

GREAT GULF ACTIVE HOUSE



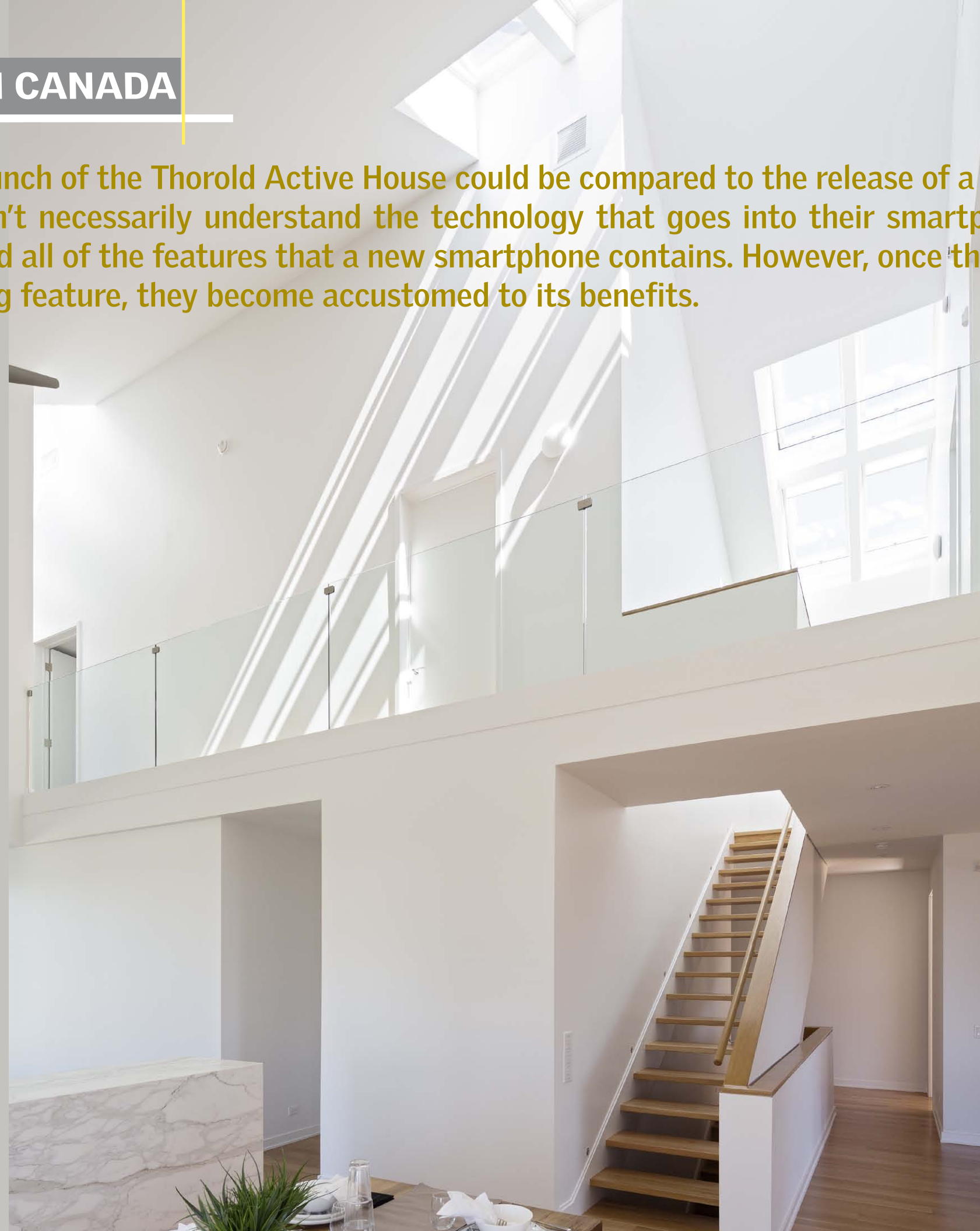
FIRST ACTIVE HOUSE IN CANADA

THE ACTIVE HOUSE IN CANADA

Most Canadians rarely factor in their overall health and wellbeing when purchasing a new home. Buying a home is largely driven by price, proximity to a decent school or the perceived quality of its interior finishes. Seldom is the level of overall human comfort and environmental sustainability considered. This is about to change with the arrival of the first Active House in Canada. Built in Thorold, Ontario, a community located in the Niagara Region and roughly 90 minutes west from Toronto, this demonstration home was achieved through a collaboration involving a team of Danish architects, the award-winning Toronto architecture firm superkül, and Great Gulf, the builder committed to bringing the Active House concept to Canada. The Active House was developed in Europe and is defined by its use of natural daylighting and ventilation, energy-efficient strategies, and an overarching concern for human comfort. With the arrival of the Great Gulf Active House, a Canadian builder has been given the opportunity to introduce a contemporary residential product that shifts the conversation beyond energy efficiency by promoting mental and physical health for its occupants.

The Great Gulf Active House is the architectural manifestation of a tremendous amount of research, analysis, visualization studies and mock-ups requiring significant investment in financial and intellectual capital that will be applied toward the evolution of future Active Houses. Many of the concepts found in the model home are already available in several Great Gulf low-rise homes.

The launch of the Thorold Active House could be compared to the release of a new smartphone. Most consumers don't necessarily understand the technology that goes into their smartphone, nor do they even initially demand all of the features that a new smartphone contains. However, once they see the benefits of a new and exciting feature, they become accustomed to its benefits.



FACTS:

Builder:
Great Gulf

Design:

- Superkül Inc. Architect
- Enermodal Engineering, a member of MMM Group
- Quaile Engineering
- Building Science Corporation
- Building Knowledge Canada Inc
- Enerquality verified for "Energy Star" and "Green House" certification
- "Brockport Built" Fully panelized home

Ensuring precision and quality

- Danish Technical Institute
- VELUX A/S Building Industry

Area:
Lot area: 600 m²/ 6,465 SF

Ground Floor: 153 m² (1,645 SF)
Upper Floor: 154 m² (1,656 SF)

Location:
Thorold, Niagara Region, Ontario, Canada

ACTIVE HOUSE

The Great Gulf Active House is designed for human comfort and well-being from the inside-out -- the clean aesthetic of its modernist architectural expression merely provides the foundation for maximum human comfort with the goal of reducing maintenance and operating costs. Even minor or imperceptible features such as interior and exterior LED lighting systems, permeable driveway surfaces, native plant species or cedar siding and detail elements help minimize maintenance costs. But what ultimately makes this home so attractive is not its technology, but the emotional appeal of an architecture that instantly reduces one's stress levels.

EXTERIOR FINISHINGS

- Exterior Wall Panel System with Rain Screen Application: James Hardie
- Architectural Series Clay brick: Hanson Brick
- Cedar clad insulated garage door: Barmac Garage Doors Ltd.
- Cedar exterior trim treatments
- Solid White Oak rift cut front entry door
- Covered outdoor living space with cedar decking and soffit
- Fully landscaped front and rear yards incorporating native plant species
- Eco Paver Permeable Interlock Driveway
- Architectural Series Exterior LED Lighting
- Exterior foundation wall insulation system: Cosella Dorken

Environmentally friendly homes or adopting sustainable design initiatives into their everyday lives. This is where the benefits of the Active House come into play

