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**Preliminary Storm Water Report**  
**The Kingstonian**  
**City of Kingston, New York**

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***July 8, 2019***

***Prepared for:***

***City of Kingston Planning Board***

**Prepared by:**

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A handwritten signature in blue ink, appearing to read 'Dennis M. Larios'.

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## Introduction

The project involves the redevelopment of the City of Kingston parking garage property, the Herzogs Supply Co., Inc. warehouse property and the Uptown Grill property (also owned by Herzogs Supply Co., Inc). The proposed project includes the following elements: 420 car parking garage, 129-132 apartment units, 32 room hotel, 8,950 Sq. Ft. of retail space, a pedestrian plaza area, and an elevated pedestrian link to connect to Kingston Plaza. Parcels of Land include: City Parking Garage (1.43 acres), Herzogs warehouse (0.50 acres), and Uptown Grille (0.313 acres), along with portions of Fair Street Extension and a small pocket park owned by the City of Kingston. The project further includes consolidation of several tax parcels (subdivision-lot line deletions).SEQRA Type 1 Action pursuant to 6NYCRR Parts 617.4(b),(6)(iv) and 6NYCRR 617.4(b)(9).

The existing site is predominantly surface parking lots, paved street, structures and building roofs. All existing and proposed surface water run-off discharges to the City storm sewer system on Schwenk Drive and ultimately discharges to the Esopus Creek.

## Purpose and Methodology

The purpose of this report is to quantify and evaluate the impact of stormwater runoff generated by the proposed project. The method used in the report follows the urban hydrology model developed by the U.S.D.A. Soil Conservation Service known as the TR-55 (Technical Release 55) procedure for calculating storm runoff volume from small watersheds. *HydroCAD* computer software (Version 10.00), developed by Applied Microcomputer Systems, was used in computation of the hydrograph routing model. The analysis utilizes the 1, 10, 25 and 100 year-24 hour storm events to model pre- and post-development conditions. The design storms utilized in this analysis are from Cornell University's Northeast Regional Climate Center (NRCC) precipitation database (<http://precip.eas.cornell.edu/>). This database provides site-specific design storms, allowing us to more accurately model the hydraulic conditions at the project location.

A full Storm Water Pollution Plan(SWPPP) is being developed for the project. This report is intended to assess the project impacts so that a SEQRA determination can be made and to set the general groundwork for the .SWPPP and SPDES General Permit requirements.

## Existing Conditions – Pre Development Model

First, the watershed areas on this site were modeled to determine stormwater runoff characteristics under existing conditions. A map of existing conditions for this site is located on Sheet 1 of the plan set. This analysis used three watershed areas; the City Of Kingston Parking Lot, the City Street(Fair Street Ext.) and the Herzog properties. **Figure 1 in Appendix B** displays this watershed area under existing conditions. For the HydroCAD model, input information on each of these catchment areas includes land cover area, soil type, and time of concentration. Some assumptions were necessary for the diameter, pipe

material, and slopes of existing storm sewers in this area due to limited information and records.

The land cover areas currently present within this watershed are as follows: 0.50 acres of roof, 2.03 acres of paved area (a total of 2.53 acres impervious), and 0.14 acres of grassed areas. This information is displayed on Table 1 below. Information on the soils on this site was obtained from a custom USDA Soil Resource Report, which is included in **Appendix C**. The report indicates four soil types on this site: Made land, Unadilla silt loam, Plainfield-Riverhead complex, and Riverhead fine sandy loam. All four soil types on this site are classified as hydrologic soil group (HSG) A or HSG B soils; where water typically infiltrates through the soil at high rates, limiting surface runoff.

In order to determine peak rates of runoff, the “time of concentration” is calculated. This is the time for stormwater from the most remote point in the watershed to reach the discharge point. The flow path used to calculate time of concentration within each catchment area is shown on the watershed area map. The time of concentration calculations for each of the 5 catchment areas, and all other input information can be found in the existing conditions HydroCAD report, which is included in **Appendix D**.

