RULE NO.: R161-24.11

NOTICE OF PROPOSED RULE **POSTING DATE:** 07/25/2024

The Director of the Department of Watershed Protection proposes to adopt the following rule after 08/26/2024.

EFFECTIVE DATE OF PROPOSED RULE

A rule proposed in this notice may not become effective before the effective date established by a separate notice of rule adoption. A notice of rule adoption may not be posted before 08/27/24 (the 33rd day after the date of this notice) or not after 10/03/24 (the 70th day after the date of this notice).

If a proposed rule is not adopted on or before 10/03/24, it is automatically withdrawnand cannot be adopted without first posting a new notice of a proposed rule.

REQUEST FOR COMMENTS ON PROPOSED RULES

The City requests comments from the public with respect to the proposed rules included in this Notice. Comments must be received by writing to the contact person below no later than 08/26/24 (the first business day following the 31st day after the date of this notice).

Contact Person:	**Email:**
Elizabeth Funk, Watershed Protection Department	elizabeth.funk@austintexas.gov 512-974-5646

TEXT OF PROPOSED RULE

The text of the proposed rule, indicating changes from the current text, is attached to this notice. A copy of the complete text of the proposed rule is available for public inspection and copying at the following locations. Copies may be purchased at the locations at a cost of ten cents per page:

Watershed Protection Department, located at 505 Barton Springs Road, 12th Floor, and Office of the City Clerk, City Hall, located at 301 West 2nd Street, Austin, Texas.

BRIEF EXPLANATION OF PROPOSED RULE

Environmental Criteria Manual

- **1.4.4, 1.6.2 C, 1.6.3 B, 1.6.7.5 E 2, 1.6.9.2 A, 1.6.10 A:** This updates the term "storm sewer" to "storm drain" for continuity across the Code and Criteria manuals and City practices.
- **Appendix Q2**: Adding Porous Pavement Exclusions to the Appendix Q-2 table. This wouldhelp applicants illustrate where they are proposing porous pavement exclusions for impervious cover.

An affordability impact statement regarding the proposal is available by contacting Elizabeth Funk, elizabeth.funk@austintexas.gov or 512-568-2244.

AUTHORITY FOR ADOPTION OF PROPOSED RULE

The authority and procedure for the adoption of a rule to assist in the implementation, administration, or enforcement of a provision of the City Code is established in Chapter 1-2 of the City Code. The authority to regulate design and construction of drainage facilities and improvements is established in Section 25-7-64 of the City Code.

CERTIFICATION BY CITY ATTORNEY

By signing this Notice of Proposed Rule (R161-24.11), the City Attorney certifies the City Attorney has reviewed the rule and finds that adoption of the rule is a valid exercise of the Director's administrative authority.

REVIEWED AND APPROVED

Jorge L. Morales, P.E., CFM, Director
Watershed Protection Department

Date: 07/16/2024

Deborah Thomas
Acting City Attorney

Date: 7/25/2024

SUMMARY OF JULY 2024 WPD PROPOSED ECM CHANGES

Revisions to the Environmental Criteria Manual

- **1.4.4, 1.6.2 C, 1.6.3 B, 1.6.7.5 E 2, 1.6.9.2 A, 1.6.10 A: This updates the term "storm sewer" to "storm drain" for continuity across the Code and Criteria manuals and City practices.**
- **Appendix Q2: Adding Porous Pavement Exclusions to the Appendix Q-2 table. This would help applicants illustrate where they are proposing porous pavement exclusions for impervious cover.**

1.4.4 - Plan Development and Implementation

G. Additional Recommendations and Requirements for Selected Projects.

4. Water Discharges from Construction Sites.

A common erosion and sedimentation control problem other than stormwater runoff that can cause significant off-site sedimentation problems from construction sites is the discharge of silted water during certain construction operations. Title 6, Article V of the Austin City Code, entitled "Discharges to Storm ~~Sewers~~Drains and Watercourses", contains the minimum water quality compliance requirements for any water discharges into city storm ~~sewers~~drains or waterways. Section 6-5-53 specifically includes water discharges from construction site excavations. Pump and Filter Press systems are acceptable and appropriate for removing sediment from water prior to discharging into surface water or storm drain. Mobile filter presses that have capacity to remove up to - 400 mesh particle size are recommended and acceptable. The following list contains the five most common types of water discharges from construction sites that can cause significant off-site sedimentation problems and the recommended control techniques used in these situations.