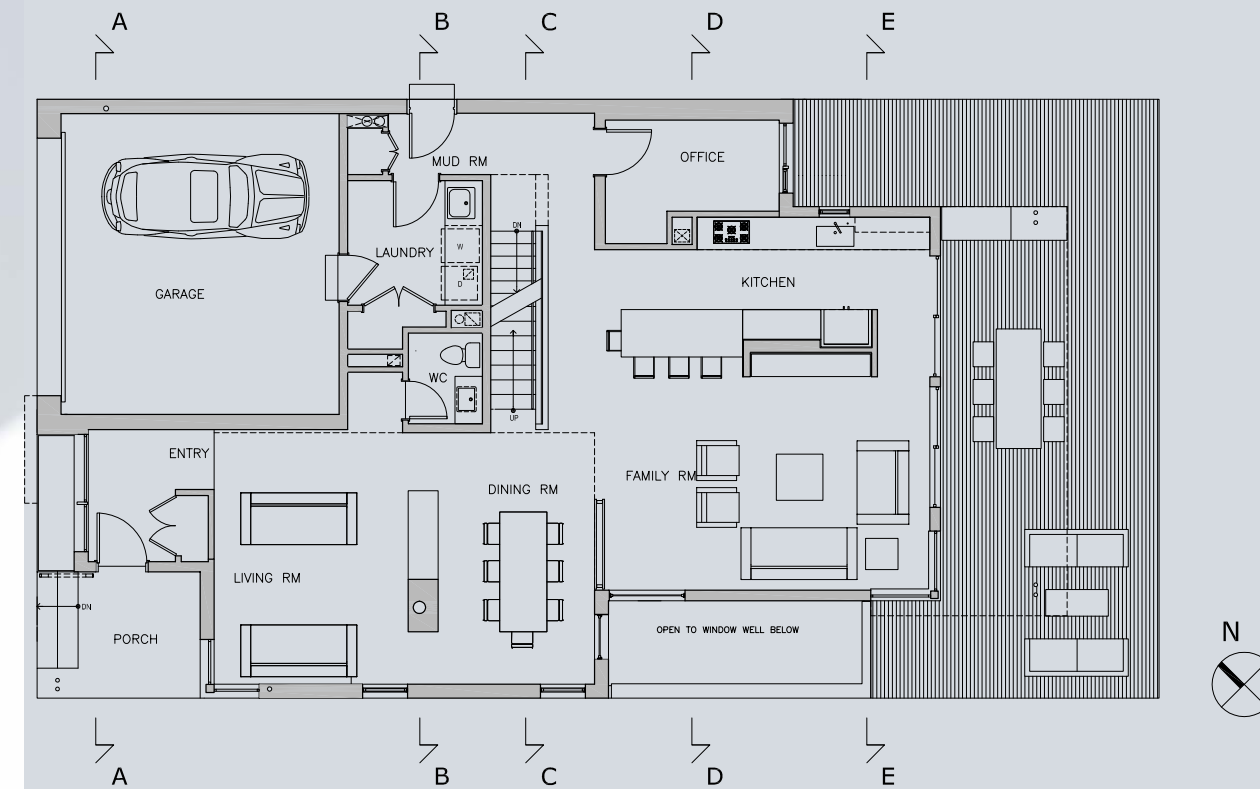
ARCHITECTURE

Achieving a new form of residential living requires shifting the conversation relating to the expectations of a single-family home to give consumers the ability to appreciate the value of human comfort over traditionally held beliefs about "traditional" design or so-called "luxury" finishes, neither of which contribute to the occupant's health outcomes. One useful example is where the architects reinterpreted some of the existing design guidelines for Great Gulf's Rolling Meadows community in Thorold and applied them to the Great Gulf Active House. Using the design guidelines of a traditional gabled roof design and adapting them for the Active House yielded a streamlined multi-functional roof design that provided a basis for double-height spaces and opportunities for the home's many skylight applications..

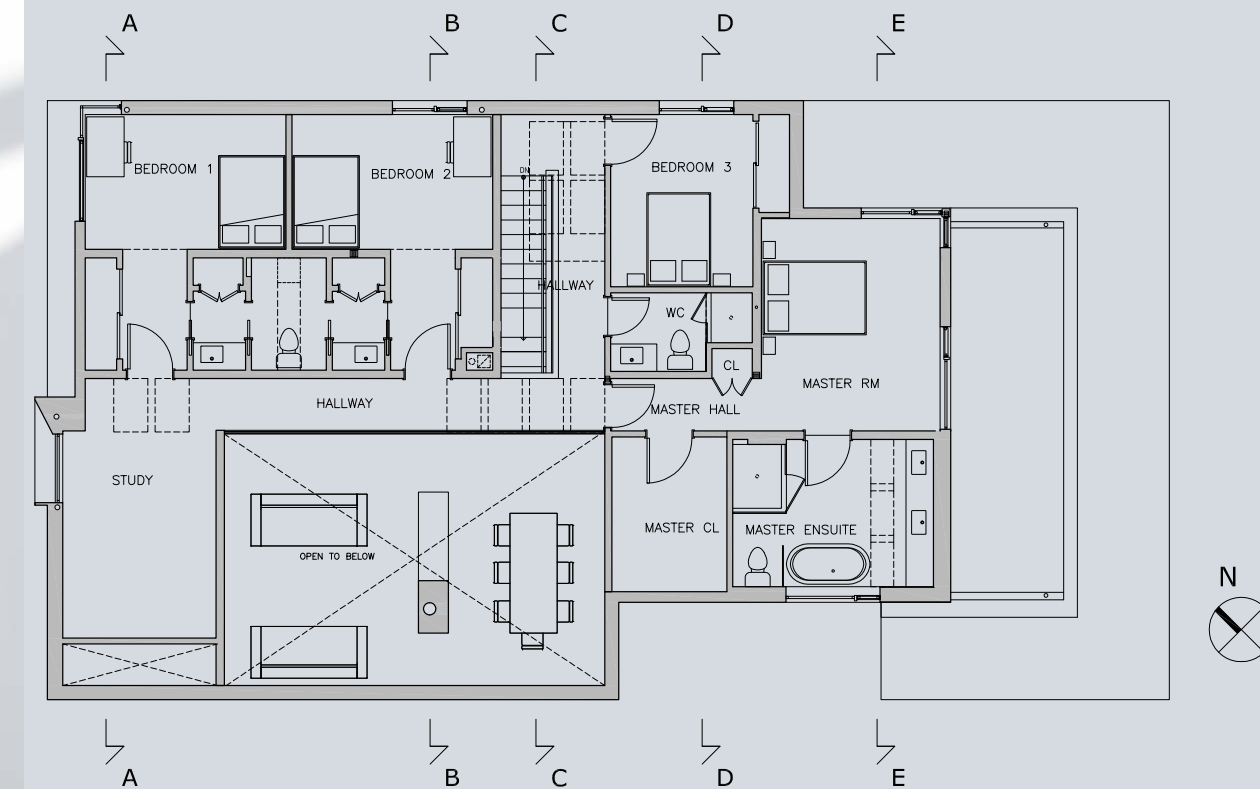
At the beginning of the design process, Great Gulf provided Superkül floor plans of other similarly sized homes currently available at the Rolling Meadows site. From this departure point, the design went through several reiterations. After examining many types of wall assemblies, the architects eventually opted for a conventional wood frame construction that was clad in brick and cement board. To ensure a design and technical rigour, a full-scale mock-up of a complete section of the house was constructed -- complete with gutters and flashing -- to verify the maximum number of energy-efficient elements into the project's designs.

INTERIOR FINISHES:

- Engineered Rift-Cut White Hardwood strip flooring throughout (excluding tiled areas): Vintage Flooring
- Porcelain tile in front Foyer, Kitchen, Laundry, Side Entrance, Powder Room and all Bathrooms : Stone Tile
- Seamless glass railing open to below as per Designer Specifications
- Frameless Glass Enclosures for all Shower Areas
- Open-Rise Rift-Cut White Oak main stairs
- Rift-Cut White oak basement stairs
- Upgraded Rift-Cut White Oak Kitchen Cabinets as per layout : Aya Kitchens
- Interior trim and hardware inclusive of solid core interior doors and chrome finish door levers
- Upgraded Plumbing fixtures throughout Specifications and as listed below: Centon Sales
 - Plumbing fixtures: Hansgrohe
 - Bathtubs: Mirolin
 - Basins: Contrac
 - Kitchen and laundry sinks: Blanco



Ground floor plan

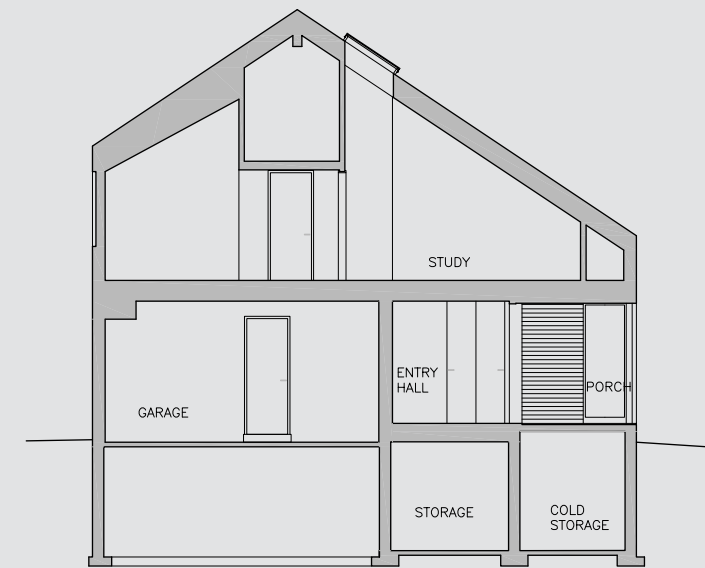


Upper floor plan

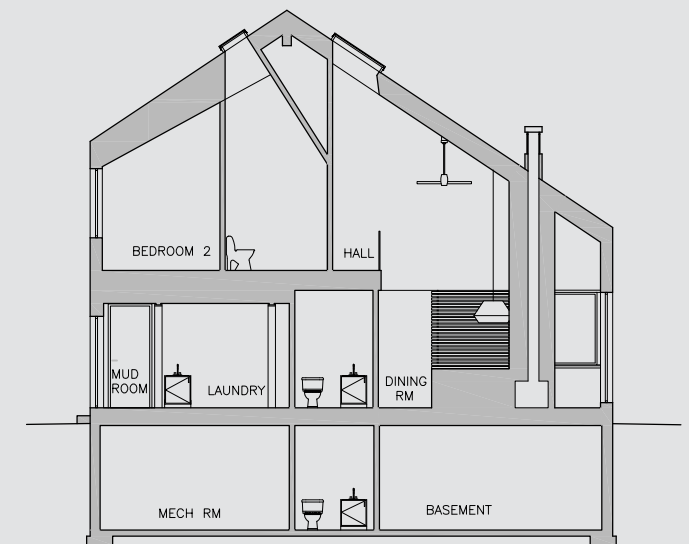
ARCHITECTURE

The fundamental qualitative aspects of the Great Gulf Active House are guided by natural daylight and how it can soothe and otherwise improve our daily lives through an immersive experience. The vestibule's standard-height ceiling leads into light-filled double-height living spaces. And the normally obtrusive stair leading to the upper levels is tucked away around the corner. This is atypical of a builder home that devotes a disproportional amount of space to a grand stair and foyer serving little purpose other than to impress. Other details which enhance human comfort are no less important. Both the stair's open risers and the clear glass guardrails are designed to maximize the penetration of natural daylight into the home. This layering of spaces is carried throughout -- from the galley kitchen to flexible living areas where a discreet loft space can be equally transformed into a bedroom or office.

