

Appendix D3

Stormwater Treatment Methodology Memorandum



NYS Route 33, Kensington Expressway Project
PIN 5512.52
City of Buffalo
Erie County
Stormwater Treatment Methodology Memo
6/5/2023

1. Introduction

The New York State Department of Transportation (NYSDOT), in cooperation with the Federal Highway Administration (FHWA), is preparing a Draft Design Report / Environmental Assessment (DDR/EA) for the NYS Route 33, Kensington Expressway Project (hereafter, “the Project”). As part of a project of this size, a stormwater treatment pollution prevention plan (SWPPP) will be required. Included in this memo is an assessment of existing stormwater systems and proposed stormwater systems and treatment methodologies. This includes summarizing the project area, disturbance area and impervious areas.

1.1. Project Overview

The Project is located in the City of Buffalo, Erie County, New York.

Figure 1 shows the project area. It is generally the NYS Route 33 Kensington Expressway Corridor and, Humboldt Parkway between High Street and Northland Avenue, and the expanded area, which includes potential enhancements to local streets between Wohlers Avenue to the west and Fillmore Avenue to the east. The local street improvement work would include resurfacing of the existing pavement, sidewalk replacement, curb replacement, curb ramps, possible curb bump outs for traffic calming, drainage system cleaning and repairs, new street lighting, new traffic signals, landscaping and other related improvements. The local street improvements would not include substantial horizontal or vertical alignment changes.

1.2. Existing Stormwater Conditions

Within the Project disturbance area, the stormwater systems along NYS Route 33 can be characterized as typical urban stormwater systems with inlets and underground pipe systems, and the stormwater systems along Humboldt Parkway can be characterized as typical City of Buffalo combined sewer stormwater systems which include inlets with laterals to the combined sewer system. The stormwater systems within the expanded Local Streets area can be characterized as typical City of Buffalo combined sewer stormwater systems which includes inlets with laterals to the combined sewer system.

1.2.1. NYS Route 33 (Kensington Expressway)

- Within the Project disturbance area, the stormwater system for NYS Route 33, Kensington Expressway collects stormwater and discharges to three stormwater system discharge points. The first discharge point for the NYS Route 33 is a stormwater trunk that continues south on NYS Route 33 and that discharges into a 96-inch combined sewer that heads south on Michigan Avenue. The stormwater along NYS Route 33 collects in this stormwater system from just north of Riley Street to the southern project limits. The second discharge point is the combined sewer on East Ferry Street. This discharge point uses an existing pump station located on the southwest quadrant of Humboldt Parkway and East Ferry Street. The stormwater along NYS Route 33 collects in this stormwater system and includes stormwater from north of Riley Street to Butler Avenue. The third discharge point for the NYS Route 33 is the Scajaquada Drain. The Scajaquada Drain is classified as a City of Buffalo stormwater overflow and is the piped underground portion of Scajaquada Creek near the project limits. The stormwater along NYS Route 33 collects in this stormwater system and includes stormwater from north of East Ferry Street to the northern project limit. All discharge points eventually discharge to the Niagara River either through a treatment plant or through a stormwater overflow.

1.2.2. Local Streets

- The local street (Humboldt Parkway and other local streets) stormwater is collected into combined sewer systems owned and maintained by the City of Buffalo Sewer Authority. Generally, all stormwater drainage within the local streets is collected with inlets and directly connected to combined sewers with laterals. These combined sewers have various discharge points.

1.3. Proposed Stormwater Conditions

1.3.1. NYS Route 33 (Kensington Expressway)

- Within the Project disturbance area, the stormwater system for NYS Route 33, Kensington Expressway as indicated above currently collects stormwater and discharges to three stormwater system discharge points. The first discharge point for the NYS Route 33 is a stormwater trunk that continues south on NYS Route 33 and that discharges into a 96-inch combined sewer that heads south on Michigan Avenue. The stormwater along NYS Route 33 prior to the proposed southern tunnel portal would collect in this stormwater system to the southern project limits. The second discharge point is the combined sewer on East Ferry Street. This discharge point uses an existing pump station located on the southwest quadrant of Humboldt Parkway and East Ferry Street; this pump station would remain and be modified due to the changes in elevation of NYS Route 33. This discharge point would receive the stormwater collected at the proposed northern tunnel portal entrance and would continue to use the pump station modified as indicated. The third discharge point for the NYS Route 33 is the Scajaquada Drain. The stormwater along NYS Route 33 north of the proposed portal entrance to the northern project limit collects in this stormwater system. The proposed tunnel portion of NYS Route 33 Kensington Expressway would have a drainage system that will be a closed system with storage that will only be pumped out with vac trucks after an event (sprinkler or chemical firefighting effort).

