



Memorandum

Date: March 12, 2021

To: Anne Canaday, Project Manager, MEPA

From: John G. Morgan Jr., P.E., PTOE

Re: ENF Filing
Atlantic Avenue Reconstruction
Project #601607
Hull, MA

CHA Consulting Inc. has prepared this Memorandum to provide additional information following the MEPA Consultation Follow-Up Meeting for the Atlantic Avenue project held on March 8, 2021. The following categories with responses are provided for your consideration.

1. Stormwater Management Standard #6

As a supplement to the previous memorandum and continued concern raised by CZM and DEP staff, we would like to provide additional details regarding the stormwater BMP's that have been considered for use along this project and the specific areas where they were considered for use.

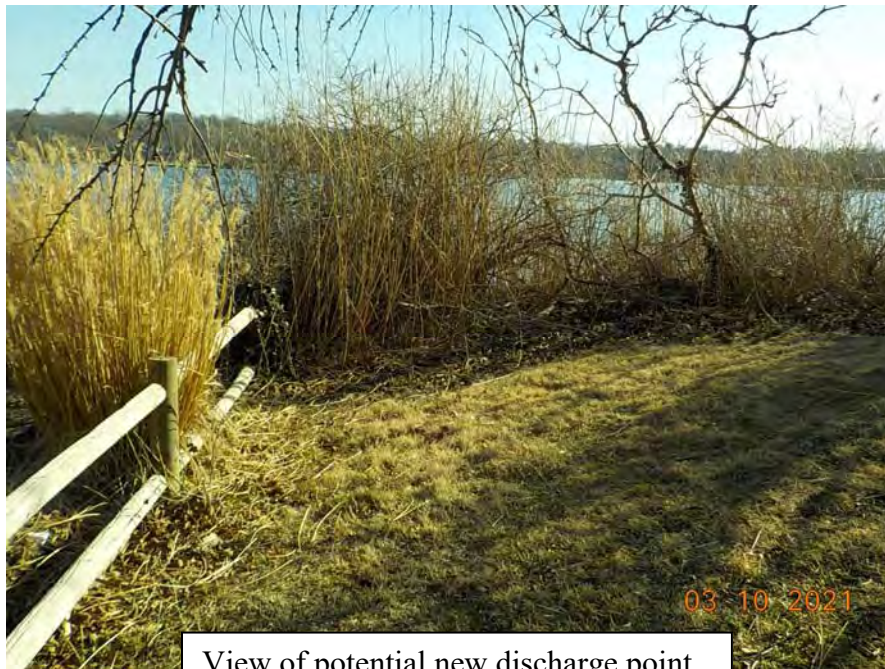
The Massachusetts Stormwater Handbook recommends several BMP treatments for use in stormwater systems with discharges to Outstanding Resource Waters which were evaluated for this project. These recommendations for implementation on this project are discussed below. A focus on BMP's with Nitrogen, Phosphorus, and Bacteria removal are most applicable in meeting Standard #6 to the maximum extent practicable for this redevelopment project.

Water Quality Swale at Pump Station

In consultation with the Conservation Commission, we have evaluated installing a water quality swale on the property of the Town Sewer Pump Station (STA 30+50 RT). A swale located to the east of the pump station building could intercept runoff from the drainage system to the west and direct it through the pump station property to a new discharge point to Straits Pond. This would provide a measure of TSS removal (70%) and Total Nitrogen and Phosphorus removal (10%-90%) if a pretreatment structure (e.g. sediment forebay) is provided. However, there are several obstacles that could potentially prevent a swale from being constructed at this location.



View of Eastern side of Pump Station



View of potential new discharge point

There is a gas line that runs down the eastern side of the property that would need to be relocated in order to install a swale here. In addition, the grading of the site would need to be more closely evaluated. The property is uphill of the roadway, reaching an elevation of approximately 10 ft. The roadway in this area is at elevation 7 ft. and the drainage system piping is at an elevation of about 4 ft. (pipe invert) to maintain at least 2 ft. of cover on the drainage pipe. Significant cuts would be required on this property and proximity to groundwater would most likely be a problem as a water quality swale must have at least 2

ft. of separation between the bottom of the sand/loam filter media (minimum of 18 inches thick) and groundwater.

