

8.0 MITIGATION MEASURES

8.1 INTRODUCTION

The Hamilton Canal District project program and design has been revised based on input received from public agencies as well as community groups. The result is a project that has been designed and programmed to respond to this feedback and to minimize environmental impacts to the greatest extent possible.

This chapter identifies the specific mitigation measures that are being proposed as part of the Project. As part of the environmental review under the Massachusetts Environmental Policy Act (MEPA), any project that requires a state agency approval or permit must demonstrate that all feasible means have been taken to avoid damage to the environment and those unavoidable adverse impacts have been minimized and mitigated to the maximum extent practicable. The principal state permits or actions are as follows: Division of Capital Asset Management Article 97 land transfer; Department of Environmental Protection- Sewer Connection Permit, Chapter 91 License; Massachusetts Highway Department- Vehicular Access Permit; Department of Housing and Community Development- Urban Renewal Plan Amendment; Massachusetts Historical Commission- Memorandum of Agreement; and state funding and financial assistance from various agencies.

8.2 PROJECT MITIGATION SUMMARY

8.2.1 SUSTAINABLE DESIGN

The project as a whole will achieve compliance with the LEED Neighborhood Development (LEED ND) criteria of the United States Green Building Council (USGBC). The LEED ND rating system integrates the principles of smart growth, urbanism, and green building. The project expects to achieve a LEED ND Gold rating. Notable sustainable design elements incorporated into the project are:

- The project site is an urban brownfield site and an infill site, and will be remediated and redeveloped.
- All new buildings within the development will be designed to meet LEED New Construction guidelines and will be certifiable under these systems. The project will LEED NC certify 30% of the overall building square footage of the project. The Phase One rehabilitation of the Appleton Mills will be an above-code energy efficient building, but will not be LEED Existing Building certifiable due to the inability to meet some of the minimum energy standards for wall insulation.

- Green Construction and Technology will be used, including energy efficient buildings, reduced water use, building reuse and adaptive reuse, reuse of historic buildings, and minimizing site disturbance in site design and construction.
- The development will include the use of renewable energy sources for 5% of the project electrical demand. Renewable energy sources may include third party photovoltaic, solar thermal, and hydroelectric.
- The proponent will employ a construction waste management plan, which will recycle 50% of construction debris.

8.2.2 LOW-IMPACT DEVELOPMENT

The proponent has included several low-impact development principles into the project design, which are described in detail in Section 7.1. These measures include:

- Reducing imperviousness
- Conserving natural resources and ecosystems
- Compliance with DEP's Stormwater Management Regulations
- Reducing off-site runoff
- Mimicking the watershed's natural hydrologic functions
- Erosion and sediment control.

The Proponent also has also incorporated the following Best Management Practices (BMPs):

- Filtering rain gardens (bioretention areas)
- Green roofs
- Rain water harvesting facilities
- Vortex units (Stormceptors: STC 3600, STC 1800, and STC 900)
- Deep sump catch basins.

8.2.3 GREENHOUSE GAS EMISSIONS

The project includes extensive mitigation for GHG emissions that are described in detail in Section 5.8, including Siting and Site Design measures, Building Design and Operating measures, and Transportation Demand Management measures.

Siting and Site Design Measures include:

- Sustainable development principles
- Protection for open space
- Minimizing building footprint
- Low-impact development for stormwater design

- Alternative transportation proximity
- Minimize energy use through building orientation.

Building Design and Operating Measures include:

- Increase in roof and wall insulation
- Green roofs
- Duct sealing
- Programmable thermostats
- High efficiency HVAC systems
- Maximizing interior day-lighting
- Third party commissioning
- Energy efficient windows
- Energy efficient interior and exterior lighting
- Environmentally friendly building materials
- Construction waste management
- Operations waste management
- Water conserving fixtures
- Rainwater reuse
- Cool roof design
- Renewable energy.

Transportation Demand Management Measures include:

- Locate new buildings in or near areas designated for transit-oriented development
- Advocate for a new transportation management association (TMA) and provide an on-site vehicle trip reduction coordinator
- Provide new transit service or support extension of existing transit
- Multi-use paths
- Limited Parking capacity
- Parking management, including shared parking
- Preferential parking for vanpools and carpools
- Provide live/work units
- Bicycle storage
- Roadway improvements
- Traffic signalization coordination to improve traffic flow and support pedestrian safety
- Make on-site improvements to reduce VMT

- Provide no-idling truck zones at loading/off-loading areas
- Encourage tenant-employers to subsidize transit passes
- Encourage tenant-employers to allow the use of pre-tax dollars for non-single occupancy vehicle commuting costs
- Encourage tenant-employers to provide a guaranteed ride home program
- Encourage tenant-employers to join MassRide and to utilize existing ride share-matching programs.

