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Aqualina NetZED Suite

NET ZERO ENERGY DWELLING BY TOWER LABS

The NetZED Concept

AQUALINA
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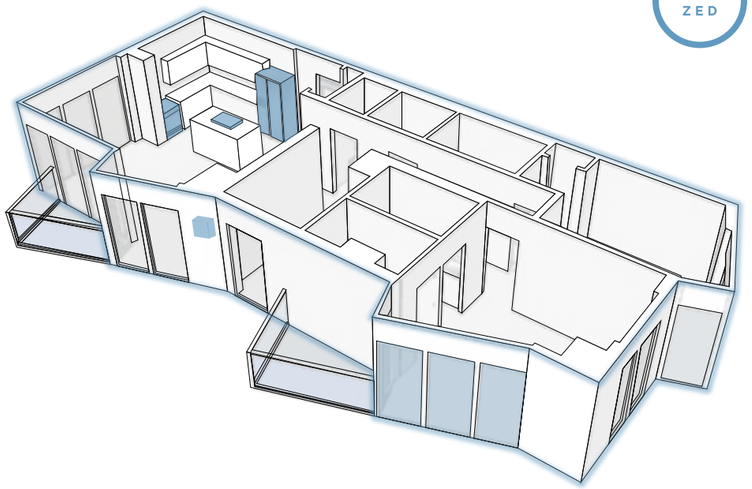
An all-electric dwelling

The Net Zero Energy Dwelling, or NetZED, is powered by renewable electricity and hot water all year round. This means the total amount of electricity produced from the sun during the year is equal to the electricity consumed by the suite during that year. The NetZED concept is also part of a broader sustainable design approach applied to every aspect of the home. From appliances and lighting to linens and mattresses, every finish, feature and piece of furniture tells the story of an eco-exuberant lifestyle.

NET ZED



NET ZED

Introducing NetZED at Aqualina, Bayside Toronto.

The NetZED suite is located on the penthouse level in the north tower of Aqualina at Bayside, targeting a LEED-Platinum community by Hines and Tridel on the Toronto Waterfront.

OUR VISION
IS SHARED WITH

PHILIPS
Whirlpool
enerworks
BRADFORD WHITE
electriQ POWER
MITSUBISHI ELECTRIC
JB&FT CONSTRUCTION
GORDON H. WILLIAMS
REVERSOMATIC
core
nubryte
sensorsuite
TOWER LABS

Domestic Hot Water GE Hybrid Heater

GENEROUSLY DONATED BY
BRADFORD WHITE

The suite will not be fed off the building's natural gas heated domestic hot water system. Instead, a dedicated heat pump will heat the water temperature using high efficiency refrigerant technology.

Washer & Ventless Dryer

GENEROUSLY DONATED BY
WHIRLPOOL

The dryer uses a new technology heat pump which is more efficient than the previous model. Heat pump technology recycles air and captures moisture for more efficient drying while keeping energy use down.

Heating and Cooling VRF

GENEROUSLY DONATED BY
MITSUBISHI ELECTRIC SALES CANADA

The hydronic fancoils used in every other suite in Aqualina are replaced here with an all electric Variable Refrigerant Flow (VRF) heat pump. The VRF A/C unit saves energy and space. Each unit can operate individually which will allow for separate zone adjustment. It operates at varying speeds instead of on/off operation, meaning it works at the needed rate allowing for energy savings at partial load conditions.

Lighting

GENEROUSLY DONATED BY
PHILIPS LIGHTING CANADA

All lighting is LED to significantly reduce power consumption. The suite was designed with different levels of lighting to address various activities, without requiring the homeowner to plug in lamps etc. It includes task lighting, under valance, dimmers, and directional pot lights.

Ventilation Reversomatic ERVs

GENEROUSLY DONATED BY
REVERSOMATIC + CORE

An individually controlled fresh air system is directly ducted to the outside and pre-conditions outdoor air to reduce HVAC loads. Furthermore, the enthalpy core uses a polymer membrane which is capable of recovering both latent and sensible heat. The recovered moisture in the winter provides a better indoor environment, prolonging the lifespan of the millwork and wood finishes.

Vent Boxes

GENEROUSLY DONATED BY
JB & FT CONSTRUCTION

Typical suite vent boxes (intake and exhaust) are insulated on site with spray foam. These boxes come preformed which allow them to perform better.

Battery

GENEROUSLY DONATED BY
ELECTRIQ + TOWER LABS

A fully integrated energy storage, home energy management and monitoring system has been connected to the photovoltaic panels located on the roof. This power storage system is located in the mechanical crawl space above the suite and will store power to be used by the suite at night and during low production times. Software intelligence combines weather, utility rate, and historical solar production and energy consumption data to improve system performance to meet the homeowner's goals. Should it empty, the grid will supply the suite.

