



# PIER 8 – BLOCK 16, HAMILTON

## ZONING SUBMISSION SUSTAINABILITY REPORT

Prepared by Purpose Building Inc. on behalf of Waterfront Shores Partners  
Issued May 30, 2022

**Healthy**  
**Resilient**  
**Low Carbon**  
**Triple Certified**  
**3rd Party Verified**

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**Transformational**

# EXECUTIVE SUMMARY

Block 16 is a proposed new high-rise residential building seeking zoning approval. The proposed 45-storey building would be located on the north-western corner of the Pier 8 site in Hamilton. The development would consist of 37,350 m<sup>2</sup> of total GFA and include approximately 364 units. The development is required to go through a tall building approvals and implementation process developed by the City specifically for this site.

## Why Approve the Proposed Block 16 Development?

Block 16 presents a unique opportunity to deliver a precedent-setting, healthy, resilient, low-carbon, future climate ready market development which will deliver long-lasting benefits to residents and the broader community and can help inform future policy, development, design, and construction practices.

- Block 16 directly supports Hamilton’s Sustainability Goal to *Increase the number of new and existing high performance state-of-the-art buildings that improve energy efficiency and adapt to a changing climate.*
- Block 16 will follow the City’s special Urban Design Guidelines for this site, which represent one of the most comprehensive and broadest municipal sustainability frameworks for new development.
- Block 16 will be the first Triple-Certified residential development of its kind in Canada (pursuing rigorous, 3<sup>rd</sup> party verified LEED, WELL, and EnergyStar Certifications and delivering comprehensive occupant and community benefits in areas of Energy & Carbon, Air Quality & Thermal Comfort, Water Quality & Efficiency, and Resilience, Health & Wellbeing.
- Block 16 can help inform future development policy and provide valuable lessons to other developments in terms of building technology, procurement, design integration and community engagement.

## Key Sustainability Features and Benefits

30-40% more energy efficient than typical high-rise development	Upwards of 70% lower greenhouse gas emissions during operations	10-20% lower GHG emissions from materials and construction practices	40% less water use
Designed to potential 2050 climate	Improved indoor air quality and thermal comfort for residents	48-hour back-up power for key building systems and a refuge area	Healthier materials and finishes
Fitness, mental health and wellness spaces	Electric car and bike parking	Communal Gardening Space	Connection to Nature

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## 1. INTRODUCTION

### 1.1 Development Overview

The City of Hamilton's Municipal Land Development Office (MLDO) has initiated Official Plan and Zoning By-law amendment applications on lands identified as Pier 8 – Block 16 located at 65 Guise Street. Through these applications, the City is revisiting a small portion (0.35 ha) of the broader Pier 8 development site that were comprehensively planned for redevelopment in 2017 as a mixed-use neighbourhood.

These development applications, submitted under the Planning Act, propose a tall building consisting of approximately 364 residential units, contributing to the range of affordable housing and residential family-units.

Block 16 is subject to an enhanced community engagement and design review process which includes:

- New Urban Design Guidelines (the UDGs) specific to a tall building application
- Input from a special Design Review Panel
- Enhanced public and community engagement

The proposed tall building is intended to achieve landmark status serving as a visual anchor within the waterfront that is emblematic of the revitalization of the Hamilton Harbour. The proposed building is organized around two curvilinear forms, which are 45 and 30 storeys respectively, and integrated with a 3-storey podium.

### 1.2 Mandate

Purpose Building was engaged by Waterfront Shores Partners, the developer of the Pier 8 site, to integrate sustainability into the proposed Block 16 high-rise residential project.

Our mandate was to:

- Lead the development of the sustainability vision and performance strategy for the project
- Support on-going community and stakeholder engagement efforts
- Manage and document compliance with the City's sustainability requirements, specifically the new tall building UDGs.

### 1.3 Report Purpose and Structure

As part of the special approvals process for Block 16, the Urban Design Guidelines (UDG) require the developer to submit a Sustainability Report summarizing all sustainability initiatives, targets, and third-party verification procedures that will be used to guide the development.

Section 1 of the report summarizes the development and process and provides relevant background context of the current sustainability landscape in Hamilton.

Section 2 of the report presents the overall sustainability vision, strategy and the project's key performance features and targets, grouping them into four core themes:

- Energy Efficiency & Low Carbon
- Air Quality & Thermal Comfort

- Water Quality & Efficiency
- Resilience, Health, & Wellbeing

Section 3 outlines the future implementation process including sustainability management processes and third-party verification procedures that will be used to keep performance on track and document compliance with the established targets and requirements.

The UDG Checklist is provided in the Appendix A, preliminary energy and carbon analysis is provided in Appendix B and further details on the selected sustainability certification programs is shown in Appendix C.

## 1.4 Development Context and Hamilton's Sustainability Landscape

The City of Hamilton has a goal of achieving net zero greenhouse gas emissions by 2050 and on March 27, 2019, declared a climate emergency. To reduce emissions the City has established nine overarching goals and focus areas the first of which is: To increase the number of new and existing high-performance state-of-the-art buildings that improve energy efficiency and adapt to a changing climate.<sup>1</sup>

*Hamilton's Sustainability Goal #1 (of 9): Increase the number of new and existing high performance state-of-the-art buildings that improve energy efficiency and adapt to a changing climate.*

Currently, Hamilton does not have a set of green building requirements for new development (e.g., the Toronto Green Standard) and while developers are encouraged to integrate sustainability into new projects, performance above the minimum requirements of the Ontario Building Code is voluntary.

At the time of this report, there were 31 certified LEED projects in the City of Hamilton, 1 certified Zero Carbon Building project (Joyce Centre for Partnership and Innovation) and 1 certified Passive House project (Ken Soble Tower).<sup>2</sup>

Of the LEED certified projects, none have been certified under the new, more stringent version 4 of LEED, and only two projects that are underway are pursuing LEED v4 certification. These projects are:

- McMaster Student Residence, 1190 Main Street West
- New Horizon's Multi-Residential Rental Building, 870 Queenston Road

The WELL Building Standard is relatively new compared to LEED and there are currently no certified projects in Hamilton, although 22 projects are registered (none of which are residential developments).

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<sup>1</sup> <https://www.hamilton.ca/city-initiatives/strategies-actions/climate-change-action>

<sup>2</sup> These numbers are based on project database lists exported from the Canadian Green Building Council (LEED and Zero Carbon Building) and the International WELL Building Institute (WELL) on 2022-05-24. They are filter to include projects from the City of Hamilton, including the municipalities that were amalgamated into Hamilton in 2001 (Ancaster, Dundas, Flamborough, Glanbrook, and Stoney Creek).

