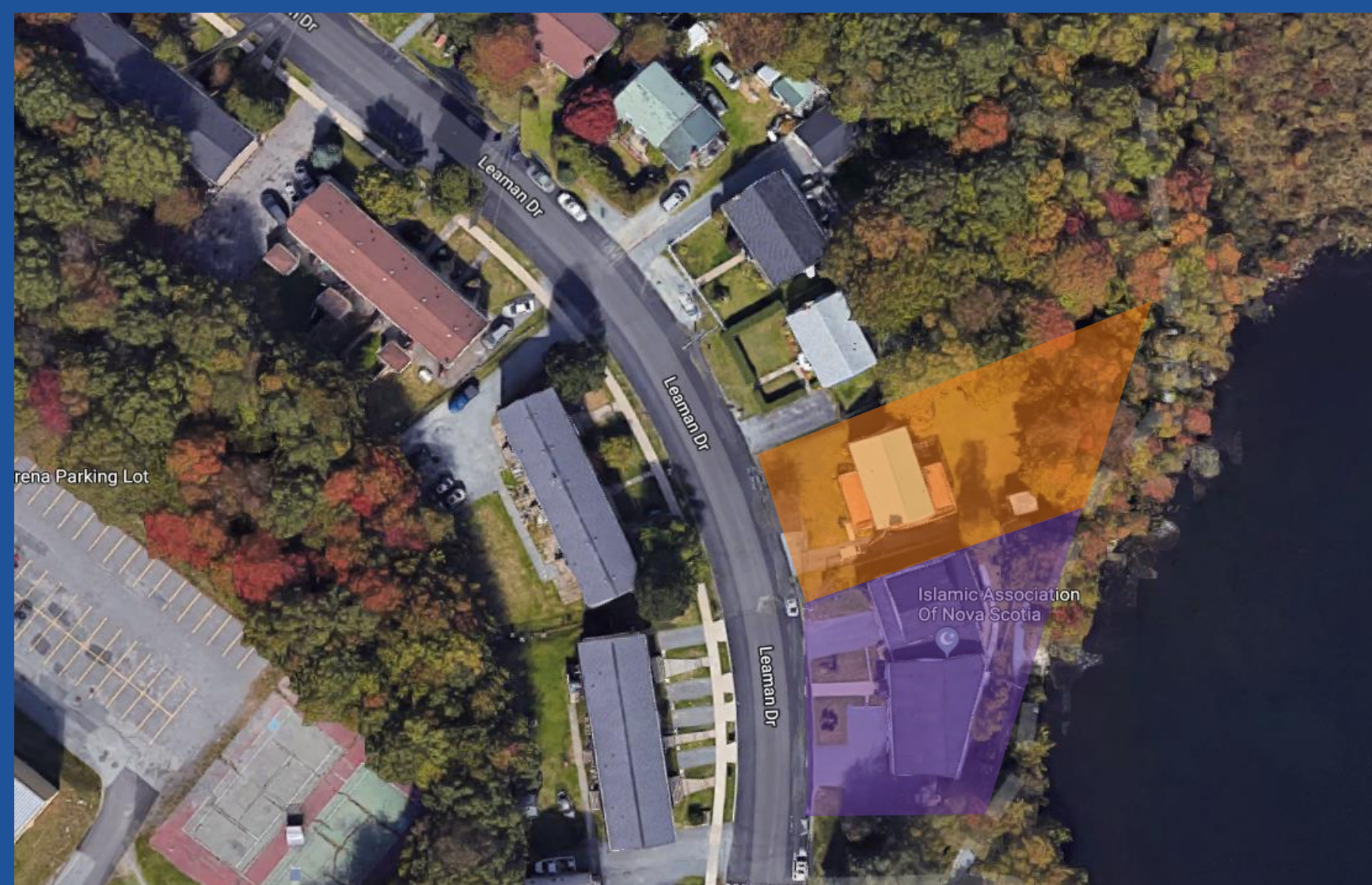


SCOPE OF WORK

The Islamic Association of Nova Scotia (IANS) is planning on expanding their community by investing in a new two-storey multi-unit, primarily wood framed, structure with a large open span basement. The basement and ground level will be used as a community center, and the second floor will have two two-bedroom units for residential use. Additionally, the project requires the safe transportation of the existing wood framed bungalow, currently located at the proposed location, to a cemetery in Truro, NS where it will be made structurally sound with a shallow frost protected slab foundation.

PROJECT LOCATION



Above: Project site, 44 Leaman Drive, Dartmouth, NS (orange). Existing IANS building/property (purple).

INITIAL CONDITIONS



Dartmouth Location:

- Bungalow in center of property.
- The topography consists of the water table at the ground surface, a one-meter layer of silty-sand-with-gravel and finally fractured bedrock (shallow).
- Albro Lake directly to the east of the property.

