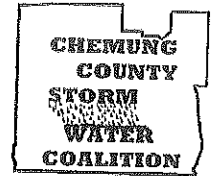


CHEMUNG COUNTY STORMWATER COALITION

851 Chemung Street, Horseheads, New York 14845



March 6, 2012

Mr. Tim Gilbert, Stormwater Management Officer
Town of Big Flats Code Enforcement Department
476 Maple Street, P.O. Box 449
Big Flats, NY 14814

**Re: Hickory View Apartments
Hickory Grove Road
Town of Big Flats, New York**

Mr. Gilbert:

As per the Town's request, I have completed a cursory review of the following information in regards to the above-referenced project.

- o Stormwater Drainage Information for Hickory View Apartments, Prepared by Larson Design Group, Not stamped by a licensed professional engineer, Received via e-mail on March 5, 2012 at 5:24 PM, Hardcopy received on March 6, 2012
 - Hydrologic calculations, dated March 5, 2012
 - Water Surface Elevations versus Time Graphs, dated March 5, 2012
 - Stormwater Management Plan, Revision dated March 5, 2012
 - Summary E-mail Memo from Mike McDonnell of Larson Design Group,

Basic Stormwater Management Plan

The proposed drainage design calls for the entire runoff volume to be stored on the site of the Hickory View Apartments and, in turn, infiltrated. Presently, stormwater runoff is also stored and infiltrated on-site. As such, the design intent is to have no stormwater leave the developed project site.

Upon a cursory review of this submitted information, the applicant's engineer has indicated that the proposed stormwater infiltration basins will be capable of draining within a 48-hour period. This is consistent with the New York State Stormwater Management Design Manual, which requires stormwater infiltration systems to drain within a maximum period of 48 hours. Provided that the proposed infiltration basins (referred to as "Vegetated Open Swales" by the applicant's engineer) can drain within a maximum period of 48 hours, this drainage concept complies with NYSDEC requirements.

Two "Ponding Areas" are proposed that are proposed to receive runoff from the various infiltration basins and are intended by the applicant and their engineer to retain water for periods longer than 48 hours.

On-Site Soils

The on-site soils are marginal in regards to the infiltration of stormwater, as per the prior soil infiltration testing completed by the applicant's engineer. Based upon this soil testing, most of the infiltration tests had a measured infiltration rate of 0.5 inches/hour. As per the New York State Stormwater Design Manual, *"to be suitable for infiltration, underlying soils shall have an infiltration rate of at least 0.5 inches/hour"*. This topic was openly discussed with the applicant's representative and engineer early in their design process.

Given the marginal nature of the on-site soils, it is believed that an increased potential for performance issues with the proposed stormwater infiltration basins. Such performance issues could include standing water for over a 48-hour period, stormwater flows leaving the project site, and the development of nuisance conditions (including the inability to mow/maintain the proposed infiltration basins).

Contingency Stormwater Management Plan

Given the nature of the on-site soils, a Contingency Stormwater Management Plan is recommended to be developed by the applicant and their engineer that outlines steps to be taken to address the possible situation of failure (or lack of performance) of the proposed stormwater management facilities. At a project review meeting, the applicant's representative indicated that he agrees that a contingency plan would be prudent and would help protect the owner. The applicant's representative indicated that the contingency plan would include the following alternatives to ensure that developed runoff from the project site is retained on the applicant's property and not conveyed off-site.

- The expansion of the stormwater infiltration basins within the current project limits to improve stormwater management system performance and/or
- The use of/modification of the existing topographic depressions to the east of the currently proposed project. These topographic depressions are located on the property owned by Arnot Realty.

This Contingency Stormwater Management Plan would include the following elements.

- Assurance that rights for the currently proposed project site to utilize the area to the east of the current project site for stormwater management would exist in perpetuity.
- Time frames that would be established by which corrective actions would be completed, after a performance issue is identified.
- General layout and location of areas that would be utilized for back-up stormwater management areas.

It is important to note that a detailed review of the revised stormwater management system and Stormwater Pollution Prevention Plan (SWPPP) has not been completed to date. During the completion of the detailed drainage review, it is anticipated that more review comments and questions will be developed regarding specific elements of the drainage design.

If you have any questions or comments, please do not hesitate to contact us. Furthermore, I would be happy to meet regarding this letter.

Sincerely,

A handwritten signature in black ink that reads "Jimmie Joe Carl". The signature is written in a cursive style with a large initial 'J' and a distinct 'C' at the end.

Jimmie Joe Carl, P.E.