## 2. SUSTAINABILITY STRATEGY

### 2.1 Overview

In line with Section 8.12 of the Urban Design Guidelines and the goal of building a landmark building for sustainability in Hamilton, Block 16 is committed to pursuing, LEED v4 Gold Certification and WELL certification, in addition to the Energy Star Multi-family High Rise certification required for all buildings on Pier 8. It will be the first triple-certified residential development of its kind in Canada and one of the most sustainable market-led projects in the City of Hamilton.

*Block 16 will be the first triple-certified residential development of its kind in Canada.*

In line with the intent of the Urban Design Guidelines, the project's overall sustainability strategy is to employ a broad and comprehensive set of strategies that will deliver a holistic approach to sustainability and set a new standard for sustainable development in the City of Hamilton.

The LEED and WELL Standards were selected because they are internationally recognized as leading 3<sup>rd</sup> party verified frameworks for delivering energy efficiency, water efficiency, healthier materials and indoor air quality, reduced impact on local ecosystems and higher quality design. Both standards require projects to achieve a number of preconditions as well as optional performance measures in order to achieve certification.

Certification is awarded to the project after a third-party reviewer reviews the documentation and performance testing results and confirms that the project meets the criteria of all required and targeted optional measures. (Detailed information on the certification programs is provided in Appendix A).

Where there is overlap between the Urban Design Guidelines and the various certification programs, the certifications programs will be used to establish performance metrics that align with the intent of the UDGs.

### 2.2 Big Moves and Key Features

To develop and implement the overall vision and strategy for the development, the team used a collaborative, iterative and integrative design process that has the potential to deliver optimal outcomes for all stakeholders. This process will continue beyond the zoning stage as the design concepts are further refined and optimized.

*Collaborative, iterative and integrative design process that has the potential to deliver optimal sustainability outcomes to all stakeholders.*

At the zoning stage, several big moves related to massing, envelope and HVAC concepts and overall sustainability initiatives were established by the team. This will help ensure that sustainability is directly integrated into the design, rather than being an after-thought.

The following sections outline some of the key features and strategies that the team adopted to achieve the overall level of performance.

## 2.2.1 Energy Efficiency & Carbon Emissions

The intent of the following design strategies is to reduce both the embodied and the operational carbon of the building and to provide the flexibility to make further improvements in the future.

The big move consisted of selecting a hybrid geothermal system that has the potential to reduce carbon emissions by upwards of 70% compared to typical residential development heated with natural gas. Combined with many passive and active design strategies and technologies, this has the potential to improve energy efficiency by approx. 30-40% compared to typical Hamilton development which meets the minimum requirements of Code.

- **Hybrid Geothermal System.** The development will use a hybrid geothermal system which exchanges energy with the ground and uses high-efficiency in-suite heat pumps to deliver low carbon thermal energy. The system is designed to supply a portion of heating, cooling and domestic hot water loads, with additional loads served by conventional equipment.
- **Embodied Carbon Reduction.** Opportunities to reduce the project's embodied carbon – the greenhouse gas emissions arising from the manufacturing, transportation, installation, maintenance, and disposal of building materials – will be identified through a lifecycle analysis. A lifecycle analysis is a methodology for assessing the environmental impacts of a product through the various stages of a product's life cycle and is used to inform the selection of materials.
- **Moderate Glazing Ratio of 60%.** A 60% glazing ratio will improve the performance of the building envelope without sacrificing daylight and views of nature.
- **In-suite Ventilation Heat Recovery.** Heat recovery ventilation will reduce the energy consumption associated with ventilation loads.
- **Energy Star Appliances.** Energy Star appliances, which are tested and certified to meet specifications for energy performance, will be specified to reduce the development's demand for energy.
- **Low Carbon Concrete.** Concrete is a significant contributor to the embodied carbon footprint of the building. Using low carbon concrete will reduce the environmental impact of the development. Additionally, opportunities to use structural steel instead of concrete will be explored.
- **Locally Sourced Materials.** By sourcing products locally, the development supports the local economy and reduces the transportation distance of materials. Reducing the transportation distance of materials will reduce the environmental impact of the development.
- **Recycled Content.** Products with recycled content will be sourced to minimize the amount of new material required for the development. Fewer new materials will reduce the environmental impact of the development.

A full list of strategies is presented in Appendix B.

## 2.2.2 Air Quality & Thermal Comfort

The intent of the following design strategies is to achieve improved indoor air quality and high levels of indoor and outdoor thermal comfort.

People spend approximately 90% of their time indoors where they are exposed to indoor air pollutants that can lead to a variety of negative short and long-term health outcomes. Symptoms can



range from less severe outcomes like headaches and dry throat to more severe outcomes like asthma attacks and carbon monoxide poisoning. Maximizing human health requires reducing, and where possible eliminating, harmful pollutants through active and passive building design strategies, operation strategies, and human behaviour interventions.<sup>3</sup>

Thermal comfort is one of the strongest factors influencing occupants' satisfaction and has impacts on the human integumentary, endocrine, and respiratory systems. Spaces that are overly warm are linked to increases in sick building syndrome and spaces that are too cold are associated with an increased risk for chronic issues related to musculoskeletal health. Providing adequate thermal comfort requires a combination of design strategies and flexibility for individuals to control their own environments.<sup>4</sup>

- **Operable Windows.** Each suite will contain operable windows. Operable windows foster a connection to nature, provide occupants with outdoor air, and can reduce the generation and persistence of indoor air pollutants.
- **Enhanced Filtration.** Ventilation systems with recirculating air will be equipped with MERV 13 filters to provide enhanced indoor air quality.
- **Contaminant Capture.** Strategies will be employed to reduce the number of pollutants that enter the building and lower indoor air quality. These include walk-off mats at entryways and direct ventilation to the outdoors for all ovens, cooking burners and stove top cooking appliances that use a range hood.
- **Healthy Materials.** The development will prioritize the selection of materials that disclose their environmental impact through Environmental Product Declarations (EPDs) and disclose their human health impact through Health Product Declarations (HPDs). This includes, but is not limited to, selecting products with low or no Volatile Organic Compound (VOC) emissions to minimize the impact of materials on the building's indoor air quality. Applicable materials include flooring, walls, ceilings, common amenity space furniture, sealants, paints and insulation.
- **Thermal Comfort Monitoring.** Thermal comfort is one of the strongest contributing factors to overall human satisfaction in the built environment and has important linkages to human health. Ongoing monitoring of thermal comfort parameters will provide building managers and occupants with feedback to address potential concerns.
- **Shade Protection.** Shade protection is incorporated into the building design to provide a comfortable outdoor environment. This will be particularly important moving forward as climate change is predicted to increase the frequency and severity of heat waves in Hamilton.
- **High Reflectance Materials.** Paving and other landscape materials with high reflectance will be selected to mitigate the urban heat island effect.
- **Weather Protection.** Weather protection at entryways and wind screens at the ground level will provide residents with protection from the elements and contribute to a comfortable outdoor environment.

