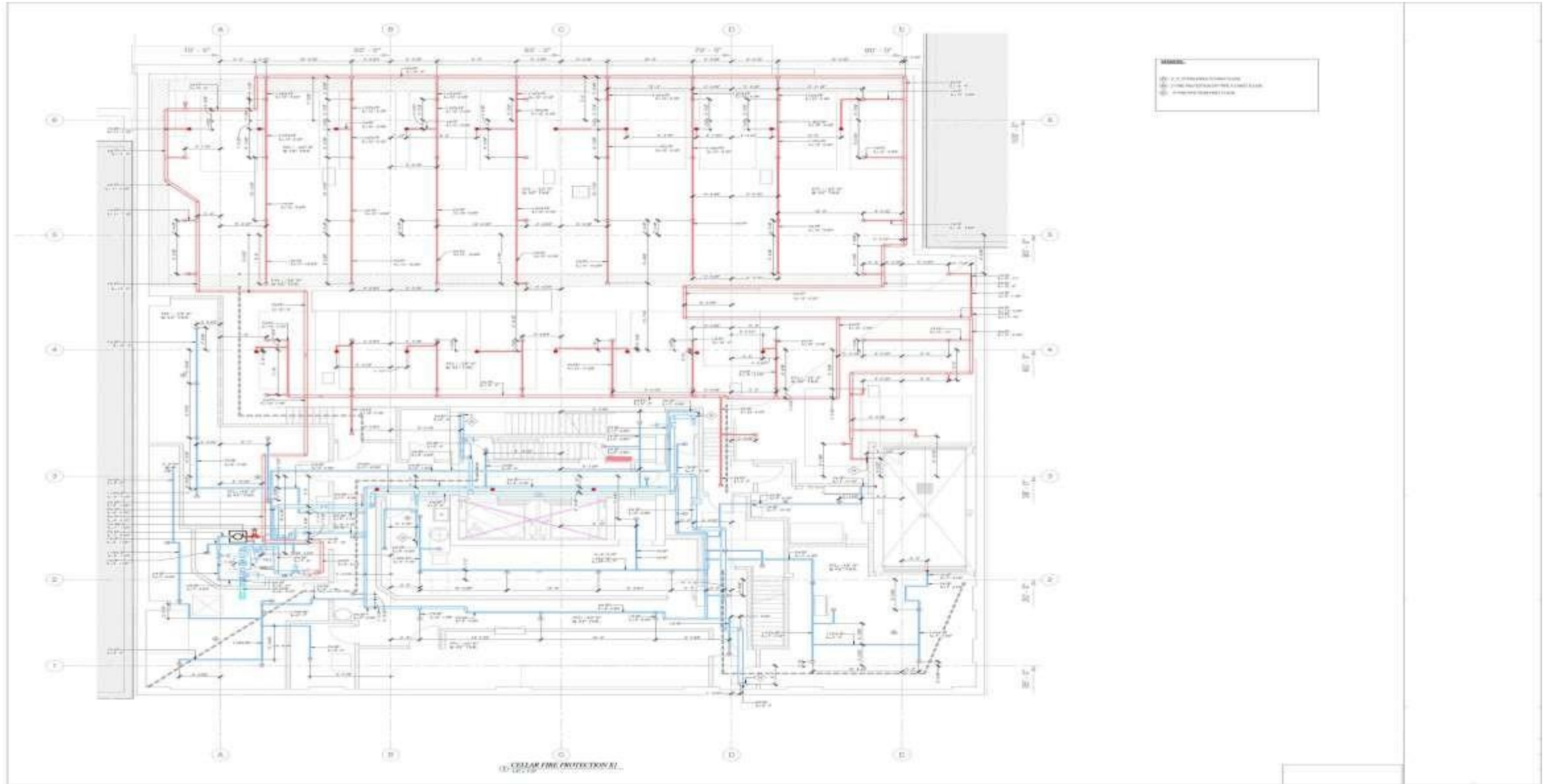
INTRODUCTION

BIM ENGINEERS
OUTSOURCING & OFFSHORING

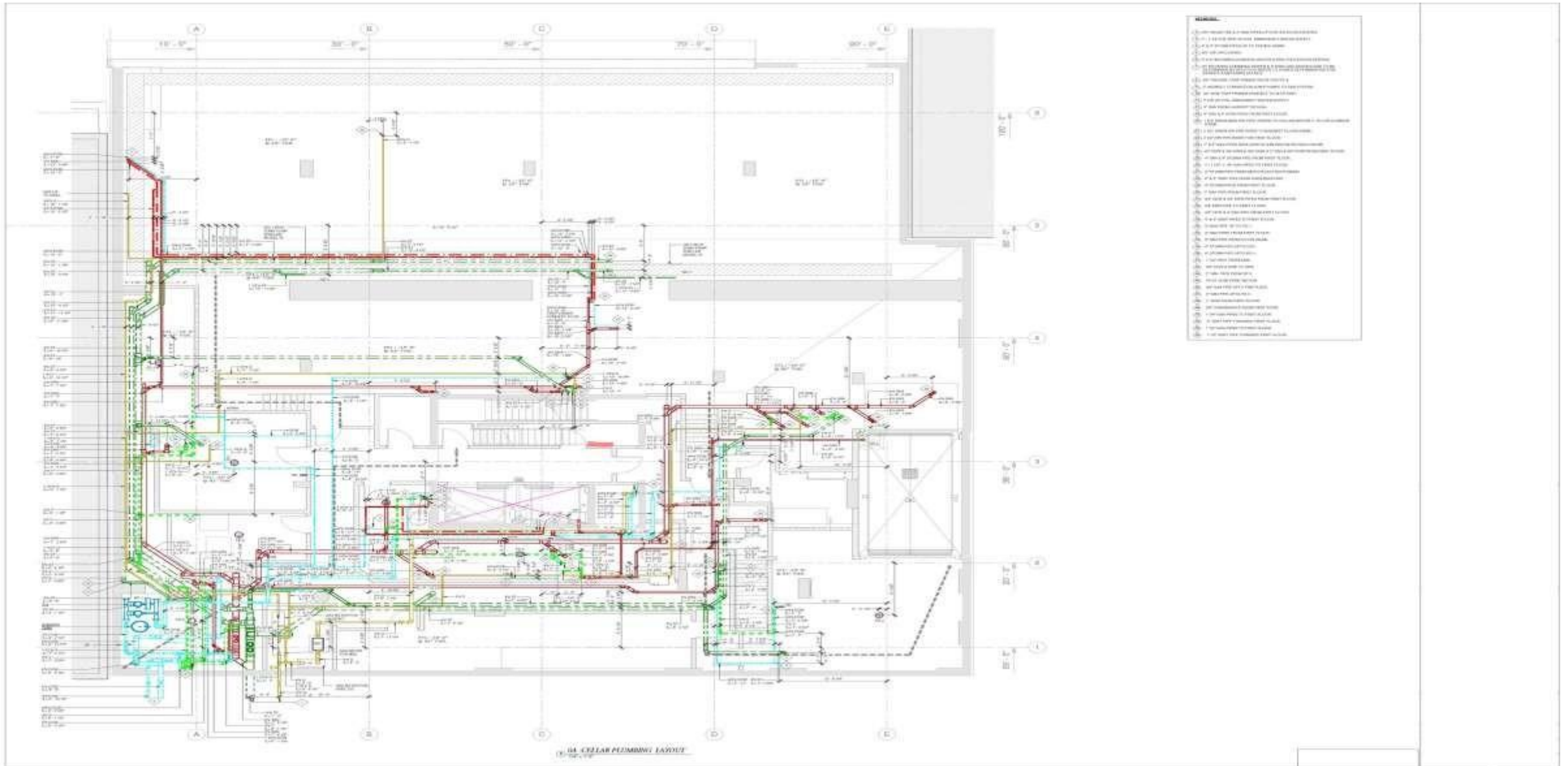
ELECTRICAL POWER PLAN



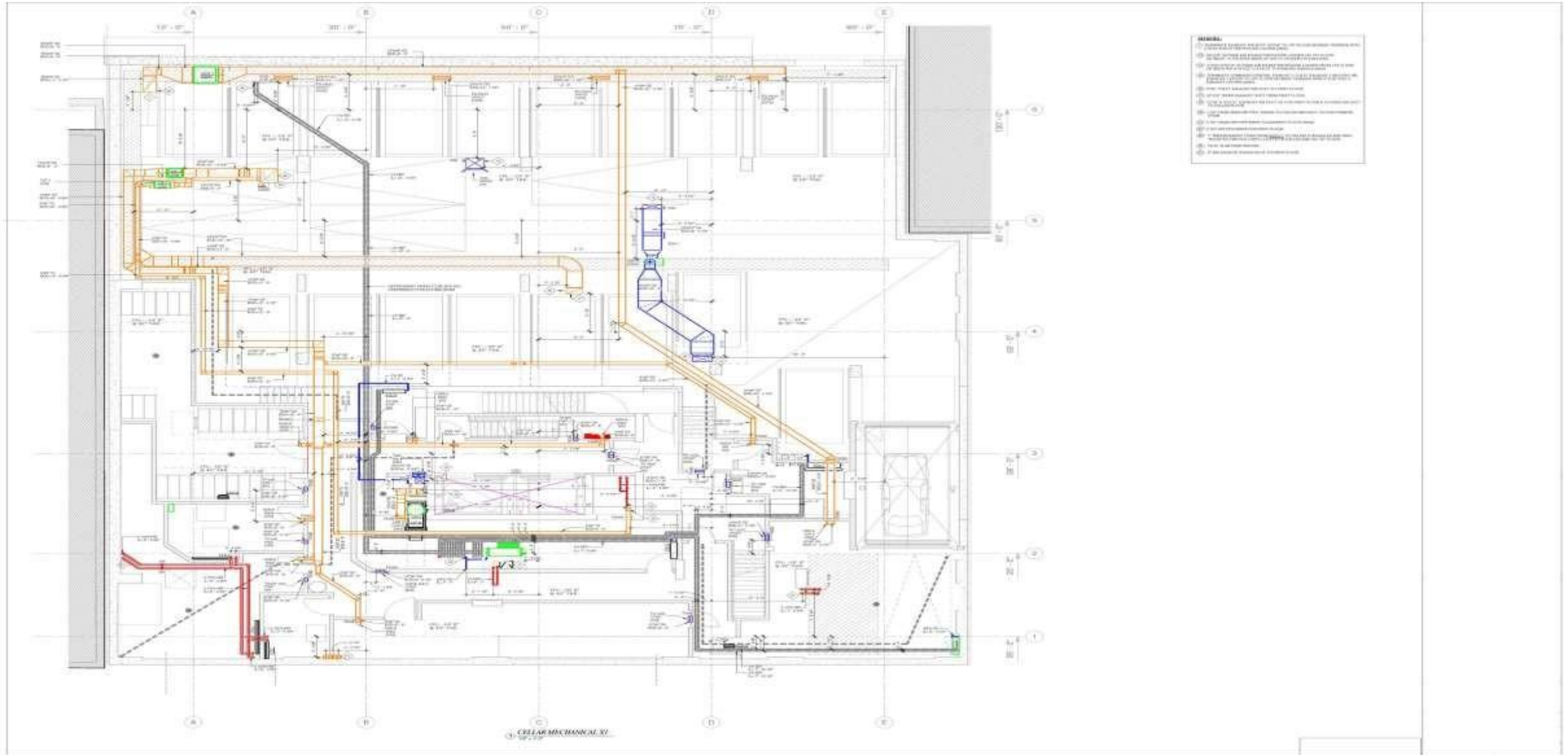
FIRE PROTECTION PLAN



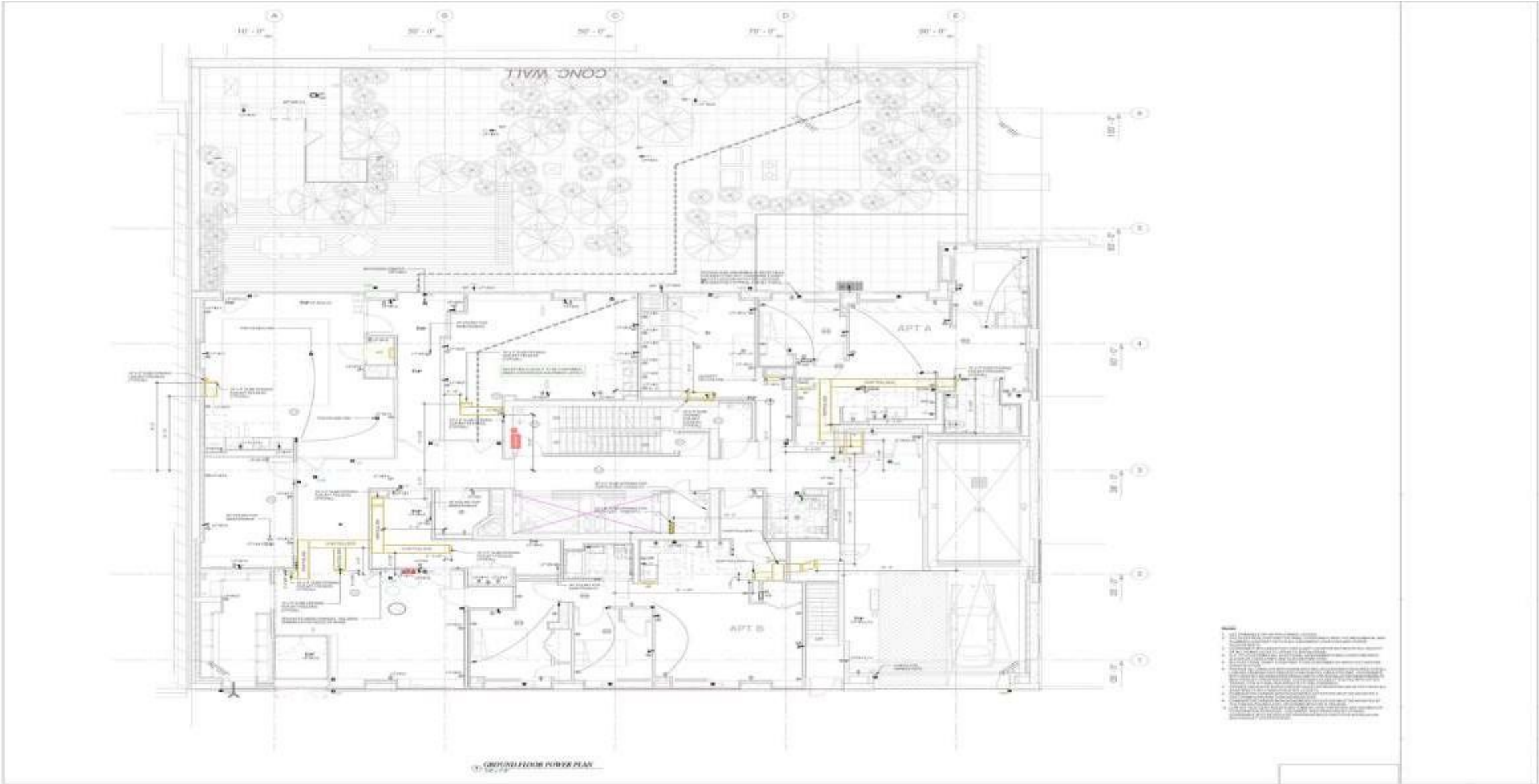
PLUMBING PLAN



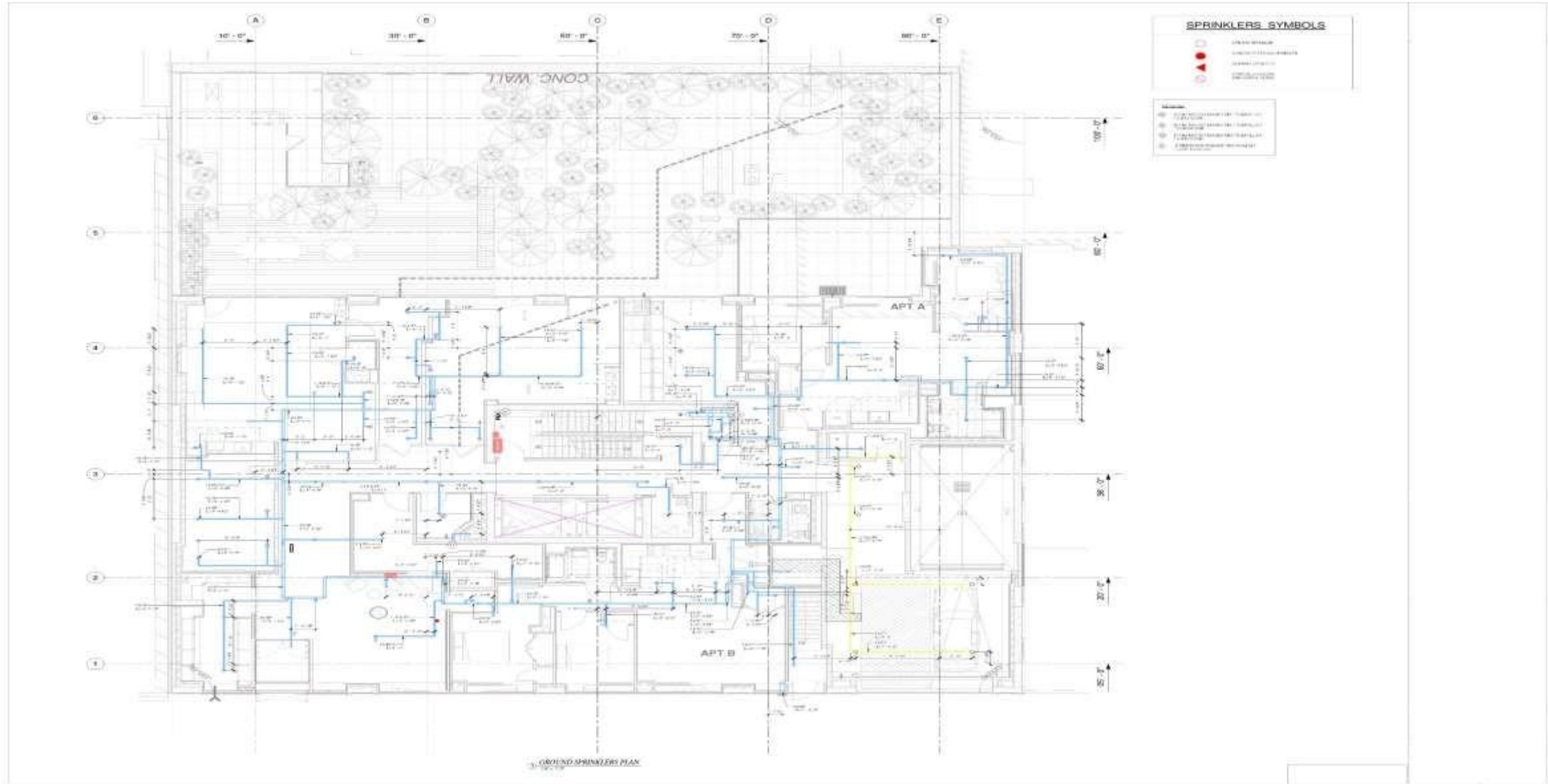
MECHANICAL PLAN



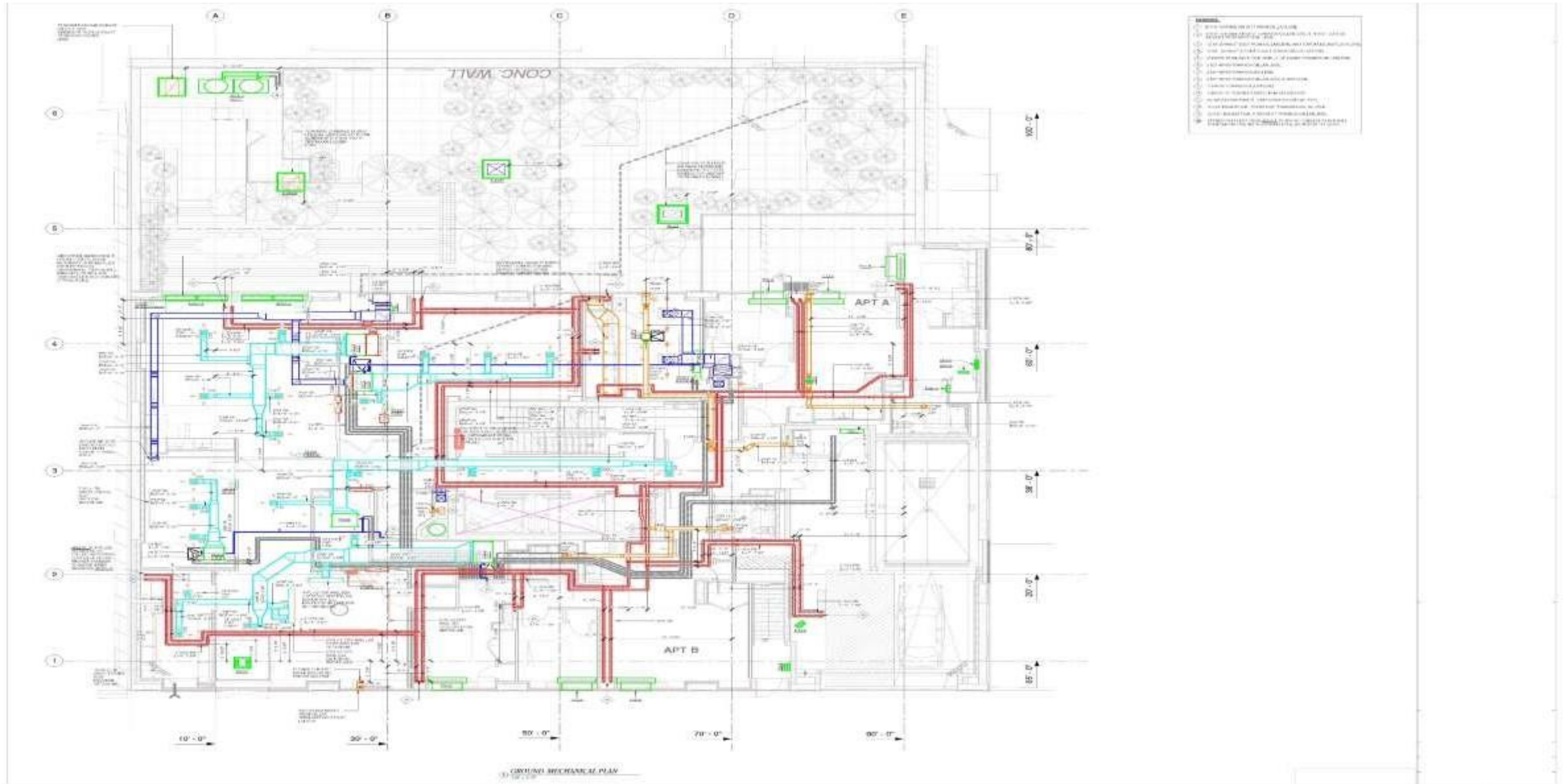
GROUND FLOOR ELECTRICAL POWER PLAN



FIRE PROTECTION PLAN



MECHANICAL PLAN





WORK SHARE PARTNERS TO SUCCESS...

