The Sifton Centre is the first building in a planned 75 acre West 5 development – a new net zero community planned by Sifton properties in the western region of London Ontario. The West 5 community is planned as a mixed use, residential/commercial development, with a focus on increased density, walkability and vibrant streets, in contrast to the low density suburban development that surrounds it. Taken in combination, the buildings that comprise West 5 will generate as much energy as they consume and this energy will be produced entirely through photovoltaics.

The Sifton Centre is a 60,000 sf commercial building, with approximately 25,000 sf of leasable retail space and 35,000 sf of leasable office space. Sifton occupies the top floor of the building. As the flagship building of the development, the Sifton Centre incorporates several sustainable strategies that will be repeated in subsequent buildings.

Five sustainable design strategies:

1. Optimized site orientation
2. High performance building envelope
3. High efficiency mechanical systems
4. Building integrated photovoltaics
5. Grey-water recycling
WALL SECTION

1. roof mounted photo-voltaic panels
2. R-40 roof
3. R-28 exterior envelope
4. office
5. building integrated photo-voltaic panels
6. triple glazed unit with light diffusing capillarity slab
7. triple glazed unit with digitally controlled electro-chromatic coating
8. green roof
9. triple glazed unit
10. retail
Strategic Decisions

The masterplan of the West 5 Development responds to the existing municipal street framework and provides a new network of streets and laneways that define the sites of the various new buildings. The success of the development will rely on the creation of refined streetscapes to support retail and commercial activity, but the organization of the streets is at odds with the energy generating objectives of the development as the street network is not optimally orientated for solar exposure.

The Sifton Centre addresses this issue by splitting the building programatically to provide ideal site orientation for each program type. Retail program, located on the ground floor, follows the street edges in order to support the public realm. The office floors located on levels 2 and 3, however are oriented directly east west in order to maximize the façade facing due south. This split in orientation provides added benefits as roof areas created by the misalignment of the ground and second floors provide opportunities for living roofs and amenity terraces.

Further enhancing these passive strategies is the design of the building envelope, which is comprised of high-performance insulated panels (effective R28) and roof systems (R40). Glazing accounts for less than 30% of the overall envelope area and is comprised of a mixture of triple-glazed vision windows, light-diffusing insulated slab glazing and insulated spandrel glazing. Solar heat gain on the ground floor is controlled by generous building overhangs. On the second and third floors, glazing incorporates a dynamic chromatic coating, which darkens in response to sun exposure to limit solar gains. This darkening effect is offset by the insulated slab glazing above, which allows daylight to flood occupied spaces without the negative warming effects.
As noted on the previous page, the West 5 development is a new model for a dense, mixed-use community located within a region of London that is currently low-density suburbs. As the community develops, it will be connected to regional bus routes; however, the objective of the development is to create a hub that will serve not only the residents who live within the community, but also those who live in adjacent communities, encouraging reduced reliance on car travel.

Community

At a community level, West 5 preserves and incorporates ecologically sensitive site area in a nature preserve that will provide amenity space for residents. Stormwater management for the entire community is consolidated in new collection ponds, which will provide enhanced wetland on the site.

Site Ecology
Water Conservation

Where roofs are not used for solar energy collection, intensive green roof systems have been incorporated to reduce the overall discharge into storm systems and to improve its overall quality. Stormwater that is collected is directed to a cistern where it is used to flush toilets.

Both the green roof systems and site landscaping utilize drought-resistant plantings, eliminating the need for supplementary irrigation.

Projected potable water consumption for the building from municipal or other centralized off-site supply: 0.6 L per m²/occupant/year; 1,664,000 Litres total

Percentage improvement over the reference building: 60.8%
ground floor lobby and green wall
The design of the Sifton Centre incorporates several daylighting and air ventilation strategies. The floor plate of the office levels is 60 feet deep—**all occupants have access to light and view, even if located in the middle of the floor**. Daylight penetration is enhanced by the use of light-diffusing insulated slab glazing, which refracts sunlight entering the windows driving it further into the space. The use of this glass offsets the dynamic chromatic glazing used to control glare and heat effects at vision glass locations, which greatly improves user comfort at the building perimeter.

Building lighting is ubiquitously LED and connected to both daylight and occupancy sensors and the building automation system. These systems ensure that artificial lighting is used, in the first instance, to enhance natural lighting; that space lighting is turned off when individual spaces are unoccupied and that the global building lighting is operable in concert with planned operating times. Taken together, these systems result in a projected total energy consumption of the lighting system of 27.4 KWhr/m².

The building owners opted against the inclusion of operable windows. There are other fresh air and ventilation strategies incorporated into the building design, however, to support user comfort and well-being.

Ventilation air is provided by a 100% outside air heat recovery air handling unit, which pre-heats and cools the outside air from the building exhaust air stream through a heat wheel. Ventilation air is delivered on an as needed basis through the monitoring of zone CO2 levels throughout to minimize energy use of treating outside air. The peak design flow for the outside air is 1 ACH.