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<sup>3</sup> For more information see IWBI. "Air Concept Overview." <https://v2.wellcertified.com/en/wellv2/air>

<sup>4</sup> For more information see IWBI, "Thermal Comfort Overview." <https://v2.wellcertified.com/en/wellv2/thermal%20comfort>

## 2.2.3 Water Quality & Efficiency

Water is a key natural resource and essential to human health and wellbeing. The intent of the following design strategies is to reduce the developments operational use of potable drinking water while also promoting drinking water amongst occupants.

- **40% Indoor Water Use Reduction.** Low flow fixtures and flush rates will be specified to reduce the development's potable water use.
- **100% of Irrigation Demand Met with Rainwater.** Rainwater will be retained in a cistern and used for irrigation purposes to further reduce the development's potable water use.
- **Enhanced Water Filtration.** Enhance water filtration and quality will be provided to encourage the healthy consumption of tap water. Water is key to human health, but many people do not hydrate enough or choose to purchase single use water bottles. The development will use the WELL performance requirements as a guide.
- **Mold Resistant HVAC System.** Mold developed in HVAC systems can trigger asthma, headaches, allergies and other respiratory system disorders. Using the WELL requirements as a guide the development will implement appropriate technology and operational protocols to mitigate this risk.
- **Moisture Resistant Finishes in Kitchens and Bathrooms.** Moisture resistant materials will be used for surfaces that are likely to be exposed to or that may absorb water. This will prevent excessive moisture and dampness which can lead to mold and other biological pests and increase the risk of developing respiratory infections and asthma for those in the building.

## 2.2.4 Resilience, Health & Wellbeing

The intent of the following design strategies is to acknowledge and capitalize on the role buildings play in human health and wellbeing. These strategies are a combination of measures to increase the resilience of occupants' during emergency events, and measures to enhance the occupants' everyday quality of life. Key to these strategies is the use of nature and movement to improve both mental wellbeing and physical health.

- **Hands-free Operation.** In response to COVID-19, automatic doors and occupancy sensors will be installed to reduce the number of contact points in shared spaces.
- **Emergency Management Plan.** As part of the WELL certification process, the development will create an emergency management plan that will address, at minimum, the following hazards: natural (e.g., flood, heatwave); fire; health (e.g., infectious disease pandemic); technological (e.g., power loss); and human-caused (e.g., civil unrest, active shooter).
- **48-hour Back-up Power and Refuge Area.** Back-up power will be provided for some building loads (potential equipment includes boilers and HW circulation pumps, sump pumps, DHW booster pumps, one receptacle per suite). A refuge area, with a dedicated HVAC system on back-up power, will also be provided.
- **Connection to Nature.** By virtue of its location and cylindrical design, the development will provide 360° views of nature, including views of Lake Ontario and the future Greenway, and will help to foster occupants' connection to nature. Exposure to plants and other natural elements has been shown to have beneficial health impacts including, but not limited to, lower levels of anxiety and depression and improved mental recovery from stress and fatigue.

- **Daylight.** The development will provide ample daylight to the residential suites. Daylight has been shown to have a significant impact on mood, circadian health and productivity. A detailed daylight analysis will be conducted as part of the design process.
- **Dimmable Lighting.** Suites will be equipped with dimmable lighting which will allow occupants to modify light levels throughout the day to better support their circadian rhythms. This is important because disruption to circadian rhythm has been linked to obesity, diabetes, depression and metabolic disorders.
- **Aesthetic Staircase Design.** The development will include at least one staircase that is open to regular occupants, services all floors and is aesthetically designed to promote stair usage. Physical inactivity and sedentariness have become major public health issues. Design strategies such as artwork and point-of-decision design prompts have been shown to be effective at increasing stair usage and help to increase the activity levels of occupants.
- **Restorative Amenity Space.** The development will include a shared amenity space designed as a place for restoration. Through the incorporation of nature and other restorative elements, the amenity space will provide occupants with a quiet space to help relieve stress support overall mental wellbeing.
- **Communal Gardening.** A communal gardening space will be provided for use by the occupants. This space will help foster a sense of community and give occupants the opportunity to grow their own food. Community gardens can help encourage the consumption of fruit and vegetables and help reduce symptoms of anxiety and depression.
- **Bike and E-Bike Storage and Repair.** The development will provide short and long-term bicycle storage, including storage spaces and chargers for e-bikes. To further promote the use of active transportation a bicycle repair area will also be provided. Cycling is associated with health benefits such as lower incidence of cardiovascular disease and is a form of low-carbon transportation, helping to reduce fossil fuel use and improve outdoor air quality.
- **Fitness Amenities.** To further promote physical activity, the development will include an indoor fitness amenity area with a variety of exercise equipment.

### 3. IMPLEMENTATION PROCESS

#### 3.1 Overview

The overall process of implementing the sustainability strategies beyond Zoning approval consists of three over-arching and integrated frameworks:

- The City’s approvals process and verification of the UDGs
- Developer-led design optimization and tracking of sustainability initiatives (via Purpose Building acting as the Sustainability Consultant)
- 3<sup>rd</sup> party testing, review and validation via the established LEED, WELL and Energy Star frameworks.

The result is a very robust, comprehensive and innovative process that will both guide future design and construction phases and also help ensure the sustainability outcomes are ultimately delivered.

Key elements of the process are summarized in the table below.

