

It's All Impervious to Me!

Redevelopment and Green Infrastructure Modeling Guidance

September 15, 2022

Questions and Answers

- Q1:** Are duplexes or two-unit residential considered commercial development?
- A1:** *Duplexes and two-unit residences are typically considered to be single-family homes and are not considered commercial development.*
- Q2:** Isn't modeling only the surface storage/active storage above ground in HydroCAD more conservative than incorporating void space below the surface? It's been a commonly accepted approach in the past so will it still be accepted?
- A2:** *Yes, modeling only the above ground storage is a conservative, more realistic, approach. Modeling of underground storage (below underdrain) is no longer allowed for peak rate control modeling. Engineered soil void space may only be modeled if the underdrain is more restrictive than the soil above.*
- Q3:** With no modeling of below ground storage within HydroCAD, how do you meet other municipality standards within Dane County that require volume reduction within the 10-yr or 100-yr storm? (For example the town of Westport requires no post development volume increase from the 100-yr predevelopment volume)?
- A3:** *You can model underground storage for volume standards that require the use of 24-hour design storms. Volume modeling is less sensitive to routing specifics and there are no better models currently available to show compliance with this standard.*
- Q4:** If all the redevelopment cannot be captured by a treatment facility, and there is nothing to offset the area, how do you meet the 1/2 in requirement?
- A4:** *It's expected that designers use all available green infrastructure practices and understand they may need to get "creative" to capture all redeveloped impervious surfaces. We're always available to discuss difficult sites prior to final design.*

Q5: Are there specific requirements for frequency of emptying rain barrels/cisterns?

A5: *Rainwater harvesting practices must have the capacity for 1/2" of runoff from the contributing watershed within 72 hours after a rainfall event.*

Q6: You mentioned we can treat 'like' areas for redevelopment. Is there a distinction between parking areas and driveways/roads? For example, if a site proposes a parking lot expansion, could an existing driveway be treated to meet the 1/2" requirement?

A6: *We generally consider all parking and drive areas to have equivalent sediment loading, so these surfaces could be traded. Roofs have much lower sediment loading, so they may not be traded for new parking areas or drives needing to meet the green infrastructure standard.*

Q7: Is the HydroCAD modeling storage change only for the redevelopment change?

A7: *No, the storage changes apply to all peak rate modeling.*

Q8: For the situation where there is a green roof, the entire rooftop is not typically going to be planted. It just is not needed to be to meet the other redevelopment or new development requirements. However, that means that significant parts of the roof go untreated and typically are sent into the site discharge pipe without further treatment. This is especially true in more urban settings (we have this in a downtown development right now) where a building may extend over most of the lot, eliminating the option to do any other infiltration on site due to needing to stay away from foundations. How is the requirement applied to those types of situations?

A8: *Some options you could consider on a site like this include directing non-green roof runoff to green portion, expanding green roof coverage, installing permeable pavement or bioretention (if infiltration isn't possible, the system could be lined with an underdrain) or rainwater harvesting (cistern, gray water reuse, irrigation for green roof, etc.)*

If the site's in downtown Madison, you'd need to meet the City of Madison stormwater requirements. As I understand, they do not look at the first half inch of runoff directly, but look to manage it through required reductions in volume and peak rates.

Q9: DNR standard shows the underdrain below engineered soil. As I understand, this is to prevent short circuiting, water flowing through a shorter path through a thinner portion of engineered soil. Is the underdrain within the engineered soil acceptable? If so, that changes how deep our outlet needs to be and can impact many designs.

A9: *It was a mistake to show the underdrain within the engineered soil. The WDNR technical standard should be followed when designing a bioretention basin.*