



## CITY OF MELROSE

## OFFICE OF PLANNING AND COMMUNITY DEVELOPMENT

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### MELROSE GREEN INFRASTRUCTURE CASE STUDY

**Municipality:** City of Melrose

**Project Title:** City Hall Parking Lot Green Infrastructure Project

**Grant Award:** \$70,313

**Match:** \$23,438

#### **Community Overview:**

The City of Melrose is located about seven miles north of Boston with a population of about 28,000. Incorporated in 1900, the city is mostly residential with access to three MBTA commuter stations, the Oak Grove T station just over the border with Malden, and the Melrose Wakefield Hospital which serves surrounding communities. Main Street runs from Malden to Wakefield and cuts through a vibrant and historic Melrose downtown that includes many shops, restaurants, post office, and two grocery stores, as well as City Hall built in 1874, the central fire station built in 1895, and the Memorial Hall performance center built in 1912. The City Hall parking lot is located behind the three municipal buildings and provides parking to city employees, shoppers, diners, and attendees at the more than 300 events that take place at Memorial Hall each year. The parking lot was the former site of Dix Pond which was paved over around 1900 due to concerns about mosquito breeding and rubbish dumping.

#### **Description of Climate Impact:**

As Melrose is located inland from the coast, the city is most vulnerable to future climate change impacts from rising temperatures, severe storms, and increases in both total precipitation and days with precipitation. These vulnerabilities and associated risks to the community and its residents, infrastructure, open space, homes and businesses were discussed at length during the MVP workshops in 2018. Installing green infrastructure solutions to both manage intermittent flooding and better manage stormwater is a priority of the MVP plan. As such, applying for an MVP Action Grant to fund the design and installation of green infrastructure at the City Hall parking lot to alleviate regular flooding and standing water issues as well as providing water quality

improvements downstream in the Mystic River Watershed was an opportunity not to be missed.

**Project Goals:**

The city was awarded funding for the first phase of the project which included hiring a firm to explore all available options and come up with the best affordable green infrastructure design to better manage stormwater in the parking lot. The specific goals of the project included using green infrastructure components with minimal grey infrastructure to capture and treat stormwater in addition to using the project as an opportunity to educate the public about the use and purpose of green infrastructure with interpretive signage at the parking lot.

**Approach and Result:**

The city posted a Request for Qualifications with proposals due early February 2020. Stantec was hired as the consultant to design the City Hall parking lot drainage. During the proposal phase, Stantec discovered that the City Hall parking lot was built on an existing pond known as Dix Pond. Soil borings were conducted and revealed groundwater to be within 2-feet of the surface in all locations with a deep layer of peat. This played a major role in the design considerations that took place. Raising the parking lot was no longer an option due to the organic material and the potential for uneven settlement. Therefore, bioretention areas and rain gardens were the primary design features to manage the nuisance flooding. In addition, an overflow pipe redirecting flow to another drainage system is proposed to help manage larger storm events.

**Lessons Learned:**

This project presented many challenges due to the high groundwater table and the unsuitable soil materials beneath the parking lot. The selection of the most appropriate green infrastructure design relies heavily on having a good understanding of existing conditions. Initially, the city had not identified soil borings as a critical step to the conceptual design process, thinking historical information may suffice. The geotechnical work that was deemed essential by Stantec proved to be critical to the successful design. Additionally, the design process highlighted the difficulty in developing solely green infrastructure components to handle large volumes of stormwater in an urban setting.

**Partners and Other Support:**

The project had support from Planning and Public Works and from department heads who manage facilities adjacent to the parking lot including the Fire Chief and Memorial Hall Manager. We also had interest from the Conservation Commission and the Mystic River Watershed Association.

The selected engineering consultant, Stantec, was a great partner throughout the project. They consistently raised questions and sought answers to ensure the final design was both technically feasible and environmentally beneficial. They also worked efficiently under a very tight timeframe while staying within the project budget. We would highly recommend this project team to others undertaking similar work.

**Project Photos:**



Dix pond was paved over around 1900 and is now the site of City Hall Parking Lot.

Existing Parking Lot Flooding





Proposed Design Rendering