ZBA Application	Special DRP	SPA	Detailed Design	Construction	Occupancy
Block 16 Tall Building Urban Design Guidelines Approved	Presentations to Special Design Review Panel	Concept Design Refinement	Design Optimization	Sustainability Status Reporting (Performance, Risk Management, Compliance with UDGs and Certifications)	3 <sup>rd</sup> Party Testing and Verification for WELL and Energy Star
Initial ZBA Application Submitted	Public and City Meetings	Detailed Sustainability Strategy and Certification Scorecards for LEED, WELL and Energy Star	Sustainability Specifications	Construction Sustainability Submittals Reviews	Final As-Built Sustainability Report
Special Approvals Process Started	Sustainability Vision and Strategy Established	SPA Stage Energy and Carbon Modelling	Permit Stage Energy Model	As-Built Submissions for LEED, WELL and Energy Star to the Authorities Having Jurisdiction (CaGBC, IWBI, EnerQuality)	Certification Award
	Preliminary Energy and Carbon Analysis to set likely Performance Targets	Preliminary Lifecycle Analysis of Embodied Carbon	Final Lifecycle Analysis of Embodied Carbon		
	UDG Sustainability Checklist	Sustainability Status Reporting (Performance, Risk Management, Compliance with UDGs and Certifications)	Final As-Designed Sustainability Report		
			As-Designed Submissions for LEED, WELL and Energy Star to the Authorities Having Jurisdiction (CaGBC, IWBI, EnerQuality)		

## 3.2 Third-Party Verification

The project will pursue 3 separate certifications – highlights of the verification process are summarized below.

### 3.2.1 LEED

LEED verification consists of a two-stage documentation review at the as-designed and as-constructed phases of the project. Interim review and oversight are typically provided by the Sustainability Consultant.

GBCI, who administers LEED, will check the initial applications for completeness and compliance with the selected rating system and attempted credits. A detailed technical review will follow with opportunities to address any performance or documentation potential gaps.

The benefit of a two-stage review is proactive risk management of design-related issues prior to start of construction to allow for potential corrective measures.

### 3.2.2 WELL

The third-party verification for the WELL building Standard is a combination of documentation review and on-site performance testing.

The project will submit supporting documentation at substantial completion. Once the project has held their certificate of occupancy for at least one month and reached 50% occupancy, performance testing by an independent testing agent will be conducted to ensure the building is meeting the performance thresholds established by WELL.

Provided that the documentation and performance testing results meet the WELL standard, certification will be awarded. Ongoing monitoring and annual reporting will be required for the project to maintain their eligibility for recertification when the initial certification expires after three years.

### 3.2.3 Energy Star

The ENERGY STAR® Multifamily High-Rise (ES-MFHR) certification program is a pilot program in Ontario developed by NRCan and administered by EnerQuality. The certification recognizes buildings which are at least 15% more energy-efficient than those built to the Ontario energy code and requires on-site verification and testing by qualified professionals. NRCan also performs an audit of submitted documentation.

## Appendix A: Urban Design Guidelines – Sustainability Checklist

Updated: 2022-05-26

Section	Requirement	Will Comply	Will Partially Comply	Will Not Comply	Not Applicable	Describe how the Guideline or design direction will be met	Project Stage
<b>Energy</b>							
9.1.2	A Sustainable Design Report identifying the sustainability standard to be used to guide the design and development of the building and site in addition to Energy Star certification. The type of standard (Leed, Green Globes, etc.) and specific sustainability targets including the GHGI target shall be agreed to in support of the Official Plan and Zoning By-law amendments. The report will provide a comprehensive summary of all sustainability initiatives, targets and third-party verification procedures that will be used to guide the development.	X				Sustainable Design Report provided by Purpose Building.	DRP 2
8.12	A LEED Certification, Green Globes or similar sustainability standard shall be used to guide the design and development of a Tall Building and site on Block 16 in addition to the Energy Star certification that applies to all buildings on Pier 8.	X				LEED, WELL, and Energy Star certification will guide the design and development of the project.	Design - Occupancy
8.12.1	The design and operations of the building shall limit operational greenhouse gas emissions and encourage use of low-carbon energy sources using whole-building energy modelling and an annual greenhouse gas intensity (GHGI) target to be established and agreed to by the City of Hamilton as contained in the Sustainability Report to be submitted in support of the Official Plan Amendment and Rezoning.		X			The design will include a hybrid geothermal system to provide a portion of heating, cooling and domestic hot water loads. Currently the project is targeting 120–140 kWh/m <sup>2</sup> /yr., which is 30–40% better than the typical Hamilton development and 8–12 kgCO <sub>2</sub> /m <sup>2</sup> /yr., which is 50–70% better than the typical Hamilton development.	DRP - Detailed Design
8.12.2	A Building Automation System (BAS) shall be designed to monitor building-level data representing total building energy consumption (electricity, natural gas, chilled water propane, biomass, domestic hot water, etc.) and renewable energy production.	X				BAS will monitor the applicable systems.	Detailed Design
8.12.3	The building shall be enrolled in Energy Star Portfolio Manager to track /energy and water consumption and waste generation of the new development during operations. Enrollment of the project in the program must occur before the project presents Detailed Design to the City of Hamilton Design Review Panel.	X				The building will be enrolled in Energy Star Portfolio Manager.	Substantial Completion
8.12.4	In Energy Star Portfolio Manager, provide the City of Hamilton with read only access to the project on an annual basis.	X				The City of Hamilton will have read only access.	Substantial Completion
8.12.5	An Operations & Maintenance (O&M) Manual will be prepared for the project and include direction and guidance for building operators in the building on how to upload data into Energy Star Portfolio Manager on a monthly basis.	X				An O&M manual will be prepared.	Substantial Completion
8.12.6 / 6.1.1	Energy Star certification shall be achieved including provision of Energy Star Certified appliances	X				Energy Star certification will be achieved. Energy Star appliances will be specified.	Post-Occupancy
8.12.7 / 6.1.2	Complete Energy Modeling, Mechanical Commissioning and Air Tightness testing to the Energy Star certification standard.	X				Energy modelling will be completed after SPA. A Commissioning and Air Tightness Testing Agent will be engaged.	SPA & Substantial Completion

