

Engineering has reviewed the plans for the Airlie at Wrightsville Sound project submitted July 9, 2018 and have the following comments:

#### **Stormwater Management Permit Application Form**

1. III. Contact Information.1.a: Per our phone conversation, Elizabeth Brinkman should replace Jeff Kentner as the Signing Official since she is signing the application. Provide her title and update the contact information.
2. III. Contact Information.1.b: Put a check beside 'The property owner'.
3. III. Contact Information.2: Leave this section blank.
4. IV. Project Information; 9:
  - a. Pervious Pavement should be listed as 17,865sf. Keep the asterisk at the end of the number.
  - b. Add '\*8,634sf of additional Pervious Concrete is receiving 100% Pervious Credit' under impervious table.
  - c. Total Onsite Newly Constructed Impervious Surface should be 313,653sf.
5. IV. Project Information; 10: Same as 9 above.
6. IV. Project Information; 11: Percent of impervious area is 60.97%.
7. IV. Project Information; 13: Total Newly Constructed Impervious Surface becomes 319,161sf.
8. IV. Project Information; 14:
  - a. BMP A:
    - I. The line item for pervious pavement under BMP A should really only show the amount of PC not receiving pervious credit (10,802sf- 8,634sf=2,168sf). Enter '2,168\*' for Pervious Pavement under BMP A.
    - II. Add additional note to the bottom of the table that states that the PC receiving credit is only in the drainage area of BMP A.
    - III. Update the Total Impervious Area as 53,094sf.
    - IV. Update the Percent Impervious Area %. Should be 53.43% instead of 62.12%.
  - b. BMP B:
    - I. The summation of the impervious areas do not add up to the total listed. Please verify that it should be 51,213sf.
    - II. Other (sf) should show a 200sf entry based on the calculations in the submittal.
  - c. BMP C:
    - I. The number for Impervious Sidewalks is incomplete. Should be 13,649sf.
    - II. The summation of the impervious areas do not add up to the total listed. Please verify that the total should be 167,680sf.
  - d. Add the 8,634 sf of permeable pavement receiving credit as a BMP.
9. IV. Project Information; 15: This line item is for off-site impervious within the BMP drainage areas. For this project, there is no off-site so it can be left blank.
10. VII. Property Owner authorization: This section should be left blank. The Applicant's Certification on page 7 is the only section needing signature and notarization.

#### **Stormwater Management Design Narrative**

11. I. Project Description:
  - a. Pervious Concrete square footage should be 26,499.
  - b. Proposed Site Impervious should be 60.97%.
  - c. Revise four SCMs to six (6).
12. Drainage Areas: Revise six (7) sub-drainage areas and five (6) flow to an SCM.
13. **Note only:** The Hydrologic Soil Group Summary shows Seagate fine sand as a 'B' type soil and Johnston as an 'A' type soil. However, Seagate is an 'A/D' type soil and Johnston is a 'D' type soil based on the TR-55 Hydrologic Soil Groups for the U.S.

14. Update the Curve number for the Post DA Remaining drainage area. Must be consistent with the CN of 42 used in the Hydraflow model.
15. Airlie at Wrightsville Sound – SCM Basin’s Summary Page:
  - a. SCM-A:
    - I. Total Impervious should be 1.22 acres.
    - II. Pervious Concrete should be 2,168 sf.
    - III. Required 1.5” Runoff volume should reduce to 6,594 cf.
  - b. SCM-B: Total impervious should be 1.17 acres.
  - c. Totals: Pervious Concrete Total should be 17,865sf.
16. Basin A (PC SCM Credit Taken):
  - a. Total Impervious should be 1.22 acres.
  - b. Pervious Concrete should be 2,168 sf.
  - c. Note Only: Impervious Cover, Runoff Coefficient and Required 1.5” Runoff Volume should update to match other submittal documentation.
17. Hydraflow Report:
  - a. Hyd. No. 1: The curve number based on calculations submitted is 67, instead of 64.
  - b. Hyd. No. 2: The curve number based on calculations submitted is 70, instead of 64.
  - c. Pond No. 6 – Infil Basin – F: The orifice size of 6-inches does not agree with the detail on sheet CG-503 (29). The detail sheet shows four (4) 4-inch pipes.
  - d. Hyd. No. 4: The curve number based on calculations submitted is 74, instead of 70.
  - e. Hyd. No. 7: The curve number based on calculations submitted is 72, instead of 73.
  - f. Pond No. 2 – Trench A: The crest length for Weir A is inactive. Please make active.
18. Submit the 10 and 50-year HGL calculations to address any changes in drainage areas. It appears that the system is basically the same in layout, but I need to verify that the inlets can handle any redistributed or additional runoff. Provide an updated inlet drainage area map along with the analysis.
19. Provide calculations based on the MDCs found in C-5 (Permeable Pavement) of the NCDEQ Stormwater Design Manual (Stone Base (MDC 5), Drawdown Time (MDC 8)).

#### **Supplements**

20. Trench A: Requires updating based on comments made regarding Trench A in the Design Narrative, i.e. impervious area, Minimum volume required, Drawdown time.
21. Trench C: The bottom elevation of the trench should be 10.00’ instead of 9.75’.
22. Trench D (Contech Stormfilter): Provide updated Supplement.
23. Trench F: Revise the infiltration rate (11.56in/hr).
24. Permeable Pavement; Ensure Supplement agrees with MDC design calculations. The City supplement is outdated so some things can be handwritten in, such as the 100% BUA credit versus the old 75% BUA credit. Other items are just no longer required, such as the handling of the 10-year, 24 hour storm. You could submit the Supplement EZ Form found on the NCDEQ website for just the permeable pavement. Much easier to complete and it is in line with the current requirements.

#### **Deed Restrictions**

25. Deed restrictions may need to be re-recorded as this permit number will be 2017038R2.

#### **Plans**

26. CS-100: Very minor detail, but the total impervious coverage number is missing the ‘1’ in 231,823sf.
27. CG-100: Piping within the right-of-way shall be RCP or HP Storm Pipe. Pipe runs from DI-G3 to DI-G5 are wholly or partially within the public right-of-way. As I understand it, this pipe has not been installed as of yet.

28. CG-101 (Future Lot Grading & Drainage Exhibit): This sheet was required previously and needs to be added back to the construction set. It illustrates final grading of the project site to ensure all runoff gets to its permitted treatment system.
29. CG-502: Update the pervious concrete terracing detail with the correct road names where the permitted pervious concrete is to be installed. Terracing is only required where the pervious concrete is receiving pervious credit.
30. CG-503: Per the technical standards, an emergency outlet must be provided for the 50-year storm. Is it possible to notch out a section of the retaining wall in Basin F on the western side to direct the water away from the CFPUA pump station?

**ADS Plans**

31. Trench A: System Area (6,706sf) doesn't agree with spreadsheet.

Please submit one complete set of plans, the stormwater application, narrative, calculations, supplements and any other supporting documentation to Engineering for additional review. Please call or email if there are any questions. Thank you.