

## **Appendix D3**

### Stormwater Treatment Methodology Memorandum



NYS Route 33, Kensington Expressway Project  
PIN 5512.52  
City of Buffalo  
Erie County  
Stormwater Treatment Methodology Memo  
12/13/2023

## 1. Stormwater Pollution Prevention Plan Introduction

The New York State Department of Transportation (NYSDOT), in cooperation with the Federal Highway Administration (FHWA), is preparing a Design Report / Environmental Assessment (DR/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 for the discharges into the waters of the U.S. Additionally, discharges into the combined sewer system are also regulated by the Buffalo Sewer Authority and New York State Department of Environmental Conservation (NYSDEC). 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 main project area in blue. The main project area is generally the NYS Route 33 Kensington Expressway Corridor, Humboldt Parkway between High Street and Northland Avenue, West Parade Street from Best Street to Dodge Street and Best Street. Figure 1 also shows the local street project area in green. The local street project area is generally where improvements to local streets between Wohlers Avenue to the west, Fillmore Avenue to the east, High Street to the south and Northland Avenue to the north are being considered. This 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 (trees) and other related improvements as necessary. The local street improvements would not include substantial horizontal, vertical alignment changes or any changes in stormwater drainage patterns.

### 1.2. Existing Stormwater Conditions

#### 1.2.1. NYS Route 33 (Kensington Expressway) Existing Stormwater

Within the Project disturbance area, the stormwater system for NYS Route 33, Kensington Expressway collects stormwater and discharges to four 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 diameter 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 a piped underground portion of Scajaquada Creek near the northern project limit. A portion of the stormwater along NYS Route 33 collects in this stormwater system and includes stormwater from north of East Ferry Street along NYS Route 33 to the northern project limit. The fourth discharge point is the Scajaquada Interceptor. The stormwater along Humboldt Parkway and a portion of NYS Route 33 north of East Ferry Street to the northern project limit collects in this stormwater system. All discharge points eventually discharge into to the Niagara River either through a treatment plant or through a storm overflow.

### 1.2.2. Local Street Existing Stormwater

The local street (Humboldt Parkway and 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 area is collected with inlets and are directly connected to combined sewers with laterals. These combined sewers have various discharge points. A portion of the local streets area that drains into the existing 84-inch diameter sewer outlets to the Scajaquada Interceptor.

## 1.3. Proposed Stormwater Conditions

### 1.3.1. NYS Route 33 (Kensington Expressway) Stormwater

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 diameter combined sewer that heads south on Michigan Avenue. The stormwater along NYS Route 33 prior to the 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 replaced or modified due to the proposed changes in elevation of NYS Route 33. This discharge point would receive the stormwater collected at the northern tunnel portal and would continue to use the pump station modified as indicated. The third discharge point for the NYS Route 33 is the Scajaquada Drain. This system would collect stormwater along NYS Route 33 north of the northern portal to the northern project limit. The fourth discharge point is the Scajaquada Interceptor. The stormwater along Humboldt Parkway and a portion of NYS Route 33 north of East Ferry Street to the northern project limit. 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 Street Proposed Stormwater

Within the Project disturbance area along Humboldt Parkway above the tunnel section, the stormwater would be collected into a separate stormwater system that would 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. Within the local street project area the drainage work would be limited to repairs and adjustments and the inlets would continue to discharge with laterals to the combined sewer system, a portion of which will continue to outlet into the 84-inch diameter sewer on Humboldt Parkway that drains into the Scajaquada Interceptor.

## 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 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 the main project area can be split into two pieces, a portion that drains into the Scajaquada Drain and a portion that drains into the combined sewer system. Note there is a portion of the Kensington Expressway that currently drains to the Scajaquada Drain that will drain into the combined sewer. This area is shaded with red in Figure 2. The existing portion that would drain into the Scajaquada Drain is estimated to be approximately 1.69 acres for the main project area. The remainder of both areas drain into the City of Buffalo combined sewer systems which is estimated to be approximately 31.6 acres for the main project area and another 17.96 acres for the local street area. Stormwater treatment is therefore required for the portion of the project that drains into the Scajaquada Drain and treatment is also required by the City of Buffalo for the portion that drains into the combined sewer. 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 the 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 on Figure 2.

