The duck pond in Assiniboine Park is an iconic spot for Winnipeggers, but after nearly 100 years this beloved destination in the premier city park was in total disrepair.

The new Qualico Family Centre, adjacent to the water feature, is part of a $200 million transformation of the park. “Assiniboine Park is sort of the backdrop for memories for generations of Winnipeggers,” says Brent Bellamy, senior design architect at Number Ten Architectural Group, the firm that designed the new center. “It’s a place that all Winnipeggers have ingrained in their memory.”

A major theme of the family center is the passage of time and this is borne out in the building’s materials and features, particularly the green roof which will evolve and mature with the structure over the years.

Bellamy explains how the green roof was created to meet several needs. “We wanted to recreate the habitat that was lost by [constructing] the building. The plantings that we put up there recreate habitat for butterflies, bees and squirrels and we were conscious to [include] plants that are food sources for animals.”

The plantings are also tailored to Winnipeg’s harsh climate. “It was important to us to use plants that also die back in the springtime. So in the wintertime we’re seeing the big tall grasses poking through the snow. It’s not just a green roof for the summertime; it’s for the wintertime as well.”

The green roof even helps combat the heat island effect that often occurs when built-up areas retain heat, and also helps with drainage because there is no real sewer system nearby. “By having a green roof, you alleviate the need to put in that infrastructure,” says Bellamy.

The exposed Douglas fir glulam structural roof system was a cost-effective solution for the complex angled roof planes of the design. The firs efficiently support a 300mm-deep green roof system over the entire building. “It was a nice, deep system,” says Bellamy. “The roof itself was really heavy, something like 1,200 kilograms per cubic meter, so it flexed almost an inch when we put the growing medium on top.”

Nicolas Heffernan
The main design problem Bellamy faced with the roof structure was the effect that weight would have on the wood structure, especially given that glass walls go right up the underside to the wood beams. "Because the wood is flexible we had to make sure that we took into account that the building was going to move when the roof went on because it weighed so much," Bellamy says. The architects also had to account for the difference in weight from when the soil was wet or frozen solid to when it was dry. "When it's soaking wet the building can really flex because the soil is [heavier]," says Bellamy.

In order to accommodate the flexing from the variable weight of the green roof, the architects left a gap that was filled in with a slip joint to make sure that glass and any other building materials underneath weren’t crushed. "It really provided the perfect solution for us," Bellamy says. "We met all the structural requirements and still got the beautiful finish of the wood. It was a win-win."

Technically speaking, there’s not a huge difference between building a green roof and a conventional one. "It’s built like a typical roof," says Bellamy. "Instead of shin-
gles you put down a root barrier [system] that goes right on top of the vapor barrier.” The root barrier not only keeps the roots from penetrating down, but it also includes a drainage mat that lets the water seep through the mud to drain out.

Green roofs are not only for commercial applications; they’re gaining popularity in residential construction as well. Sabine Karsenti, owner of Ecologia Montreal, wanted an eco-friendly home and a major part of that involved a green roof. Her green roof easily blends a contemporary aesthetic with an eco-friendly approach.

The roof is constructed from fiberglass and supported by a Douglas fir structure. Once built, a truck sprayed six inches of soil over the 1,400-sq.ft. roof. “The beams are very close together so structurally there’s not an issue," she says.

In addition to environmental benefits, the roof also saves money on heating and cooling expenses. The plants and growing medium of a green roof provide thermal mass, evaporative cooling and shade that reduces temperatures on the roof surface and in the building interior. According to the Natural Resources Defense Council (NRDC), temperatures on the surface of a conventional dark roof may exceed those of ambient air by 90 F or more on a hot, sunny day, with much of the heat transferred into the building’s interior. The temperature of a green roof may actually be cooler than the surrounding ambient air. Though results have varied, studies have found that green roofs can reduce the energy needed for building cooling on the floor below the roof by upwards of 50 per cent. “Our considerations for the green roof were the longevity and eco-friendliness of the materials used. The longevity is over 100 years,” Karsenti says. “We can plant our fruit and veggies so we can be self-sufficient.”

LiveRoof is a company that caters to both residential and commercial clients. Launched in 2006 with its first installations in 2007, the company has since installed
approximately three million sq.ft. of green roofs in the U.S. and Canada. "It’s a growing market," says Amber Ponce, LiveRoof’s Business Development Manager.

Ponce says a green roof offers numerous financial benefits, including extended roof life, energy savings, and increased property value. Green roofs reduce the volume of rainfall runoff and pollutants entering the water system by absorbing the water on the roof.

There are two types of green roofs: intensive and extensive. The former is widely used on commercial buildings where owners want to have large green areas that incorporate all sizes and types of plants. The soil depth usually starts at

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LiveRoof has installed about three million sq.ft. of green roofs in the U.S. and Canada since 2007.
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six inches. Extensive systems are primarily used for residential buildings and are suited to spaces where people are rarely going to be walking on the roof surface. They range in depth from 1.6 to six inches.

LiveRoof’s most popular system offers a soil depth of four inches, which allows for 30 pounds per sq.ft. fully saturated and fully vegetated. “It provides enough structure for the roots of the plants that in most climates you can plant it with very drought-tolerant plants that will need minimal supplemental irrigation,” Ponce says.

Such a system makes so much sense for the Qualico Family Centre, Bellamy says, which invites visitors to imagine a beautiful space nestled under a canopy of trees by a quiet pond. “The building is carved out of the forest so we wanted to make it blend back into the natural surroundings,” Bellamy says. “It stands as a symbol of the sustainability of the building and the park itself.”