

April 28, 2014

ARLC 1201

Mr. Stephen Burgo, PE  
Tredyffrin Township  
1100 Duportail Road  
Berwyn, PA 19312-1079

**RE: Wayne Glen  
Conditional Use Submission – Stormwater Supplement  
Response to 4/18 Princeton Hydro Stormwater Review Letter**

Dear Mr. Burgo:

On behalf of Arcadia Tredyffrin LLC, Pennoni Associates Inc. submitted revised calculations and plan sheets on April 21, 2014. The revisions were part of ongoing discussions with Princeton Hydro and the Township as result of Princeton Hydro's review. The revised plans and calculations demonstrate compliance with Tredyffrin Townships Trout Creek Overlay Ordinance as it relates to Stormwater Management.

The following are our responses to Princeton Hydro's letter dated April 18, 2014:

### **Comments on April 16, 2014 Response Letter**

7. On page 2, second full paragraph, it states that the site has been designed to avoid overlap of infiltration facilities with "concentrations of solution activity". While this is generally true for the surface stormwater infiltration BMPs, it is not necessarily so for the subsurface BMPs. Regardless of their identifying name as "pervious pavers", these subsurface features are designed to manage the 2-year storm event from areas larger than the pervious paver coverage area and, therefore, are considered infiltration BMPs. The letter must be revised to acknowledge the fact that these are BMPs located below structures, and engineering justification must be provided to allow the placement of these features below the roadway.

**The letter has been revised as requested. See page 2 in the paragraph beginning with "The subsurface conditions" and page 7 in the paragraph beginning with "It is our professional opinion."**

8. As stated in comment 7 above, on page 6 within the middle paragraph that starts "It is our professional opinion the Carbonate Geology Study...", the stormwater infiltration BMPs within the roads are not mentioned as avoiding identified areas of solution feature activity. The stormwater features in the road must be acknowledged as stormwater BMPs and justification provided for their location below the road (i.e. structure) and how and if identified sinkholes have been avoided or are being remedied to allow for their placement

atop and within 100 feet of a sinkhole.

**This acknowledgement, justification and explanation have been provided. See page 2 in the paragraph beginning with “The subsurface conditions” and page 7 in the paragraph beginning with “It is our professional opinion.”**

9. Other than the comments discussed within comment 7 and 8 above, this letter provides reasonable assurance that the project as designed will reduce the risk associated with developing over carbonate geologic formation. Regarding the assurances, including financial coverage, presented at the bottom of page 7, we defer to the Planning Commission, Township Engineer, and Solicitor on whether or not the assurances provided are adequate to protect the future homeowners from undue financial hardship in the event of solution activity that may damage the site’s infrastructure, including the stormwater management features.

**As stated in our Geology Letter and based on our professional experience, we believe that the risk associated with this development is mitigated through an engineered karst feature remediation as well as designed loading ratio’s for the stormwater BMPs.**

## Stormwater

As stated in the Princeton Hydro Letter, page 4 last paragraph, “In fact, two of the seven proposed subsurface roadway systems currently exceed the two-foot total effective depth guideline in Appendix B of the Stormwater Ordinance.”

**We acknowledge that the permeable paving system has an effective depth of over 2’ as noted. Sections of Road C have an effective depth of 2.25’, which is 0.25’ above the recommended depth stated in Chapter 174, Appendix B, Section A.2(f). This section of the Stormwater Ordinance states the following:**

**“The hydraulic head or depth of water should be limited. The total effective depth of water should generally not be greater than two feet to avoid excessive pressure and potential sealing of the bed bottom. Typically the water depth is limited by the loading ratio and drawdown time and is not an issue.”**

**While a portion of our permeable pavement systems have a storage area 0.25’ above the general guideline for effective depth, in our professional opinion, the systems have been designed to avoid excessive pressure and potential sealing of the bed bottom.**

Pennoni has continued to work with Princeton Hydro and the Township to provide clarity to the design as needed. As previously noted, revised calculations and plans were submitted to Princeton Hydro on February 14, 2014 to address the comments noted in this letter. We appreciate the willingness to work through these remaining items and look forward to additional discussion. Should you have any questions feel free to contact me at (610) 422-2457 or [mkissinger@pennoni.com](mailto:mkissinger@pennoni.com). Thank you for your continued attention to this project.

Very truly yours,

**PENNONI ASSOCIATES INC.**



Michael Kissinger, PE  
Division Manager



Edward J. Sander, PE  
Vice President  
Chief Geotechnical Engineer

Cc: Arcadia Tredyffrin LLC