Detail Design Capabilities

ALPHA BIM ENGINEERS SERVICES – STAKEHOLDER COVERAGE



Surveyors and Cost Consultants

Building Product Manufacturers

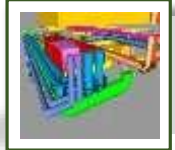
ALPHA BIM ENGINEERS DETAIL DESIGN & BIM SERVICES



ARCHITECTURE



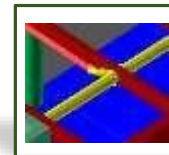
STRUCTURE (PRE-FAB, CASH-IN-SITU)



MEP — MECHANICAL, ELECTRICAL, PLUMBING & FIRE



CONTENT CREATION / REVIT LIBRARIES



COORDINATION / CLASH DETECTION SERVICES



ENERGY ANALYSIS / LEED FACILITATION



INTEGRATION WITH PROJECT SCHEDULES — 4D



QUANTITY TAKE-OFF/ ESTIMATION

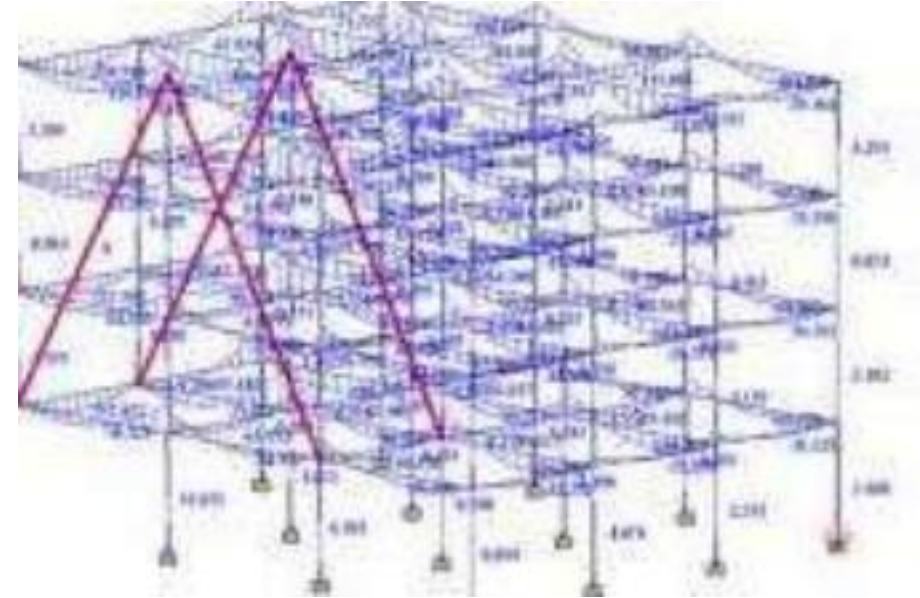
- QUALIFIED STAFF with Domain Knowledge
- EXPERT TEAM OF Engineers, Architects and Technical Experts
- EXPERIENCE across mature markets (US, UK, ME, Australia and Far-east)
- ONE-STOP solution provider for knowledge based services to AECO, Utilities, Infrastructure Sectors

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- Design development
- Interiors Modeling
- Façade Detailing and Modeling
- Construction documentation
- As-built drawings
- Landscape and Hardscape modelling
- Family and Content Creation
- Renderings, Animations & Walk Through
- Laser Scan to BIM
- Integration with FM tools



- Preliminary Structural Design
- Preliminary Structural Drawings
- Structural Analysis
- Detailed Structural Design
- Detailed Structural Drawings
- Design for Building Foundation
- Rebar Modeling and BBS
- Pre-Cast and Cast-in-Situ Expertise
- Pre-Cast Optimization and Equipment Consulting





















- Heat Load calculations
- Sizing & selection of HVAC equipment
- Zoning & Pressurization diagrams
- Air flow diagrams
- Schematics - Heating, Cooling & Ventilation
- Energy efficiency analysis
- Equipment General arrangement plan
- Ducting plan, section details, fabrication drawings
- Plant room layouts
- Equipment schedules
- Datasheets / specifications, BOQs

PLUMBING & FIRE PROTECTION



- Plumbing detailed engineering
- Domestic water services
- Sewage & Storm water services
- Storage tanks and distribution pumps
- Fire protection services
- Fire water storage and pumps
- Hydrant systems
- Sprinkler systems
- Fire detection and -alarm systems

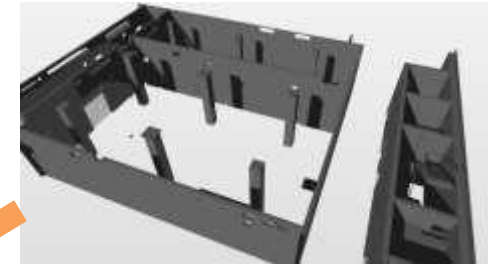
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 <p>Revit Architecture / Structure / MEP – <i>Basic ASMEP Modeling</i></p>	 <p>API/ Software Development – Microsoft Technologies</p>
 <p>Tekla-RC Structure (CIP and Steel) – <i>Steel and Rebar Modeling with BBS</i></p>	 <p>Database – MS-SQL, Oracle, MS-Access, My-SQL</p>
 <p>Navisworks and Solibri – <i>Model Integration and Clash Analysis</i></p>	 <p>ESRI (ArcGIS), MapInfo, MapGuide – <i>GIS Tools</i></p>
 <p>Primavera / MS Projects – <i>Project Scheduling, 4D Integration</i></p>	 <p>Google Maps, Bing Maps, Google Earth – <i>GIS Integration</i></p>
 <p>Synchro/ Navisworks – <i>4D/ 5D Integration</i></p>	 <p>Autodesk Green Building Studio – <i>Energy Simulation</i></p>
 <p>Photoshop /3DS Max/ VRay/ InDesign/ Lumion – <i>3D rendering and walkthroughs</i></p>	 <p>IES – <i>Energy Analysis</i></p>
 <p>MS- Excel – <i>Qty Take-off and Revit Integration</i></p>	 <p>HAP and Hevacomp – <i>Heat and Cooling Load calculations</i></p>
 <p>Etap – <i>Electrical Design Calculations, Short Circuit Analysis</i></p>	 <p>AMTECH Design Pro</p>
 <p>Etab 's – <i>Structural Design & Building Analysis</i></p>	 <p>Concrete Slab & Foundation Design</p>

3D – Design Reviews



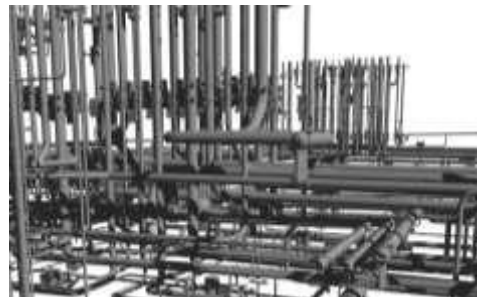
Common 3D Review
Platform;
Virtual Reality
NavisWorks



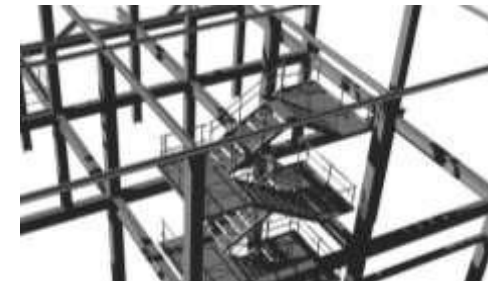
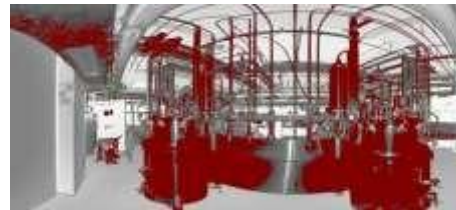
Process piping; PDMS



Steel structure; e.g. TEKLA



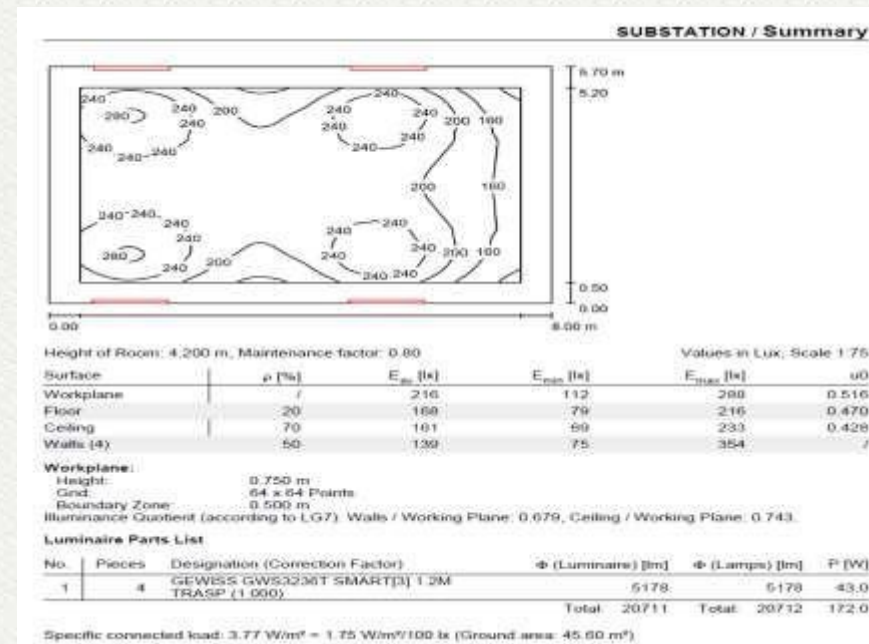
Point clouds from Laser scans



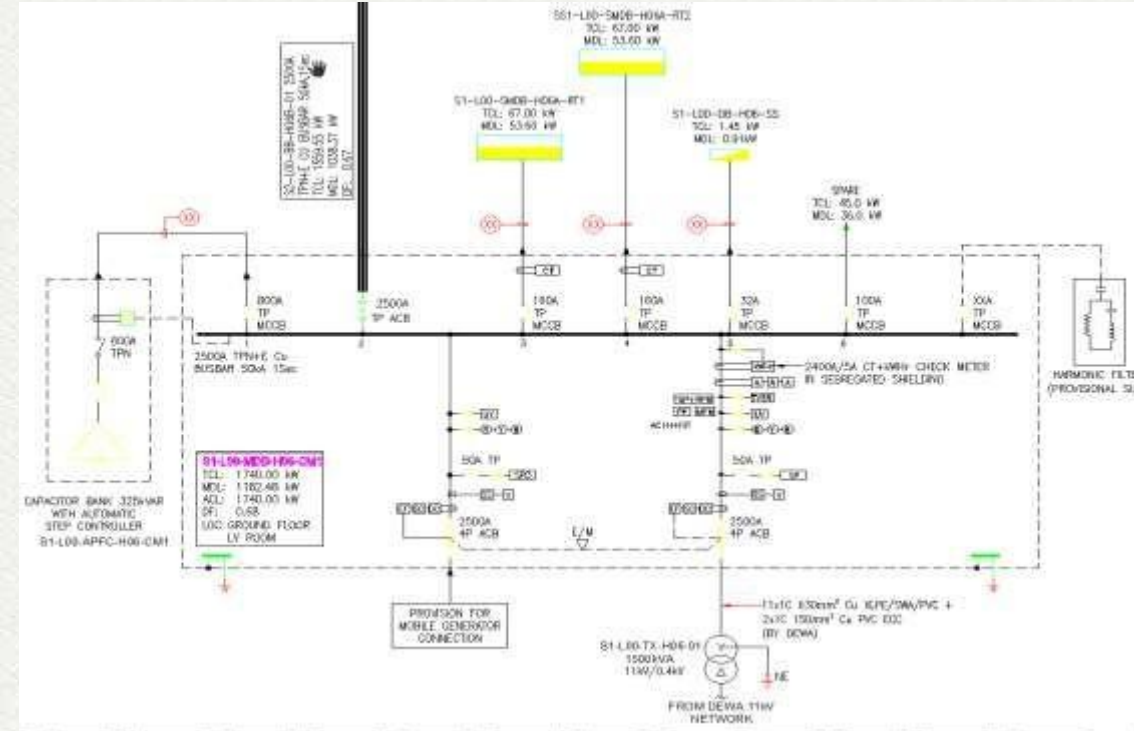
- Preparation of Design basis report for Power Distribution, Illumination, Earthing & Lightning protection, Communication and Security surveillance systems & Fire detection system.
- Estimation of load demand for the facility including emergency load demand.
- Detail design for Sub-station and load centers.
- Preparation of Single Line Diagram (SLD) for the complete power distribution concept with Emergency backup supply and UPS.
- Detailed calculation for equipment and system sizing as per relevant codes and standards.
- Design of Illumination system, selection of suitable luminaires and preparation of Illumination and Small Power Layout with Panel schedules for the building.
- Preparation of Lightning, Cabling, Grounding, Communication and CCTV layouts.
- Preparation of cable schedules and interconnection.

DETAILS OF CONNECTED LOAD / MAXIMUM DEMAND
SUB MAIN DISTRIBUTION BOARD

PROJECT		SITE NAME / DISTRIBUTION BOARD		OWNER													
PROJECT REF	SI24.00-MDS-H04-001	Sheet (1 of 1)		OWNER													
FED FROM	SI24.00-TS-H04-01			CONTRACTOR													
LOCATION	WB4 Ground Floor LV Room-1																
DESCRIPTION	SP	DATE	AMPS	FALL	PVC/CABLE	CABLE SIZE	EDC	CONNECTED LOAD - LV	COMM. LOAD	STANDBY LOAD	DIVERSITY	PROCT. TYPE	TYPE	LF	UNIT	REMARKS	
	TR	SC	ACB	PROCB	3X75	SWA/PVC	3C+3N/C, 3C	P-PH, V-PH, S-PH	W, W, W	W, W, W	W, W, W	W, W, W	W, W, W	W, W, W	W, W, W	W, W, W	W, W, W
REMARKS	1	200A	100	0.05	65	ALR	BY M'S DEVA	241.10	501.88	147.51	100.43	100.12	1101.14	0.70	80	1	2400A
REMARKS	2	100	250A	100	0.05	65	BY M'S DEVA										
MOBILE GENERATOR PROVIDED																	
OUTDOOR																	
SI-00-APP-004-001	TR		200A		50	XLPE SWA/PVC	2R4C 200 / 2R1C 100	255W/8									
SI-00-DB-004-002	SP		32A	50	XLPE SWA/PVC	2C10 / 1C10		0.00	0.00	0.00	0.00	0.00	0.00	0.00			
SI-00-DB-004-003	TR		1000A	50		SMMA TRAPE (U) RUBBER		379.20	363.00	300.37	1112.30	854.20	0.93				
SI-00-SMDS-004-001	TR		300A	50	ULP/SWA/PVC	4C 100 / 1C 50	44.50	44.00	44.44	120.00	110.00	0.00					
Fire Alarm	TR		250A	50	FIRE RATED	2X4C 240 / 2X1C 120	50.00	50.00	50.00	100.00	100.00	1.00					STARTER=1000A-ELC-1W
SI-00-ATS-004-001	TR		200A	50	FIRE RATED	4C 240 / 1C 120	73.01	73.02	73.02	210.40	202.14	0.93					SMDS=
Spah	TR		100A	50			15.00	15.00	15.00	45.00	36.00	0.80					
Automated Warning Fire Protection																	
								TOTAL CONNECTED LOAD PER PHASE:	501.88	147.51	100.43	STANDBY LOAD (3 PH) = 3.00					
								TOTAL CONNECTED LOAD (3 PH):	1008.83	300							
								MAXIMUM DEMAND (3 PH):	1001.14	300	AT	0.70	DIVERSITY				
								ACTUAL CONNECTED LOAD (3 PH):	1008.83	300							
TYPE OF MATERIALS/OF RECORDS																	
[TABLE WITH MATERIALS AND PHASES]																	

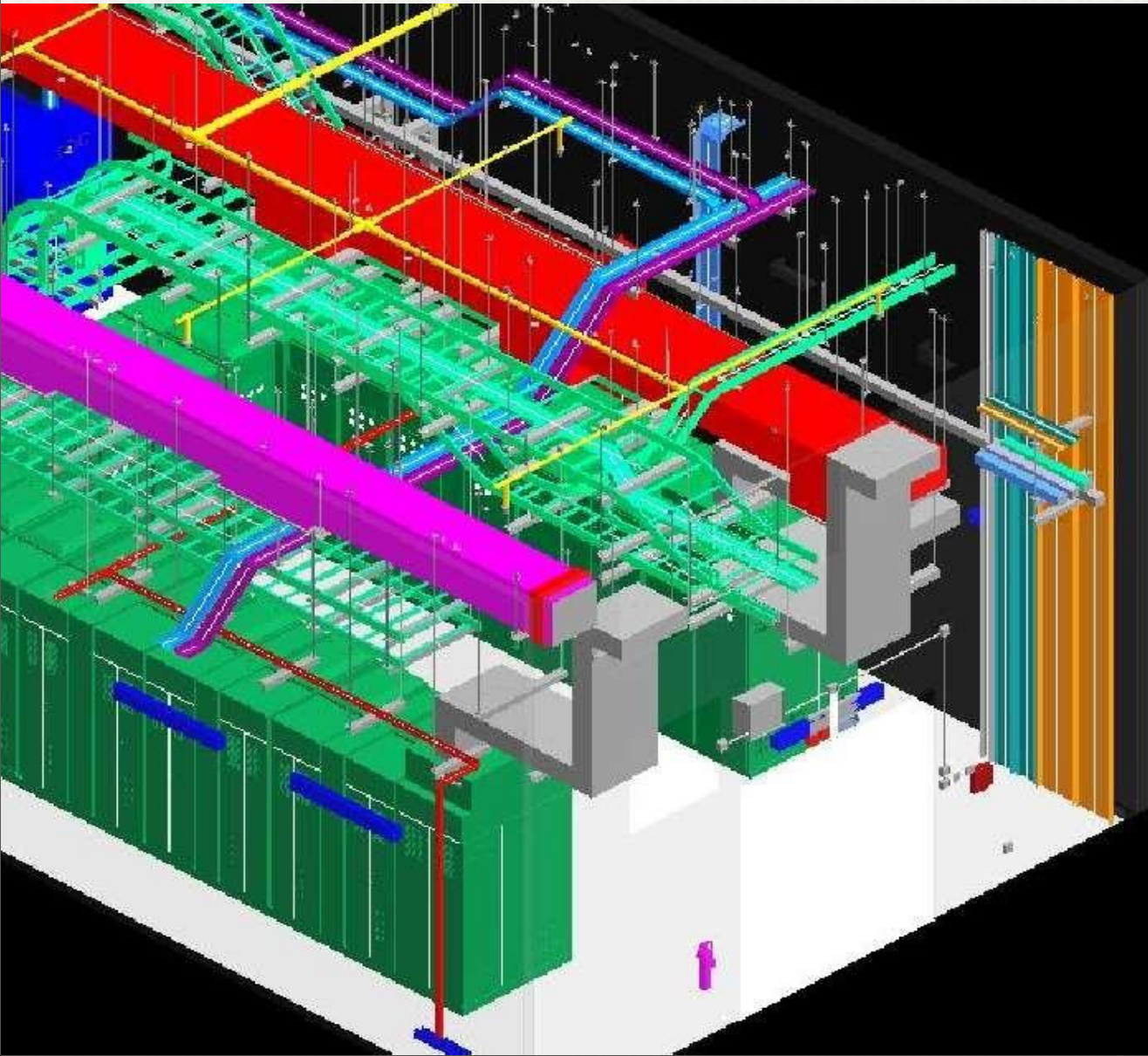


- Design Basis Report
- Substation/control rooms Design.
- Power Flow Scheme and Detail Design for PCC& Aux.Panels.
- Transformer Sizing and Emergency Back up.
- Technical specifications & Bill of Quantities.

