ORDINANCE NO. 2020-230

AN ORDINANCE AMENDING THE LAND DEVELOPMENT CODE, ARTICLE 1100 DESIGN STANDARDS, OF THE BENTONVILLE MUNICIPAL CODE TO ESTABLISH STORMWATER RUNOFF MITIGATION FOR ALL DEVELOPMENT.

WHEREAS, the City of Bentonville wishes to ensure development does not negatively impact stormwater runoff; and,

WHEREAS, all development that creates impervious surfaces should mitigate stormwater runoff.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF BENTONVILLE, ARKANSAS:

Section 1. That within this ordinance, except section headings, all underlined text shall be added and strikethrough text shall be deleted.

Section 2. That the Land Development Code, Article 1100 Design Standards, shall be and is hereby amended with Attachment A: Runoff Mitigation, an electronic copy and paper copy of which is on file with the City Clerk, and is hereby adopted by reference as though it were copied herein fully.

Section 3. This Ordinance shall be in full force and effect 30 days from the date of its passage and approval.

PASSED and APPROVED this 8 **day of** DECEMBER **, 2020.**

Approved:

Stephanie Orman

Mayor Stephanie Orman

ATTEST:

Kristy Commins

City Clerk

CITY OF BENTONVILLE CORPORATE Seal ARKANSAS

ATTACHMENT A
Runoff Mitigation

Underlined text to be added, strikethrough text to be deleted.

Sec. 1100.08 Grading and Drainage Regulations

(d) *Stormwater run-off for impervious areas.*

(1) *Requirement.* All development not subject to Large Scale Development or Preliminary Plat must mitigate stormwater run-off of all impervious areas. All stormwater must be directed to a stormwater collection system. If new impervious areas cannot be directed to a stormwater collection system, each new impervious area shall be mitigated at a rate of 0.2 cubic ft. of storage for each 1 sq. ft. of impervious area. Mitigation techniques must be the Low Impact Development practices listed here or other techniques as approved by the City Engineer:

Practice	Collection Requirement
Redirect downspouts	0.05 cubic ft. for each 1 sq. ft. of roof that is redirected
Rain barrels / cisterns	100% of the volume of the structure
Rain gardens	20% of the volume of the rain garden
Porous pavers	40% of the volume of the rock under the pavers + 0.10 cubic ft. for each 1 sq. ft. of pavers
Green roofs	.20 cubic ft. for each 1 sq. ft. of roof
Terraced landscape	40% of the volume of the terrace

(2) *Waiver requests.* The property owner or developer may request a waiver of run-off mitigation requirements from the Planning Commission in accordance with Sec. 300.04 Waivers. The Planning Commission shall grant waivers only upon a review and consideration of the following review criteria.

a. Staff support of the waiver.
b. Sufficient documentation showing that the increased impervious area will not increase flows off-site or cause negative impacts.
c. Sufficient documentation that flows are already accounted for in an existing system that is functioning as designed.

(3) *Replacement and maintenance.* Property owners are responsible for maintenance and replacement of the stormwater run-off mitigation practices required by this section.

Runoff Mitigation Requirements

PC Date: 12/1/2020
Reviewer: Shelli Kerr, AICP, Comprehensive Planning Manager

Type	Amendment
Code Impacted	Land Development Code
Section(s)	Article 200 Definitions & Sec. 1100-08 Grading and Drainage

Background

Currently, formal drainage design requirements are limited unless the project is addressed by a preliminary plat or large scale development. Regulations are needed to manage stormwater run-off for those smaller developments that could impact neighboring properties.

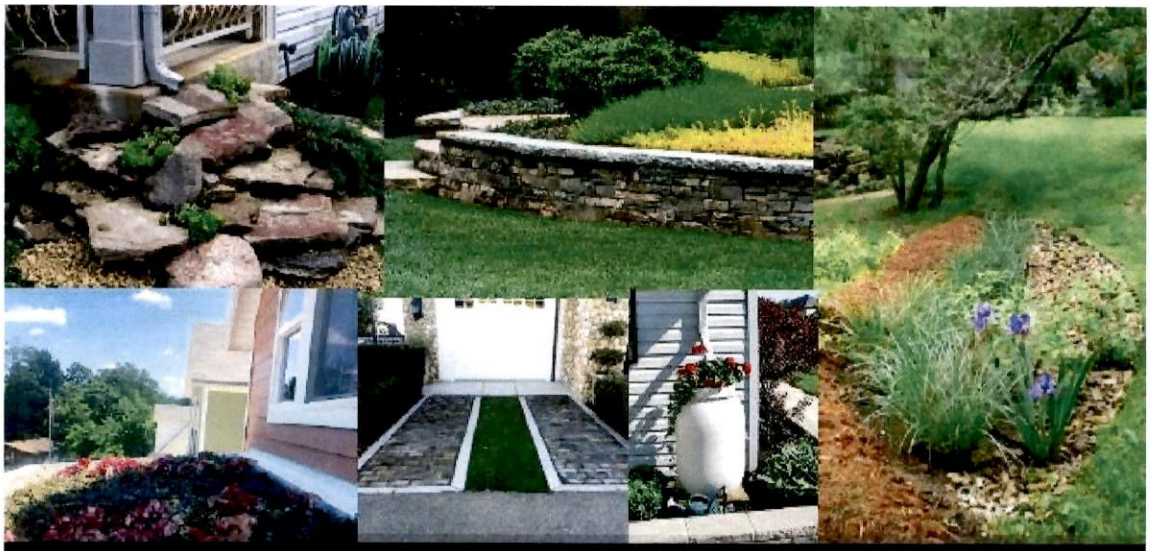
Proposal

Staff are proposing the following amendment to help mitigate the impacts of additional stormwater runoff caused by new developments and redevelopment.

