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To: MBIA, Review Agencies and the General Public

From: Raghavenderrao Badami, PE, Assistant Director

Subject: Ultra-Urban Planter Boxes

Date: May 3, 2022

Background

Replicating natural hydrology, maintaining predevelopment runoff characteristics, and protecting natural resources are a key component of Environmental Site Design (ESD). "ESD" relies on integrating site design, natural hydrology, and smaller controls to capture and treat runoff. Small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources shall be evaluated and proposed as a part of the site design.

Micro-bioretenion practices capture and treat runoff from discrete impervious areas by passing it through a filter bed mixture of sand, soil, and organic matter. Filtered stormwater is either returned to the conveyance system or partially infiltrated into the soil. Micro-bioretenion provides water quality treatment, aesthetic value, and can be applied as ultra-urban planter boxes under certain site conditions.

Purpose

Over the past year or so, Ultra-Urban Planter Boxes (UUPB) have been proposed for use in various residential settings in the County to meet ESD requirements. UUPB have been proposed adjacent to houses on sites with sensitive environmental features and their buffers, high water table, hydric & wet soils, and this has caused issues with infiltration near/into foundation, basement flooding, sump pump activation and other issues, causing hardship to homeowners. Currently, the County does not have specific design guidance for UUPB.

The purpose of this notice is to provide guidance¹ in the design of Ultra-urban planter boxes². The County recognizes that BMPs are designed, reviewed and approved based on many factors including but not limited to

¹ This guidance does not cover the design of the building foundation. Foundation design shall be performed by a qualified professional and potential infiltration, exfiltration or seepage from UUPB shall be considered in the foundation design.

² Per MDE manual landscape infiltration may be designed as constructed planters (planter box) made of stone, brick, concrete, or in natural areas excavated and backfilled with stone and topsoil. This memo does not cover planter boxes designed as landscape infiltration. Planter boxes designed as landscape infiltration shall not be proposed adjacent to houses/structures.

site conditions, watershed conditions, terrain, stormwater treatment suitability, and physical feasibility – this guidance is not intended to cover each and every design scenario or site condition the design professional may encounter in the design of BMPs.

Ultra-Urban Planter Boxes

The information below is to provide general guidance when Ultra-urban Planter Boxes (UUPB) are proposed to meet ESD and stormwater management requirements:

1. Ultra-Urban Planter Boxes should generally be proposed in ultra-urban site development settings such as Downtown or High density type development sites that are characterized by structured or underground parking, high to mid-rise buildings, and with little to no landscape area. (Reference – City and County of Denver Water Quality Management Plan, 2004). Outside of these types of development settings, UUPB shall only be proposed as a last resort where site conditions make all other ESD techniques, microscale, and nonstructural practices unsuitable or unsustainable;
2. Water table elevation, soil conditions in relation to the bottom of the practice should be considered in the design and structural design of the box shall be based on site conditions and soil bearing capacity;
3. UUPB shall not adversely impact the foundation of the house/adjacent structure. It is up to the design professional to coordinate the UUPB design as a part of the foundation design;
4. UUPB shall be designed as impervious (e.g., concrete) and treated wood, plastic, and galvanized metal should not be used. Impermeable layer (10-20 mm. Minimum) shall be proposed on the sides and bottom to prevent foundation infiltration, exfiltration or seepage;
5. Minimum depth of the filter media should be 2 to 4 feet to provide sufficient root zone for plant palette. The maximum ponding depth allowed is 6 inches. Additional permitting, design, review (building permit) requirements may apply depending on the height of the box, proximity to the foundation, structure and property lines;
6. The maximum drainage area to each UUPB must be less than 1,000 sq.ft.;
7. As much as possible, the designer should ensure that the UUPB blend in and enhance aesthetics of the adjacent structures;
8. A 1 foot (minimum) clear horizontal distance shall be provided between the closest face of the UUPB and the house/adjacent structure. For homes/structures with basements, a minimum setback of 5-ft (minimum) is strongly recommended. UUPB shall be setback 10-ft (minimum) from public right-of-way;
9. The design shall consider property line setbacks (5-ft minimum) to ensure constructability, maintenance, and to also ensure that easements (permanent, temporary) are not required to be obtained from neighboring properties for construction, maintenance;
10. UUPB shall be located at least 30 feet from water supply wells and 25 feet from septic systems;
11. Safe and non-erosive discharge of the overflow drain discharges including location, elevation shall be provided and shown on the plans. Underdrain and overflow discharges shall be away from neighboring properties, foundation of the house/adjacent structure and these discharges should not create nuisance flooding conditions;
12. A 2-ft (min) clearance should be provided between the bottom and the water table. The probability of practice failure increases if the filter bed intercepts groundwater;
13. Energy dissipation should be provided at concentrated inflow points. Concentrated discharges are not allowed - Design shall ensure that there is even distribution of runoff across the entire surface area;
14. Gravel for the underdrain system should be clean, washed, and free of fines. Underdrain pipes should be checked to ensure that both the material and perforations meet specifications. The upstream ends of the underdrain pipe should be capped prior to installation;

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15. Vegetation is critical to the function and appearance of any UUPB. Native and adapted plants are preferred, hardier, and usually require minimal nutrient or pesticide application. Trees should not be planted in UUPB. Also, aesthetically pleasing landscape designs generally enhance property value and community acceptance;
16. The filtering media or planting soil, mulch, and underdrain systems shall conform to the specifications found in MDE manual Appendix B.4
<https://mde.maryland.gov/programs/water/StormwaterManagementProgram/Documents/www.mde.state.md.us/assets/document/Design%20Manual%20Appendix%20B4%2001%202009.pdf>
17. BMPs must have dedicated maintenance access for the maintenance personnel and equipment to be able to access and maintain BMPs. The BMP location and configuration of access must be established during the design phase and should be an integral part of the BMP design. BMPs designs should also consider that BMPs may fail due to a host of reasons, and that the owners are required to replace, repair or retrofit them to meet County requirements;
18. Designers should review conflicts with utilities, drainage structures, foundation drainage discharges, sump pump discharges, basement walkout, HVAC systems and other infrastructure in the design. The design should also consider practical and homeowner conflicts (e.g., fencing, decks, and privacy issues); and
19. Operation and Maintenance (O&M) plan should be included as a part of every stormwater BMP design. O&M guidance should list specific inspection and maintenance activities required to ensure the proper functioning and upkeep of a particular BMP.

Timing

This memo is effective immediately for all new grading permits and major revisions submitted on or after this memo date. For projects under review prior to the date of this memo, I&P strongly recommends the use of this guidance in the design of UUPB. Any questions regarding specific project reviews should be coordinated with the County reviewer directly.