

December 16, 2022

Township of Huron-Kinloss
21 Queen Street
Ripley, ON, N0G 2R0
Attn: Mike Fair, Director of Community Services

Energy Modelling

17 Queen Street, Ripley, ON

1 Terms of Reference

Further to your request, Pretium Engineering Inc. (Pretium) is pleased to submit this proposal for energy modelling services relating to proposed renovations at the above captioned site. An outline of Pretium's proposed scope of work and fee schedule is provided below.

2 Property Description and Background Information

We understand that the Township of Huron-Kinloss is in the early planning and design stages of a multi-phased renovation of the Ripley Huron Community Centre and Arena and are planning to apply for funding through the Green and Inclusive Community Buildings Program offered by Infrastructure Canada.

To be eligible for funding consideration, all retrofit projects are required to achieve at least 25% in energy efficiency improvements as compared to the building's base energy consumption. Projects with greater energy efficiency improvements will receive a higher score and are more likely to be selected for funding. Projects demonstrating high GHG emission reductions relative to the baseline are also more likely to be selected for funding.

3 Scope of Work

Our proposed scope of work includes the preparation of an Energy Model of the building including all planned renovations. The performance of the renovations will be compared to the original building performance. This includes the following:

- .1 **Documentation and Data Review:** A review of all available drawings, documentation, designated substance surveys, and previous engineering reports. This includes the collection and analysis of 24 to 36 months of historical utility billing records (gas, electricity, and water consumption) for each property. The data will be normalized to account for weather variations and will be used to evaluate the building's energy/demand rate structures and energy use profile.
- .2 **Kick-Off Meeting:** A meeting with the Client to discuss the buildings and any known issues that exist, including a history of all previous repairs, planned renovations, investigations, and assessments (if

any). During this meeting we will collect pertinent information on the building energy systems, equipment, (including planned maintenance or capital repairs or replacement) and operating schedules that contribute to the energy consumption.

- .3 **Optional: Site Review and Condition Assessment:** If the data necessary to populate the energy model cannot be collected from available drawings, documents, and discussions with the client alone, a site visit will be required to collect the necessary details. This will include a comprehensive visual review to document the equipment, components, and condition of any systems that impact the building energy consumption. This includes the following:
 - .1 Review from grade, and roof areas of the building envelope including wall cladding, windows, doors, and roofing.
 - .2 A visual review of the mechanical and electrical systems including the HVAC, domestic hot water, plumbing power distribution, lighting, etc.
 - .3 A general visual review of exterior site energy consuming components such as lighting.
- .4 **Modelling and Benchmark Performance:** A model of the building will be developed using RETScreen Expert (Professional). The normalized utility data will be used to calibrate the baseline model that will be used for calculation of energy savings for the proposed design.

It will also be used to calculate the current Greenhouse Gas Intensity (GHGI), the Building Energy Performance Index (BEPI) and the Total Energy Use Index. The GHGI is the ratio of the total annual GHG emissions and the floor areas of the facility ($\text{KgCO}_2/\text{m}^2/\text{year}$). BEPI is the ratio of the total annual energy consumption and the floor area of size of the facility (ex. kWh/ft^2). Similarly, the Total Energy Use Index converts all energy sources to a common unit, equivalent kWh (ekWh) and divides that value by the area of conditioned space within the building. These values are particularly useful when comparing buildings or performance before and after renovations and additions.
- .5 **Final Report:** Preparation of a report complete with description and analysis of the baseline building performance and results of the proposed building performance including budgets for the proposed energy conservation measures, simple payback, and net present value.

The report will be based on visual observations from a limited number of locations and our experience with similar types of buildings. Deficiencies or alternate conditions may exist at other areas not referenced in this report or that are not visually apparent given the level of evaluation. No responsibility is therefore assumed concerning these matters, or for failure to carry out technical or engineering techniques that would be required to discover any inherent or hidden conditions of the property, since such an investigation is not included in the scope of work. This report is also not to be construed as a warranty of structural components or other components therein, or their fitness for a particular purpose or use.

4 Fee Estimate

The following is our fee estimate to complete the scope of work outlined above.

Description	Cost
Energy Modelling	\$ 7,450
Optional Site Visit	\$ 1,950

Notes:

- .1 The above costs include all disbursements, i.e., travel, etc., but are exclusive of HST.
- .2 The proposed scope of work is recommended for a project of this size and complexity. Please do not hesitate to contact us to discuss the proposed scope. We would be pleased to discuss the possibility of modifying the scope and associated fees to suit your needs.
- .3 This proposal and associated engineering fees are valid for a period of ninety (90) calendar days after issuance.