1.3.2. Local Streets

Within the area along Humboldt Parkway above the proposed tunnel, the stormwater will be collected into a separate stormwater system that will discharge to one of the three discharge points that the existing NYS Route 33 discharges to and/or into the combined sewer system at locations where the existing Humboldt Parkway inlets discharge to. Within the local street improvement area the drainage work is limited to repairs and adjustment and the inlets will continue to discharge with laterals to the combined sewer system.

1.4. Proposed Stormwater Management Design

- The purpose of stormwater management design is to protect the waters of the State of New York from the potential adverse effects related to stormwater runoff. Per the New York State Department of Environmental Conservation (NYSDEC) State Pollutant Discharge Elimination System (SPDES) General Permit for stormwater discharges from construction activity (GP-0-20-001), the permit applies to construction activities involving soil disturbance of one or more acres. The disturbance area for this project is anticipated to be approximately 76.7 acres. Stormwater treatment is therefore required for the project. The entire project area has been previously developed therefore redevelopment standards apply. The Project would reduce impervious area by building a tunnel that includes 3 feet or more soil above it with green space. Per chapter 9 of the NYSDEC Stormwater Design Manual, treatment of 25% of the Existing Water Quality Volume (WQv) is required for this project. The plan proposes treatment of the WQv by a combination of reducing impervious cover and standard practices.
- Standard practices that have successfully been used within the City of Buffalo on recent roadway reconstruction projects have included pervious pavement within parking lanes and rain garden designs (with and without storage areas beneath them). The City of Buffalo Department of Public works and the City of Buffalo Sewer Authority will need to review and approve of any treatments within the City of Buffalo Right of Way. The City of Buffalo Sewer Authority requires property owner approvals for rain gardens in front of residences and commercial properties.
- The project area is shown on Figure 1.
- The proposed disturbance area is shown in Figure 2.

Stormwater Management Design Summary Calculation:

- The total project area is 108.9 acres (within the ROW) (Figure 1).
- Project Area (Disturbance Area): 76.7 Acres (Figure 2)
- Existing Impervious Area within the disturbed area: 50.5 Acres (Figure 3)
- Proposed Impervious Area within the disturbed area: 38.4 Acres (Figure 4)
- Impervious Cover reduction = 12.1 Acres (24% reduction)
- Based on this calculation, the Project would result in a 24% reduction of impervious cover.

- So, the additional 1% (25%-24%) of the total WQv will need to be treated with standard practices.
- 1% of the Total WQv = 1% $\frac{(P * Rv * A)}{12}$

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- P =1 (90% Rainfall Event Number) (Figure 4.1 of the NYSDEC Stormwater Design Manual)
- Rv= 0.05 +0.009(I) = 0.05+0.009*100% (Rv (Runoff Coefficient), I (Percent Impervious Cover))
- A = 76.7 Acres (Disturbance Area (Figure 2))
- 1% of WQv = 1% (6.07 acre-ft) or 0.06 acre-ft = 2645 ft³

Technical assumptions at the time of these calculations:

- *NYSDEC Stormwater Design Manual Redevelopment stormwater chapter 9 was used.*
- *Landscaped area above the tunnel is considered pervious due to the 3+ feet of soil.*
- *Justification for the landscaped area to be considered pervious is based on the definition of a reduction of site imperviousness. A reduction in site imperviousness will reduce the volume of stormwater runoff, thereby achieving, at least in part, stormwater criteria for both water quality and quantity. The final grading of the site will be planned to minimize runoff contribution from new pervious areas (area above the tunnel) to the impervious areas. Effective implementation of this option also requires soil properties in the newly created pervious areas that meet both the depth requirements and the permeability of best management practices. This includes soil that will meet minimum percolation rates (1" per hour minimum) while also meeting water retention capabilities, ensuring that the water does not flow too quickly through the soil and into the subdrainage system. This will be a physical function of the physical makeup (sand/silt/ clay) of the soil. The soil mix will be designed so that it will drain fast enough to eliminate surface flow but slow enough to retain moisture for trees and reduce loading on the storm system. The soil that will be placed above the tunnel will meet these properties and include a 6" layer of topsoil which will be installed and planted per the landscaping plan.*
- *Local street improvements would include milling and resurfacing existing pavement, in-kind replacement of sidewalks and driveway aprons (as needed), and curb replacement. The milling and resurfacing work would not be considered disturbance since they would not disturb the subbase or expose soil. Aerial Photos were used to identify impervious areas where Local Streets improvements would be made (This will be updated based on survey information as the project progresses.)*
- *Roundabouts at Best Street were included.*