Truro Location:

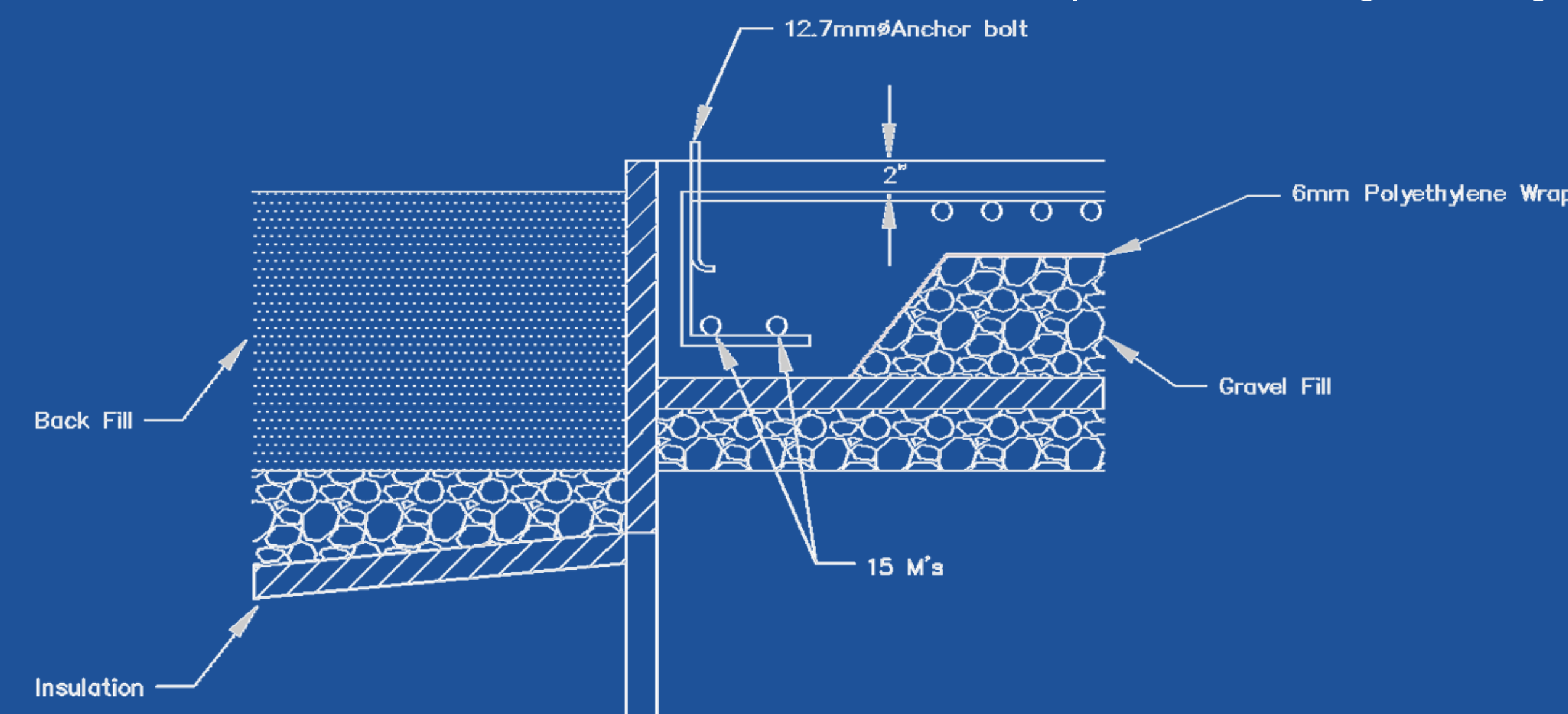
- The topography consists of a sandy silt (low bearing capacity) with the water table one metre below the surface.

DESIGN PROCESS

- Bungalow Design
 - ↳ Relocation
 - ↳ Geotechnical Analysis
 - ↳ Bearing Capacity
 - ↳ Foundation
- Site Inspection
 - ↳ Load Calculations
- Structural Analysis
 - ↳ Roof
 - ↳ Truss Selection
- Choice of Structural Members
 - ↳ Connections
 - ↳ Floors and Walls
 - ↳ Shear Walls
 - ↳ Insulation and Sound Proofing



Above: Rendered image Dartmouth Community Centre. Footprint of existing building on right side (in pink).