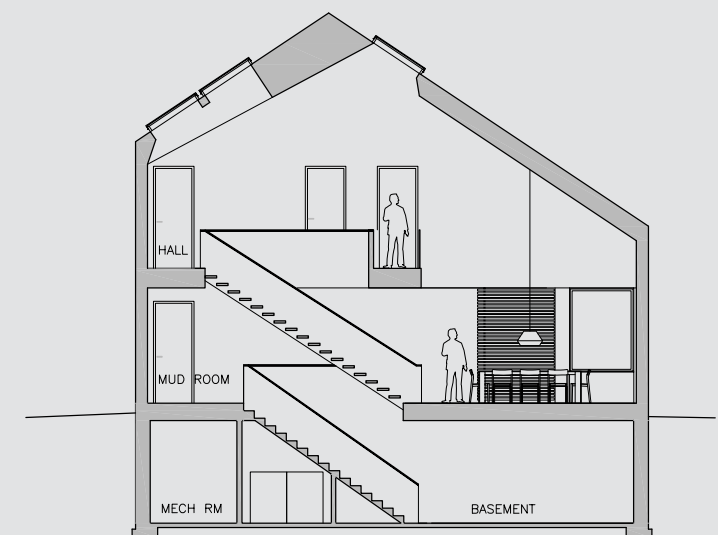
Removing visual barriers between living spaces helps give the impression of a home much larger than its 3,200 square feet. The openness of the plan is guided by two intersecting axes that maximize cross-breezes and natural ventilation, therefore minimizing a reliance on air conditioning. Even the patio has a greater purpose. Its amply dimensioned wooden deck aligns with the width of the living room, reinforcing a visually seamless extension of interior spaces toward the exterior -- notwithstanding the fact that it encourages occupants to keep the patio's doors open, thereby encouraging natural ventilation whenever possible. Maintaining a strong visual connection is a strategy used throughout to capture exterior views from almost every room without sacrificing privacy..



cross section A-A



cross section B-B



cross section C-C

Buildings that give more than they take

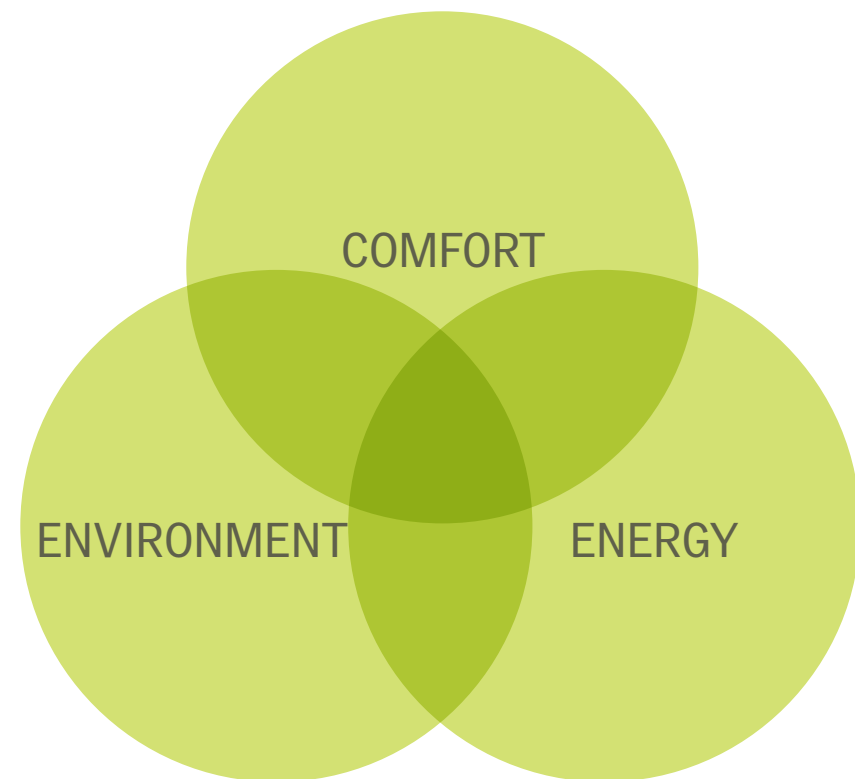
Active House is a vision of buildings that create healthier and more comfortable lives for their occupants without impacting negatively on the climate – moving us towards a cleaner, healthier and safer world.

The Active House vision defines highly ambitious long-term goals for the future building stock. The purpose of the vision is to unite interested parties based on a balanced and holistic approach to building

design and performance, and to facilitate cooperation on such activities as building projects, product development, research initiatives and performance targets that can move us further towards the vision.

The Active House principles propose a target framework for how to design and renovate buildings that contribute positively to human health and well-being by focusing on the indoor and outdoor environment and the use of renewable

energy. An Active House is evaluated on the basis of the interaction between energy consumption, indoor climate conditions and impact on the environment.



The Active House key principles are as follows:



COMFORT

- a building that provides an indoor climate that promotes health, comfort and sense of well-being
- a building that ensures good indoor air quality, satisfactory thermal climate and appropriate visual and acoustical comfort
- a building that provides an indoor climate that is easy for occupants to control and at the same time encourages responsible environmental behaviour.



ENERGY

- a building that is energy efficient and easy to operate
- a building that substantially exceeds the statutory minimum in terms of energy efficiency
- a building that exploits a variety of energy sources integrated in the overall design.



ENVIRONMENT

- a building that exerts the minimum impact on environmental and cultural resources
- a building that avoids ecological damage
- a building that is constructed of materials that can be recycled.

The fundamental qualitative aspects of the Great Gulf Active House are guided by natural daylight and how it can soothe and otherwise improve our daily lives through an immersive experience

The Active House was born from the efforts of a European consortium comprised of various partners from academia, professional practice, and building manufacturers to develop a methodology that promotes energy efficiency and human comfort. Adopting Active House specifications depends upon factors that include site location, climate, life-cycle costs, thermal comfort, indoor air quality and energy sources. Essential factors like thermal comfort can affect sleep and work patterns while proper indoor air quality promotes a healthier indoor climate -- a relief to those who suffer from asthma and allergies. An Active House design prefers renewable energy sources such as wind, geothermal and solar energy to reduce its dependency on fossil fuels. Synthesizing these and other factors into a single home represents an important challenge, given that we spend such a large percentage of our lives indoors.

3.3 RESPONSIBLE SOURCING

The score of the 3.3 is normally a combination of two scores. One for recyclable content and one for FSC (Forest Stewardship Council), PEFC (Programme for the Endorsement of Forest Certification) and EMS (Environmental Management System) documented material. Since FSC, PEFC and EMS certificates are not very common in Canada but instead replaced by other certificated like SFI (Sustainable Forest Initiative), that part of the criteria has been removed from the evaluation. Instead the score for the 3.3 indicator is identical with the score of recyclable content. The score for this parameter is 1. It has been calculated that more than 50% of the materials in the house will have a recycling potential.

3.2 FRESH WATER CONSUMPTION

The freshwater consumption and savings compared to standard values have been evaluated and a score of 1.7 was achieved. The installation of a rain water cistern has a very positive impact on the score. The system captures rain from the roof and lawn close to the house. The water is pumped from the weeping tile into the cistern. The large roof area provides good conditions for rain water system and gives the opportunity to store large volumes of water for later use. A saving potential of 35% has been calculated, based on the annual rainfall in Ontario combined with the area of the roof and the number of people in the house. The number and type of installations that can be supplied with rainwater has also been taken into consideration.

3.1 ENVIRONMENTAL LOADS

A Life Cycle Analysis calculation is carried out with the score 2.0 as result. Generally 2.0 is a good result for the LCA-calculation and is considered as above average compared to other houses evaluated. If a better score is desired, the installation of Photovoltaics on the roof could have a positive effect.



