



851 Chemung Street
Horseheads, New York 14845

May 3, 2016

Mr. Thomas Skebey, Stormwater Management Officer
City of Elmira
101 West Second Street
Elmira, NY 14901

**Re: Stormwater Management Plan Review
LECOM Elmira Parking Lot
College Avenue, City of Elmira, New York**

Mr. Skebey:

I have completed a review of the following submitted information for the above-referenced project regarding the proposed stormwater management system for that project.

- Stormwater Pollution Prevention Plan (SWPPP) for LECOM Elmira Parking Lot, Not stamped by a NYS licensed design professional, Prepared by QPK Design, LLP, Dated March 2016, Received on March 22, 2016
- Site Development Plan for LECOM Elmira Parking Lot, Not stamped by a NYS licensed design professional, Prepared by QPK Design, Dated March 18, 2016, Received on March 22, 2016
- Hydrologic Model Diagram of Pre- and Post-Developed Conditions, Prepared by QPK Design, Received on April 26, 2016

My review comments and questions regarding the SWPPP and stormwater management system for the above-referenced project, based upon this submitted information, are as follows.

STORMWATER CONVEYANCE

1. It is unclear why a storm sewer is proposed from the LECOM parking lot to the adjacent municipal sewer system, as it appears that the design objective is to fully infiltrate the 100-year runoff from the proposed parking lot. It appears that the intent of this storm sewer may be to act as a back-up system, where stormwater flows in excess of the capacity of the proposed stormwater management system would be directed to a municipal sewer system. The use of this proposed storm sewer could effectively mask a poorly performing stormwater management system and introduce increased stormwater flow rates and volumes to the municipal system. As per input from both the City of Elmira and the Chemung County Sewer District, it is formally requested that no storm sewer be directed from the project site to the municipal sewer system (or municipal roadway).

POROUS ASPHALT

1. What is the anticipated effective life of the complete porous asphalt system (including the underlying reservoir)? An associated technical reference is requested. Towards the end of its design life, will the performance of the porous asphalt system meet the current design objectives? At the end of its effective life, would the entire porous asphalt system have to be replaced?

BIORETENTION AREAS

1. The planting media specification for the proposed bioretention areas should be noted on the plans.
2. In regards to the pretreatment of stormwater for the proposed bioretention areas, the following items are noted.
 - i. In accordance with the NYS Stormwater Design Manual, adequate pretreatment for bioretention systems should incorporate gravel diaphragms (in addition to grassed filter strips and mulch layers).
 - ii. The length of the grassed filter strips appear to be too short, given the proposed inflow approach length of the proposed pavement. Refer to Table 6.2 of the NYS Stormwater Design Manual.

STORMWATER MODELING

1. The existing land use of the project site is largely lawn area in Good Condition (>75% grass cover). As per the Chemung County Soil Survey, the site is situated upon Howards soils which belong to Hydrologic Soil Group A. An associated Curve Number of 39 would apply and, as such, very little (if any) runoff would be expected from this area. Upon review of the design calculations, it appears that the design objective of the proposed stormwater management system is to infiltrate the entire 100-year runoff from the proposed parking lot on-site.
2. In the narrative of the SWPPP (as well as the associated stormwater modeling), it is noted that the proposed increase in impervious area shall be 0.81 acres. From some cursory measurements, it appears that the increase in impervious area would be over 1 acre. Accordingly, it is requested that the proposed increase in impervious area be reviewed/checked.
3. In regards to the modeling of the proposed permeable pavement, the following items are noted.
 - i. A design infiltration rate of 30 inches/hour is utilized. Although it is understood that infiltration testing of on-site soils revealed rates of 30 to 48 inches per hour, has consideration been given to the potential that particulates could accumulate over time at the interface of the reservoir stone and native soil that could, in turn, reduce the effective infiltration rate? Similarly, could particulates accumulate over time on the proposed geotextile fabric between the reservoir stone and the native soil and reduce the effective infiltration rate?
 - ii. In regards to estimating the available storage in the reservoir course stone, a 60% void volume was utilized. Typically, washed stone (with stones of approximately the same size) has a 40% void volume roughly. It is recommended that the selected void volume percentage be reviewed and fully documented.

