Newton Group Ltd.
EST. 1994

KiwiCondo/Commercial

Integrated Precast Building System

Where innovation, technology and integrity come together

Panelized Modular Construction

- Condominiums
- Purpose Built Rental
- Commercial & Office
- Institutional
- Hospitals
- Student Residences
- Hotels

DESIGN PREFAB BUILD

Our vision is to provide clients with ‘**one source**’ solutions for all of their construction and development needs.

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KiwiCondo/Commercial

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A New Approach

The KiwiCondo/Commercial Building System is offered as an alternative to traditional methods for building condominiums and commercial projects. The entire building is pre-designed and then tailored to suit your needs. Building components are all factory made and then shipped to site with insulation, windows, heating, cooling, and electrical integrated into the elements. On site they are erected and connected together where the finishes including drywall, tile, millwork and cladding are added. This results in an architecturally designed building with all the advantages that come with a factory made product.

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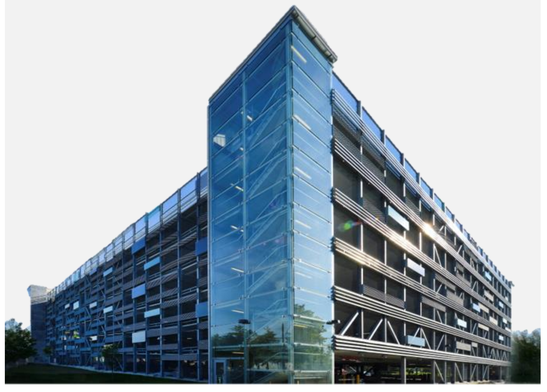
01

Newton Group Ltd.

Newton Group Ltd. is a vertically integrated General Contractor focused on developing and constructing Building Systems and bringing efficient methods of construction to the industry.

DESIGN BUILD
PARKING STRUCTURES



DESIGN BUILD
NET-ZERO BUILDINGS

DESIGN BUILD
INDUSTRIAL, COMMERCIAL, INSTITUTIONAL (ICI)

EPC SOLAR
ENGINEER, PROCURER, CONSTRUCTOR

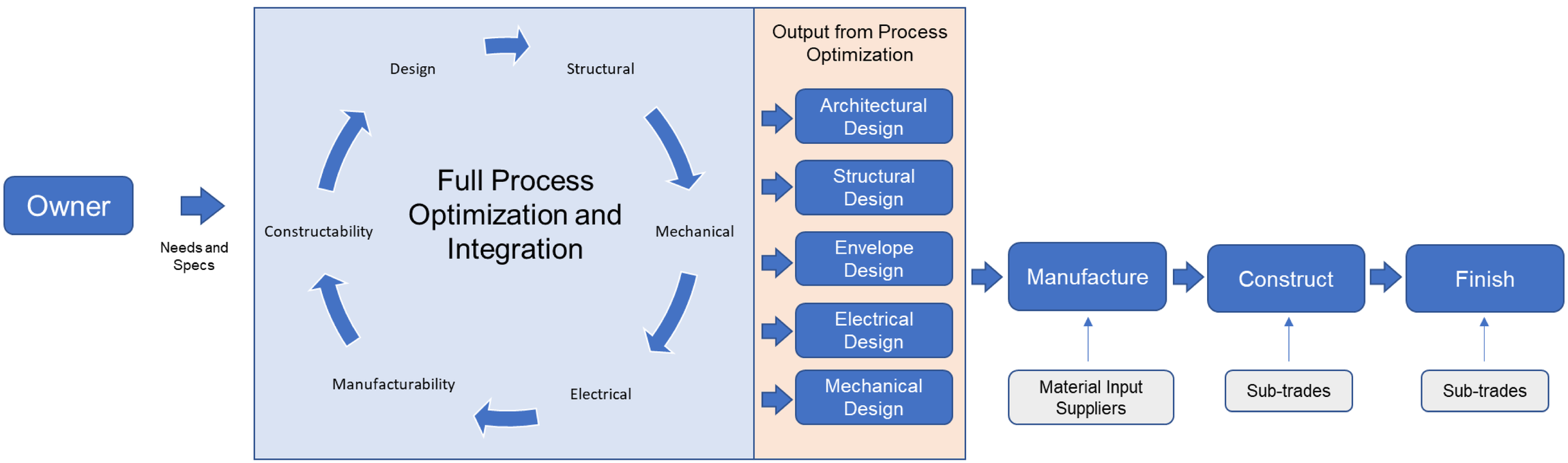
Newton Group Ltd.
EST. 1994

Newton Group Ltd. owns and operates our own Precast Concrete Manufacturing Plant and Steel Fabrication Shop

This vertical integration of services allows Newton Group Ltd. to provide clients with ‘one source’ solutions for all their development needs

Newton Group Ltd.