1.1 DAYLIGHT

The daylight factor has been calculated and is based on the calculations and assumptions on of the direct sunlight availability resulting in the total score of 1.5 is developed. The score is high and shows very goodfantastic daylight conditions in the different target rooms.

1.2 THERMAL ENVIRONMENT

The score of the thermal environment is 1. The score is a result of the combination of natural ventilation, and the possibility of mechanical cooling on warm days. The control-system that leads to the results is based on the assumption that the open motorized windows will provide adequate cooling until the indoor temperature reaches 24 deg C. If the temperature exceeds 25 deg C, the mechanical cooling will be activated and the windows closed.

1.3 INDOOR AIR QUALITY

The score for the indoor air quality is 1. The score is a result of the function of the fresh air - supply system. Two heat recovery ventilation, HRV units supply the house with fresh air.

The air is supplied directly through the pipes offrom the HRV system and through the pipes ducts of the furnace heating system. The air change rates and the volume of the house along with many other parameters have been accounted for. The combination of large volumes and continuous fresh-air supply results in an very good admirable score on the IAQ indicator.

2.1 ENERGY DEMAND

The score of the energy demand is 1.5. The score is the result of a well-insulated and air tight building envelope and fenestration with a low U values. The compactness achieved by building in two storeys with a finished basement also has a good effect on the energy performance.

The grey water heat recovery unit captures heat from showers and baths and preheats incoming cold water which also helps to reduce the energy demand for the domestic hot water.

2.2 ENERGY SUPPLY

Since the energy supply is a combination of heat from the solar thermal panels and renewable gas from Bullfrog Power, the heat supply is considered as being 100% renewable. The electricity is also supplied by Bullfrog Power which comes in 100% from renewable sources. The score of the energy supply is 1.

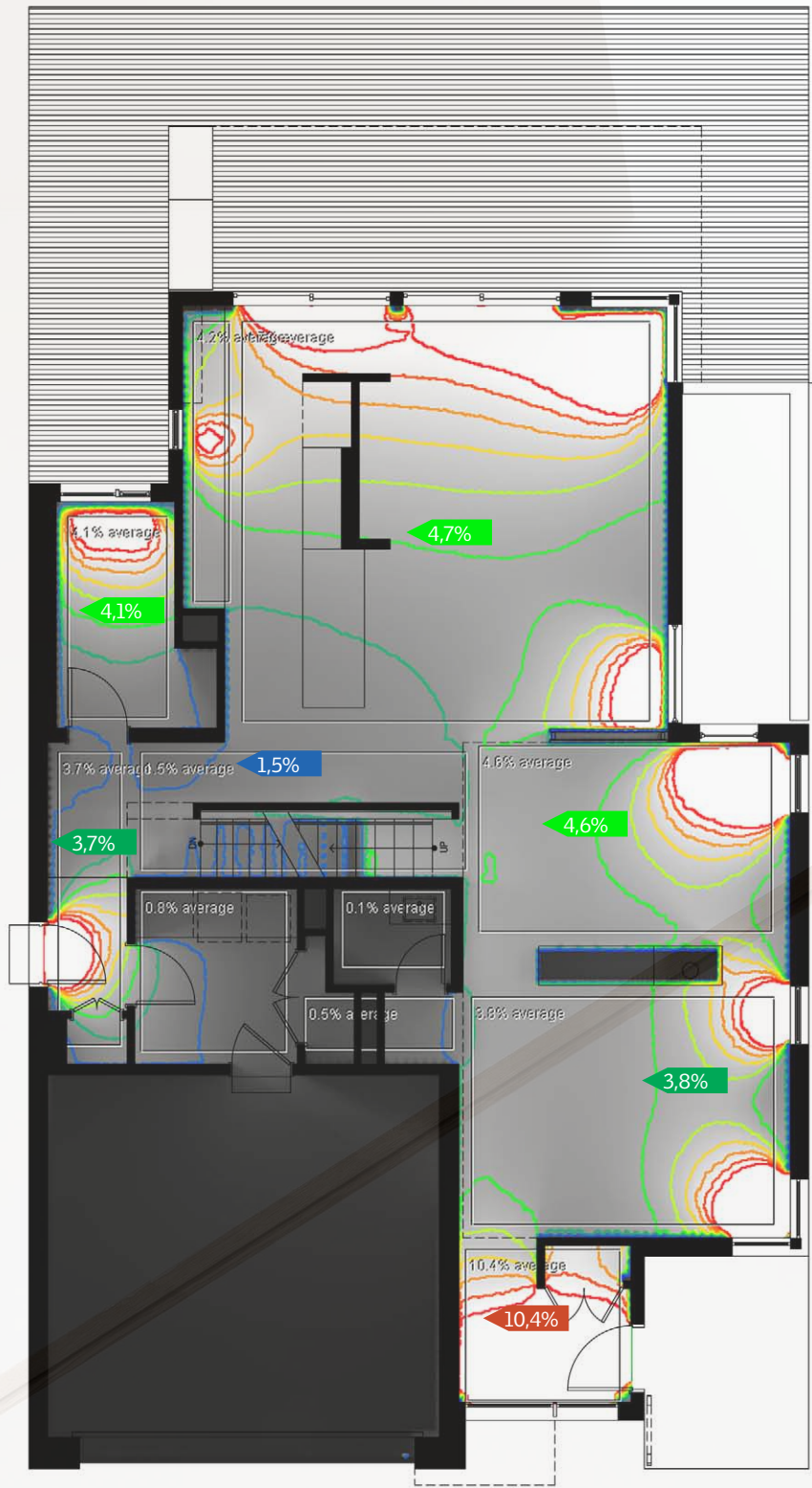
2.3 PRIMARY ENERGY PERFORMANCE

Since the energy supplied to the house is 100% renewable the score for the primary energy performance is 1.

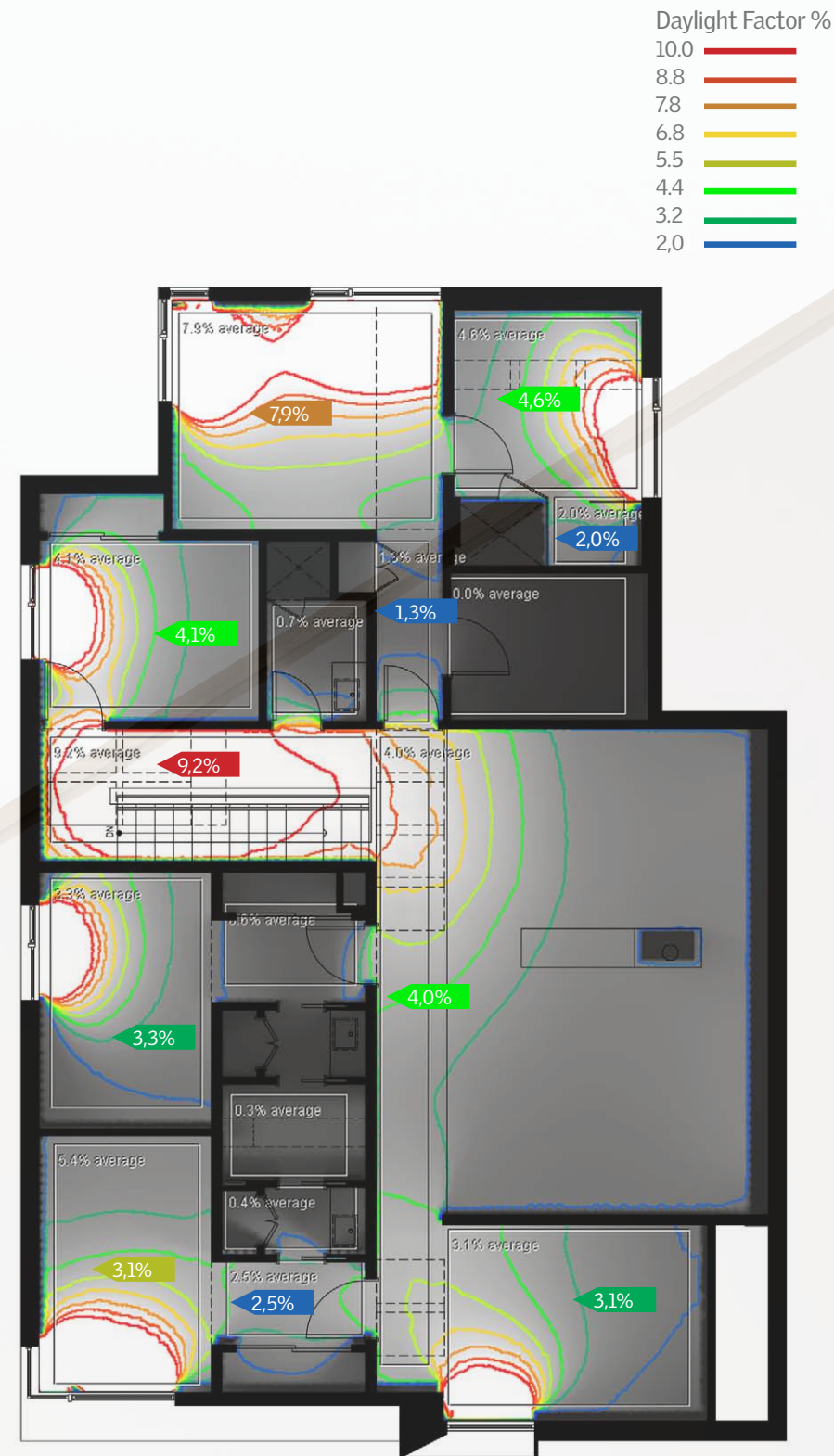
DAYLIGHT

It is the strategic use of natural daylighting that defines the true character of the Great Gulf Active House. So much illumination is provided that little to no artificial lighting is required during the day. This occurs even in the secondary living spaces where a skylight framed by a sculpted ceiling bisects the shared washroom between the two adjoining bedrooms, or in the master bathroom where three skylights grouped together and inserted into a long vertical "slice" in the ceiling are complemented by a nearby horizontal fritted window designed to mitigate glare.