### **Stormwater Management Design Summary Calculation:**

The total project area is 108.9 acres (within the ROW) (Figure 1, blue and green areas).

Project Area (Disturbance Area): 51.25 Acres (Figure 2, aqua, purple, red, and orange areas)

### **Drainage to the Scajaquada Drain**

Assuming the Main Corridor will be constructed as a separate project from the Local Streets the calculations are separated. Additionally, no local street drainage is directed to the Scajaquada Drain.

#### **Main Corridor**

Project Area (Disturbance Area to the Scajaquada Drain): 1.69 acres (Figure 2, purple & red)

Existing Impervious Area within the disturbed area: 1.69 acres (Figure 3, purple)

Main Corridor Proposed Impervious Area within the disturbance area: 1.11 acres (Figure 4, purple) (Portion of proposed impervious drains to the combined sewer (red area on Figure 2)).

Impervious Area reduction is 0.58 acres (34% reduction)

### **Drainage to the Combined Sewer systems**

Assuming the Main Corridor will be constructed as a separate project from the Local Streets the calculations are separated.

#### **Main Corridor**

Project Area (Disturbance Area to the Combined Sewers): 38.33 acres (Figure 2, aqua, red)

Existing Impervious Area within the disturbed area: 31.6 acres (Figure 3, aqua)

Main Corridor Proposed Impervious Area within the disturbed area: 22.36 acres (Figure 4, aqua)

Impervious Area reduction is 9.24 acres (29% reduction)

No additional treatment is necessary if the tunnel cap is considered pervious.

### **Local Streets**

Project Area (Disturbance Area to the Combined Sewer): 27.14 acres (Figure 2, orange)

Existing Impervious Area within the disturbed area: 17.96 acres (Figure 3, orange)

Proposed Impervious Area within the disturbed area: 18.75 acres (Figure 4, orange)

The Impervious area to the Combined Sewer will be increased by 0.79 acre for the Local Street area.

Based on this, the project will need to treat 100% of the increased impervious and 25% of the existing impervious area with standard practices.

$$\text{Total WQv} = 100\% \frac{(P * Rv * A)}{12} + 25\% \frac{(P * Rv * A)}{12}$$

P = 1 in. 90% Rainfall Event Number (Figure 4.1 of the NYSDEC Stormwater Design Manual)

$$Rv = 0.05 + 0.009(I) = 0.05 + 0.009 * 100\% \text{ (Rv (Runoff Coefficient), I (Percent Impervious Cover))}$$

$$\text{Total WQv} = 100\% \frac{(1 * 0.95 * 0.79)}{12} + 25\% \frac{(1 * 0.95 * 17.96)}{12}$$

$$\text{Total WQv} = 0.418 \text{ acre ft or } 18,208 \text{ ft}^3$$

*Technical assumptions at the time of these calculations:*

*NYSDEC Stormwater Design Manual Redevelopment stormwater chapter 9 was used.*

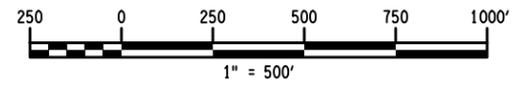
*The proposed green space above the tunnel would include 3 feet of soil depth and can be considered pervious based on the definition of a reduction in site imperviousness.*

*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 designed to minimize runoff contribution from new pervious areas (area above the tunnel) onto the impervious area. Effective implementation would involve 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 would 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-inch layer of topsoil which will be installed and planted per the landscaping plan.*

*Local street improvements would include milling and resurfacing of existing pavement, which is not considered disturbance since it would not disturb the subbase or expose soil. In-kind replacement of sidewalks and driveway aprons (as needed, assumed needed) and curb replacement would also be considered.*

*Photogrammetry survey was used for impervious areas, assumptions were made for gaps in the photogrammetry.*