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Section	Requirement	Will Comply	Will Partially Comply	Will Not Comply	Not Applicable	Describe how the Guideline or design direction will be met	Project Stage
8.12.8 / 6.1.3	Include high performance facade design that may include elements such as solar shading, lower glazing to wall ratio, triple glazing and renewable materials.		X			Recessed balconies will provide solar shading. Moderate glazing ratio will reduce heating loads.	Detailed Design
8.12.9 / 6.1.5	Complete a Lifecycle Carbon Assessment (LCA) that is third party verified and identify opportunities to reduce carbon emissions through building material selection.		X			We will identify opportunities to reduce embodied carbon through material selection. LCA can be completed once material quantities are sufficiently developed. Targeting a 10-20% reduction.	Detailed Design
6.1.1	Energy Star Certification and Energy Star Certified Appliances	X				Energy Star certification will be achieved. Energy Star appliances will be specified.	Post-Occupancy
6.1.2	Complete Energy Modelling, Mechanical Commissioning and Air Tightness testing to Energy Star certification standard	X				Energy modelling will be completed after SPA. A Commissioning and Air Tightness Testing Agent will be engaged.	SPA & Substantial Completion
6.1.4	Consideration should be given to preparing for future District Energy connections by: <ul style="list-style-type: none"> <li>• Providing space for future equipment and thermal piping;</li> <li>• Securing an easement between the mechanical rooms and the property line for future thermal piping;</li> <li>• Including two-way pipes within the building to carry thermal energy from the district energy network to the section in the building where the future energy transfer station will be located.</li> </ul>					Under consideration.	Detailed Design
6.1.6	Cool Roof design and material should be used to reflect UV rays and self-cool by efficiently emitting radiation away from the building.	X				Cool roof design and materials will be determined later in the design.	SPA
6.1.7	Building roofs should include a minimum of 50% coverage for green roofs. Alternative configurations may include a minimum of 50% roof coverage for solar capture equipment, cool roofing materials, or a combination thereof.	X				Under consideration. Analysis of green roof feasibility to follow.	SPA
<b>Air Quality and Thermal Performance</b>							
6.2.1	Design the building's Heating, Ventilation and Air Conditioning (HVAC) system to support enhanced air quality and thermal performance.	X				HVAC system will be designed to meet the standard in place such as ASHRAE 55 and ASHRAE 62.1 for ventilation standards. All suites will have stand-alone ERV units.	Detailed Design
6.2.2	Design building HVAC system to be mold resistant.	X				All major HVAC equipment will have surfaces that can be easily cleaned, no fibres exposed in the airstream and any internal duct insulation will have an antimicrobial protection.	Detailed Design

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Section	Requirement	Will Comply	Will Partially Comply	Will Not Comply	Not Applicable	Describe how the Guideline or design direction will be met	Project Stage
6.2.3	Include enhanced filtration systems to filter out particulate matter that may enter through operable windows.		X			Filtration will be provided on indoor re-circulating HVAC units.	Detailed Design
6.2.4	Select building materials that reduce VOC emissions to contribute to healthy air within the building. Applicable materials include flooring, common amenity space furniture, sealants, paints and insulation.	X				LEED and WELL certification will guide the selection of products with low VOC emissions as well as products with EPDs, HPDs, and material ingredient disclosures. Insulation that are applicable to the HVAC and plumbing systems will meet this requirement.	Detailed Design - Construction
<b>Resiliency and Health</b>							
6.3.1	Implement design strategies to reduce viral transmission by reducing common touch points within shared spaces, including entryways, lobby, elevator and amenity areas.	X				Under consideration. Exploring hands-free operation (automatic doors and lights) in common spaces and copper-alloys on hardware and other commonly used surfaces.	Detailed Design - Construction
6.3.2	In an effort to reduce contact with respiratory droplets, natural ventilation should be provided throughout all building areas to enhance fresh air flow.		X			Operable windows will natural ventilation in suites.	Detailed Design
6.3.3	The building should be designed with access to back up generators that can supply energy to the entire building for a period of up to 48 hours.		X			Back-up power will be provided for some building loads (potential equipment includes: boilers and HW circulation pumps, sump pumps, DHW booster pumps, one receptacle per suite). Refuge Area will be provided. (with dedicated HVAC system on back-up power).	Detailed Design
6.3.4	The building should be designed to provide residents with a back-up drinking water supply for a period of 48 hours.			X		The building domestic cold water booster pumps will be put on emergency power to meet this requirement.	
6.3.5	The building should be designed to ensure ease of communication of updates during states of emergency.				X	N/A	
6.3.6	The building should be designed to ensure equal access to high speed internet, including the provision of wi-fi in amenity areas.		X				
<b>Light</b>							
6.4.1	Amenity spaces, lobby areas and a minimum of 50% of a dwelling unit shall have access to natural light.					Detailed Analysis to follow.	Detailed Design
6.4.2	LED lighting should be provided to reduce energy requirements	X				LED lighting and occupancy sensors (where appropriate) will be used to reduce energy requirements. Exploring dimmable lighting in residential suites to support circadian rhythms.	Detailed Design



## Appendix A: Urban Design Guidelines – Sustainability Checklist

Updated: 2022-05-26

Section	Requirement	Will Comply	Will Partially Comply	Will Not Comply	Not Applicable	Describe how the Guideline or design direction will be met	Project Stage
<b>Microclimate</b>							
6.5.1	Building design and landscape design should mitigate adverse wind impacts on at-grade and elevated areas used by the public or building occupants.	X					Detailed Design
6.5.2	Ensure building design and mitigation measures allow for the appropriate wind comfort criteria desired for an area.	X					Detailed Design
6.5.3	Provide sufficient mitigation measures where wind comfort criteria is exceeded.	X					Detailed Design
6.5.4	Provide permanent pedestrian weather protection, including overhangs and canopies, at building entrances and along at-grade frontages and pedestrian sidewalks.	X					Detailed Design
<b>Water</b>							
6.6.1	The building design should be compliant with City and Provincial standards and guidelines for Low Impact Development Measures.		X			Under consideration.	
6.6.2	Water filtration systems should be designed to enhanced standards	X				Under consideration. Approach will be guided by the Enhanced Water Quality Standards outlined in WELL certification. Potential strategies include: UV light, activated carbon filters, ion exchange resins or reverse osmosis systems.	Detailed Design
6.6.3	The building should be designed with appropriate ventilation systems to remove humidity from bathrooms.	X				Suite bathroom will be continually exhaust (24/7) to meet the ventilation requirements for the space. Increase ventilation (boost mode) with timers are also designed during high humidity uses.	Detailed Design
6.6.4	Provision of water efficient fixtures that meet Energy Star standards shall occur to reduce indoor water use.	X				Water efficient fixtures will be specified. Exploring options to achieve a 40% reduction in indoor water usage.	Construction Documents
6.6.5	Domestic water heating fixtures that meet Energy Star standards should be provided.	X				Domestic hot water heating boilers will be Energy Star certified.	Construction Documents
6.6.6	Greywater recycling should be used as a source for irrigation of the site landscaping		X			Collected rainwater will be used for irrigation. 0% potable water is to be used for irrigation.	Detailed Design
6.7.1	Buildings shall be designed with appropriate waste sorting facilities to ensure recycling and organic waste collection programs are supported.	X				Under consideration.	Detailed Design
<b>Landscaping</b>							
6.8.1	Plant 100% native plants. Preference should be given to drought resistant planting strategies. Invasive species shall be avoided.	X					SPA