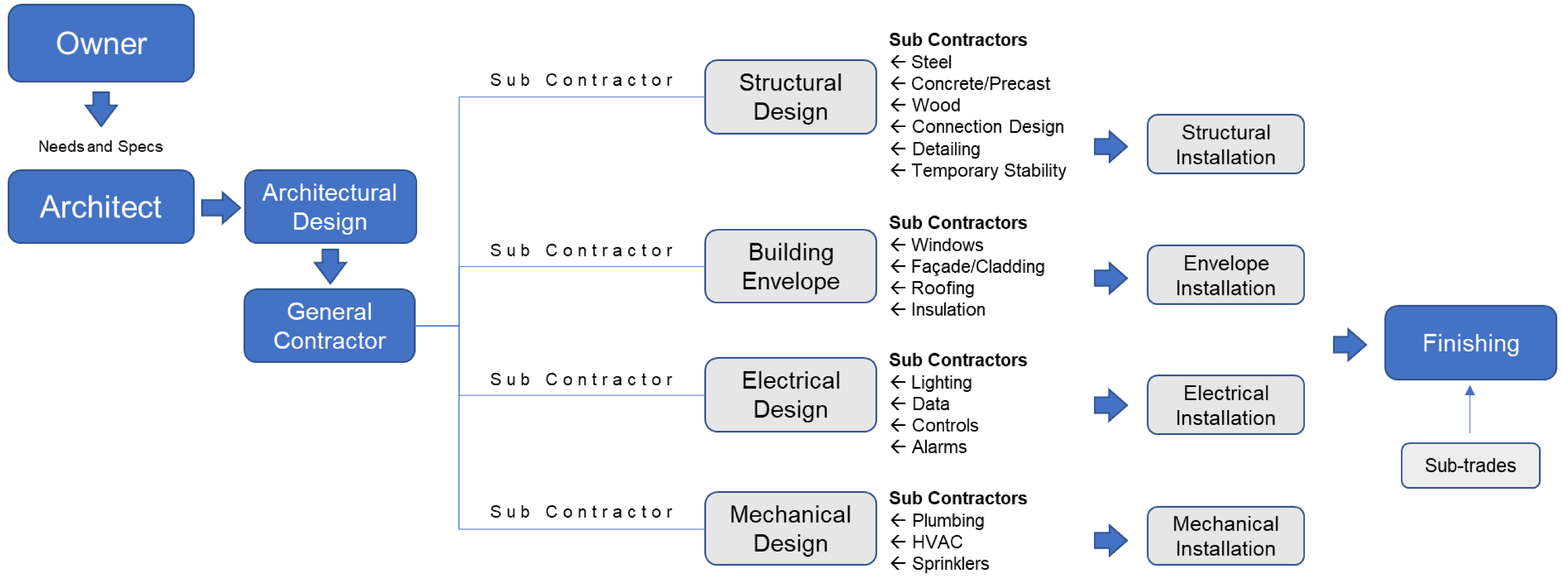
The Newton Group Method; Integrated Design and Delivery



The Newton Group Method is an Integrated Design and Delivery model, an extension of the Design-Build model. The method brings all project teams to the table to iterate through a Full Process Optimization and Integration cycle to ensure that all functions of the building are integrated and work together for Optimal Building Performance.

This process is similar to how the Automotive Industry uses Design for Manufacturing and Assembly (DFMA) to provide efficient and functional design.

Traditional Method



02

KiwiCondo/Commercial

A **Building System** specifically designed to *integrate* all elements of construction to work cohesively; resulting in cost efficiency, energy efficiency, durability, and adaptability.

Utilizing a Total-Precast approach to realize the benefits of off-site construction and prefabrication, while allowing for customization through a Vertically Integrated delivery model.

A **Building System** is a predefined approach to designing and constructing a particular type of building.

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System Components and Benefits

Main Precast Elements

- Exterior Walls
- Interior Walls
- Floor Slabs
- Staircases
- Stairwells
- Elevator Shafts

Embedded into Elements

- In-Floor Hydronic Lines
  - Heating/Cooling
- Windows
- Electrical
- Sprinklers

Multiple Functions

- Structural
- Building Envelope
- Insulation
- Façade
- Fire Suppression

Main Benefits

Prefabrication	Factory precision for building components. Decreased site time and disruption.
Energy Efficiency	Low energy consumption. Large insulated thermal mass with inherent energy storage.
Alternative Sources	Integrates well with alternative energy sources (Geothermal, Solar, etc.).
Schedule	Accelerated construction schedule with prefabrication.
Operating	Low running costs and less maintenance than conventionally constructed buildings.
Adaptable	Completely customizable to suite owner and architect preferences for façade, layout and finish.