Wallpads & Switches

GENEROUSLY DONATED BY
NUBRYTE

Nubryte is a smart home automation which can be integrated with other elements of the suite's energy system. All of the home's lighting can be controlled from conveniently located kiosks and wall switches that also include motion and temperature sensors. Lights can also be controlled by phone and by smart voice assistants such as Google Home and Alexa.

Bi-directional Meter and Circuit Level Metering

GENEROUSLY DONATED BY
SENSORSUITE

In order to provide maximum visibility on energy consumption, meters are installed on individual circuits, reporting data to a user friendly dashboard. A whole home bi-directional meter is also installed to measure the flow of energy in and out of the suite. All surplus renewable energy generated and not required by the suite will be fed into the building amenity

Window Screen

GENEROUSLY DONATED BY
NORTHGREEN TECHNOLOGY

Pleximesh is a state-of-art screen product made out of toxic-free and recyclable material. Its advanced ventilation technology guarantees great breathability by the numerous funnel-shaped micropores, which can effectively block dust, pollen and insects as well as prevent water molecules from coming into the suite so windows can be left open during rainfall without the risk of flooding. A unique graphene-based coating and its thickness gives Pleximesh great thermal and antistatic properties, helping with noise reduction and enhancing the longevity of interior finishes.

Shades

These shades are motorized and capable of smart phone app and voice control. They can be programmed to automatically open and close, even following sunrise and sunset based on the time of year. This increases use of natural light and heat from the sun in winter, helping reduce energy consumption.

Envelope Design

The thermal envelope refers to all the systems that prevent the transfer of energy between the inside and outside of the suite. Preventing energy transfer ensures that demands for cooling and heating are reduced, in turn reducing electrical demand.

Thermal Break

Concrete is a good conductor of heat energy. That is why protruding balcony slabs contribute to the dissipation of heat to the outdoors. NetZED's balconies have thermal breaks, which means there is an insulated section in the slab beneath the balcony threshold. This technology is common in some European countries and has been shown to reduce heat loss from thermal bridging by 90%.

Soffit Assembly Clips

These clips connect the interior and exterior assemblies of the soffit. They were installed at the soffit above the suite as recommended by RDH. These clips are fiberglass and reduce thermal bridging. The improved assembly clips limit the thermal transfer between the suite and the exterior.

Energy Model and Working Drawings

An advanced digital energy model for the home was developed by the design engineers to determine the power draws and generation requirements. The model's simulated monthly energy use provided the basis for the specifications for mechanical and electrical equipment and the envelope. The main focus was to reduce the loads with high performance equipment and materials.

Solar Panel

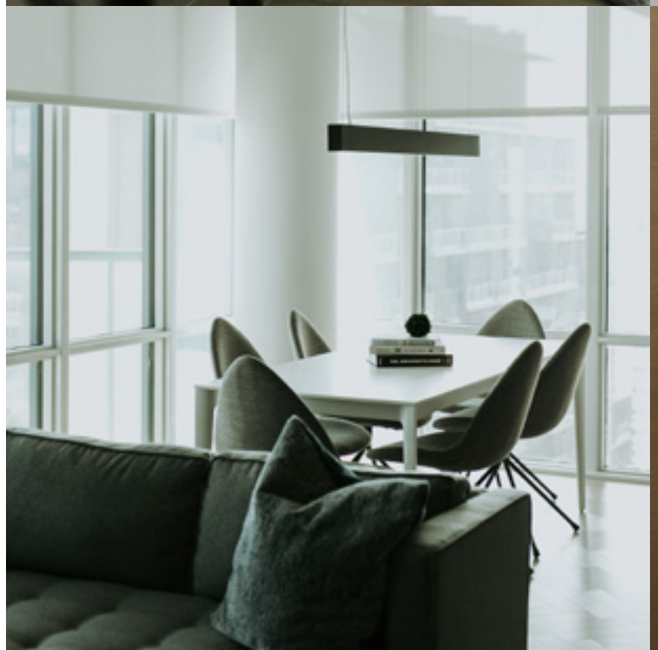
A 7KW Solar photovoltaic collector system on the roof harvests enough renewable energy over the course of the year to support the electrical loads of the suite.

Smart Vapour Barrier

Vapour barriers are installed on the 'warm side' of a solid wall. Traditionally in a Northern climate like Toronto, that has meant the surface behind the drywall and in front of the insulation cavity. While that works in the winter time, due to the inside being warmer, it does not translate to summer temperature conditions. What can happen in the summer is that hot, humid air migrates from the outside into the stud cavity and wets that surface. Over time this can lead to rot and mold growth, compromising insulation effectiveness. The smart vapour barrier system prevents this from happening through the opening of the pores which allow moisture to wick out. When colder temperatures arrive in the winter, the pores close up, preventing warm humid air from the inside migrating into the stud cavity.

T5 Series Window Frames

The T5 series from Toro has a greater thermal resistance than conventional frames and therefore provide a better thermal break than conventional frames. These frames surround the edges of the window panes.



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