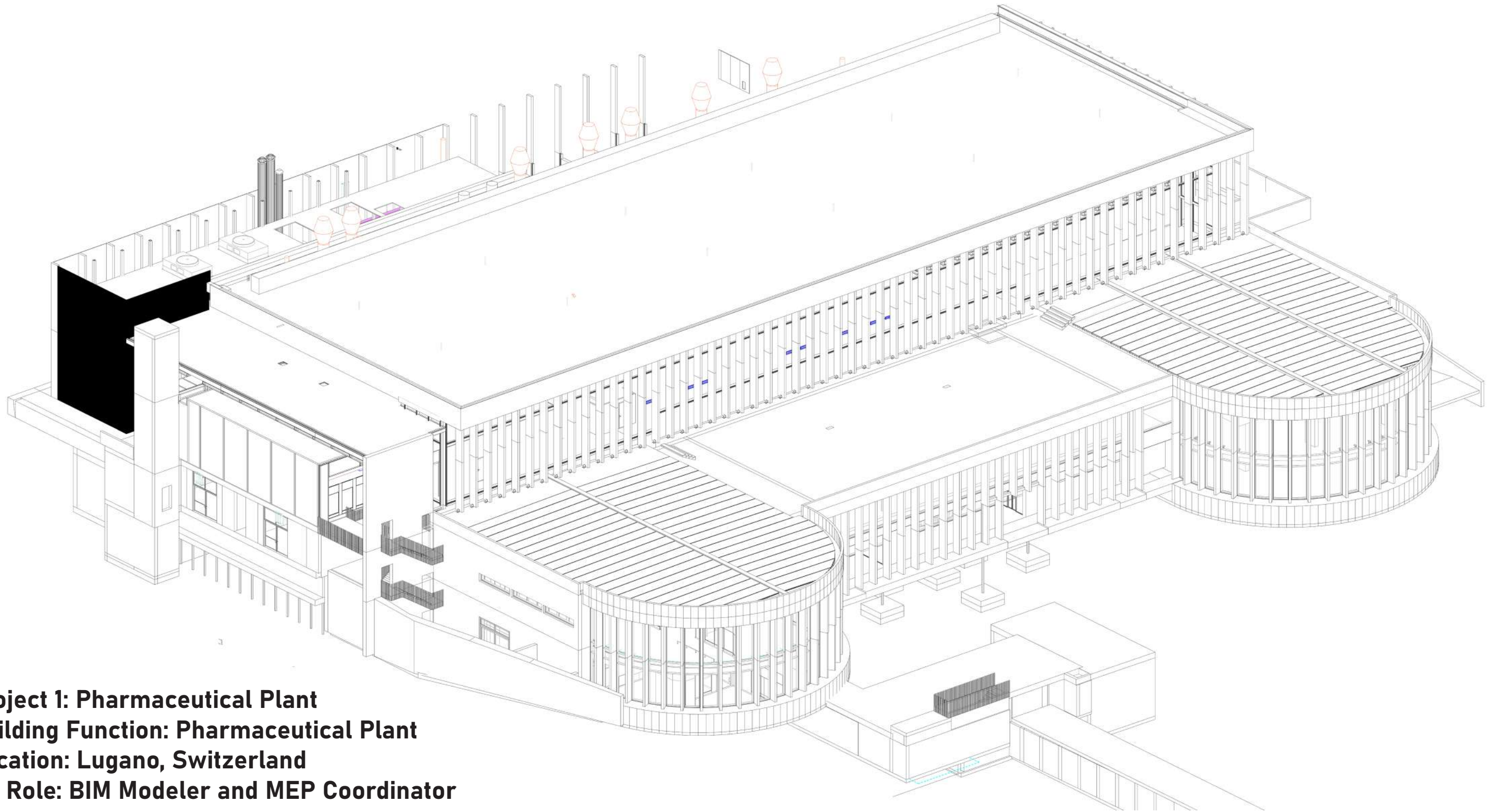


PORTFOLIO

SELECTED WORKS

SAHAND SAEIID
MAY 2023-AUGUST 2024



Project 1: Pharmaceutical Plant

Building Function: Pharmaceutical Plant

Location: Lugano, Switzerland

My Role: BIM Modeler and MEP Coordinator

Project Overview:

This project involved the construction of a new pharmaceutical plant in Lugano, Switzerland. My role was integral to the development of the as-built model for the piping system, as well as the incorporation of additional pipes. I was also responsible for designing and implementing a new HVAC system, which required rerouting existing cable trays to accommodate the updated configuration.

Challenges and Solutions:

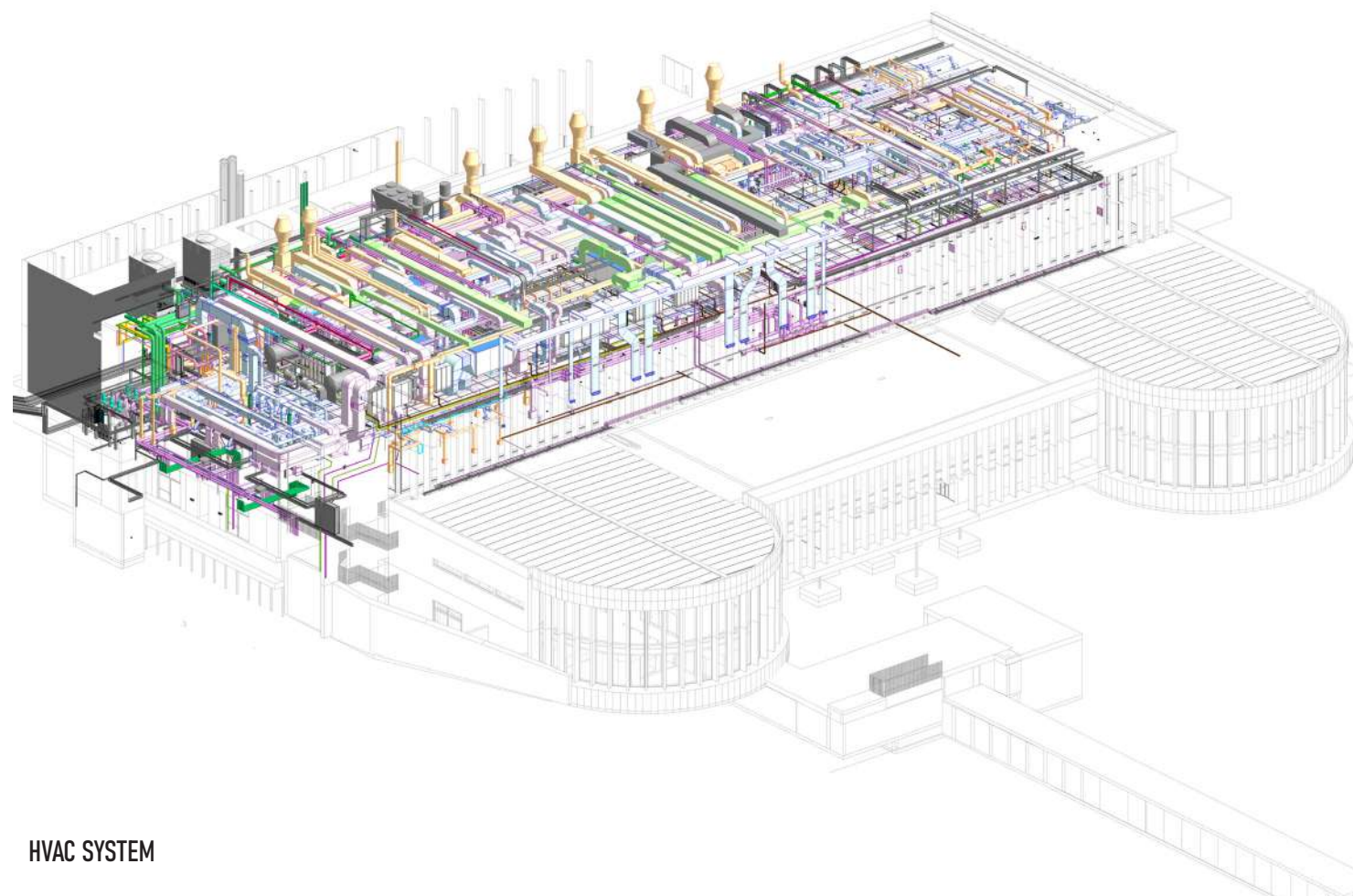
A key challenge was integrating the new HVAC system with the existing infrastructure while ensuring minimal disruption to the piping and electrical systems. I conducted on-site surveys to capture the as-built conditions accurately, which informed the 3D model creation. Through thorough clash detection and coordination, I resolved conflicts between the piping, HVAC, and electrical disciplines, ensuring a seamless integration.

Technologies and Tools:

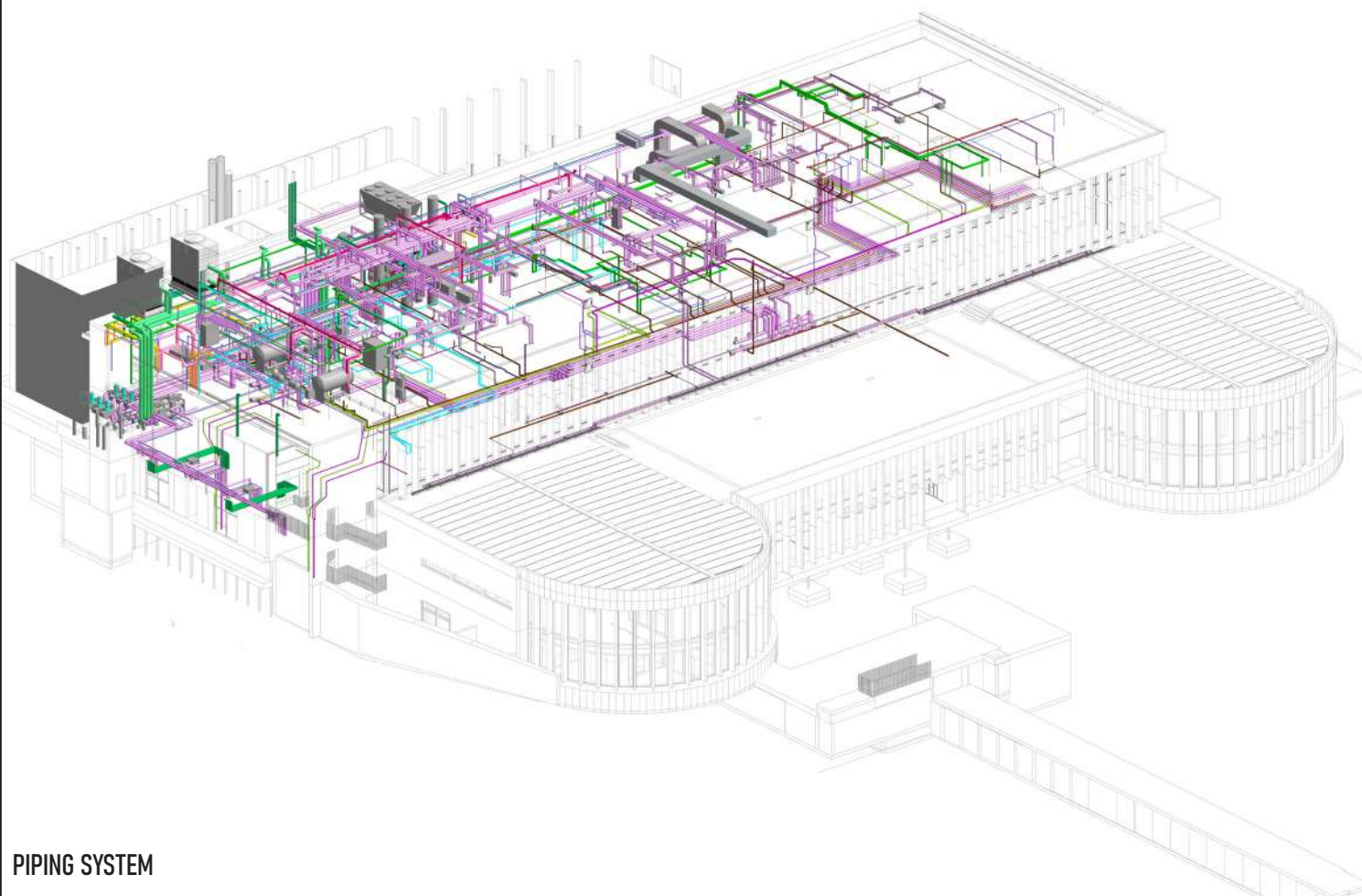
Revit for creating the 3D model

Navisworks for performing clash detection

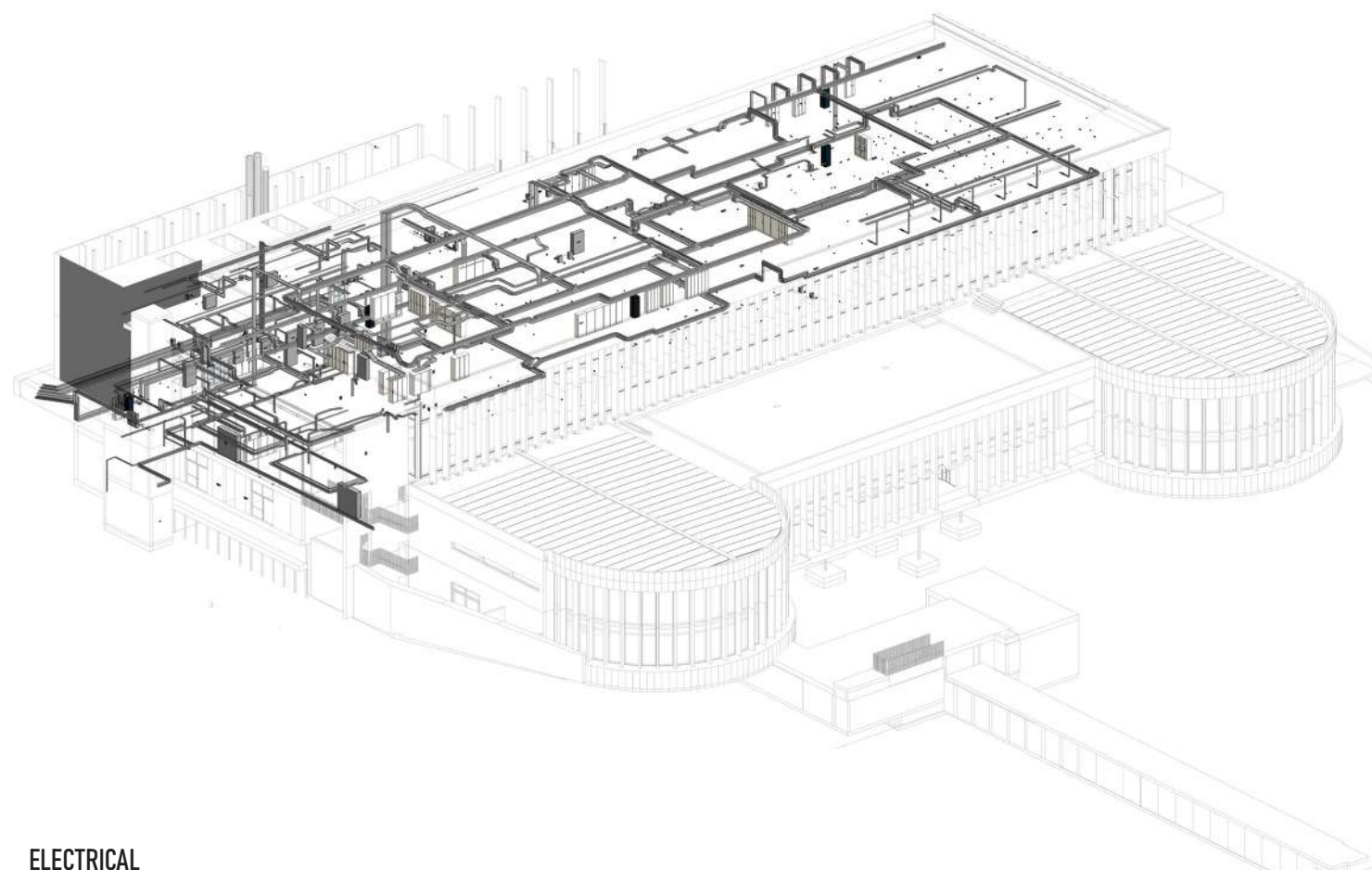
On-site surveying equipment for capturing as-built conditions



