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Stone34, USA

Case Study 128

Stone34 is a mixed-use commercial building in Seattle that uses around 75 percent less energy and water than the project baselines. The building is certified to LEED Platinum and is designed according to the City of Seattle's Deep Green Pilot program.

Aspects of Sustainability

This project highlights the following:

Green Aspects

- Energy
- Carbon
- Materials
- Water
- Local Impacts

Social Aspects

- Human Resources
- Corporate Community Involvement
- Business Ethics
- Health and Safety



Project Sustainability Highlights

Economic

- At least 75% reduction in utility bills for tenants
- Stone34's sustainability profile contributed toward a 6 m increase in building height compared with local building regulations
- CEO of Brooks (tenant) is attributing the company's hiring and market success to the new building and its attention to the community

Green

- Certified LEED Platinum & Deep Green Pilot program
- 75% **Energy** savings
- Embodied **Carbon** footprint conducted
- 97% of construction waste diverted from landfill
- 75% **Water** savings

Social

- Widespread community consultation during planning and design

Project Introduction

Stone34 is located at the corner of N. 34th Street and Stone Way, within the specific neighborhoods of Fremont and Wallingford. The building is the world headquarters of Brooks Sports, which sells specialty running shoes and apparel, and is home to the company's first ever retail store, it calls the trailhead. Stone34 is adjacent to the Burke-Gilman trail, which is a 43 km cycling and walking path that connects to other urban trails and extends north beyond the city limits.

With a market rate of US\$ 71 million, Stone34 was developed and built by Skanska USA Building for Skanska Commercial Development USA, which acquires, finances, develops and leases commercial properties. The five-story building includes 9,476 m² of office space, which is entirely occupied by Brooks Sports, and 2,347 m² of ground-floor retail space in eight separate retail store units. Brooks occupies two of the retail units and 88 percent of the building's total floor area. The building has a 5-story "active stair", which is a highly prominent feature visible from the street that includes a glass curtain wall enclosed staircase on the exterior of

Skanska Color Palette™

Building

Energy



Carbon



Materials



Water



the building adjacent Stone Way. The site includes a 740 m² outdoor plaza that features sculptural bike racks, and is designed to attract public gatherings. The building also has an underground parking garage with space for 218 vehicles. Stone34 was completed in the Summer 2014.

Stone34 is certified to LEED Platinum. LEED is a voluntary U.S. Green Building Council (USGBC) certification process intended to encourage and guide the construction of green and energy efficient buildings. The project is also designed according to the City of Seattle's Deep Green Pilot program, which requires projects to meet over 60 percent of the Living Building Challenge Imperatives. The Living Building Challenge is a deep green building program that promotes a high degree of sustainability in the built environment.

Contributing Toward Sustainable Development

Stone34 is designed to be one of the most efficient buildings on the market and uses over 75 percent less energy and water than comparable buildings, which significantly reduces tenant energy and utility risk during the term of its lease.



The building reuses rainwater, and incorporates low impact and highly sustainable materials. Stone34 also promotes healthy working environments and sustainable modes of transport. The development was designed to foster connection with the local community, and promoted urban renewal in northern Seattle. During construction, the team removed petrochemical contamination from the site, worked to minimize environmental impacts and diverted 97 percent of construction waste from landfill. The project incorporated significant input from the community and worked to create a lasting community asset for the neighborhoods of Wallingford and Fremont. The regional economy was boosted by utilizing local workers, subcontractors contractors and materials.

Green Aspects

Energy

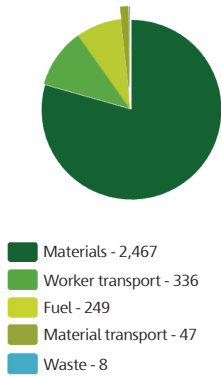
Energy Efficiency

Stone34 uses around 75 percent less energy than the CBECS (Commercial Buildings Energy Consumption Survey) 2003 database baseline. Skanska and Brooks designed a program for how the building would achieve its energy targets. The building is designed to minimize heat loss, with wall and roof U-values of 0.31 W/m²K and 0.14 W/m²K respectively.