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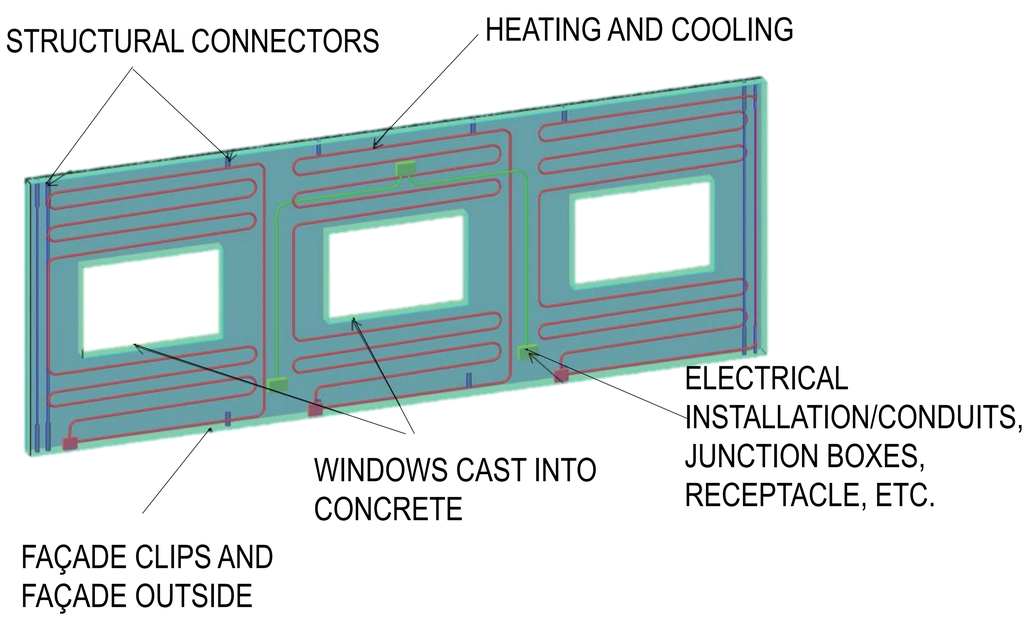
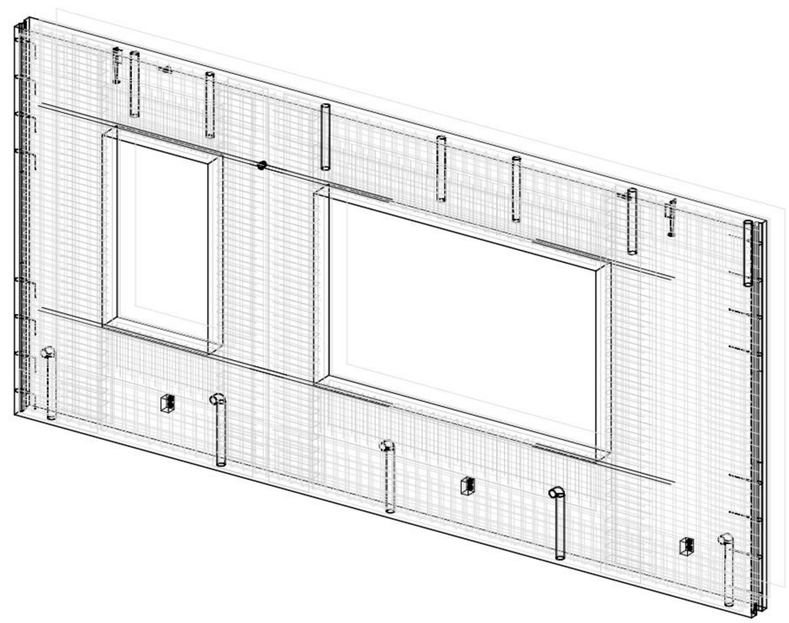
Embedded Integration

Exterior Wall Element

A KiwiCondo/Commercial exterior wall element is manufactured of precast concrete. Prior to the concrete being poured in the mold, the electrical conduit is placed so that it will be embedded into the wall. Before it leaves the Newton Group facility, the insulation is added on the outside, facade clips are installed (thermally isolated) and the windows and patio doors are installed. The walls are poured interior side down, leaving an extremely smooth form finish on the inside of the building. Paint this interior wall and there is no need for drywall.





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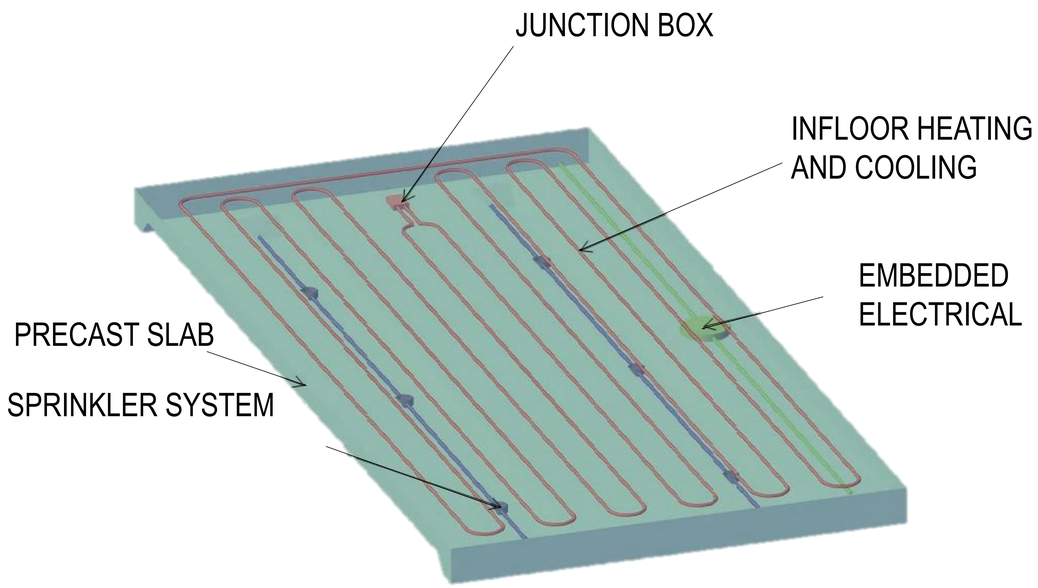
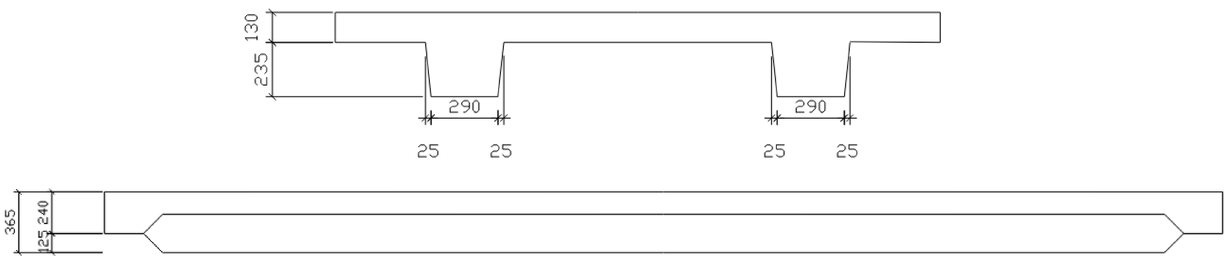
Embedded Integration





