

**Prince Rupert Stormwater Management Facility
Public Consultation
Held December 4, 2013 at the Lion's Centre, 11113 113th Street NW**

Attendance: 11

Presenters:

- Max Mao, Project Manager, Drainage Services
- David Yue, Principal, Sameng Inc.

Councillor Bev Esslinger was in attendance.

Presentation

The following is a brief summary of the topics covered in the presentation.

- The City established an Opportunistic Flood Prevention Program in 2011. This is a proactive program to improve the level of stormwater service and reduce the flooding risk in high-risk, mature neighbourhoods. The program depends on the availability of suitable surplus school sites and community parks.
- The Prince Rupert neighbourhood was identified as a neighbourhood that would benefit from participation in the Opportunistic Flood Prevention Program and the abandoned Prince Rupert Elementary School was identified as a possible location for a stormwater management facility.
- The Prince Rupert neighbourhood is currently serviced by combined sewers. One of the benefits of the completion of the project is to reduce the sewage released into the North Saskatchewan River via combined sewer overflows (CSOs).
- The three major objectives of the overall project is to:
 - Reduce the flooding risk in the neighbourhood;
 - Reduce the volume of CSOs to the river;
 - Improve the quality of water being released to the storm sewer system and eventually the river.
- Various improvement options were considered by different engineering firms and the installation of storm sewers and the construction of a stormwater management facility (SWMF) at Prince Rupert Elementary School Park was determined to be the most effective option to address the three major objectives.
- At this stage of the preliminary design, the improvement recommendations are:
 - Stormwater management facility at Prince Rupert Elementary School Park (4.5 m deep at maximum depth)
 - Installation of stormwater pipes at:
 - 113th Ave from 117 Street to Tower Road
 - 113th Ave from 113 Street to 115 Street with a connection along the alley to the inlet at the NW corner of the SWMF
 - 115th Street from 113A Ave to 113 Ave

- 116th Street from 113 Ave to 111 Ave with connections to the inlet at the NW corner of the SWMF and the outlet from the SWMF at the SW corner
 - Catchbasin reconnections
 - Catchbasin flow restrictors
- The current conditions of the Prince Rupert Elementary School Park were discussed. The proposed plan is to locate the stormwater management facility at the south side of the park, leaving the north side of the park for a Community Facility. Presently the Community Facility is being planned by the Prince Rupert Community League, the Terra Association and the Alberta Thai Association.
- Four design options for the SWMF were presented to the public:
 - Design Option 1: Shape 1 and Bioswale: landscaped with trees and pond vegetation, bioswale to improve water quality, open play area with room for sports net, space for skating rink at the NE corner of the site.
 - Design Option 2: Shape 1 and Wet Meadow: landscaped with trees and pond vegetation, bioswale in connection to a permanent wet meadow design to improve stormwater quality, provides space for a skating rink at the NE corner of the site.
 - Design Option 3: Shape 2 and Bioswale: landscaped with trees and pond vegetation, bioswale to improve water quality, open play area with room for sports net, space for social skating in the central portion of the site.
 - Design Option 4: Shape 2 and Wet Meadow: landscaped with trees and pond vegetation, bioswale in connection to a permanent wet meadow design to improve stormwater quality, provides space for social skating in the central portion of the site.
- The water depth in the pond during a 1:100 year storm event would peak at 2.8 m. It would take 4 hours to reach this depth and 35 hours post-event to drain. The depth during a 1:2 year event would peak at 1 metre above the pond bottom. It would take 4 hours to fill to this depth and 18 hours to drain.
- The benefit of the proposed improvements is a reduction of surface ponding, reduced likelihood of sanitary backups and basement floods and less property damage. The proposed improvements provide sewer separation for approximately 50% of the neighbourhood, and 68% during large flood events. These improvements result in reduced sewer overflows to the river and improvements to the quality of stormwater being discharged to the storm sewer and the river.
- The project is currently at preliminary design. There will be a second public information session in the spring of 2014, pre-construction. Construction is proposed to start in the spring of 2014, to be completed in the fall of 2014. Final commissioning is anticipated in September 2015.
- Several recommendations to homeowners were presented with the objective to further protect the homes from flooding.
- At the end of the presentation, the public was invited to ask questions (see below for Comments and Feedback). The public was then invited to review presentation boards that were displayed around the room, and to fill out the feedback form.

