

Engineering has reviewed the plans for the Greenlawn Funeral Home project submitted October 04, 2018 and have the following comments:

**Stormwater Management Permit Application Form:**

- 1) IV. Project Information; Line item 14: Update Percent Impervious for BMP#2.
- 2) IV. Project Information; Line item 14: Add each section of Pervious Concrete to the table. Additional BMP Drainage Area sheet may be necessary. Please call if clarification is needed.
- 3) Note Only: Please consider adding future BUA allocation if infiltration sizing will allow.

**Narrative:**

- 4) Table 2: Please show 2, 10, & 25 yr. routing summaries. Show per routing calculations that Pre-Post has been met for the 100yr storm event. Please perform an inspection of existing onsite pond and describe if it is adequate to handle runoff from this project. Does existing pond have a spillway, outlet structure, and/or any existing piping? Is any maintenance necessary?

**Operation & Maintenance Agreement:**

- 5) Provide O&M Agreement for Pervious Concrete. NCDEQ O&M EZ form may be useful to include Pervious Concrete and two (2) infiltration basing together.

**Stormwater Calculations:**

- 6) Provide Pervious Concrete calculations for Depth & Drawdown time. Each section of pervious concrete must meet all MDC requirements such as SHWT separation and drawdown to receive 100% pervious credit.
- 7) Infiltration Basin Calcs SCM#1 & 2: Remove Text Descriptions concerning elevation head, remove 7.23 inch from simple method equation, remove sediment storage text from stage storage table.
- 8) Infiltration Basin Calcs SCM#2: Drainage area needs to match Drainage Area Map and Application. Please update % impervious and Required Runoff Volume. The basin should be appropriately sized because drainage area will be reduced. Please correct heading and title on sheet 2 of 2.
- 9) Routing: Drainage areas from Pre & Post must match. Please updated all storm events.
- 10) Routing: Assure all storms are using a Type III event.

**Supplements**

- 11) Provide Pervious Concrete Supplements for each designated drainage area. Please feel free to call or email for clarification. NCDEQ Supplement EZ is now recommended to be used.
- 12) Update SCM#2 Drainage area to reflect Drainage Area Map and Application. Please update all corresponding data which will be effect by change.
- 13) Basin Bottom Dimensions: Please update Length & Width to equal Bottom Surface Area for both SCM supplements.

**Plans:**

- 14) Existing Conditions (CX-100): Turn off proposed signage layer.
- 15) Tree Removal Plan (CX-102): There looks to be trees along Shipyard Blvd. frontage and internal access road that can be saved and not located within essential site improvements.
- 16) Site Plan (CS-100): Proposed Multi-Use path along Shipyard Blvd. potentially has conflicts with existing utilities such as Power Poles, Guy Wires, Fire Hydrant, and Fiber Optic pedestal. Please show all conflicts on plan and coordinate multi-use path re-alignment and/or relocation of utilities. Based on clear recovery safety concerns the MUP cannot be shifted closer to Shipyard Blvd. Providing a Pedestrian easement internal to the site may be helpful to avoid utility conflicts.
- 17) Site Plan (CS-100): Show 10'x10' concrete pad with two (2) ADA truncated dome mats for each of three (3) driveway MUP ramps. Curb & Gutter shall vertically transition into ramp.

- 18) Site Plan (CS-100): Right-in Right-out driveway connection is set up as Street Style. Please remove Commercial Driveway labeling. Commercial Driveway Detail can be removed.
- 19) Site Plan (CS-100): Provide concrete edge restraint between all pervious concrete and asphalt per NCDEQ Pervious Pavement MDC.
- 20) Site Plan (CS-100): Provide observation well at low point of the system per NCDEQ Pervious Pavement MDC.
- 21) Grading Plan (CG-101): Provide Soil Boring locations with existing grade elevation, depth to SHWT, and elevation of SHWT.
- 22) Grading Plan (CG-101): Provide Stormwater Project boundary acreage on plans consistent with application and calculations.
- 23) Grading Plan (CG-101): Provide additional spot elevations for clarity.
- 24) Grading Plan (CG-101): Provide Storm Drainage table on plan while also labeling all storm structures, pipe sizes, pipe types, and slopes.
- 25) Grading Plan (CG-101): Identify FES entering infiltration basins will need rip-rap aprons shown per detail provided.
- 26) Grading Plan (CG-101): Draw in Emergency Spillway for SCM #2. Please align spillway with existing pond feature located in the Northwestern corner of the property.
- 27) Grading Plan (CG-101): For clarity darken pervious concrete hatch.
- 28) Grading Plan (CG-101): Provide spot elevations for driveway connections to Shipyard Blvd. EOP.
- 29) Grading Plan (CG-101): Provide additional spot elevations at Right-of-Way driveway locations to illustrate stormwater is being directed into the site for treatment.
- 30) Grading Plan (CG-101): Provide spot elevations along proposed Multi-Use Path located along Shipyard Blvd. Grading shall assure MUP meets ADA cross slope and longitudinal slope standards.
- 31) Grading Plan (GG-101): Please provide a Cross Section for Right-Turn lane. Provide tie-in to Shipyard Blvd, shoulder, and MUP.
- 32) Utility Plan (CU-100): Assure Water Meter will not encroach into MUP.
- 33) Utility Plan (CU-100): Proposed 6" Fire line needs to be relocated from underneath Pervious Concrete.
- 34) Landscape Plan (CL-101): One (1) proposed tree in conflict with SCM#1 outfall pipe. Please relocate.
- 35) Stormwater Details (CN-501): Align SCM#2 20' Emergency spillway with existing pond feature located in the Northwestern corner of the property.
- 36) Stormwater Details (CN-501): Adjust pipe length and invert for 15" Outfall pipe from Infiltration Basin #1. The length (127') and invert (46.20') should be to MH-1.
- 37) Site Details (CS-502): Add Pervious Concrete Section Detail along with concrete edging and observation well.
- 38) Site Details (CS-502): Provide Asphalt Section Detail.
- 39) Site Details (CS-502): Add Curb Inlet, Drop Inlet, & Storm Manhole Details.
- 40) Drainage Area Maps (DA-1 & DA-2): Pre & Post Drainage Areas need to match.
- 41) Drainage Area Maps: Provide Pervious Concrete DA Map designating PC areas and showing 1:1 drainage areas are being met.

Please submit revised plan sheets, revised application page, supplements, O&M, & calculations, and any other documentation to Engineering for additional review. Please call or email if there are any questions or concerns.