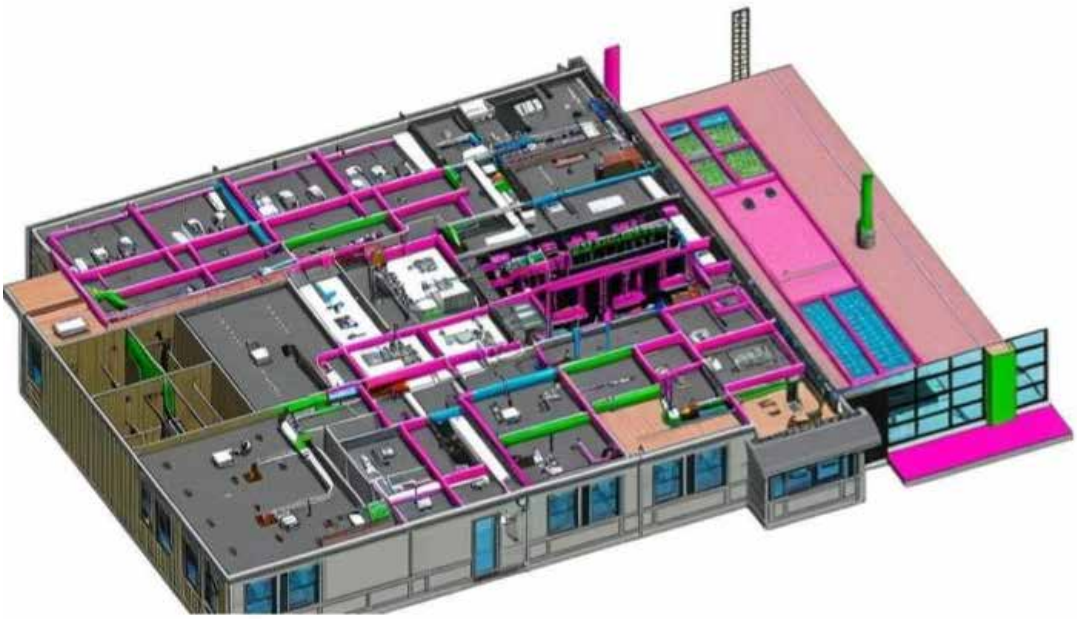
# Fire Sub-Station

(Mechanical & HVAC Modeling, BIM & VDC Coordination Services)

CASE STUDY

TECHTURE



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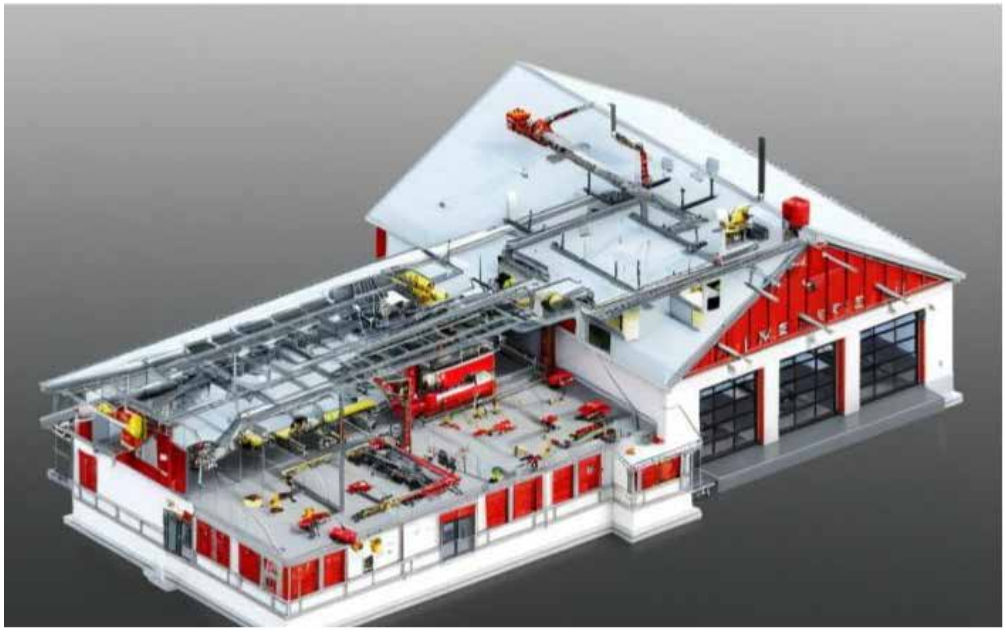
| **Client** | : Mechanical Contractor | **Team Size** | : 2 No.s ( BIM Engineer & BIM Coordinator) |
| **Disciplines** | : Mechanical & HVAC | **Duration** | : 3 Months |
| **Scale** | : 10,000 Sq Ft. | **Software** | : Autodesk Revit, Navisworks & Evolve |
| **Type** | : Fire Station | **Location** | : Ontario, Canada |



