

The Board of Directors, Staff, and Volunteers  
of Camp Kawartha thank you for attending  
the opening ceremony of the  
Rotary Health Centre!

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The Rotary Health Centre was designed and constructed by Straworks  
[www.straworks.ca](http://www.straworks.ca)



# What's inside the Rotary Health Centre? *From the Bottom Up!*

OFFICIAL OPENING

OCTOBER 2ND, 2021



# Special Features

**RUBBLE TRENCH FOUNDATION** — The mining and burning of limestone to make cement is energy intensive. A ton of cement equals nearly a ton of carbon emissions. This project started by avoiding materials like cement, that are responsible for high carbon emissions, at the foundation stage and carries that all the way through. A rubble trench, a bed of compacted stone, replaced a conventional concrete frost wall.



**NEXCEM BASEMENT WALLS** — A Nexem block is the only ICF that isn't made of foam or polystyrene (high carbon emissions). It is made here in Ontario from waste wood chips and some cement. But a portion of the carbon emissions are offset by the wood chips (trees sequester carbon) mixed in with the Nexem blocks. The cement protects the wood from decay while the wood adds insulation.



**HIGH PERFORMANCE WINDOWS & DOORS** – Triple pane windows and doors maintain excellent energy performance for a building facing North-West, all the while flooding the Rotary Health Centre with natural light.

**FOAM FREE PROJECT** – No rigid foam, no used foam, and no spray foam were used. All of these are made with incredibly toxic ingredients, have a huge carbon footprint, and are deadly in a fire.

**HIGH EFFICIENCY AIR-SOURCE HEAT PUMP** – In addition to a net-zero carbon emission’s budget for the construction of the project, the Rotary Health Centre will also operate on a tight carbon budget thanks to super levels of insulation, its connection to a green electrical grid, and the Sanden High Efficiency Air-Sourced Heat Pump. The Sanden uses CO<sub>2</sub> - a benign refrigerant compared to the highly potent hydrofluorocarbons (HFCs) used in most heat pumps, air conditioners, fridges, and freezers. Project Drawdown estimates that HFCs “have 1,000 to 9,000 times greater capacity to warm the atmosphere than carbon dioxide.” ([www.drawdown.org/solutions/refrigerant-management](http://www.drawdown.org/solutions/refrigerant-management)). The Sanden Heat pump takes heat from the outside air, boosts it before it is used to heat the radiant floors and the domestic hot water.

**LIVING ROOF** - Another special feature is a living roof over the main entrance that is full of native plants. A living roof, also referred to as a roof garden or green roof, is a vegetated roof assembly with engineered layers. These layers work together to create a suitable growing environment while maintaining the integrity of your roof structure. *Source: Restoration Gardens -- [restorationgardens.ca](http://restorationgardens.ca)*



**GLAVEL AND PORAVER** — The basement floor of the Rotary Health Centre is insulated with two different types of recycled glass that otherwise might have ended up in the landfill. Glavel and Poraver are both made by heating and expanding glass into insulation suitable for below-grade applications.

**LOCAL WOOD** – Look around and you will see a variety of local wood - white pine beams, eastern white cedar decks and hemlock posts and rafters—all grown and milled within 100 km of Camp Kawartha. Local, natural, beautiful, carbon-storing, low-carbon emissions mean there is every reason to choose local wood.



**STRAW BALE WALLS** – The exterior walls are insulated with 300 bales of wheat straw. Annually renewable, locally grown, non-toxic, super insulating, ultra-low carbon emissions, super carbon-storing, the list of reasons to build with bales keeps getting longer and more important in light of the climate crisis. Straw sequesters tons of carbon from the atmosphere as it grows. The bales in the exterior walls of the Rotary Health Centre are storing that carbon, over 5 tons in fact. They are a carbon sink!



**HEMP INSULATION** – The interior walls are insulated with hemp batts to reduce sound transmission between rooms. They are made in Quebec by Natural Fibres primarily to insulate against heat loss or gain. Similar to conventional batt insulation, they fit between studs in exterior walls but, they do not carry the huge carbon footprint.



