The Current State of Stormwater on the University of Winnipeg Campus

Final Project

Course: Critical Environmental Issues: Campus Sustainability

ENV – 4614 – 001

Professor: Dr. Alan Diduck

Student: Samantha Leech

Student #: 3037179

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Purpose

Stormwater management is an important component of environmental sustainability in the urban environment including university campuses and especially those located in downtown

Objectives

- Professor Alan Diduck and my classmates in ENV-4614 – Cody Lapointe, Patrick Carty, Tessa Ausborn, Maureen Hanlon and Nadine Kanik (along with frequent class guest Justine Backer).

Literature and documents used and referred to throughout this project were found either online or graciously provided by individuals mentioned above:

- The University of Winnipeg Water Use Management Policy. http://uwinnipeg.ca/sustainability/docs/policies/water-use-mgmt-policy.pdf
- Sustainability Tracking, Assessment & Rating System (STARS) Sustainable Campus Index. University of Winnipeg Scorecard – OP-27: Rainwater Management.

from all University programs, facilities, and operations through the hierarchical application of demand reduction, reuse, recycling and recovery."

This goal would be achieved if collected storm water was reused for landscaping to reduce the amount of potable water used currently for such purposes. Rather than collecting water solely for diversion reasons (although still serving this important function), this water, if collected from rooftops could be used to water green spaces such as lawns and flowerbeds on campus. Currently 100% potable (drinkable) water is used for this purpose.

STARS Certification

Currently the University holds STARS rating of Silver, and achieved a total score of 58.86/100 overall. STARS stands for Sustainability Tracking, Assessment & Rating System. Participating in STARS allows institutions to measure their sustainability efforts over time, compare themselves to institutions worldwide, generate new ideas regarding policies, planning and budgeting as well as to incentivize institutions to continuously improve their efforts. Assessments are based on self-reported data and points are awarded to sustainable practices outlined in such reports. Ratings include; Reporter, Bronze, Silver, Gold and Platinum. Submitting to STARS requires lengthy data collecting and should be viewed as a success regardless of rating. Campuses can resubmit to STARS every three years. Our last submission was March 5th, 2015. Therefore, the University will be permitted to resubmit in March of 2018. Under the category OP-27: Rainwater Management our University scored 1.00/2.00. One point awarded for our Water Use Management Policy, but we failed to receive a second point because we lack 'Low Impact Development (LID)' practices. Such developments could include policies or standard practices to reduce stormwater runoff volume and improve outgoing water quality.

Criteria in this category would likely have been satisfied if the proposed storm water holding cisterns were incorporated into the construction of the RecPlex. Under 'OP-26: Water Use', a score of 1.51/3.00 was earned. It is possible that this rating could also be improved, depending on the amount of potable water (US gallons/cubic meters) that would be replaced with non-potable, recycled stormwater.

Results of Consultations

In one of our first meetings as a class, we toured buildings on campus. We had heard that the newest building on campus, the RecPlex, was built with stormwater retention tanks. As a class we decided this was an interesting topic for a course project and I then chose to learn more about our stormwater management systems. We soon learned that the tanks had not been built as proposed in initial design plans. With help from the individuals mentioned above, I discovered that our campus indeed does have retention tanks, i.e., the tanks located in the Richardson Green Corridor, built a few years before the RecPlex, but water stored there is not reused in any way by the university. I also discovered that stormwater management systems are much more complicated than I had originally expected and that was reflected in costs. According to the websites of retailers of such tanks, a tank the size the proposed RecPlex tank (40,000 US gal) ranges from $25,000USD-$50,000USD. In addition to the tanks, piping is required and addition plumbing and filtration is required if the intent is for the water to be reused, further adding to cost. Ultimately, the university decided that it was too expensive to invest in such a system at the time of construction.

Feasibility

In discussion with Greg Hasiuk, the head architect at Number TEN involved in the construction of the RecPlex, I was informed of the cost savings associated with abandoning the

Fig. 3. Current cistern location

Figure 3 is a photograph of the location of the current retention tank, facing Spence Street. This is the Richardson Green Corridor, or the green lane phase two shown in Figure 2. In this picture, one cannot see the physical tanks, but you can see there is a la

would not be exposed to reuse-inhibiting pollution. This of course is a good “selling point” because using this water would reduce potable water consumption ad the payback period of the project. This would be a good next step if this project were to continue.

Concluding Comments

Stormwater management is much more complicated and costly than I had originally presumed. The cost savings for the university for removing the plan for a storm water retention tank in the development of the RecPlex was $175,000. These systems are complex because there are many different options depending on size, use, and location of the tanks (above or underground). There is no doubt that the collection of stormwater from a roof-top for the purpose of reuse on campus in landscape maintenance would be beneficial to our sustainability practices. Unfortunately, it was too costly at the time of construction to accommodate such infrastructure on the RecPlex. A major component in the completion of the RecPlex is to have a sustainable building. Future-proofing measures are an important feature in the building for new development to occur. It is possible for tanks to be added in the future, and a further feasibility study would reveal where, when and what size of tank could be possible to incorporate to the building. To continue this project, the best next steps would be to begin this feasibility study with an in-depth cost-benefit analysis and to identify the most efficient location and tank size to suit desired purposes. Application for a government grant would be a crucial next step in the realization of a stormwater management system on campus.

Acknowledgements

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the course. I am grateful to Kyle MacDonald for showing us first hand some of the sustainable features of our campus, and for providing me with and redirecting me to information about stormwater, stormwater tanks and stormwater tanks on campus. I am also grateful to Dave Torz for touring me around the RecPlex and sharing information regarding the physicality of stormwater retention tanks both already in use and proposed. Thank you to Linda Palmer for getting me in contact with the head architect in the building of the RecPlex. Many thanks to Greg Hasiuk for answering my questions about the economic barriers the university and the architectural firm felt during construction of the building, and providing further information on subsequent decisions. As well, thank you to Alan Diduck and all of my classmates; Cody, Patrick, Tessa, Nadine and Maureen (and Justine) for offering information and suggestions throughout the course.

Appendix A – Sources

The University of Winnipeg Water Use Management Policy. (2007). Retrieved from: http://uwinnipeg.ca/sustainability/docs/policies/water-use-mgmt-policy.pdf

STARS.AASHE Sustainable Campus Index. (2015). University of Winnipeg Scorecard – OP-27: Rainwater Management. Retrieved from: https://stars.aashe.org/institutions/university-of-winnipeg-mb/report/2015-03-03/OP/water/OP-27/

Number TEN Fieldhouse (RecPlex) Parkade Floor plan.
Shows size (40,000 US/Gal) and location (underground parkade) of proposed RecPlex cistern. Provided by Kyle MacDonald.

Appendix B – Figures

Figure 1 – Combined Sewer System Schematic

City of Winnipeg Water and Waste Department. Retrieved from:

http://www.winnipeg.ca/waterandwaste/sewage/combinedSewerOverflow.stm

Figure 2 – Schematic of Proposed Cistern Location

Provided in an email from Kyle MacDonald.

Figure 3 – Current Cistern Location

Photograph taken by myself.

Figure 4a & 4b – Possible Alternative Tank Locations on the Eastside of the RecPlex

Photographs taken by myself.