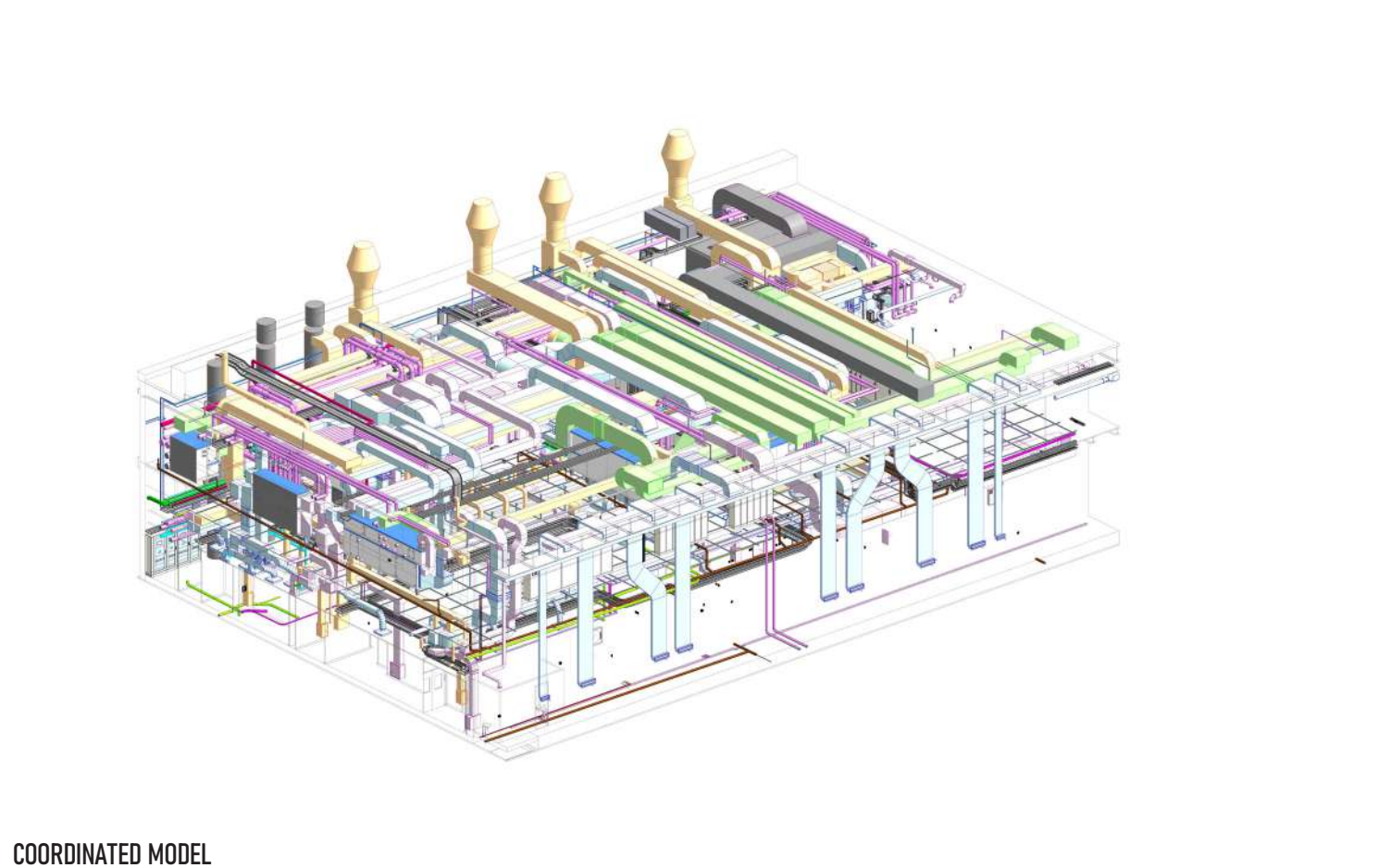
HVAC SYSTEM



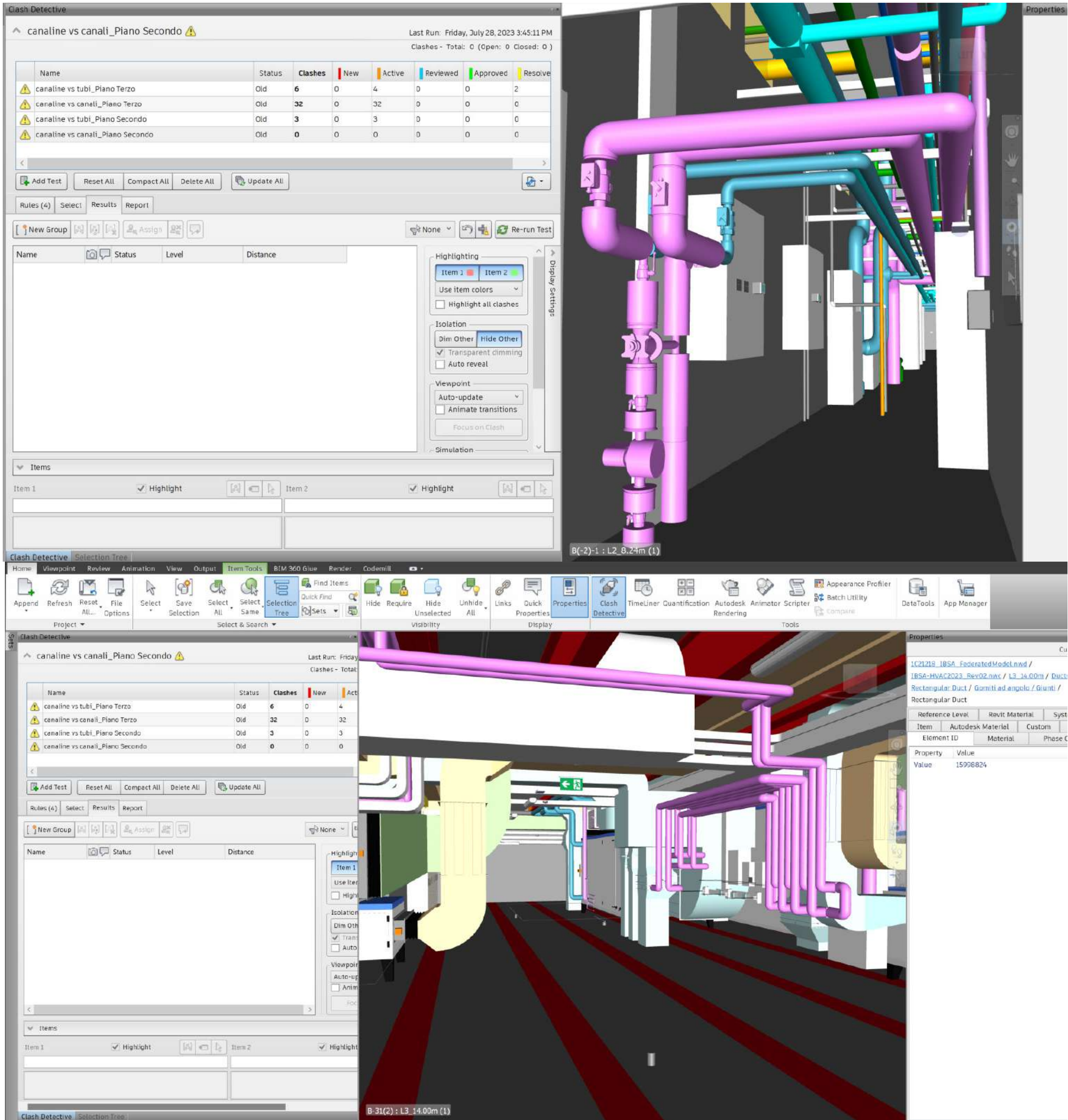
PIPING SYSTEM



ELECTRICAL

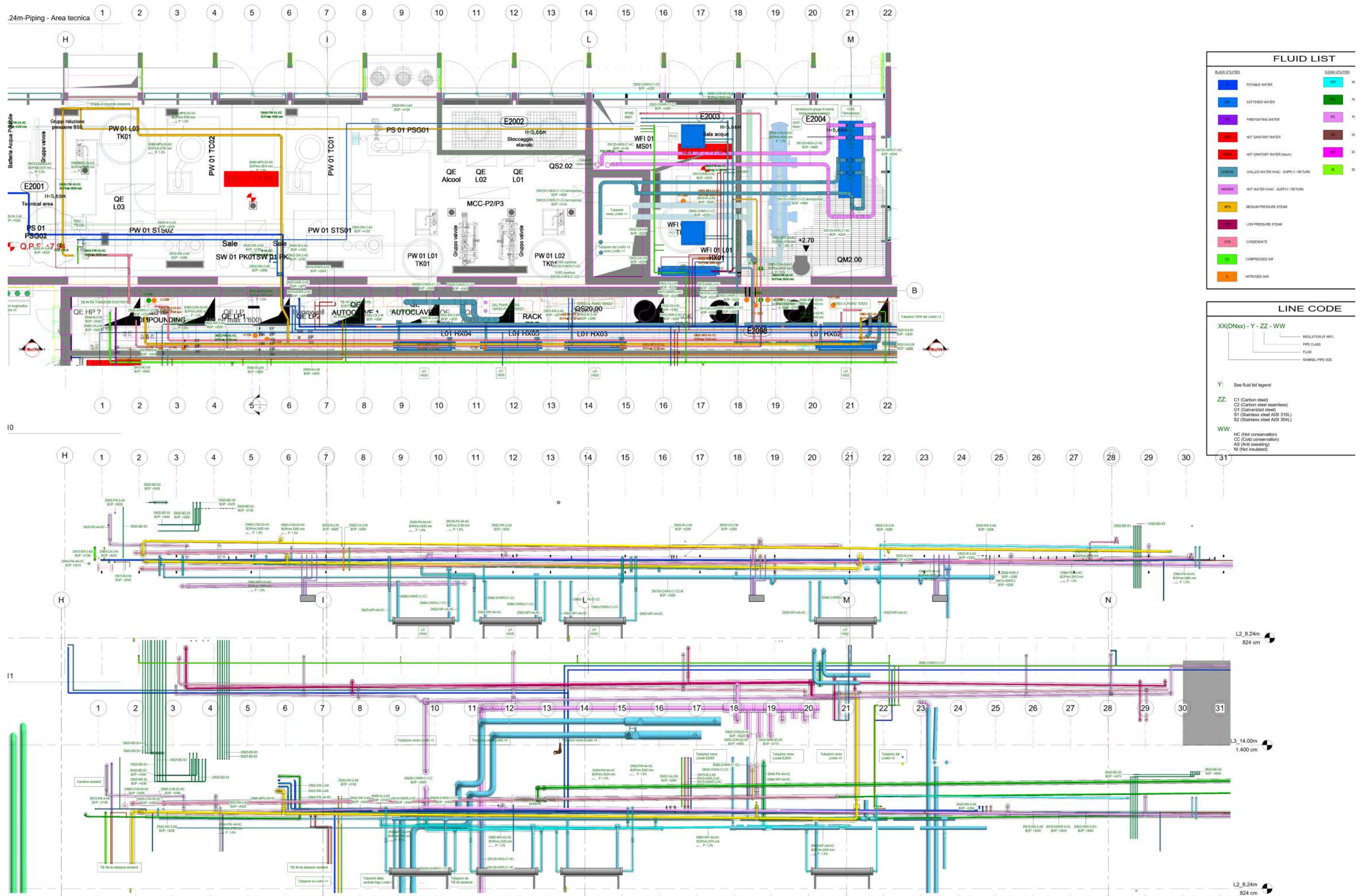


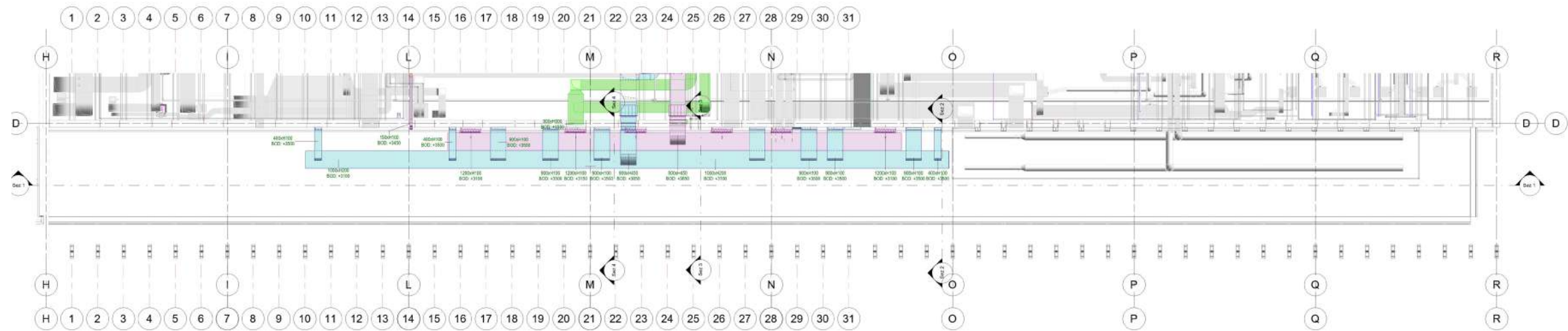
COORDINATED MODEL



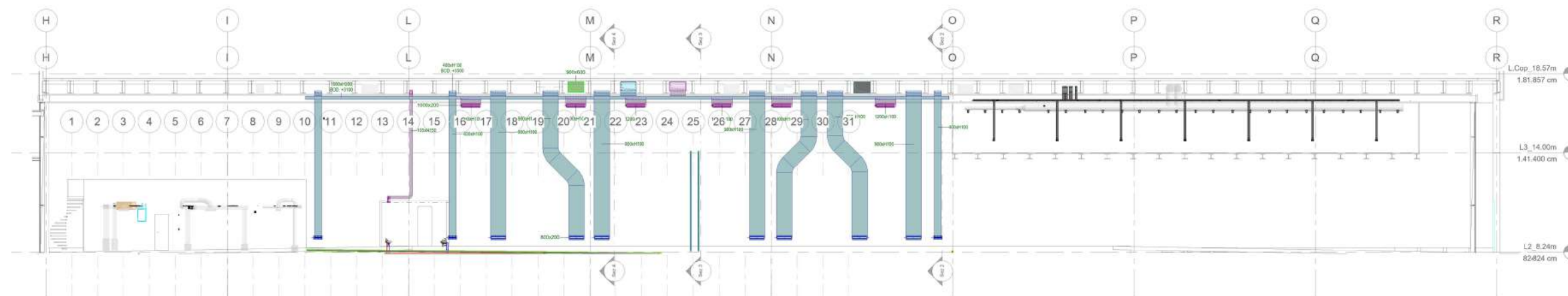
As-built model of the technical room in Navisworks, showcasing the detailed piping system layout, developed to ensure accurate representation and coordination within the overall project

Coordination model in Navisworks displaying the integration of piping and HVAC systems,

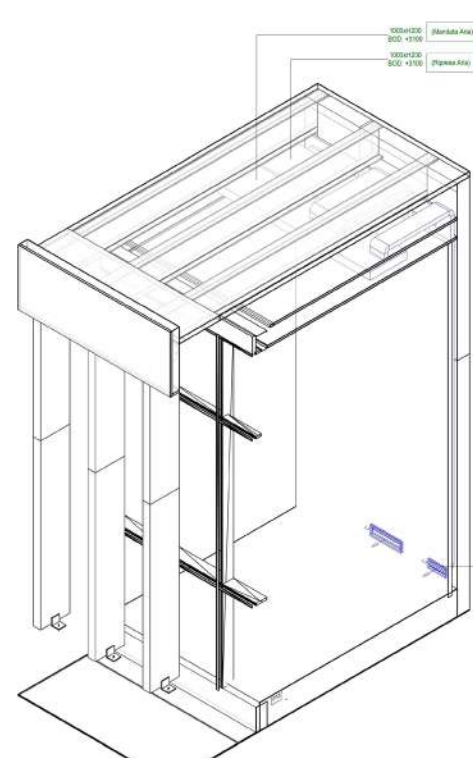




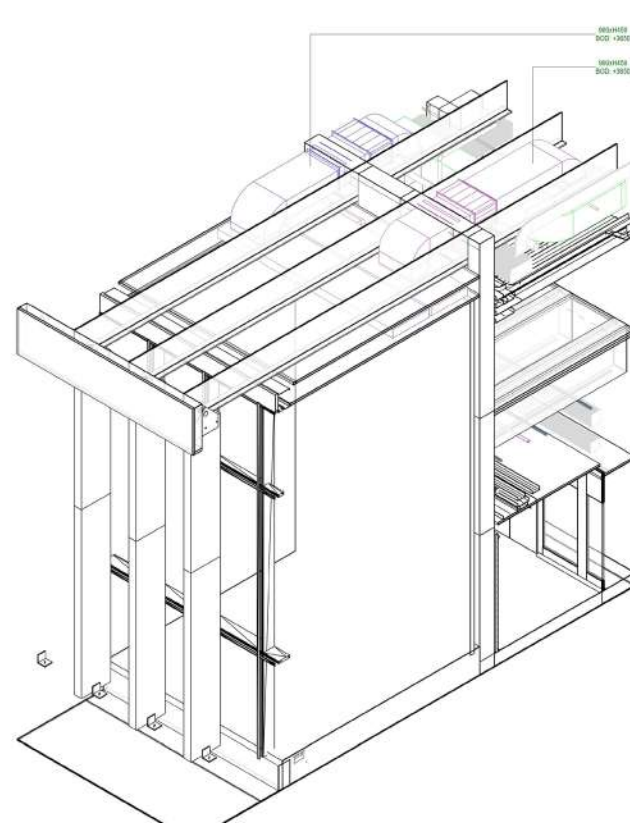
L3_14.00m-Galleria_vista dall'alto
1:100



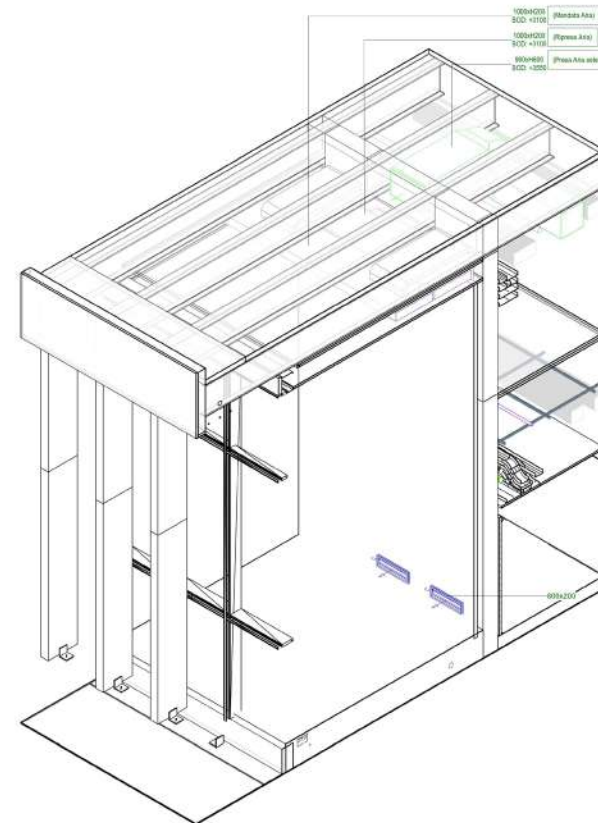
Sez 1
1:100



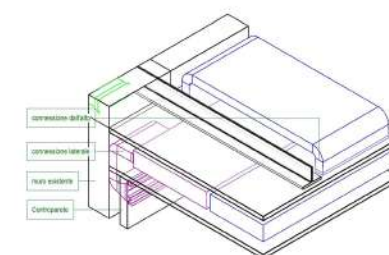
3D_Sez 2
HVAC SHOP DRAWING
6



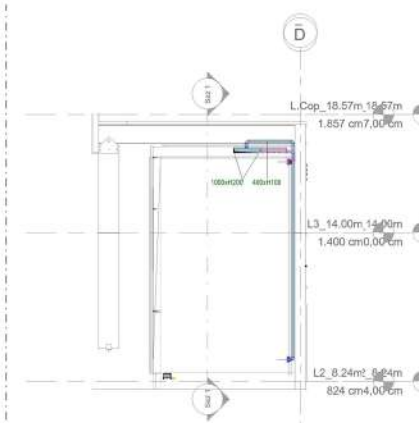
3D_Sez 3



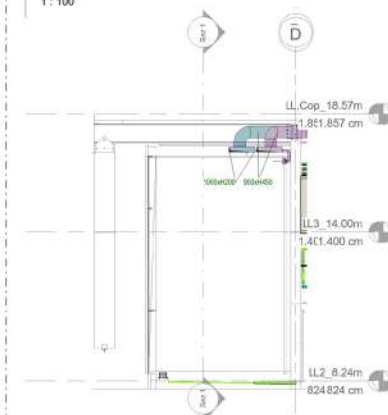
3D_Sez 4



Dettaglio



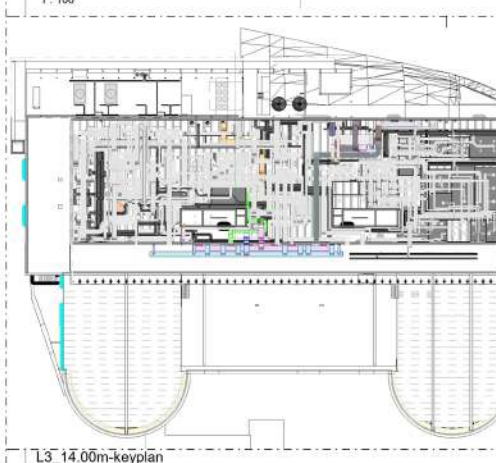
Sez 2
1:100



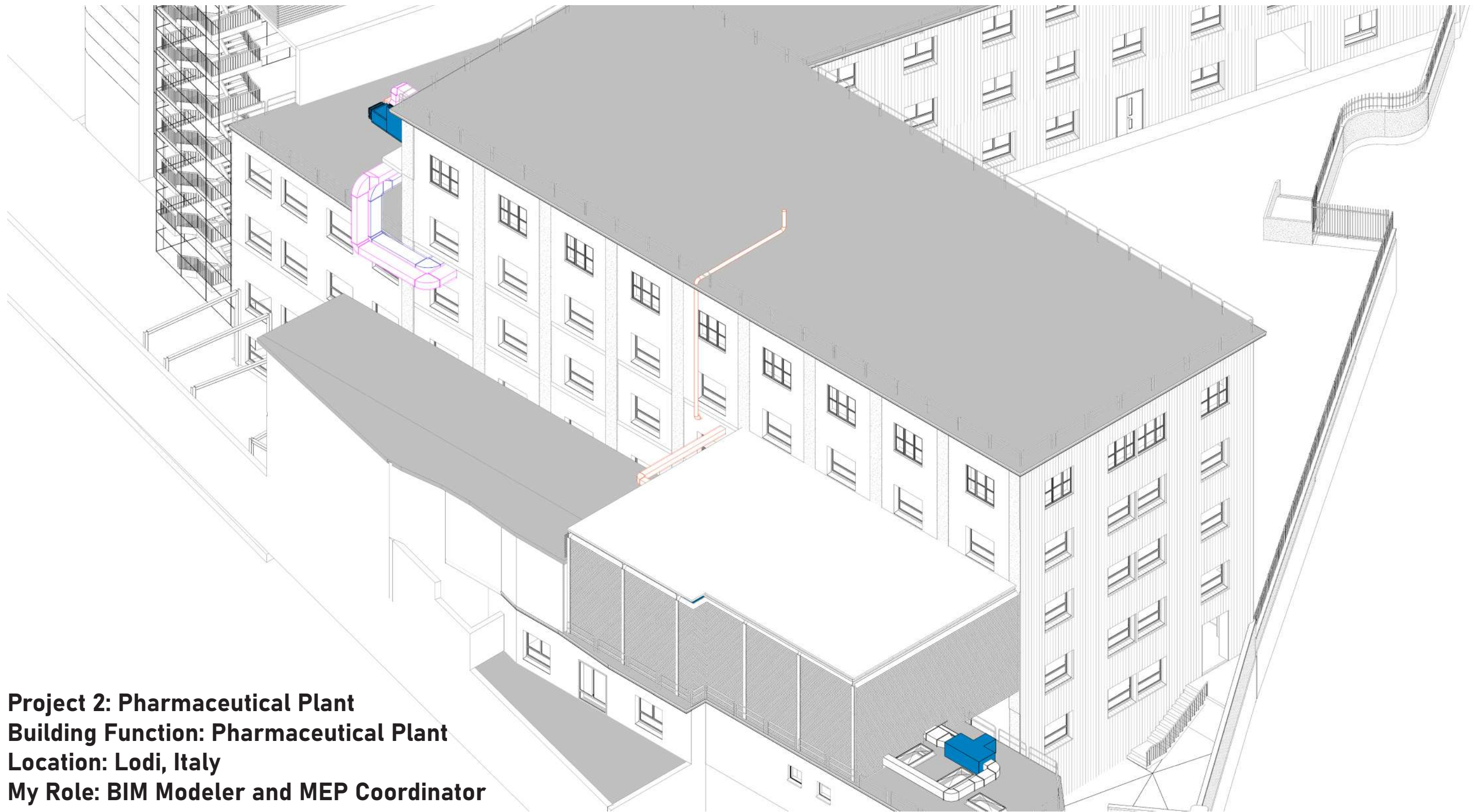
Sez 3
1:100



Sez 4
1:100



L3_14.00m-keyplan
1:500



Project 2: Pharmaceutical Plant

Building Function: Pharmaceutical Plant

Location: Lodi, Italy

My Role: BIM Modeler and MEP Coordinator

Project Overview:

This project involved developing the HVAC, piping, and electrical models for a pharmaceutical plant located in Lodi, Italy. Working within an existing building with limited space, I was responsible for creating detailed 3D models based on P&ID provided by the engineers for all the disciplines. My tasks included sizing the ducts according to airflow requirements, routing pipes and electrical systems, and ensuring the constructability of the designs within the constrained space.

