



FUSS & O'NEILL

June 13, 2019

Comments: June 18, 2019

Mr. Richard Harris, AICP
Town Planner
Town of South Hadley
116 Main Street
South Hadley, MA 01705

RE: Peer Review of the Stormwater Management
South Hadley Dog Park, Mulligan Drive Site Plan Review
Fuss & O'Neill Reference No. 20150214.P31

Dear Mr. Harris:

Fuss & O'Neill has conducted a review of the documents submitted by Berkshire Design Group related to the development of a dog park on Mulligan Drive. The overall concept of the project appears to be feasible; however, there are several technical items which need to be addressed in order to verify the proposed design meets the South Hadley Stormwater Bylaws. We have conducted a review of the following materials as they relate to the stormwater management and standard engineering practice.

Materials Reviewed

1. Plant Set, "South Hadley Dog Park Permit Set," prepared by The Berkshire Design Group, Inc., dated May 20, 2019, total 10 Sheet.
2. South Hadley Dog Park Stormwater Management Report, prepared by The Berkshire Design Group, Inc., dated May 16, 2019.
3. South Hadley Dog Park Stormwater Permit Application, dated May 21, 2019.
4. South Hadley Dog Park Site Plan Review Application, dated May 20, 2019.
5. South Hadley Dog Park Site Plan Review Application Narrative, prepared by The Berkshire Design Group, Inc., dated May 21, 2019.

Stormwater Management

1. All new impervious areas shall comply with Standard 3, 4 and 5 on the Massachusetts Stormwater Handbook. There is a portion of the proposed asphalt walking path that is not threatened by a BMP. Grading must be revised to direct all new impervious areas to a BMP.

Standard 3: Infiltration of recharge volume is met. Capture area adjustment formula is used for areas which are not tributary to one of the rain gardens.

Standard 4: 80% TSS removal is met for areas P2 and P3. LID credit is claimed for areas P1, P4, and P5.

Standard 5: Land uses with higher pollutant loads is not applicable to this project.

Note: The site was graded to direct as much impervious area as possible to stormwater practices (2 rain gardens and an underground storage/infiltration system). Because of the linear nature of the proposed impervious area, a small portion of impervious area is not tributary to a stormwater treatment facility. Runoff from these 5' wide paths sheet flows into the adjacent vegetated areas.



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2. Per Section 200-16 M of the Stormwater Management Bylaw, a map depicting endangered species, threatened or of special concern, estimate habitats of rare wildlife and certified vernal pools, and priority habitats of rare species within 500 feet of the site shall be provided.

There are no habitats of rare, threatened, or endangered species, priority habitat, or certified vernal pools, within 500-feet of the proposed dog park site. Please see attached map, South Hadley NHESP Priority Habitat.

3. Per Section 200-16 N of the Stormwater Management Bylaw, information showing seasonal high groundwater elevation in areas of infiltration must be provided.

- Rain garden 1 is located at or 1' above grade in one of the higher areas of the site. It is assumed that groundwater will not be present within 3' of the surface.
- Rain garden 2 is located 2'-5' above grade. It is assumed that groundwater will not be located within 1' of the surface.
- The underground system has been redesigned as a shallower system (see L-401). The stone base of the revised system is located 1.5 to 3' above existing grade. It is assumed that groundwater will not be present within 1.5' of the surface at the upper end of the system.

4. Per Section 200-16 P of the Stormwater Management Bylaw, stormwater flows path used to calculate time of concentration must be shown on Figure 4 and 5 of the Stormwater Management Report.

Lag method was used. The inputs to the model include the flow length and total length of the contours within the drainage area. No specific flow "path" was used.

5. Per Section 200-16 T of the Stormwater Management Bylaw, soil information from test pit at the location of proposed stormwater management facilities must be provided.

Soil mapping indicates that the soils are loamy sand with depth to the water table of more than 6'.

6. Per Section 200-16 X and Section 200-21 of the Stormwater Management Bylaw, an Erosion and Sediment Control Plan shall be provided. The provided Sediment & Erosion Control Plan does not provide sufficient information to meet the requirements outlined within these sections.

Silt Fencing is part of erosion control barriers on sheet L-201. Refer to detail 12 on sheet L-601.