Feedback Form Summary

In the feedback form, the residents were asked to indicate their preferred pond shape and landscaping option and any other recommendations that should be integrated in its design and return it to the consultants. A total of 9 exit surveys were filled out and returned. After the public consultation, the feedback form was circulated through the Prince Rupert Community League. The comments from the returned feedback forms will help to guide the design process.

The following is a summary of the preferred landscaping options submitted on these forms:

Landscaping Option	Number of votes
Option 1 – Shape 1 and Bioswale	2
Option 2 – Shape 1 and Wet Meadow	2
Option 3 – Shape 2 and Bioswale	3
Option 4 – Shape 2 and Wet Meadow	2

Question and Answer Period

Q: During construction, will there be any water and sewer restrictions? Last year the gas lines were replaced and they took longer than scheduled. What will be the impacts of this project on the water and sewer service?

A: The scope of the work that is being proposed is to install new storm sewers and reconnect sewer catchbasins. This work will be separate from the water and sewer lines. There will be crossings, and adjustments will be made to minimize any potential service interruptions. One portion of the preliminary design is to identify these potential conflicts and develop routes and methods to avoid unnecessary service interruptions.

Q: What will be done about foreseeable traffic problems? How will traffic flow be maintained, particularly on 116th Street? This is the main access to the neighbourhood because crossing 111th Avenue at 113th Street is nearly impossible. There needs to be another way to get on to 111th Ave.

A: The consideration of traffic routing is something that will be part of the detailed design, the particulars will be discussed with the appropriate city departments and they will be reviewed with a contractor. The specific reminder of locations is helpful and these areas will be given special attention.

Q: On the slides you included how long it would take to drain and fill the pond in a 1:100 year storm, a pond with a volume of 12 500 m³. Do you have the calculation present to determine the volume of the pond required to manage a 1:80 year storm? What volumes are needed for a 1:80 year storm, or 1:90 or 1:70? Would these be completely different?

A: The 1:80 is a non-standard storm. The design storms are determined through a collection and summary of historical rainfall data. In a computer model, these storms are used to determine the flows into the sewers and those volumes are used to determine how much water will require storage in the pond.

Q: This question is related to wet meadow options. Do you know the risks? Have you done a risk assessment? I like the idea of a water body nearby, I just want to know that the risks are small.

A: The detailed design is not complete, so we don't have a completely accurate view of how much water will be stored in the wet meadow on a permanent basis, but a depth of under a foot is part of the design criteria. One of the goals is to work with the subsurface soil to hold water longer on site resulting in more retained water and less water ultimately flowing to the river. The pond wouldn't be an open pond with a lot of standing water. The depth would be under a foot. It would be heavily vegetated with tall grasses. In the wet meadow option, there would not be an open play area at the bottom of the pond. The wet meadow option would be mainly an aesthetic feature for the residents. The option with the open play area would have a bioswale. That option would have water flowing through it but no standing water.

Q: Would there be a need to spray for mosquitoes?

A: There are some calculations to do to determine the amount of water the pond would hold, the retention time of the pond and how long it takes to breed mosquitoes. There would be no mosquito concern for the bioswale option but if the wet meadow were to hold water for more than five days, that could begin to become a concern.

Q: What is the standard design storm for stormwater facilities associated with new construction in residential areas?

A: The 1:100 year event is the design storm for stormwater management facilities. The majority of city facilities are designed to handle the 1:100 year event. In the street there will be no more than 12 or 10 inches of water. The pond is required to safely contain the rainfall of a 1:100 year design storm and ensure no ponding on private property exceeds 12 inches. To manage this, all calculations are performed for the 1:100 year storm event. Because the city has historically had flooding issues, they have a record of the rainfall in extreme events. Commonly, designs are checked against these historical storms as well as they may exceed the 1:100 year event; and we intend to accommodate these storms in the neighbourhood after the improvements have been completed.