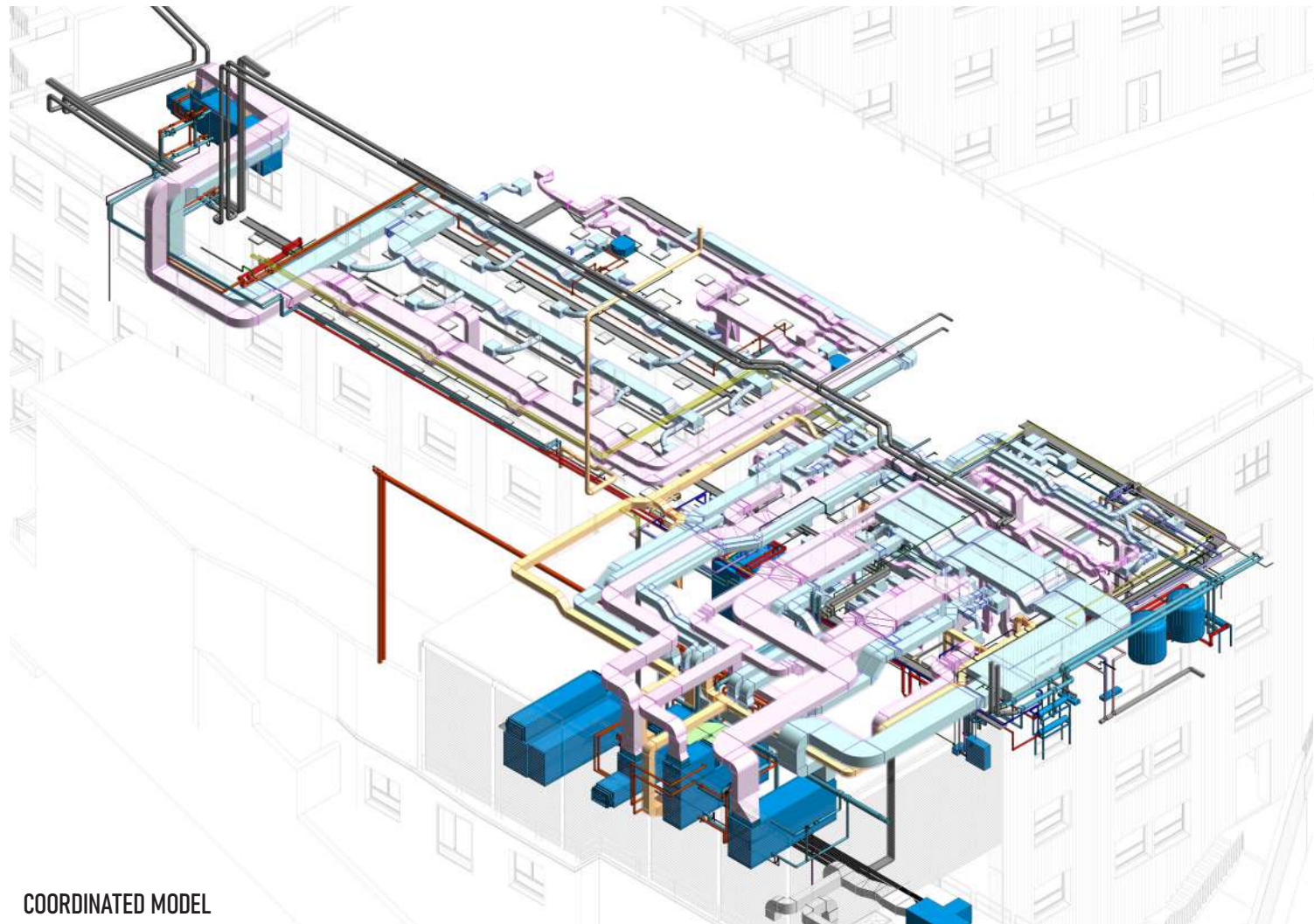
Challenges and Solutions:

The tight spatial constraints posed a significant challenge, requiring careful coordination to ensure all systems could be installed without conflict. I conducted comprehensive clash detection across different disciplines, making necessary adjustments to ensure all systems were constructible. The final deliverables included detailed shop drawings, material take-offs, and a fully coordinated model ready for construction.

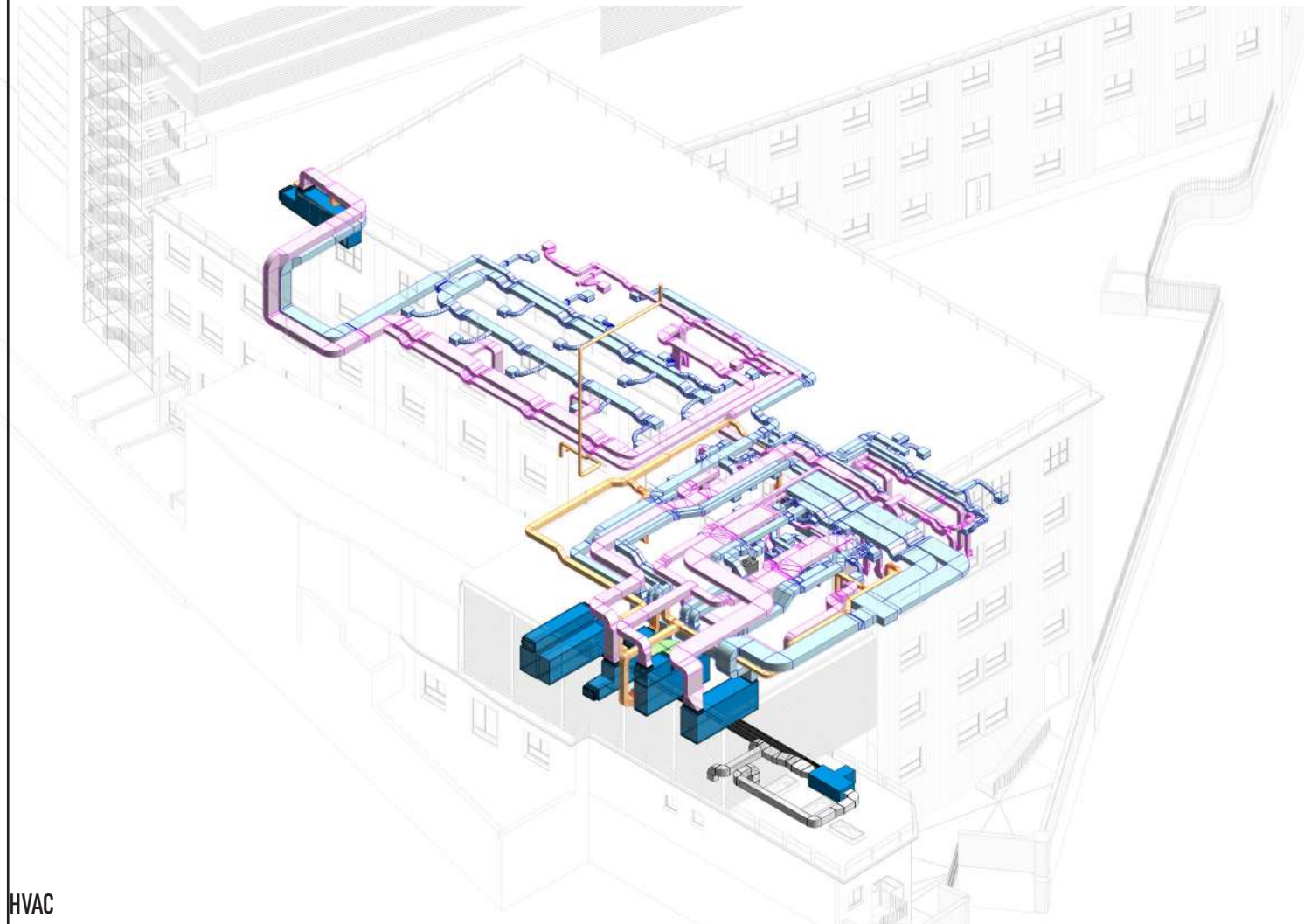
Technologies and Tools:

Revit for creating the 3D model

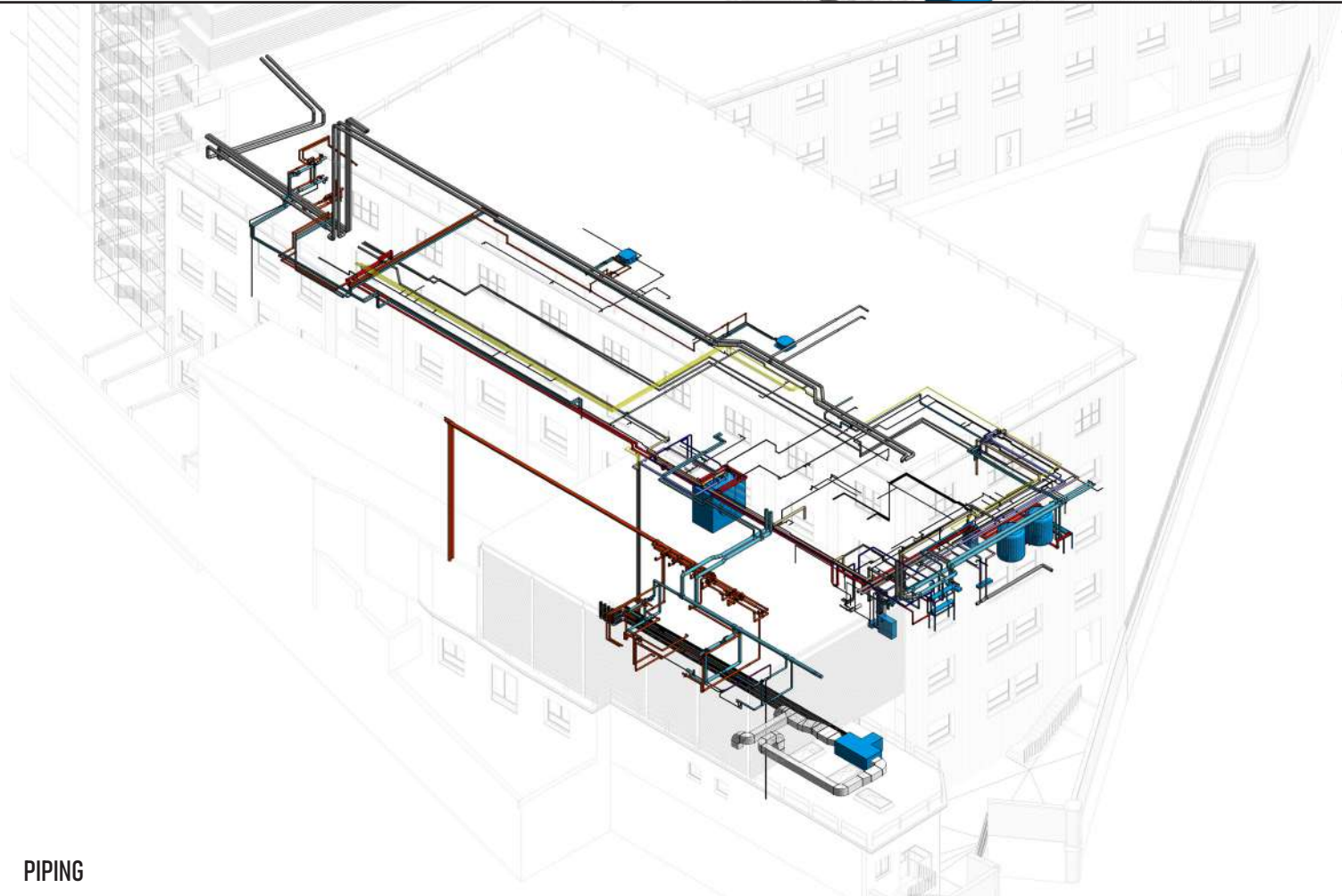
Navisworks for performing clash detection