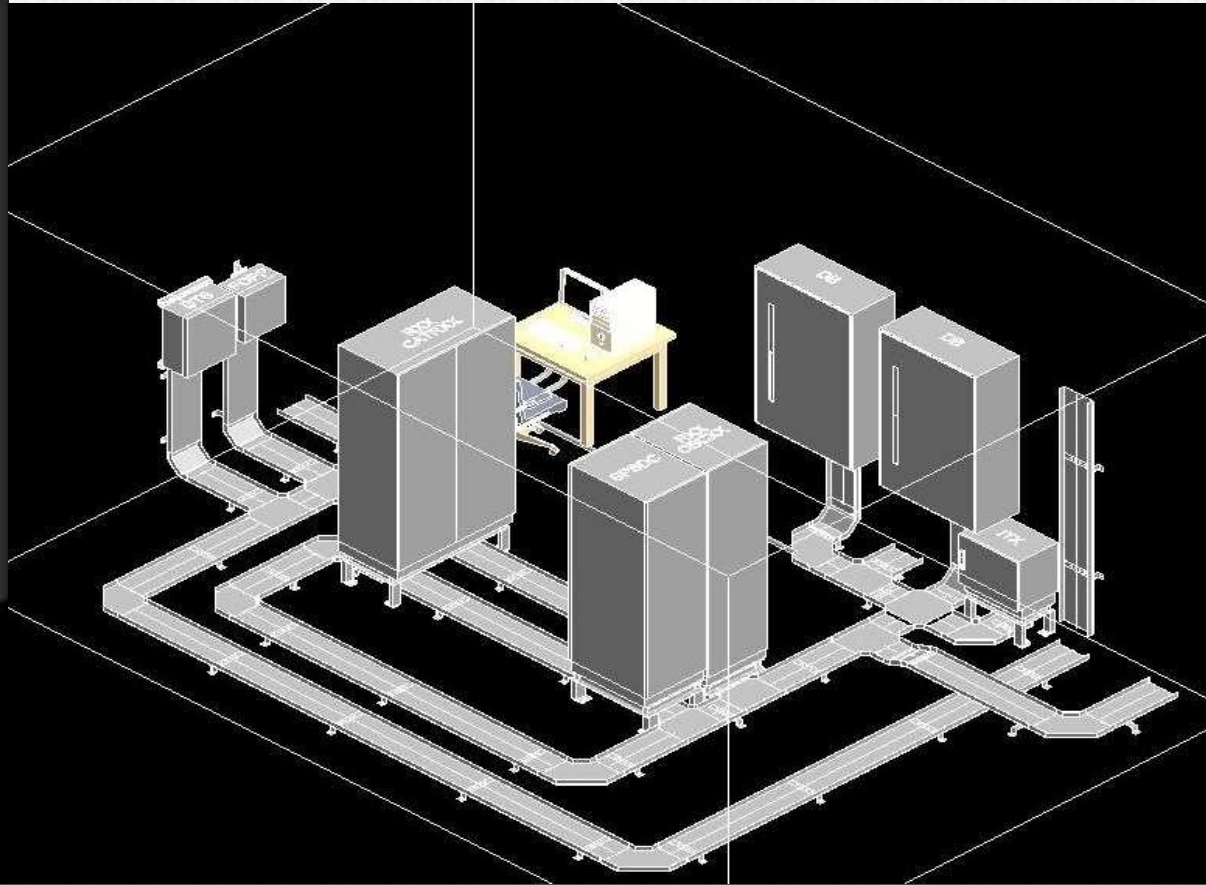


VOLTAGE DROP CALCULATIONS																			
Sl.No.	Cable From	Connected To	Trains per phase	Cores	Cable Size Span or Busbar Current Rating	Wire 'C' for Cable or 'B' for Busbar Duct	TYPE XLPE OR Cable & CU or AL for Busbar Duct	Operating Voltage (V)	Length (m)	TCL in kW	A DM IN KW	ACB / MCCB Rating	Voltage Drop (mV)	% Voltage Drop Allowed (%)	Max. Voltage Drop allowed (V)	Power factor	Load Current A	Act. Voltage Drop (V)	Act. % Voltage Drop (V)
1	MSB	DB-GLP1	1	4	50	C	XLPE	400	12	16.50	16	125	0.870	1	4	0.9	30	0.3	0.08
2	MSB	DB-GPP1	1	4	50	C	XLPE	400	12	26.30	22	125	0.87	1	4	0.9	42	0.4	0.11
3	MSB	DB-GLP2	1	4	50	C	XLPE	400	70	27.90	24	125	0.87	1	4	0.9	45	2.7	0.68
4	MSB	DB-GPP2	1	4	50	C	XLPE	400	70	33.70	29	125	0.87	1	4	0.9	54	3.3	0.82
5	MSB	DB-GPP3	1	4	50	C	XLPE	400	70	10.70	9	125	0.87	1	4	0.9	17	1.0	0.26
6	MSB	MCP-01	1	4	70	C	XLPE	400	12	81.50	89	160	0.8	1	4	0.9	131	0.9	0.24
7	MSB	MCP-02	1	4	70	C	XLPE	400	12	64.00	54	160	0.8	1	4	0.9	103	0.7	0.18
8	DB-GLP1	Longest lighting ckt	1	1	2.5	C	XLPE	230	55	1	0.85	10	16.4	4	4.6	0.9	5	4.4	1.89
9	DB-GLP2	Longest lighting ckt	1	1	2.5	C	XLPE	230	67	0.6	0.68	10	16.4	4	4.6	0.9	4	4.2	1.85
10	DB-GPP1	Longest Power ckt	1	1	4	C	XLPE	230	62	1	0.85	32	10.2	4	4.6	0.9	5	3.1	1.33
11	DB-GPP2	Longest Power ckt	1	1	4	C	XLPE	230	72	0.8	0.68	20	10.2	4	4.6	0.9	4	2.6	1.23
16	MCP-01	ACCU/FAHU/TA/IRF-04	1	4	10	C	XLPE	400	55	8.0	7	40	4	2	8	0.9	13	2.8	0.71
17	MCP-01	FAHU/TA/IRF-04	1	4	10	C	XLPE	400	53	4.0	3	32	4	2	8	0.9	6	1.4	0.34
18	MCP-01	FAHU/TA/IRF-04	1	4	10	C	XLPE	400	57	4.0	3	32	4	2	8	0.9	6	1.5	0.37
19	MCP-01	ACCU/TA/IRF-04	1	4	10	C	XLPE	400	55	2.0	2	20	4	2	8	0.9	3	0.7	0.18
20	MCP-01	ACCU/IT/TA/IRF-04	1	4	10	C	XLPE	400	55	2.0	2	20	4	2	8	0.9	3	0.7	0.18
21	MCP-01	TEF/TA/IRF-02	1	4	10	C	XLPE	400	46	2.5	2	20	4	2	8	0.9	4	0.7	0.18
22	MCP-01	FAHU/TA/IRF-01	1	4	10	C	XLPE	400	27	4.0	3	40	4	2	8	0.9	6	0.7	0.17
23	MCP-01	FAHU/TA/IRF-01	1	4	10	C	XLPE	400	32	4.0	3	40	4	2	8	0.9	6	0.8	0.21
24	MCP-01	ACCU/TA/IRF-01	1	4	16	C	XLPE	400	32	20.0	17	63	2.5	2	8	0.9	32	2.6	0.64
25	MCP-01	ACCU/TA/IRF-02	1	4	16	C	XLPE	400	32	20.0	17	63	2.5	2	8	0.9	32	2.6	0.64
26	MCP-01	KEF/TA/IRF-01	1	4	10	C	XLPE	400	52	3.0	3	20	4	2	8	0.9	5	1.0	0.25
27	MCP-01	ACCU/FAHU/TA/IRF-01	1	4	10	C	XLPE	400	32	8.0	7	40	4	2	8	0.9	15	1.5	0.41
28	MCP-02	FAHU/TA/IRF-03	1	4	10	C	XLPE	400	48	4.0	3	32	4	2	8	0.9	6	1.2	0.31
29	MCP-02	ACCU/FAHU/TA/IRF-03	1	4	10	C	XLPE	400	46	8.0	7	40	4	2	8	0.9	13	2.4	0.59
30	MCP-02	ACCU/TA/IRF-03	1	4	16	C	XLPE	400	42	20	17	63	2.5	2	8	0.9	32	3.4	0.84
31	MCP-02	TEF/TA/IRF-01	1	4	10	C	XLPE	400	43	2.5	2	20	4	2	8	0.9	4	0.7	0.17
32	MCP-02	EF/TA/IRF-01	1	4	10	C	XLPE	400	39	4.0	3	32	4	2	8	0.9	6	1.0	0.25
33	MCP-02	FAHU/TA/IRF-02	1	4	10	C	XLPE	400	36	4.0	3	32	4	2	8	0.9	6	0.9	0.23
34	MCP-02	ACCU/FAHU/TA/IRF-02	1	4	10	C	XLPE	400	32	8.0	7	40	4	2	8	0.9	13	1.6	0.41
35	MCP-02	EF/TA/IRF-01	1	4	10	C	XLPE	400	20	4.0	3	32	4	2	8	0.9	6	0.5	0.13
36	MCP-02	EF/TA/IRF-01	1	4	10	C	XLPE	400	25	4.0	3	32	4	2	8	0.9	6	0.5	0.16
37	MCP-02	FAHU/TA/IRF-03	1	4	10	C	XLPE	400	48	4.0	3	32	4	2	8	0.9	6	1.2	0.31

- Voltage drop Calculations.
- Lighting Calculations using Dialux software.
- Capital equipment selection and Sizing.



- 1) Detail Installation drawings.
- 2) Detailed Layout tagging and circuiting
- 3) Typical Light installation drawings.
- 4) Co-ordination with other MEP/ Structure/ Architecture.



Activities.....Detail Engineering Services



Mechanical Engineering

- Preparation of Design Basis Report (DBR) of all mechanical packages including HVAC, firefighting, Plumbing, Drainage & Sanitation
- Detailed calculations for equipment and system sizing as per relevant codes and standards.
- Developing the Schematic Diagrams.
- Preparation of Tender Specifications for all mechanical packages including HVAC, firefighting, Plumbing etc.
- Review/evaluation of the Technical Offers submitted by the bidders.
- Preparation and submission of Technical Recommendations.
- Preparation of Coordinated Layout drawings and Bill of quantities.
- Preparation of 3D modeling and clash checking.
- Preparation of piping / Ducting isometric drawings and support details.

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GROUP - I	
6.	INTERNAL LOAD DETAILS
7.	HVAC DATA GATHERING SHEET
8.	COMPUTER GENERATED HVAC LOADS CALCULATION
9.	VENTILATION, EXHAUST AND PRESSURIZATION
10.	SAND TRAP LOUVRE SIZING
11.	PRESSURE RELIEF DAMPER SIZING
12.	SMOKE PURGE FAN SIZING
13.	ELECTRIC DUCT MOUNTED HEATER SIZING
14.	SUMMARY OF COOLING LOAD
15.	EQUIPMENT DATA SCHEDULE

Design Criteria
(TOC)..Typ

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Calc Document (TOC)..Typ

Content

Development

ALPHA BIM ENGINEERS assists architects to transform 2D drafting and drawings to BIM base work process and provides the following for Content Development:

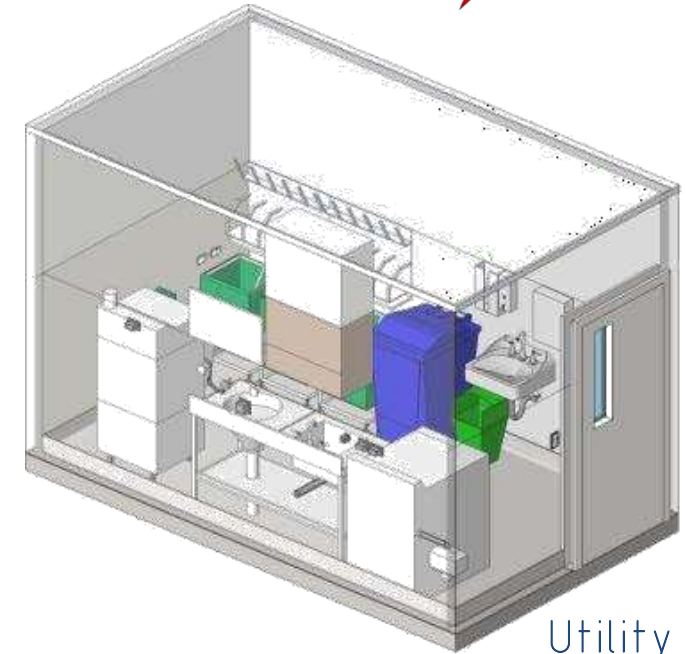
- ✓ Drawing and/or Revit Template files
- ✓ Standard Details/Callouts
- ✓ Revit Families
- ✓ BIM Consulting & Training

Revit Families contain all relevant information about technical specification including product manufacturer, Omni Class Code, Title & Subcategories, that help clients to identify the required component with much ease.

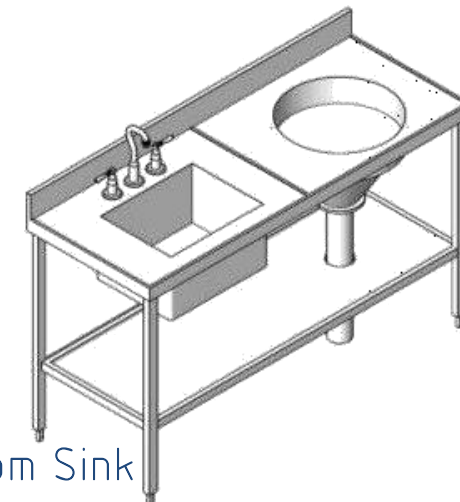
Instances of Revit Families created by Intec:

- | | |
|-------------------------------|-----------------------|
| ❖ Cabinet and Drawer | ❖ Plumbing Fixtures |
| ❖ Fixture & Furniture | ❖ Mechanical |
| ❖ Doors & Windows | ❖ Equipment |
| ❖ Specialty Equipment | ❖ Electrical Fixtures |
| ❖ Stairs & Railings | ❖ Structural |
| ❖ Care Cart and Desk | ❖ Components |
| ❖ Caseworks, Sheets & Watches | (Columns, Beam, |
| | etc) |
| ❖ Interior Decoration | |

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Utility Room



Utility Room Sink

QC CHECK



QC 1

- CHECKING AFTER FIRST PLOT
- PERFORMED BY INDIVIDUAL TEAM MEMBER

QC 2

- CHECKING AFTER SECOND PLOT
- PERFORMED BY THE TEAM LEADER

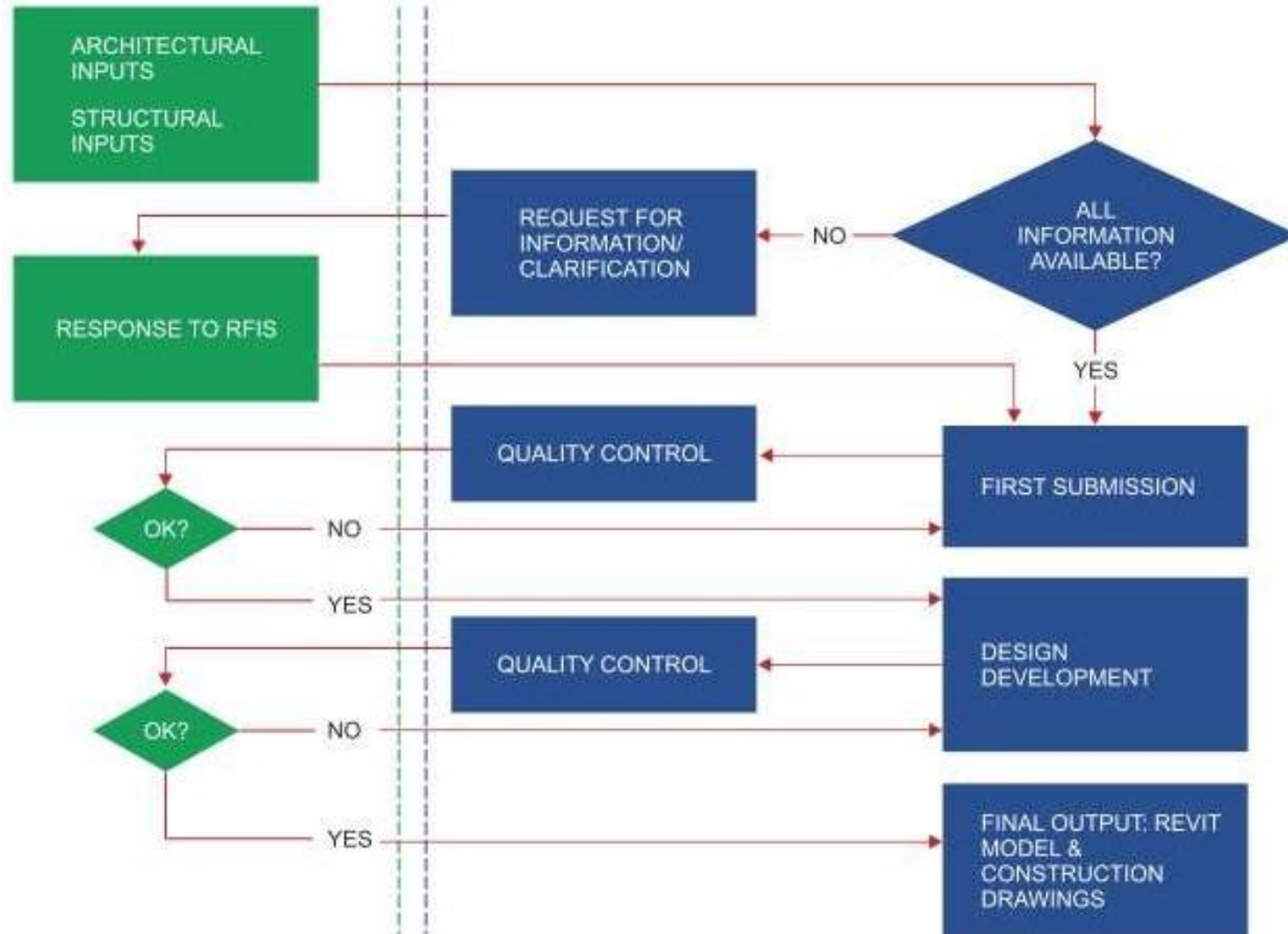
QC 3

- FINAL CHECK
- PERFORMED BY RESPECTIVE PROJECT MANAGER

**DELIVERY
TO
CLIENT**

WORKFLOW

CLIENT
ACTIVITY



Design Execution Plan

Detailed Design

Review

- Review Client provided Basic Design/ requirements/inputs/ information on site studies
- Review Validation Master plan provided by TEVA
- Develop Project Schedule and Critical Milestones
- Finalize Tender Packages
- **Identify Long Lead Items**
- Interaction with TEVA to agree on Time lines

30% Detailed Design

- Finalize Process Layout, P&IDs with Mechanical, Piping and Instrumentation details
- Finalize the master plan, CSA DBR
- Release Early works packages.
- Finalize Electrical / Utility Consumption requirements
- Finalize MEP DBR and schematics
- Design Review and Sign off

60% Detailed Design

- Develop Equipment / Piping / Arch / HVAC Mechanical utilities/ Instrumentation / Electrical Layouts
- Release Tenders for Long lead items
- Finalize tender specifications/Data sheets
- Space management/Coordination checks
- Design Review and Sign off

90% Detailed Design

- Release of Tender packages for all packages of CSA/MEP
- Develop BOQ and Cost estimate $\pm 10\%$
- Design Review and Sign off

Coordination/GFC Drawing Release

- Based on vendor input release of GFCAs per project Time line

References

Project

- xxx Facility, City, Tamil Nadu. (Manufacturing of Injectable)