## Appendix A: Urban Design Guidelines – Sustainability Checklist

Updated: 2022-05-26

Section	Requirement	Will Comply	Will Partially Comply	Will Not Comply	Not Applicable	Describe how the Guideline or design direction will be met	Project Stage
6.8.2	Utilize bioswale, rain gardens, and permeable paving materials within landscaping.			X			
6.8.3	Greywater irrigation systems should be used.			X			
6.8.4	Soil volumes for tree plantings should be increased at least 5% above City of Hamilton minimum standards.	X					SPA
6.8.5	Green roofs should be used on roof surfaces that are not used as active terraces and also as landscape features within active terraces.	X					SPA
<b>Green Infrastructure</b>							
6.9.1	Provision of Electric Vehicle (EV) infrastructure for a minimum of 10% residential parking spaces.	X				EV charging stations will be provided for 10% of parking spaces.	SPA
6.9.2	The remaining vehicle parking spaces must be designed to be EV capable (i.e. a complete electrical circuit terminating in an electrical outlet for the purpose future installation of EV charging).		X			The remaining vehicle spaces will be roughed-in for future EVSE.	SPA
6.9.3	Provision of well-designed bicycle parking facilities to meet the needs of cyclists and support bicycle use. Short-term parking (visitors or less than two hours parking), long-term parking (residents parking) and bicycle parking facilities should be provided within the below-grade parking structure.	X				Bicycle parking facilities will be provided and will accommodate electric bicycles. A bicycle repair area is also under consideration.	SPA
6.9.4	Short-term outdoor bike parking: a. Located close to building entrances (no more than 20.0 metres) to make it easily accessible; b. Within the view of residents, building security, or in an area close to street or public amenities and; c. The design of bike parking racks or other systems should be attractive and integrated into the site design, public art opportunities, street furniture other amenities on site.	X				Provision of short and long-term bicycle parking will be design to meet LEED and/or WELL standards.	SPA
6.9.5	Short-term and long-term indoor bike parking: a. Located in the ground level or in the first level of the underground parking garage to provide easy access from the ground level designed to minimize the interactions between bicycles and automobiles. b. The below-grade parking garage bike parking room should be easily accessible by elevator and ramp. A dedicated two-way bicycle ramp (3.0m wide at 6-7% slope) should be provided. c. The ground level bike room should be located away from the main entrance but side of the building facing the mid-block connection. d. Ensure regular security surveillance to improve safety and prevent vandalism and misuse. e. Provide electrical outlets for electric bikes and scooters.		X			Under consideration.	SPA

## Appendix A: Urban Design Guidelines – Sustainability Checklist

Updated: 2022-05-26

Section	Requirement	Will Comply	Will Partially Comply	Will Not Comply	Not Applicable	Describe how the Guideline or design direction will be met	Project Stage
<b>Bird Friendly Design</b>							
6.10.1	Design new development with bird friendly best practices including sunshades or louvers, visual markers within glazed surfaces, and non-reflective glazing to reduce window collisions with birds.	X				Bird-friendly glazing best practises will be implement.	SPA
6.10.2	Exterior lighting fixtures should be programmable to allow for dimming during migratory seasons.	X				Under consideration.	SPA
6.10.3	Ensure the design of buildings complies with Bird Friendly Design Guidelines in accordance with the Canadian Standard Association's CSA A460 Bird friendly building design.	X				Will comply.	SPA
<b>Setting Sail Secondary Plan (Sustainability Extract) Environmental Policies</b>							
6.11.1	The design and construction of new development and redevelopment shall incorporate best practices and appropriate building technology to minimize energy consumption, conserve water, reduce waste and improve air quality	X				Will be achieved through Energy Star, LEED and WELL certification.	Design - Post Occupancy
6.11.2	New development and redevelopment shall be encouraged to incorporate rooftop terraces, green walls, rooftop gardens and/or other green technologies to improve micro-climatic conditions, energy efficiency, air quality and for stormwater management.	X				Will be achieved through landscape design.	
<b>Pier 7 and 8 Design Study</b>							
6.12.1	A core focus on environmental sustainability should be reflected in both the building and landscape designs.	X				Will be achieved through Energy Star, LEED and WELL certification.	
6.12.2	Pedestrian and cycling paths can double as a naturalized storm water management areas. The landscape features should be engineered to minimize the overall environmental impacts of development. If required, the overall water quality can be maintained by having water flow through an oil grit separator and then into the water gardens.		X				

## Appendix A: Urban Design Guidelines – Sustainability Checklist

Updated: 2022-05-26

Section	Requirement	Will Comply	Will Partially Comply	Will Not Comply	Not Applicable	Describe how the Guideline or design direction will be met	Project Stage
6.12.3	An objective for redevelopment at Pier 7 + 8 is to reduce the ecological footprint of the community and to minimize life cycle costs. This is to be achieved through a holistic design approach to development that considers the natural conditions of the site and the sustainability opportunities that arise when planning a new community from the very beginning. Designers will be asked to further the area's sustainability goals through consideration of the following: <ul style="list-style-type: none"> <li>• Alternate energy sources such as wind or solar should be encouraged in the schematic design phases of each development project.</li> <li>• The landscape and architectural design of the community will highlight its sustainable features.</li> <li>• Landscape architectural design will prioritize the use of indigenous, non-invasive plant material and will promote biodiversity, stormwater management and creation of shade.</li> </ul>	X				A holistic sustainability design process is being followed.	
6.12.4	Cycling should be accommodated in all development plans by providing for secure bicycle parking for visitors, residents and employees.	X				Bicycle parking facilities will be provided and will accommodate electric bicycles. A bicycle repair area is also under consideration.	SPA
6.12.5	Bicycle parking should be placed closer to front doors and key destinations.	X				Location under consideration.	SPA
6.12.6	Parking structures should include parking for bicycles, motorcycles, mopeds, e-bikes, small cars, electric car parking with charging stations and accessible parking.	X				A variety of parking space types are under consideration.	SPA
6.12.7	Parking structures should be designed with the ability to be retrofitted into usable space should the area's demand for parking be reduced in the future.			X			
6.12.8	Priority parking spaces should be provided for car share stations.		X			Car Share spaces are under consideration.	SPA
6.12.9	Priority parking spaces should be provided for electric vehicles as well as the provision for electrical supply stations and their expansion should be provided for in utility designs.	X				Priority Car spaces will be equipped for electric vehicles.	SPA
<b>Green Façade</b>							
8.9.1	The south facade of the building is encouraged to integrate design features that reference green elements such as micro sunrooms, greenhouses, patterned wind screens, color accents and design themes that relate to elements within the Greenway. The south side facade should include unique design patterns and additional balcony and terrace areas to accommodate outdoor planting and landscaping.		X			Under consideration.	Detailed Design
<b>Total:</b>		<b>43</b>	<b>14</b>	<b>4</b>	<b>1</b>		
		<b>69%</b>	<b>23%</b>	<b>6%</b>	<b>2%</b>		

## APPENDIX B: ENERGY & CARBON ANALYSIS

Preliminary energy modelling was used to develop the initial design concepts and establish a likely range of performance. These strategies and performance estimates should be considered preliminary and will be further refined during later stages of design.

