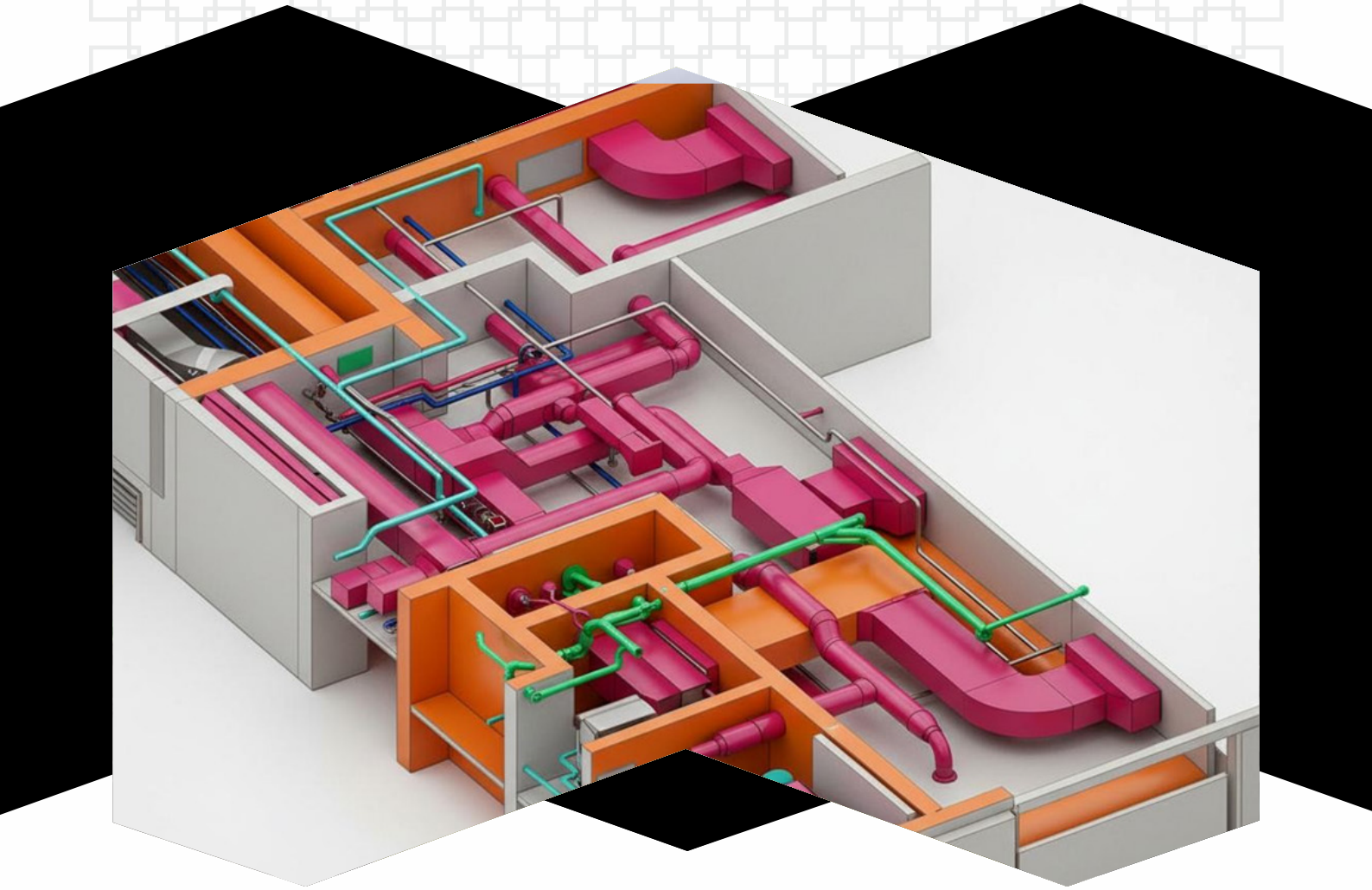
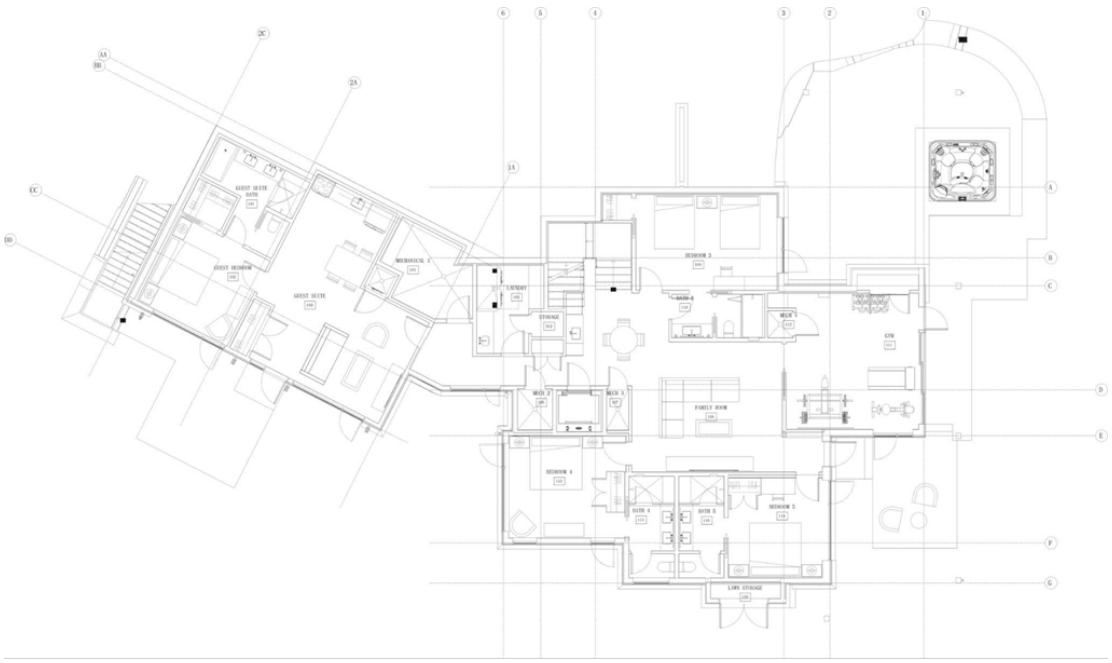