Building Features

- Expansion of
- area to be developed in the new and existing facility

Building Purpose

- Facility for

Scope of Services

- xxt
- aaaaat
- aaaa
- Sss services



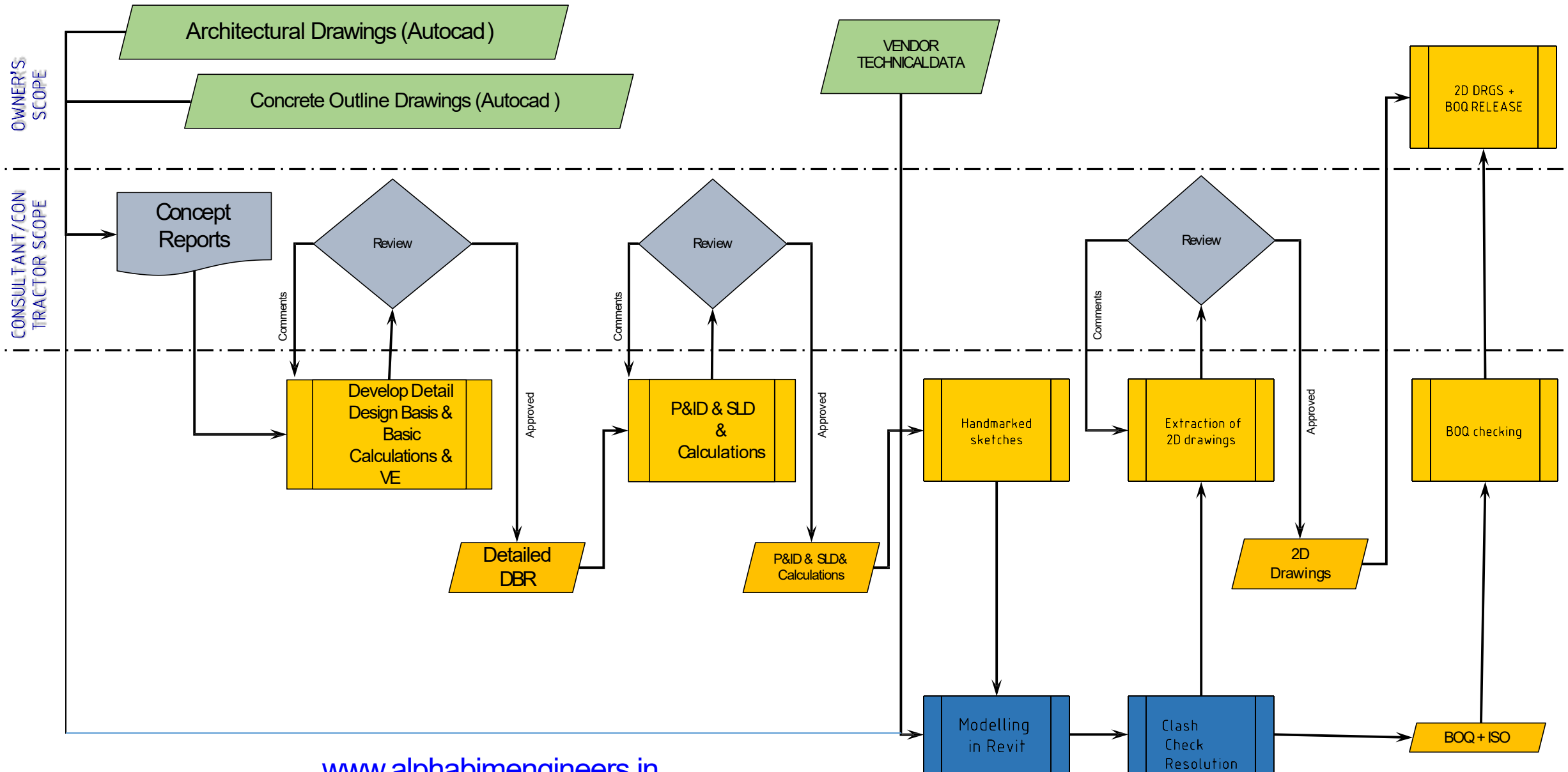
Project Brief



Detail design services for an expansion of the existing manufacturing facility its supporting functions. The major scope of work includes:

- Architectural Building
- Structural steel works for ground floor Service area.
- xxxxx
- Compressed Air Generation distribution system
- Steam Generation & Distribution systems
- Chilled Water
- HT Panel room
- Fire Protection system
- Sanitary Drain, Process Drain
- HVAC

DOR/Workflow Map.....Detailed Engineering Services



Details of Activities.....of ALPHA in Detail Engineering Services

Concept Design Design Input to ALPHA



Detailed Design Design/Deliverable output from ALPHA

HVAC Works:

Ventilation System

- ✓ Basement ventilation and smoke extraction system design
- ✓ Brief & layout of Fire Compartments/Zoning
- ✓ Determination of Fire Compartments/Zoning and basic layout
- ✓ Staircase & Lift Lobby Pressurization scheme and basic layout
- ✓ Toilet exhaust, Smoke extraction and Fresh air system layout and schematic
- ✓ Basic design calculation for ventilation system

Air-conditioning System

- ✓ Concept stage Basic Heat Load Estimate
- ✓ Proposed system type to be used for different areas of the development
- ✓ Heat recovery assessment, Proposed equipment location and proposed concept ducting layout
- ✓ Space allocation for AHU room, Pump Room, PHE Room, Chiller Plant Room, DGRoom, Cooling Tower, Pipe & Duct Risers, etc.

HVAC Works:

Ventilation System

- ✓ Basement ventilation and smoke extraction system in compliance to NBCI
- ✓ Validation of Fire Compartments/Zoning as per NBCI
- ✓ Calculation for Staircase & Lift Lobby Pressurization air flow requirement
- ✓ Toilet exhaust, Smoke extraction and Fresh air flow requirement calculation

Air-conditioning System

- ✓ Detailed heat load estimation using software program
- ✓ Heat recovery assessment and equipment selection
- ✓ Prepare ducting (air-conditioning & ventilation) and piping (chilled water) schematic drawings and & floor layout plans
- ✓ Pressure drop calculations for ducting & piping networks
- ✓ Equipment selection
- ✓ Designing the layout for AHU room, Pump Room, Plant Room, DGRoom, Cooling Tower, Pipe & Duct Risers, etc.

Details of Activities.....of ALPHA in Detail Engineering Services

Concept Design Design Input to ALPHA



Detailed Design Design/Deliverable output from ALPHA

Plumbing Works :

- ✓ Occupancy Load detail and water consumption
- ✓ Propose water storage , supply & drainage system layout
- ✓ Propose plumbing fixture layout (Toilets, Washroom, Kitchen, Pump Room etc.)
- ✓ Plumbing Risers locations and pipe routing
- ✓ Sump pits & Manhole layout
- ✓ Rain water pipe, layout and disposal
- ✓ STP capacity estimation
- ✓ Determine Spatial requirement for above.
- ✓ High Level BOQ
- ✓ Basic Technical specifications for proposed material and equipments for various plumbing systems.
- ✓ Landscape related services (if included as part of scope)

Plumbing Works :

- ✓ Revisit the occupancy Load and consumption detail to comply with NBCI.
- ✓ Pressure Pipe sizing and pressure drop estimation
- ✓ Soil & waste pipe – Size & Slope determination
- ✓ Plumbing Risers Sizing for Supply Water & Drainage (Soil, Waste & Vent) system
- ✓ Determine invert levels of the sump pits and manholes
- ✓ Determine pipe size and slope connecting the manholes
- ✓ Revisit STP capacity estimation
- ✓ Equipment selection (Pump, valve etc)
- ✓ Clash resolution in BIM
- ✓ Check and issue the 2D drawings for peer review and approval
- ✓ Issue the drawings for construction
- ✓ Issue Detailed Technical Specs & BOQ as per the prevailing standards
- ✓ Detailing of Landscape related services (if included as part of scope)

Details of Activities.....of ALPHA in Detail Engineering Services

Concept Design Design Input to ALPHA



Detailed Design Design/Deliverable output from ALPHA

Fire Protection Works:

Fire Protection Works:

- ✓ Occupancy Hazard Classification
- ✓ Preliminary Fire Engineering advice and feedback
- ✓ Preliminary Fire Safety Strategy Report (FSSR) summarizing proposed Alternative Solutions to address identified NBCI departures
- ✓ Assess external water supply capabilities (if possible)
- ✓ Determination of Fire Compartments/Zoning
- ✓ Estimate water supply demand & plan the storage for the same
- ✓ Select type of system to be used for different areas
- ✓ Determine Spatial requirement
- ✓ Determine extent of warning required
- ✓ Determine required sound levels to be achieved
- ✓ Qualitative and/or quantitative fire engineering analysis to support Alternative Solutions as required, including Computational Fluid Dynamics computer fire and smoke modeling, occupant egress Modeling, radiant heat flux calculations and structural fire engineering analysis (e.g. Finite Element Analysis)
- ✓ Fire Engineering report

Fire Protection Works:

- ✓ Revisit Occupancy Hazard Classification
- ✓ Fire Engineering Brief (FEB) and meeting with Authority Having Jurisdiction (AHJ) including Fire Brigade
- ✓ Validation of Fire Compartments/Zoning as per NBCI
- ✓ NBCI Compliance Assessment and Identify NBCI departures
- ✓ Revisit external water supply capabilities and demand estimate
- ✓ Estimate the water supply storage capacity
- ✓ Review the concept design w.r.t the NBCI
- ✓ Undertake hydraulic calculations for pipe sizing & pressure drop
- ✓ Select Fire Pumps & design the Pump Room Layout
- ✓ Check hydrant & hose reel coverage
- ✓ Determine type of detection & detectors layout
- ✓ Review the extent of warning required w.r.t the NBCI
- ✓ Review the required sound level to be achieved w.r.t the NBCI
- ✓ Check and issue the 2D drawings for peer review and approval
- ✓ Clash resolution in BIM
- ✓ Check and issue the 2D drawings for peer review and approval
- ✓ Issue the drawings for construction
- ✓ Issue Detailed Technical Specs & BOQ as per the prevailing standards