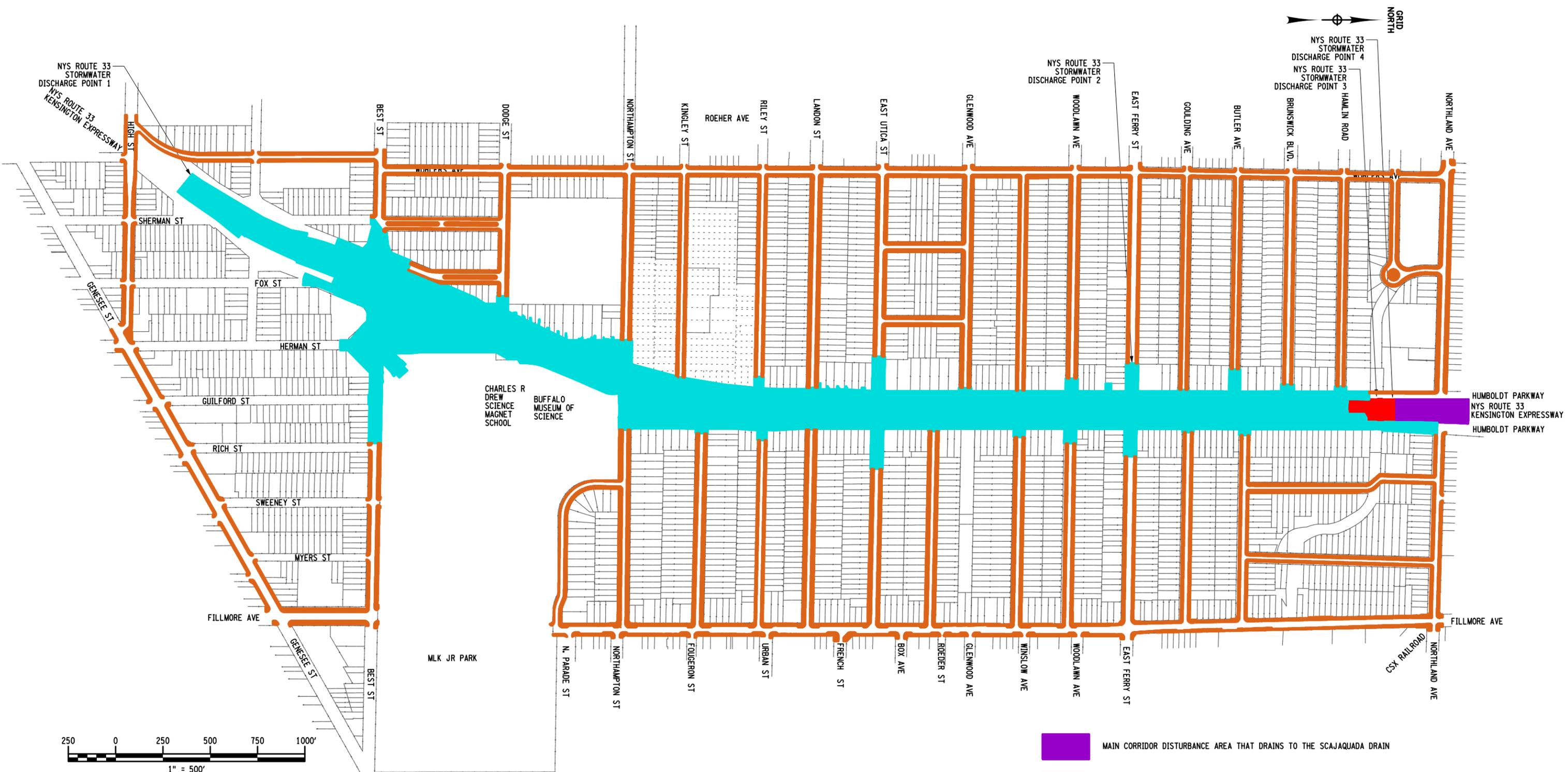
*Proposed Design as of 10/26/2023 was used.*



-  MAIN CORRIDOR PROJECT AREA
-  LOCAL STREETS PROJECT AREA

PIN 5512.52 NY ROUTE 33 KENSINGTON EXPRESSWAY  
(INCLUDING LOCAL STREET IMPROVEMENTS)