8.2.4 TRANSPORTATION

Transportation mitigation measures for the project are described in detail in Chapter 4 and include:

- District access improvements through the extensions of Revere and Jackson Streets
- Intersection improvements at 18 intersections to alleviate congestion;
- Pedestrian access improvements with the creation of new sidewalks, canalwalks, and street-lighting
- Facilitate trolley expansion by providing a 14-foot wide dedicated right-of-way through the district to accommodate a future trolley connection between Dutton Street and the Gallagher Transportation Terminal and
- Transportation demand management program that will be implemented in order to reduce the number of single-occupancy vehicle trips to and from the site and encourage the use of alternative modes of transportation.

8.2.5 HISTORIC RESOURCES

It has been documented that the project site is located within a historic district and contains historic resources. A Memorandum of Agreement (MOA) has been executed among the Lowell National Historical Park, Massachusetts Historical Commission, City of Lowell, and the proponent, with the Lowell Historic Board as a consulting party. A copy of the MOA is included in Appendix H. The MOA includes measures to mitigate the project's adverse impacts on historic resources, as follows:

- Rehabilitation of Historic Resources: The MOA acknowledges the project includes the proposed rehabilitation of a portion of the former Appleton Manufacturing Company mill complex (Building Nos. 1 and 4 and the Office Building) and a portion of the Saco-Lowell Shops Building #14 (Freudenberg Building), as well as three bridges (loading dock bridge, vehicular bridge, and overhead stucco-clad pedestrian bridge) spanning the Hamilton Canal. The MOA directs the LNHP and proponent to ensure that the buildings and bridges will be rehabilitated in accordance with the Secretary of the Interior's Standards for Rehabilitation and outlines a process for review of the rehabilitation of historic resources.

- **Open Space and Public Realm Improvements:** The MOA identifies proposed open space and public realm aspects of the project, including landscaping, parks, and infrastructure improvements to enhance the setting of historic districts, including: re-creation of a mill yard framed by residential housing, retention and repair of the remnant north elevations of the Appleton Manufacturing Company Mill No. 3 and the Dye House (to be stabilized and maintained in place along the southern wall of the Pawtucket Canal), creation of a right-of-way for a future trolley track connection to the Gallagher Terminal, and setting aside of land for three new district parks. The MOA outlines a review process for review of the proposed open space and public realm improvements.
- **Design Review of New Construction:** The MOA identifies new construction aspects of the project including construction of multiple new mixed use buildings and parking structures. It also outlines a process for review of proposed new construction.
- **Other Mitigation Measures:** The MOA identifies other specific mitigation that will be implemented by the proponent and the City, including:
 - Attention to the design character of the replacement bridges over the Pawtucket and Hamilton Canals.
 - Rehabilitation of the Appleton Manufacturing Company overhead pedestrian bridge and the two pedestrian bridges from the Appleton Mills to Jackson Street.
 - Retention and repair of the remnant north elevations of the Appleton Manufacturing Company Mill No. 3 and the Dye House to be stabilized and maintained in place along the southern wall of the Pawtucket Canal.
 - The commitment that Phase One of the project will have no adverse effect on the waterwheel and raceway in the eastern end/rear ell of Mill No. 1 of the Appleton Mills. Phase One activities will not result in the demolition of the raceway and waterwheel in the eastern end/rear ell of Mill No. 1 of the Appleton Mills and will not preclude the future reuse of these structures for hydroelectric power generation.

8.2.6 INFRASTRUCTURE

In addition to the LID measures and BMPs incorporated into the project design, the proponent will abandon in place the existing wastewater infrastructure on the site and replace the existing combined sewer system with separate storm and sanitary sewers. By removing and/or eliminating any of the combined sewer/drainage systems on site, the project will reduce the infiltration and inflow into the existing combined sewer and replace failing infrastructure on-site.

8.2.7 ENVIRONMENTAL

The project contains the location of multiple Massachusetts Contingency Plan (MCP) release tracking numbers (RTNs). Excavation and handling of contaminated soils, as well as dewatering and discharge activities, will be conducted per the requirements of a Release Abatement Measure (RAM) Plan and a soil management plan prepared in accordance with the MCP, as well as any existing Activity and Use Limitations (AULs) that have been implemented to date. Dewatering and discharge activities will also be conducted per the requirements of the U.S. Environmental Protection Agency (EPA) Remediation General Permits (RGP) or other dewatering permits as applicable.

The potential for vapor intrusion at each parcel will be evaluated through review of site data and information from nearby properties, and/or collection of additional data. Data reviewed and/or new data collected will include an analysis of groundwater, soil, and soil vapor for volatile organic compounds. DEP guidance regarding indoor air contamination assessment, published in 2008, will be considered in this evaluation. RAM Plans would be prepared to address response actions related to mitigation of vapor intrusion and would consider the potential for migration to or from nearby properties. Response actions would be documented in the RAO Statements. Vapor intrusion would be addressed through compliance with existing AULs, remediation of soil or groundwater as feasible, design and implementation of engineering controls such as barriers or ventilation, other building design techniques, and application of new AULs as appropriate.

Groundwater quality will be monitored during construction as part of the NPDES discharge permit requirements. The application for temporary construction dewatering and discharge will contain a plan for management and location of discharges. It is anticipated that dewatering discharge would be treated using solids removal, metals precipitation, resin treatment, and/or carbon filters as appropriate.