### **Proposed Conditions - Post Development Model**

In order to evaluate potential increases in stormwater runoff, the watershed areas on this site were revised to reflect the proposed, post-development conditions.

The proposed site was modeled using 4 separate watershed areas. The watershed areas for the proposed site conditions are displayed on **Figure 2 in Appendix B**. The proposed drainage plan for the roof drains and level one of the garages are showing on **Figure 3 in Appendix B**.

The changes in land cover areas from existing conditions to the proposed conditions for both watershed areas are shown below in Table 1. Table 1 shows a 0.3-acre net decrease in impervious area for the proposed site.

**Table 1. Watershed Land Cover Areas**

	<b>Existing Conditions</b>	<b>Proposed Conditions</b>
<b>Land Cover</b>	(acres)	(acres)
Roof	0.50	1.25
Paved	2.03	0.98
Grass	0.14	0.24
Permeable Pavers	0.0	0.20
<b>Total</b>	<b>2.67</b>	<b>2.67</b>

The site soils types remain the same as in the existing conditions model. The time of concentration data can be found in the post-development HydroCAD report included in **Appendix D**.

### Summary of Stormwater Calculation Results

Results from the pre-development and post-development HydroCAD models for the 1-year, 10-year, 25-year, and 100-year design storm events are summarized below. The HydroCAD reports in **Appendix D** include detailed input and output values for both models. Table 2 below displays the peak runoff values to the design point at a storm sewer inlet on Schwenk Drive (City Street downgradient from the project).

**Table 2. Existing vs. Proposed Peak Runoff Results**

<b>Stormwater Runoff to Point of Analysis</b>				
	<b>Existing Conditions</b>		<b>Proposed Conditions with IC Reduction</b>	
	<b>Peak Runoff</b>	<b>Runoff Volume</b>	<b>Peak Runoff</b>	<b>Runoff Volume</b>
<b>Design Storm</b>	(cfs)	(acre-feet)	(cfs)	(acre-feet)
1-year (2.6")	7.55	0.43	6.63	0.36
10-year (4.7")	12.87	0.85	11.79	0.74
25-year (5.9")	15.75	1.08	14.6	0.95
100-year (8.3")	20.95	1.54	19.78	1.40

The results in Table 2 demonstrate that the proposed construction will result in lower peak stormwater runoff rates and runoff volumes than under existing conditions for all four design storms.

### Preliminary Approach- Redevelopment Standard -Stormwater Treatment

It is proposed to meet the redevelopment requirements of the New York State SPDES General Permit for Stormwater Discharges from Construction Activities (GP-0-015-002) by using the following methods: Chapter 9 of the New York State Design Manual(2015) Since the redevelopment activities will result in no increase to the discharge rate from the project site, certain criteria do not apply (i.e., channel protection).

The project approach will include the use of alternative SMPs to treat the water quality volume from the disturbed and impervious areas, as follows:

## **Green Infrastructure Practices**

The Pedestrian Plaza area, which is currently paved roadway, will be replaced with a permeable paver system with a filter layer, drainage layer, and underdrains. This area is approximately 8000 sq. ft.

## **Reduction in Impervious Cover (IC Reduction)**

Three areas will constitute a reduction in Impervious Cover, totaling 13,000 sq. ft., or 12% of the project area:

1. Pedestrian Plaza- 8000 +/-sq. ft.
2. Land behind east side of new building – 1800 +/-sq. ft. of building to be replaced with lawn area
3. Land at Uptown Grill side parking (to be replaced with dog park and green space), - 3200 +/-sq. ft.

## **Treatment**

To reduce pollutants from the site storm water, high performance hydrodynamic separators will be installed prior to discharge to the City of Kingston stormwater system on Schwenk Drive. These will be located at the final collection point for the east and west project areas, and are identified as ponds 8P and 9P in the post development mode.