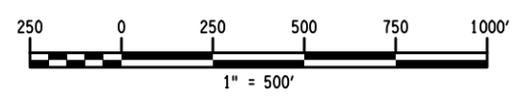
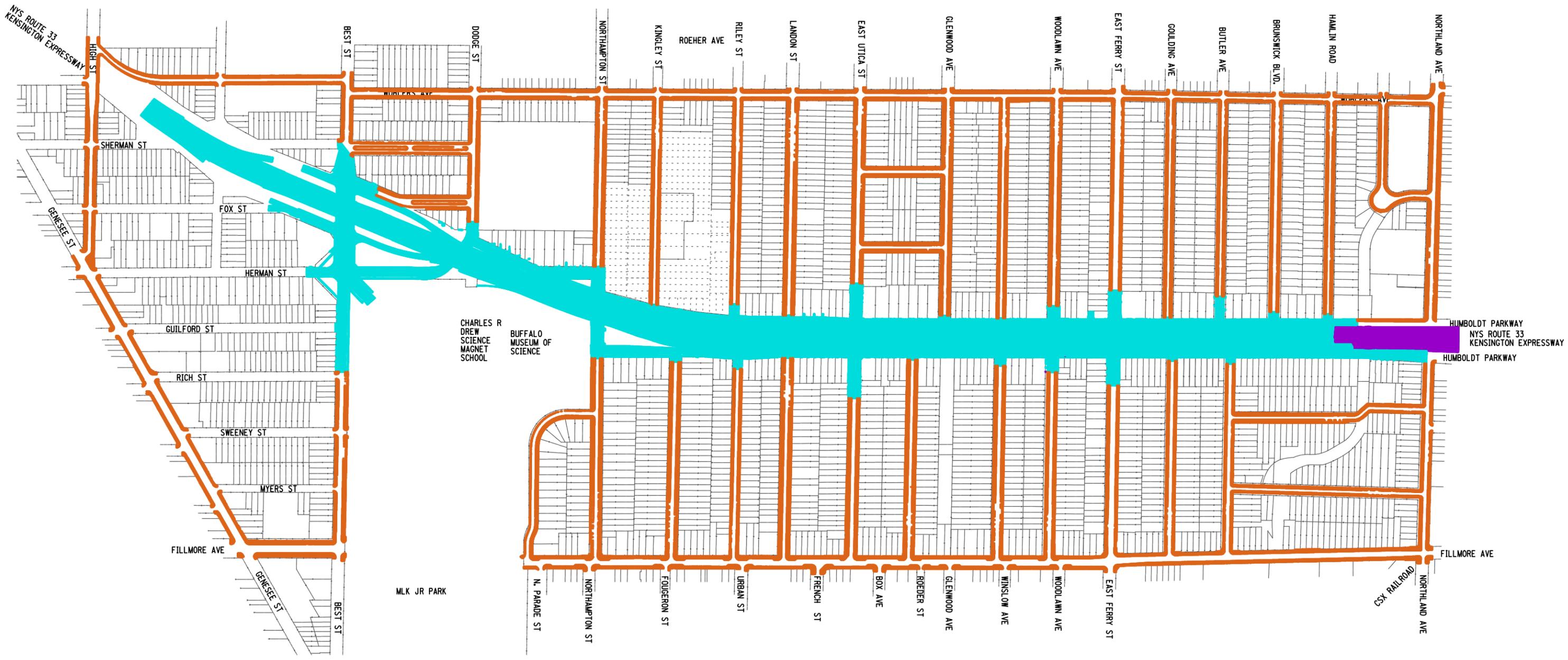
FIGURE 1 - PROJECT AREA



PIN 5512.52 NY ROUTE 33 KENSINGTON EXPRESSWAY  
(INCLUDING LOCAL STREET IMPROVEMENTS)