- Require all new development, not already subject to large scale development or preliminary plat, to mitigate stormwater run-off of all impervious areas.
- To mitigate run-off, developers/property owners have the option of:
    - directing run-off to an existing stormwater collection system;
    - using a low impact development technique as listed in the amendment; or
    - using another method as approved by the city engineer.
- The low impact development practices listed in the amendments are provided below. An illustration of these practices is attached.
    - Redirect downspouts
    - Rain barrels/cisterns
    - Rain gardens
    - Porous pavers
    - Green roofs
    - Terraced landscape

Recommendation

Staff recommends approval of an ordinance to amend the Land Development Code to require stormwater run-off mitigation for impervious areas on development not subject to large scale development or preliminary plat.



Residential LID Options

Which is the right one for you?

Know the Flow

#KnowTheFlowNWA

Low Impact Development - LID

One inch of rainfall creates approximately 623 gallons of water falling on a 1,000-square foot roof. Impervious surfaces such as roofs, sidewalks, and driveways prevent rain from soaking into the ground. When it rains, stormwater runs over these hard surfaces picking up pollutants such as yard debris, trash, fertilizers, vehicle fluids, and pet waste, which are washed into storm drains that connect to local creeks.

Low Impact Development or LID are methods and techniques that are used to slow down, spread out and soak in stormwater on site. Incorporating these practices reduces the amount of stormwater leaving your property and slows it down. Reducing the speed and volume of water helps protects the receiving streams and minimize erosion.

On the reverse-side, there are options that may work for your home to help slow down, soak in or spread out stormwater as it flows over your property.

For more information, contact the Northwest Arkansas Stormwater Education Program at UofA Cooperative Extension Service at 479-444-1755 or www.uaex.edu/nwastormwater.

U of A Division of Agriculture Research & Extension
University of Arkansas System

NWArkansas stormwater education

RESIDENTIAL LID OPTIONS

Gauges rank costs and if it needs professional installation. These are averages and can vary greatly based on individual projects. Go to **uaex.edu/nwastormwater f**or more details on these LID practices.

REDIRECT DOWNSPOUTS

To slow stormwater runoff and reduce pollution, add a splash guard or extender to your gutter's downspout to direct to runoff to surfaces that can soak up water such as a yard or garden. Washed out spots at the base of gutters can cause soil to wash away. Rain chains can be a simple, aesthetically pleasing alternative to downspouts that can minimize the velocity of stormwater.

Diversion berms, or swales, can be constructed to reduce runoff velocity and erosive flows and to promote infiltration and plant growth by retaining water in depressions.

RAIN BARRELS/CISTERNS

Rain barrels can be a creative option for redirecting downspouts with added perks. Harvesting stormwater can offer many benefits including:

- Reducing use of treated water for home irrigation
- Lowering peak demands on public water systems
- Reducing stormwater runoff volume and velocity which reduces potential for further erosion downstream

Cisterns have the capacity to harvest more water but can be more costly. What are your water needs?

RAIN GARDENS

Rain gardens are landscaped depressions that collect rainfall. These bowl-shaped gardens are designed to capture stormwater runoff and allow it to slowly soak into the soil, recharging groundwater and removing stormwater pollutants.

The garden's flat bottom helps distribute rain water evenly across the planted area. Topsoil amended with compost and sand allows the water to slowly soak into the ground within a few days so there is no standing water to breed mosquitoes.

POROUS PAVERS

Porous pavers can be an attractive way to let runoff sink in by turning hard surfaces soft. Sidewalks, driveways or even patios spaces can become areas that allow water to sink in rather than runoff.

Pavers need to have sub-basin designs that provide a space for water to go as it passes through the pavers.

Consider what long-term maintenance your pavers may require. If they become clogged with sediment or debris, they are no longer functioning to allow water to soak in.

GREEN ROOFS

A green roof is simply one that fosters the growth of vegetation. The general design of a green roof consists of four distinct layers: an impermeable roof membrane and root barrier, a drainage layer, lightweight growth media, and adapted vegetation.

Extensive green roofs are a surface treatment for rooftops, typically less than 6 inches in depth, involving the addition of growth media and plants to create a sustainable green space on a flat or nearly flat roof.

Intensive green roofs have deeper soil beds allowing more type of vegetation but are more expensive.

TERRACED LANDSCAPE

Sloped landscapes create the potential for erosion. Terracing the slope by creating a structural wall on the downslope face can slowdown excess runoff. Planters can be used for added green space.

Cost and the ability to do this project yourself depends greatly on the scale of the project. Small slopes my be fixed with a manual digging and hand placed rocks. Larger slopes will require heavy excavation and may use large rocks or retaining walls. Some may even need underdrains to help move the water once the area is saturated.