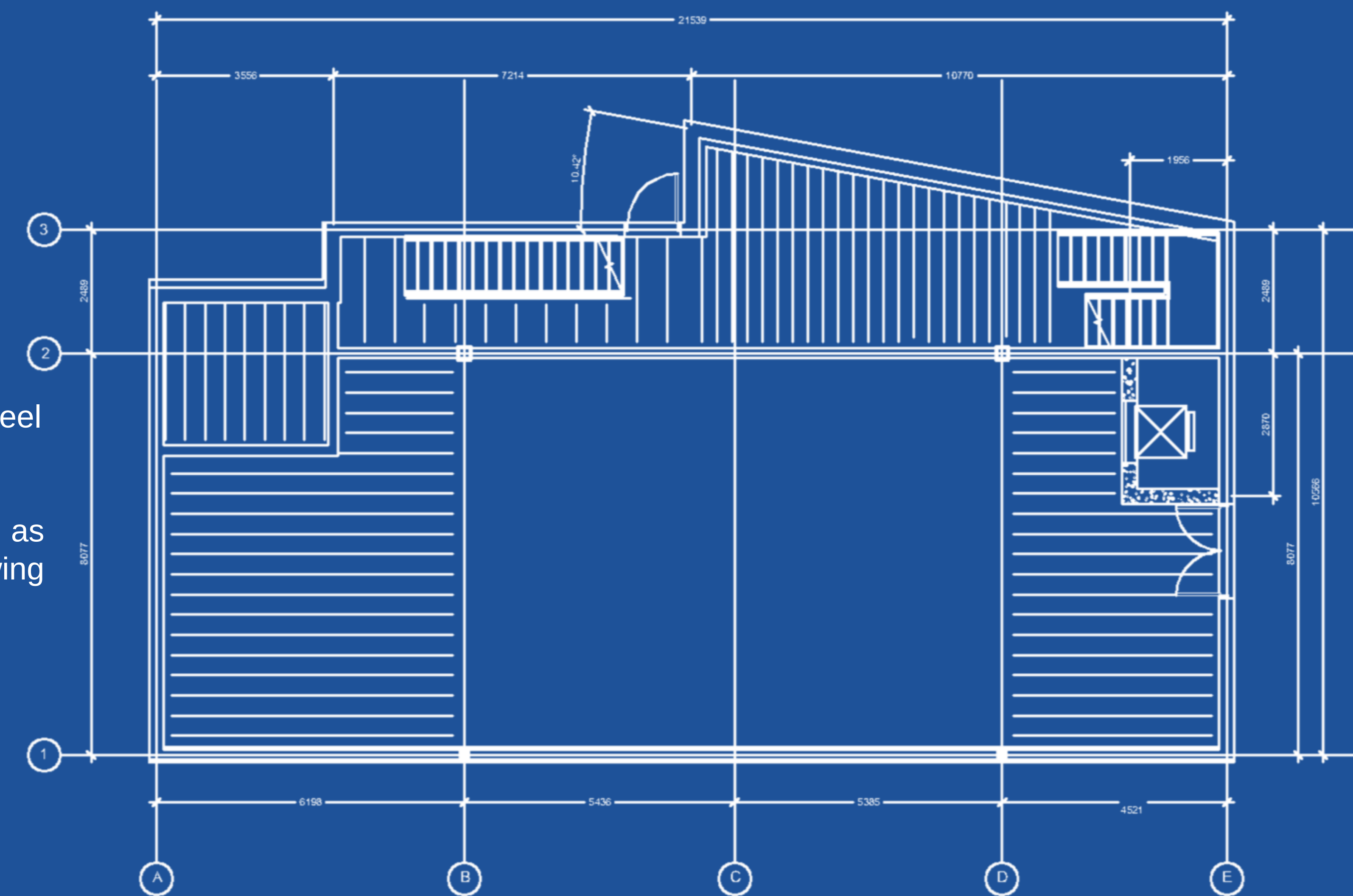


Above: New frost protected slab on grade with thickened edge foundation for bungalow in Bible Hill.

Right: Connection between W-Shape steel beams and engineered (TJI) floor joists using a "Top Mount Hanger" (first and second floor framing).



Right: First floor Framing layout (millimetres) using steel beams, engineered (TJI) and commodity lumber joists. As well as timber columns. Showing the 6.1 metre high opening to the atrium/gymnasium in the basement.



CONCLUSIONS AND RECOMMENDATIONS

The existing bungalow will be transported, in one piece, by truck and placed on a slab on grade with thickened edge and proper insulation to reduce consolidation potential. The new structure is a wood framed building with steel beams used to frame the atrium. Wood TJI joists are used to frame longer spans, as they are environmentally friendly and their light weight makes installation easier. The atrium, spanning two stories, led to the need for a retaining wall to be design for that section. The remainder of the Dartmouth foundation uses a strip foundation sitting on bedrock. The lateral load resisting system used are plywood shear walls with hold downs to resist tension uplift. Soundproofing insulation (Rockwool, which is known for its high fire resistance rating) is installed in the walls surrounding the gym and on the entire floor of the residential units (second floor). The total project cost, using a Class D Cost Estimate is approximately \$1,070,000.

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