

STORMWATER MANAGEMENT (Revised August 1, 2014)

This section has been prepared to present the design approach to be taken for stormwater drainage system as part of this project.

Existing Conditions

Presently the length of rail corridor in this vicinity of Nash Road does not meet current design criteria for the expected rail service to be provided. Except in embankment / fill areas, much of the track corridor does not provide for adequate stormwater runoff conveyance away from the track's ballasted support system. Based on plan research and site inspections, there appears to be no constructed drainage system associated with the existing railroad track, including no defined ditches where necessary. At several locations, significant lengths of ponding adjacent to the track have been observed. At some of these areas the existing ground surface is near the top of cross tie elevation. Therefore, the surface of ponded stormwater runoff at these locations has been near the bottom of rail.

At the Nash Road intersection with the railroad track, on the east side of track, the street drains westerly towards the track. Prior to the track crossing there are drain inlet structures on each side of Nash Road. These structures collect the roadway storm runoff and connect to a storm drain which conveys these flows westerly beyond the grade crossing. On the west side of the track crossing there are inlet structures on each side of the road which collect the roadway runoff and also connect to the Nash Road municipal storm drain.

Hydrological Patterns

All the terrain within the limit of work of the project at the Nash Road crossing in New Bedford is tributary to the Acushnet River, about 4,000 feet to the east. The Acushnet River is directly tributary to New Bedford Harbor.

Soil Types and Characteristics

Generalized soils conditions were determined from the National Cooperative Soil Survey, Bristol County, Massachusetts, compiled by the USDA, Natural Resources Conservation Service (NRCS). The soils along the track corridor within the limits of work are for the most part mapped as Urban Land. This soil has no NRCS Hydrologic Soil Group nor Drainage Class assigned.

Proposed Drainage System Design

In order for the track's support system (cross ties, ballast and sub-ballast) to function properly and maintain a stable track, storm precipitation runoff needs to be directed away from these components. The proposed railroad track drainage system will typically utilize defined ditches and piped underdrains. The design of the storm drain system will comply with the requirements and criteria established by the MBTA. Drop inlets will be used at several locations along the track corridor to intercept surface runoff, including at low points.

To the extent possible, the standard MBTA cross will be used, and as adjacent topography dictates, this will incorporate the standard ditch configuration. In areas where limited width exists, a pipe underdrain will be used to collect and convey the stormwater runoff. All underdrain discharge points will include installing ground surface protection measures.

At one point along the track corridor there is a low-point in its profile, about railroad mainline station 2805+00. Due to the adjacent topography in this vicinity, the up-gradient collected track drainage flows

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are being conveyed in an underdrain. Given the topographic constraints in this area, this flow is proposed to be split into three separate smaller flows to be conveyed to the west and then discharged at three separate points where the pipes can then daylight in lower elevation terrain. These outlets are just up-gradient of a bordering vegetated wetland resource area, but within the 100 foot buffer zone. To add some opportunity for stormwater management of the track drainage flows, leaching basins are proposed to be installed along this piping. Flows that are not infiltrated continue on to the discharge point. At the pipe outlets, a riprap apron is to be installed to prevent erosion and scouring during higher flow events. A stone-lined outlet ditch will follow the apron downgrade of these outlets to allow the flows to further dissipate energy and to provide additional opportunity for flows to infiltrate through the soils beneath the stone-lining.

At the Nash Road grade crossing it is anticipated the proposed work will include new re-positioned roadway municipal inlet structures on the east side of the tracks. To accommodate the revised Nash Road profile, new municipal inlet structures will be proposed on the west side of the crossing. These structures would be connected to the existing municipal storm drain piping. No additional flows would be directed to the railroad track drainage system. The new inlet structures proposed will be specified as municipal standard catch basins, modified to include 4 foot deep sumps and hoods. These new catch basins will have no connected inlet piping. The proposed drainage collection and conveyance design will not change existing hydrological patterns. There will be no increase of impervious area as a result of the constructed improvements of the project.

Applicable Regulatory Standards

The Massachusetts Wetlands Regulations (310 CMR 10.00) states that stormwater discharges impacting jurisdictional resource areas or discharges within a 100-foot buffer zone of certain resource areas are required to meet regulatory performance standards. These performance standards are listed in 310 CMR 10.05 and the MassDEP Massachusetts Stormwater Handbook. The standards can apply differently to new development projects as opposed to those categorized as redevelopment. Per 310 CMR 10.04, redevelopment includes replacement, rehabilitation or expansion of existing structures and improvement of existing roads, including correcting substandard intersections and improving existing drainage systems. Based on these preceding qualifications and the scope of the proposed rehabilitation work, this project is a redevelopment project. There will be no proposed work or discharges directly in resource areas but work and discharges will occur within the 100 foot buffer area. Therefore, this project's design complies with the DEP's Stormwater Performance Standards regulated as a redevelopment project.