Cc: Jessica Verrigni, Chemung County Stormwater Coalition

Jimmie Joe Carl

From: Michael McDonnell [mpm@larsondesigngroup.com]
Sent: Monday, March 05, 2012 5:24 PM
To: Michael McDonnell; Jimmie Joe Carl; 'Tim Gilbert'; 'Larry Wagner'
Cc: David Young; Maureen Bower; Keith Bianco; Adam Kirchner; carlcarson
Subject: RE: 6632-006: Hickory View Stormwater Management Plan for VOS F-1 through F-4
Attachments: 030512.1 Stormwater Management Plan.pdf; 030512.2 Hydrology Report.pdf; 030512.3 WSE vs Time.pdf

Jimmie Joe:

As we just discussed, the revised Stormwater Management Plan for the Hickory View Apartments project incorporating discussions from the Stormwater Review Meeting at the Town of Big Flats Town Hall on Tuesday, February 28, 2012, and the discussion held through today are illustrated on the e-attached PDF 030512.1, and are summarized in the following:

1. LDG modified the Vegetated Open Swale [VOS] B, C, & D in to a single VOS BCD to have the characteristics noted in the following:
 - {1} Bottom Elevation of 992.0,
 - {2} Top Elevation of 994.21,
 - {3} Infiltration rate of 0.87,
 - {4} 100-year Water Surface Elevation [WSE] of 993.70,
 - {5} 100-year Freeboard of 6.12",
 - {6} Volume Required is 8,430-cf and the Volume Provided is 12,081-cf,
 - {7} 8" Equalization Pipe is 142' in length (from VOS BCD to VOS E), with an Invert at VOS BCD of 992.57 and an Invert at VOS E of 992.00, which results in a Pipe Slope of 0.004 ft/ft.
 - {8} 100-year Maximum Drain Time is 43.67-hrs.

2. LDG modified the VOS E to have the characteristics noted in the following:
 - {1} Bottom Elevation of 992.0,
 - {2} Top Elevation of 994.42,
 - {3} Infiltration rate of 0.50,
 - {4} 100-year WSE of 993.91,
 - {5} 100-year Freeboard of 6",
 - {6} Volume Required is 5,692-cf and the Volume Provided is 8,233-cf,
 - {7} 8" Equalization Pipe is 80' in length (from VOS E to Pond 1A), with an Invert at VOS E of 992.0 and an Invert at Pond 1A of 991.68, which results in a Pipe Slope of 0.004 ft/ft.
 - {8} 100-year Maximum Drain Time is 28-hrs.

3. LDG modified the VOS G to have the characteristics noted in the following:
 - {1} Bottom Elevation of 994.0,
 - {2} Top Elevation of 996.0,
 - {3} Infiltration rate of 1.0,
 - {4} 100-year WSE of 994.83,
 - {5} 100-year Freeboard of 14.04",
 - {6} Volume Required is 165-cf and the Volume Provided is 634-cf,
 - {7} 8" Equalization Pipe is 80' in length (from VOS G to Pond 1A), with an Invert at VOS G of 994.0 and an Invert at Pond 1A of 993.68, which results in a Pipe Slope of 0.004 ft/ft.
 - {8} 100-year Maximum Drain Time is 24-hrs.

4. LDG modified the VOS F4 to have the characteristics noted in the following:
 - {1} Bottom Elevation of 993.5,
 - {2} Top Elevation of 995.5
 - {3} Infiltration rate of 0.7,
 - {4} 100-year WSE of 994.76,

