SÖDERHAMN EWL & HEAWATER

Output 4.1 of Interreg Baltic Sea Region project NOAH

Protecting Baltic Sea from untreated wastewater spillages during flood events in urban areas

Contents

1 HeaWater pilot sites

1.1 Site description

There are two pilot sites in Söderhamn that are within NOAH test area:

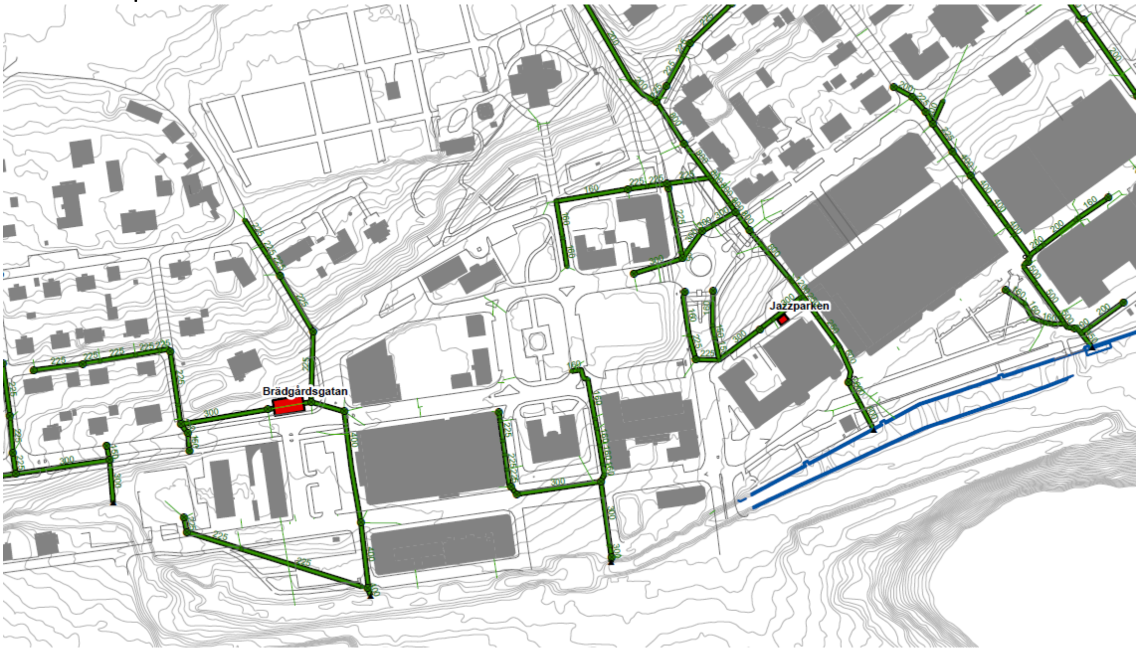

Figure 1 Site map with NOAH drainage model (green lines) and HeaWater sites (marked with red rectangles)

Preliminary design drawings were used to model the sites with the stormwater model. Brädgårdsgatan raingarden unit will take water from one street inlet, has detention volume and overflow for the excess water to the stormwater system (Figure 2). Most of the rainwater will be infiltrated to the ground. The rainwater from Jazzparken catchment will be directed to the unit by two street gutters (Figure 2). One existing stormwater inlet has bee cut off from the pipeline and collected water is directed to the unit. The site has an overflow that directs excess water to the main stormwater pipeline. Most of the runoff is expected to be infiltrating. The volume of Brädgårdsgatan unit is 46 m^3 and Jazzparken 5 m^3.

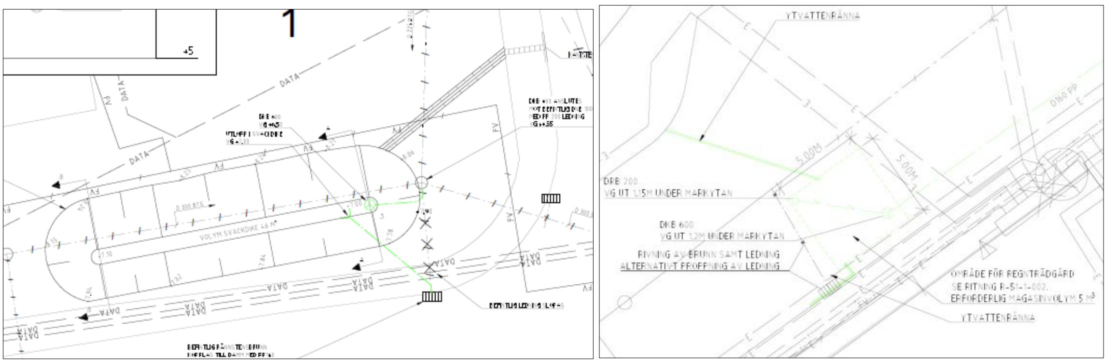

Figure 2 Brädgårdsgatan site (left) and Jazzparken design drawings (right)

Both units were modelled in SWMM as raingardens. As no water quality data is available, the analysis focused only on the impact on peak flow and runoff volume reduction. The analysis was done by using RCP4.5 rainfall curve created in NOAH project for EWL risk maps (Figure 3).