Floor Plate

The shallow 'double-tee' floor plate spans from the exterior structural wall to an interior structural wall (likely a corridor wall). The floor plates are prestressed precast concrete elements manufactured in Newton Group Ltd.'s facility. Before pouring the concrete into the form, Newton Group can embed hydronic lines for heating and cooling the building (Yes, and cooling!). In-floor heating and cooling comes standard with a KiwiCondo/Commercial building as it can be effectively integrated in the facility. Electrical conduit and sprinkler lines can also be integrated into the floor plate for the level below. The floor element now has structural, mechanical and electrical functions.

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Refined Process

KiwiCondo/Commerical Construction Process

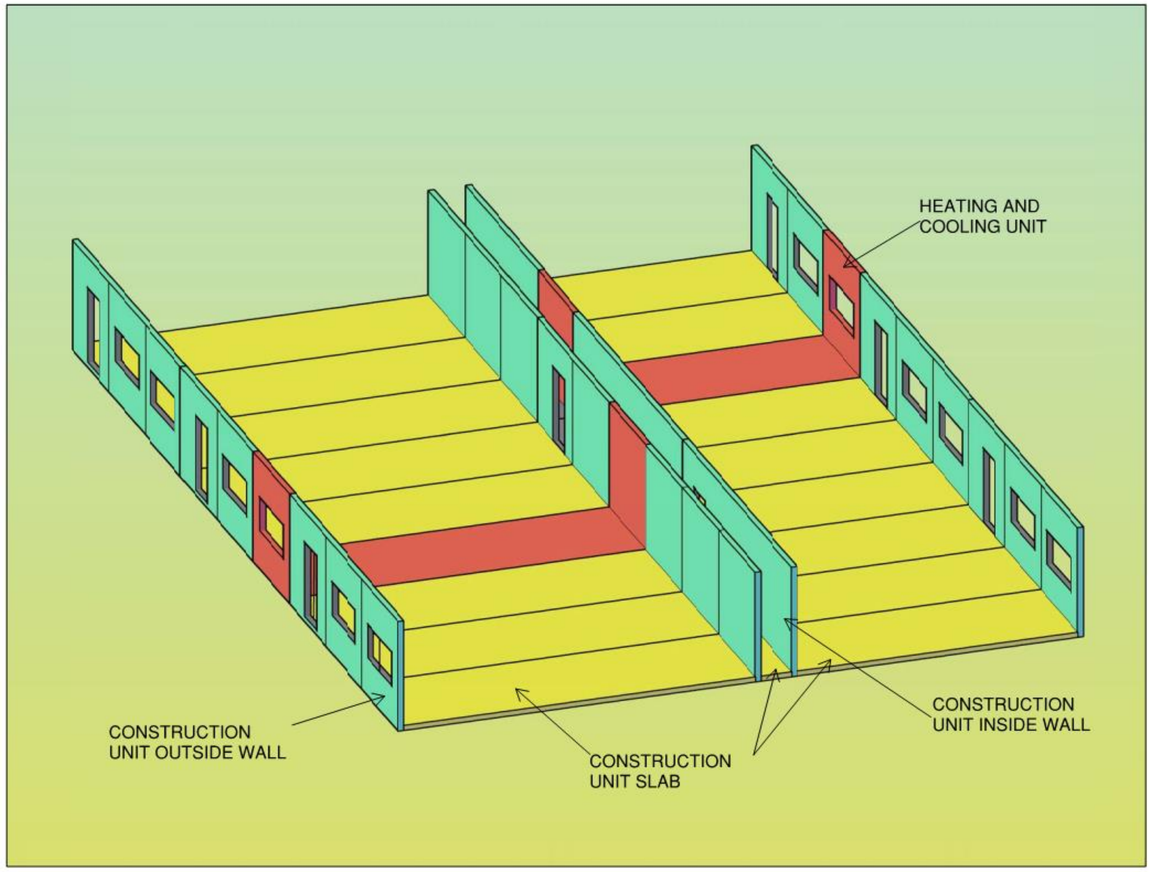
1. Concrete molds are set and embedded items are placed in the mold. Building components are poured using in the Newton Group Ltd. facilities
2. Post-Pour items (windows, flashing, insulation, pre-applied facade, etc.) are added.
3. The components are wrapped and shipped to site.
4. Components are lifted into place and grouted/connected together
5. Once the main components are in place, the façade can be added (if not pre-applied in the factory).