Q: The current design to accommodate the 1:100 year storm requires about half of the property. If the design storm was reduced to 1:80 year flood event, is there a sense of what kind of reduction in the footprint would be associated with this change? Could you provide the neighbourhood with this information? The question is that if the stormwater management facility was designed for a 1:80 year rainfall event, how much area would be required? Would the area required be significantly reduced?

A: The computer model would be able to provide for us the information on pond sizing in a 1:80 year rainfall event. Presently, those calculations are not complete, but off hand, the difference would likely not be that great. The difference between a 1:10 year storm and a 1:100 year storm event is about double, so changing to a 1:80 year storm from a 1:100 year storm wouldn't change very much. If you and the City were willing to consider the 1:10 year storm as the design storm, that might make a small difference.

The size of the pond is constrained by design standards. City regulations will not allow ponds to be constructed with side slopes greater than 5H:1V. There is a low point in the area that the design will drain. To attain the required depth for drainage, the bottom of the pond has to be more than 4 metres deep. When that depth is projected with a 5:1 side slope, a large amount of

space horizontally is required. If the rainfall event is reduced, the pipes could have smaller diameters but the pond size doesn't have very much flexibility.

Q: What are the pros and cons for a bioswale versus a wet meadow? Does the city have a preference in terms of efficiency?

A: The city and design team doesn't have a strong preference for a design; this process is to determine the desires and requirements of the community. The city and design team have reviewed the options prior to presenting them to the community. If the majority of the community prefers a meadow design, the design team will take that into account.

Q: Is one design more efficient than the other? Can one handle water more efficiently than the other?

A: The option with the wet meadow offers more environmental benefits. It can introduce more diverse species of vegetation. The facility actively has more room when the space is not taken up by passive recreation and is instead consumed by environmental areas to produce stronger environmental benefits. The flood protection will be exactly the same. The decision is more about environmental benefits and the preference for the space usage of the park.

Q: Earlier in the presentation you mentioned that the area to the east is actually a lower area, this space is Airway Park. Have you considered the option of locating this pond on Airways Park rather than on the school ground? The school ground itself is a fairly tight area; Airways Park has a much larger area.

A: When Sameng was contracted to do the work, we were contracted with the concept of a stormwater management facility on the school site already in place, so no, we have not considered that option.

The city has hired numerous people to consider the options for flood protection in the area. The Opportunistic Sewer Separation program identified land in available abandoned school property and park sites. This is a school site available for stormwater management. Drainage has purchased the land at the Prince Rupert Elementary School Park for drainage purposes. This site is the centre of the neighbourhood. All water can be directed towards this site. If the pond is constructed on the east side of the neighbourhood, the water will have to be piped a greater distance. For cost effectiveness this site is the ideal site for the facility. Other engineering consultants have completed feasibility studies and have identified this location as an ideal location for stormwater management for the neighbourhood.

Q: What is the catchment area? What are the catchment boundaries?

A: The catchment area covers approximately 50 hectares from 118th/119th Street to 113th Street and between 113 Avenue and 111 Avenue. Some areas will still be on combined sewers, particularly in areas that were previously twinned where even with the increase in the severity of storm events, flooding should not occur in the 1:100 year scenario.

Q: Is there much capacity in the sewer system for future development? For example, if more multifamily housing is built here?

A: Although the objective of the project is not to increase sewer capacity for intensification, increased capacity will be one of the benefits. Combined sewers are fairly large when they only have to handle household drainage. The size of pipe that is being installed is close to three feet in diameter to manage the 1:100 year storm; that is the magnitude of flow that is being removed from the combined sewers.

Q: The area prior to the Second World War was a boggy area. Then there was 10 years of drought and a couple of wet years. Although those are all likely factors, is climate change also something that is being considered because our storms are becoming more violent and more productive?

A: The city has been measuring rainfall for years. Over time, the design rainfalls have increased. The city has hired the University of Alberta to study the impact of global warming on drainage systems. The facility that is being designed for Prince Rupert is being designed for updated design storms. The new 1:100 year design storm is 30% greater than the previous design storm.