Technical parameters were taken from the preliminary drawings, and default values suggested by the modelling software was used in case the information was missing in draiwngs.

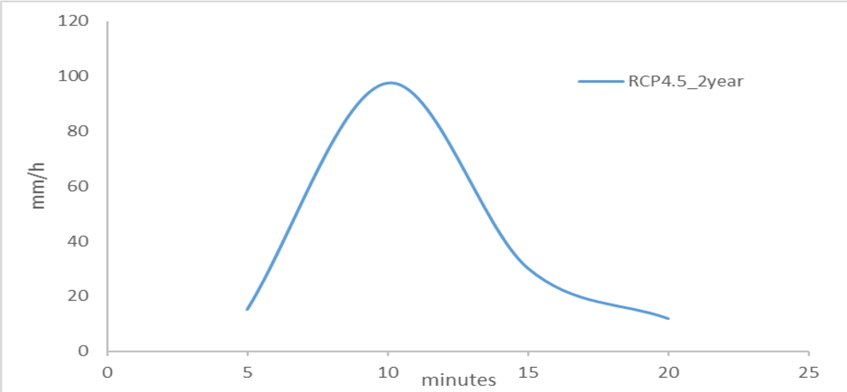

Figure 3 RCP4.5 2 year rainfall event used in NOAH analysis

Soil saturation before the simulation was set to 50% in order to analyse the realistic situation in warm period of the year.

1.2 Results

For the analysis flowrate from the catchment, i.e. street inlet with and without raingarden was compared. The results are presented in the figures below.

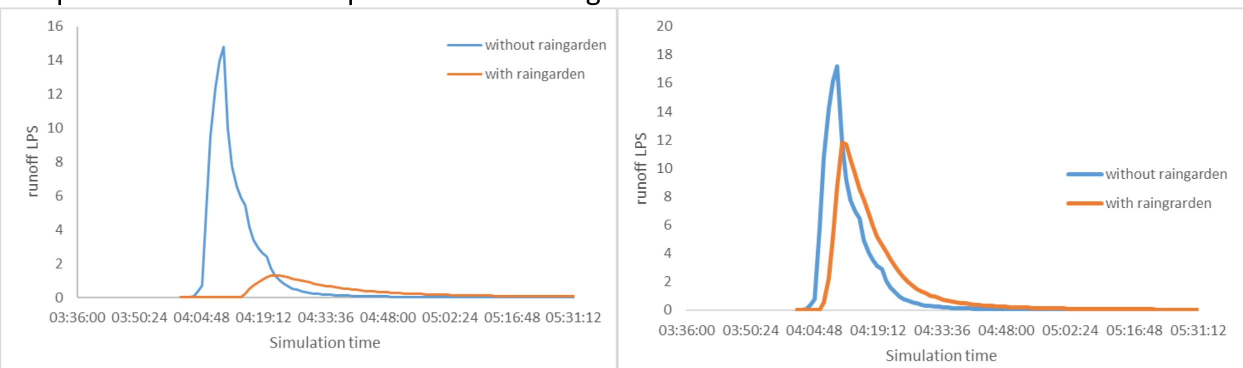

Figure 4 Impact of the raingarden on runoff from the street inlet: Brädgårdsgatan site (left) and Jazzparken (right)

It can be seen from the footages that although the peak runoff from the both sites is similar (ca 17 LPS), Brädgårdsgatan manages to reduce the outflow more efficiently (90.8%) than Jazzparken (41%). Brädgårdsgatan also causes substantial shift in peak flow timing. Both sites also reduce the runoff volume. It can be assumed that the difference stems from the sizes of the unit (Brädgårdsgatan 46 m^3, Jazzparken 5 m^3).

According to the literature the peak flow reduction of typical LID solutions is around 30-50%. Therefore, it can be concluded from the analysis that both sites show high efficiency and are contributing to the reduction of flood risk at the downstream. As the sites capture water from only one inlet, their impact of the total runoff of the area is not remarkable (the peak runoff from Brädgårdsgatan stormwater collector is 250 LPS and Jazzparken 120 LPS). Despite that, the investigation showed that the sites perform well under tested future rainfall event and more similar pilots should be constructed for preparation of the climate change in the area.