5 Sustainability at Pretium

Working to create a more sustainable built environment is woven into the fabric of Pretium's culture and values. Internally, we have a Sustainability Team which meets to discuss and implement initiatives such as minimizing paper and single-use disposables, minimizing waste and carbon emissions, and reducing the use of water and electricity where possible. As a part of this endeavour, Pretium has met with local sustainability organizations to discuss these initiatives and take the best steps forward.

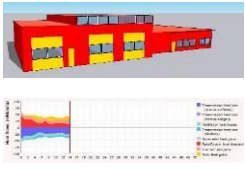

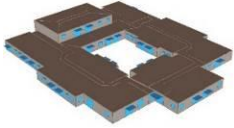
Pretium's commitment to sustainability is also evident in the projects we pursue and the sustainability-focused clients we consistently support.

Pretium's Energy and Carbon Reduction team has led numerous projects with an emphasis on sustainability, taking a holistic and evidence-driven approach to achieve a more sustainable project, whether that be through the materials and methods we specify or the integration of mechanical and building envelope repair recommendations to achieve optimal building performance.

Our staff have obtained several certifications across various sustainable building standards, including LEED AP, GA, and Passive House Certification. These building science professionals have the theoretical knowledge and construction experience to allow pragmatic interpretation of energy and hygrothermal modelling software data and provision of meaningful and constructible energy saving solutions.

Pretium has extensive experience in providing energy and hygrothermal modelling services for code compliance to the Toronto Green Standard, Supplemental Standard SB-10, or as part of design development for all building types and systems. We perform climate change vulnerability assessments, ASHRAE Level I and II energy audits, Carbon modelling and reduction planning, as well as assistance with obtaining rebates to implement more energy saving measures for our clients. Pretium has also been involved in several Passive House and EnerPHit projects, providing consulting services and leading multi-disciplinary teams to achieve the highest standard of energy performance for new or existing buildings. We have also provided building envelope commissioning services for new construction projects targeting a variety of certifications including LEED BD+C, CaGBC Zero Carbon Building Standard, WELL Building Standard, and Passive House.

Our team is involved in the design and construction of multiple deep energy retrofit projects and provides energy and water reporting and benchmarking services to help clients identify how their buildings could perform better, and how changes should be implemented to ensure a more sustainable future.

Project Name	Property Address and Description	Project Description and Value	
DesignPH and PHPP Modelling 2020 - Present	10988 / 19990 Warden Ave., Markham, ON Single Storey Office and Service Garage Client: York Region c/o IBI Group	Pretium completed schematic design modelling of the proposed building using DesignPH software to assist in guiding the design towards achieving the Passive House Standard. The design and modelling is on-going as the project moves from schematic design to design development and construction documents, scheduled to be completed later this year. Project Fees: \$116,000	
EnerPHit Deep Energy Renovation (2018 - Present)	255 Riverside Drive East, Windsor Twenty (20) Storey High-Rise, 300 Unit Non-Profit Housing Client: Windsor Essex Community Housing Corporation	The project includes a feasibility study to determine options for each of the systems requiring renovation. Eighteen (18) scenarios were modelled in PHPP with changes to the exterior cladding, balconies, roof assembly, floor slab and foundation walls, ventilation design, domestic hot water system, vent stacks, penthouse, and lighting. The design options were narrowed down based on the EnerPHit requirements, impact on the residents, and price until an optimal recommendation was achieved. Energy modelling and reporting for the National Housing Co-Investment Fund was completed. Specifications for the renovation were prepared including the preparation of detailed drawings, the permit application, and architectural renderings for the new exterior cladding. The project is on-going with mechanical system upgrades complete and building envelope upgrades underway. Project Fees: \$744,000	
Energy Modelling (HIC and CMHC) (2019)	6015 Barker St., Niagara Falls, ON Two (2) Storey, 30 Unit Non-Profit Housing Client: Shabri Properties Ltd.	Pretium completed energy modelling of the proposed project to confirm the annual energy consumption and GHG emissions. The results were compared to the requirements of the HIC and CMHC National Housing Co-Investment Fund. Pretium prepared a detailed report, including all required documentation for application to HIC and CMHC. The project was successful in securing significant funding. Project Fees: \$14,200	
ASHRAE Level II Energy Audit (2022)	61 Yorkville Ave., Toronto, ON High-Rise Residential Client: Minto Properties	Field investigation to evaluate on-site energy and water consumption. Identification and calculation of ECMs for the building envelope, mechanical, electrical, and plumbing retrofits. The recommended ECMs were combined into several bundles. The "Deep Energy Retrofit" option was predicted to reduce energy consumption by 48%. Project Fees: \$9,750	