INTRODUCTION



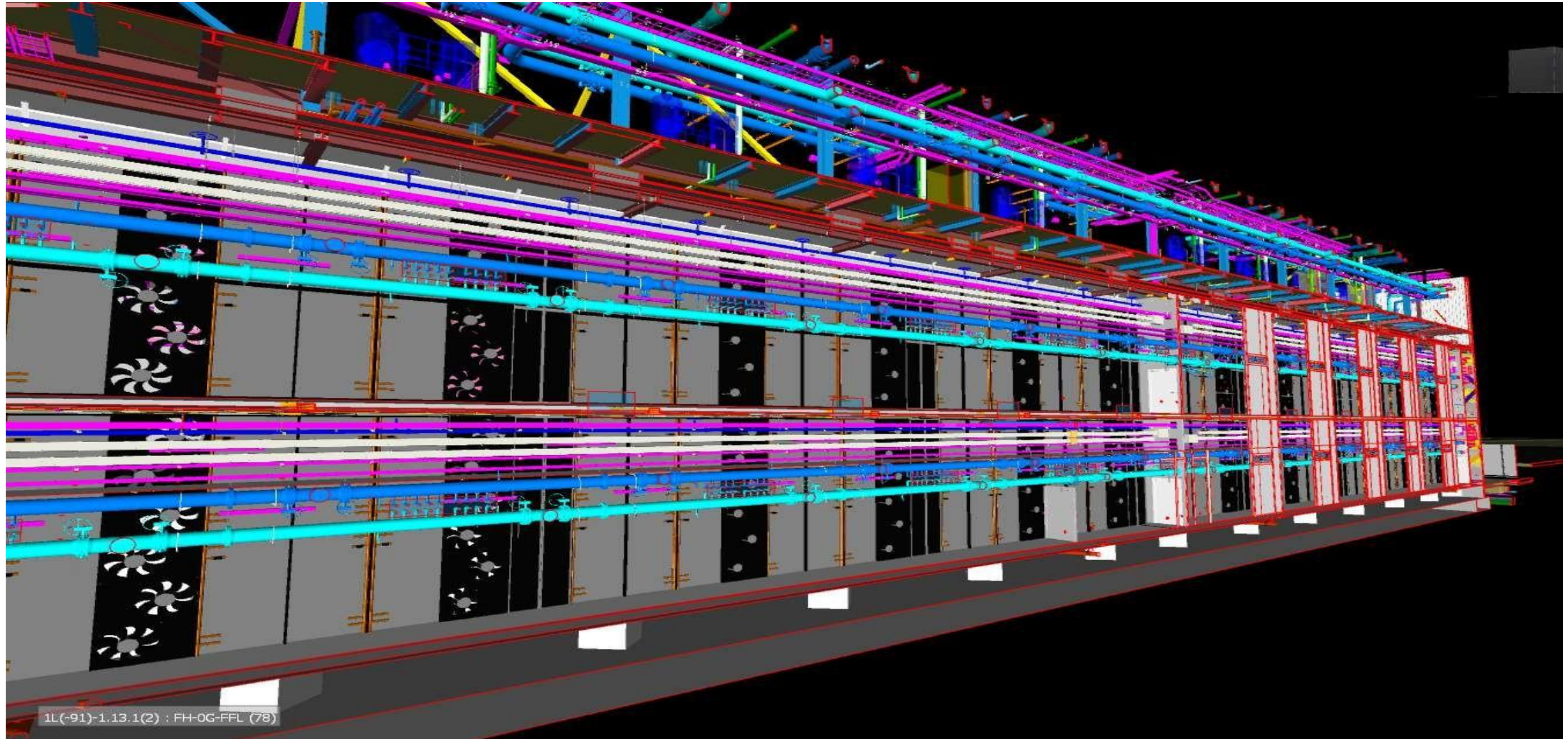
Project Type : Data Center - Ireland

Scope of Work : LOD400 Electrical Modeling,
Coordination and Documentation

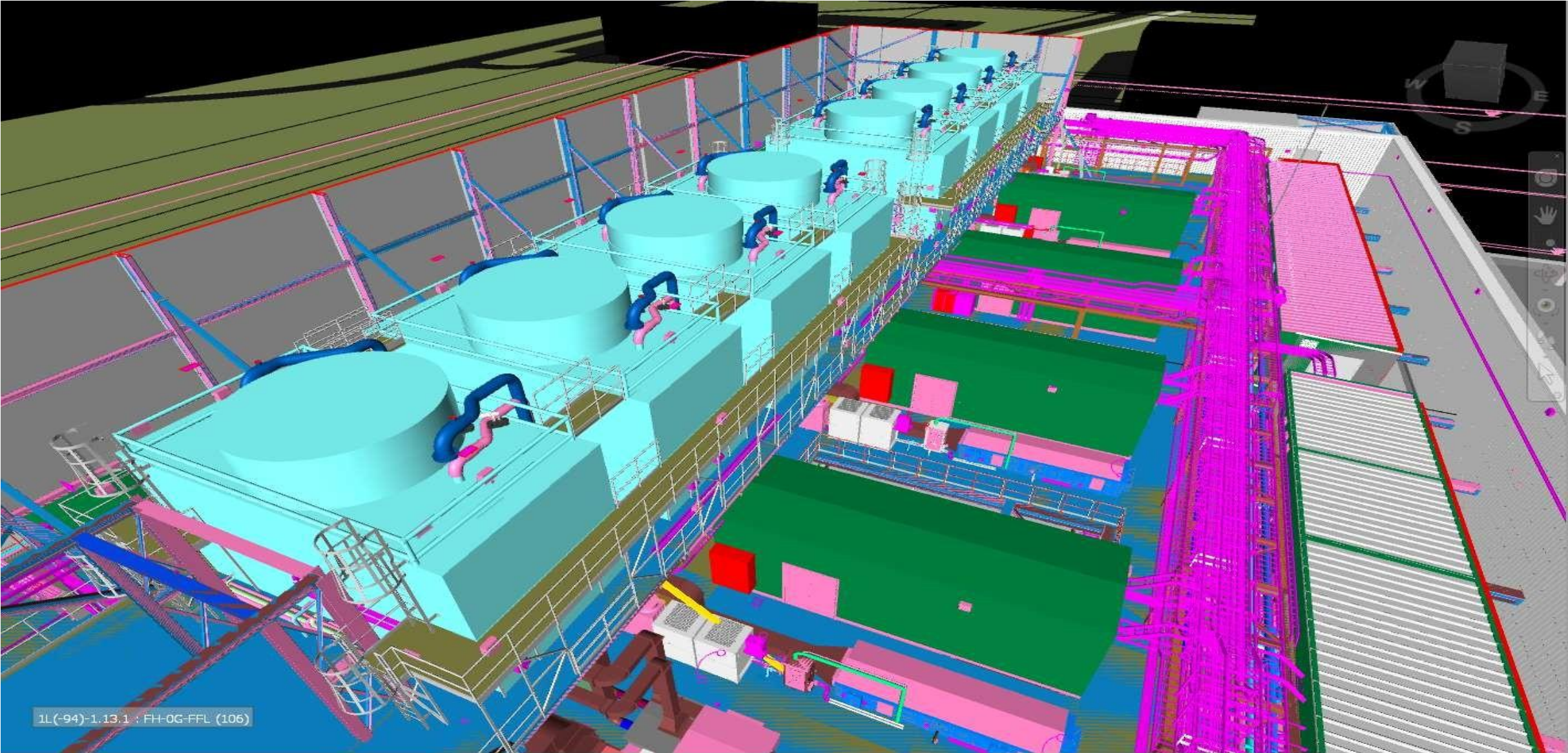
No. of Floors : Ground+3 Levels

Project Year : 2021-2022

DATA CENTER- ELEVATION VIEW

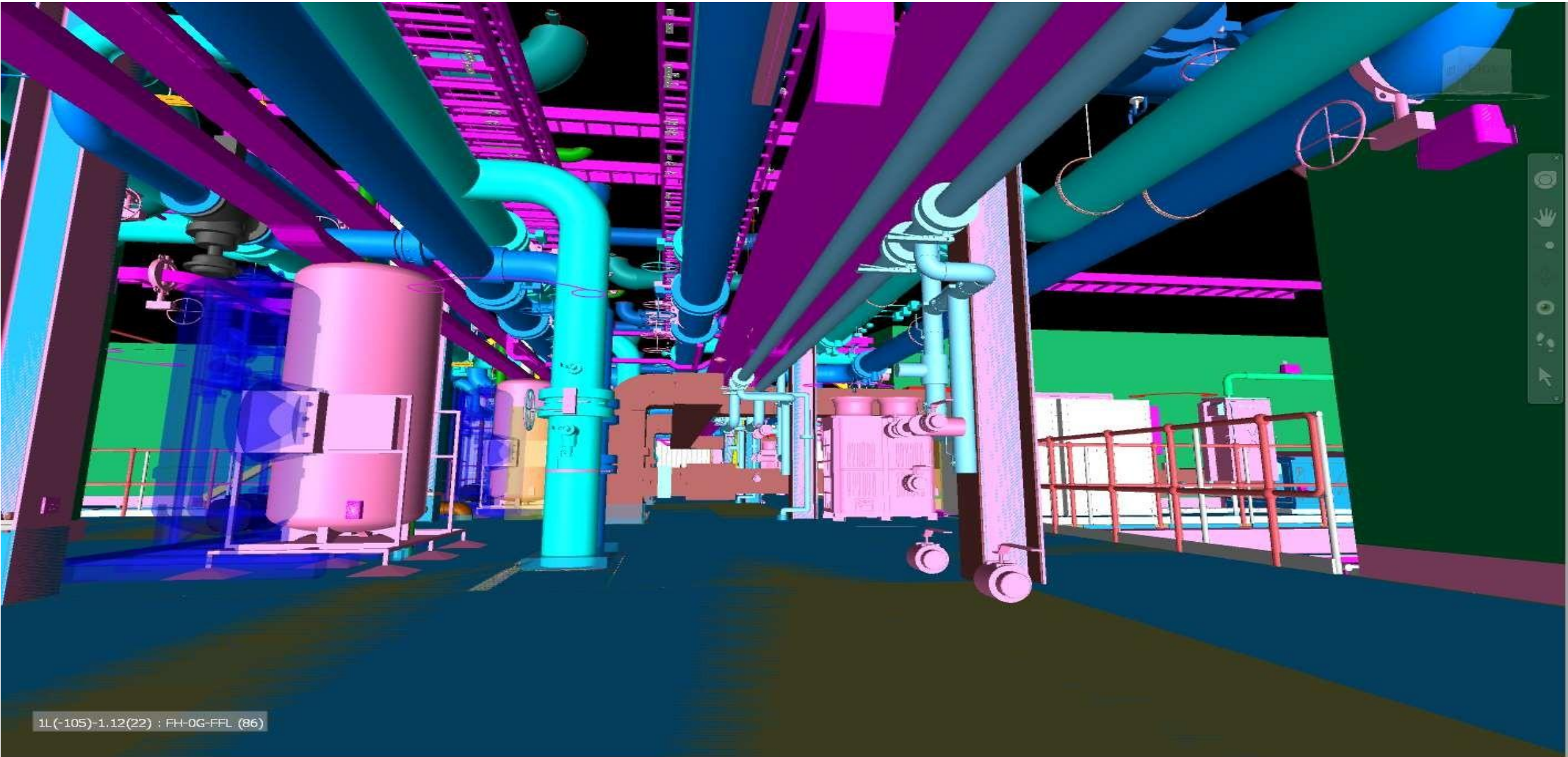


DATA CENTER- MECHANICAL ROOFVIEW

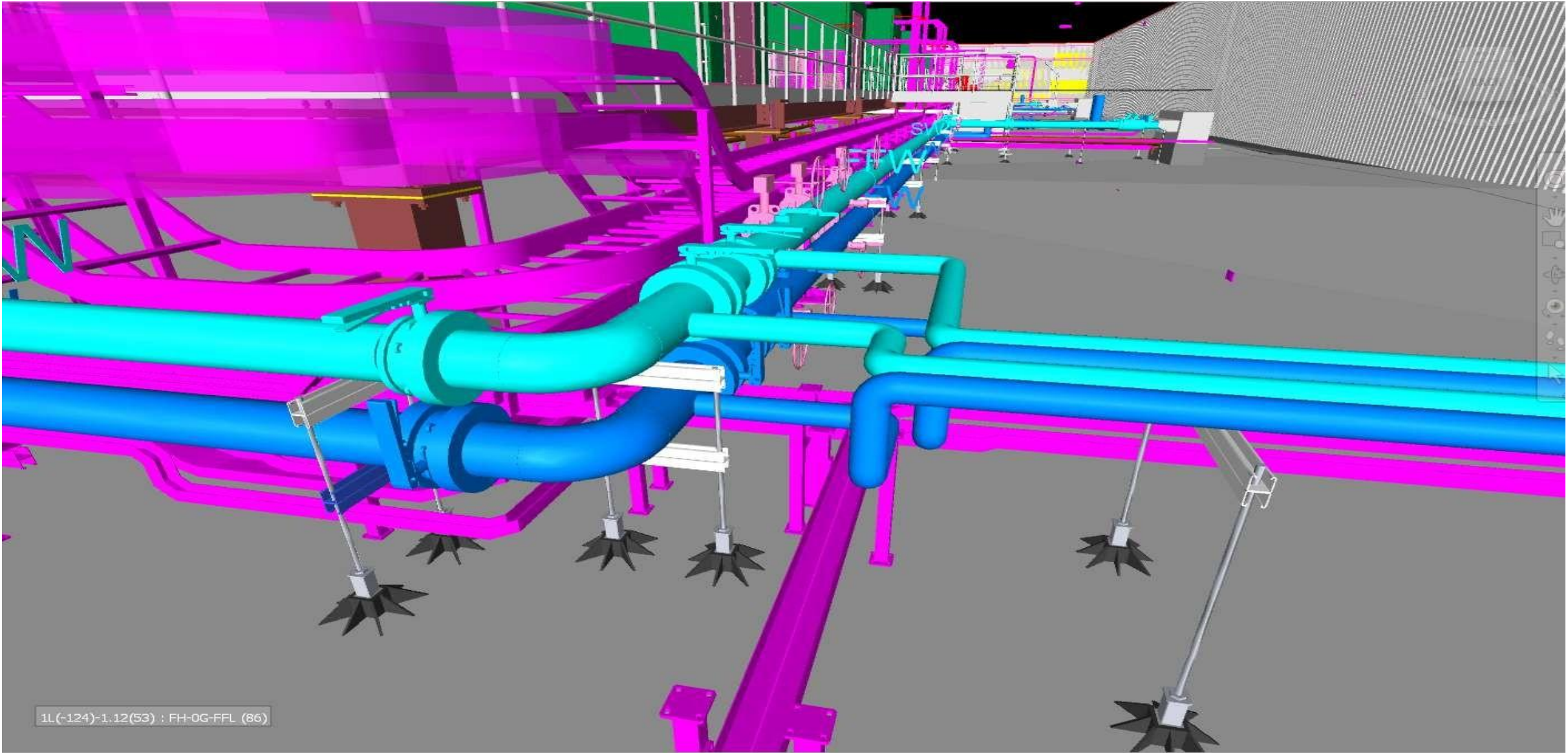


1L(-94)-1.13.1 : FH-0G-FFL (106)

DATACENTER- ELECTRICAL & MECHANICAL VIEW

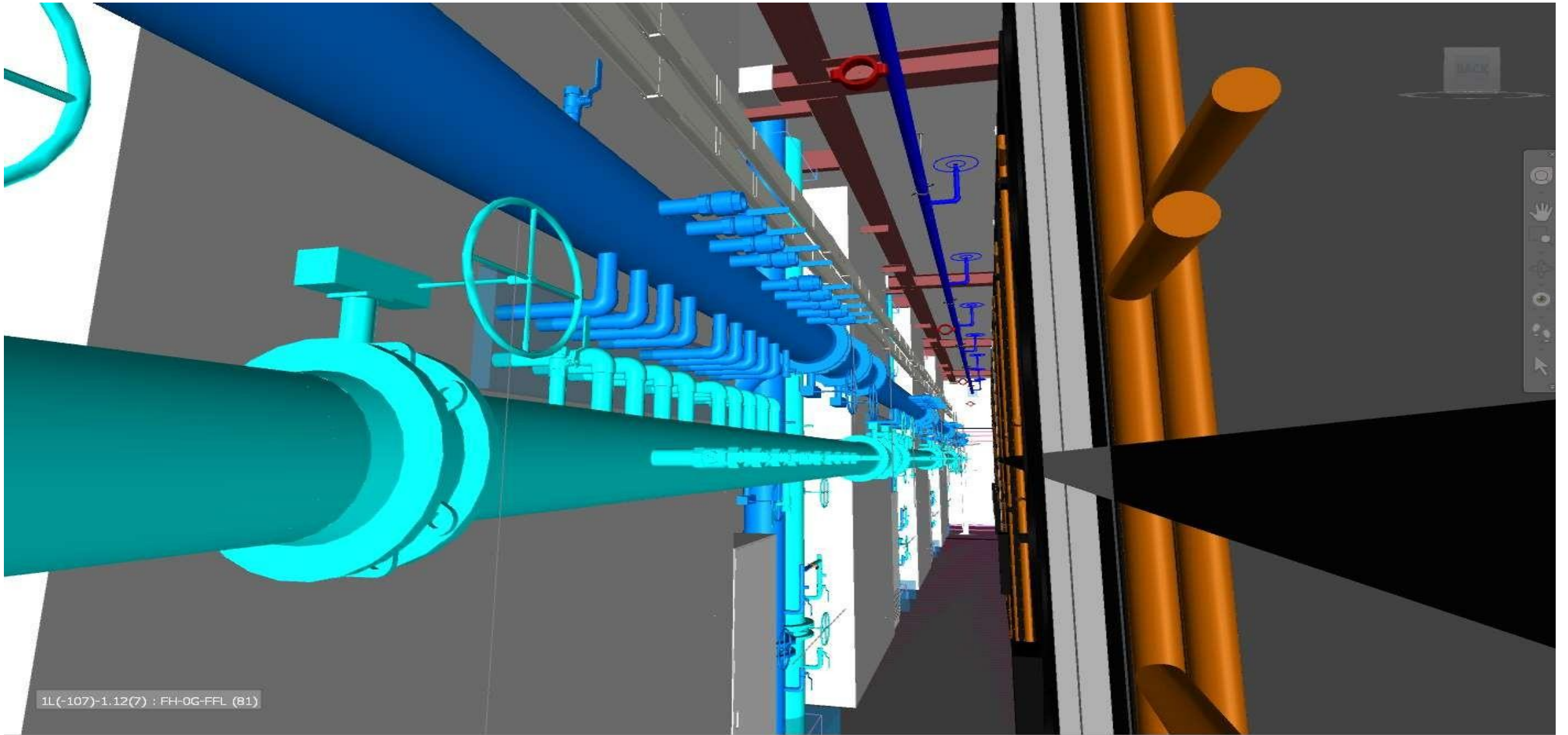


DATACENTER- ELECTRICAL & MECHANICAL PIPING VIEW



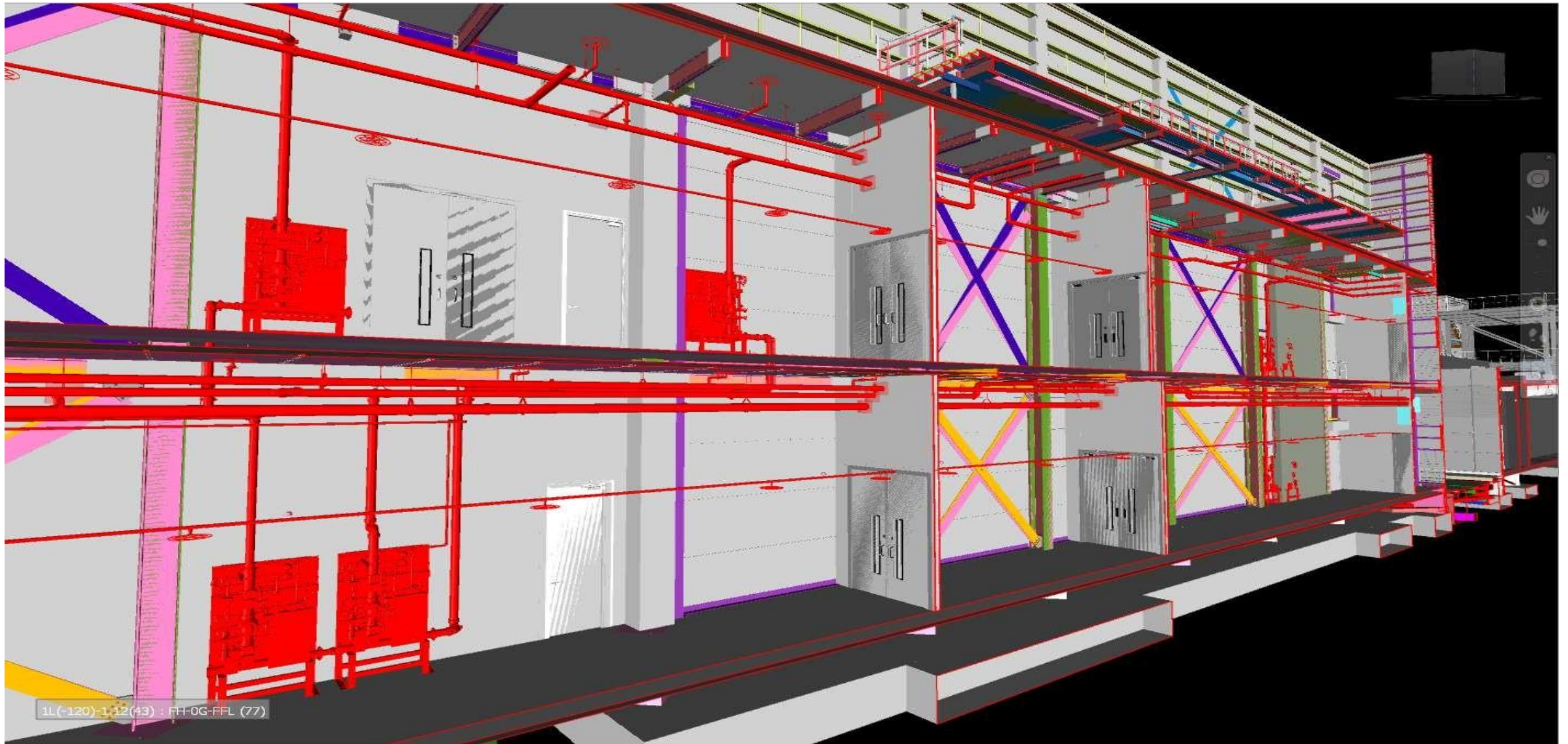


DATACENTER- MECHANICAL & FIRE PROTECTION VIEW

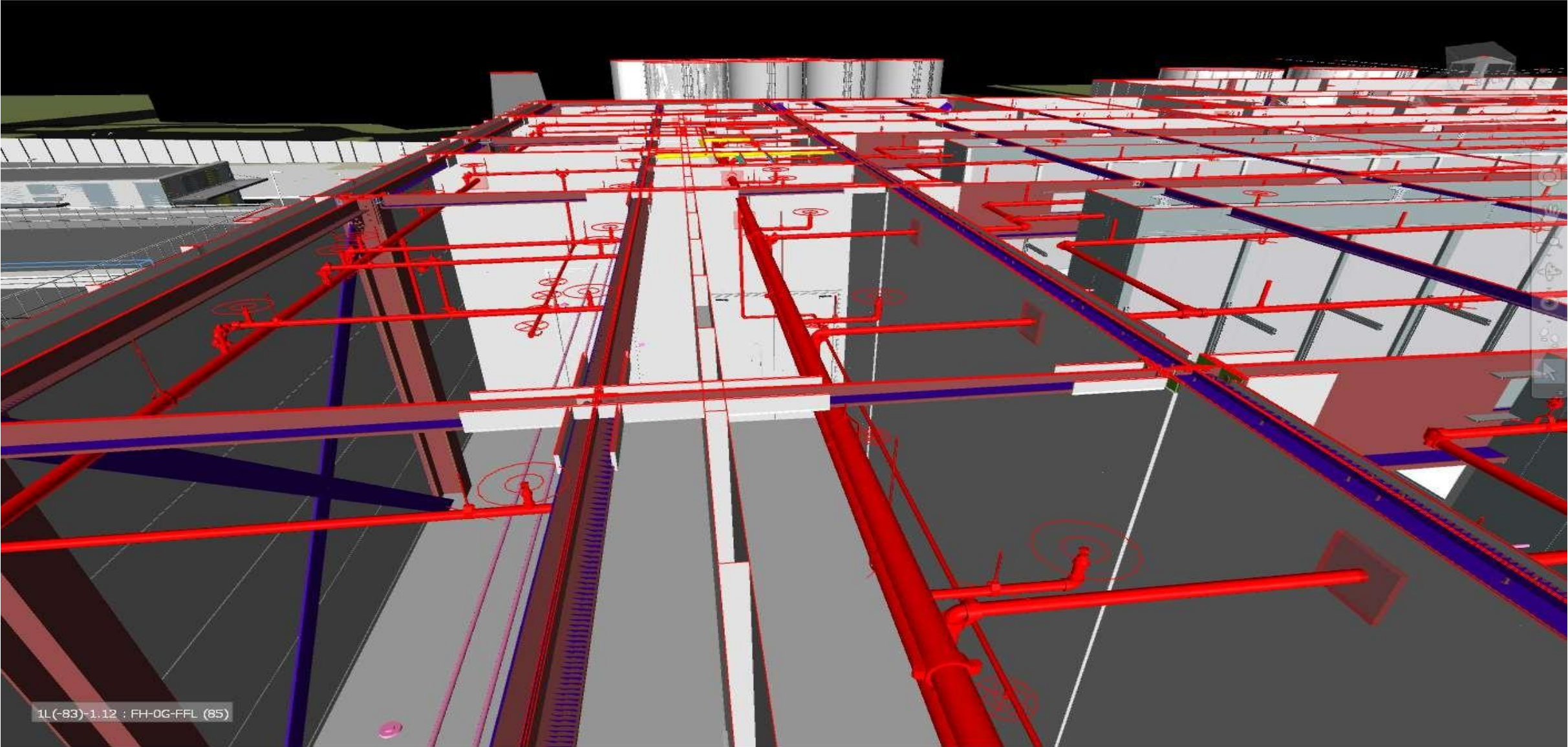


1L(-107)-1.12(7) : FH-0G-FFL (81)

DATA CENTER- ELEVATION VIEW



DATA CENTER- FIRE PROTECTION VIEW



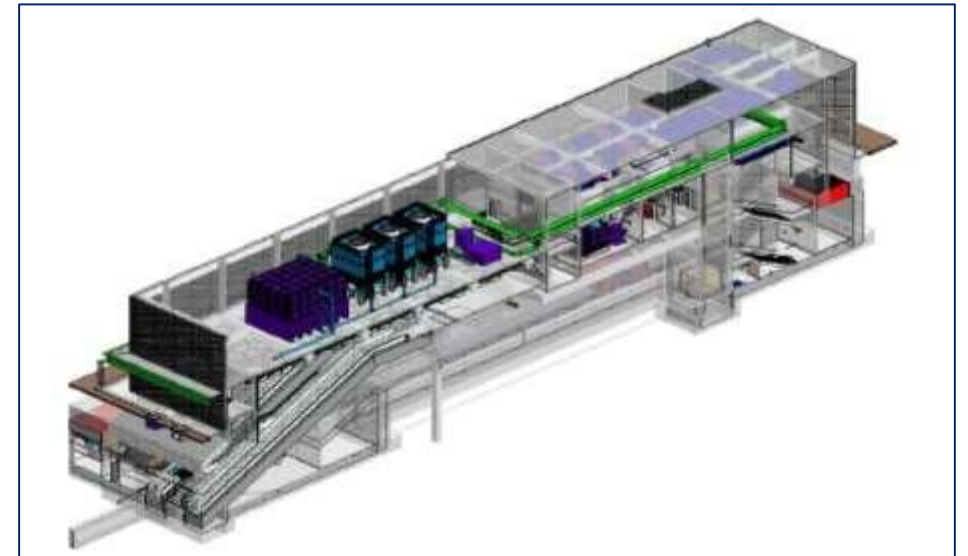
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INTRODUCTION

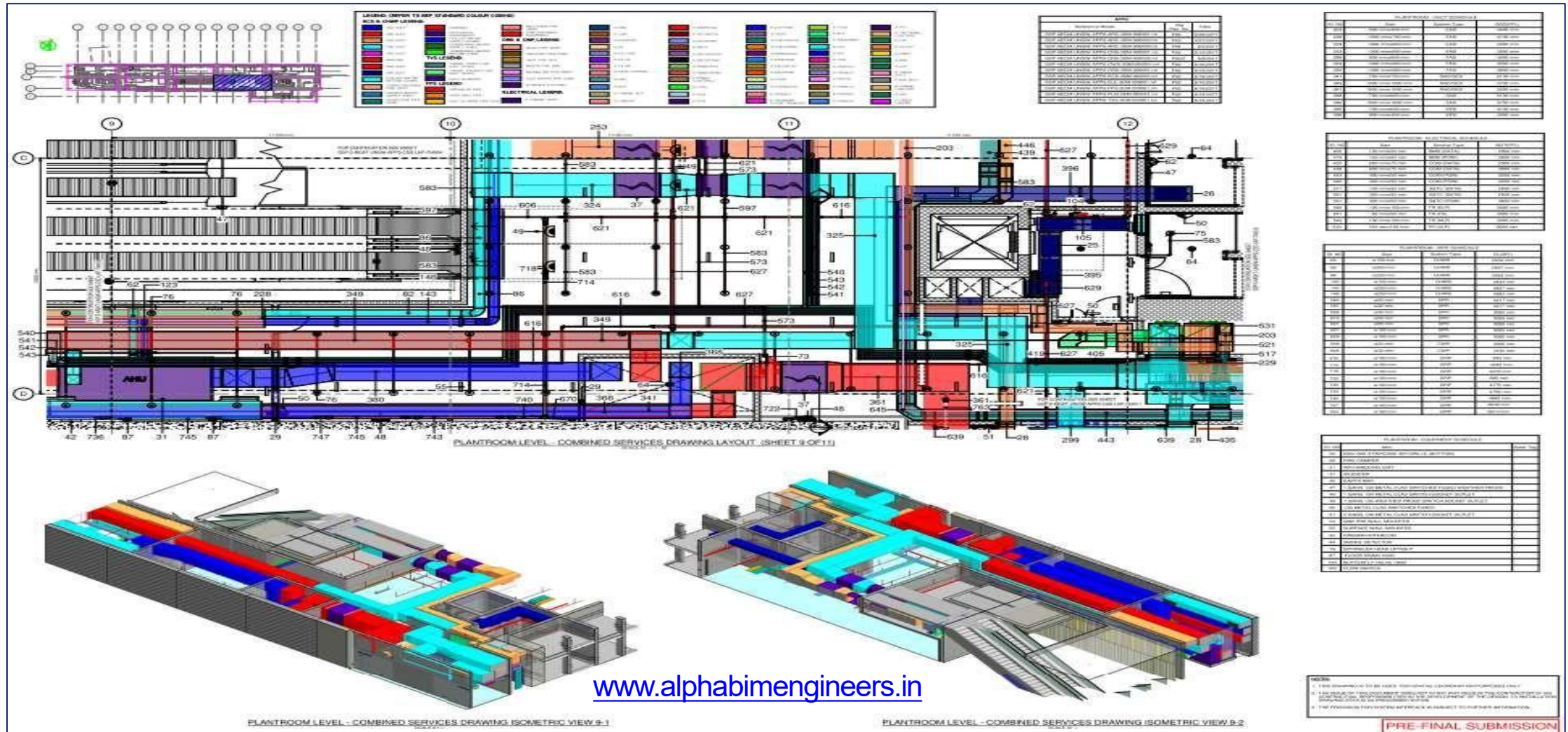
Project Type : Under Ground Metro Station-
Malaysia