7. Per Section 200-20 A(6) of the Stormwater Bylaws, infiltration basins shall be constructed with a minimum 3 feet of separation from the bottom of the structure to seasonal high groundwater elevations. MassDEP Stormwater Standards require a minimum 2 feet of separation from the bottom of an infiltration structure to seasonal high groundwater elevations. The Applicant proposes a rain garden, a stormwater basin, and an underground infiltration system; they do not provide documentation on separation distances from high groundwater.

See response to comment 3.



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8. Per Section 200-20 F, where stormwater management plan involves direction of some or all runoff off directed to adjacent properties, the Applicant must obtain from adjacent property owners any easements or other necessary property interests concerning flowage of water.
**Runoff from the site currently flows from west to east. This pattern is unchanged after the development of the dog park. Runoff from the proposed dog park includes sheet flow and the outlet from the underground storage which is directed to a level spreader at the property line. Runoff flowing from the level spreader will flow into the adjacent property.
Modeling shows that post development peak flows are equal to or less than pre-development peak flows.**
9. Per Section 200-20 G of the Stormwater Bylaws, hazardous waste materials shall incorporate handling and storage of the best management practices. It is recommended language be added to the Operation and Maintenance Plan to include maintenance of dog waste within the dog park and how will it be properly disposed.
Dog waste stations have been included in the plan. Please refer to Sheet L-301
10. Per 200-20 H of the Stormwater Bylaws, runoff from parking lots shall be treated by oil and water separators or other controls to remove oil and sediment. An oil water separator for the parking lot does not appear to be provided.
The parking lot design includes sheet flow to a gravel diaphragm, vegetative filter strip and rain garden. This design provides 90% TSS removal according to MA Stormwater Handbook.
11. Per Section 200-22 of the Stormwater Bylaws, prior to any site work for which stormwater management is required, the Planning Board shall require the applicant or owner to execute an operation, maintenance, and inspection agreement binding on all subsequent owners of land served by the private stormwater management facility. No agreement has been provided.
The stormwater facility is strictly for the dog park development. Other development of the parcel would necessitate a revised design.
12. Per Section 200-22 B of the Stormwater Bylaws, the operation and maintenance agreement must be recorded by the Applicant in the land records of the Registry of Deeds. Once the agreement has been finalized, the Applicant shall ensure it gets recorded.
See comment 11 response.
13. Per Section 200-23 C of the Stormwater Bylaws, installation records of the stormwater facilities must be maintained in perpetuity and all maintenance and inspection records must be retained for a minimum three (3) years. Maintenance and inspection records and reports must be submitted to the DPW Superintendent within 30 calendar days of completion of the maintenance activity or inspection. To ensure compliance, the Applicant should update the Operation and Maintenance Plan to include these requirements.
This requirement could be added to the Operation and Maintenance Plan.



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General

14. The Stormwater Permit Application does not appear to list the correct impervious surface amount. The Applicant shall revise to show total proposed area of impervious surface.
The impervious area was omitted from the permit by error. The total impervious area for the site is: 13,999 sf.

15. For clarification purposes, Figure 4 Existing Hydrology and Figure 5 Proposed Hydrology of the Stormwater Management Report, should be revised to show time of concentration paths and design point.
The design point as described in the report includes the proposed entrance to the parking lot (for culvert design) and the eastern boundary of the site extended to Mulligan drive to represent current flow conditions. Time of concentration was calculated using the lag method which includes a contour length and flow length calculation but no flow path.

16. For clarification, please revise contour labels on the Site Plans and Figure 5 of Stormwater Management Report. Currently, the labels are not on the contours and it is difficult to follow.
Contour labels on sheet L-401 Grading and Utilities Plan are legible and aligned with the contours. Figure 5 contours labels have been clarified.

17. In review of the grading, it appears as the northern portion of Drainage Area P2 does not contribute to the rain garden and contributes to Drainage Area P4. The Applicant should review the grading and revise to show a more accurate sub-watershed delineation on the northeast corner.
This area has been graded to allow for sheet flow across the pathway to the rain garden.

18. Figure 3 of the Stormwater Management Report shows a storm drainage pipe running from the concrete entrance pad to the catch basin outlet for the rain garden 1, but this pipe is not shown on Sheet L-401 of the RDA Permit Set. Please clarify and revise plans as required.
Sheet L-401 has been revised to include drainage pipe from concrete pad to catch basin.

19. Per Volume 2, Chapter 2 of the Massachusetts Stormwater Handbook, Rain Garden must be designed with a 2 to 4 feet of media depth. Please revised detail on sheet L-603 to show a planting media depth between 2 – 4 feet.
The rain garden media will be increased to 24".