6 Corporate Profile

What We Do: Pretium Engineering Inc. (Pretium) is a specialist building science, mechanical and structural consulting engineering firm that provides high-quality, evidence-driven services including Building Envelope and Structural Restoration; New Building Third Party Review and Bulletin 19 Consulting; Property Condition Assessments and Capital Planning; Building Envelope Commissioning and Testing; Energy Performance; Passive House Consulting and Universal Design (Accessibility).

Our engineered solutions have solved building performance problems, on time and within budget since 1993. We are managed by our partners and senior management, all of whom have 10 to 40 years of experience. We provide our expertise to a wide variety of sectors including commercial, residential, retail, healthcare, educational, institutional, industrial, recreational and hospitality.

Who We Are: We are a Canadian controlled private corporation which is majority owned and operated by employee shareholders with offices throughout Ontario, in Breslau (Waterloo), Burlington, Milton, Newmarket, Ottawa and Toronto, and a staff complement of over 75 building engineers and technologists. Pretium is one of the largest firms in Ontario focusing solely on building engineering with many staff having the "Building Science Specialist" (BSS) designation.

Pretium is a member of the C3 Group of companies (1973) (www.c3group.com), a multi-discipline engineering/contracting organization specializing in building science, restoration, industrial maintenance, foundation systems, environmental technologies, and advanced materials. Pretium leverages these resources and with Pretium, Arbitech and our C3 affiliates our staff count is close to 150 personnel.

Pretium's staff of engineers, technologists, and construction specialists has accumulated years of practical experience, training, and education, enabling the firm to provide competent and sensible solutions to meet our clients' needs.



History: Pretium Engineering Inc. (www.pretiumengineering.com) was formed in 2018 with the amalgamation of Pretium Anderson and Pretium-GRG, formerly GRG Building Consultants Inc. (1993). Pretium Anderson was formed in 2010 with the amalgamation of Pretium Engineering Limited (2004) and Anderson Building Science Inc. (1996). In 2017, the team expanded through a strategic partnership with Arbitech Inc. (www.arbitech.ca). Arbitech provides arbitration, mediation, litigation support, and expert testimony and reports on claims across Canada. In 2020, Pretium announced a partnership with Fishburn Building Sciences. Fishburn brings more than 50 years of knowledge and consulting experience with a focus on all types of roofing services including historical restoration and litigation support.

Our Approach: Each new project is approached as a collaborative process that encourages multidisciplinary professional teams to design solutions based on experience, knowledge, and evidence. Every solution is grounded by a practical approach that is tailored to each individual client to ensure that their visions are realized. We are collaborative, evidence-driven and committed in the delivery of services to our clients.

- **Collaborative:** We collaborate and partner with our clients to solve their building related needs.
- **Evidence-Driven:** We are evidence-driven – that is, we make conscientious, explicit, and judicious use of best evidence and practices when problem-solving for our clients.
- **Committed:** We are committed to the efficient delivery of our services through continued development of processes and technical knowledge, master reports, and cost estimate databases.
- **Empowering:** We empower all employees to develop client relationships through delivery of high-quality service and demonstrated trust and respect.

Consulting Engineers | Working Together, Better - Our slogan not only describes how we approach our internal operations, but also embodies the approach to our work and our service to clients.

Our Core Values: At the core of all work performed by Pretium are paramount principles which each employee undertakes to uphold.

- **Integrity:** Our integrity can never be taken away and must always be exhibited.
- **Responsiveness:** We are responsive to show that we respect and put a priority on others' needs.
- **Investment in Relationships:** we will invest the time and resources to support others in achieving their goals.
- **Risk Management:** We manage our risk and our client's risk through responsible planning and action.
- **Technical Differentiation:** We differentiate ourselves through our expertise which is refined and systematically made valuable and unique.