KiwiCondo/Commercial

Energy Concept

The Building System centers around inherent energy efficiency. The insulation is placed on the exterior side of our precast concrete walls. This places all of the concrete inside a thick layer of insulation. As the building is heated, the concrete acts as a large thermal mass. which mitigates fluctuations in outdoor temperature keeping the inside temperature consistent. The in-floor hydronic Heating/Cooling systems uses this thermal mass to efficiently provide temperature control to the building. An Energy Recovery Ventilator (ERV) and dehumidifier provide fresh air to each suite.

During the day, the concrete soaks up the energy from the sun to "charge" the building, it then slowly releases this energy back into the building during the cooler nights. This concept is known as Core Activation.



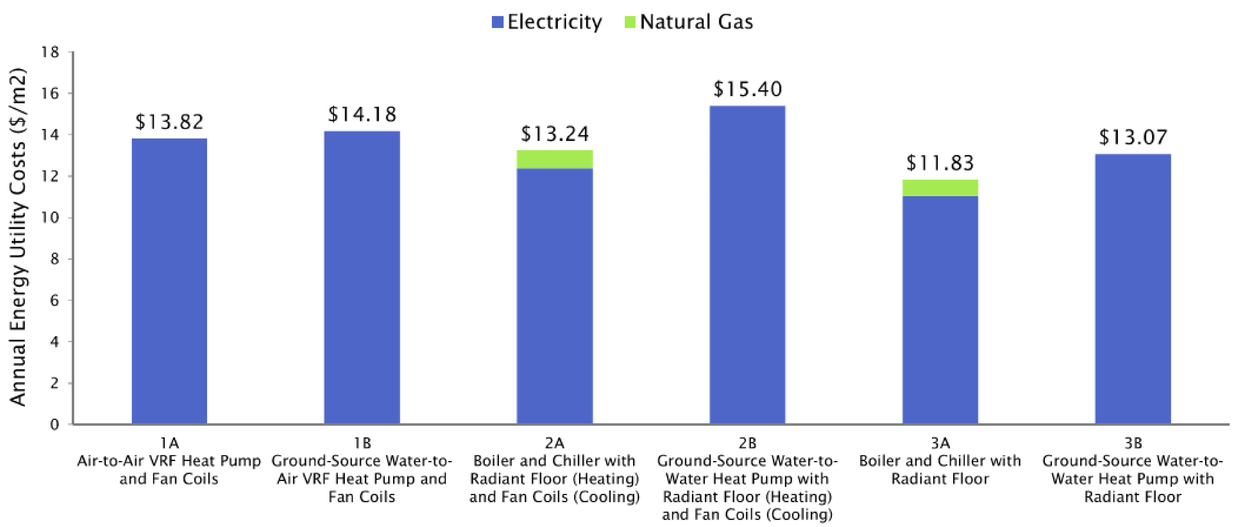


Figure 3 *Annual utility costs for different HVAC system options at NiMa Trails Block 127. Blue indicates electricity costs while green indicates natural gas costs. Utility costs are for energy consumption only and do not include any annual or monthly service charges.*

- Insulated Concrete Provides Large Thermal Mass
- Low Temperature Differences Between Air And Heating/Cooling Surface
- In-floor Hydronic Heating/Cooling Allows For Centralized System
  - Geothermal
  - Solar PV and Solar Thermal
  - Air heat pump
  - Waste Heat Recovery
  - Combination of any

Typical Building Heat Loss through Balconies.

The KiwiCondo/Commercial System makes sure that all balconies and necessary clips are all thermally broken

With such an inherent insulating value, special care is taken to limit thermal bridging. Thermal bridging occurs when an exterior element is directly connected to an interior element without any thermal breaks. A prime example is when a balcony is simply an extension of the floor slab, cantilevered out. With this building detail, the cold concrete balcony is an express bridge for your heating energy to leave your building. Newton Group uses thermally broken balconies and facade mounting to eliminate thermal bridges.

03

Case Study: NiMa Trails

- Photovoltaic Solar Power system on roof, carport and parking structure total 160 kW
- Thermal solar panels for hot water supply
- Geothermal grid and heat pumps for hot and cold water energy source
- Hydronic In floor heating and cooling system plus in suite individual ERVs and dehumidifier
- In floor heating and cooling using hydronic is more efficient than pushing hot air for heating and cooling due to energy draw on fan capacity.
- Thermally engaged building
  - Concrete mass walls 200mm thick plus concrete floors and roof inside with all of this mass thermally broken to the exterior behind R25 rigid wall insulation on the exterior.