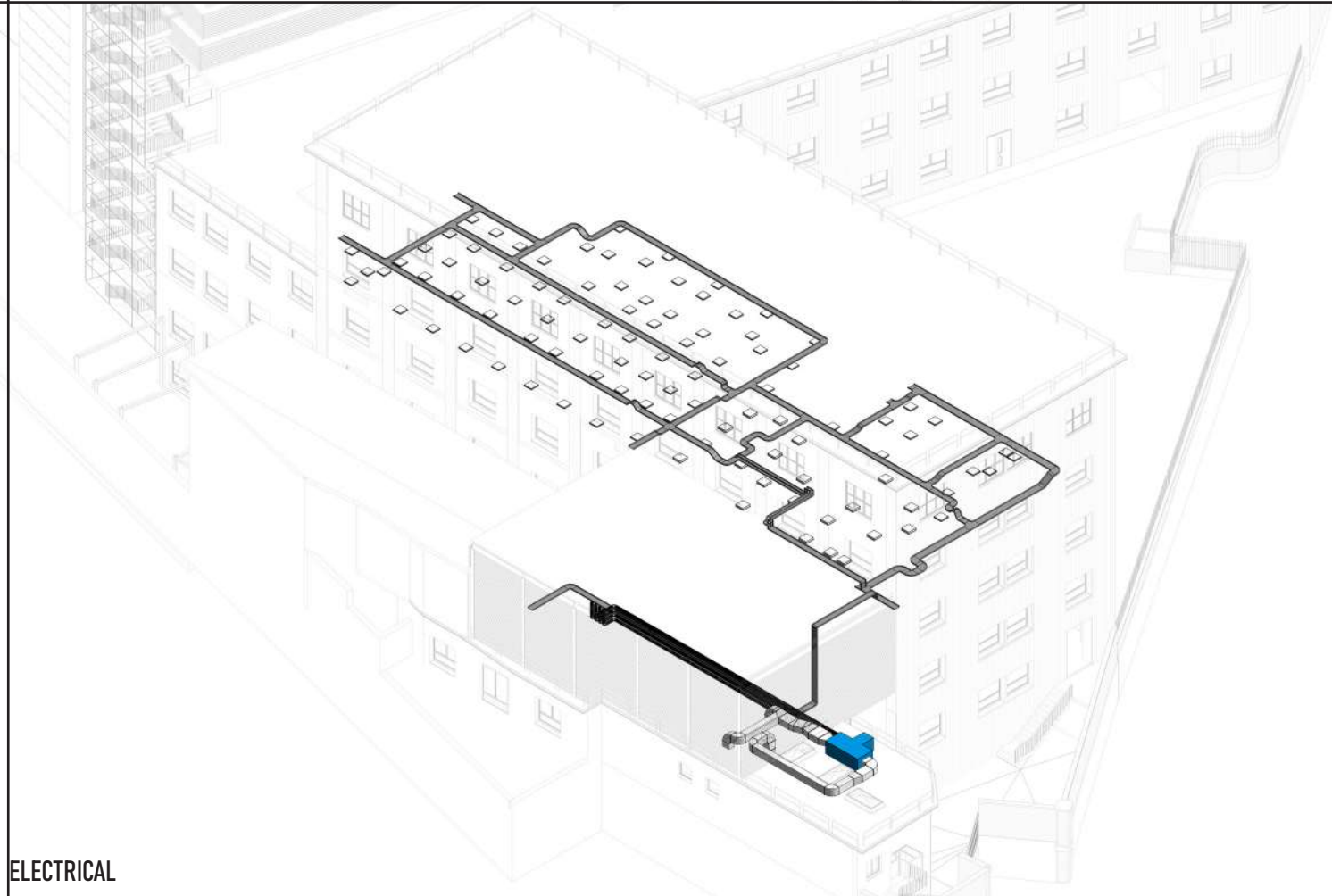
COORDINATED MODEL



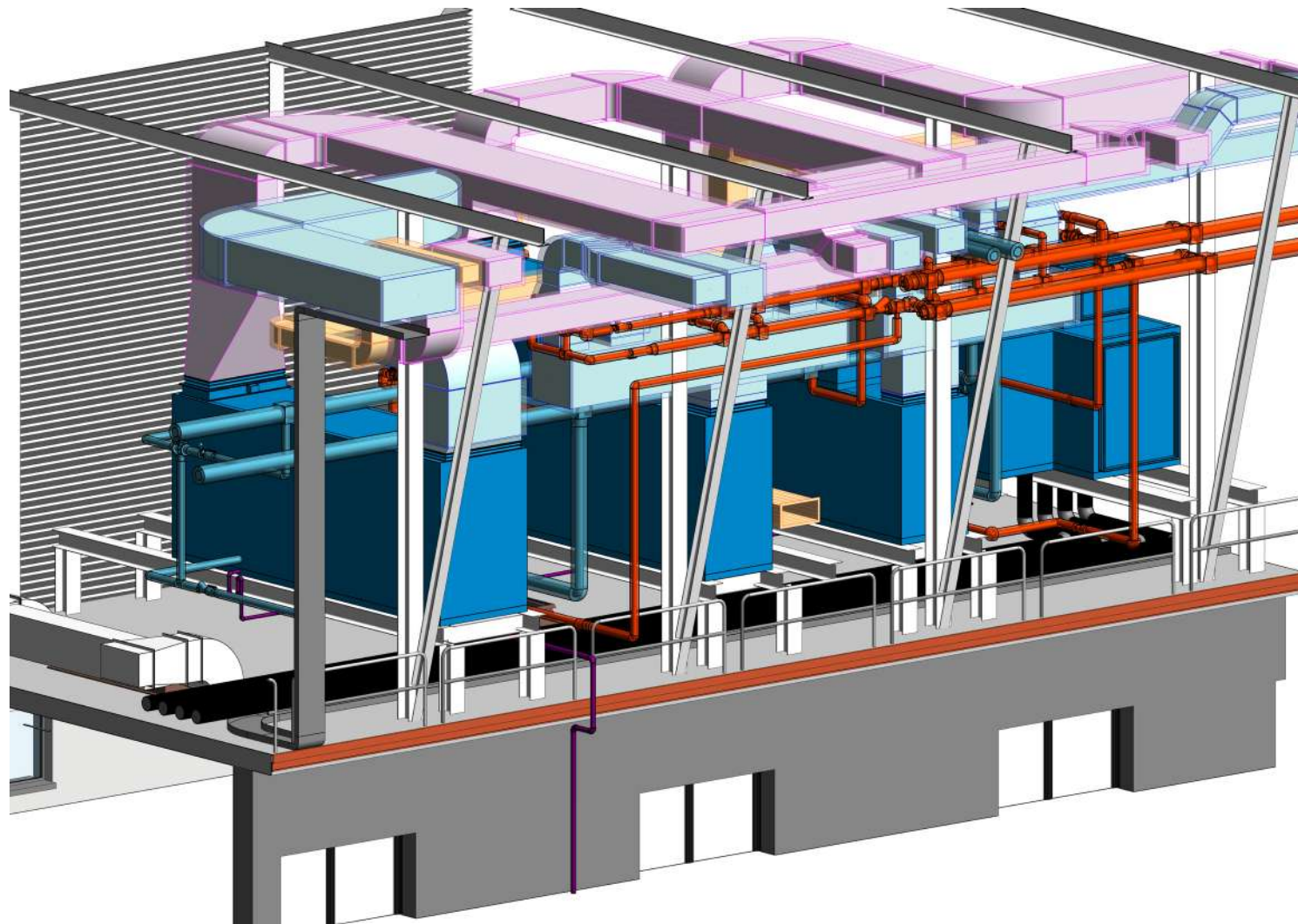
HVAC



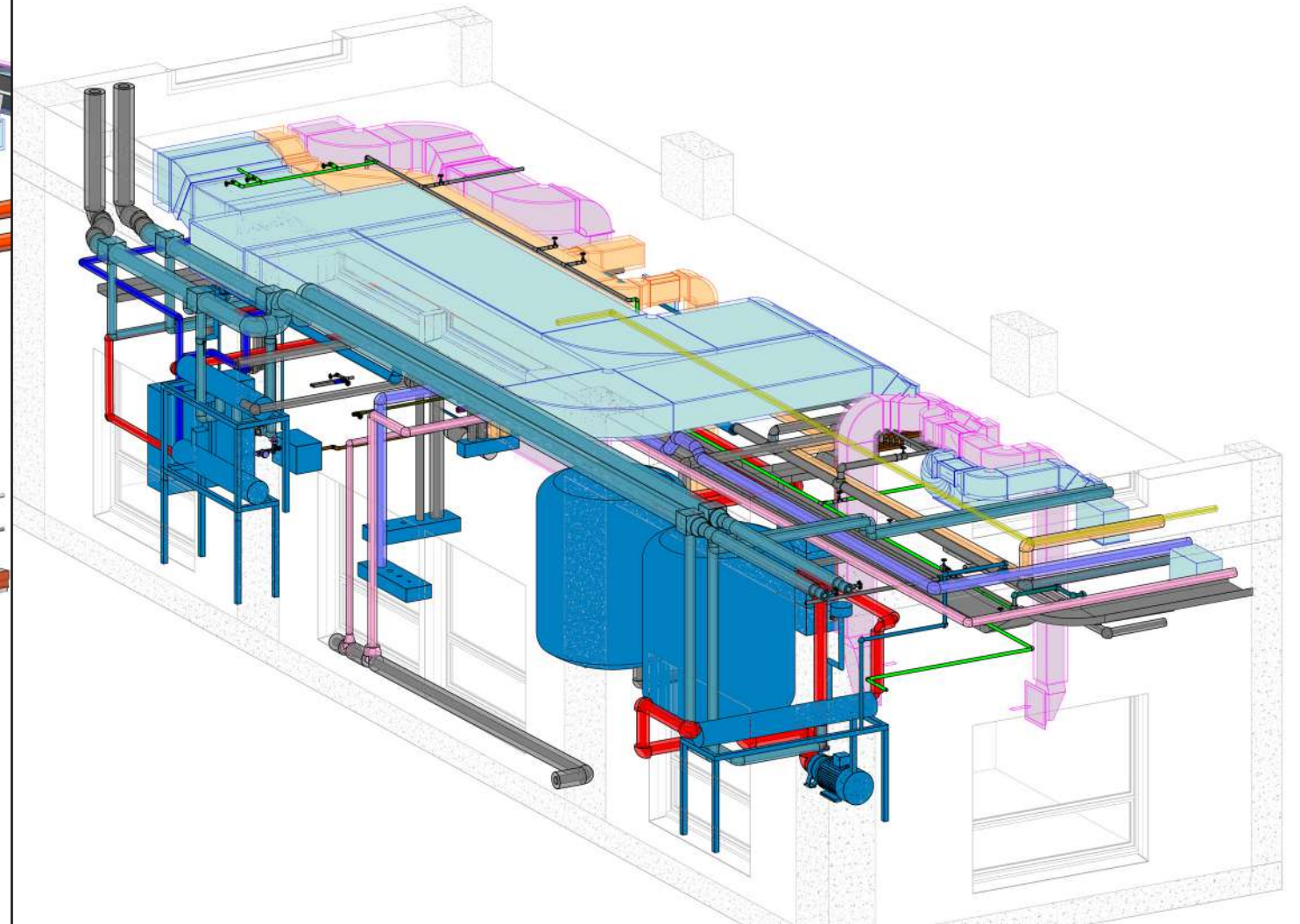
PIPING



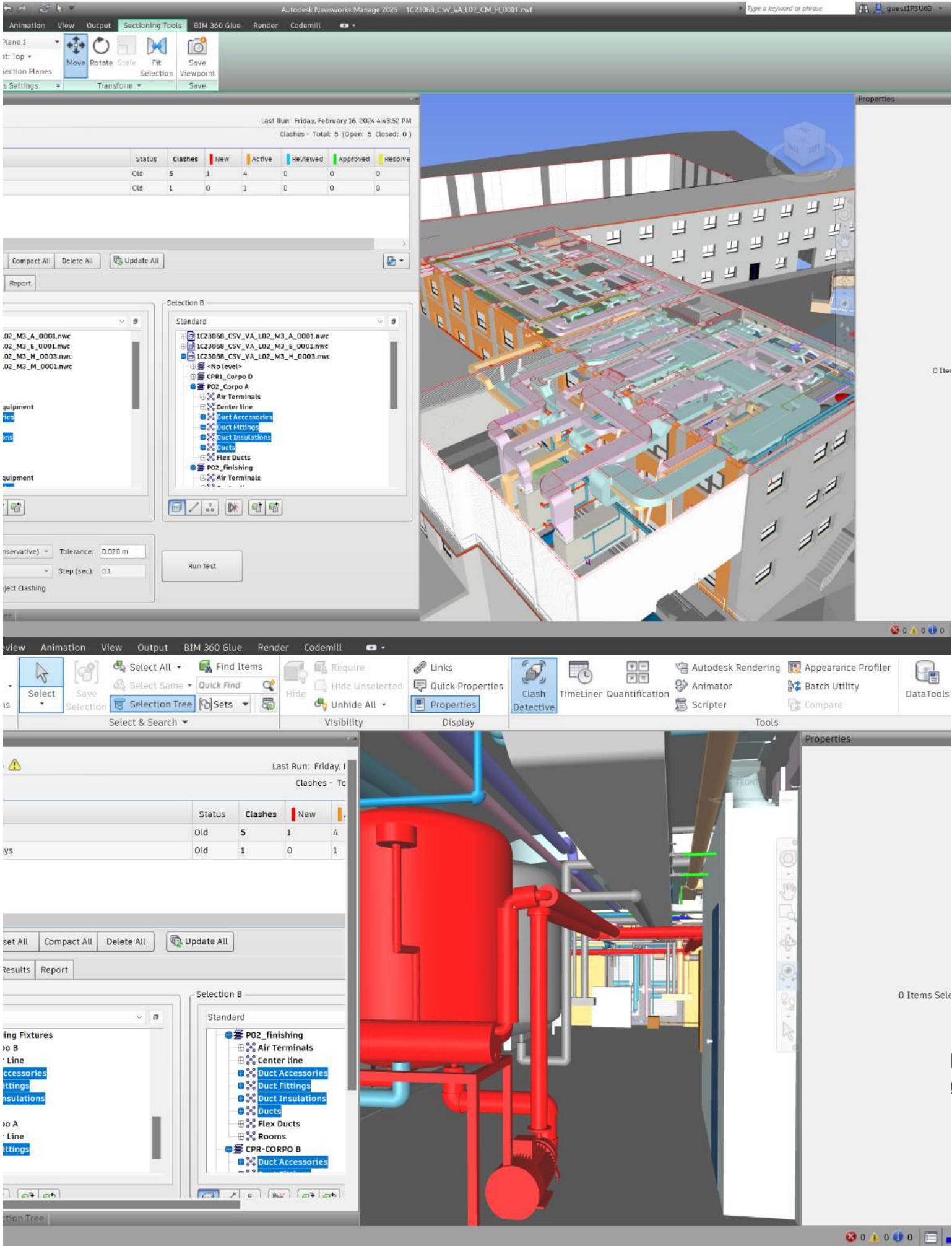
ELECTRICAL



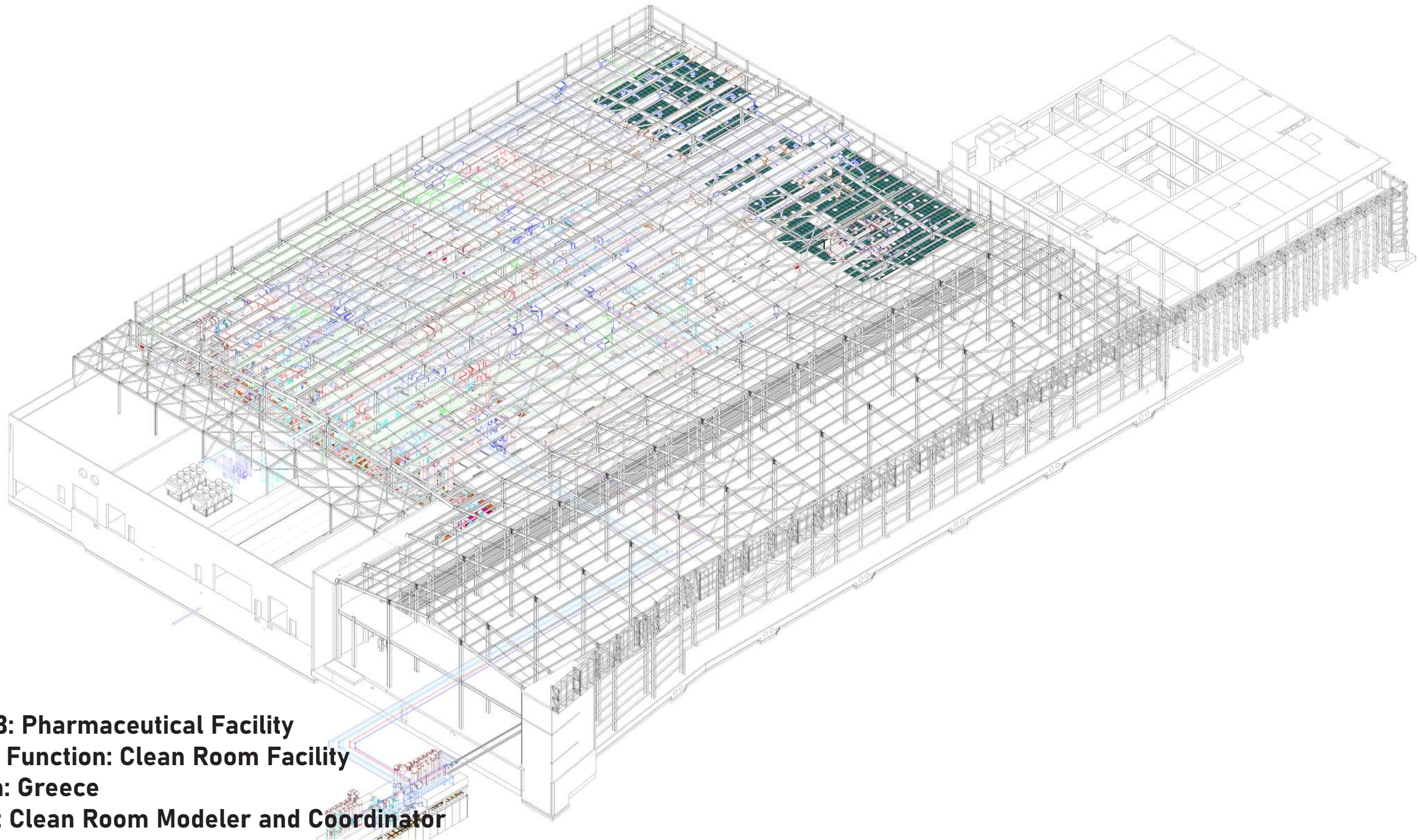
Detailed view of the roof area, illustrating the connection of pipes to the AHU along with the coordination of ductwork. All valves and pipe accessories are modeled, emphasizing the high level of detail and ensuring accurate installation and constructability within the confined space.



Technical room layout showcasing the coordination of tanks, pumps, ducts, and piping within a highly confined space. This image demonstrates the careful planning and precise modeling required to ensure all components fit and function efficiently without conflicts



Navisworks screenshot displaying the federated model used for clash detection. This view highlights how different systems were integrated and coordinated to identify and resolve conflicts, ensuring a seamless and accurate construction process.



Project 3: Pharmaceutical Facility

Building Function: Clean Room Facility

Location: Greece

My Role: Clean Room Modeler and Coordinator

Project Overview:

This project involved creating a highly detailed clean room model for a pharmaceutical facility in Greece. My primary responsibility was to develop the clean room layout, incorporating all essential elements such as furniture, ceiling profiles, and precise locations for air filters and return air grills. To achieve this level of detail, I developed numerous Revit families based on supplier standards. Coordination with external partners, who were responsible for other systems(MEP), was also a key aspect of this project.

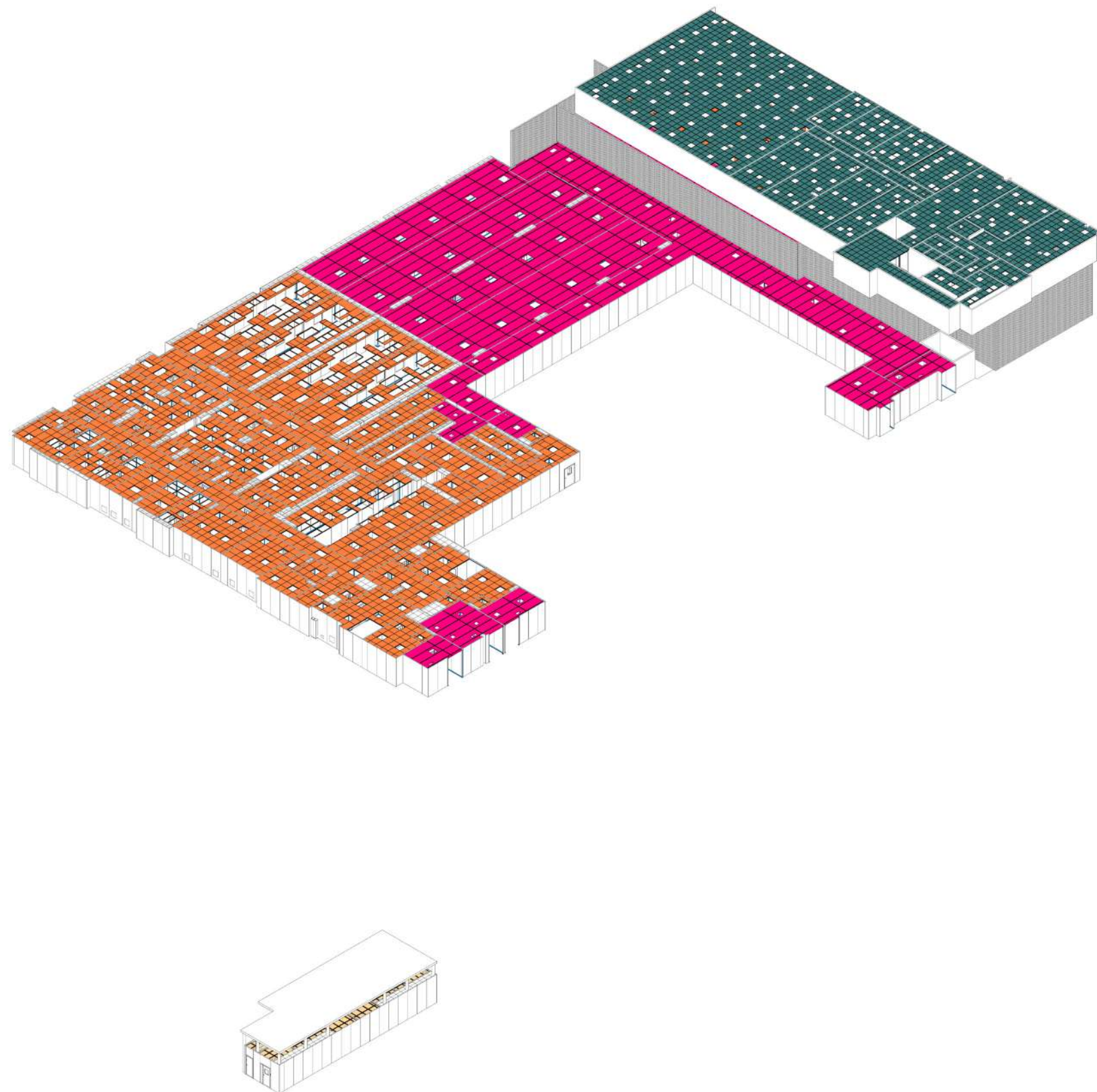
Challenges and Solutions:

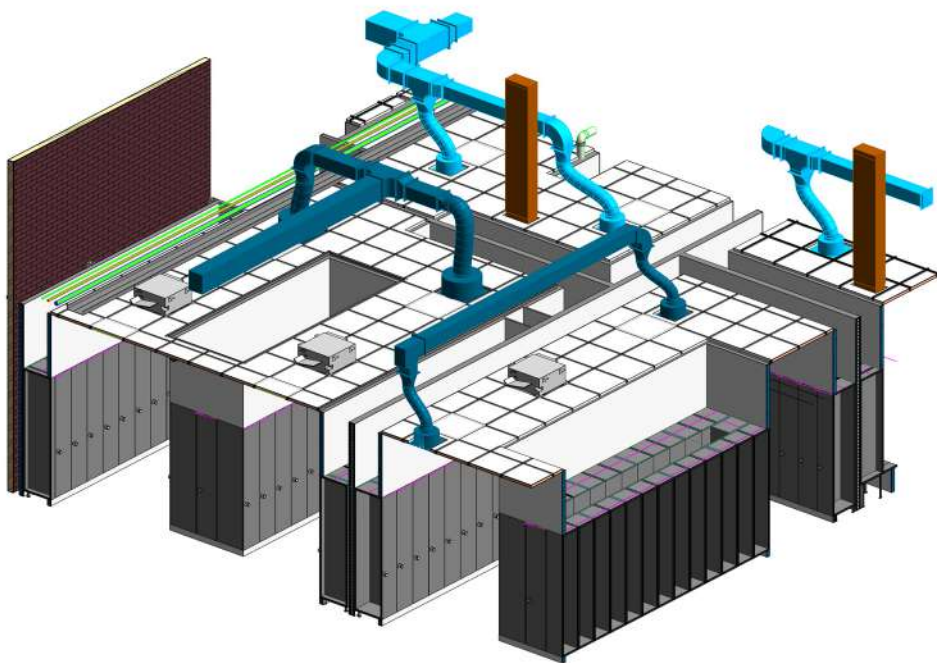
A significant challenge was managing the collaboration with external parties while working in parallel. Ensuring proper coordination was critical for example to accommodate vertical ducts passing through pharmaceutical walls and positioning air filters correctly on the ceiling. To address these challenges, we conducted weekly coordination meetings to align our work and resolve any conflicts promptly.

