



**APPENDIX M ADDENDUM**  
**TO**  
**STORMWATER POLLUTION PREVENTION PLAN**  
**DATED 4/30/2018**  
**FOR**  
**THE LEARNING EXPERIENCE**

**530 North State Road  
Section 90.15 Block 2, Lot 18  
Town of Ossining / Briarcliff Manor  
Westchester County, New York**

**Prepared by  
Jarmel Kizel Architects & Engineers, Inc.**

**Prepared For:  
Briarcliff Manor Partners, LLC  
42 Okner Parkway  
Livingston, NJ 07039**

**Jarmel Kizel Project No. TLENY-S-17-155  
Dated: September 20, 2018**

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**STORMWATER MANAGEMENT REPORT**  
**FOR**  
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## **APPENDICES**

1. Existing Peak Flow Hydrographs
2. Proposed Peak Flow Hydrographs
3. Pond Routing Calculations
4. Existing and Proposed Drainage Area Plans

## **INTRODUCTION**

This report has been prepared on behalf of the applicant, Briarcliff Manor Partners, LLC, in support of their application for the construction of a child daycare center located at 530 North State Road, Town of Ossining\Briarcliff Manor, Westchester County, New York. The purpose of this report is to demonstrate compliance with the local stormwater management regulations applicable to this project.

## **PROJECT DESCRIPTION**

530 North State Road is located along the east side of North State Road roughly midway between the intersections of Blue Lantern Road to the south and Ryder Avenue to the north. Refer to Figure 1, Location Map, located in Appendix A. The parcel is designated as Section 90.15, Block 2, Lot 18 on the tax maps. The property is a square shaped lot with an area of 43,262 square feet (0.993 acres). Commercial properties exist immediately to the north and south of the subject property as well as across North State Road. To the east of the subject property is a residential zoned neighborhood.

The proposed project is for the development of a 10,000 square foot single-story child-care center with an outdoor play area of just over 4,000 square feet, and on-site parking for 35 vehicles.

The Site development will increase the amount of impervious surface from the previously developed conditions thus increasing the amount of stormwater runoff leaving the site. In order to mitigate the increase in runoff, the project will incorporate a sub-surface HDPE detention system.

## **PROPOSED STORMWATER MANAGEMENT**

### **Existing Site Conditions**

The site was formerly developed as a garden center and contains a single story main structure and two (2) smaller ancillary structures. Site access is presently is currently provided via two (2) full-movement driveways along North State Road. The site is paved to roughly the front of the existing main building and the remainder of the lot is bare earthed compacted from its use as

a storage area. The existing structures and ancillary impervious surfaces will be demolished for the new development.

The site, roughly 75 percent, slopes mildly from north to south toward the watercourse along the rear of the property. The remaining 25 percent of the site is an area along North State Road that slopes toward North State Road. For analysis, both the above described watershed areas were examined with Area 1, 0.213 acres, being the area draining onto North State Road and Area 2, 0.773 acres, being the area draining directly to the existing watercourse along the rear of the property. An Existing Conditions Drainage Area Map is enclosed for reference. Existing peak flow rates for the watershed areas are provided in Table 1 below.

**Table 1: Existing Peak Flows**

Storm Event	Existing Peak Flow (cfs)	
	Area 1 0.213 Acres to North State Road	Area 2 0.773 Acres to Ex. Watercourse
2-YR	0.191	0.336
10-YR	0.895	2.823
100-YR	1.565	5.337

### **Proposed Site Conditions**

The development of the proposed child daycare center will require the demolition of all existing structures and impervious surfaces. The proposed development calls for a 10,000 square foot single-story child-care center with an outdoor play area of just over 4,000 square feet, and on-site parking for 35 vehicles. The proposed condition has been divided into three (3) watershed areas for the purposes of analysis. Area 1, 0.103 acres, is the developed condition area that will drain toward North State Road. Area 2, 0.241 acres, is the developed area that will drain directly toward the existing watercourse along the rear of the property, and Area 3, 0.651 acres, is the developed area that will be captured and directed to the sub-surface detention system.

The proposed detention system will consist of a network of solid 36-inch HDPE pipe totaling 560 linear feet located below the parking area. The pipe network will discharge into an outflow control structure designed to attenuate flows such that the total developed runoff from the site

when adding the routed outflow to the un-detained flow from Area 2 will be at or below the existing condition flows from Area 2. In addition, the developed peak flow rates for Area 1 will be at or below the existing condition flow rates for Area 1. The watershed areas and associated developed peak flow rates are provided in Table 2 below.