The Danish design team modelled extensive computer visualizations to avoid insufficient levels of natural daylight in nearly every space of the home. Their work supported the architects' ability to select the most efficient sizes and the most effective locations for the skylights. The results are dramatic. The architects were able to maximize direct and indirect light which can be reflected off of walls, ceilings and even the engineered rift-cut white hardwood strip flooring to help increase light reflectivity throughout.



Ground floor plan



Upper floor plan

The daylighting performance of the Great Gulf Active House has been measured using the daylight factor (DF) as the performance indicator.

The daylight factor is a common and easy to-use measure for the available amount of daylight in a room.

It expresses the percentage of daylight available inside, on a work plane, compared to the amount of daylight available outside the building under known overcast sky conditions.

The higher the DF, the more daylight is available in the room. Rooms with an average DF of 2% or more are considered daylit. A room will appear strongly daylit when the average DF is above 5%. The daylight factor analysis has been performed using computer simulation software Daylight Visualizer.

The figures above are showing the daylight factor levels of each floor and the impact of the installed roof windows.

Comfort



Natural Ventilation

Upon entering the Great Gulf Active House, it is clear that one of the project's primary objectives is the promotion of natural daylight and ventilation achieved through the proper marriage of intelligent design and technology. Natural daylight has a huge positive benefits to our well-being which includes boosting concentration, efficiency and mood. To illuminate the primary and secondary spaces to a level which virtually eliminated the need for artificial lighting during the day, daylighting evaluation studies modelled and studied various living spaces such as kitchens, bedrooms and dining rooms but also included secondary rooms such as bathrooms or basement play areas.

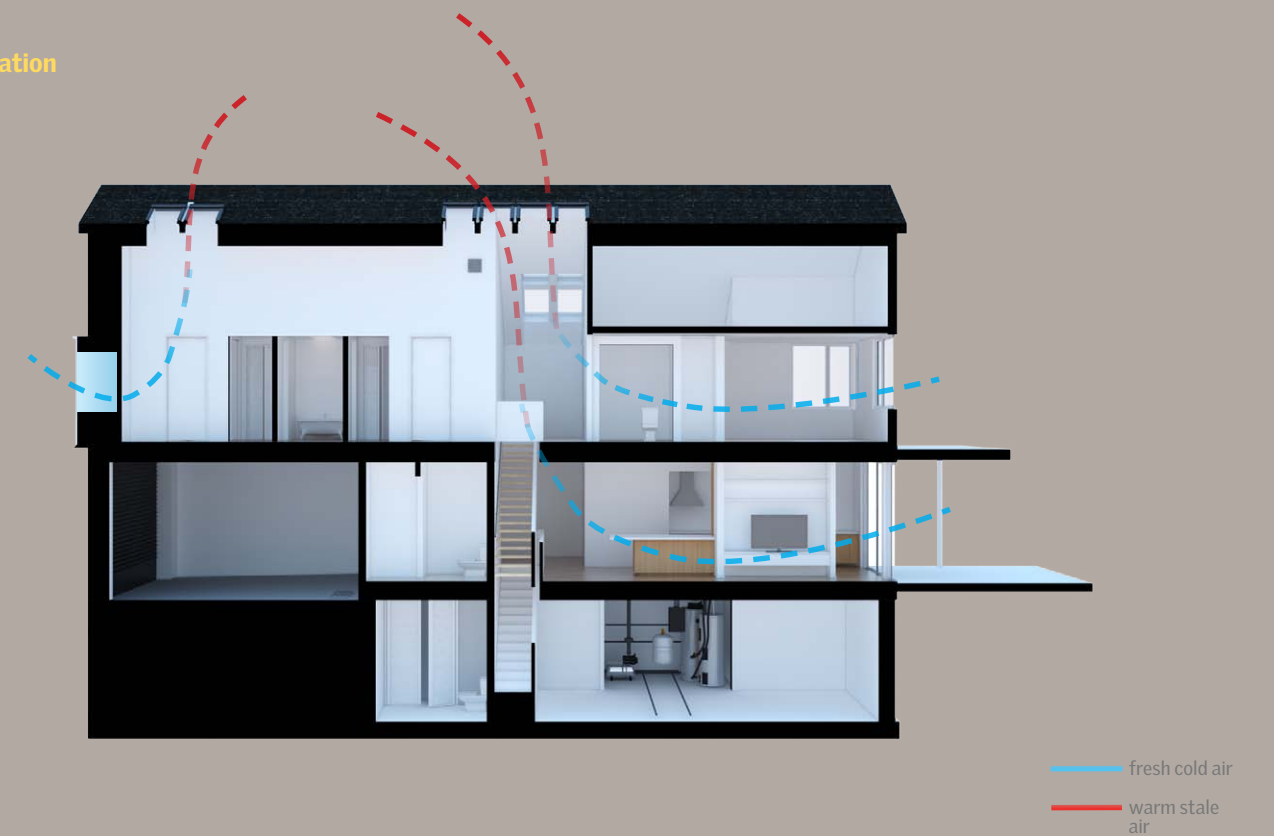
Natural Ventilation features

Natural Ventilation Features
 Airflow driven by natural forces cross ventilation (wind) and the stack effect (hot air rises, cold air falls)
 Avoids fan energy
 Provides good air quality
 Controlled by the user
 Does not require maintenance