Scope of Work : LOD400 MEPF Modeling,
Coordination and Documentation

Project Year : 2016-2018



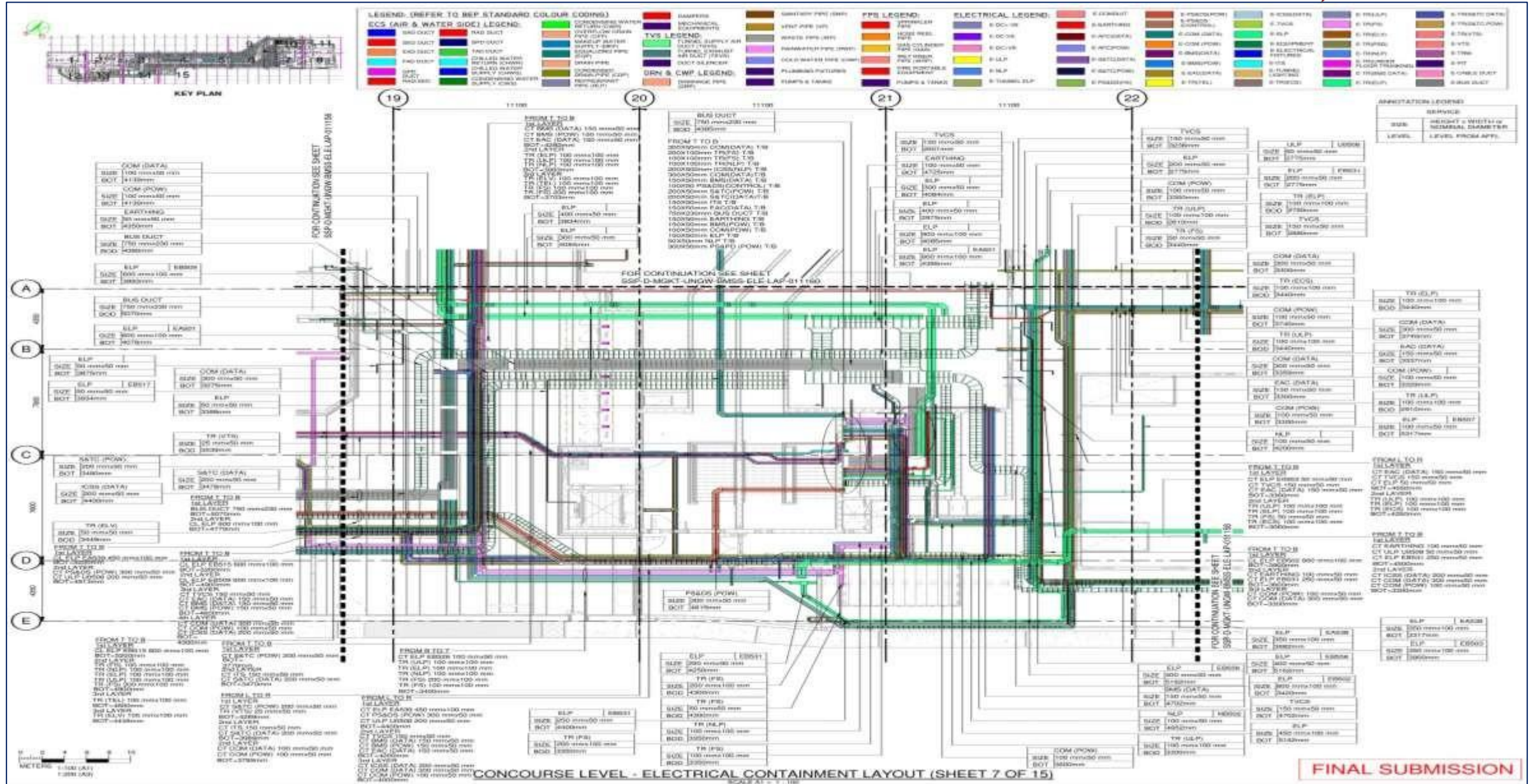
METROSTATION—COMBINED SERVICE DRAWING



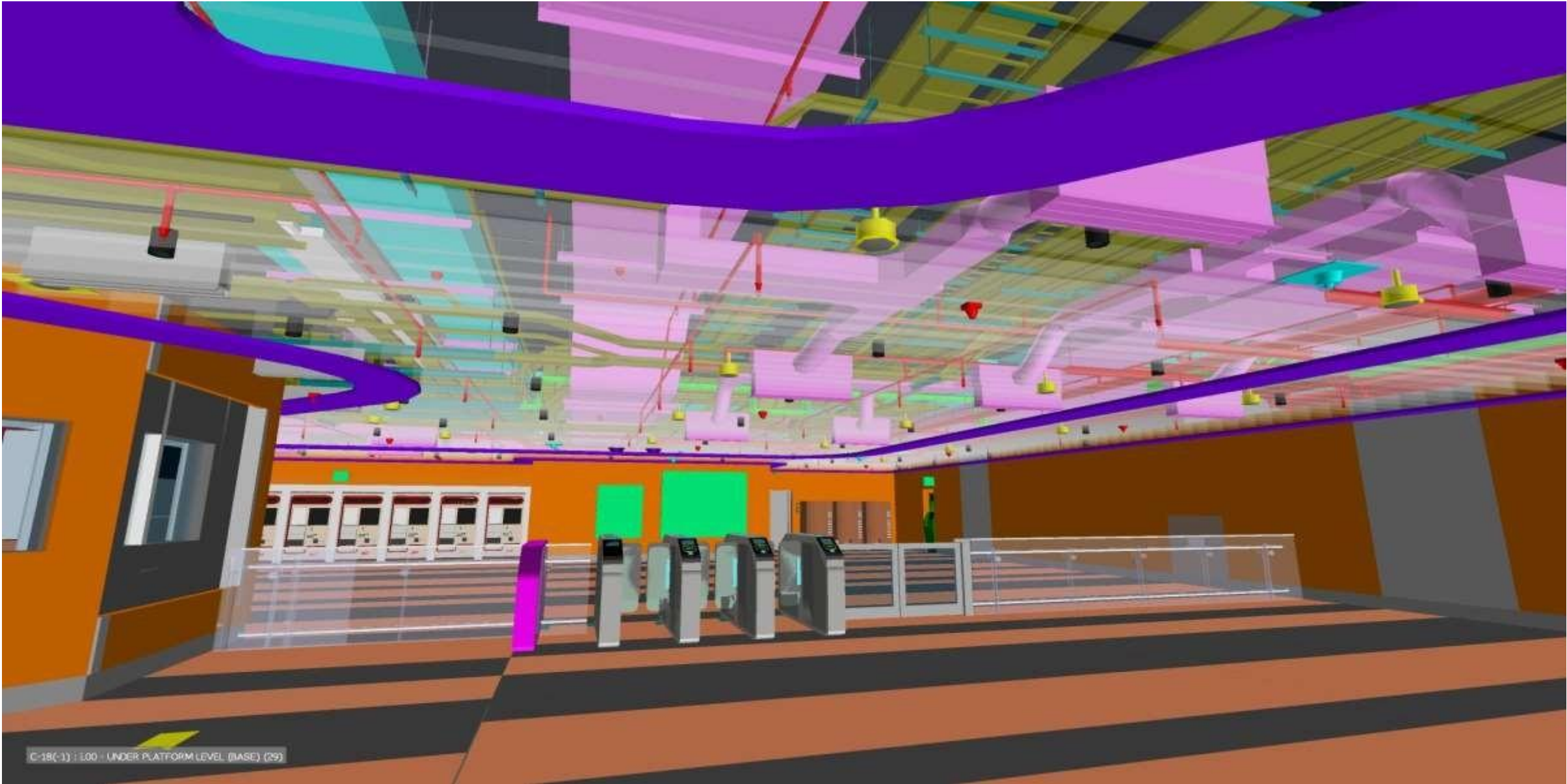
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PRE-FINAL SUBMISSION

METROSTATION - ELECTRICAL SHOP



METROSTATION- ENTRANCE AREA



C-18(-1) : 1.00 - UNDER PLATFORM LEVEL (BASE) (29)

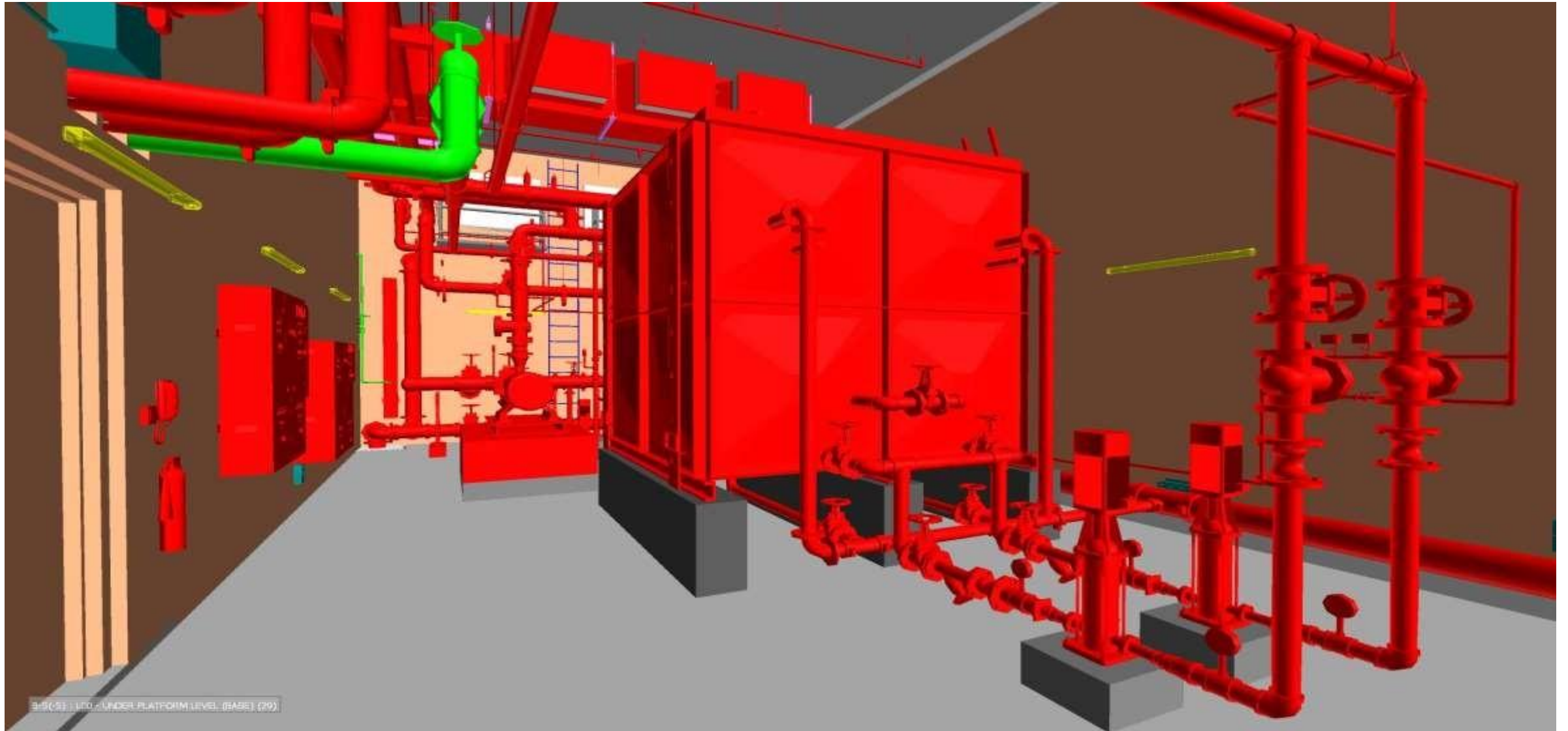
METROSTATION- TICKETVENDOR



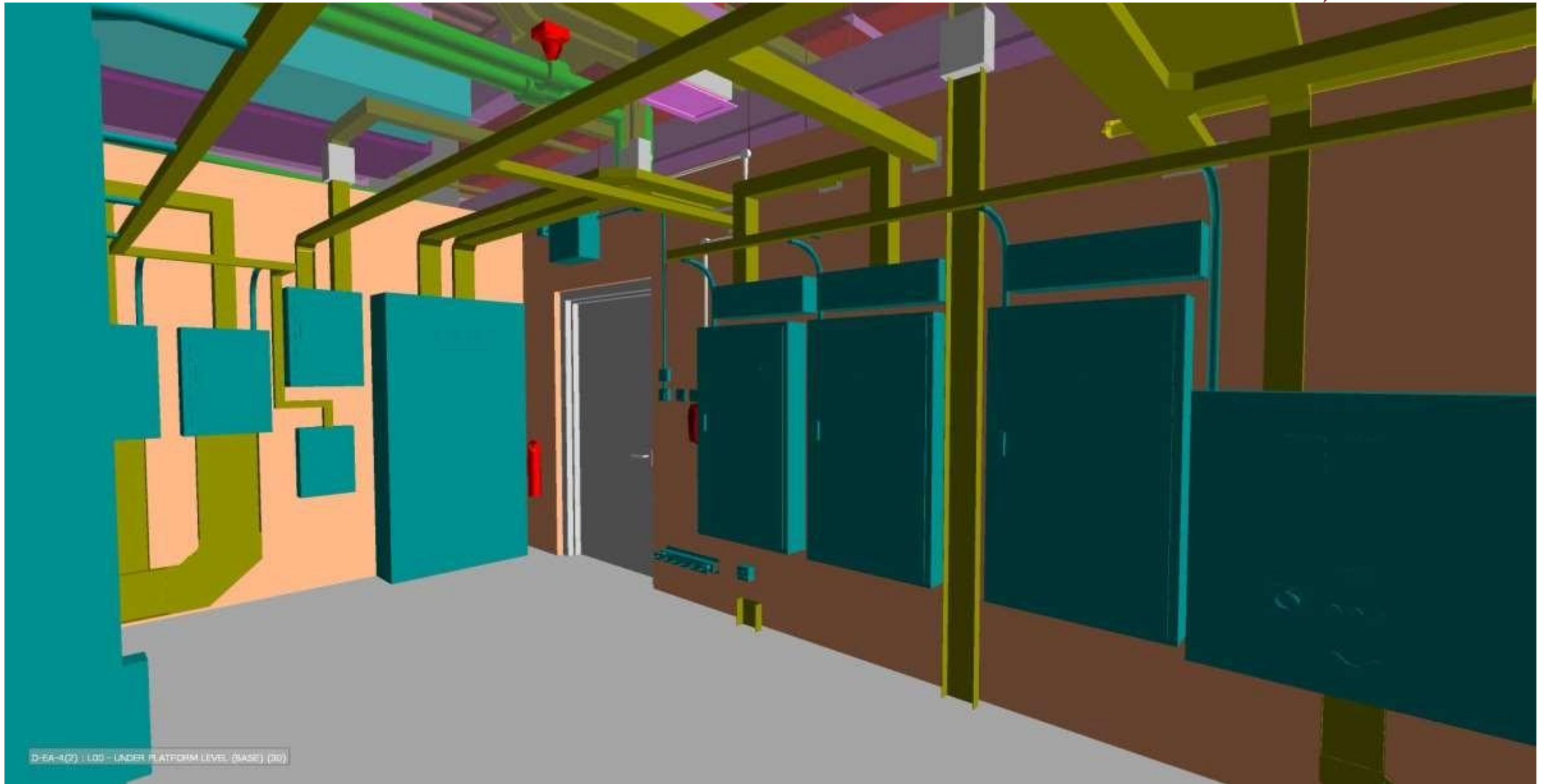
METROSTATION- PLATFORM



METROSTATION- FIRE PUMP ROOM(BACK OF HOUSE)

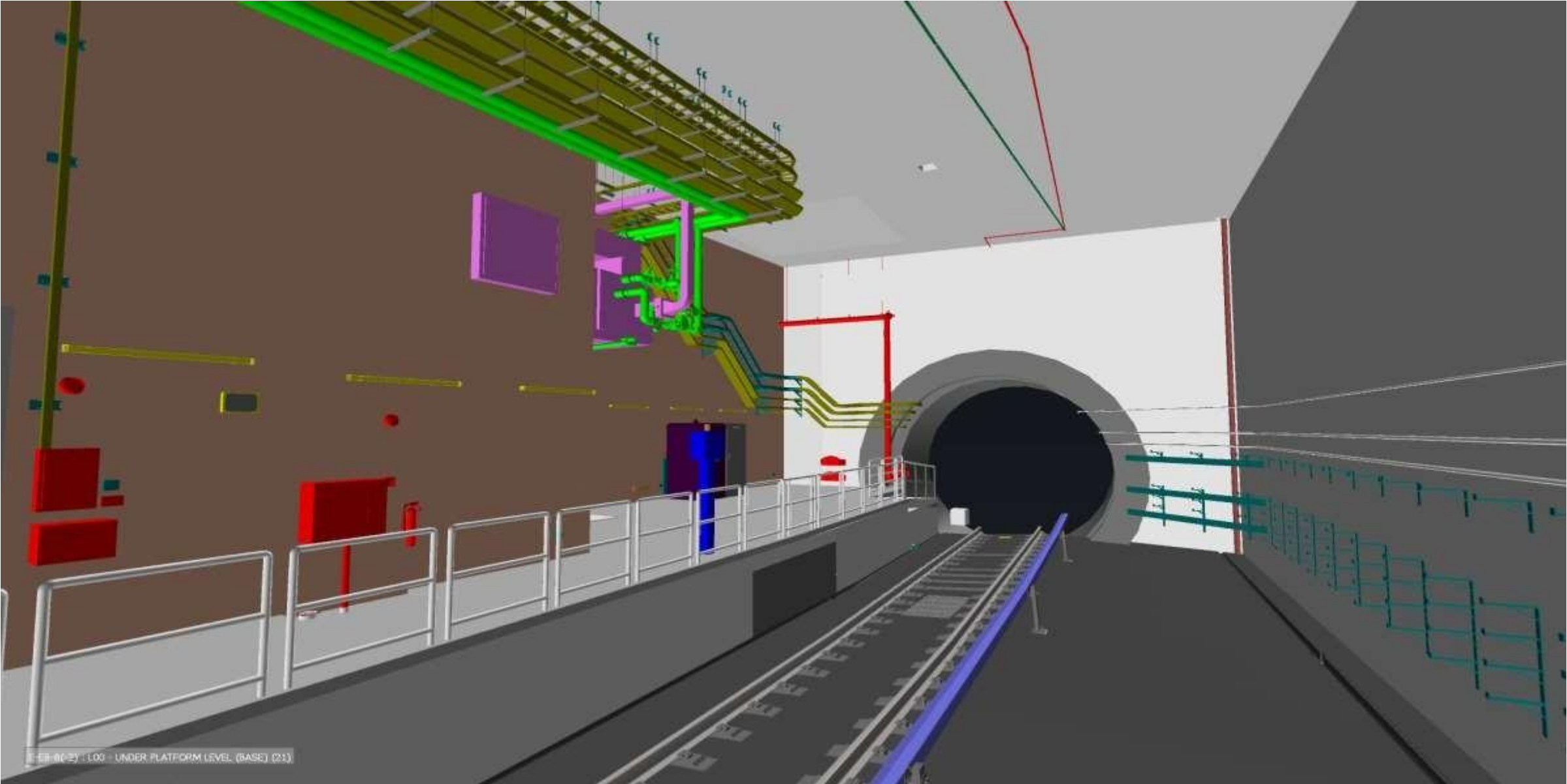


METROSTATION-ELECTRICALROOM(BACK OFHOUSE)

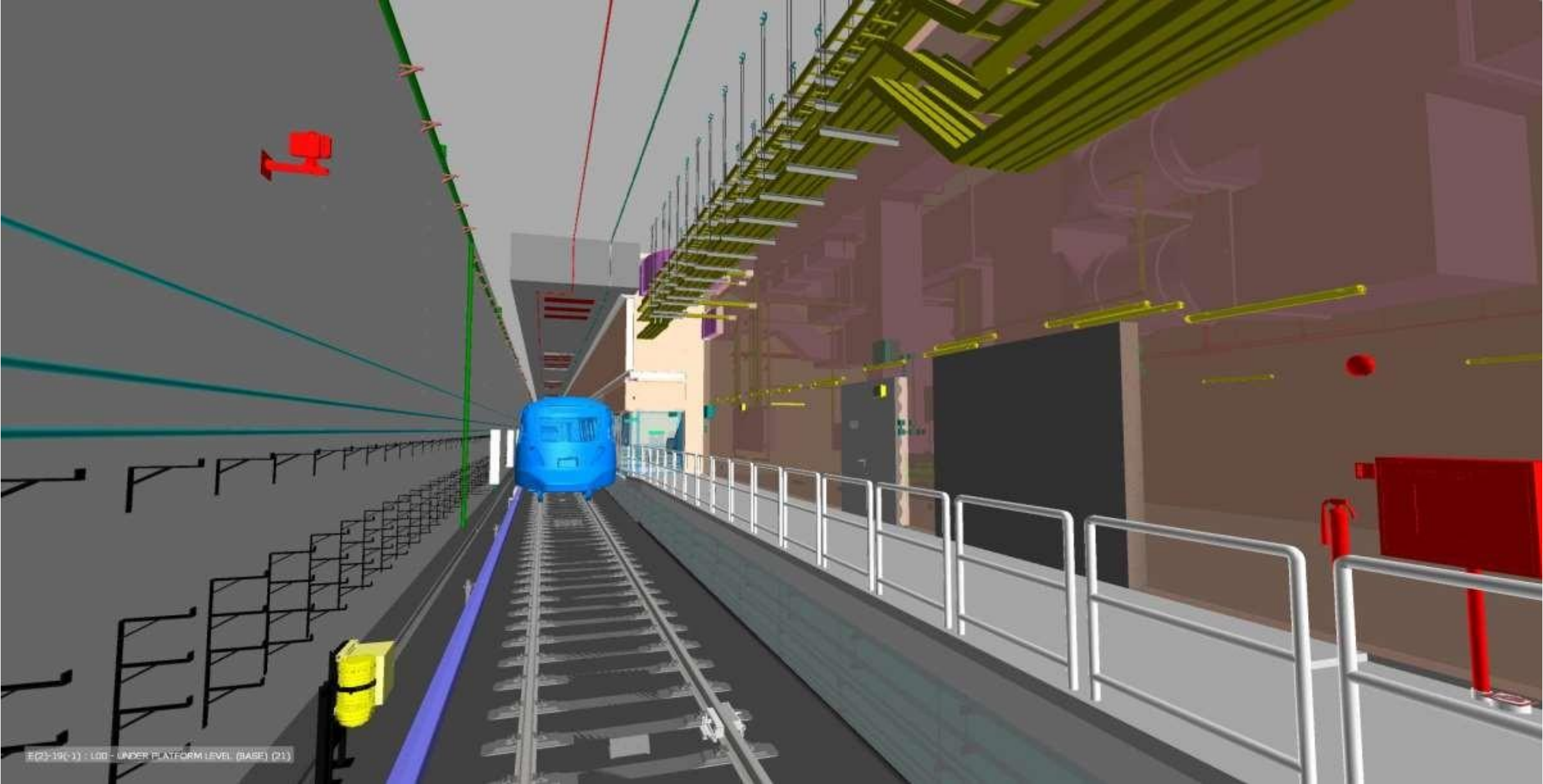


D-5A-1(2) : L00 - UNDER PLATFORM LEVEL (BASE) (3D)

