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DRAINAGE REPORT

FOR

PROPOSED SITE IMPROVEMENTS

BLOCK 152.02, LOTS 176, 179 & 186
TOWNSHIP OF WEST ORANGE
ESSEX COUNTY, NEW JERSEY

APPLICANT
MONTCLAIR STABLES LLC

PREPARED BY

ROBERT M. CUNNINGHAM, PE
NEW JERSEY LICENSE #GE31540

January 10, 2025

INTRODUCTION

This report is submitted in support of an application to the Township of West Orange for site plan approval. The Applicant, Montclair Stables LLC, has purchased the existing equine facility on Woodland Avenue and proposes to make improvements to the site. The primary improvements are the re-orientation and reconstruction of the existing outdoor sand riding arena and the re-location of the paved parking lot and driveways. The Applicant also proposes to make improvements to Nicholas Avenue, a paper street located at the rear of the property. This facility has used part of Nicholas Avenue as a driveway for decades. The proposed improvements include extending the driveway to connect to the paved portion of Nicholas Avenue near its intersection with Cannon Street. The driveway would function as a one-way driveway which would exit near the Cannon Street intersection and there would be new security gates at both ends.

There are presently two buildings on the site, a barn and an indoor riding arena which are connected by a one-story concourse. There are no changes proposed to the configuration of these buildings. The Existing Drainage Area Plan, as well as the Existing Conditions Plan in the application set, depict a dwelling and related improvements which existed on Lot 176 until recently.

EXISTING DRAINAGE

The existing drainage patterns are indicated on the attached Existing Drainage Areas Plan. The area considered includes the site, a portion of Nicholas Avenue, a small portion of adjacent Lot 132 and an existing bridle path on Lots 1 and 2 in Block 152.26. An easement for the bridle path appears on the Tax Map. The total study area includes 175,847 square feet, or 4.037 acres.

Under present conditions, five drainage areas were identified.

Drainage Area A includes 19,498 square feet. This area is on the west side of the site and drains onto adjacent Lots 162 and 172. This area includes part of the existing riding arena, a lightly wooded area adjacent to Lot 162, the rear and west side of Lot 176 and approximately one quarter of the paved parking lot. Nearly all the runoff to Lot 172 is intercepted by the curbed, paved driveway and is directed to the curbline of Woodland Avenue.

Drainage Area B includes the front yards of the buildings, a small portion of the roof area, the majority of the existing paved parking lot and approximately one quarter of Lot 176 and drains onto Woodland Avenue. The area is 22,685 square feet. No formal drainage system exists for the parking lot.

Drainage Area C includes 64,808 square feet. This drainage area encompasses most of the center of the site and a portion of Nicholas Avenue as shown. Approximately three quarters of the roof surface is in this drainage area, as is the land between the barn and the indoor riding arena. Drainage Area C drains to an existing type E inlet in Nicholas Avenue and ultimately to the municipal drainage system located in an easement between Lots 5 and 6 in Block 152.26. Part of this drainage area is tributary to an existing riprap swale that is connected to a type E inlet at the west side of the indoor riding arena by a 12" corrugated metal pipe and flows to the type E inlet in Nicholas Avenue through a 15" corrugated metal pipe.

Drainage Area D includes the easterly half of the barn roof, a gravel driveway to the east of the barn, existing paddocks, a small portion of adjacent Lot 132, the site area to the rear of the barn, a portion of Nicholas Avenue, and a portion of the existing bridle path on Lots 1 and 2 in Block 152.26. The total area is 54, 179 square feet. Drainage Area D drains into a riprap swale and open ended 15" RCP pipe and ultimately through the same municipal drainage system as Drainage Area C.

Drainage Area E includes 14,677 square feet that drain toward Nicholas Avenue. This drainage area is near the southwest corner of the site and consists of a portion of the existing sand riding arena.

PROPOSED DRAINAGE IMPROVEMENTS

Under present conditions, no formal drainage system exists for the parking lot and roof runoff simply drips from the roofs onto the ground.

The applicant proposes to construct a drainage system for the re-configured parking lot which will include a type D inlet, 15" RCP pipe, and a doghouse manhole at the connection point to the existing storm drain in Woodland Avenue. A road opening permit will be required for this work. The applicant also proposes installing gutters on the barn and on the indoor riding arena. Downspouts will be piped to collector pipes which will connect to the existing drainage systems as shown on Sheet SE-4 of the application set.

The reconstruction of the outdoor riding arena will also be an improvement to stormwater runoff and groundwater recharge. The new arena will be totally level and will capture the rainfall over its entire area. The arena will consist of a 6" thick sand surface over a layer of filter fabric over a 12" thick layer of 1 ½" clean crushed stone. The subgrade below the stone will be scarified prior to stone installation. A flush concrete curb will surround the entire arena and will serve to confine the sand and stone as well as rainfall. Disregarding any infiltration that will occur during a rainfall event, we estimate that the riding arena will be able to store approximately 4 ½" of rainfall.

The Applicant also proposes to locate, expose, and make any necessary repairs to an existing inlet that is part of the municipal drainage system in Nicholas Avenue. This inlet was identified on the original topographic survey but is not visible at this time.

POST CONSTRUCTION DRAINAGE AREAS.

Post Construction Drainage Area A is located at the west side of the site and is a smaller version of Existing Drainage Area A due to the interception of runoff by the new riding arena and the parking lot construction. The area tributary to Lots 162 and 172 will be 10,971 square feet.

Post Construction Drainage Area B contains 19,252 square feet of area and still includes most of the front of the site. The net area will be reduced by approximately 3,400 square feet due to the outdoor riding arena construction. Runoff from the western half of this drainage area will now be directed into the existing storm drain system, thereby reducing the amount of curblin flow to the downstream inlet in Woodland Avenue.

The lower level will be constructed over a crawl space having a concrete floor to provide for the existing flood storage capacity of the property to remain after construction. The lower floor will be set at least one foot above the flood hazard area design flood elevation. The handicapped accessible parking space and access aisle will be constructed as a slab on-grade.

Post Construction Drainage Area C is reduced in size to 36,478 square feet from the existing area of 64,808 square feet. This reduction is due to the proposed outdoor riding arena construction (new Drainage Area F) and the connection of the easterly half of the indoor riding arena roof (new Drainage Area D.1) to Drainage Area D facilities. Drainage Area C will still contribute flow to the storm drain system as under present conditions.

Post Construction Drainage Area D will be larger than Existing Drainage Area D due to the capturing of the roof runoff from the westerly half of the barn roof by the gutters and leader drain system. The new area will be 59,517 square feet. The proposed construction of the Nicholas Avenue driveway extension will not alter existing drainage patterns.

Post Construction Drainage Area E will still drain toward Nicholas Avenue but will be significantly smaller at 4,649 square feet. This reduction is due to the new outdoor riding ring construction.

Post Construction Drainage Area F includes the new outdoor riding arena and a small area between the proposed low retaining wall and the retaining curb. The surface area will be 35,605 square feet. As stated above, this drainage area will provide for a reduction in stormwater runoff and an increase in infiltration.

CONCLUSION

The designer believes that the proposal reduces stormwater runoff to adjacent properties and does not create increased demand on the public drainage system.

ENCLOSURES

Existing Drainage Areas Plan
Proposed Conditions Drainage Areas Plan