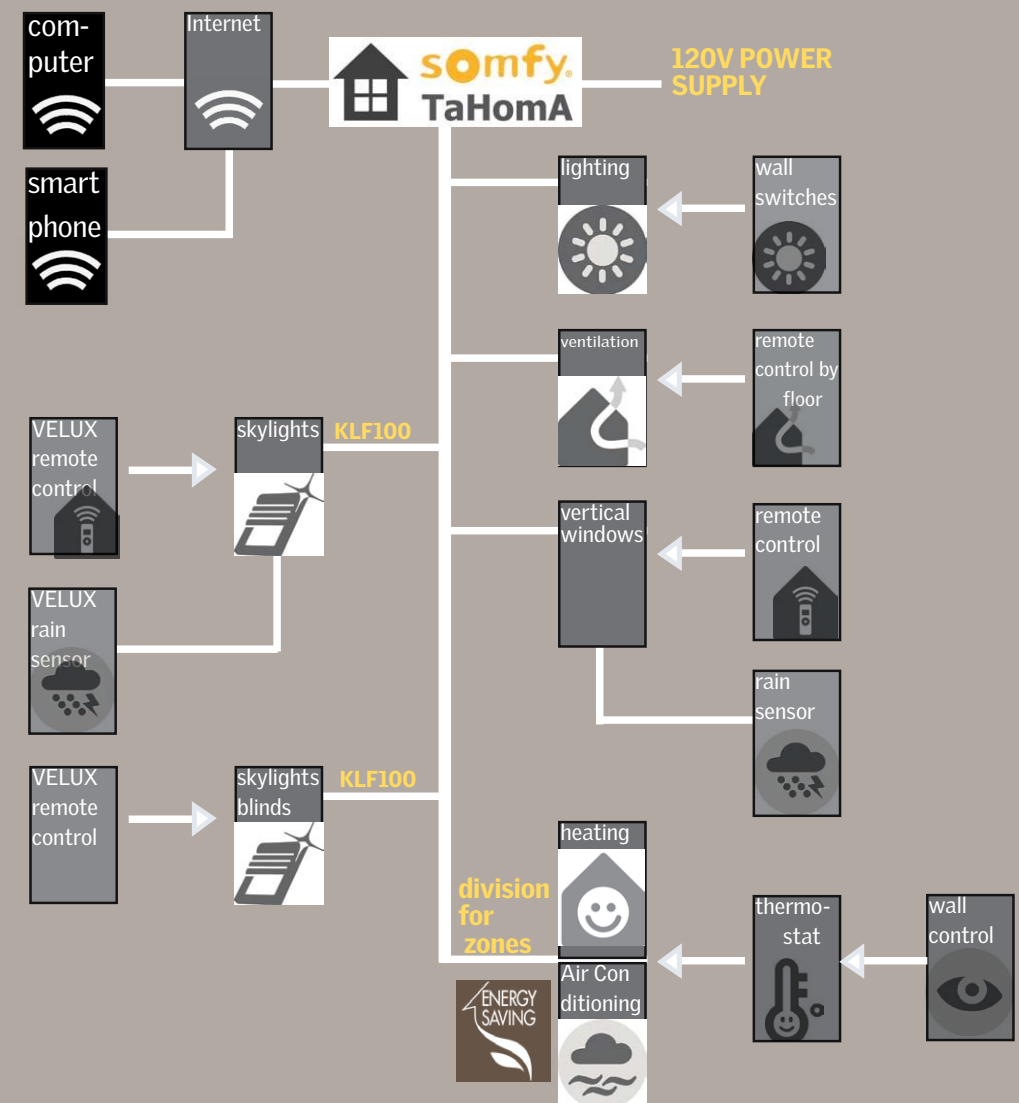
Home Control

Placing a high priority on optimal human comfort necessitates the need to reduce energy requirements with technologies like the dual-zone HVAC system connected to a Somfy Tahoma Smart House system. This system provides automated controls for windows, blinds and skylights while giving occupants the ability to adjust for humidity, temperature and natural ventilation in nearly every room. The benefits of a dual-zoned system allow occupants to heat their bedrooms at night while lowering the temperature of unused living spaces.

Natural ventilation Diagram



Home Control Diagram



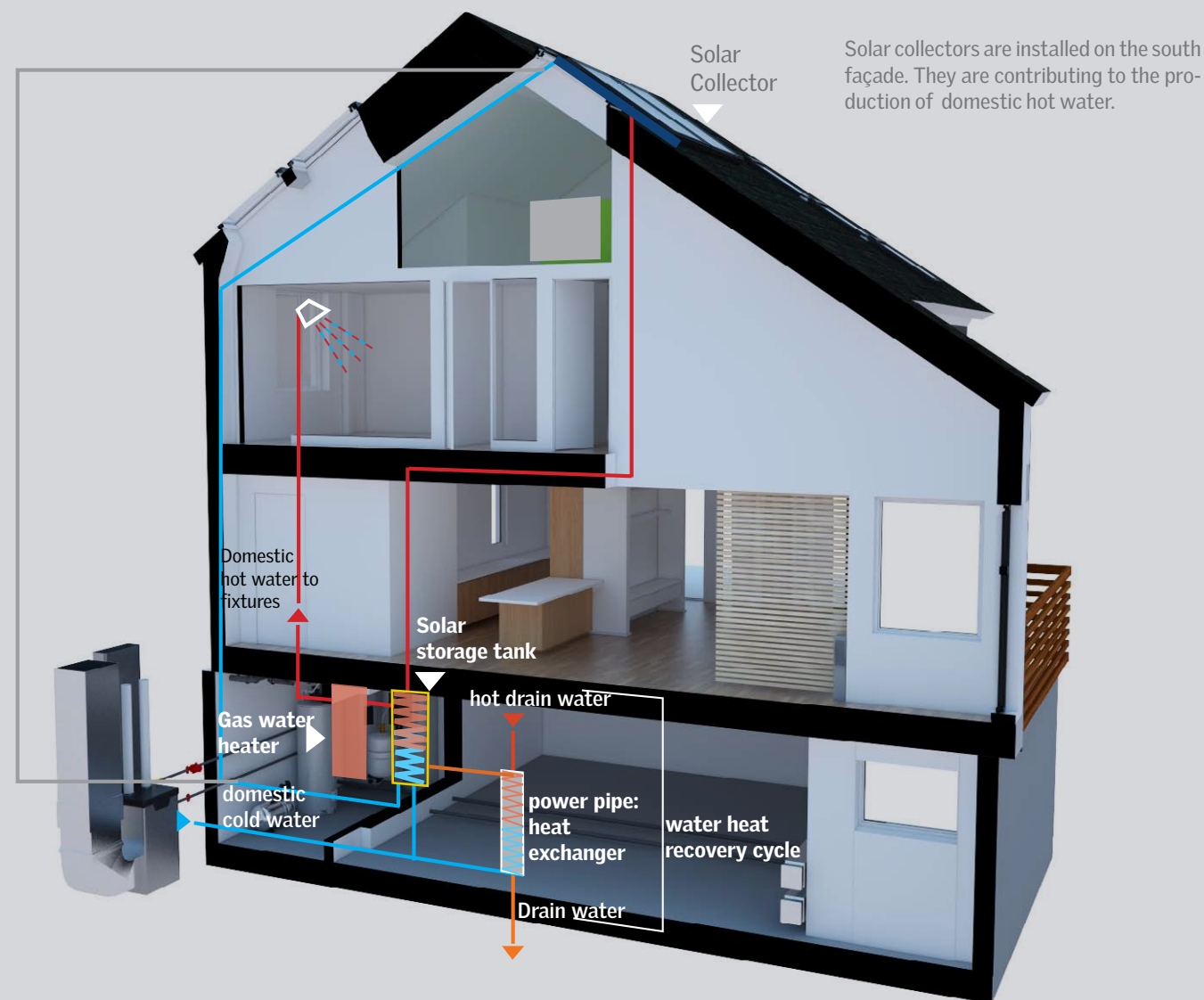
TECHNICAL SOLUTIONS

The thermal environment of the Great Gulf Active House optimizes comfort and efficiency by using zoned heating by floor, a modulating blower fan, and industry leading equipment which also ties into two HRVs (heat recovery ventilation) to ensure the home has excellent indoor air quality. A modulating fan is used to deliver fresh conditioned air through the ducting system to each room, and since it can modu-

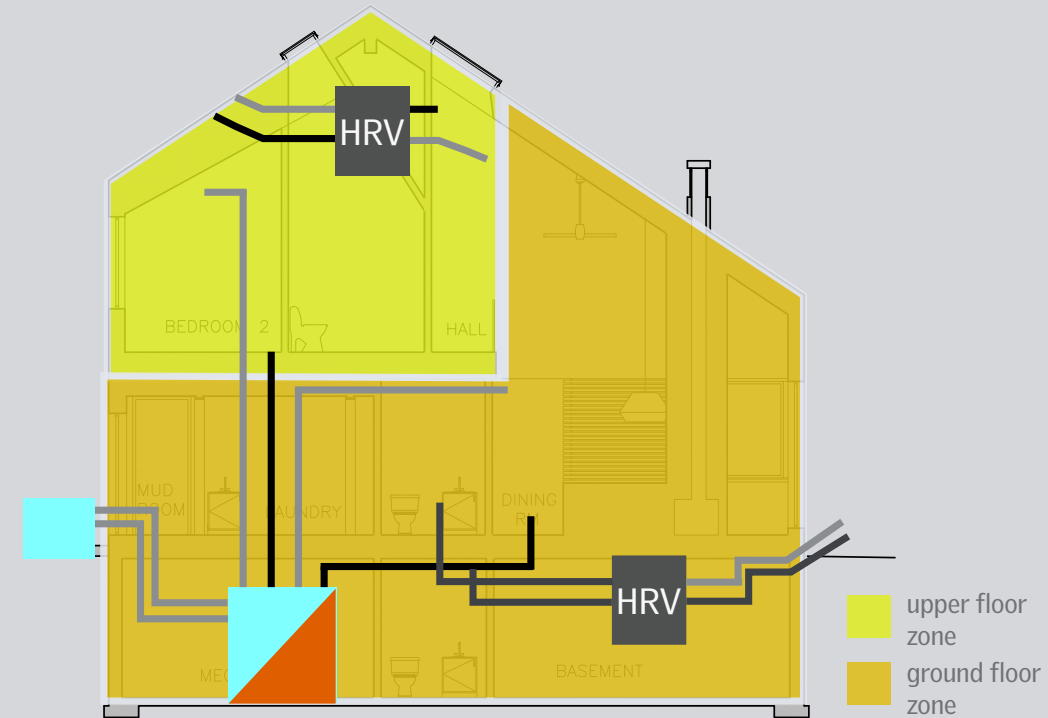
late down to a low speed, it can run continuously and more quietly to deliver fresh air to each room, even when heating and cooling are not being used. Zoned heating divides the home into smaller spaces so thermal comfort is more easily and effectively controlled. Each floor of the home has a thermostat to control the desired daytime and evening temperatures, turning on the heating system or air

conditioner as needed on that floor. The thermostats are located on interior walls and not in direct sunlight. The duct work is insulated and sealed to ensure enough conditioned fresh air reaches each room. This optimizes an even temperature distribution and ensures that even the furthest bedroom will be warm in the winter and cool in the summer