METROSTATION- INTERFERENCEAREA(STATION AND TUNNELS)



METROSTATION - VIEW FROM BACK OF HOUSE



METROSTATION—PUMP ROOMVIEW



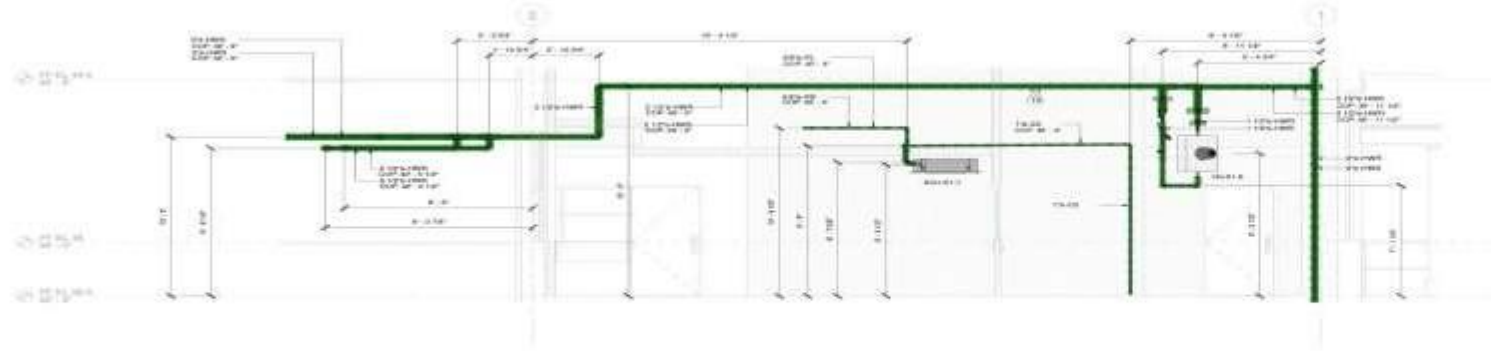
INTRODUCTION



Project Type : Process Plant - U.S.A

Scope of Work : LOD400 MEPF Modeling,
Coordination and Documentation

Project Year : 2021 - 2023



1 MECHANICAL PIPING AT FLOOR EL 32.50 AND 36.00 SECTIONAL VIEW-1

GENERAL SHEET NOTES

1. ALL ELEVATIONS ARE GIVEN FROM JMW LEVEL.
2. ALL DIMENSIONS ARE GIVEN FROM NEAREST GRID.
3. FOR LARG SYSTEMS, DIMENSIONS FROM 0 TO 100000, SHALL BE SHOWN IN METERS.
4. FOR LARG SYSTEMS, DIMENSIONS FROM 0 TO 100000, SHALL BE SHOWN IN METERS.
5. FOR LARG SYSTEMS, DIMENSIONS FROM 0 TO 100000, SHALL BE SHOWN IN METERS.

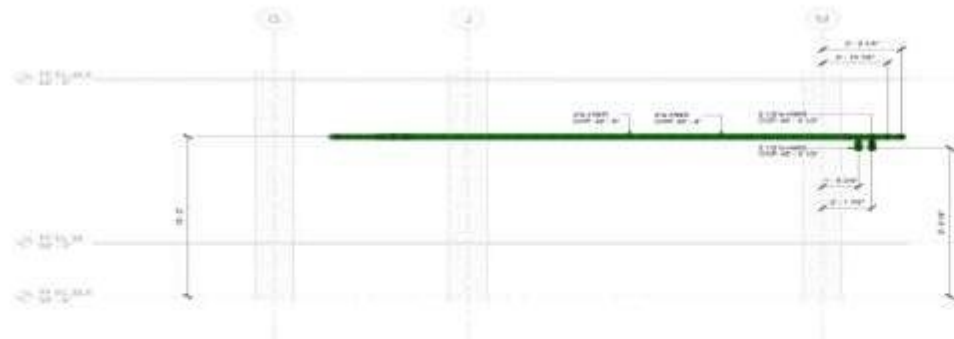
ABBREVIATIONS

ABOVE	ABOVE
ALL	ALL
AS SHOWN	AS SHOWN
AS NOTED	AS NOTED
AS NOTED	AS NOTED
AS NOTED	AS NOTED
AS NOTED	AS NOTED
AS NOTED	AS NOTED
AS NOTED	AS NOTED
AS NOTED	AS NOTED
AS NOTED	AS NOTED

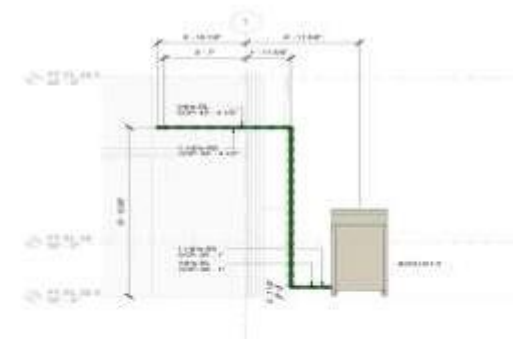
PIPEWORK INSULATION SCHEDULE

INSULATION	TYPE OF INSULATION	THICKNESS OF INSULATION
Temperature below 0°C	Type P1 (Asbestos)	10 mm thickness for pipe diam up to 100 mm, 15 mm thickness for pipe diam above 100 mm
Temperature above 0°C	Type P2 (Asbestos)	As per schedule
Temperature above 0°C	Type P3 (Asbestos)	10 mm thickness for pipe diam up to 100 mm, 15 mm thickness for pipe diam above 100 mm
Temperature above 0°C	Type P4 (Asbestos)	10 mm thickness for pipe diam up to 100 mm, 15 mm thickness for pipe diam above 100 mm
Temperature above 0°C	Type P5 (Asbestos)	10 mm thickness for pipe diam up to 100 mm, 15 mm thickness for pipe diam above 100 mm
Temperature above 0°C	Type P6 (Asbestos)	10 mm thickness for pipe diam up to 100 mm, 15 mm thickness for pipe diam above 100 mm

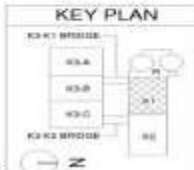
NOTE: For pipe insulation schedule and thickness, refer design code and specifications document.



2 MECHANICAL PIPING AT FLOOR EL 32.50 AND 36.00 SECTIONAL VIEW-2



3 MECHANICAL PIPING AT FLOOR EL 32.50 AND 36.00 SECTIONAL VIEW-3



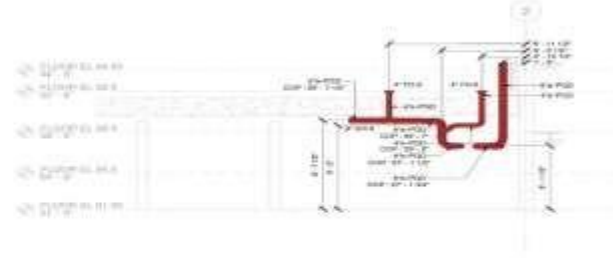
MECHANICAL PIPING PLAN AT FLOOR EL 32.50 AND 36.00 SECTIONAL VIEW
 Date: 01/01/2023
 Scale: 1/2" = 1'-0"
 Rev: A
 K1-MP-2031

GENERAL SHEET NOTES

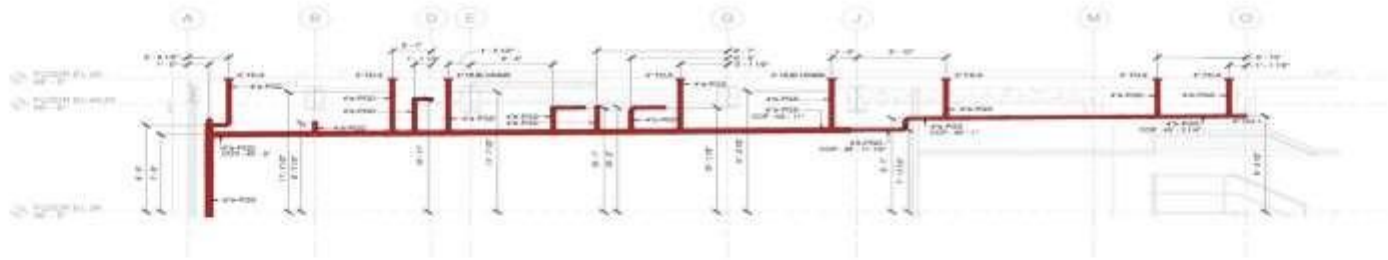
1. ALL DIMENSIONS UNLESS SPECIFIED ARE IN METERS AND DECIMALS THEREAFTER SHALL BE TO NEAREST 0.001M.
2. REFER TO ALL LAYOUTS AND DETAILS FOR CORRELATION AND TO TYPE AND SIZE.
3. ALL DIMENSIONS ARE FROM FINISH SURFACE UNLESS SPECIFIED OTHERWISE.
4. ALL DIMENSIONS ARE FROM FINISH SURFACE UNLESS SPECIFIED OTHERWISE.
5. DIMENSIONS ARE FROM FINISH SURFACE UNLESS SPECIFIED OTHERWISE.
6. DIMENSIONS ARE FROM FINISH SURFACE UNLESS SPECIFIED OTHERWISE.

ABBREVIATIONS

CG	CUSTOMER NAME
DR	DESIGNER
EC	ENGINEER
MR	PROJECT MANAGER
PR	PROJECT ENGINEER
SR	SENIOR ENGINEER
TR	TRAINER

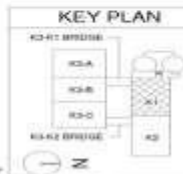


1 PROCESS GRAVITY PIPING AT FLOOR EL 32.50 AND 36.00 SECTIONAL VIEW -1
1/4" = 1'-0"



2 PROCESS GRAVITY PIPING AT FLOOR EL 32.50 AND 36.00 SECTIONAL VIEW -2
1/4" = 1'-0"

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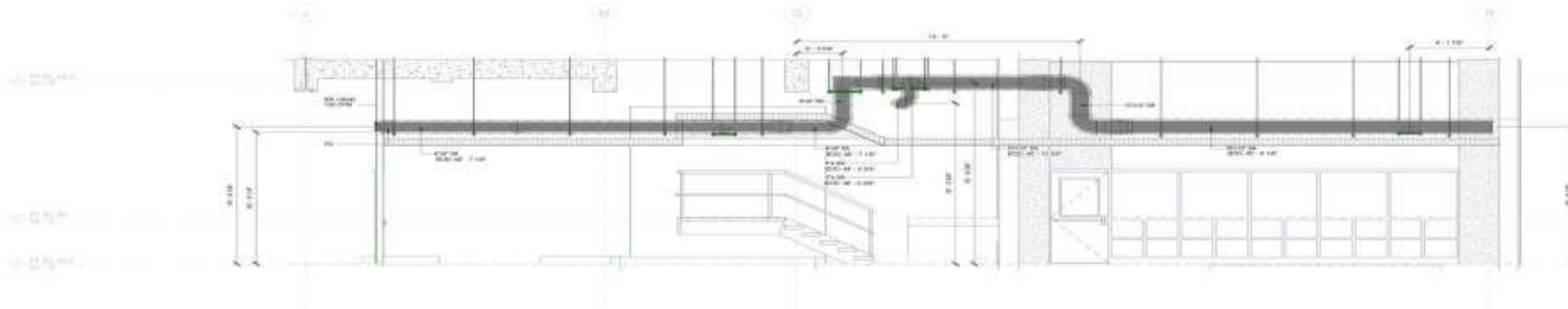


GENERAL SHEET NOTES

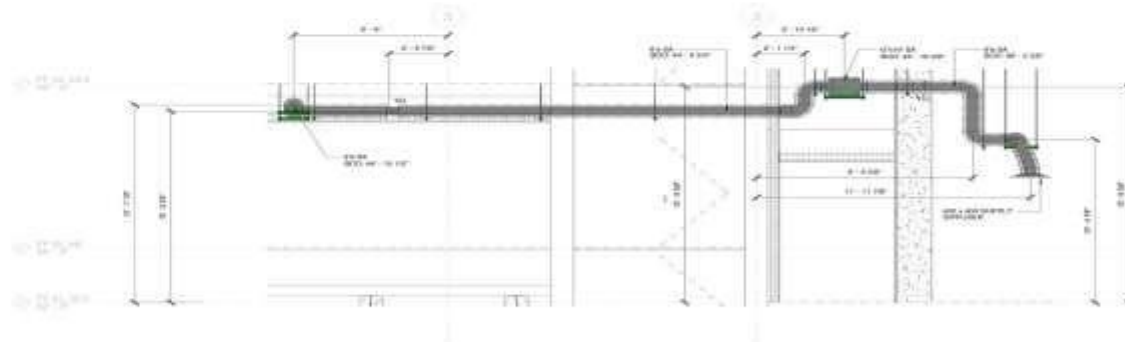
1. ALL ELEVATIONS ARE TAKEN FROM GRID LEVELS.
2. ALL DIMENSIONS ARE GIVEN FROM NEAREST SURFACE.
3. FOR FURTHER SYMBOLS, ABBREVIATIONS & LEGENDS, REFER TO THE GENERAL NOTES SHEET 4 OF 7.
4. FOR STANDARD DETAILS REFER TO THE GENERAL NOTES SHEET 4 OF 7.

ABBREVIATIONS

ME	METRIC	SE	SEWER
ME	METRIC	TE	TELEPHONE
ME	METRIC	TR	TRASH
ME	METRIC	TR	TRASH
ME	METRIC	TR	TRASH
ME	METRIC	TR	TRASH
ME	METRIC	TR	TRASH
ME	METRIC	TR	TRASH
ME	METRIC	TR	TRASH
ME	METRIC	TR	TRASH



1 MECHANICAL DUCTING AT FLOOR EL 32.5 AND 36.00 SECTIONAL VIEW - 1
32'-0\"/>



2 MECHANICAL DUCTING AT FLOOR EL 32.5 AND 36.00 SECTIONAL VIEW - 2
32'-0\"/>



INTRODUCTION



Project Type : Office Head Quarters -
Ireland

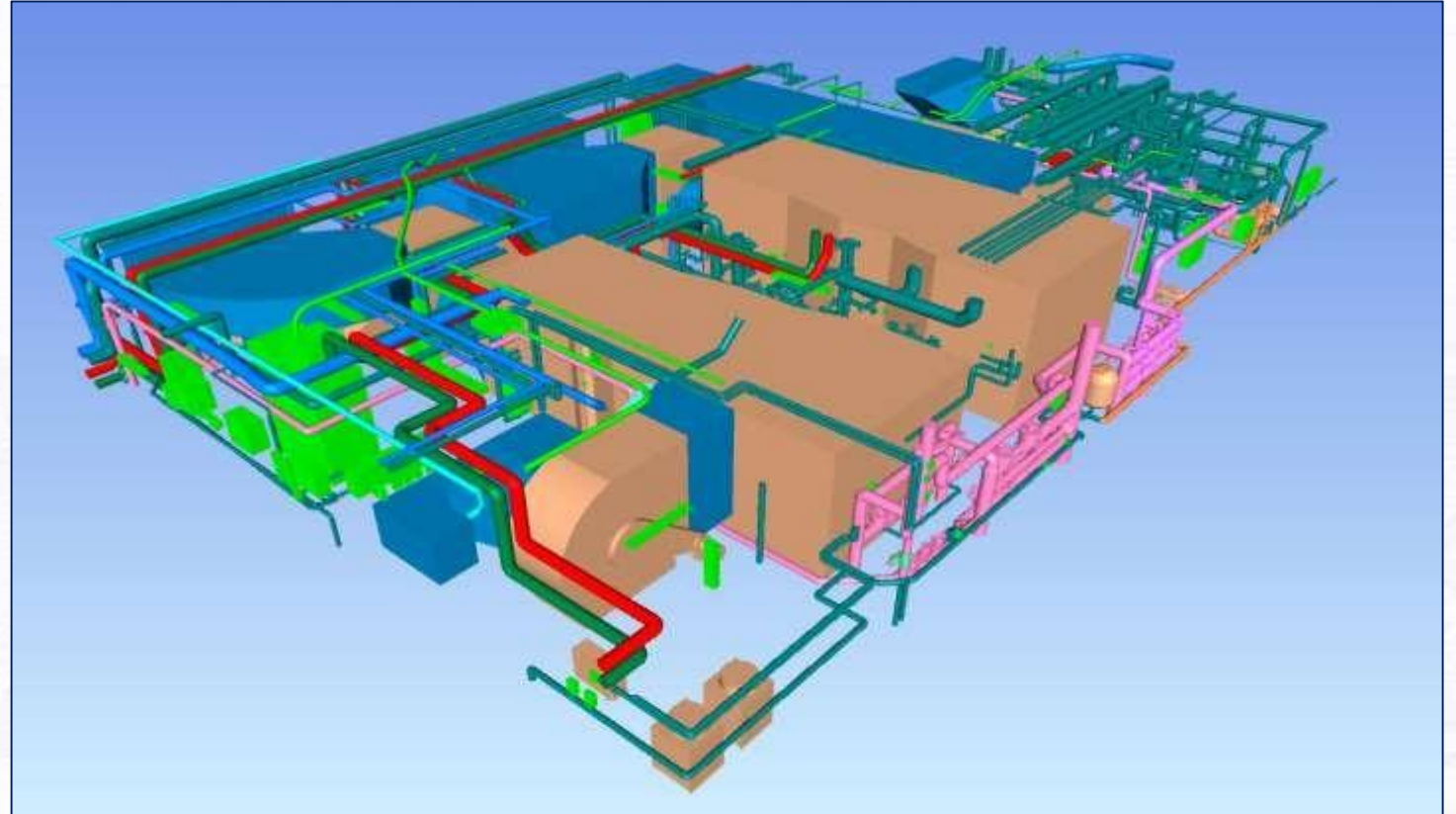
Scope of Work : LOD400 Electrical Modeling,
Coordination and Documentation