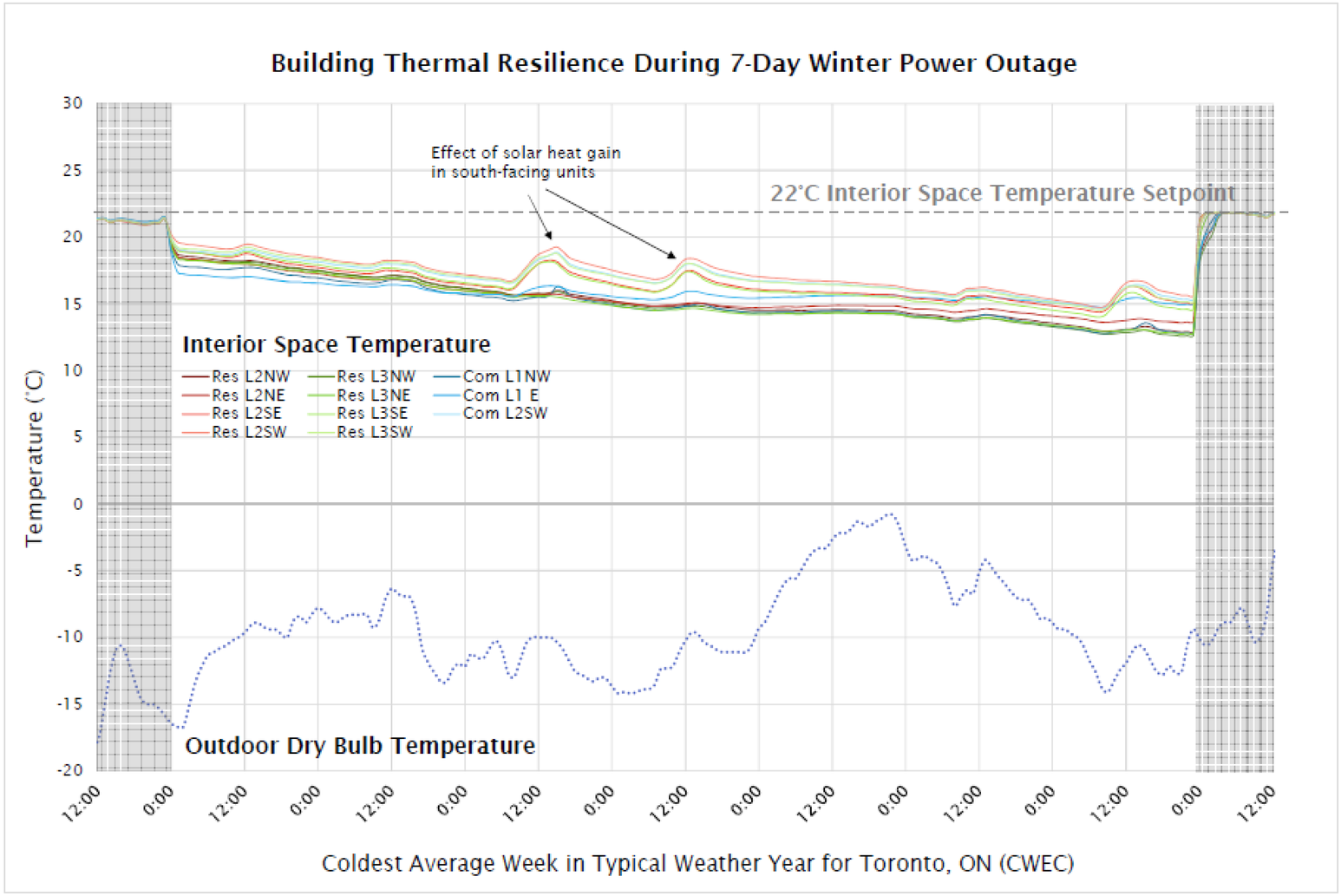
Case Study: NiMa Trails

- Thermal insulated concrete mass gives 8% more energy efficiency due to levelling peaks and valleys of temperatures during the day and from day to day.
- Building has resilience enough to keep it warm for 7 days during winter with no heat.
- All balconies and connections to the exterior are thermally broken. All framing thermally broken connected only using SS screws.
- Thermally broken triple glazed high performance window systems.
- Economically Priced. Commercial condo project for sale.

Case Study: NiMa Trails

Energy Concept

Thermal resilience during a simulated 7-day winter shut down at NiMa Trails Block 127 with improved building enclosure. Interior space temperatures in each zone generally decrease through the week but stay above 13˚C to 15˚C. Solar gain through the south-facing windows provide some heat to those zones during the afternoon when there is sufficient incident solar radiation.



Comparison to a Typical Building

Without considering the on-site electricity generation from the solar photovoltaic (PV) panels, the NiMa Trails condo building is estimated to be approximately **60%** more energy efficient[2] and produce fewer than 10% of the GHG emissions[3] compared to a typical low-rise condo building.