Solar Collectors system Water Heat Recovery

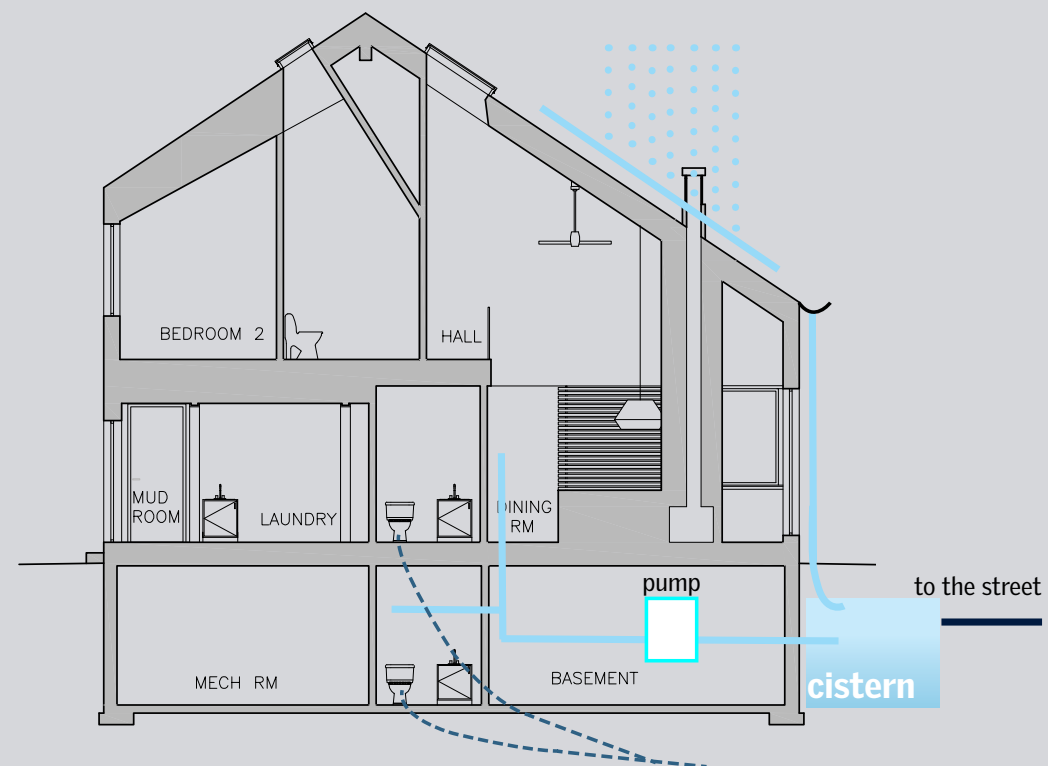


TWO ZONE -MECHANICAL SYSTEM



Fresh air is supplied through the furnace intake and is pre-conditioned by one of two HRVs in the home. An HRV is a heat exchanger that uses the warm air being exhausted from the home to pre-heat outside winter air coming in. Likewise, in the summer the HRV can pre-cool fresh air coming into the home which reduces the energy needed to heat and cool the home while providing ample amounts of fresh air to all rooms. A second HRV is located in the conditioned attic near the master bedroom and ensures each bedroom has ample amounts of fresh air, important for a good night's sleep.

WATER MANAGEMENT



A cistern and rain water collection system was installed to reduce the need for municipal water when watering the lawn or using the low-flush toilets. These climate and environmental control features represent higher upfront costs for the consumer but are worthwhile investments, becoming increasingly commonplace as both energy and water costs rise.

Water Heat Recovery

RenewABILITY Energy's Power-Pipe is a heat exchanger that is comprised of standard plumbing components: copper fresh water coils wrapped very tightly around an inner Type "DWV" copper drainpipe. As fresh water flows up the multiple fresh water coils, warm to hot drainwater flows down the inside wall of the drainpipe as a falling film. This counter-flow design maximizes the amount of energy that can be recovered from the drainwater while minimizing pressure loss. The Power-Pipe is a passive energy saving device. It has no moving parts, it's self-cleaning and will require no maintenance.

ACTIVE ELEMENTS

ENERGY/COMFORT

- R-35 2LB closed cell spray foam insulation on all exterior 2x6 walls equipped with Icynene. Excel III R-1.5 exterior wall sheathing/ air barrier system
- Hybrid windows/ patio doors strategically orientated to provide high solar heat gain
- Dual zoned mechanical system with 97% efficient high efficiency variable speed furnace: Lennox and 19 SEER air conditioner providing a balanced distribution of air on all floors
- All supply and return ducts sealed and insulated to minimize heat loss
- 2 VanEE heat recovery ventilators to better provide conditioned air to all areas of house

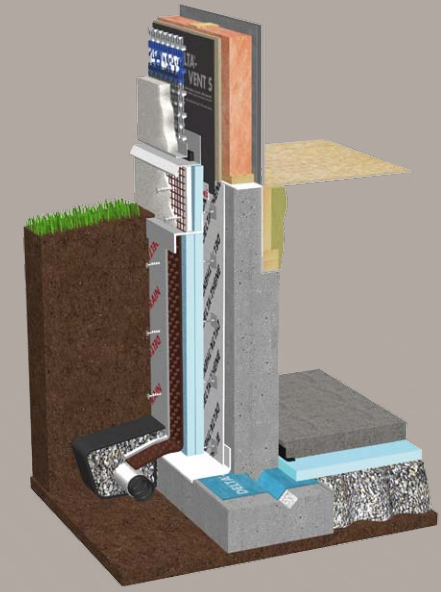
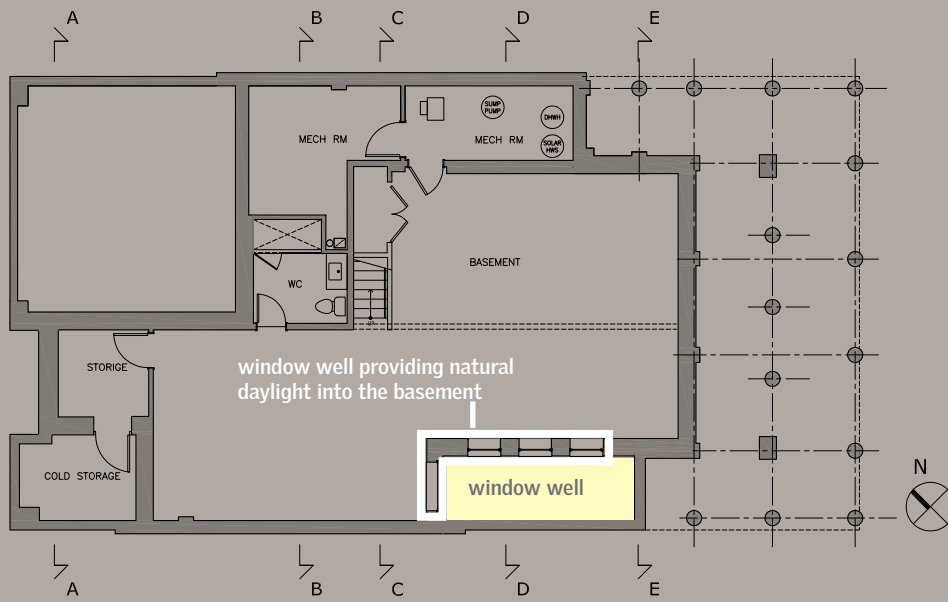
- Somfy Tahoma Smart House Automation system to provide control of windows/skylights/ blinds
- Somfy system to also provide automated control for operation of windows and skylights to allow for passive ventilation minimizing use of the mechanical system
- LED light fixtures throughout to provide low electrical consumption as per Designer Specifications
- VELUX Operable solar powered ventilated Skylights strategically placed to provide an abundance of light
- Automated roller sun shades throughout to control sun

ENVIRONMENT

- Upgraded low-flow plumbing fixtures
- Graff Rainwater Cistern utilizing rain-

- water collected from roof and ground to supplement municipal water in the operation of all toilets and the outside irrigation system
- Bullfrog Power supplying 100% renewable energy to both natural gas and hydro grids for total energy
- VELUX solar hot water collectors utilizing the sun to heat municipal water minimizing the natural gas usage
- "Brockport built" ensures that there is minimal waste during on-site assembly reducing the carbon footprint from removal of waste from site
- Eco Paver Permeable Driveway interlock system to better control surface rainwater runoff into local storm systems

BASEMENT



One example where the Great Gulf Active House achieved the synthesis of building technology and design is in the basement where the foundations are insulated from the exterior side of the walls, thereby acclimating the walls while stopping condensation from occurring on the interior. Known as a