**Table 2: Developed Peak Flows**

Storm Event	Developed Peak Flow (cfs)		
	Area 1 0.103 Acres to North State Road	Area 2 Un-detained 0.241 Acres to Ex. Watercourse	Area 3 0.651 Acres to Sub-surface Detention to Ex. Watercourse
2-YR	0.024	0.065	0.709
10-YR	0.332	0.797	2.808
100-YR	0.668	1.586	4.832

### **Water Quantity Design**

A comparison of the existing and proposed peak flow rates summarized in Tables 1 and 2 above indicate a decrease in runoff to North State Road and an increase in runoff to the existing watercourse along the rear of the property. In order to mitigate the increase in runoff to the existing watercourse such that the developed peak flow rates will be the same or less than the existing peak flow rates, a sub-surface detention system is proposed. As described above, the proposed detention system will consist of a network of solid 36-inch HDPE pipe totaling 560 linear feet located below the parking area. The pipe network will discharge into an outflow control structure designed to attenuate flows as necessary.

The runoff from Area 2, 0.241 acres un-detained to the existing watercourse, was subtracted from the existing Area 2 peak flow rates to determine the allowable detention system routed peak flow rates. The tank will release collected storm runoff through a 3.5-inch diameter low flow orifice and a secondary 9-inch orifice set 0.8 feet above the low flow orifice, and an 18-weir set 2.50 feet above the low flow orifice invert. The routed peak discharges through the detention structure result in a reduction of peak flows such that the developed peak flow to the existing watercourse is less than the existing peak flow toward the same location.

Tables 3 and 4 below summarize the existing peak flow rates, developed peak flow rates and the actual routed outflows from the proposed detention tank.

**Table 3 – Summary of Peak Discharges – North State Road**

Storm Event	Peak Flow Comparisons	
	Area 1-Existing 0.213 Acres to North State Road	Area 1-Developed 0.103 Acres to North State Road
2-YR	0.191	0.024
10-YR	0.895	0.332
100-YR	1.565	0.668

**Table 4 – Summary of Peak Discharges and Routed Outflow - Watercourse**

Storm Event	Existing Peak Flow (cfs)	Bypass Peak Flow (cfs)	Allowable Routed Peak Flow (cfs)	Actual Routed Peak Discharge (cfs)	Peak Flow Reduction %
2-YR	0.336	0.065	0.271	0.251	6.0%
10-YR	2.823	0.797	2.026	1.933	3.3%
100-YR	5.337	1.586	3.751	3.414	6.3%

The routed outflow from the detention basin will discharge via roughly 90 linear feet of 15-inch diameter pipe to a proposed scour hole located at the watercourse just outside the wetland line.

### **Water Quality Design**

The proposed development has been designed to incorporate measures to improve the water quality leaving the site. Due to the predominantly bare earth nature of the existing ground coverage, runoff overland to the existing watercourse most likely contains a high sedimentation rate. The development of the site will eliminate this condition by replacing the bare earth coverage with pavement and turf play area. The change in surface coverage alone will greatly enhance the water quality leaving the site. In addition, the design will incorporate a “Downstream Defender” manufactured treatment device sized appropriately for the flow coming from the one-year design storm, 2.8 inches of rainfall, per the NY State Stormwater

Design Manual. The play area will incorporate a gravel base with an underdrain system. Any surface runoff from the play area will sheet flow toward the rear of the site which will be provided with a heavily vegetated 20-foot landscape buffer which will provide a natural filter for the runoff before it reach the watercourse.

### **Conclusion**

As demonstrated by the above and attached hydraulic computations, there will be no increase, as compared to the existing condition, in the peak runoff rates of stormwater leaving the site for the 2, 25, and 100-year storm events. As is demonstrated in the tables presented in this report, stormwater runoff leaving the site will be reduced.

It is our opinion based on the above and enclosed calculations and supplemental information that the proposed improvements are designed in accordance with local, county and state standards. The measures and design provided herein and as shown on the Preliminary\Final Site Plan Drawings submitted as part of this application are intended to prevent or limit the impact of the proposed development on the site and the surrounding areas with respect to stormwater quantity and quality control.