Most notably, this would involve constructing a new discharge point to Straits Pond that would require the stormwater to reach treatment levels required by the general MS4 permit. Determining nitrogen and phosphorus removal percentages for the swale would need to be further evaluated as the 10%-90% removal rate provided in the Stormwater Handbook may not meet the MS4 requirements. The combination of a Deep Sump Catch Basin, Sediment Forebay, and Water Quality Swale meets pre-treatment and treatment TSS removal requirements.

Rain Garden at Summit Avenue

We have considered the recommendation by CZM staff to install a surface BMP structure in the vicinity of Summit Avenue. Installing a BMP on Summit Avenue, further north of Atlantic Avenue as suggested, would not be able to treat stormwater from Atlantic Avenue due to the drastic elevation increase moving north on Summit Avenue from Atlantic Avenue and thus is not applicable to this project. However, we evaluated utilizing the northeast corner of the intersection (STA 63+50 LT) to install a rain garden. The area is currently paved, but due to the proposed “T-ing” up of Summit Avenue with Atlantic Avenue, the area is currently proposed to be loamed and seeded. A rain garden here could receive direct sheetflow from Summit Avenue and the adjacent driveways as well as intercept stormwater from the drainage system in Atlantic Avenue. However, there is an existing gas main and water main in this area that would need to be relocated to provide a rain garden at this location, making it impractical.

Leaching Catch Basin Structures

Leaching catch basins, combined with the proposed deep sump catch basins, were evaluated for use on this project in order to improve water quality treatment and provide a measure of peak rate attenuation. However, proximity to groundwater in the low lying areas of Atlantic Avenue as well as well-documented ledge (as evident by ledge outcroppings and recent utility excavation associated with gas main and sewer main replacement projects) throughout the western portion of the project eliminates this as a feasible alternative.

Low Impact Development (LID) Techniques – “Country Drainage”

We have evaluated more closely the low impact development (LID) techniques set forth in the Massachusetts Stormwater Handbook for implementation in this project. The current design calls for granite curbing to be installed along the corridor on both sides of the roadway. While curbing is required along the sidewalk on the south side of the roadway in order to provide a raised pedestrian path for safety, we are considering removing curbing on the north side of the roadway in stretches to provide country drainage in order to reduce peak runoff rates to Straits Pond. Potential stretches for country drainage include approximately STA 33+00 – STA 39+50 LT and STA 52+00 – STA 66+00 LT. Slopes from the roadway will limit the effectiveness of implementing country drainage.

2. Reducing impervious area in locations of high overwash

CZM staff recommended evaluating the option to not increase impervious area (requiring removal of parking) in localized areas where overwash from the Atlantic Ocean during severe storms is of most concern. Specifically, one of these areas that was discussed is the area between Gunrock Avenue and Bath Avenue (STA 32+00 – STA 41+00). We have evaluated this specific area and would like to note that the project does not propose to widen the roadway between STA 32+00 and STA 38+90 on the south side, where parking is proposed. Only minor widening between STA 33+75 and STA 35+00 on the north side of the roadway is proposed in this area to correct a pinch point in the existing pavement (refer to project plans). The project does not worsen the overwash velocities in this area as the increase in impervious area on the north side is negligible. It should also be noted that narrowing the road from its existing extents on the south side would provide minimal benefit as there are existing low cement concrete retaining walls (12"-24" tall) at the back of the sidewalk. Reducing the southern shoulder from 7 ft. to 4 ft. would introduce a 3 ft. gap between the back of the existing sidewalk and the retaining walls. The surface treatment in this 3 ft. gap is unlikely to provide a substantial reduction in overwash velocities.

Residential development is denser moving east from STA 34+00 and is where providing an on-street parking shoulder is most critical to ensuring safe accommodations for vehicles and pedestrians.



The CZM staff also recommended that we evaluate the repetitive loss claims along the corridor due to storm damage to determine other areas where Atlantic Ocean overwash is of most concern. This is currently being evaluated with the Hull Conservation Commission staff which has compiled repetitive loss information.

If there are any questions regarding this memo, please contact John Morgan at 781-982-5437.