



Storm Water Commission  
6801 Delmar Boulevard, University City, Missouri 63130,  
Phone: (314) 505-8560, Fax: (314) 862-0694

**MINUTES OF THE STORMWATER COMMISSION – AD-HOC SUB-COMMITTEE  
TO REVIEW UNIVERSITY CITY MUNICIPAL CODE REVISIONS PROPOSED BY THE UNIVERSITY  
HEIGHTS FLOOD TASK FORCE  
February 20, 2024**

**Call to Order.** The subcommittee listed above was called to order at 5:13 PM by Eric Karch.

1. **Attendance-Roll Call.** The following Commission members were present at 7360 Princeton: Susan Armstrong, Garry Aronberg, and Eric Karch. City representative Mirela Celaj was unable to attend. This was a non-quorum meeting, as allowed by our bylaws.

**Agenda.** To discuss revisions to the proposed code language, and specifically the matrix of eight (8) proposed Green Infrastructure Stormwater Volume Reduction Techniques (**GISVRTs**) presented by the University Heights Association Flood Task Force (version dated 11/10/2023 Impervious Surfaces Draft Bill). This meeting is being held in response to an action item from the 11/14 Ad-Hoc Subcommittee meeting and is a continuation of topics discussed on 11/14/2022, 11/30/2023, 1/18/2024, and 1/24/2024.

2. **Old Business**

- 2.1 **Flatwork permit**

- 2.1.1 Mirela provided a DRAFT 1-page permit application. This is not code language but simply a sheet to collect basic information about the proposed project (address, name, total proposal impervious area). The group still needs to develop ordinance language that will call for a flatwork permit.
    - 2.1.2 Suggestion to the City is to add on the back of the permit the definitions/examples of Impervious Surfaces (paved driveway, pool, etc); and Green Infrastructure for Stormwater Management (tree, rain garden, french drain, etc).

- 2.2 **Definition of Impervious Area**

- 2.2.1 Suggest that the ordinance just use the term impervious. U City permits and guidelines is the best place to define impervious area.
    - 2.2.2 One possible definition is in the Kirkwood Guidelines for Stormwater Management. Page 1 (Background and Purpose), 1st paragraph, second sentence "Impervious cover or areas are man-made areas that cannot absorb water from rain or snow. Driveways, rooftops, patios, sport courts, tennis courts, and pools, for example, are considered impervious; surfaces such as decks, lawn, or gardens, where the rainwater is allowed to soak into the ground, are not considered impervious. Impervious area increases the amount of rainwater runoff and can cause flooding."
    - 2.2.3 Question to U Heights Flood Task Force. Should a wood deck be considered impervious? Kirkwood does not. It stands to reason that a wood deck with planks butted tightly together (<1/8 inch gap) could act similarly to concrete pavement and would be considered impervious

- 2.3 **Avoiding potential conflict between MSD permit requirements and U City matrix**

- 2.3.1 Ordinance should state that the matrix applies when a MSD permit is not required.
    - 2.3.2 This helps address the fact that:
      - 2.3.2.1 MSD occasionally does regulate new land disturbance and impervious area < 1 acre in size
      - 2.3.2.2 Techniques being considered in the matrix are not all acceptable to MSD (e.g. dry wells)



#### **2.4 Kirkwood Guidelines for Stormwater Management.**

- 2.4.1 Address water quantity (e.g. flooding) as well as water quality (e.g. pollutants). The purview of the stormwater commission is stormwater quantity NOT quality.

#### **2.5 How to make sure a GISVRT item remains in place in subsequent years?**

- 2.5.1 Options:

2.5.1.1 Tie to occupancy permit

2.5.1.2 Easement area recorded on the legal plat document

2.5.1.3 Annual self-inspection, where property owner submits signed document that the matrix item is still in place and provides a photo as proof.

- 2.5.2 Our recommendation is that City staff develop procedure for this, with preference for annual self-inspection since this has a lower cost burden on City staff. This procedure could also allow for the potential to adjust/change GISVRTs.

#### **2.6 Matrix Item #3 – install tree cover**

##### **(BELOW IS ACCUMULATED FROM PREVIOUS MEETINGS)**

- 2.6.1 We should account for two different tree sizes: overstory (biggest trees) and understory (smaller trees). 1 mature overstory tree (e.g. oak) can be used to offset 500 SF of new impervious area. 1 mature understory tree (e.g. dogwood or eastern redbud) can be used to offset 100 SF of new impervious area. Require using only trees native to Missouri. Yield to City Forester to provide further guidance to City staff for administering the matrix.
- 2.6.2 Discussed how to implement item #3:
- 2.6.2.1 Forest Activity Permit - Residents can apply for a permit to plant a tree within the road right of way. City Forester (Jacob Kaiser) would need to approve the permit and the species to be planted. More information can be found in the tree ordinance (Article II Trees and Shrubs, 505.160 C) <https://ecode360.com/28296103#28296103>.
- 2.6.2.2 Mirela suggested involving the U City Arborist to approve of the developer's tree planting plan. This would help address the following possible complications. Planting trees too close together would compromise the tree's health. Planting trees too close to a house or utility (e.g. power line or sanitary lateral) should be avoided.
- 2.6.2.3 Consensus that requiring approval from the City's arborist should be required.
- 2.6.3 What if the existing tree is old and soon dies and is removed? Item 2.5 would address this concern.
- 2.6.4 Credit for existing trees?
- 2.6.4.1 Kirkwood Guidelines for Stormwater Management (pg. 4) indicate that there may be credit for existing trees.