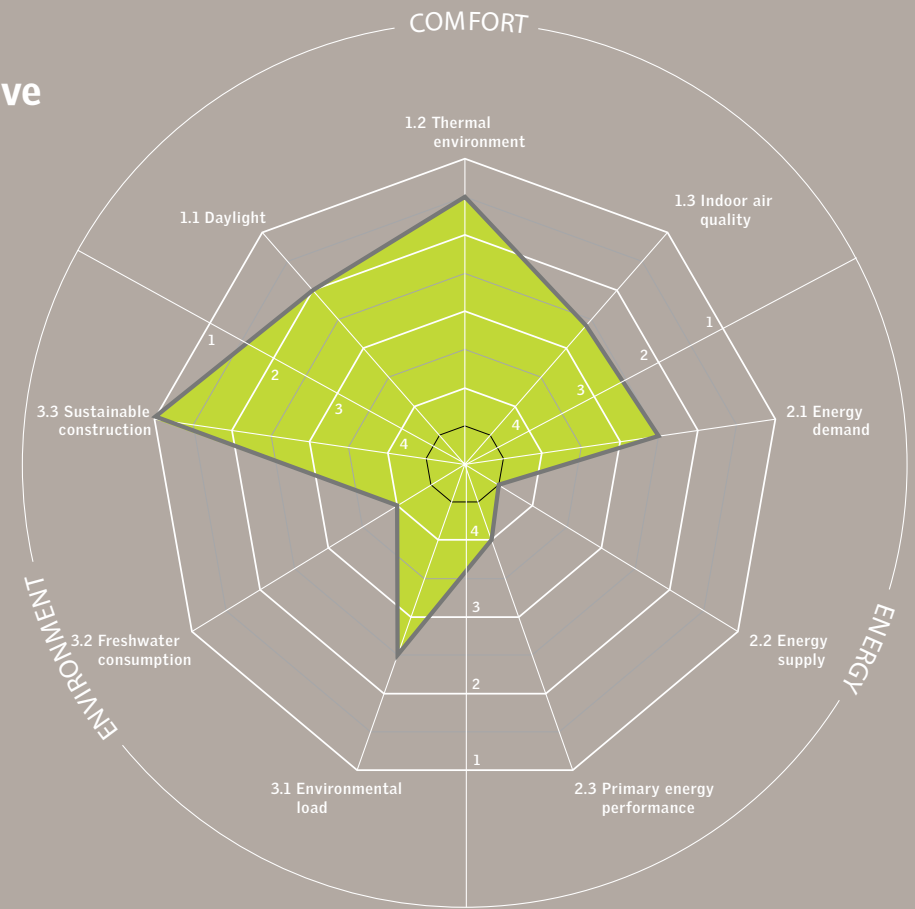
Cossela-Dörken system, this approach to construction uses an environmentally friendly construction process which vastly improves the home's energy efficiency and human comfort. The result is the simple joy of being able to watch one's children play on a warm basement floor. To maximize the amount of natural

daylight into this space, exterior grading permitted the use of large window wells, therefore enabling the installation of unusually large operable windows to provide an experientially uplifting light-filled basement with direct views to the outside.

Comparison of Active House and standard house built according to the code

Windows & Energy	ACTIVE HOUSE	STANDARD HOUSE
Glazing (%)*	21,6%	16%
Windows	Triple glazed (0.97-1.19 W/m2C)	Double glazed (<1.6 W/m2C)
Low/high heat gain by orientation	Yes	No
Skylights	Yes (2.29 W/m2C)	No (<2.8 W/m2C)
Electric venting windows & skylights	Yes	No
Insulation		
Walls	6.16(R35)	3.87 (R22)
Basement walls	2.11 (R12) (outside of wall)	2.11 (R12)
Basement slab	1.32 (R7.5)	0
Ceiling without attic	7.04 (R40)	5.46 (R31)
Mechanical		
Space heating AFUE	97%	>94%
Zoned heating	Yes	No
HRV	83%	>60%
Solar Water Heating	Yes	No
Grey Water Heat recovery	Yes	No
Cistern (toilets, irrigation)	Yes	No
Other		
Permeable driveway	Yes	No
Home Automation	Yes	No
Pre-fab panels	Yes	No
LED lighting	Yes	No
Durable, long lasting, low VOC finishes	Yes	No

Standard house Active House evaluation (approximation)



QUALITATIVE ASPECTS



The double-height space is uplifting and even festive whereas the light-filled airiness gives the impression that the home is even larger than its already generous proportions.



To describe the overall qualitative feeling that one experiences inside the Great Gulf Active House, it is best to observe the ways in which children behave and react to its various spaces. When the house is filled with young families, children are naturally drawn to

light-filled spaces where they play on the landing of brightly lit stairways, run in and out of skylight-equipped washrooms, or hang out with their friends alongside large picture windows while looking out toward the views beyond. Overflowing with laughter, children also

tend to run along the corridor on the second floor, following the same path of travel where late summer breezes move through the house that is kept cool without the need for air conditioning.

ASSEMBLING COMPONENTS



An integral component to the success of the Active House is Brockport Home Systems, an advanced indoor automated manufacturing plant that allows roof, wall and floor assemblies to be built as integrated panels in a controlled environment -- even providing the opportunity to build full-scale mock-ups to verify the project's energy efficiency. The Brockport facility is supported by myriad construction visualization, prototyping and fabricating technologies needed to refine the design and manufacture of future Active House's building components so they become increasingly affordable to future homeowners.



ASSEMBLING COMPONENTS

Integrating the Components for Active House Living

Tad Putyra, President and Chief Operating Officer of Great Gulf's low-rise division explains the importance of integrating the Great Gulf Active House's various technological applications into an attractive package that reinforces market demand for a home de-

finied by rigorous concerns for human comfort. For example, natural daylighting and ventilation strategies are supported by well-insulated basement floors and high-performance windows that are optimized for solar heat gain by orientation with the goal of creating a design that completely blurs the boundaries between architecte-

ture and engineering. This strategy involved the coordination efforts of the project's many engineering and design professionals to create spaces that trigger positive emotional responses rather than concerns about building technology. Here, the talents of architects Andre D'Elia and Wendy Wisbrun of Superkül were instrumental in

synthesizing the ideas from Henrik Norlander Smith and Agnieszka Szwarczewska from the VELUX design team in Denmark while the work by MMM Group Ltd. and other environmental and engineering consultants supported the overall vision for the construction process managed by Great Gulf's Louis Previte.



Similar to the latest smartphone, the concepts contained within the Great Gulf Active House have a huge potential to trigger an emotional appreciation for technological innovation and design strategies that make for healthy and sustainable living.

EPILOGUE

The launch of the Great Gulf Active House could be compared to the release of a new smartphone. Most consumers don't understand the technology that goes into their smartphone, nor do they initially recognize the need for all of its features. However, once they are introduced to well-designed

technology, they become accustomed to its benefits and begin to wonder how they managed through life without it. It is hoped that such market demand will be created through Great Gulf's Active House. Most consumers don't immediately demand operable skylights but after experi-

encing the benefits of natural daylighting and ventilation in the Great Gulf Active House, they will start demanding these and other healthy features in every home they choose. By extension, they will increasingly demand built environments that include the capacity to improve their physi-

cal and mental health. Similar to the latest smartphone, the concepts contained within the Great Gulf Active House have a huge potential to trigger an emotional appreciation for technological innovation and design strategies that make for healthy and sustainable living.



PARTNERS

A Gathering of Partners and Contributors

It takes the collaboration of many partners to bring a concept model such as the Thor-old Active House to the marketplace. The research and analysis that supported this Scandinavian-inspired design is evident, but what is less apparent is the cooperation amongst various product manufacturers. Many of the building products -- from bricks and mortar, to windows and roofing materials -- are already widely available in Canada and well within the range of products that Great Gulf already specifies for their homes. This is significant as it also creates a precedent to continue evolving innovative technologies and strategies so that the success of the Active House concept will continue to reach more Canadians. As the President and Chief Operating Officer of Great Gulf's low-rise division, Tad Putyra stewarded the eventual completion of his company's first Active House. He has already been using passive energy and natural daylighting in many of his company's model homes, largely through the operable skylights manufactured by VELUX, but the introduction of the Active House concept through the support of VELUX and its design team provided the key to unlocking new housing opportunities for Great Gulf.



Automation & Controls



NEXT STEPS

The architectural intentions that define the Great Gulf Active prototype have enabled the architects, Putyra's team, and product manufacturers such as VELUX opportunities to measure and study the Active House's performance, improve upon it, and then implement the necessary modifications before building a second generation of homes. It remains to be seen what will happen next. Will a third-generation of Great Gulf Active Houses be marketed on smaller lot sizes or even as semi-detached units or townhouses to further distinguish Great Gulf's interest in marketing healthy homes?

From Great Gulf's perspective, the value of offering various "comfort packages," or levels of energy efficiency, climate and environmental controls to the consumer will certainly shift the conversation from granite countertops to human comfort and wellbeing. This will undoubtedly enable Great Gulf to competitively reposition itself in the competitive low-rise housing market by promoting the Active House design methodology as the next paradigm in human comfort and wellbeing.



GREAT GULF <http://www.greatgulf.com/>