Technologies and Tools:

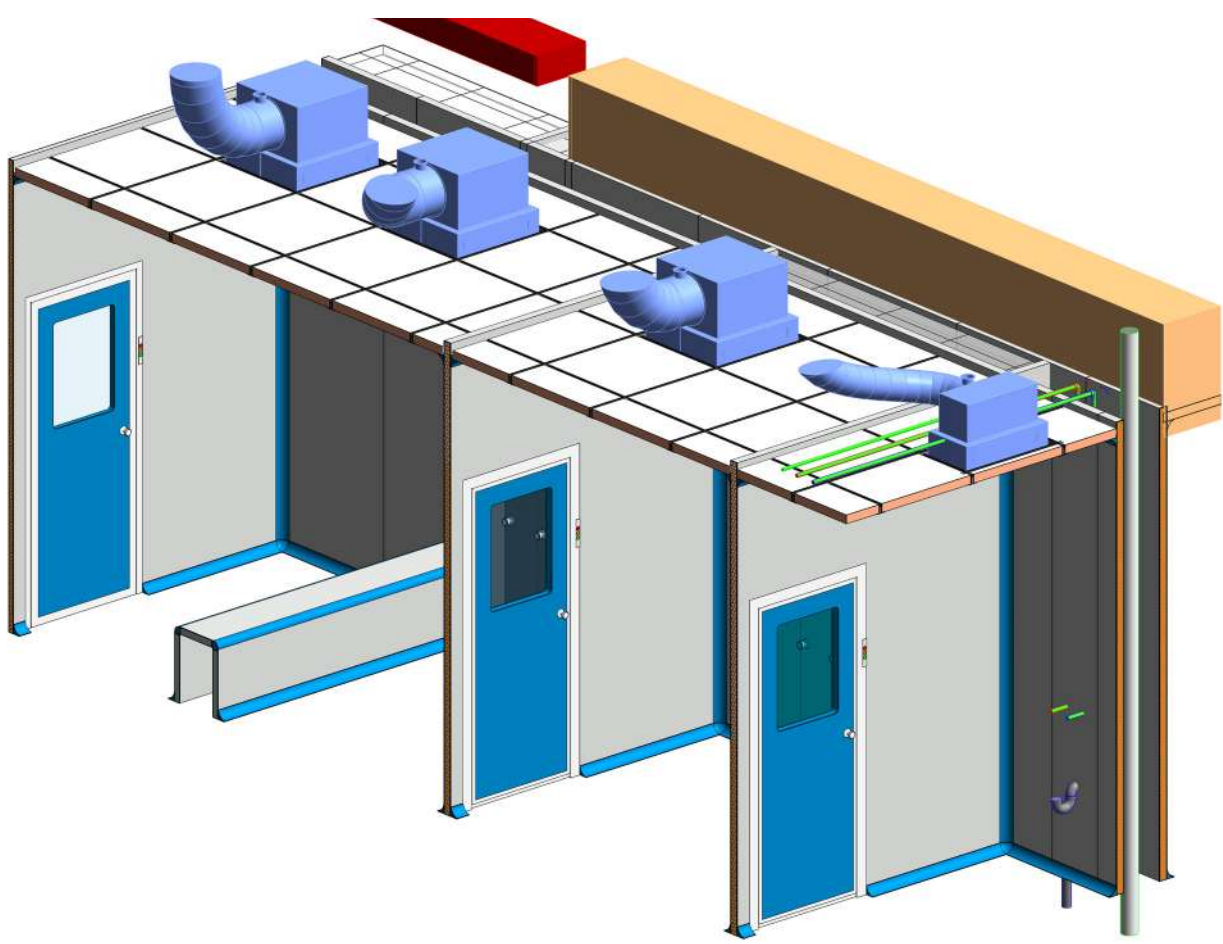
Revit for clean room modeling and detailed layout

LUMION for rendering

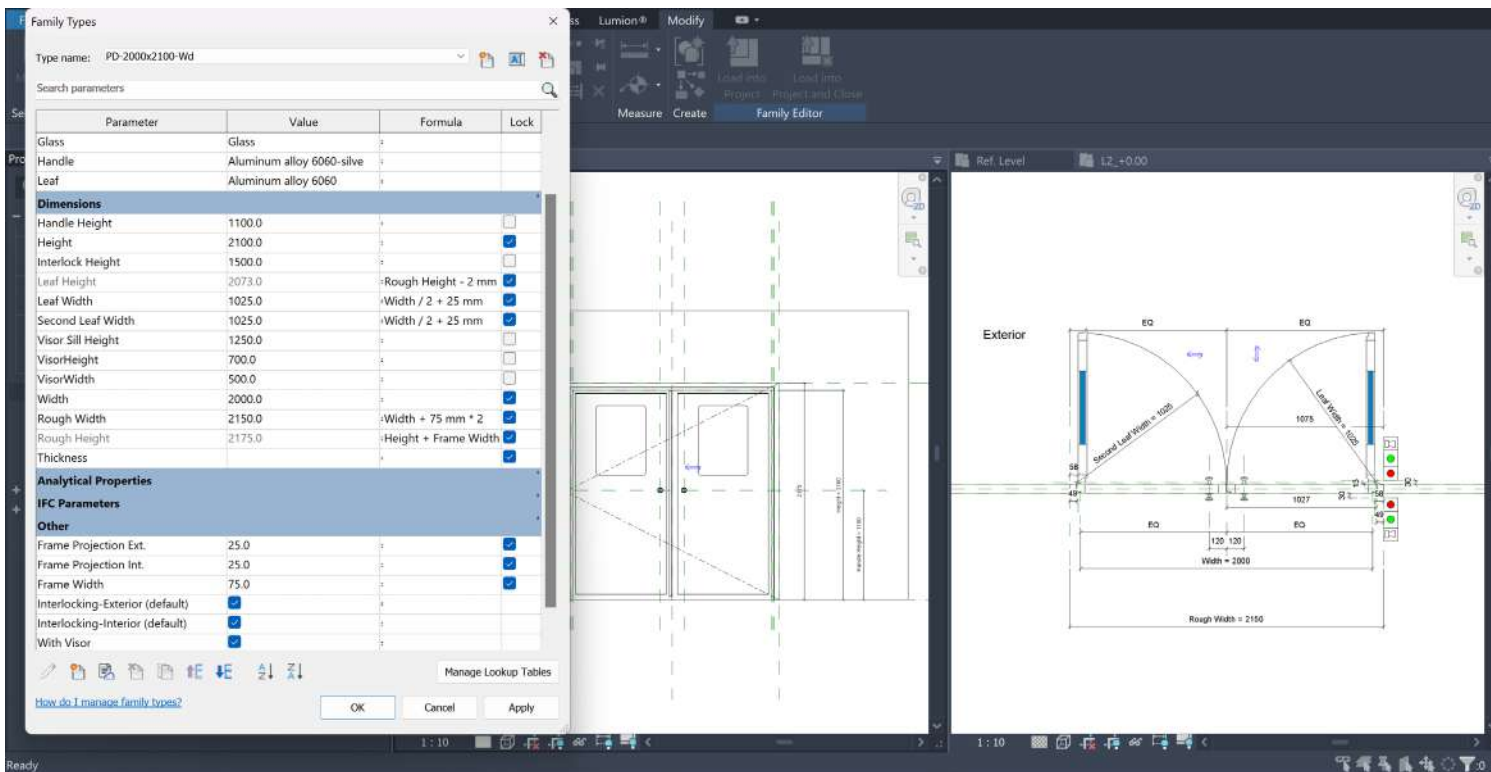




COORDINATION WITH HVAC MODEL-HIGH DETAILED FURNITURE



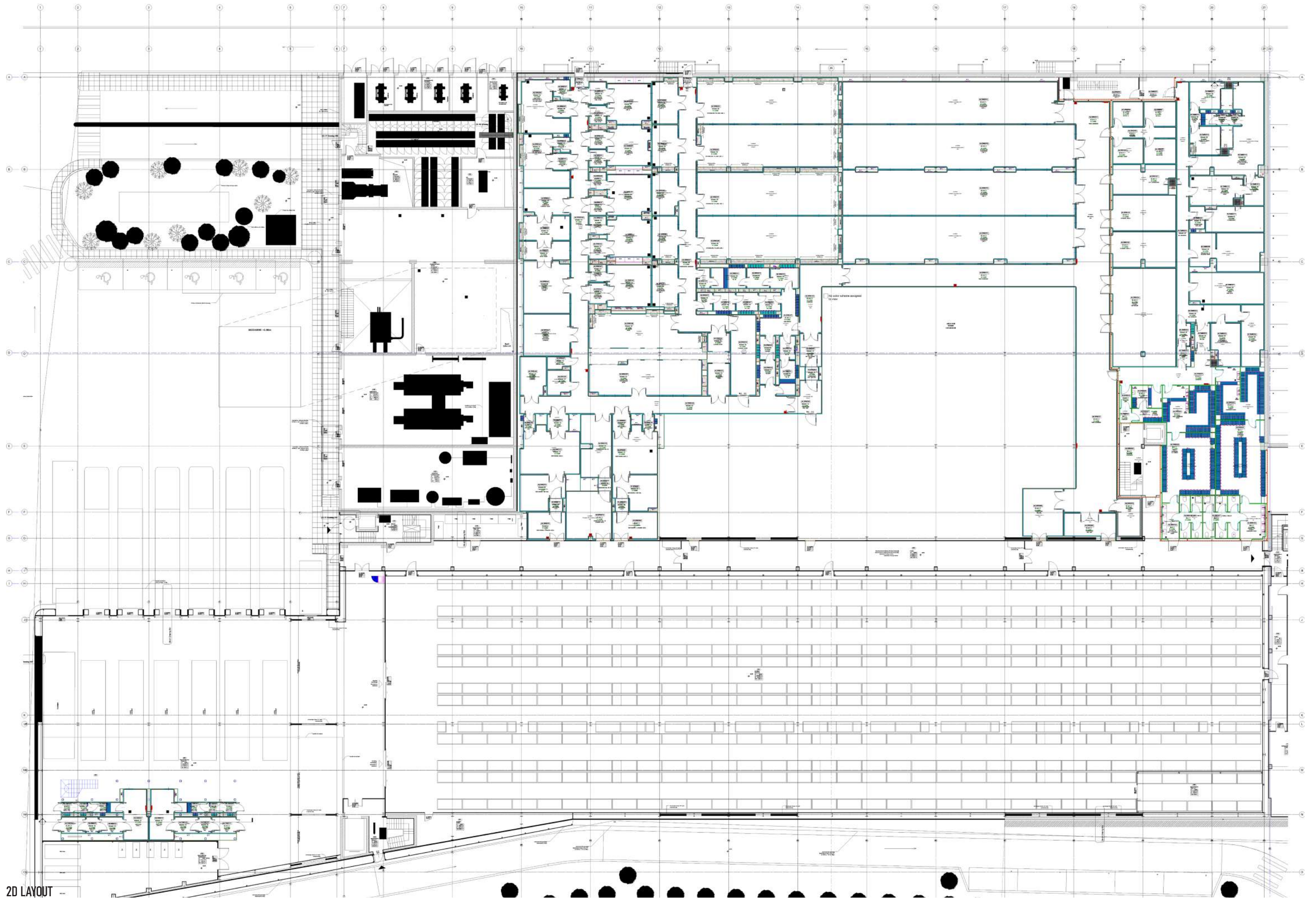
COORDINATION WITH HVAC MODEL-HIGH DETAILED FURNITURE



EXAMPLE OF PARAMETRIC FAMILY

A	B	C
Type	Count	Room: Number
Connection R70_Corner_Without Floor	1	AL2MB018
Connection R70_Corner_Without Floor	12	AL2PR028
Connection R70_Corner_Without Floor	10	AL2PR029
Connection R70_Corner_Without Floor	8	AL2PR030
Connection R70_Corner_Without Floor	11	AL2PR031
Connection R70_Corner_Without Floor	3	AL2PR033
Connection R70_Corner_Without Floor	2	AL2PR034
Connection R70_Corner_Without Floor	3	AL2PR035
Connection R70_Corner_Without Floor	2	AL2PR036
Connection R70_Corner_Without Floor	3	AL2PR037
Connection R70_Corner_Without Floor	9	AL2PR038
Connection R70_Corner_Without Floor	1	AL2PR039
Connection R70_Corner_Without Floor	3	AL2PR059
Connection R70_Corner_Without Floor	2	AL2PR062
Connection R70_Corner_Without Floor	3	AL2PR064
Connection R70_Corner_Without Floor	3	AL2PR065
Connection R70_Corner_Without Floor	1	AL2SR007
Connection R70_Corner_Without Floor	1	AL2SR014

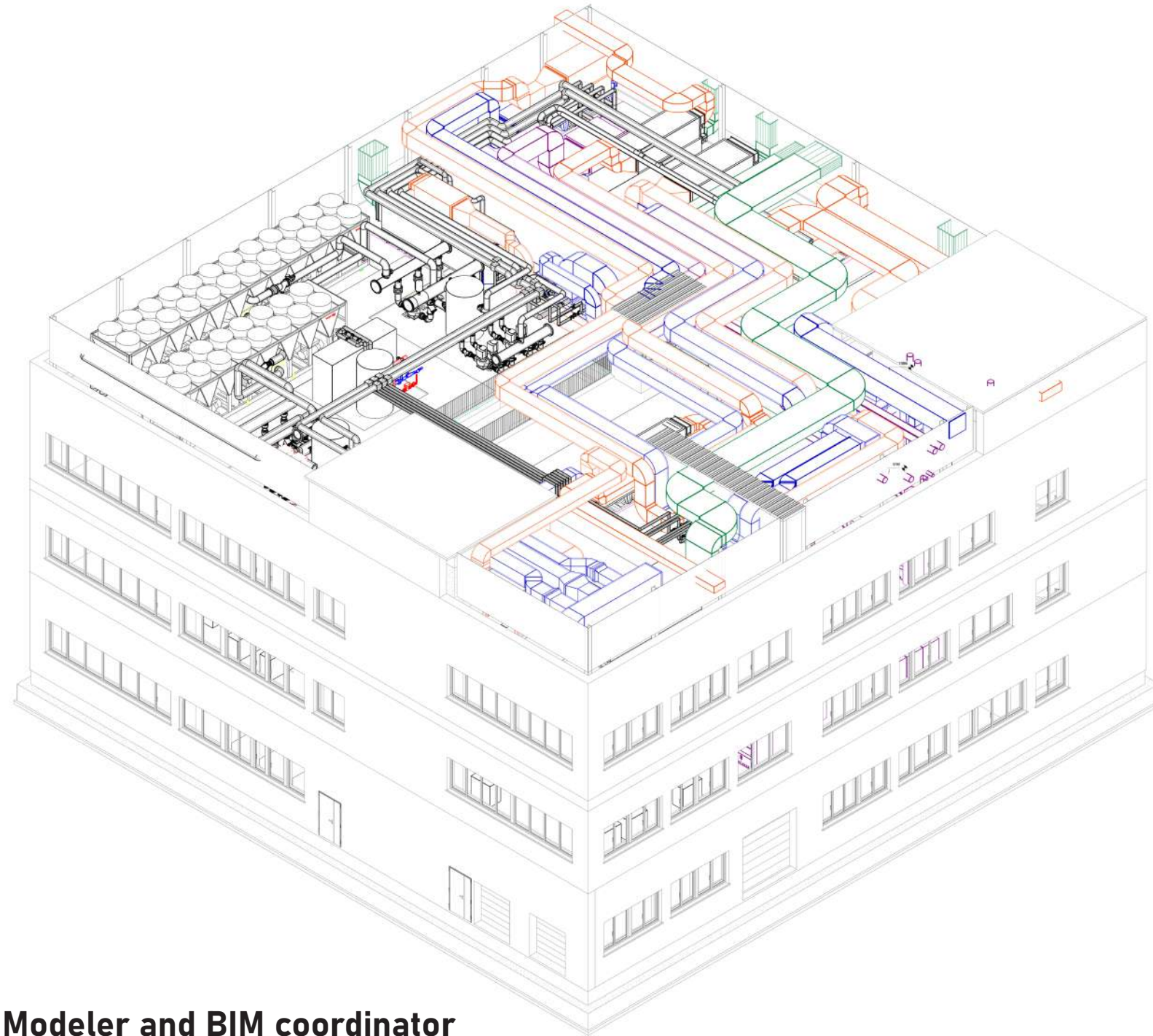
Schedule showcasing the Revit families created for the clean room model. This detailed schedule demonstrates that the families were not only used for 3D modeling but also for material take-offs and cost estimation, underscoring their practical application in project planning and budgeting





2D FALSE CEILING LAYOUT





Project 4: Laboratory Facility

Building Function: Laboratory

Location: France

My Role: HVAC and Piping System Modeler and BIM coordinator

Project Overview:

This project involved designing the HVAC and piping systems for a multi-storey laboratory building in France. My responsibilities included creating the HVAC model based on P&ID, sizing and routing ducts throughout the building, and incorporating all necessary duct accessories. Similarly, I developed the piping system, integrating pumps, valves, and chillers, and ensuring proper connections throughout the system.

Challenges and Solutions:

The primary challenge was accommodating numerous ducts within a very limited space. To overcome this, I meticulously planned the duct routing and performed extensive clash detection to ensure that all elements fit and functioned properly. This involved coordinating closely with other systems to resolve conflicts and guarantee constructibility. Additionally, I created detailed schedules for material take-offs to support accurate project budgeting and procurement.

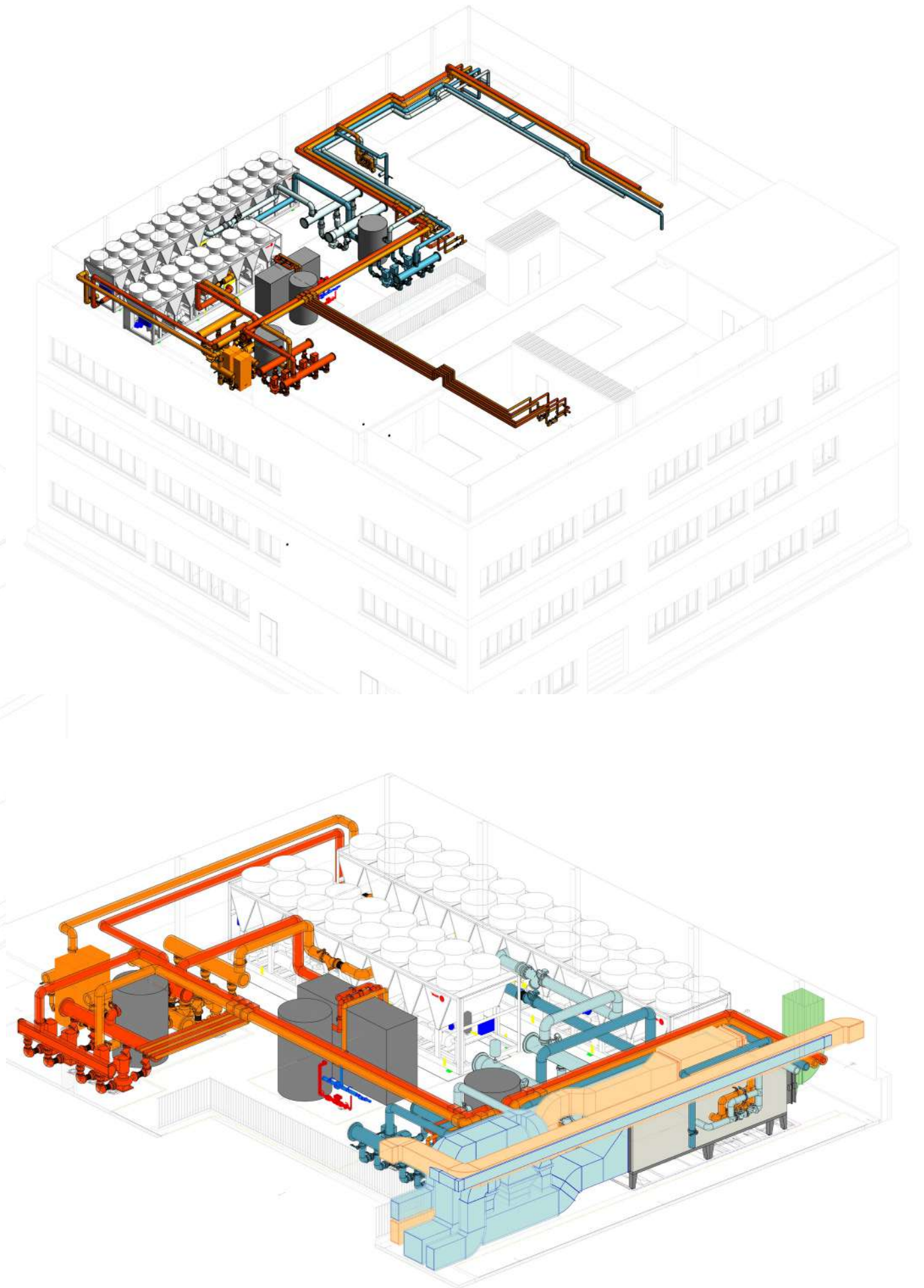
Technologies and Tools:

Revit for HVAC and piping modeling

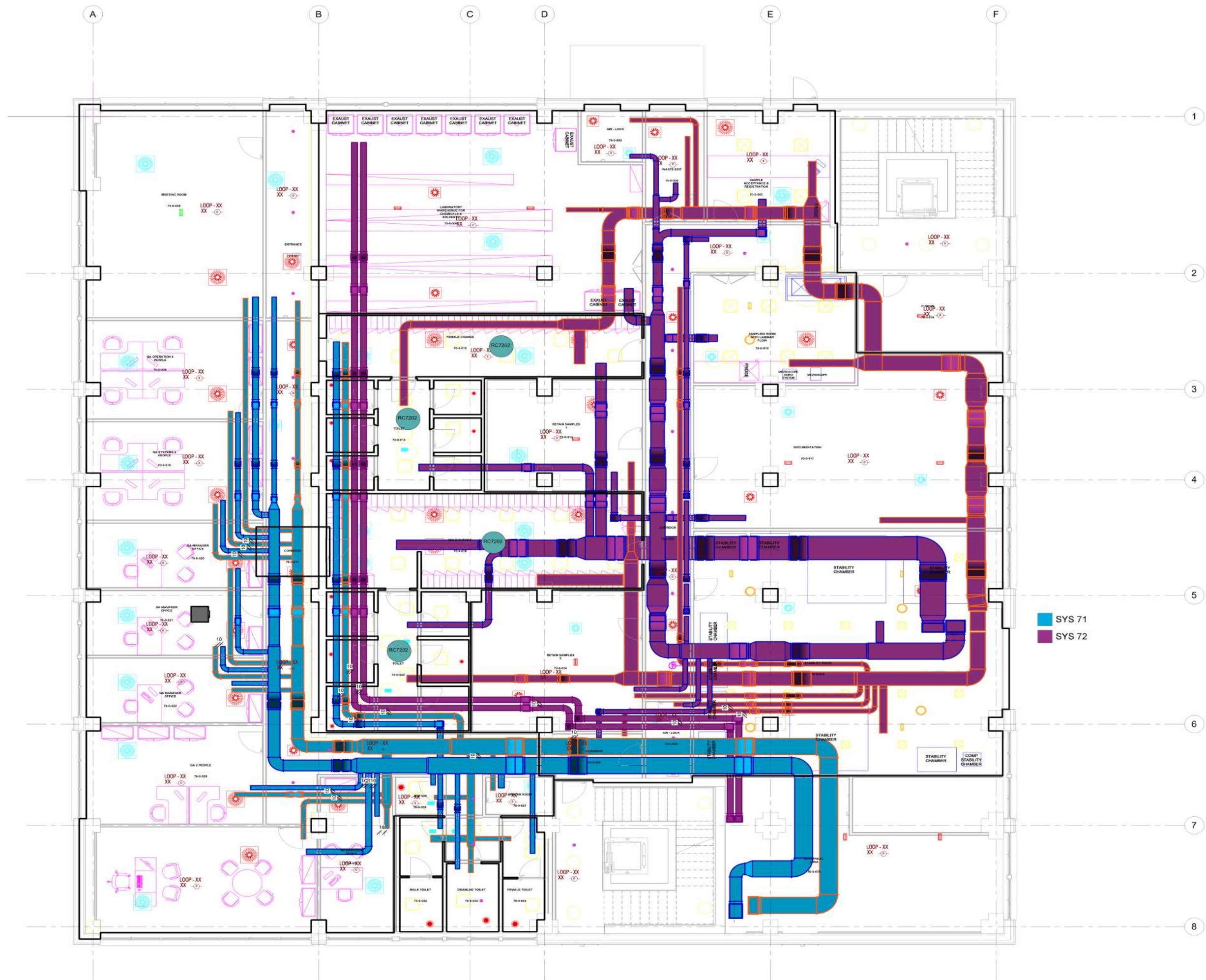
Navisworks for clash detection and coordination



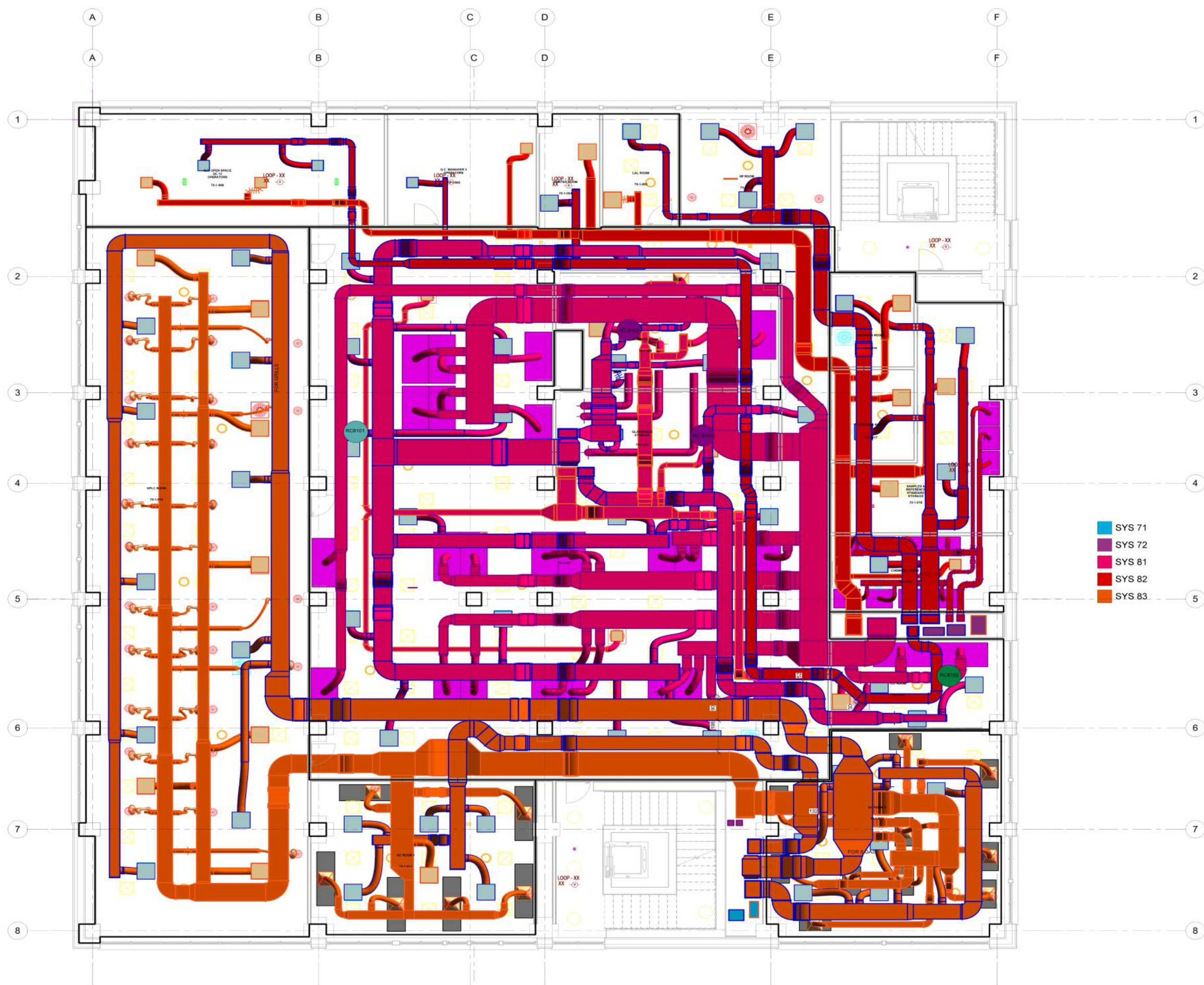
HVAC SYSTEM
20

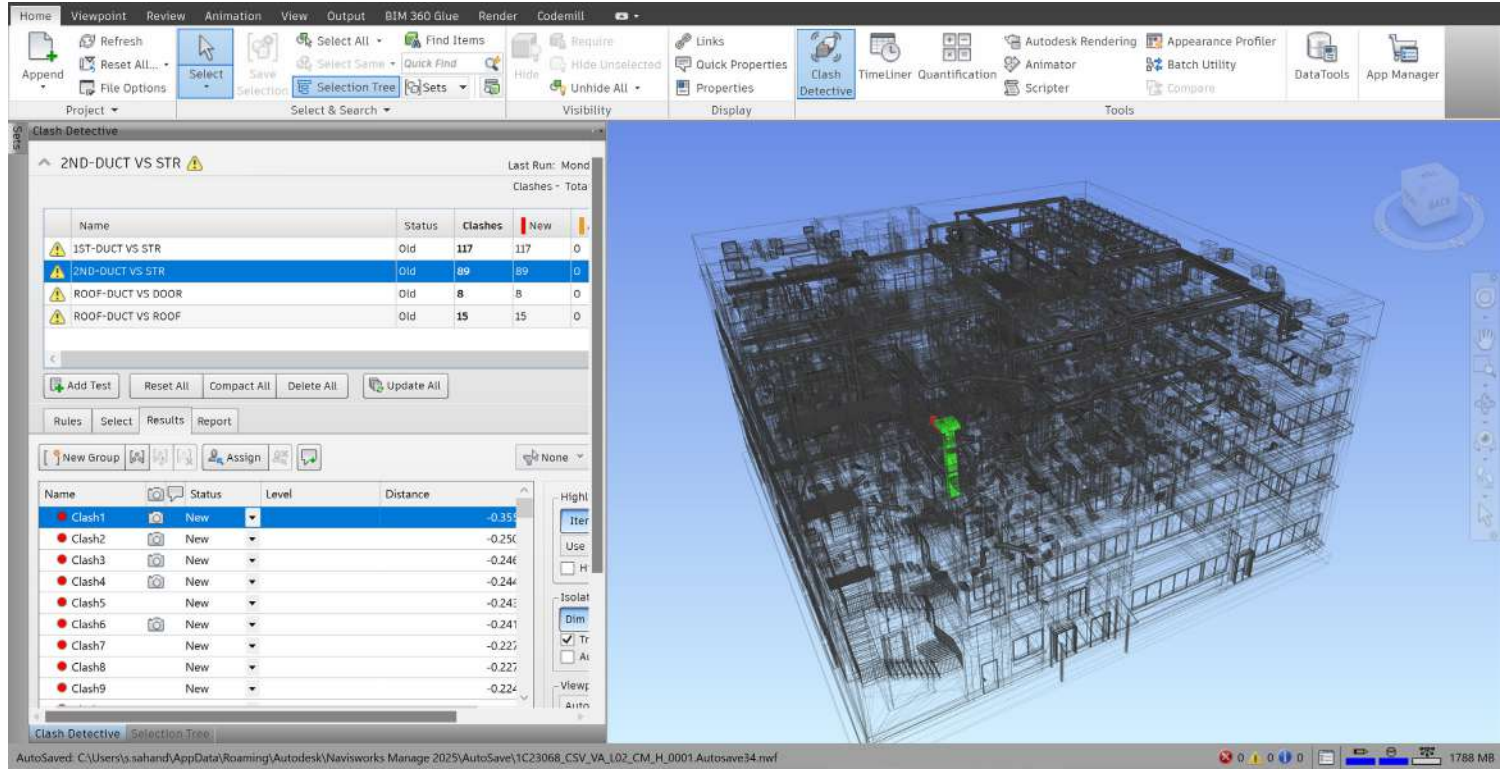


PIPING SYSTEM

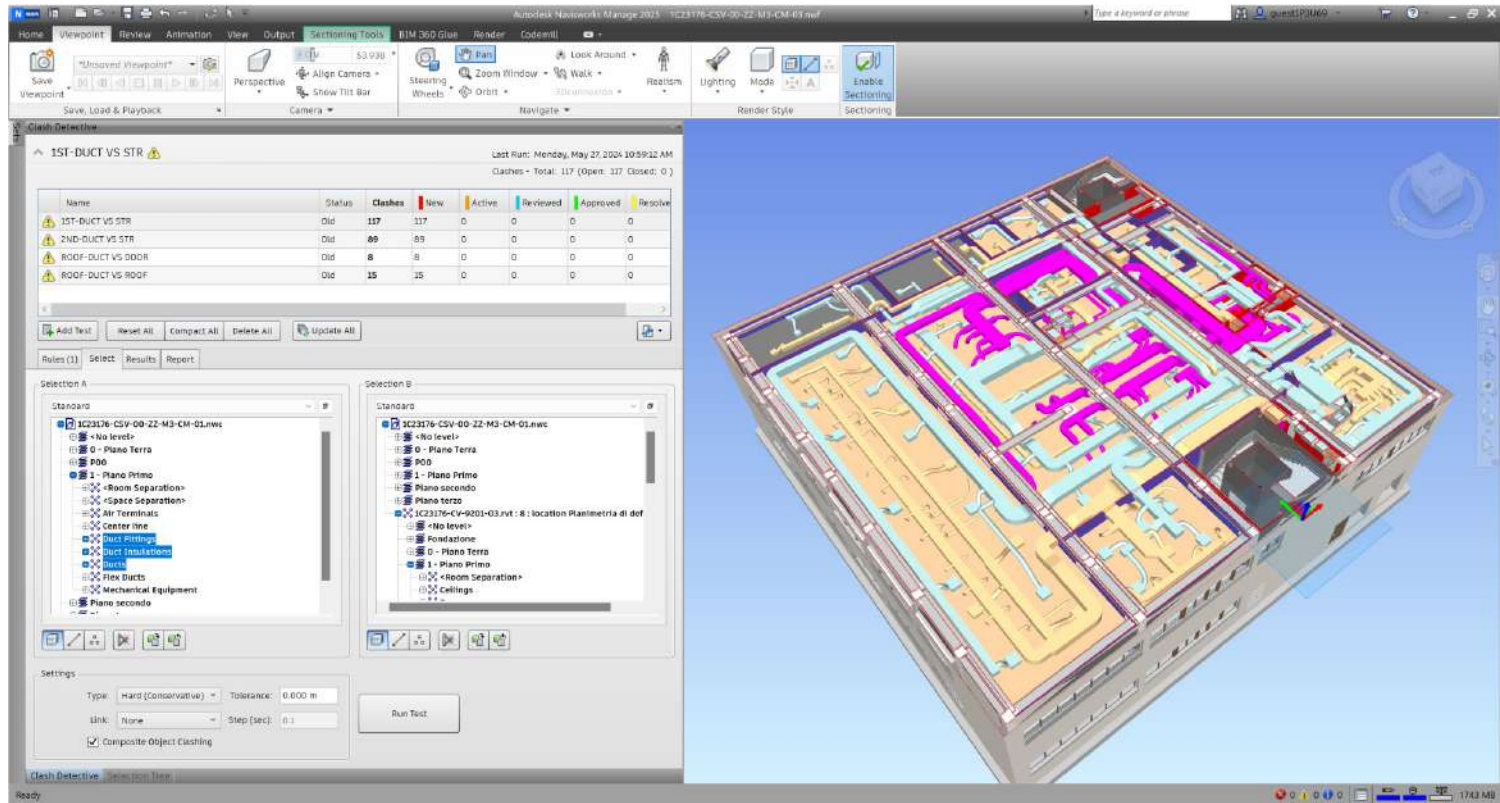


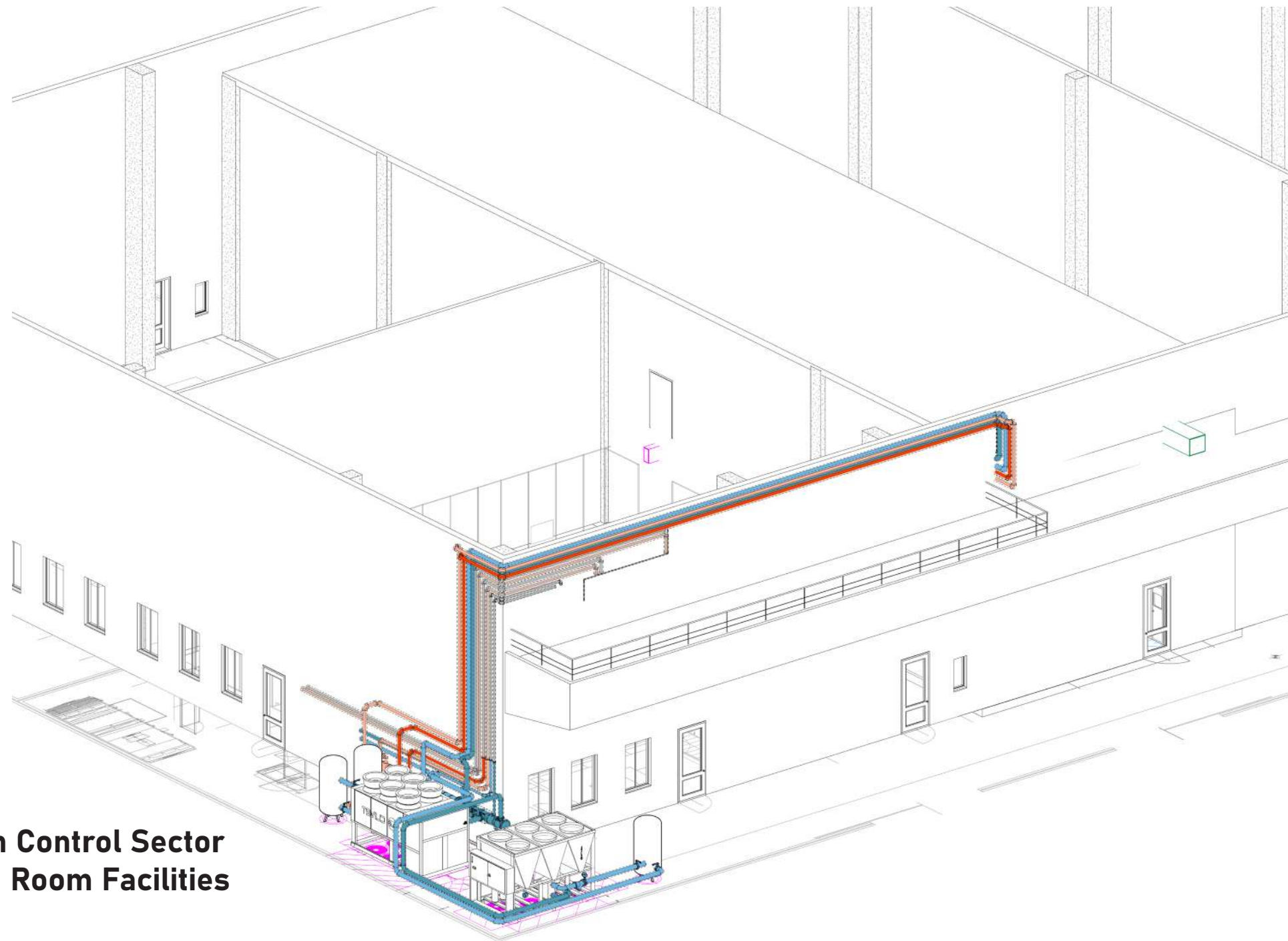
DUCT LAYOUT





Screenshots from Navisworks illustrating the clash detection process, a crucial step in complex projects like this laboratory. Clashes are inevitable during the design phase, making it essential to run clash detection regularly. As a BIM Coordinator, generating and resolving clash reports is vital to ensure a seamless and constructible design.





Project 5: Contamination Control Sector
Building Function: Clean Room Facilities
Location: Milan, Italy

My Role: HVAC , Clean Room and Piping System Modeler , and BIM coordinator

Project Overview:

This project involved developing a new HVAC system and modeling new clean room facilities within an existing building in the contamination control sector. My responsibilities included implementing the HVAC system for the new clean rooms, as well as creating a new mechanical system for the air handling units (AHUs). Additionally, I modeled the new clean rooms and used point cloud data to accurately represent the existing pipes and infrastructure, ensuring the future installation was correct. The project also required the integration of a new chiller and polyvalent system.