## Project Overview

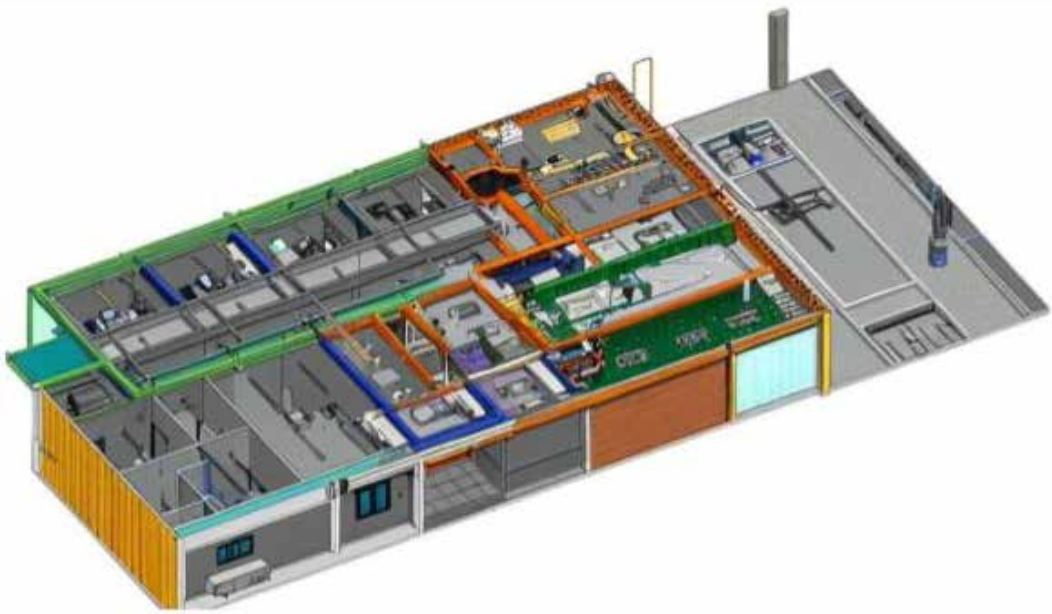
This project involved the Mechanical BIM modeling of a 10,000 sq. ft. fire station, delivered to LOD 300. The scope included detailed modeling of HVAC systems from DD stage drawings, coordination with other trades through clash detection and resolution, and incorporation of ongoing design updates. Using Revit and Navisworks, the model was continuously refined to reflect RFIs and site inputs.

## Scope & Deliverables

- Develop LOD 300 Mechanical model incorporating HVAC systems and ductwork.
- Clash Coordination & Solutions: Identify potential conflicts with other Disciplines and implement solutions to ensure efficient integration within the available space.
- BIM Coordination Meetings: Collaborate with subcontractors to review progress, address clashes, and finalize service alignments.

## Challenges

- Tight ceiling spaces made it difficult to route ductwork and mechanical equipment without interfering with structural and electrical elements.
- Frequent design revisions and updates from the architect and other trades led to repeated coordination cycles and model rework.
- Balancing airflow efficiency with spatial constraints in a building like a fire station, where operational zones (bays, dorms, etc.) have very different ventilation needs.
- Limited mechanical room space required compact yet efficient equipment layouts without sacrificing maintainability or performance.



## Techture Approach

- Developed a strategic zoning plan for HVAC layout, prioritizing areas like apparatus bays and dormitories for optimal air distribution.
- Used real-time clash detection and resolution loops within Navisworks to minimize rework cycles and maintain model progress with design updates.
- Participated in focused coordination calls with MEP and GC teams to pre-align service priorities and minimize spatial conflicts before they hit the model.
- Employed modular modeling logic, making it easier to shift duct routes and equipment when late-stage changes occurred, without losing detailing accuracy.

## Benefits

- Delivered a fully coordinated and install-ready Mechanical model, reducing guesswork and change orders during construction.
- Achieved efficient use of service zones, ensuring that HVAC routing was compact, compliant, and serviceable—critical in a space-constrained fire station.
- Minimized on-site coordination effort by resolving clashes virtually, leading to faster installation and fewer RFIs from the field.
- Enabled the client team to visually verify system access and clearances in advance, helping avoid downstream operational issues.