## **Summary and Conclusions**

This drainage study assesses potential impacts due to the proposed residential development at the proposed Kingstonian Project located at Fair Street Extension and North Front Street in the City of Kingston. The proposed development includes two buildings with a footprint of approximately 55,000 square feet (1.25 acres), and other site work including sidewalks, pedestrian plaza, and delivery area. This development will result in a net decrease in impervious area of approximately 0.2 acres on this 2.67-acre drainage area, as shown in Table 1 of this report.

In order to evaluate impacts on stormwater runoff, the HydroCAD software was utilized. This software allowed for the computation of the hydrograph routing model for the two conditions: (1) existing conditions and (2) proposed conditions with IC Reduction. The analysis utilizes site-specific design storm events (1-year, 10-year, 25-year, and 100-year) provided by Cornell University's Northeast Regional Climate Center (NRCC) precipitation database.

The analysis for this project includes the use of three watershed area under existing conditions, and the use of multiple watershed areas for the proposed conditions. The entire site was found to contain four soil types, Made Land, Plainfield-Riverhead Complex, Riverhead Fine Sandy Loam, and Unadilla Silt Loam. The soils are classified as hydrologic

soil groups A and B. In addition to soil type, model inputs for the drainage areas included land cover area and time of concentration.

The HydroCAD report for all conditions and design storms considered are included in Appendix D. When comparing proposed conditions to existing conditions (see Table 2), there is a slight reduction in peak storm water runoff due to the proposed construction, and this is largely due to the fact that the site is fully developed at present and there will be a small decrease in impervious area resulting from the project. The Post-Development with IC Reduction includes an area of permeable pavers with a filter bed beneath in the front portion of Pedestrian Plaza area.

The two major project areas (area 1 and area 2) will each include a stormwater treatment unit. Preliminarily, these treatment units are proposed to be the Contech CDS Stormwater Treatment System and/or Vortechs 7000, which are both high-performance hydrodynamic separators. These units are on the NYSDEC approved list of “stormwater manufactured treatment devices” (by reference to New Jersey DEP approved list). Appendix E includes a design summary provided by Contech Engineering Solutions.

Stormwater treatment components and erosion control measures will be further addressed in a SWPPP (Stormwater Pollution Prevention Plan) to be submitted as the detailed plans progress. The project will fall under the redevelopment standards for a SPDES General Permit for Stormwater Discharges from Construction Activities (GP-0-015-002).

In summary, the proposed project will reduce the rates of discharge from the site, and reduce the total volume run-off from the site. Specifically, the peak rate of discharge for a 100 year event will be reduced from 20.95 cfs to 19.78 cfs, approximately a 5.4% reduction. The total volume run-off will be reduced from 1.54 acre-feet to 1.40 acre-feet in the 100 year rainfall event, also a reduction of approximately 8%.

In addition, the project will provide stormwater treatment in accordance with the NYSDEC Stormwater Design Manual as it pertains to redevelopment projects. This will result in an improvement to water quality discharging from the site (to City Storm System and ultimately to the Esopus Creek). Currently there is no water quality treatment on the site and this will be supplanted with two treatment units, an area of infiltration (lawn area) and an area of permeable pavers with filter media beneath.

## **Appendix A**

1. USGS Map, Kingston East Quadrangle.

## **Appendix B**

2. Figure 1-Exhibit Map of Watershed Area Delineation (existing)
3. Figure 2-Exhibit Map of Watershed Area Delineation (proposed)
4. Figure 3- Garage Drainage Plan (preliminary/proposed)

## **Appendix C**

5. Ulster County Soil Survey

## **Appendix D**

6. HydroCAD report, Pre-development conditions
7. HydroCAD output- Post development with IC Reduction and Permeable Paver Area