#### **EARTHEN FLOORS -**

An earthen floor is similar to a polished concrete floor except clay is the binder instead of cement. Making one starts by mixing clay, sand and straw and plastering a 3/4" thick layer over a stable base such as limestone screenings. Once dry, it's hardened with a blend of oils and sealed with varnish. They have a warm, natural feel, but are also cool in summer. Earth is a natural, biodegradable, non-toxic material, with no energy required for processing. The earth can be sourced on-site, reducing transport distances and therefore fuel. And of course obtaining earth is free!

**5.6 TONNES OF CO2 EMISSIONS SAVED!** Thanks to the Builders for Climate Action carbon calculator, we estimate the Rotary Health Centre's material carbon emissions to be 6.9 tons. But the wood, straw and cellulose insulation will be storing 12.5 tons that they absorbed during photosynthesis when they were plants. The net difference is -5.6 tons, so as long as the building stands, it will be a carbon sink! The calculator also tells us that if we built the Rotary Health Centre conventionally, with a concrete foundation, spray foam insulation in the walls, floor and ceiling and clad the exterior in brick, the material emissions would jump to approximately 39 tonnes! The Rotary Health Centre is on the right side of climate change during its operational phase too. Super levels of insulation and diligent air sealing mean the heating loads will be low. An ultra efficient air sourced heat pump, powered by Peterborough's relatively green grid, will do the job and fit the project goal of low carbon construction and operation emissions.



**NATURAL PLASTER** – The early straw bale houses in Ontario were plastered with cement, lime, and sand. Today recipes have mostly shelved cement in favour of clay, lime, chopped straw and sand mixes. They offer better protection from the elements, less maintenance and lower carbon emissions.

Builders for Climate Action Material Emissions Calculator		Project Carbon Content	
<b>INSTRUCTIONS</b> +	<b>SECTION 1</b> Fill out Project Information (YELLOW AREAS)	GRAND TOTAL kgCO2e	kgCO2e/m2
	<b>SECTION 2</b> Fill out the Building Dimension Calculator (YELLOW AREAS) to establish your working area. This information will self-populate the corresponding Building Elements tabs.	-5570	-29
	<b>SECTION 3</b> Click on the BOTTOM TABS to select the Component Materials you plan to use in your building. If necessary, use the percentage area in YELLOW. NOTE: change your materials to reduce your carbon footprint.	Note: kg/m2 comes from total kg divided by habitable floor area	
	<b>SECTION 4</b> Once you have finished choosing all of your materials, print out the all sheets on submit with your plans.		
<b>SECTION 1</b> +	<b>PROJECT INFORMATION</b>		
PROJECT TITLE	Health Centre Camp Kawartha		
BUILDING TYPE	Straw Bale		
COMPANY NAME	Straworks Inc.		
PROJECT MANAGER	Deirdre McGahern		
CITY/ PROV/STATE/COUNTRY	Lakefield, Ontario, Canada		
DATE OF CONSTRUCTION	September 2020		
CONTACT INFORMATION	info@straworks.ca		
PROJECT CERTIFICATIONS			
<b>SECTION 2</b> +	<b>BUILDING DIMENSION CALCULATOR</b>		<b>YOUR DATA</b>
COMPONENT	CALCULATION APPLIES TO THESE ELEMENTS	REQUIRED UNITS FOR YOUR CALCULATION	UNITS TOTAL kg of CO2e
			Information carries over from 1

**Dense Pack Cellulose:** Dense-packed cellulose insulation is an environmentally friendly alternative to batt insulation. It is a highly efficient option for insulating exterior walls. It insulates as well if not better than the average batt (R3.5-3.8/inch), and slows air flow through walls making buildings cheaper and easier to heat and cool. In addition, the high density of packed cellulose provides a better sound barrier than batt insulation. Cellulose is commonly manufactured with borate, which is non-toxic and a fire retardant that resists mold and insects. It is a biodegradable material that breaks down far quicker than fiberglass insulation.



**Non Toxic Finishes** - The indoor air quality of most new homes is often more polluted than the outdoor air because of the toxic materials we put into them—formaldehyde in the glues, mildewcides and fungicides in the drywall mud...In high enough doses those toxins can make people sick and have no place in our homes or in our public buildings. The Rotary Health Centre at Camp Kawartha is finished entirely with natural non-toxic materials. Your nose will be judge in the end. If we pass the sniff test, it will smell like nothing.