#### **2.7 Matrix Item 8 – Install Infiltration basins such as rain gardens and bioswales and dry wells**

##### **(BELOW IS ACCUMULATED FROM PREVIOUS MEETINGS)**

- 2.7.1 50 SF impervious requires 7.48 gallons of volume control; that's a cube 1ft x 1ft x 1 ft.
- 2.7.2 Discussed that the MO Botanical Garden rule of thumb (5:1) respects that calculation with some accommodation of sloped ground and berm. We support requiring 5 impervious area : 1 rain garden ponding area for a 6 inch deep rain garden. Applicant



must demonstrate adequate ponding area for depths that vary from 6 inches.

- 2.7.3 Dry Well – discussed defaulting to Kirkwood guidelines for the design of the dry well. Garry offered to look at how these guidelines relate to the volume calculations we've been discussing for item 8. The sizing utilized by U City should essentially use the same total volume as discussed in the rain garden, but would be divided by 30% to account for the void space within the gravel. This void ratio depends on the gravel size and gradation, and could be adjusted. Garry offered to provide a suggestion.

**2.8 Matrix Item 9 - Detention basin  
(BELOW IS ACCUMULATED FROM PREVIOUS MEETINGS)**

- 2.8.1 Discussed that at scale of a residential lot, the area and volume sizing of the detention basin is the same as the rain garden sizing.

**2.9 Method of determining rainfall runoff volume used to determine the offsets for all matrix items:**

- 2.9.1 The goal clarified by the U Heights Flood Task Force at the 11/14/2023 meeting was:
  - 2.9.1.1 Improve U City code which does not currently regulate new impervious area less than 1 acre. Improvement should be as close as you can get to zero increase in stormwater runoff.
- 2.9.2 Differential rainfall runoff – The offsets discussed to date (on 11/30/2023, 1/18/2024, and 1/25/2024) have been based on using a differential rainfall runoff increase. The understanding is that turfgrass itself creates a certain amount of rainfall runoff. A development to change turfgrass to impervious would generate more rainfall runoff. The matrix items would then be sized to handle these differential runoff increases. In doing so, the U Heights goal for no increase would be met.
- 2.9.3 Mirela presented an alternative. She presented an example calculation for a dry well, which was based on total runoff volume. This approach would create an enhanced treatment of not only the new impervious area from the development, but also additional pre-existing runoff. Mirela pointed out that asking developers to understand the differential runoff might be asking too much. There was agreement on that point, but this was countered by the fact that although the matrix would be based on the differential runoff, the matrix could be presented in a way that the developer would not need to perform the calculations themselves. This would be in keeping with the goal clarified by the U Heights Flood Task Force on 11/14/2023 to:
  - 2.9.3.1 Include a table of acceptable stormwater offsets to new impervious area that can be understood and installed by a homeowner or craftsman.
- 2.9.4 The group did not reach agreement on whether the alternative rainfall runoff method should be used. If it is, the group would need to revise the offsets determined on 1/18/2024.

**2.10 Status of Matrix Review**

- 2.10.1 The group was unable to conclude remaining questions on matrix items 3, 8, and 9.
- 2.10.2 Presentation – Discussed that once the ad-hoc committee finalizes suggested revisions to the University Heights proposed ordinance, they should make a summary



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presentation to the Stormwater Commission and request a motion to accept. Susan offered to make the presentation.

**2.11 Subjects raised, but not yet fully addressed**

- 2.11.1 Flatwork permit – Need ordinance language.
- 2.11.2 Definition of rainfall runoff volume – Determine whether to use differential rainfall runoff or full rainfall runoff.
- 2.11.3 Matrix Item 3 - Should credit be given to a pre-existing tree?
- 2.11.4 Matrix Item 8 and 9 sizing
  - 2.11.4.1 Should the basin be sized for the actual drainage area that it receives? In other words, consider an example where the basin receives not only 100 SF of new impervious area, but also 50 SF of grass. The basin should be sized to accommodate all of this drainage or the basin will become overwhelmed, which could lead to increased maintenance or even premature failure of the basin.
  - 2.11.4.2 Should there be a requirement that the developer demonstrate the watershed area draining to the selected location for the basin, and that the required area and depth can be achieved at this location?

3 **Next meeting** – Business was not completed. The group agreed to further this discussion via email.

4 **Adjournment.** Adjourned at 6:40 PM.

Minutes Preparation. The minutes were prepared by Eric Karch.