List of Services

Building Restoration & New Construction

- Design and Specifications
- Contract Administration and Construction Review
- Third Party Review
- Tarion Bulletin 19R – Field Review

Structural and Geotechnical Engineering

- FRP (fiber reinforced polymer) Retrofit
- Geotechnical and Foundation Engineering
- Micropile and Helical Pile Deep Foundations
- Concrete, Steel, Wood and Masonry Analysis and Design
- Roof Anchor Systems
- Design, Assessment and Remediation of Structural Building Components

Assessments and Capital Planning

- Property Condition Assessments
- Performance Audits
- Investigations
- Reserve Fund Studies
- Due Diligence Assessments

Mechanical Engineering

- Heating, ventilation, air conditioning (HVAC), plumbing & drainage, fire protection, electrical
- New construction design and system replacement, renewal, retrofit
- Revit/BIM modeling

Testing

- Air Leakage
- Water Penetration
- Level 3 – Advanced Enclosure Integrity Testing – NFPA 2001 (2012 Edition)
- Infrared Thermography

Energy Performance

- Passive House and EnerPHit Consulting
- Computer Modeling and Analysis
- Energy Audits
- BOMA/LEED Requirements

Commissioning and Retro-Commissioning

- Design development and construction document support
- On-site construction review
- In-situ testing and performance verification

Universal Design (Accessibility)

- Client awareness seminars
- Accessibility compliance analyses
- Documentation review, design development and construction document support
- On-site construction review and verification

Infectious Disease Control

- Ventilation Improvement (air filtration, cross-contamination, pressurization, economizers & outdoor air control)
- Humidity Control (RH 40-60%)
- UVGI - Ultraviolet Germicidal Irradiation (AHU coils, air cleaning devices)
- Building Automation System Upgrade (remote access, touchless sensors, disable DCV & operable windows interlock with AC)
- HVAC Strategy for Protected Spaces (HVAC separate systems, portable equipment)
- Air Purification (high efficiency media-filters)
- Plumbing (touchless fixtures, trap inspections, Legionella prevention)
- Building Envelope (air seal building enclosure openings to optimize mechanical system operation)
- High Touch Surface Treatment (application of antimicrobials to frequently exposed surfaces)
- Touchless Entry, Exit, and Internal Barrier / Separation Design (minimize opportunity for contact and reduce proximity)

Development Services

- Site feasibility studies
- Planning and zoning review
- Management of municipal applications and processes

New Construction & Design

- Client programming and space planning
- Conceptual design
- Prime consulting services including full-service architectural, structural, mechanical, electrical and civil engineering (in collaboration with associate firms)
- Project tendering and contract administration
- Construction review

Professional Associations

Pretium is a member of several professional organizations, including:

- Professional Engineers of Ontario (PEO)
- Building Commissioning Association (BCA)
- Ontario Building Envelope Council (OBEC)
- Building Owners and Managers Association (BOMA)
- Passive House Canada (PHC)
- Passive House Institute US (PHIUS)
- Toronto Construction Association (TCA)
- EIFS Council of Canada (ECC)
- International Institute of Building Enclosure Consultants (IIBEC)
- Sealant, Waterproofing & Restoration Institute (SWRI)
- Canadian Condominium Institute (CCI)
- Canada Green Building Council (CAGBC)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
- Association of Condominium Managers of Ontario (ACMO)
- Ontario Non-Profit Housing Association (ONPHA)
- The Federation of Rental-Housing Providers of Ontario (FRPO)
- Ontario Association of School Business Officials (OASBO)
- International Facility Management Association (IFMA)
- Canadian Federation of Independent Business (CFIB)
- Building and Concrete Restoration Association of Ontario (B&CRAO)
- International Concrete Repair Institute (ICRI)
- Construction Specifications Canada (CSC)
- Co-operative Housing Federation of Canada (CHF)
- Standards Council of Canada (SCC)
- CSA B651 Accessible Design and the Built Environment
- International Association of Accessibility Professionals (IAAP)

7 Closure

The proposed services will be performed by Pretium as outlined in this proposal and within the limits prescribed by the attached Agreement for Professional Services and Terms of Engagement. Our fee does not include for effort required to resolve conditions that arise that vary significantly from the specified scope of work. Any additional work (either recommended by Pretium or requested by the Client) and related fees would be discussed and would require written authorization from the Client before proceeding.

We trust that the above is satisfactory for your purposes. If you have any questions regarding this proposal, please do not hesitate to contact us.

Yours very truly,

Pretium Engineering Inc.

Prepared By:



Jennifer Hogan, B.Arch.Sci., C.E.T., RRO, LEED AP, Certified Passive House Consultant
Energy and Carbon Service Area Leader