## **Appendix E**

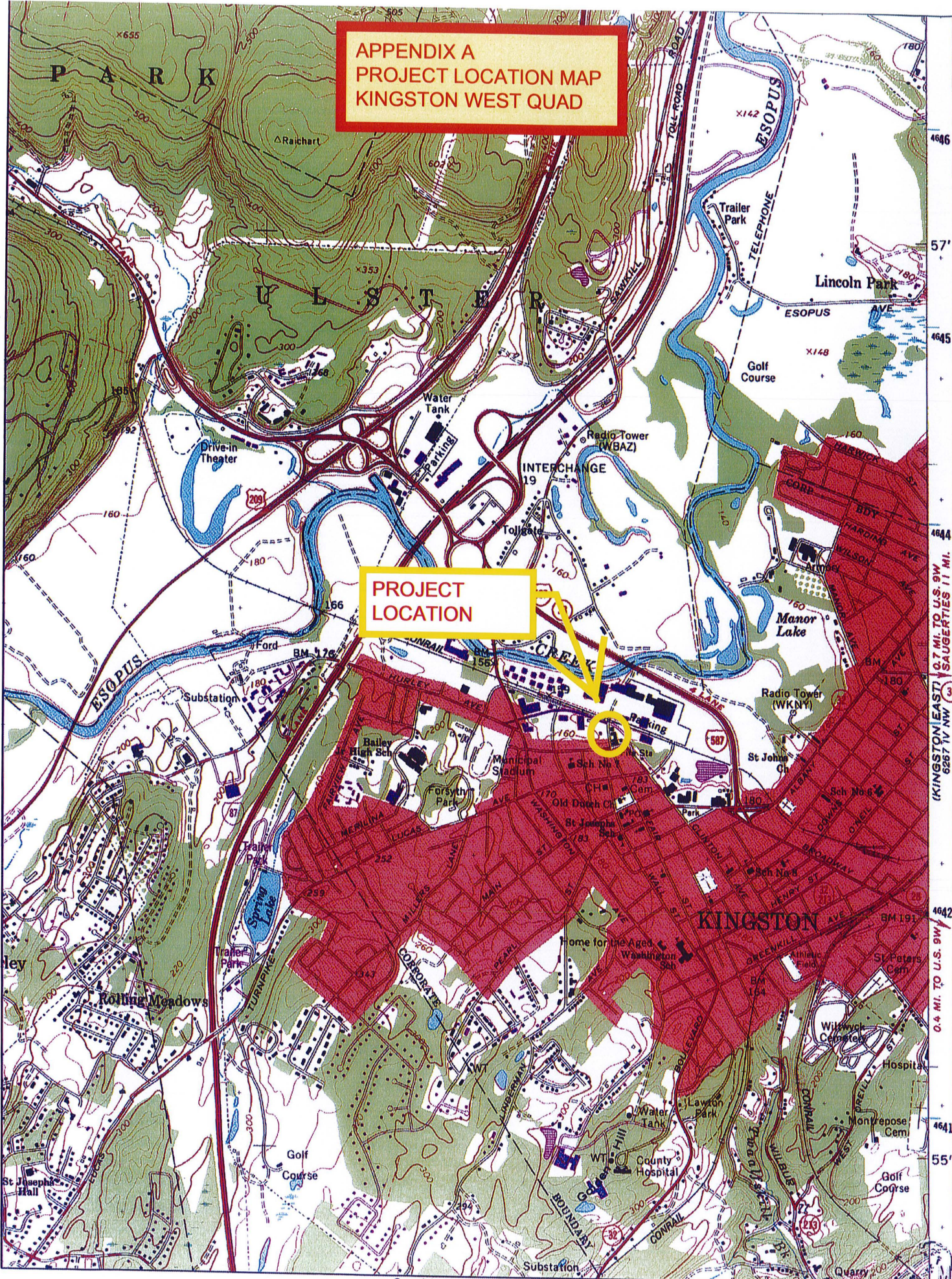
1. Contech Stormwater Treatment Unit Information

## **APPENDIX A**



APPENDIX A  
PROJECT LOCATION MAP  
KINGSTON WEST QUAD

PROJECT  
LOCATION



## **APPENDIX B**