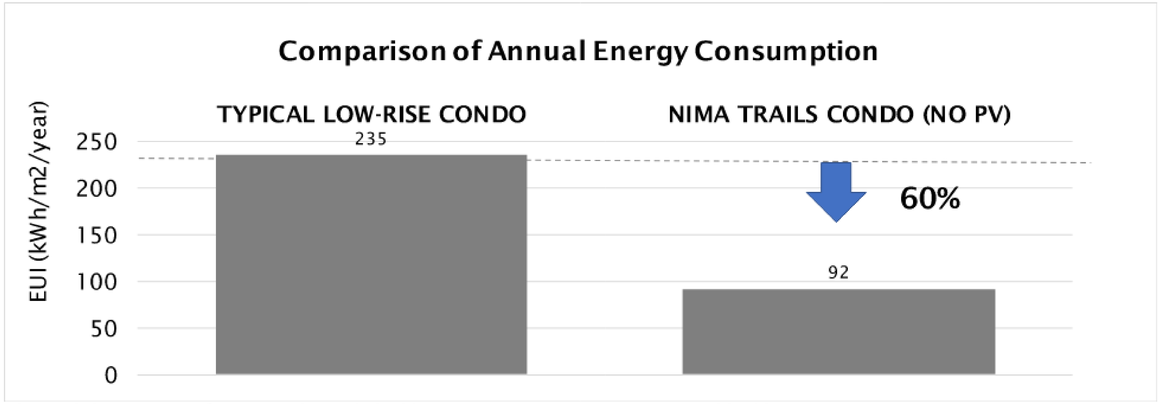


Figure 6 Comparison of NiMa Trails condo building energy consumption to a typical building.

"...approximately 60% more energy efficient..."