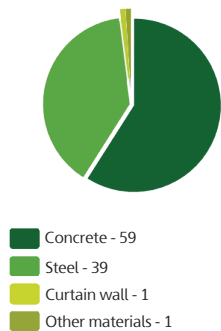
The building's heating and cooling are primarily provided by an efficient heat recovery chiller, with a combined heating/cooling Coefficient of Performance (COP) of up to 10.6 (i.e. the system can produce 10.6 units of energy for every unit put into it). The system, which is the first of its kind in Seattle, can simultaneously provide heating and cooling to different parts of the building if required. Heating and cooling are distributed by hydronic beams, which can realize energy savings of between 25 and 30 percent compared with conventional fan coil units. If only cooling is required, recovered heat from the building is stored in a 37 m³ thermal storage tank in the basement that contains phase change materials, which can store up to 1,025 kWh of heat for later use. A natural gas fired condensing boiler with an efficiency of 91 percent provides supplementary heating when the heat recovery chiller cannot provide sufficient heat.

The active stair feature and central stairwell act as a natural heat exhaust and ventilation system by using passive cooling and natural ventilation. A thermostat automatically opens the top louver and bottom damper in the stairwells to allow hot air to flow out of the louver and draw in cooler air from below.

Breakdown of Stone34's carbon footprint (CO₂e)



Percentage breakdown of emissions resulting from construction material manufacture (%)



In addition, the need for artificial lighting has been reduced by strategically placing large windows and by narrowing the floor plate depth early in the design process to allow natural light to better penetrate the building. Efficient LED lighting and motion sensors have also been installed to further reduce energy use.

Energy savings are also achieved through energy efficient occupant behavior as Brooks made an early commitment to limit energy use through their tenant lease. For example, they have a lighting and plug load allowance that they have committed to achieving. The allowances have led to most Brooks office employees exchanging their desktop computers for more efficient laptops, and switching off all office equipment at the end of the day. A dashboards is prominently displayed in their café and broadcasts real-time energy consumption statistics to ensure that Brooks are aware of their energy performance on a daily basis to promote efficient occupant behavior. The 5-story visible active stair feature is designed to encourage occupants to use the stairs rather than the elevators, in order to reduce energy use and promote exercise among occupants.

Intelligent energy management

Stone34 is equipped with a state-of-the-art Building Management System (BMS) that is able to identify deviations in energy performance in real-time and can send automated alerts to building managers. The system enables managers to quickly respond to performance issues in order to maintain the building's efficient operation.

Most BMSs installed in the USA do not provide real-time notification of building performance issues, and only notify of equipment failure or major maintenance issues, which means that energy performance issues may only be identified when utility bills have been received and processed. The BMS also allows tenant sub metering, which enables individual tenants to monitor and minimize their own energy use and ensures they are billed precisely for the resources they consume.

Carbon

Carbon footprinting

Skanska calculated the project's total embodied carbon footprint to be 3,117 tCO₂e. Emissions resulting from the manufacture of construction materials used on the project accounted for around 80 percent of the total footprint, and concrete and steel were the most significant construction materials in terms of embodied carbon.

Materials

Environmentally responsible materials

All wooden beams and columns from the existing buildings demolished on site were recovered and reused on the project to clad wooden canopies, two sides of the visible active stair feature and other feature walls. Additional reclaimed timber from another Skanska project site was also reused on Stone34, and all new timber used on the project was certified according to the Forest Stewardship Council. Other reused materials included "rumber" (recycled rubber tires) and old railway tracks that were used to create exterior seating.

As part of the project's LEED efforts, the team specified paint that met the Green Seal label, and all sealants, glues, adhesives and carpets were low-VOC (Volatile Organic Compound).

Waste management during construction

The team diverted 97 percent of the project's construction waste from landfill. Waste was comprehensively sorted on site and commingled waste was sent to a specialized sorting facility to minimize waste sent to landfill.

Water

Water efficiency during construction

Stone34 is designed to use 75 percent less water than the LEED baseline. The building is equipped with water saving bathroom fixtures and fittings, including showers that time-out after 4 minutes. Rainwater is harvested on site in an underground storage tank, which supplies water to toilets, urinals and the irrigation systems on the roof and in the plaza.

Stormwater management

The building has a rainwater harvesting, storage and treatment system, which is designed to ensure that over 50 percent of the site's stormwater is harvested and reused on site. The system includes a 245 m³ stormwater storage tank under an adjacent alleyway. Rainwater passes through vortex filters prior to entering the tank and the stored water is disinfected with ultraviolet light before being filtered inside the tank. The green roofing and landscaping on the site also help to absorb precipitation and reduce stormwater runoff and pressure on the municipal wastewater system.