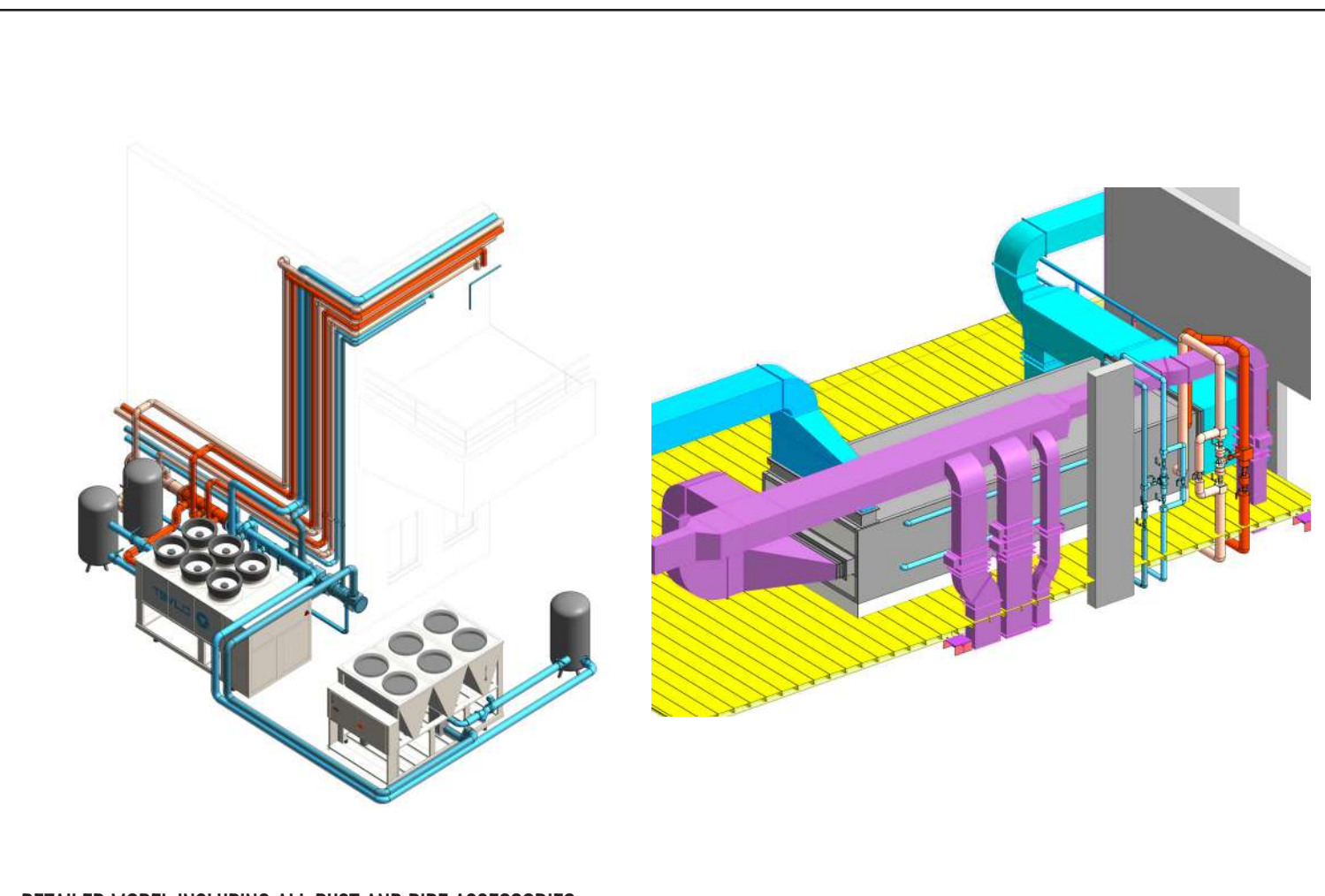
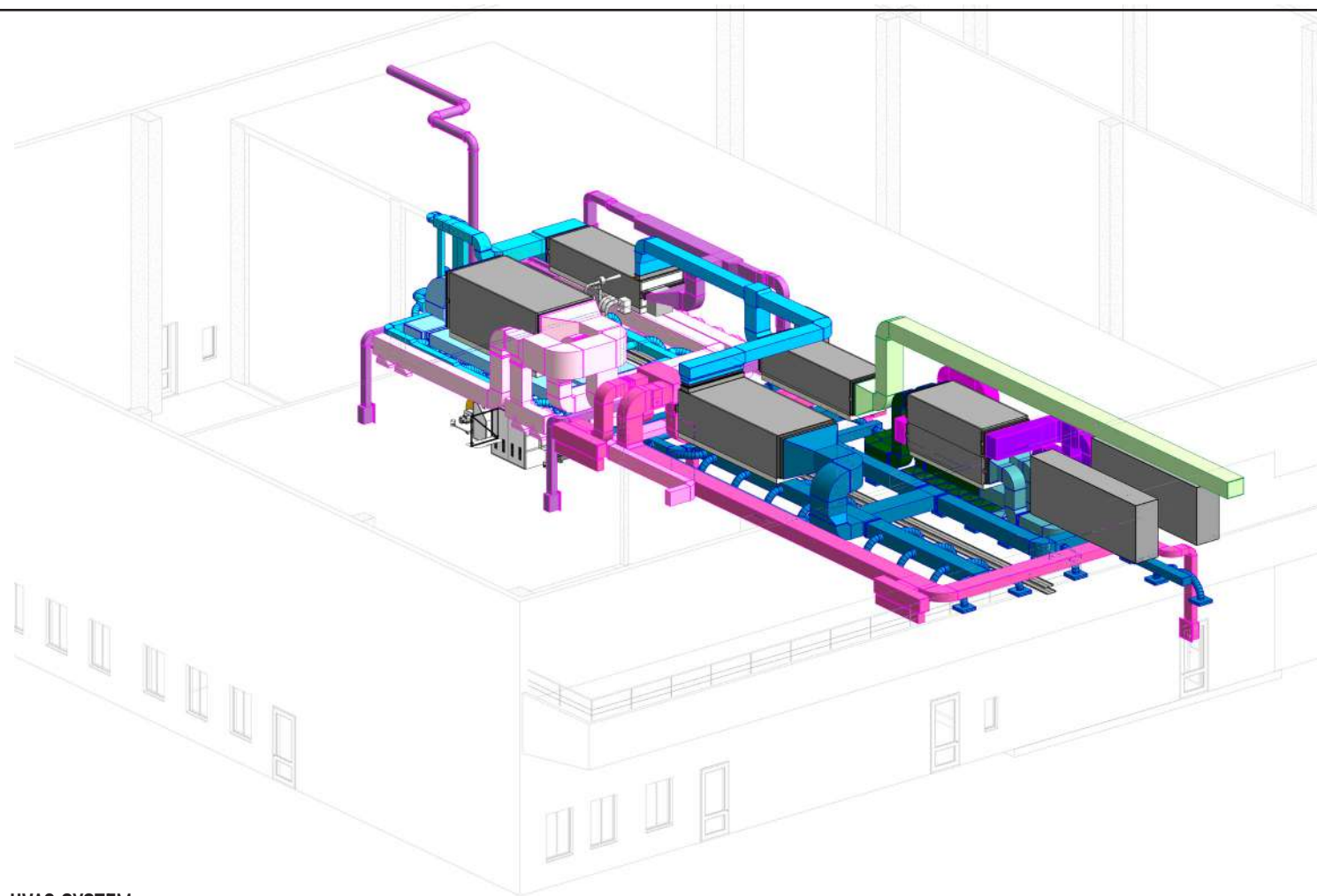
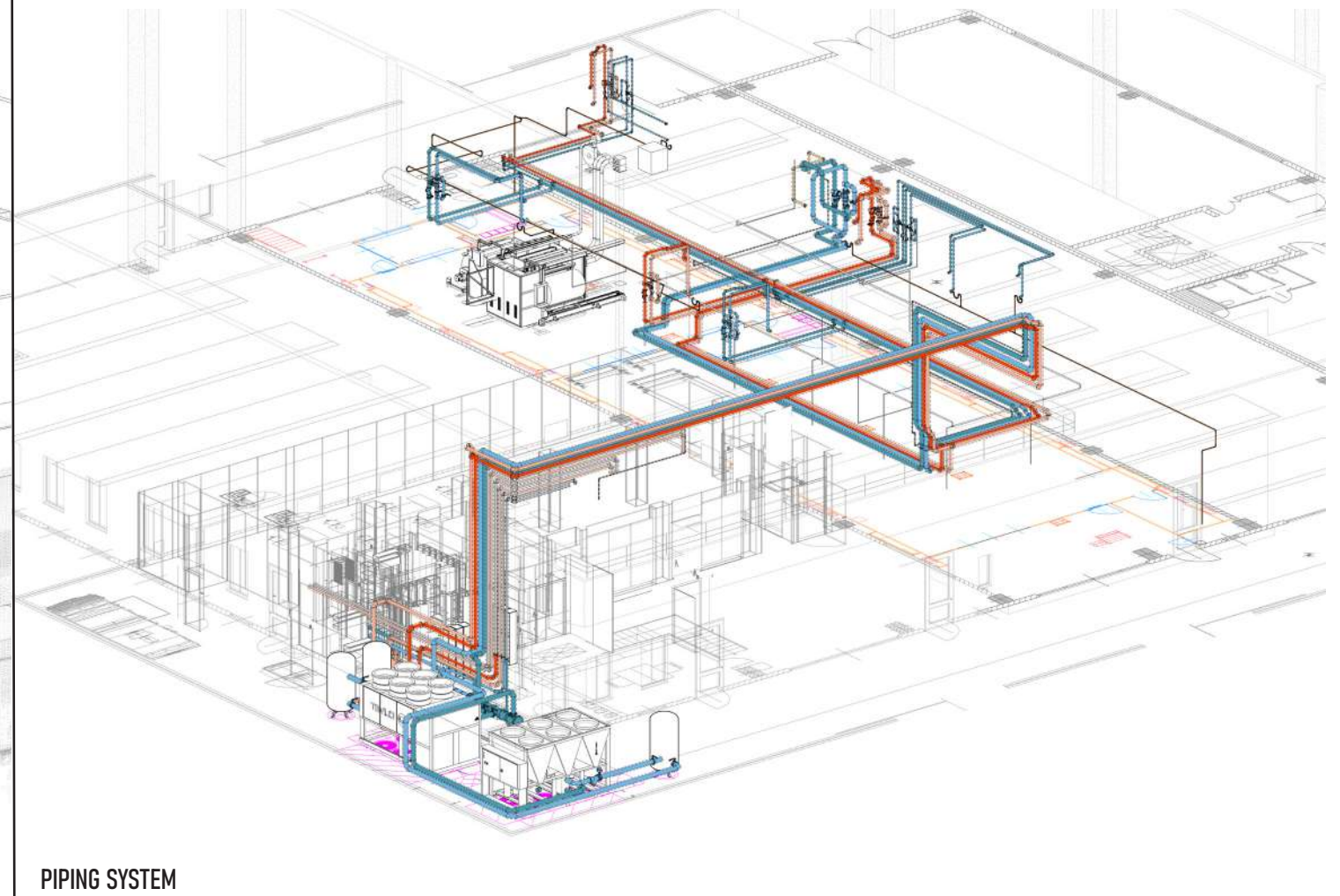
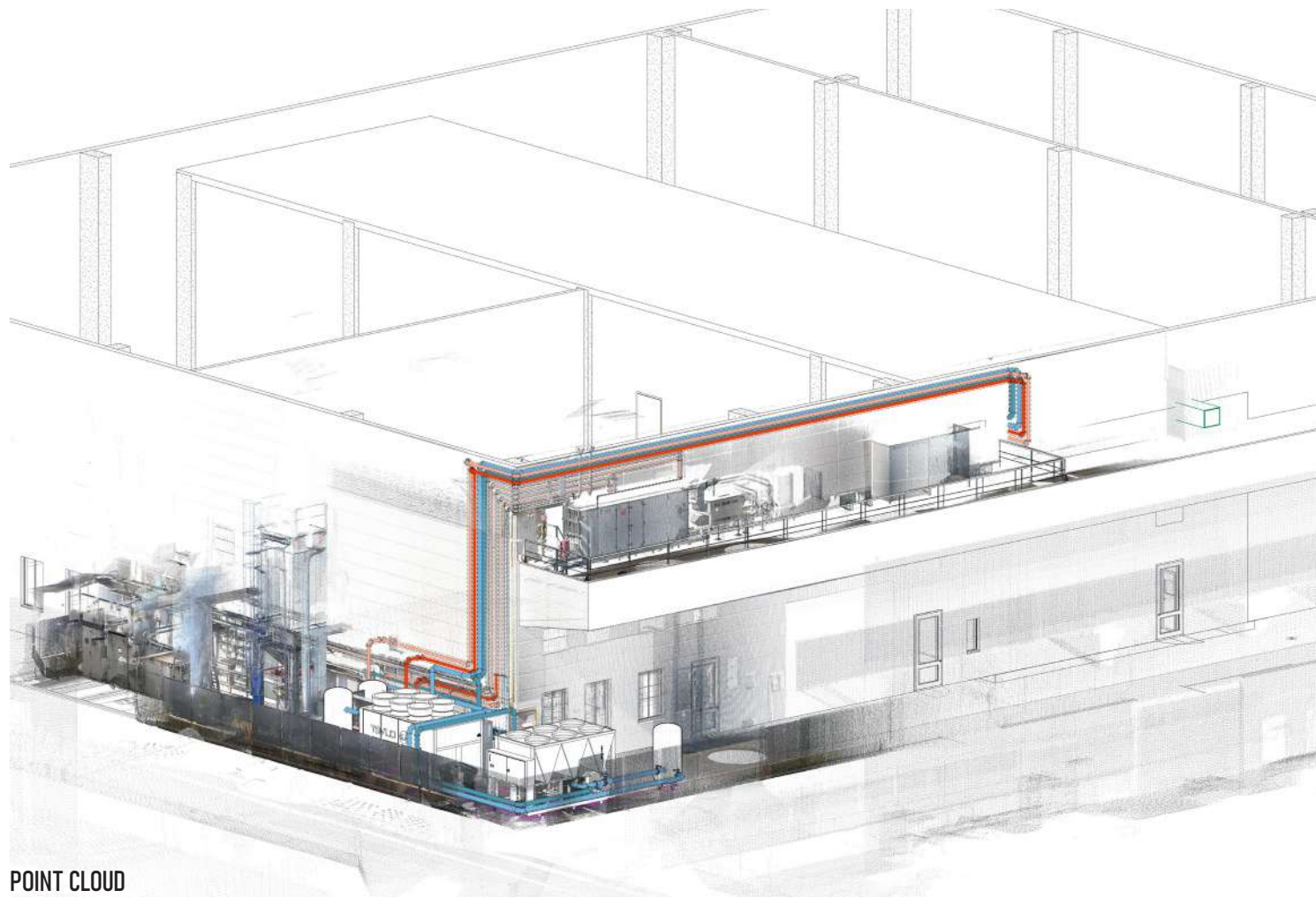
Challenges and Solutions:

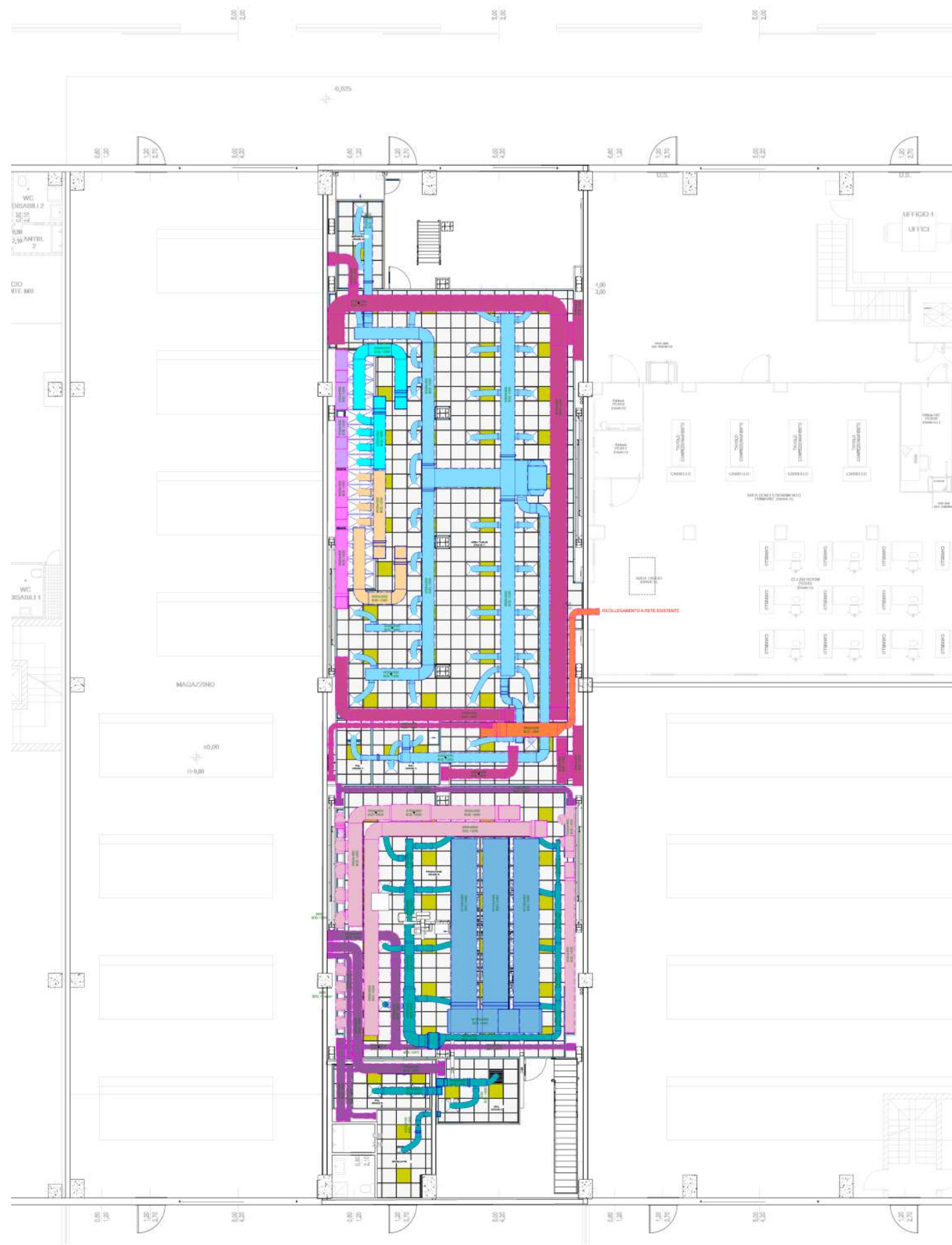
Working within an existing building presented challenges in integrating new systems without disrupting the current infrastructure. To address this, we utilized point cloud technology to model the existing building and pipes accurately. This ensured that the new installations would be correctly aligned with the existing conditions. The design and modeling of the new clean rooms required precise coordination to meet contamination control standards, while the integration of the new HVAC and mechanical systems, including the AHUs, chiller, and polyvalent system, was carefully planned to fit within the existing layout.

