Eric,

I hope all is well with you. As requested, here are a few comments on the manual:

1. Operations and Maintenance Issue - recommend that a system similar to the one used by the City of Tallahassee be used where a Operation Permit is obtained after it has been demonstrated that the facility was constructed and operates as designed. The City requires not only as-built certifications but also field tests to prove recovery rates are consistent with design. These tests can include field measurement of the drawdown over time or geotechnical test results.

2. As part of the Operations Permit, the inspections should be performed on an annual basis for the first 3 years. If there are no problems with the system, then the inspections should change to biennial. Inspections for sinkholes should also follow this schedule with the exception of the 1st year - where there should be at least two inspections, and then follow the stormwater inspection schedule. The inspections should be performed by a professional engineer or designee and should be expanded beyond just the Best Management Practice. The entire site should fall under the inspections to identify any other problems on the site that may lead to future problems in the stormwater facility.

3. Need to provide design criteria for porous asphalt. Our recommendation is to use FDOT FC-5 Polymer Modified porous asphalt and then follow the recommendations for porous concrete for the other requirements. FC-5 is specifically design to have 20% voids and we have used it successfully on few porous asphalt projects. Because it is an open graded asphalt design that is used throughout the world and refined by FDOT, it is a proven product that can be used by standard asphalt contractors.

4. The design guidance for estimating pollutants generation and removal seems to preclude the use of models such as EPA SWMM to make these calculations. The methodology proposed in the draft manual is very applicable for small sites. For larger watersheds, other tools may need to be implemented to better estimate the effects of the proposed project. In TMDLs and impaired waterbodies, these models may include the use of the models used in the assessments of the TMDL or impaired waterbody.

5. Details on the methodology to be used when treatment trains are being implemented are not clearly defined. A method of adding the removal efficiency for each BMP would be the simplistic method. Our past experience with various reviewers is that they prefer the removal by each BMP - therefore you can never get to the desire goal. An example of what the reviewers want is if the 1st BMP has a 60% removal efficiency, this leaves you with the second BMP having to remove 40% of the pollutant load. If the second BMP has a removal efficiently of 50%, the reviewer's comment is that now you have 20% remaining. By this method, you could never provide enough BMPs to satisfy the reviewer (yes, this has happened). Our recommendation is to account for the whole efficiency rather than parts; otherwise we end up in this endless loop.

6. The additional monitoring requirements being added to select BMPs such as porous pavements and underground systems could make these cost prohibitive as compared to other BMPs. Our recommendation is to either eliminate the additional requirements or to add the same requirements to all BMPs. Both porous pavement and underground systems are valuable tools for highly impervious projects and redevelopment projects. By adding additional requirements to porous pavement and underground systems, we could be eliminating them from being a part of the treatment train. Equalizing the additional requirements will keep both of these BMPs in the alternatives analysis. The stormwater systems are in competition with local requirements to provide sufficient parking, landscaping, buffers, tree preservation, and other land use conditions. In a very densely developed site, porous pavement or underground systems should have equal merit with a pond.

7. A section should be added for the use of sediment and trash removal devices such as baffle boxes or commercial products such as Vortechnics. These devices do have some pollutant removal efficiencies

and not including them in the document will all but eliminate them from the treatment train. These devices can be used as an alternative to sediment sumps. Review staff are reluctant to allow devices that are not identified in the manual.

8. Include a section for the proper design of oil and grease skimmers.

9. There should be discussion on the use of stormwater as a greywater system in the rainwater harvesting section. The primary problem that we are experiencing is the level of disinfection that is required to reuse the stormwater in a greywater system. The requirements of having a chlorine residual eliminates the use of UV or Ozone as a method of disinfection. Our example is the greywater was being used to supply water in the toilets in a building; although UV and Ozone have higher energy demands, they require a smaller space; in the end, UV and Ozone were eliminated to maintain a chlorine residual. The storage of chlorine in a enclosed building has its own complications and in the end it was located outdoors, an architectural eye sore.

10. The methods to calculate runoff are limited to rational and NRCS TR-55. New developments in runoff modeling include Green-Ampt; this is a method that accounts for percolation over the pervious areas and is consistent with LID design.

11. Allowance should be made for vegetative natural buffers to be planted instead only natural conditions. An example would be a pasture that is converted to a residential project - rear lot buffers are used for stormwater treatment that can be planted with native plants.

12. Other treatment systems such as rain gardens, bioretention areas, and wetland treatment systems are not listed as where they would be included in the design requirements.

I understand that some of these suggestions are adding more information to an already large document but what we have experienced is that if it is not included then the reviewers are clueless. Case in point, I am designing a porous asphalt parking lot for a nature park that has sufficient storage for 4" of runoff and then it overflows into a dry retention pond that can hold 7" of runoff; all total 11" of runoff. I have gone through 3 rounds of RAIs and the client is about ready to just turn this into a big pond. The parking lot is 14 spaces and is surround by trees that we need to preserve. For this small parking lot, we have two ERIK devices and 18" deep curbs. By the time I get through with this, it would be cheaper to build the big pond and mitigate for the trees. The odd thing is that we permitted a similar project with the same District a 1-1/2 years ago (w/ porous asphalt) and did not have this many problems. By the way, the porous asphalt project has been in operation for over a year and it still works great.

Hope this is helpful - let me know if you need anything else.

Sincerely,

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