The project is targeting the following design strategies:

- Moderate Glazing Ratio of 60%
- Low-e Double Glazing
- Improved Opaque Wall Performance
- Optimized Solar Heat Gain / Shade
- In-suite Ventilation Heat Recovery
- Reduced Corridor Pressurization
- Hybrid Geothermal Heating and Cooling
- Low-flow Domestic Hot Water fixtures
- DHW Preheat
- Energy Star Appliances
- LED Lighting and Occupancy Sensors
- Variable Speed Drives and Efficient Motors

Based on preliminary modeling and technical analysis, these strategies have the potential to deliver:

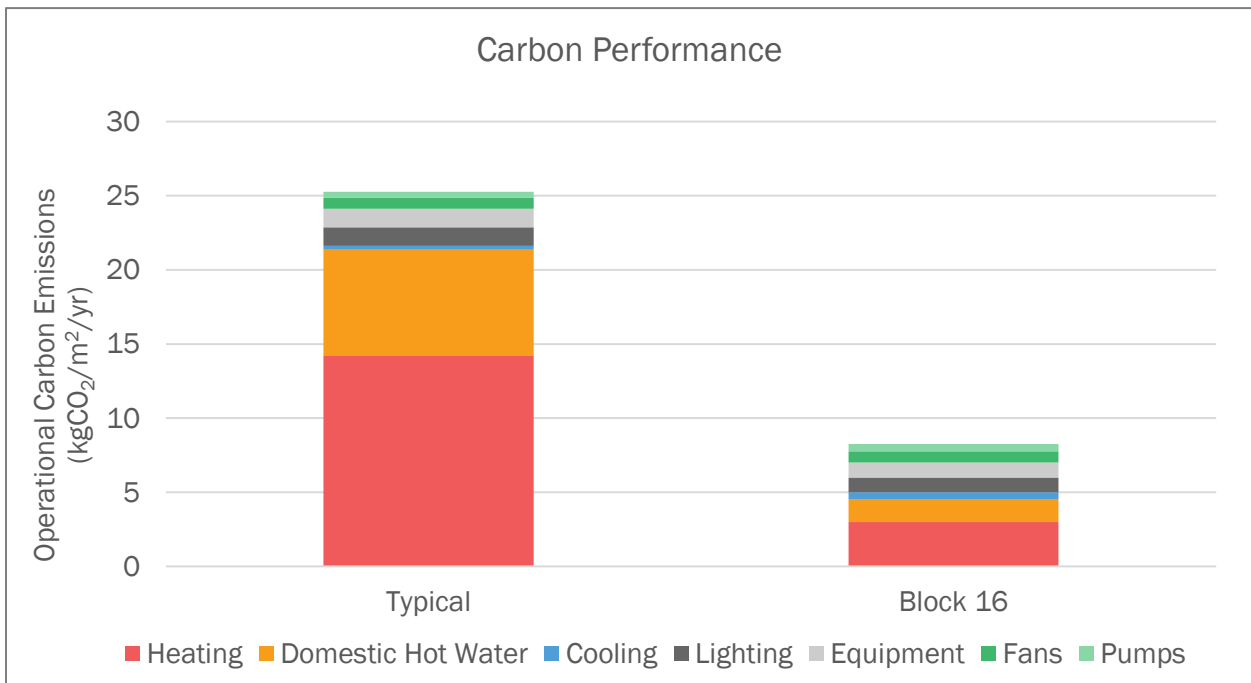
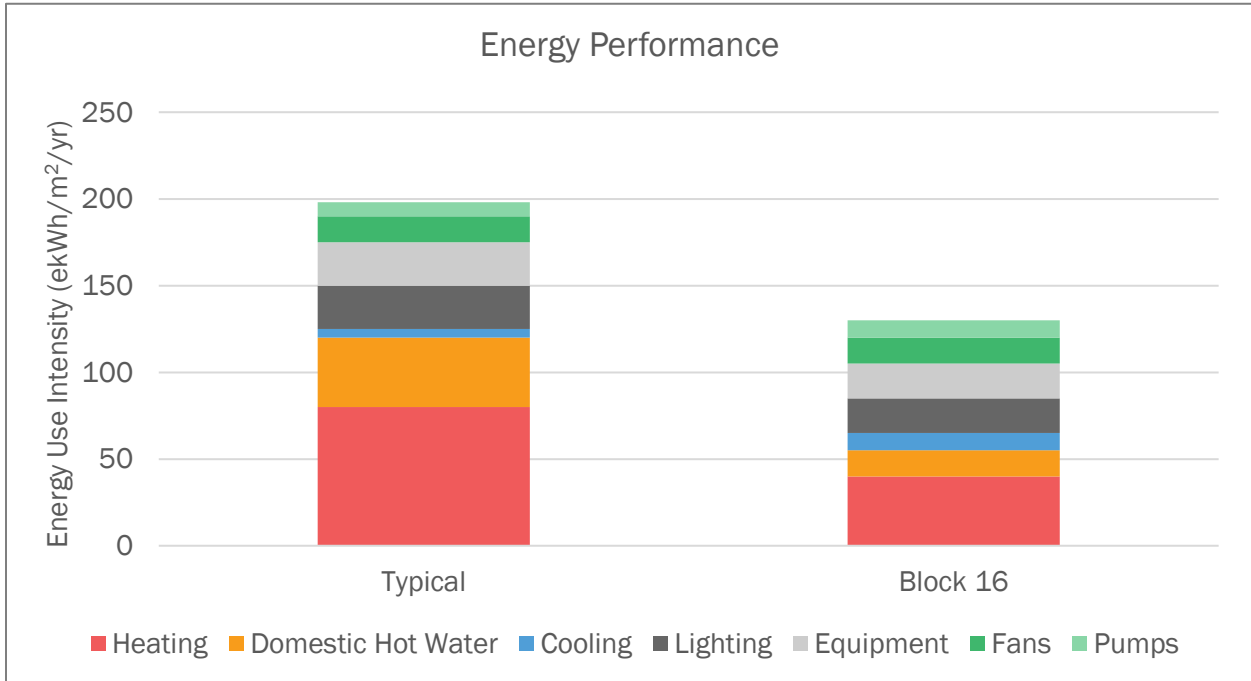
- Energy Use Intensity in the range of 120-140 kWh/m<sup>2</sup>/yr (which is approx. 30-40% better than typical Hamilton Development)
- Carbon (GHG) Emissions during operations in the range of 8-12kgCO<sub>2</sub>/m<sup>2</sup>/yr (which is approx. 50-70% better than typical Hamilton Development)