Compliance with Stormwater Performance Standard For Redevelopment

Due to the nature of the proposed scope of the work, this project is considered to be redevelopment, and is subject to the Massachusetts Wetland Regulations, and subject to Standard 7 of the DEP's Stormwater Performance Standards. Standard 7 states:

"A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5 and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions."

Following each Standard is listed along with a brief summary with respect to compliance with that Standard.

10.05 Procedures

The proposed project complies with the performance standards under 10.05 (6)(k)

“10.05 (6) Orders of Conditions Regulating Work and Orders of Resource Area Delineation (k) No Area Subject to Protection Under M.G.L. c. 131, § 40 other than bordering land subject to flooding, isolated land subject to flooding, land subject to coastal storm flowage, or riverfront area may be altered or filled for the impoundment or detention of stormwater, the control of sedimentation or the attenuation of pollutants in stormwater discharges, and the applicable performance standards shall apply to any such alteration or fill. Except as expressly provided, stormwater runoff from all industrial, commercial, institutional, office, residential and transportation projects that are subject to regulation under M.G.L.c. 131, § 40 including site preparation, construction, and redevelopment and all point source stormwater discharges from said projects within an Area Subject to Protection under M.G.L.c. 131, § 40 or within the Buffer Zone shall be provided with stormwater best management practices to attenuate pollutants and to provide a setback from the receiving waters and wetlands in accordance with the following Stormwater Management Standards as further defined and specified in the Massachusetts Stormwater Handbook:

1. No new stormwater conveyances (e.g., outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Commonwealth.”

All proposed ditch and pipe discharge outfalls of this project will include the stone aprons for ground surface protection in order to prevent erosion in wetlands or waters of the Commonwealth.

The proposed drain inlet structures collecting roadway runoff at Nash Road will be deep sump catch basins to provide a level of pre-treatment before conveyance to ultimate discharge.

The discharge outlet pipes for the track corridor include on-line leaching basins which will provide an opportunity for flow infiltration to ground water, especially during low flow events. In addition, all the collected flows in these discharge pipes have been conveyed through long lengths of underdrain piping, which also provides the potential for flow infiltration.

“2. Stormwater management systems shall be designed so that post-development peak discharge rates do not exceed pre-development peak discharge rates. This Standard may be waived for discharges to land subject to coastal storm flowage as defined in 310 CMR 10.04.”

The work to be constructed in this project does not propose to construct additional impervious surfaces. It is expected the post-construction peak storm flows would be essentially the same as the pre-construction flow rates.

“3. Loss of annual recharge to ground water shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices and good operation and maintenance. At a minimum, the annual recharge from the post development site shall approximate the annual recharge from the pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.”

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There is no loss of annual recharge to groundwater expected due to no new impervious surfaces being constructed. Significant lengths of track underdrain piping in full depth ballasted trenches are to be installed to both collect and convey stormwater runoff. These underdrain installations will present opportunities for more annual recharge to ground water than exists presently.

- “4. Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when:
- a. Suitable practices for source control and pollution prevention are identified in a long-term pollution prevention plan and thereafter are implemented and maintained;
 - b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with the Massachusetts Stormwater Handbook; and
 - c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.”

The project includes some deep sump catch basins to collect and pre-treat roadway runoff. Long lengths of underdrain piping are proposed to collect and convey track storm runoff, portions of which may infiltrate to ground water, providing both a water quality and volume benefit.

- “5. For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable.”

Per the Massachusetts Stormwater Handbook, railroad track corridors are not specifically included as a land use with higher potential pollutant loads. This Standard is not applicable.

- “6. Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such area as provided in the Massachusetts Stormwater Handbook.”

The project has no stormwater discharges to a Zone II or Interim Wellhead Protection Area of a public water supply. This Standard is not applicable.

- “8. A plan to control construction-related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented.”

The final construction documents will include details of materials and methods required to be used and implemented during land disturbing activities to control erosion, sedimentation and other pollutant sources during construction. The proposed project will result in land disturbance over an acre and therefore a NPDES Construction General Permit (CGP) is required from the US EPA. As part of the CGP, a Stormwater Pollution Prevention Plan (SWPPP) is required. As part of the SWPPP, a construction period pollution prevention sedimentation and erosion control plan will be prepared. The SWPPP document will satisfy the requirements of the CGP and the construction period erosion, sedimentation and pollution prevention requirements referred to in Standard 8.

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“9. A long-term operation and maintenance plan shall be developed and implemented to ensure that stormwater management systems function as designed.”

Massachusetts Coastal Railroad as operator is responsible for maintenance of the line including stormwater management systems.

“10. All illicit discharges to the stormwater management system are prohibited.”

There are no known existing illicit discharges within the project limits, nor are there any proposed. If illicit discharges are discovered, they will be immediately discontinued.

Conclusion

From a stormwater management perspective, the project will improve existing conditions and has complied with Stormwater Performance Standard 7, to maximum extent practicable, as applicable, all as required of a redevelopment project.