Project Year : 2020

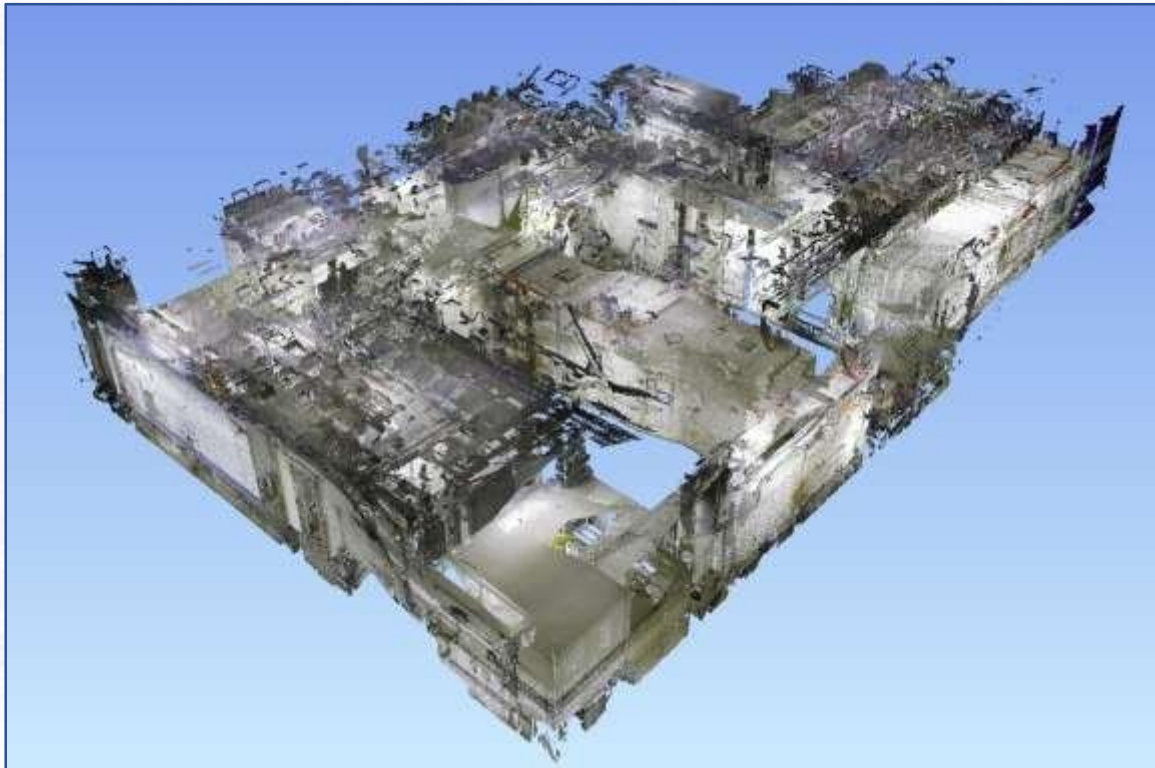
BIM ENGINEERS
OUTSOURCING & OFFSHORING

INTRODUCTION

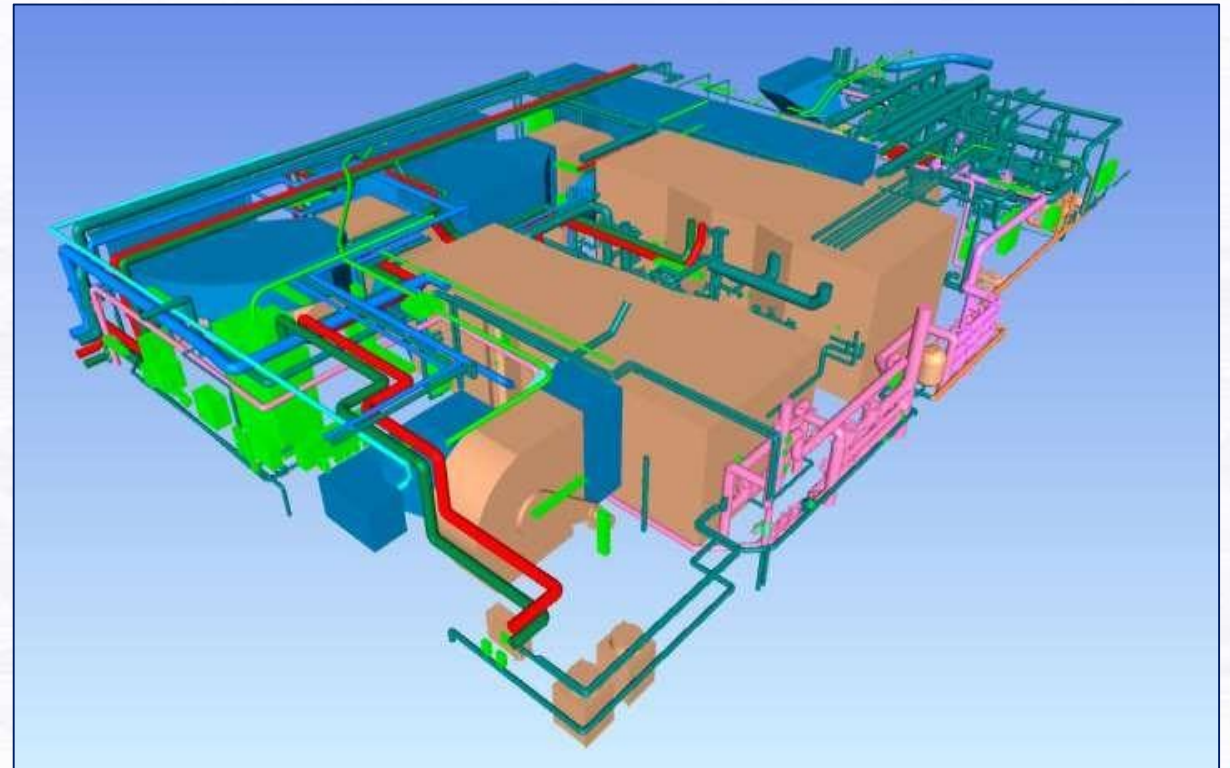
Project Name : CODA
Project Type : POINTCLOUD
Scope of Work : MEPF MODELING &
COORDINATION
No. of Floors : FLOOR
Location : U.S
Project Year : 2022
Client Name :

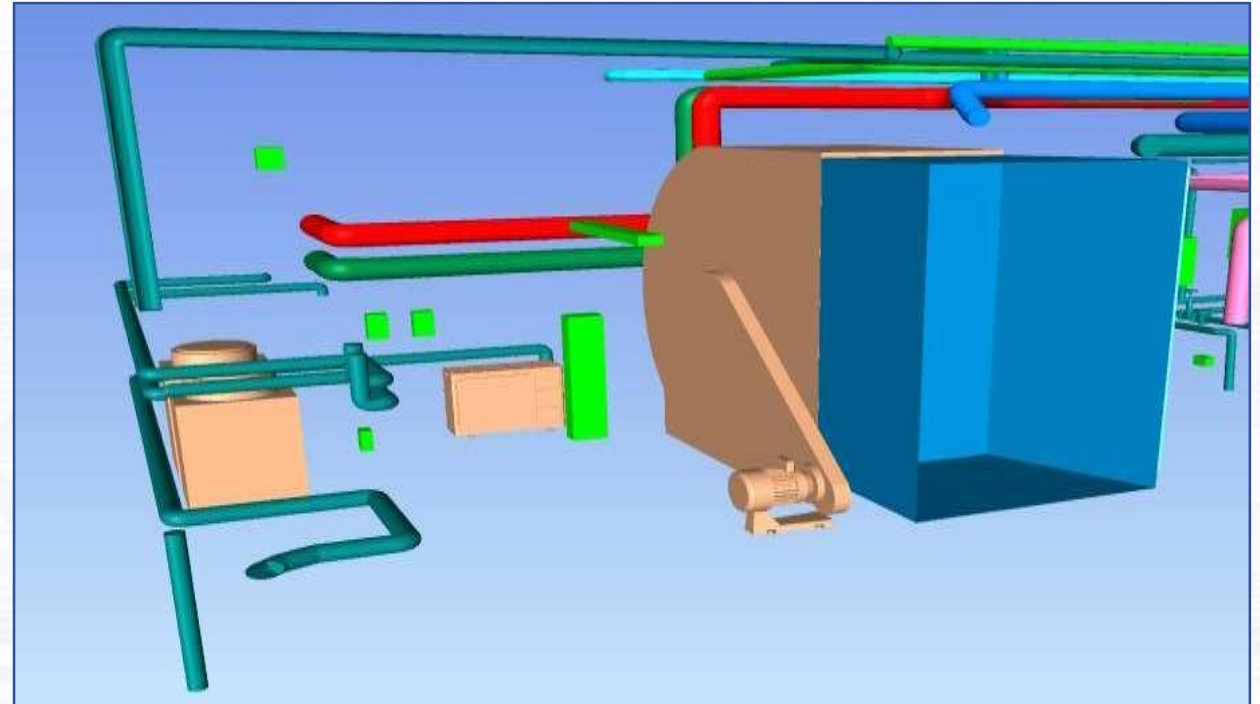


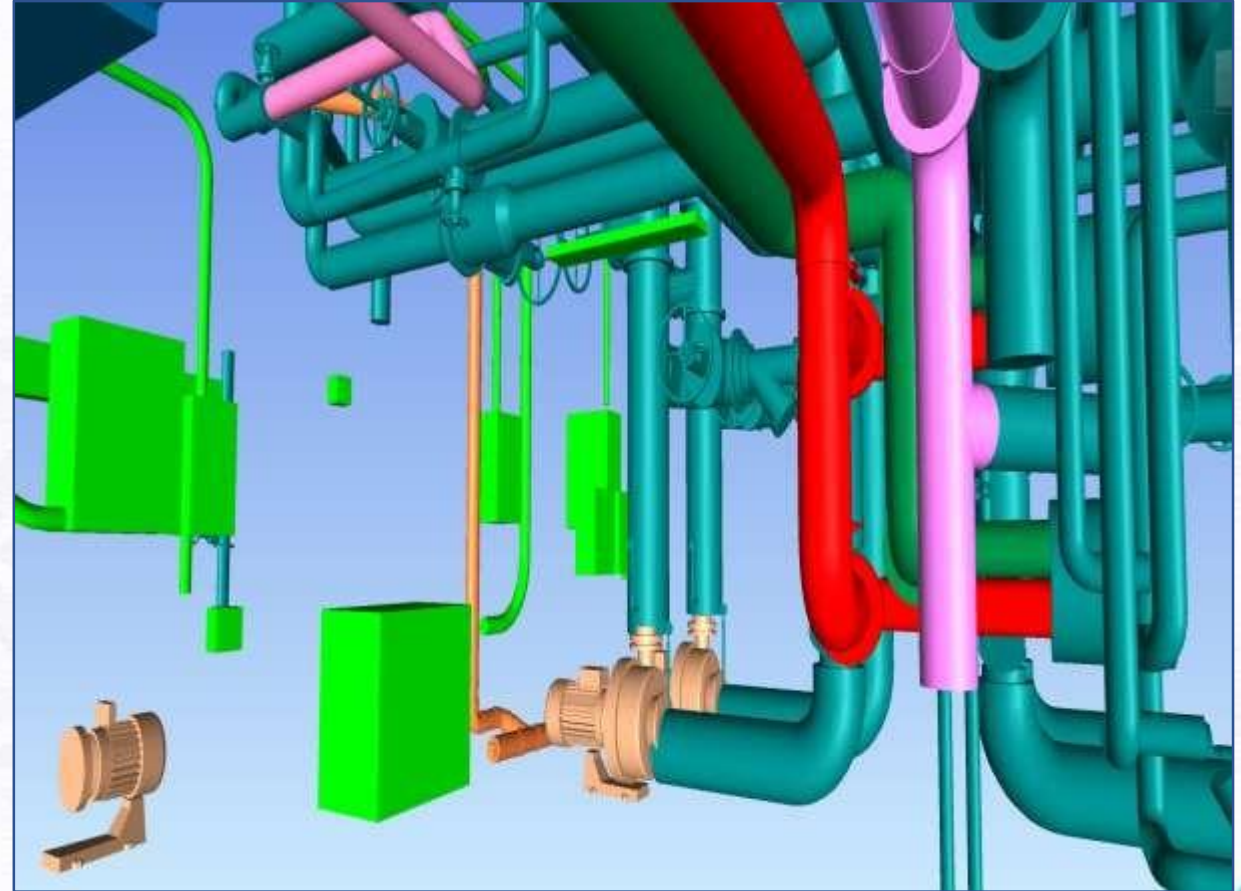
SCAN FROM CLIENT

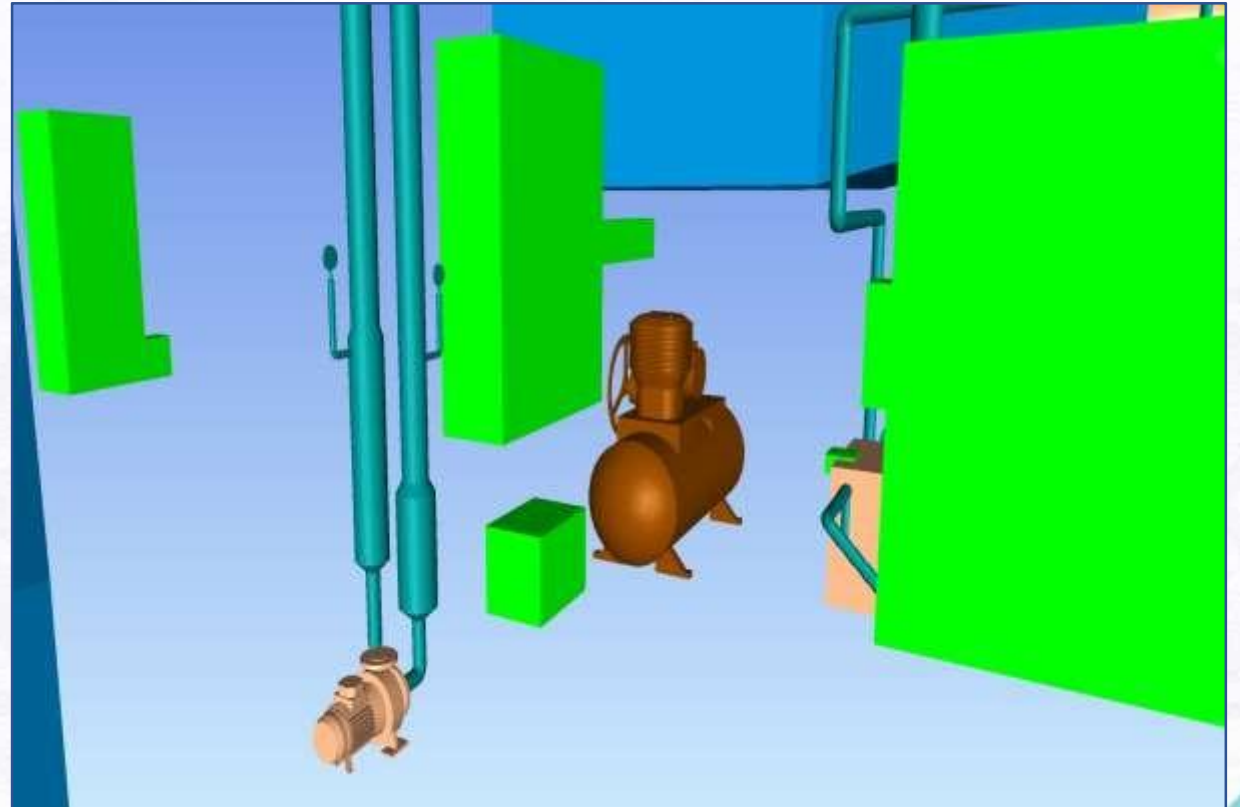


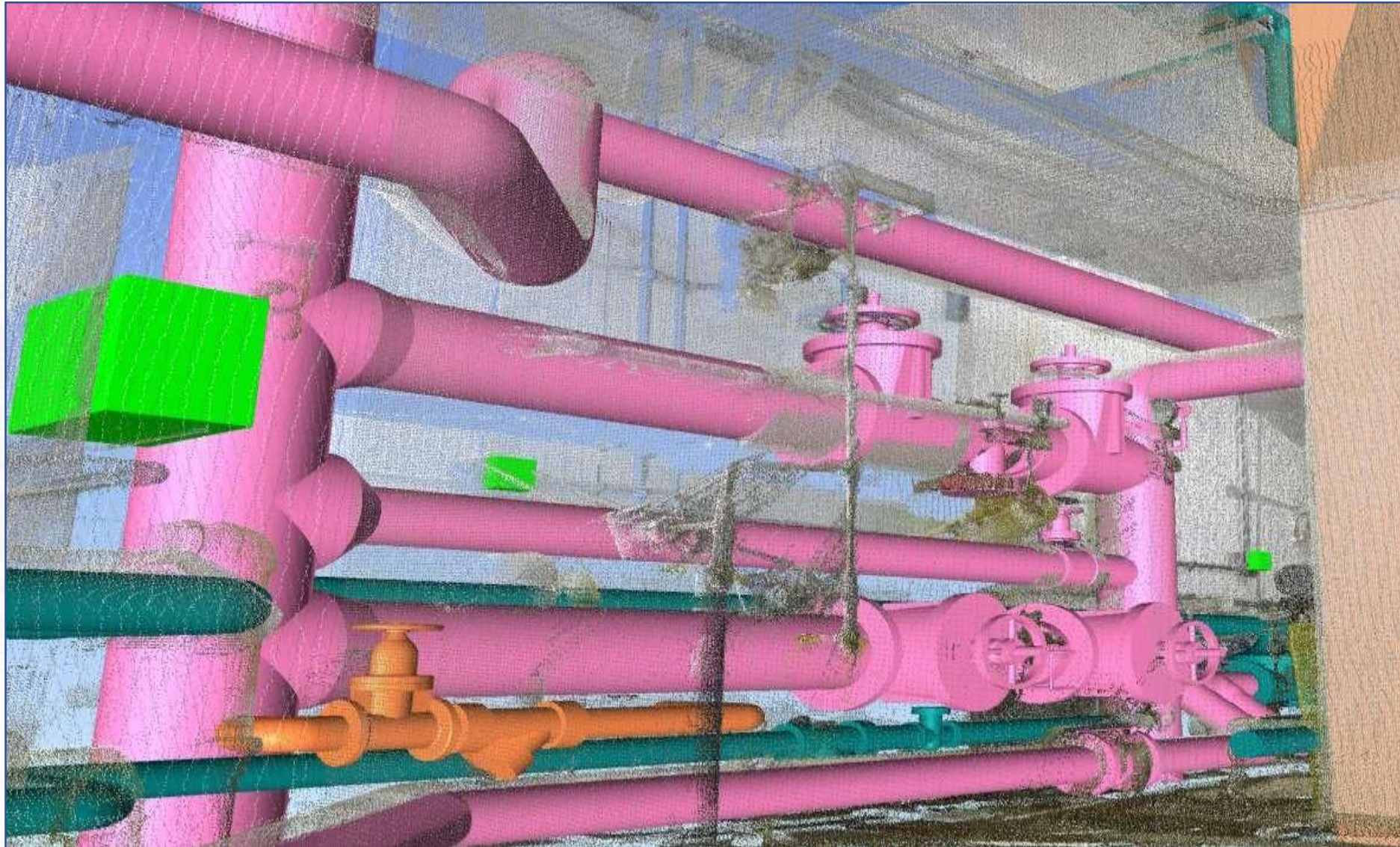
MECHANICAL MODEL





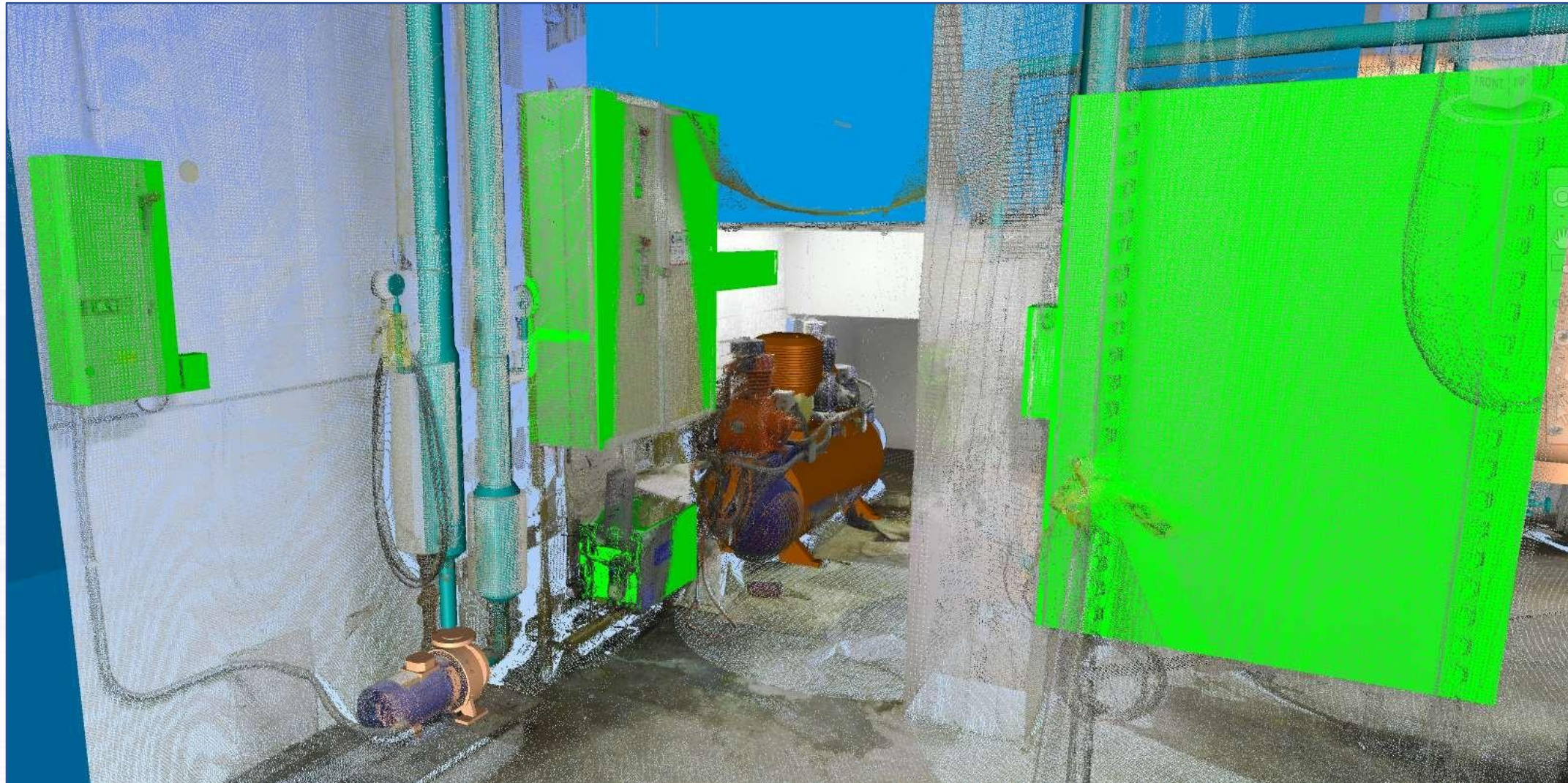












Thank You

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