4. In regards to the modeling of the proposed bioretention areas, the following items are noted.
 - i. A design infiltration rate of 30 inches/hour is utilized and appears to be too high, given that the bioretention areas are proposed to have bioretention planting soil. The infiltration rate of this planting soil would have a lower infiltration rate than the underlying native soils. As per the NYS Stormwater Design Manual, a coefficient of permeability of 0.5 feet/day is noted for bioretention soil.
 - ii. Additional information regarding the development of the stage vs. storage relationship is requested.
5. In regards to the hydrologic modeling, the following items are noted.
 - i. The Time of Concentration for Existing Watershed 2 appears to be under-estimated. A flow path can be selected that would result in a longer Tc.
 - ii. The Time of Concentration for Existing Watershed 1 appears to be under-estimated. In the associated Tc calculation, a sheet flow length of only 50 feet was utilized.
 - iii. In regards to the post-developed sub-area referred to as "Proposed Watershed 2E", given the proposed Grading Plan, it appears that runoff from a portion of this area could sheet past the proposed Bioretention #2 towards the entrance drive. Similarly, it appears that a runoff from Proposed Watershed 2B may not be directed to Bioretention #1. It is requested that the Grading Plan be refined to address these items.
 - iv. Consideration should be given to separating the existing streets as separate drainage sub-areas. Given the distinctly different nature of these streets and the project site, the hydrologic model would be improved by modeling these areas as separate sub-areas.

SOIL RESTORATION & DECOMPACTION

1. In accordance with Chapter 5 (Green Infrastructure Practices) of the New York State Stormwater Management Design Manual, soil restoration or modification of curve numbers is a required practice. If soil restoration is not applied, the calculated WQv should be increased by factoring in the compacted areas to remain as impervious areas. Furthermore, the CN for unrestored areas to remain should be increased. The SWPPP should clearly outline the specifics of the soil restoration and decompaction that are proposed.

OPERATION & MAINTENANCE

1. In accordance with the City's Stormwater Management and Erosion and Sediment Ordinance, a formal, signed enforceable operation and maintenance agreement for the stormwater collection and management system shall be provided by the Applicant. Furthermore, this agreement must reference and include an approved Operation & Maintenance Plan. This is especially pertinent to this project as porous asphalt and bioretention systems will have specific O & M needs to maintain their on-going performance.

This agreement shall be binding on all subsequent landowners and recorded in the office of the County Clerk as a deed restriction on the property. Also, the Applicant shall convey to the City easements and/or rights-of-way to assure access for periodic inspections by the City or their representatives (and for maintenance if required). These agreements, as well as the Operation & Maintenance Plan, shall be subject to the review and approval of the City of Elmira, their attorney, and Chemung County Stormwater Coalition.

2. In regards to the proposed porous asphalt system, the following items are noted
 - i. Maintenance of the porous asphalt system will be critical to the long-term performance and effective life of this system. As part of the maintenance of this system, routine vacuuming of the porous asphalt will be needed. Failure to complete appropriate maintenance of this system would result in reduced performance and a decrease in the effective life of the system. Who will be responsible for the maintenance of the system and are they prepared for the special maintenance requirements associated with porous asphalt?
 - ii. In the submitted "Checklist for Inspection of Porous Pavements", it is stated "Note complete winter maintenance guidance is available at UNHSC". What is this reference? Should it be part of the O & M agreement?
 - iii. What type of vacuum equipment is required for the vacuuming of the porous pavement? Given the critical nature of the vacuuming requirement, the associated vacuum equipment should be clearly specified to ensure that proper maintenance would be performed.
 - iv. Is the use of sand and cinders prohibited on the proposed parking lot? What restrictions would apply in regards to snow-plowing the porous asphalt?
3. As part of the Operation & Maintenance Agreement, it is recommended that a provision be included in the agreement requiring the Owner to make prompt modifications to, additions to, and/or replacement of the proposed stormwater management system, if the stormwater management system is not able to completely infiltrate the parking lot runoff and developed stormwater reaches off-site areas. As part of this provision, associated action steps and timeframes should be clearly outlined.

MISCELLANEOUS

1. This review pertains to stormwater management. The Applicant is responsible to obtaining all necessary approvals, including a driveway access permit from the City of Elmira DPW.
2. In regards to runoff from the proposed access drive, the following items are noted. More specifics regarding access drive requirements should be obtained from the City of Elmira DPW.
 - i. A means to prevent (or limit) the amount of sheet runoff crossing the sidewalk and entering College Avenue should be pursued.
 - ii. The City of Elmira DPW may require a concrete sidewalk across the proposed access drive.

If you have any questions or comments regarding this letter, please do not hesitate to contact me. Furthermore, I would be happy to meet to discuss this project in greater detail.

Sincerely,



Jimmie Joe Carl, P.E.

Cc: Andy Avery, City of Elmira
Matt Hourihan, Chemung County Sewer District