FIGURE 2 - DISTURBANCE AREA

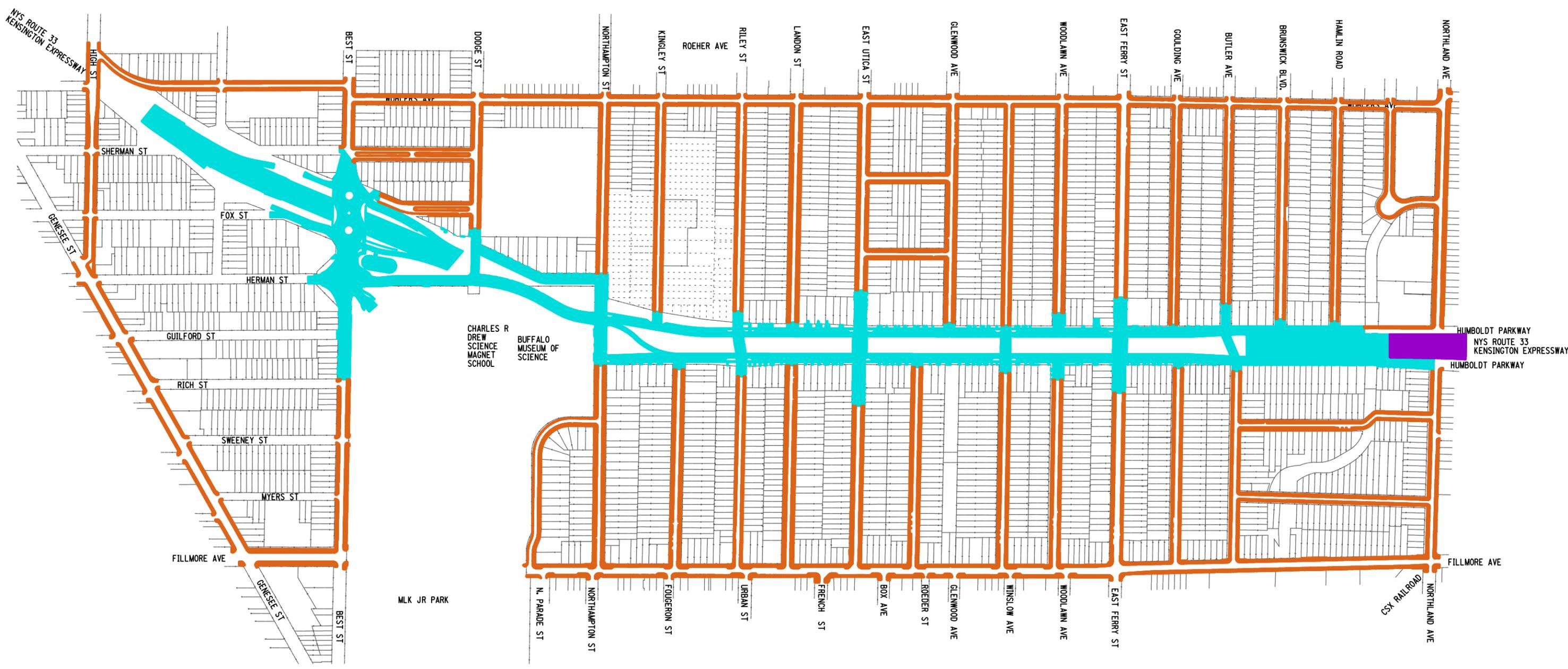
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- MAIN CORRIDOR DISTURBANCE AREA THAT DRAINS TO THE COMBINED SEWER
- LOCAL STREETS DISTURBANCE AREA THAT DRAINS TO THE COMBINED SEWER



-  MAIN CORRIDOR EXISTING IMPERVIOUS THAT DRAINS TO THE SCAJAJUQUADA DRAIN
-  MAIN CORRIDOR EXISTING IMPERVIOUS DRAINS TO THE COMBINED SEWER SYSTEMS
-  LOCAL STREETS EXISTING IMPERVIOUS DRAINS TO THE COMBINED SEWER SYSTEMS

PIN 5512.52 NY ROUTE 33 KENSINGTON EXPRESSWAY  
(INCLUDING LOCAL STREET IMPROVEMENTS)

FIGURE 3 - EXISTING IMPERVIOUS WITHIN THE DISTURBED AREA



-  MAIN CORRIDOR PROPOSED IMPERVIOUS THAT DRAINS TO THE SCAJAGUADA DRAIN
-  MAIN CORRIDOR PROPOSED IMPERVIOUS THAT DRAINS TO THE COMBINED SEWER SYSTEMS
-  LOCAL STREETS PROPOSED IMPERVIOUS THAT DRAINS TO THE COMBINED SEWER SYSTEMS

PIN 5512.52 NY ROUTE 33 KENSINGTON EXPRESSWAY  
(INCLUDING LOCAL STREET IMPROVEMENTS)

FIGURE 4 - PROPOSED IMPERVIOUS WITHIN THE DISTURBANCE AREA