Additionally, the following strategies will reduce the carbon emissions associated with materials and constructions practices:

- Low-Carbon Concrete
- More Structural Steel
- Recycled Content
- Locally Sourced Materials

Combined they have the potential to deliver approx. 10-20% lower embodied carbon than typical residential development.

These estimates should not be considered predictions of actual performance during operations, rather, relative comparisons of the current design concept vs. a typical market development.



## APPENDIX C: CERTIFICATION PROGRAMS OVERVIEW

### LEED

LEED is green building certification system of the U.S. Green Building Council (USGBC). LEED provides a framework for healthy, efficient, carbon and cost-saving green buildings. LEED certification is a globally recognized symbol of sustainability achievement and leadership.

To achieve LEED Certification projects must adhere to 13 prerequisite credits and earn points through the achievement of optional credits that address carbon, energy, water, waste, transportation, materials, health and indoor air quality. Projects are awarded a certification level based on the number of points they achieve.



#### Credit Categories:

- Integrative Process
- Location and Transportation
- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality
- Innovation
- Regional Priority

#### Certification Levels:

- Certified (40 to 49 Points)
- Silver (50 to 59 Points)
- Gold (60 to 79 Points)
- Platinum (80 to 110 Points)

For More Information Visit: <https://www.usgbc.org/leed>

## WELL

The WELL Building Standard Version 2 focuses on advancing human health and well-being through design interventions, operational protocols and company-wide practices. Each optimization is required to meet WELL's four tenets: evidence based, verifiable, implementable and presented for outside input.



To achieve WELL certification projects must adhere to a set of universal preconditions and earn points through optional optimization organized according to WELL's ten concepts. Optimizations are weighted with varying point values based on the potential for impact, defined as the extent to which a feature addresses a specific health and well-being concern or opportunity for health promotion, and the potential impact of the intervention.

### Concepts:

- Air
- Water
- Nourishment
- Light
- Movement
- Thermal Comfort
- Sound
- Materials
- Mind
- Community
- Innovation

### Certification Levels:

- Bronze (40 to 49 Points, 0 Minimum Points Per Concept)
- Silver (50 to 59 Points, 1 Minimum Point Per Concept)
- Gold (60 to 79 Points, 2 Minimum Points Per Concept)
- Platinum (80 to 110 Points, 3 Minimum Points Per Concept)

For more information visit: <https://v2.wellcertified.com/en/wellv2/overview>



## ENERGY STAR MULTI-FAMILY HIGH RISE RESIDENTIAL

ENERGY STAR® Multifamily High-Rise (New Construction) Pilot (ES-MFHR) is a new certification program being piloted in Ontario by NRCan in partnership with EnerQuality. The certification recognizes buildings which are at least 15% more energy-efficient than those built to the Ontario energy code and requires on-site verification and testing.

The ENERGY STAR® program was developed by the U.S. Environmental Protection Agency (EPA) in 1992 and managed by Natural Resources Canada (NRCan) in Canada since 2001. In 2017, NRCan partnered with EnerQuality and the Ontario home building industry to develop and launch the ENERGY STAR® Multifamily High-Rise (New Construction) Pilot (ESMFHR) in Ontario.



The focus of the certification program is on energy. It provides a single set of criteria and certification level and assess energy performance relative to baseline. It does not have an explicit requirement for carbon performance.

### Requirements:

- Energy Efficiency
- Suite Air Tightness
- Testing and Balancing of HVAC Systems
- Energy Star Appliances
- Motor Efficiency
- 3<sup>rd</sup> Party Commissioning

For more information visit: <https://www.nrcan.gc.ca/energy-efficiency/buildings/new-buildings/energy-starr-multifamily-high-rise-pilot-program/21966#communities>

## APPENDIX D: CONDITIONS OF USE

### GENERAL

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The scope of work and related responsibilities for this report are defined in Purpose Building's proposal and Terms and Conditions.

No party other than the Client shall rely on any content of this report without Purpose Building's express written consent. Any third-party user of this report specifically denies any right to any claims, whether in contract, tort and/or any other cause of action in law, against Purpose Building (including officers, employees, agents and Sub-Consultants).

Any reliance on this report requires accepting all of the following:

- The report is written to be read in its entirety. No portion of this report may be used as a separate entity.
- Only the specific information identified has been reviewed.
- The results from any energy models can vary from actual performance. Unless a full digital twin of the building is developed and calibrated, the model is an approximation of many factors, and the modelling methods are not standardized. The results are therefore our opinion of the performance that should be achieved based on the information and assumptions used to create the model.
- Work performed to achieve or verify compliance with Code, by-law or certification systems is subject to interpretation by the certification agency. The opinion we provide about likelihood of compliance is based on our experience and expertise, but the outcome can vary based on many factors.
- The work does not express or imply warranty as to the fitness of the property or properties for a particular purpose or compliance with current or future regulations unless otherwise agreed in writing by Purpose Building. The work reflects Purpose Building's best judgement considering the information reviewed at the time of preparation.
- This work does not wholly eliminate uncertainty regarding the potential for existing or future costs, hazards or losses in connection with a property.
- Any budget figures provided represent Purpose Building's opinion of a probable current dollar value of the work and are provided for approximate budget purposes only. If an actual construction budget is required for some or all of the work, Purpose Building can provide an additional service to establish a scope of work and receive quotes from suitable contractors.

Unless specifically recorded in the report, this scope and these responsibilities do not include:

- Responsibility to identify errors or insufficiencies in the information obtained from the various sources.
- Responsibility for decisions made or actions taken as a result of this report unless Purpose Building is specifically advised and participates in such action, in which case the responsibility will be as agreed to at that time.
- Investigating or providing advice, about pollutants, contaminants or hazardous materials. Any user explicitly denies any right to any claim, including personal injury claims, which may arise out of pollutants, contaminants or hazardous materials.