Technologies and Tools:

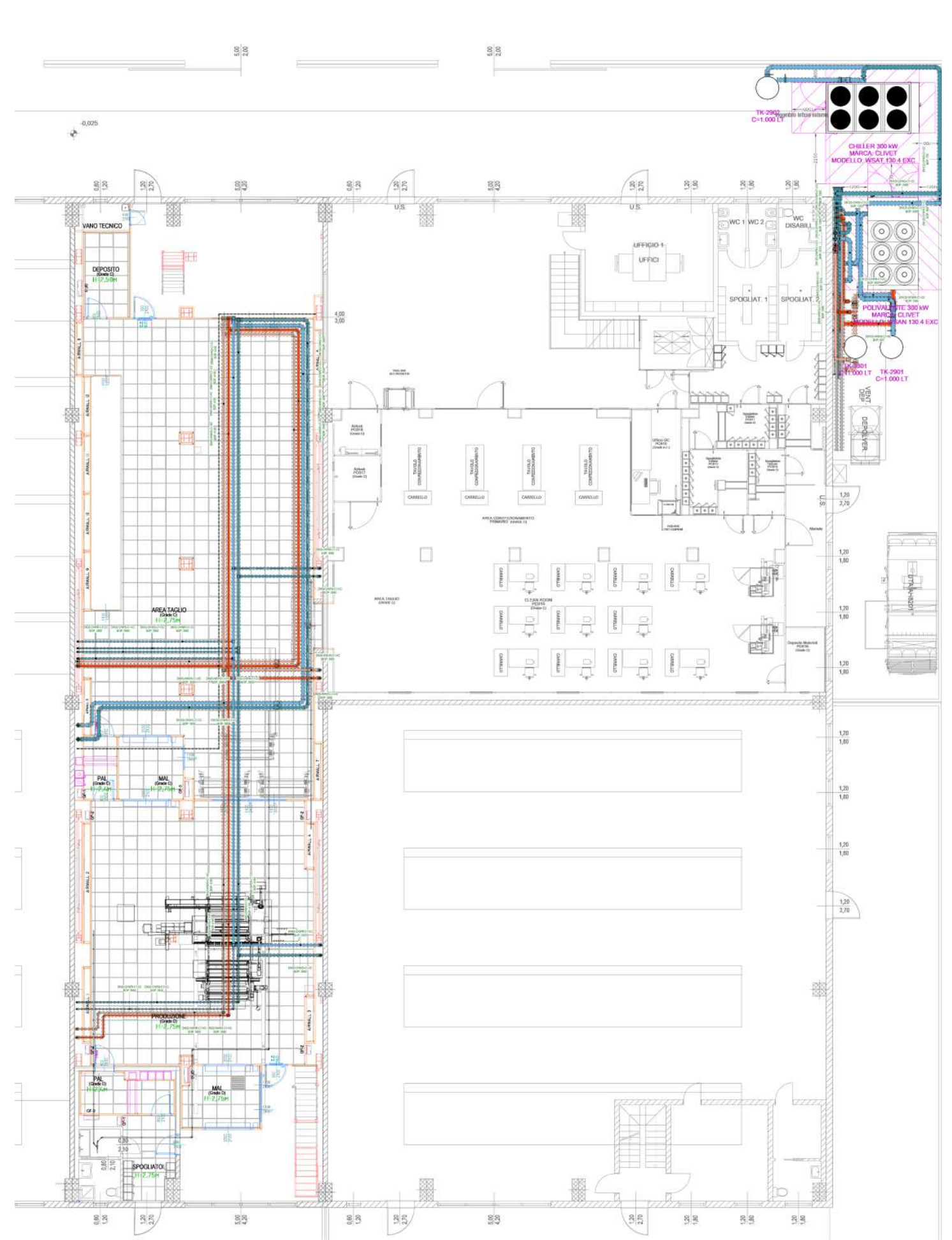
Revit for HVAC and mechanical system modeling and clean room design
Point cloud data for accurate modeling of the existing building and pipes
Coordination tools for integrating new systems with existing infrastructure(Naviswork)
Scheduling tools for material take-offs and project planning

LUMION

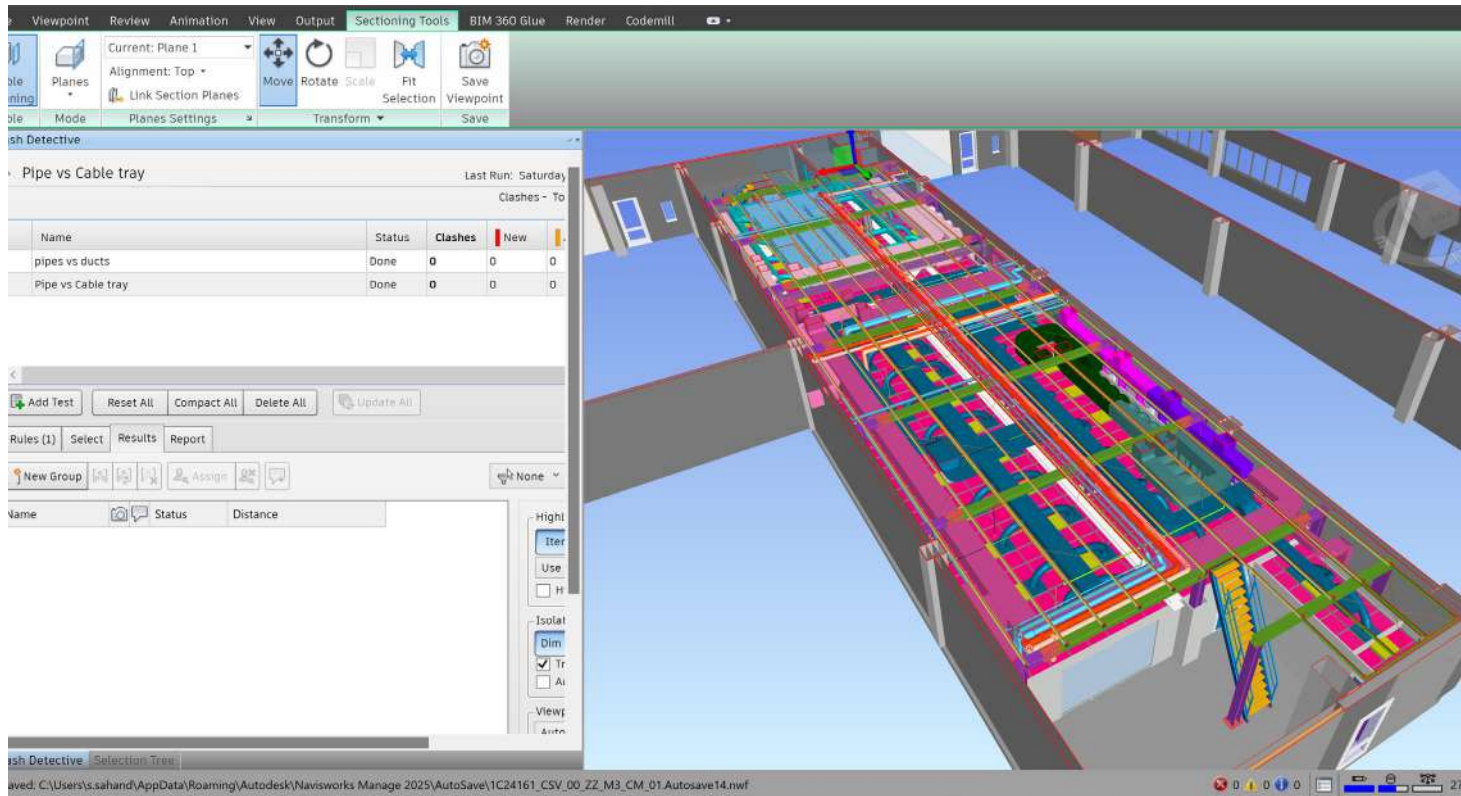
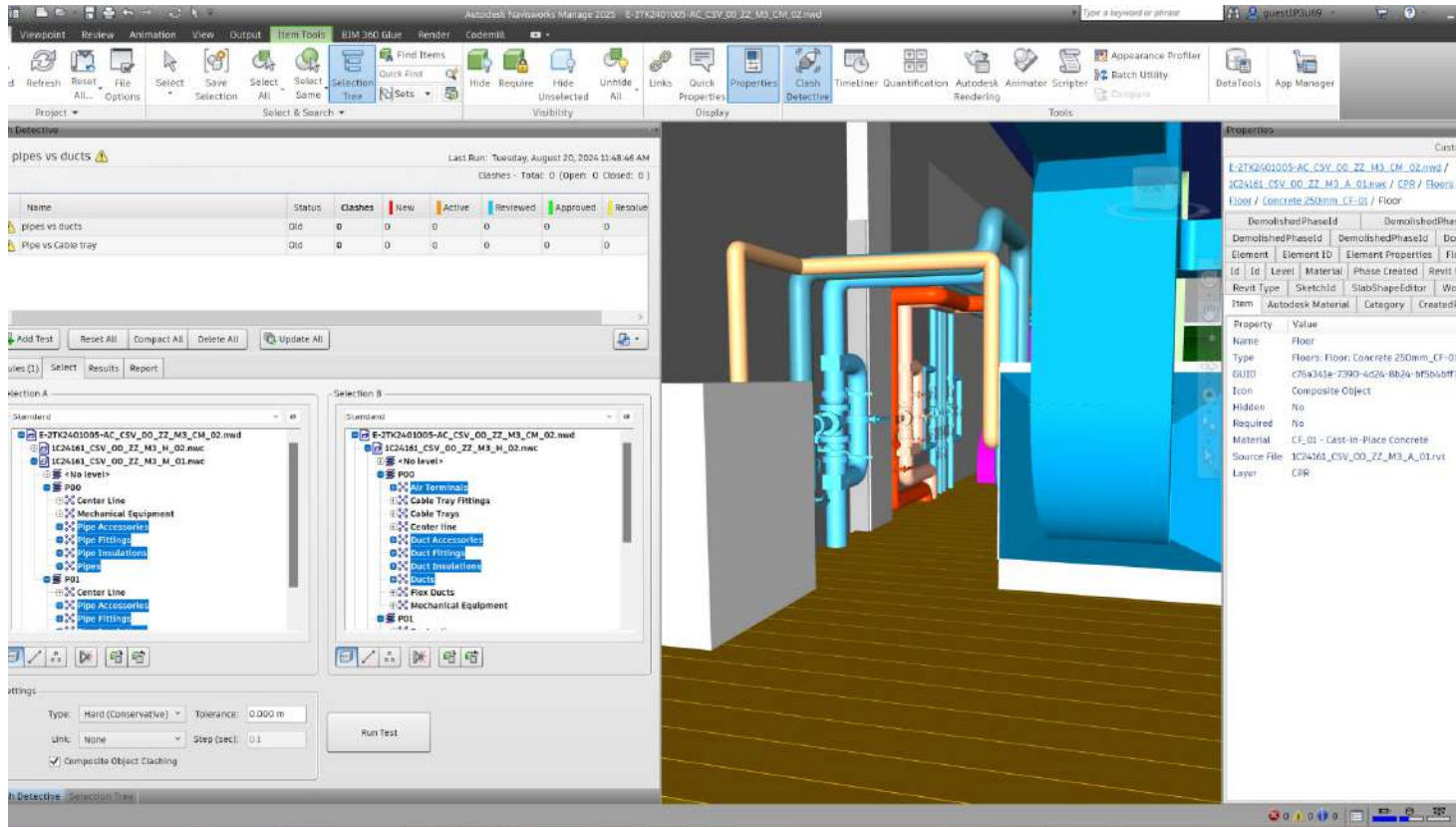




- _ARIA DI MANDATA_SYSTEM 9102
 ■ _ARIA DI MANDATA_SYSTEM 9105
 ■ _ARIA DI RITORNO_SYSTEM 9102
 ■ _ARIA DI RITORNO_SYSTEM 9105
 - _ARIA DI MANDATA_SYSTEM 9103
 ■ _ARIA DI MANDATA_SYSTEM 9106
 ■ _ARIA DI RITORNO_SYSTEM 9103
 ■ _ARIA DI RITORNO_SYSTEM 9106
 - _ARIA DI MANDATA_SYSTEM 9104
 ■ _ARIA DI RITORNO_PCB15
 ■ _ARIA DI RITORNO_SYSTEM 9104
 ■ _ARIA DI RITORNO_SYSTEM 9106
- DUCT LAYOUT**

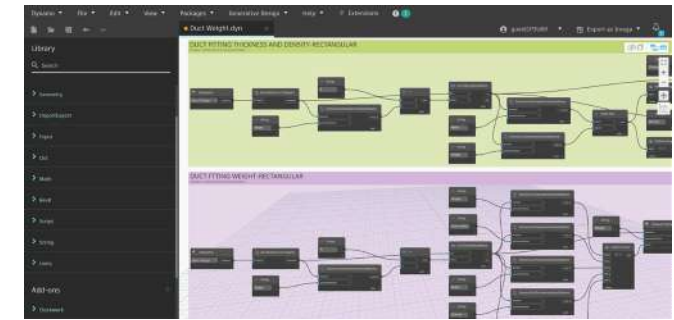
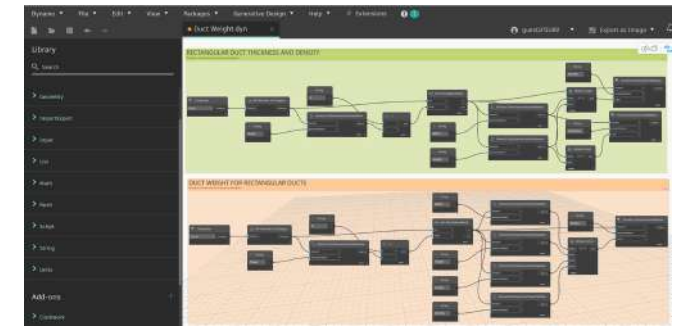
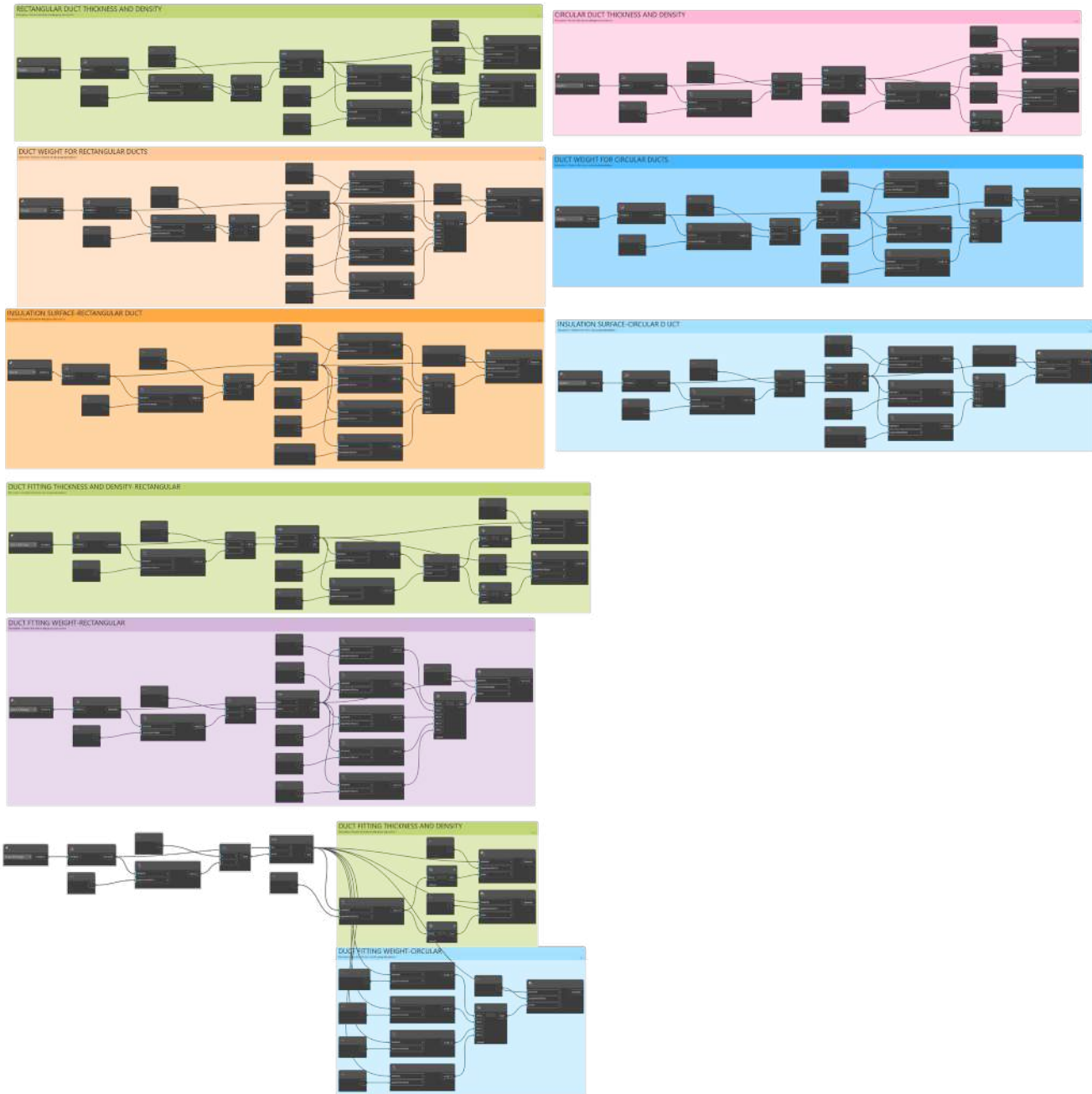


- No color scheme assigned to view
- PIPE LAYOUT**



coordinating the model and eventually having clash-free model





```

Python Script
1 import math
2
3 def calculate_weight(height, inner_radius, width, density,
4   angle):
5     try:
6         # Convert parameters to floats
7         height = float(height)
8         inner_radius = float(inner_radius)
9         width = float(width)
10        density = float(density)
11        angle = float(angle)
12    except ValueError:
13        # If conversion fails, return 0
14        return 0
15
16    # Convert angle from radians to degrees if necessary
17    angle_deg = math.degrees(angle) if angle <= math.pi
18    else angle
19
20    # Convert other parameters to meters if needed
21    (assuming they are in cm)
22
23 Save and run
  
```

Custom Dynamo Script for Duct Weight Calculation

Project Overview:

As part of my ongoing efforts to enhance project efficiency and accuracy, I developed a custom Dynamo script to automate the calculation of duct weight and, consequently, the cost. This script is particularly valuable because calculating duct weight is a complex process, given that each duct section has different thicknesses and densities.

Challenges and Solutions:

Manually calculating duct weight can be time-consuming and prone to error, especially in large projects with diverse duct sections. To streamline this process, I created a complex Dynamo script, incorporating Python, to automatically calculate the weight based on the thickness and section of each duct. This automation significantly speeds up the process, providing precise and reliable results that are essential for accurate material take-offs and cost estimation.

Key Features:

Automatic Weight Calculation: The script calculates the weight of each duct section based on its specific thickness and density.

Precision and Reliability: By automating the calculation, the script ensures a high level of precision, reducing the risk of human error.

Efficiency: This solution dramatically speeds up the process, making it much more efficient compared to manual calculations.

Technologies and Tools:

Dynamo for script development

Python for advanced calculations within the Dynamo script

Revit for model integration and data extraction

A	B	C	D	E	F	G	H
System Type	System Classification	Length(m)	Width	Height	Weight(kg)	Insulation Thickness	Insulation surface-m2
_ARAIA DI MANDATA_SYSTEM 9101	Supply Air	5.65	500	400	83.89	19 mm	10.7
_ARAIA DI MANDATA_SYSTEM 9101	Supply Air	3.12	600	400	55.85	19 mm	7.07
_ARAIA DI MANDATA_SYSTEM 9101	Supply Air	3.52	600	400	66.53	19 mm	8.42
_ARAIA DI MANDATA_SYSTEM 9101	Supply Air	0.96	600	600	19.53	19 mm	2.44
_ARAIA DI MANDATA_SYSTEM 9101	Supply Air	0.45	1840	210	3.95	19 mm	0.33
_ARAIA DI MANDATA_SYSTEM 9101	Supply Air	0.11	2450	410	7.99	19 mm	0.66
		13.81			237.74		29.62
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	1.82	150	300	11.44	19 mm	1.91
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	0.15	200	100	0.64	19 mm	0.11
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	0.24	200	100	1.02	19 mm	0.18
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	0.43	200	100	1.8	19 mm	0.32
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	0.45	200	100	1.86	19 mm	0.33
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	2.49	200	100	7.51	19 mm	1.35
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	2.49	250	300	19.2	19 mm	3.12
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	2.43	250	400	26.8	19 mm	3.52
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	1.28	250	500	16.28	19 mm	2.11
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	4.56	250	500	58.15	19 mm	7.53
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	0.24	300	200	1.67	19 mm	0.28
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	2.45	300	200	11.83	19 mm	1.95
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	1.81	300	200	12.65	19 mm	2.08
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	1.82	300	250	13.98	19 mm	2.27
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	0.71	300	300	5.98	19 mm	0.96
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	0.88	300	300	7.35	19 mm	1.18
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	2.09	300	300	11.67	19 mm	1.88
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	2.50	400	300	29.77	19 mm	3.88
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	1.90	400	400	25.79	19 mm	3.32
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	0.55	450	300	7.01	19 mm	0.91
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	1.31	450	300	15.8	19 mm	2.05
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	0.27	500	400	4.16	19 mm	0.53
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	1.83	500	400	28.05	19 mm	3.58

Revit schedules displaying the results of the Dynamo script, with key parameters such as duct weight and insulation surface area directly integrated. These values, automatically calculated using the custom script, ensure precise and reliable data for material take-offs and cost estimation, seamlessly incorporated into the Revit environment.

A	B	C	D	E	F
System Type	System Classification	Width	Height	Angle	Weight (kg)
_ARAIA DI MANDATA_SYSTEM 9101	Supply Air	400	500	90.00°	
_ARAIA DI MANDATA_SYSTEM 9101	Supply Air	600	400	90.00°	8.491725
_ARAIA DI MANDATA_SYSTEM 9101	Supply Air	600	600	90.00°	9.13261
					17.624335
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	100	200	90.00°	0.802677
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	100	200	90.00°	0.802677
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	200	100	90.00°	1.297478
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	200	100	90.00°	1.297478
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	200	300	90.00°	1.693318
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	200	300	90.00°	1.693318
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	250	500	90.00°	3.087597
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	300	300	90.00°	2.622444
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	300	300	90.00°	2.622444
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	300	450	90.00°	
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	450	300	90.00°	
_ARAIA DI MANDATA_SYSTEM 9102	Supply Air	500	400	90.00°	6.542367
					22.461798
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	250	350	45.00°	1.356039
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	250	350	45.00°	1.356039
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	300	300	45.00°	1.311222
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	300	300	45.00°	1.311222
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	300	300	90.00°	2.622444
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	300	300	90.00°	2.622444
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	400	250	90.00°	4.439463
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	400	250	90.00°	4.439463
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	400	250	90.00°	4.439463
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	500	500	90.00°	6.842781
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	500	500	90.00°	6.842781
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	500	1500	90.00°	14.480779
_ARAIA DI MANDATA_SYSTEM 9103	Supply Air	800	1000	90.00°	18.064158

THANK YOU