Duggan SWMF and Storm Sewer Improvements

City of Edmonton

Location

Edmonton, AB

Key Team Members

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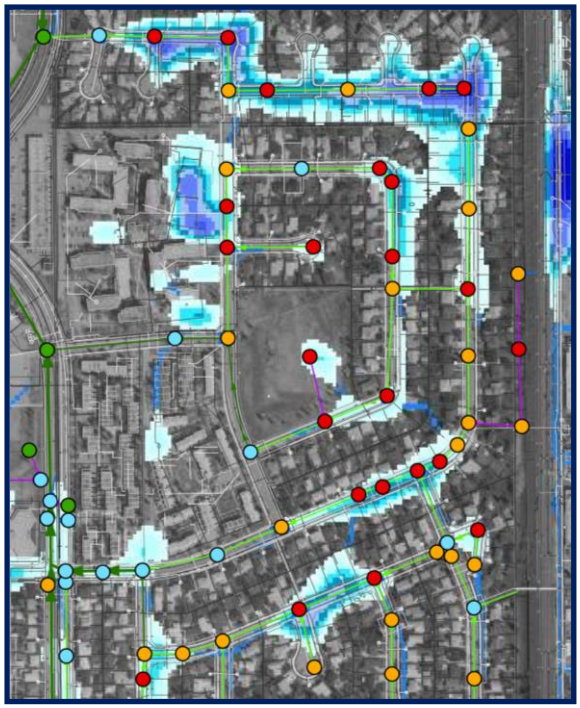
Duration

2012 - 2017

The Duggan Stormwater Management Facility (SWMF) was constructed at Charles Anderson Park and performs as both a naturalized bioretention area (during frequent rainfalls) and a surge pond (during intense rainfalls). The SWMF, together with the storm sewer and catchbasin improvements, will provide a 100-year level of flood protection to the area. Landscaping of the pond was designed as an LID feature with a naturalized bioretention area.

Sameng was retained by the City of Edmonton in 2012 to provide concept validation, preliminary design, detailed design, contractor procurement, general engineering during construction and project commissioning of these components. The project also involved geotechnical investigations completed by Thurber Engineering, landscaping design by EDA Collaborative Ltd., value engineering and risk assessment workshops, as well as stakeholder meetings and public consultations.

During the concept validation stage, Sameng developed a detailed stormwater model using Mike Urban. The computer model was constructed using the most up-to-date City trunk models and local pipe information from the City's DRAINS database. Sameng updated the model to include a coupled minor system (sewers) and major system (surface drainage) within the same storm model. The integration of surface drainage flows allowed the model to provide a more accurate representation of the surface flooding mechanism during large rainfall events.



Anticipated flooding during 1:100yr rainfall event prior to improvements (red dots indicate surface ponding of more than 0.3m above ground)

As part of the design, Sameng developed a cost-benefiting conveyance improvement plan that would see flooding to the northeast of the neighbourhood reduced significantly; an area that saw several flood reports in the past. Simulation results of the improved system shows that a 1-in-100-year level of flood protection is achieved in the vicinity of the SWMF. A catchbasin improvement plan was also developed for the area, to allow capture of the 100-year flood event.

SWMF under construction

Following a public consultation, in which a majority of residents were in favour of a naturalized landscaping design concept, our project team designed a LID bioswale design at the bottom of the SWMF, from the inlets to the outlet. This would provide low-flow conveyance of some reconnected catchbasins to the facility and provide water quality enhancement. The pond would act as a surge pond during larger rainfall events.

Detailed design of the project was completed in 2013. Construction of the SWMF and sewer improvements concluded in 2016. The project is currently under warranty period.

SWMF shortly after construction completion