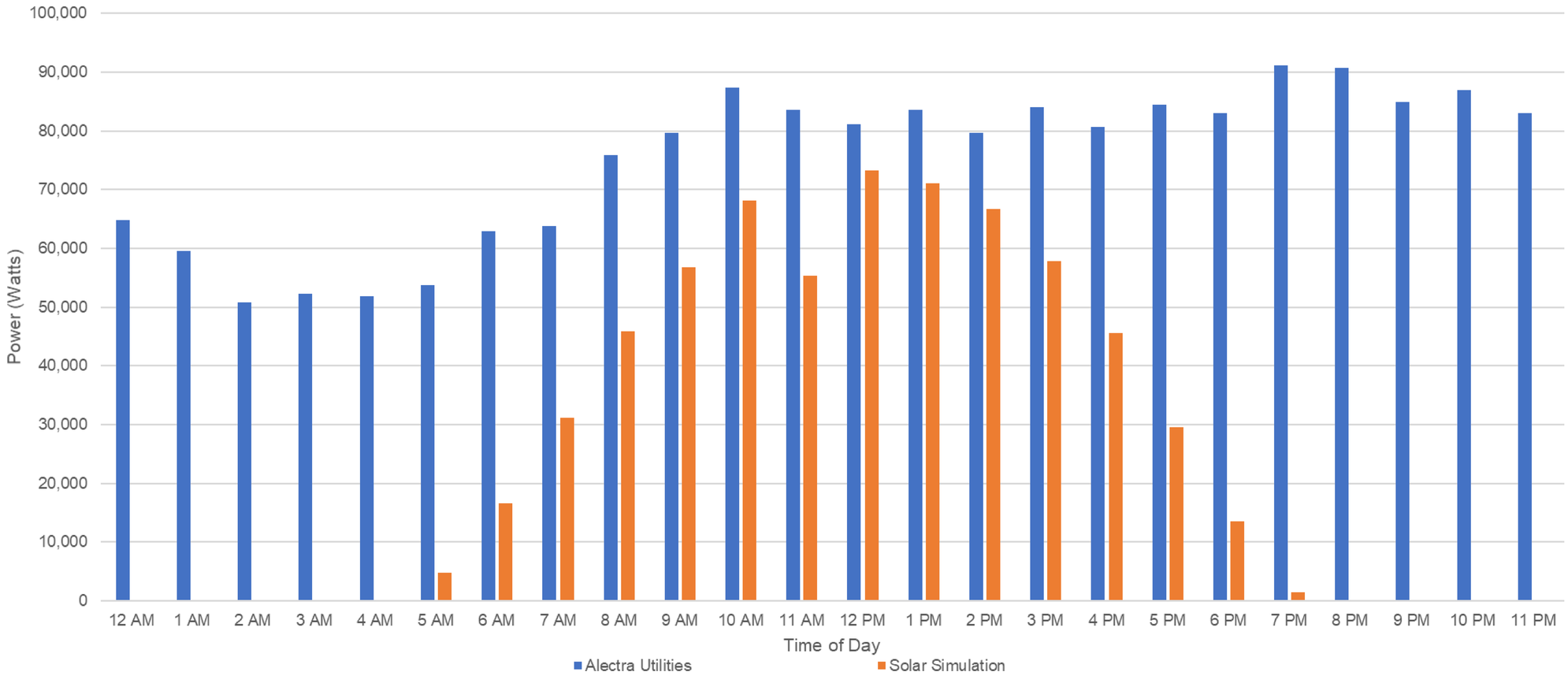
Case Study: 10-Storey

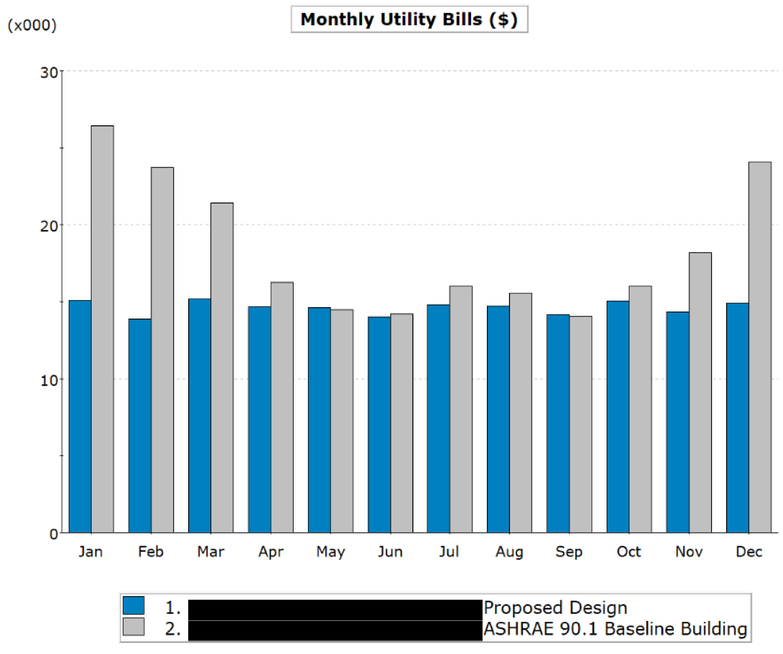
Project includes building a parking structure on the site so that the current surface lot can be developed into a 10-storey, slab-on-grade apartment building.

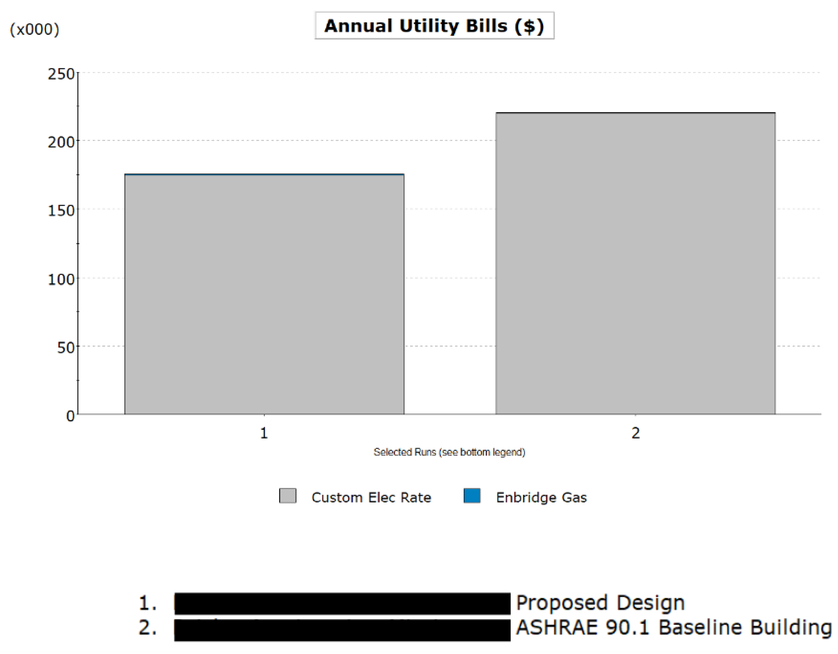
The parking structure will utilize a 280 kW Solar Roof to generate power for both the existing and new building. Battery storage is integrated into the project to further utilize Solar Power generation on-site.

Case Study: 10-Storey

The power generation from the Solar Array on the parking structure reduces the stress on the power grid during the day.







04

Optimally Designed For:

Condominiums

The Building System is cost effective through the use of prefabricated elements, yet flexible enough to achieve a customized designed. End users will enjoy a durable, energy efficient, acoustically resilient, and functional building.

Purpose Built Rentals

With a superior energy concept at the core of the KiwiCondo/Commercial design, owners of purpose built rental buildings can offer attractive rates with confidence and lowered utility costs. Precast concrete also offers high durability and is more favourable for building insurance.

Hospitals & Healthcare

Highly durable precast concrete buildings with efficient centralized heating and cooling keeps monthly utility bills low, and can be easily adapted in the future as technology changes. With a centralized system, maintenance is also less complicated.

Commercial & Office

The Building System is designed to span from the exterior wall to an internal structural wall or column grid line. These long spans leave flexibility for the owner to arrange their space how they desire. With less shear walls in the main space, the building can be easily renovated in the future to adapt to different uses.

Institutional

High traffic buildings such as student residences, classroom buildings, or hospitals are perfect for the KiwiCondo/Commercial Building System. Efficient centralized heating and cooling keeps monthly utility bills low, and can be easily adapted in the future as technology changes. With a centralized system, maintenance is also less complicated.

Hotels

Similar to all of the above, the KiwiCondo/Commercial Building System can be used for Hotel projects which would result in an energy efficient building making a positive impact on the overall operating budget.

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