20. Table 3 of Appendix C within the provided Stormwater Management Report appears to be missing information. To ensure sufficient storage has been provided, please update the Table to show storage volume provided to each drainage area.
Recharge calculations have been revised.

21. Drawdown calculations provided in Appendix C of the Stormwater Management Report were not completed as outlined within Volume 3, Chapter 3 of the Stormwater Handbook. The provided calculations are not sufficient enough to determine the system will drawdown within



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72 hours. In addition, drawdown calculation must be provided for each BMP. Please revise the calculations.

The drawdown calculations are included in Appendix C to exactly match the Stormwater manual.

22. It appears there is a discrepancy between the tabulation for impervious area for each the recharge calculations (Appendix C) and the water quality calculations (Appendix D). It appear as the Applicant has included stone dust paths and dirt areas within the calculations for some of the Sub-catchment Areas and not others. The calculations should be consistent. Please review and revise.

The calculations include all proposed stone dust, asphalt and concrete paving. The numbers were consistent.

23. Per Stormwater Standards each BMP must be designed to provide water quality volumes for the contributing watershed area. In review of Table 3 in Appendix D of the Stormwater Management Report, the volume for P1 and P3 is not full accounted for, please review and revise accordingly.

The rain gardens provide water quality for areas P2 and P3 which include 83% of the proposed impervious area and 100% of the parking area. Due to the linear nature of the project and the desire to sheet flow off of the dog walking paths rather than stepping through a swale, it is not feasible to provide water quality for all the impervious area. LID credit 3 is claimed for areas P1, P4, and P5 since these areas sheet flow to vegetated areas. TSS removal for P2 and P3 is 90%.

24. Table 3 in Appendix C and Table 3 in Appendix D of the Stormwater Management Report show different total storage volume provided to drainage area. These tables should be consistent, please revise.

The recharge volume required and the water quality volume required are different volumes. The recharge is based on 0.6 in and the water quality volume is based 0.5 in.

25. Based on the Construction General Permit (CGP), site construction activities, that will disturb one or more acres of land, shall provide a Stormwater Pollution Prevention Plan (SWPPP). The Applicant has stated, for compliance to Standard 8 of the MassDEP Standards, one will be completed prior to the start of construction. Once completed, the Applicant shall provide a copy to the Board to ensure proper erosion and sedimentation control measures are provided. It is at the discretion of the Board on if review of the SWPPP is required by Fuss & O'Neill.

No Comment.

26. It is good engineering practice to provide 1 foot freeboard for the 24hr 100-year storm for the stormwater basins.

The rain gardens are small LID stormwater facilities with low volume intended for water quality. The design includes a catch basin with the rim approx. 9" above the basin floor and an overflow weir notched into the berm about 6" above the catch basin elevation. Modeling shows that in all storms flows are conveyed through the catch basin.

27. It is good engineering practice to provide a 10 feet wide berm with an emergency overflow on



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the downgradient side of the stormwater basins.

The rain gardens already include an emergency overflow in the event the internal overflow structure fails. Due to limited space and the small size of these gardens and low volume storage, 10 ft wide berms are not part of the design.

28. Fuss and O'Neill recommends the Applicant references within the project Operation and Maintenance Manual, and the manufacturer Operation and Maintenance Manual for the subsurface infiltration system.

The O&M plan can reference the O&M chamber manual.

29. If the Dog Park is to be used during winter months, Fuss and O'Neill recommends that a Snow Storage plan be provided.

The dog park will only be used in the winter season if the site is accessible. During inclement winter weather, the dog park will be closed. Snow plowing is not intended to be part of the park maintenance plan.

30. There appears to be a discrepancy between the infiltration rates used in the HydroCAD calculations and the drawdown calculations. The HydroCAD calculations use an infiltration rate of 1.5 in/hr where the drawdown calculations use an infiltration rate of 2.41 in/hr. The two should be consistent. Please review and revise.

The 1.5 in/hour rate was used. See comment 21.

The above comments are based on plans and documentation received at the time of review. Any revisions to the plans and documentation will require further review. Please feel free to contact us with any questions.

Sincerely,

Aimee Bell
Project Engineer

Reviewed by:

Daniel F. DeLany, P.E.
Senior Project Manager

Sincerely,

Berkshire Design Group

Doug Serrill, Landscape Designer