- {1} 100-year Freeboard of 8.88",
 {6} Volume Required is 1,511-cf and the Volume Provided is 1,984-cf,
 {7} 12" Equalization Pipe is 47' in length (from VOS F4 to VOS F3), with an Invert at VOS F4 of 993.5 and an Invert at VOS F3 of 993.31, which results in a Pipe Slope of 0.004 ft/ft.
 {8} 100-year Maximum Drain Time is 26-hrs.
5. LDG modified the VOS F3 to have the characteristics noted in the following:
 {1} Bottom Elevation of 993.0,
 {2} Top Elevation of 995.6,
 {3} Infiltration rate of 0.7,
 {4} 100-year WSE of 994.87,
 {5} 100-year Freeboard of 8.76",
 {6} Volume Required is 3,149-cf and the Volume Provided is 6,142-cf,
 {7} 12" Equalization Pipe is 56' in length (from VOS F3 to VOS F2), with an Invert at VOS F3 of 993.0 and an Invert at VOS F2 of 992.78, which results in a Pipe Slope of 0.004 ft/ft.
 {8} 100-year Maximum Drain Time is 28-hrs.
6. LDG modified the VOS F2 to have the characteristics noted in the following:
 {1} Bottom Elevation of 992.5,
 {2} Top Elevation of 995.0,
 {3} Infiltration rate of 0.7,
 {4} 100-year WSE of 994.45,
 {5} 100-year Freeboard of 6.6",
 {6} Volume Required is 3,425-cf and the Volume Provided is 4,906-cf,
 {7} 12" Equalization Pipe is 44' in length (from VOS F2 to VOS F1), with an Invert at VOS F2 of 992.5 and an Invert at VOS F1 of 992.32, which results in a Pipe Slope of 0.004 ft/ft.
 {8} 100-year Maximum Drain Time is 28-hrs.
7. LDG modified the VOS F1 to have the characteristics noted in the following:
 {1} Bottom Elevation of 992.0,
 {2} Top Elevation of 995.0,
 {3} Infiltration rate of 0.7,
 {4} 100-year WSE of 994.33,
 {5} 100-year Freeboard of 8.04",
 {6} Volume Required is 2,665-cf and the Volume Provided is 3,823-cf,
 {7} 12" Equalization Pipe is 93' in length (from VOS F1 to Pond 1A), with an Invert at VOS F1 of 992.0 and an Invert at Pond 1A of 991.63, which results in a Pipe Slope of 0.004 ft/ft.
 {8} 100-year Maximum Drain Time is 28-hrs.
8. LDG modified Pond 1A to have the characteristics noted in the following:
 {1} Bottom Elevation of 990.0,
 {2} Top Elevation of 996.0,
 {3} Infiltration rate of 0.25,
 {4} 100-year WSE of 994.83,
 {5} 100-year Freeboard of 14.04",
 {6} Volume Required is 43,596-cf and the Volume Provided is 54,750-cf.
 {7} 12" Equalization Pipe is 127' in length (from Pond 1A to VOS K), with an Invert at Pond 1A of 993.5 and an Invert at VOS K of 993.0, which results in a Pipe Slope of 0.004 ft/ft.
9. LDG modified the VOS J to have the characteristics noted in the following:
 {1} Bottom Elevation of 994.0,
 {2} Top Elevation of 996.0,
 {3} Infiltration rate of 0.50,

- {4} 100-year WSE of 994.35,
- {5} 100-year Freeboard of 19.8",
- {6} Volume Required is 72-cf and the Volume Provided is 634-cf,
- {7} 8" Equalization Pipe is 95' in length (from VOS J to VOS K), with an Invert at VOS J of 994.0 and an Invert at VOS K of 993.62, which results in a Pipe Slope of 0.004 ft/ft.
- {8} 100-year Maximum Drain Time is 26-hrs.

10. LDG modified the VOS K to have the characteristics noted in the following:

- {1} Bottom Elevation of 993.0,
- {2} Top Elevation of 996.35,
- {3} Infiltration rate of 0.50,
- {4} 100-year WSE of 995.85,
- {5} 100-year Freeboard of 6",
- {6} Volume Required is 19,626-cf and the Volume Provided is 21,169-cf,
- {7} 8" Equalization Pipe is 78' in length (from VOS K to VOS L), with an Invert at VOS K of 993.0 and an Invert at VOS L of 993.68, which results in a Pipe Slope of 0.004 ft/ft.
- {8} 100-year Maximum Drain Time is 36-hrs.

11. LDG modified the VOS H, I, & L in to a single VOS HIL that is combined with Pond 1B to have the characteristics noted in the following:

- {1} VOS HIL Bottom Elevation of 993.0,
- {2} VOS HIL Top Elevation of 996.0,
- {3} VOS HIL Infiltration rate of 0.50,
- {4} VOS HIL 100-year Maximum Drain Time is 47.50-hrs.
- {4} Pond 1B Bottom Elevation of 989.5,
- {5} Pond 1B Top Elevation of 996.0,
- {6} Pond 1B 100-year WSE of 993.84,
- {7} Pond 1B 100-year Freeboard of 25.92,
- {8} Volume Required is 88,750-cf and the Volume Provided is 200,898-cf,

E-attached for your use/review, please find the Hydrology Reports (PDF 030512.2) using Hydraflow Hydrographs to illustrate the USDA Soil Conservation Service TR-55 modeling for the conditions summarized above, along with the graphing of WSE vs Time (PDF 030512.3) for all VOS.

All of the Vegetated Open Swales now successfully dewater the 100-year Storm Event within 48-hours, as indicated in the e-attached documentation. Please let me know of any questions/issues, and feel free to call me anytime at 607-590-6578.

Thanks,
Mike

Michael P. McDonnell
Site Engineering Project Designer

PHONE: (607) 590-6578
LDG EXT: 414
EMAIL: mpm@larsondesigngroup.com

Larson Design Group ®
www.larsondesigngroup.com

1 West Market Street
3rd Floor, Suite 401
Corning, NY 14830
or
8836 Route 434
Apalachin, NY 13732

Please consider the environment before printing this email.