The main lobby incorporates a two-story living biofilter wall which filters and humidifies air within the common spaces, enhancing air quality.
circulation.
Wellness

Occupant wellness is supported through the provision of ample natural light and view, as noted on the previous page. The building lobby features a grand staircase that connects the three levels and is more prominently visible than the building elevators, encouraging occupant use. This lobby also includes the Living Wall – a two-story biofilter comprised of a continuously irrigated wall of living plants, which filters and conditions the lobby air and provide pleasant background noise for the adjacent environment.

Roof spaces created by the misalignment of the ground and second levels are covered with an intensive green roof system and surround amenity terraces provided for the benefit of building occupants.

Within the Sifton office spaces, natural materials such as FSC-sourced wood veneers are used throughout to provide warmth and connections to nature. Wall graphics and glazing films depict local natural conservancies, including the famous “Sifton Bog”, a wetland conservation trail donated to the City of London by the developer.

The Sifton office includes a large social gathering/lunch space – the “forum” - which includes a fully-appointed kitchen, open lounge space (including digital entertainment area) and a variety of seating configurations. This space is literally the heart of the office space and provides a hub for social interaction and collaboration.

Materials and Resources

The use of recycled materials was not a priority for the building owner, nor was waste diversion. Metrics on these measures are therefore unavailable.

Finishes within the Sifton offices uniformly followed sustainable best practices by utilizing FSC certified wood products; low-emitting composite woods, adhesives, paints and finishes; gypsum and acoustic products and carpet tile with high-recycled content.
NORTH SOUTH SECTION 1

1. office
2. R-38 effective exterior wall
3. roof mounted photo-voltaic panel on R-40 effective roof
4. triple-glazed unit with light-diffusing capillarity slab
5. facade-mounted photo voltaic panel on R-28 effective exterior wall
6. triple-glazed unit with digitally controlled electro-chromic coating
7. triple-glazed insulated spandrel panel c/w enhanced thermal break
8. triple-glazed vision glass
9. intensive green roof R-40 effective
10. roof terrace
11. retail
12. stairs
13. R-28 effective soffit assembly
14. rainwater cistern pump room
15. service
Energy performance is achieved, in the first instance, through the passive strategies noted in item 1 on the previous page.

The building HVAC systems further contribute. Ventilation air is equipped with energy recovery systems, which pre-conditions outside air before it is delivered to the Variable Refrigerant Flow (VRF) distribution system. The VRF system is an electrically driven, 3-pipe refrigerant-based, dynamic energy recovery and sharing system. Heat and cooling generated in a central compressor plant is delivered to terminal units in various zones on an “as-needed” basis through supply and return piping. The third pipe in the system forms a continuous loop between terminal units, allowing energy being rejected from one zone to be utilized in another – better responding to the energy needs of specific building spaces related to differences in occupant load, proximity to the building perimeter, or equipment-generated heat loads.

The Sifton Centre incorporates extensive photovoltaic installations – both on the upper roof in a 115 kw array and also in façade-mounted panels on the south and west building faces, which provide an additional 57 kw. Taken together, these installations generate more electricity than the building consumes during the summer months. Additional solar arrays, which are slated to be constructed over the building’s parking lot during 2019, will increase this energy output to a point where the Sifton Centre will perform in a consistent net-zero energy condition.

The Sifton Centre does not utilize any natural gas or other fossil fuels for its base building systems.

What is the projected annual energy consumption for the building: 81 KWhr/m²

What percentage of the energy consumed is from renewable sources site installations: It is estimated approximately 60% of the annual electricity usage is generated by on site photovoltaic panels.
Flexibility and durability are built into the Sifton Centre design in the following ways.

The floor plate design is open, with a regular column grid and generous spans, which encourage flexible layouts. The reduced depth of office floors supports various layout configurations, each of which delivers improved access to natural light and view.

The building envelope is highly insulated, includes high-performance glazing and incorporates a continuous, warm-side air-vapour barrier. Transitions between materials and systems are carefully detailed to ensure the continuity of both the AVB and the insulation performance. The integrity of the building envelope contributes to the durability and lifecycle of the project by eliminating condensation and thermal effects.

Building cladding incorporates the rainscreen principle, including where this cladding is comprised of photovoltaic panels. The detailing of the panel connections will permit panels to be replaced as more efficient models come on line, meaning that the energy performance of the building is future-proofed from improvements in the technology.

Sifton has incorporated several educational initiatives into the building design. Within public washrooms, signage informs users of water reduction related to the use of greywater flushing toilets. The main building lobby includes a description of building and community features that contribute to the energy performance and sustainability of the development. As the building spaces are leased, Sifton intends to meter the energy use of each tenant and issue monthly reports that not only identify total energy consumption, but how this consumption compares to the expected energy use of the building as a whole. Tenants who consistently consume less than targets will be recognized to the building community, encouraging friendly competition between users.