Residential – HVAC Modeling & Family creation

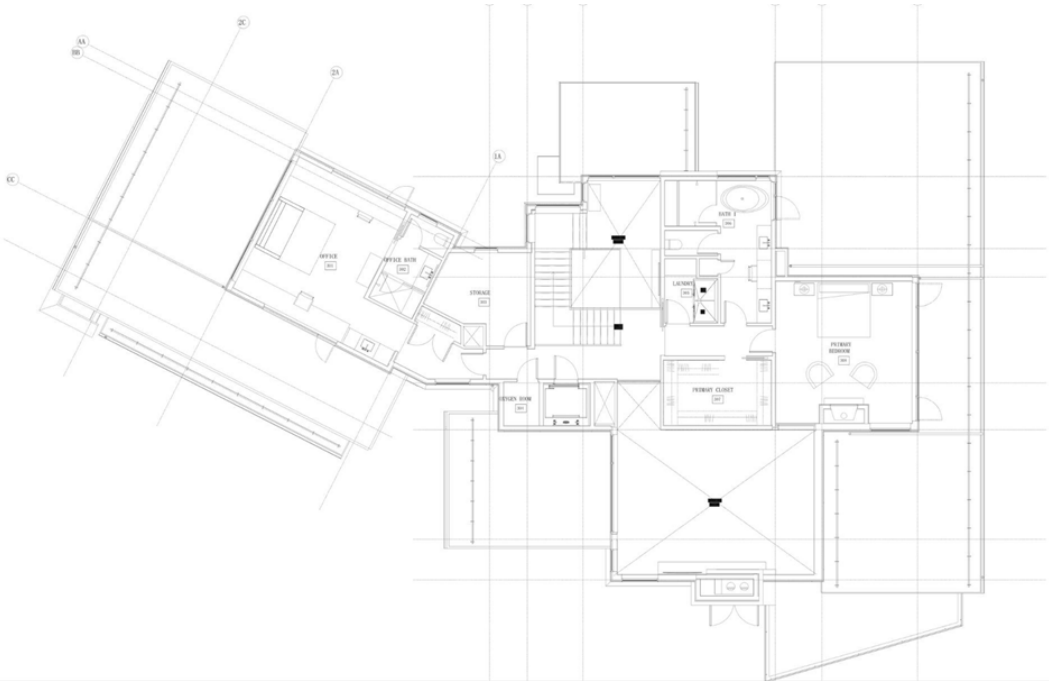
(Mechanical Modeling, BIM & VDC Coordination Services)

CASE STUDY

TECHTURE



Client	: Mechanical Engineer	**Team Size**	: 2 No.s (BIM Engineer & BIM Coordinator)
Disciplines	: Mechanical	**Duration**	: 1 Week
Scale	: 3,200 Sq. Ft.	**Software**	: Autodesk Revit & Naviswork
Type	: Residential	**Location**	: Texas, USA



Project Overview

This residential project involved the development of a discipline-specific Mechanical BIM model for a 3,200 sq. ft. building using Autodesk Revit and Navisworks. Techture delivered an LOD 350 mechanical model based strictly on client-issued construction drawings, using the architectural model as the spatial reference. The scope included detailed modeling of air handling units, ductwork, and associated mechanical components. Model-based clash detection with architectural and structural models ensured constructability prior to construction.

Scope & Deliverables

- Development of an LOD 350 Mechanical BIM model in Autodesk Revit based on client-provided drawings
- Modeling of air handling units, duct systems, and associated mechanical components aligned with final design intent
- Creation of generic Revit families for mechanical equipment lacking manufacturer-specific content, with accurate geometry and coordination-ready parameters
- Execution of clash detection between Mechanical, Architectural, and Structural models using Navisworks
- Preparation of a numbered clash and constructability report including viewpoints, screenshots, and location references"

Challenges

- Integrating mechanical systems within limited residential ceiling and shaft spaces
- Coordinating duct routing with architectural layouts and structural framing constraints
- Managing missing or incomplete equipment data during early-stage inputs
- Ensuring LOD 350 accuracy for coordination without manufacturer-specific families

Techture Approach

- Established a clean architectural base model to control elevations, clearances, and spatial coordination
- Modeled mechanical systems to LOD 350 with accurate duct sizes, elevations, and equipment placement
- Developed coordination-grade Revit families with standardized parameters for identification and tracking
- Conducted Navisworks-based clash detection supported by visual walkthroughs and structured viewpoints
- Issued clear, reference-ready clash reports to support efficient coordination discussions

Benefits

- Early identification and resolution of mechanical clashes reduced on-site rework
- Improved constructability through accurate spatial coordination at LOD 350
- Streamlined coordination with architects and structural consultants
- Clear, traceable clash documentation enabled faster decision-making
- Reliable mechanical BIM model ready for downstream coordination and construction