Other Green Aspects

Raising awareness of more sustainable buildings

The Stone34 project and its sustainability aspects have been extensively covered in the local media. Brooks' dedicated building performance dashboard is installed in their café to allow visitors and employees to see energy and water consumption. Skanska also commissioned a Seattle-based artist to create a 5 m² kinetic sculpture for the lobby featuring brass flowers that bloom when the building is running efficiently and wilt when energy use is too high.

Reduced heat island effect

The site's landscaping and canopy trees, green roofing and indoor parking contribute to a reduced urban heat island effect in Seattle by minimizing the extent of dark and paved surfaces on the site.



Green roofing and walls

Around 560 m² of the roof is covered with sedum and green walls have been planted that include species of Virginia Creeper, Boston Ivy and Kiwi. The green roofing provides additional thermal insulation and extends the roof's lifespan by protecting it from weathering and ultraviolet light. Roofing and wall vegetation can also create habitats for birds and insects, filter airborne pollution and reduce stormwater runoff.

Social Aspects

Community consultation

Skanska reached out to several neighborhood groups to better understand their needs and concerns, and how to better integrate Stone34 into the community. Dozens of small meetings were held with individuals, neighborhood groups and local chambers of commerce. The building design was presented at several public meetings where design strategies and elements were debated and discussed. Ultimately the input refined the design into a project that incorporates elements that create a distinct community asset.

Minimizing public disturbance

Skanska ensured that local people were informed of upcoming construction activities and potential disturbances during the project. A monthly newsletter was issued to local stakeholders and a Facebook group set up for interested parties. Events were held to give the community a window into the construction and process of building.

Occupational health and safety

There was one minor injury on site during construction and the Lost Time Accident Rate per million hours worked was 0.65. Skanska followed its standard health and safety procedures.

Healthy working environments

Stone34 was designed to promote healthy working environments for the building's occupants. Low VOC (Volatile Organic Compounds), such as paints, were used and the penetration of natural daylight was maximized through extensive glazing and by narrowing the floor plate depth. The hydronic beams distribute cool air evenly without creating drafts and do not allow moisture, dust and dirt to collect on ventilation coils.

Community connection

Stone34 has been designed to foster connection with the local community and the wider running community.

For example, the building's stair feature with its glazing has been designed to connect the entire building with the outdoor plaza and the Burke-Gilman cycling and walking trail. The project also connects with the surrounding community through its expanded sidewalk and other public areas, historic railway elements that have been converted into seating and art from local artists. In addition, the site includes landscapes made up of native edible plants, which can be eaten by tenants, visitors, customers and passersby. The Brooks concept store connects with the running community through events, lectures and clinics.

Contributing toward urban renewal and sustainable urban development

The project has contributed toward the revitalization of a previously underused and peripheral site in northern Seattle that was contaminated with petrochemicals. Stone34 has helped to create a thriving neighborhood, and is thought to have attracted further development to the area, including over 1,200 new apartment units.

Stone34 has created an urban mixed-use space, which includes offices, street level retail units and a spacious public plaza, with seating and local art, for neighborhood gatherings and community interaction. The mixed-use nature of the site helps to promote a vibrant urban neighborhood. In addition, the team worked to promote a thriving street environment through design.

Promoting more sustainable modes of transport

Stone34 is equipped with showers, changing rooms and secure bicycle storage, and is conveniently situated adjacent to a major cycling and pedestrian route in Seattle. The building's facilities and location are intended to encourage employees and visitors to walk or cycle to the site to reduce car dependency. The underground parking garage is equipped with plug-in stations for electric vehicles.

Economic Impacts

Regional construction workforce and materials

670 workers underwent project orientation, and around 30 percent were Seattle residents. The project involved a large number of local subcontractors and consultants, including electrical, drywall, glazing, precast panel fabrication and landscaping companies.

Over 20 percent of the construction materials were regionally sourced (according to LEED criteria), including glazing, metal panels, precast concrete and mechanical systems.

Efficiency financial savings

The building is designed to be 75 percent more resource efficient than other newly constructed commercial office buildings in Seattle. Assumed financial savings for tenants, who directly pay for the energy they use, can be expected to be at or exceed this estimated figure.

Learning From Good Practice

The sustainability aspects of the project make significant financial and environmental savings throughout the building's lifespan, and help to strengthen the client's brand and its connection with the community. The building's sustainability profile also contributed toward the City of Seattle approving a 6 m increase in building height compared with the neighborhood's height restrictions during the planning phase.