1.6.2 - General Design Guidelines

C. **Basin Liners.** All wet ponds require an impermeable liner. Impermeable liners are also required for water quality basins located over the Edwards Aquifer Recharge Zone. If a liner is required and there are multiple controls in series, liners are only required for the first control in series. Impermeable liners may be clay, concrete, geosynthetic clay liner (GCL), geomembrane, or other approved liner, depending on the application. For water quality SCMsin the Edwards Aquifer Recharge Zone, clay liners are not acceptable. The analysis and designshould entail a comprehensive review of the site specific conditions to determine the most appropriate type of liner for the site, and should include a stability assessment of the pond side slope. The criteria in item 1. is applicable to any size basin or pond, while the criteria in item 2. may be applied to sedimentation basins, filtration basins and retention ponds that areless than 1,000 square feet in area. When required for sedimentation/filtration basins, the liner must underlie both the sedimentation basin and filtration basin and any gabion wall areas.

The following criteria applies to all SCMs where a basin liner is required:

There are a number of important engineering design and construction considerations for wet pond liners and other basin liners. A geotechnical engineer

must be involved in all aspects of the liner design. All liner studies, plans, details, specifications and other related documents must be sealed by a geotechnical engineer. Careful attention must be paid to each of the following areas:

a. **Liner subgrade** - A stable subgrade is very important in the construction of the pond or basin. Careful evaluation must be conducted to ensure the liner will be placed on a suitable base. If any voids are encountered, proper geotechnical analysis must be performed to ensure that the integrity of the liner can be maintained. Proof rolling must be conducted as necessary to determine the suitability of the subgrade, and any suspect areas must be reworked and recompacted, or the weak soils removed and replaced with suitable fill material. The subgrade for geomembrane or GCL must be smooth and contain no particles greater than 0.375 inch diameter.
b. **Liner characteristics** - At least three types of liners can be considered, including a clay liner of appropriate thickness and permeability, a geomembrane liner, and GCL. Alternative liner designs may also be considered.

If *geomembrane* is used, it must have a minimum thickness of thirty (30) mils and be ultraviolet resistant. Use of a geomembrane also requires that a suitable geotextile fabric be placed on the top and bottom of the membrane for puncture protection if any particles greater than 0.375 inch are present in the cover soil or subgrade surface, respectively. The geotextile material must have a minimum unit weight of 8 oz./sq. yd., a minimum puncture strength of 125 lbs., a minimum Mullen Burst Strength of 400 psi, and a minimum tensile strength of 200 lbs. The designer must demonstrate the liner's impermeability, and the method of liner protection to be used during maintenance and sediment removal operations. Equivalent methods for protection of the geomembrane liner will be considered by the Watershed Protection Department on a case by case basis. Equivalency will be judged on the basis of ability to protect the geomembrane from puncture, tearing and abrasion. Individuals installing geomembrane liners must be trained and/or certified by the liner manufacturer. Standard Details 661-4A, 661-4B and 661-5 illustrate acceptable geomembrane liner end details for use on concrete walls, stacked stone walls, and earthen embankments.

If a **clay** liner is used, it must be designed for the site-specific conditions by a geotechnical engineer, and must have a minimum thickness of twelve (12) inches or greater. Coefficient of permeability must be 1x10-7 cm/sec or less. Other parameters must be as follows: plasticity index of not less than 15; liquid limit of not less than 30; and at least 30% clay particles passing the No. 200 sieve, with a maximum particle size of 1 inch. Soil must be processed to reduce clod size as much as possible prior to compaction and compaction of the lifts must be done using footed rollers. Clay compaction must be no less than 95% of Standard Proctor Density at or above optimum moisture content or 90% of Modified Proctor Density at a moisture content between 1% dry and 3% wet of optimum. Soil sampling and testing must be conducted on the borrow source and installed liner samples as applicable. Liner material verification sampling and testing should occur at frequencies which must be in accordance with the QA/QC plan. In- situ materials may be used if it can be demonstrated that all required liner parameters will be met. If the clay liner is to be overlain by a drainage layer, a suitable

geotextile fabric must be placed on the surface of the liner prior to placement of the drainage layer to prevent plugging of the drain by the clay liner. Standard Detail 661-5 illustrates this placement.

Geomembrane or GCL liner placement over excavated rock requires installation of protective material to prevent damage to the liner. Examples of protective material include spray-on fiberglass, additional clay liner material, or placement of a geosynthetic fabric.

An **alternative liner design** may be approved by the Director of the Watershed Protection Department if it can be demonstrated by the responsible party that the liner is at least equivalent to or exceeds the above requirements.

c. **Handling of liner penetrations** - Liner penetrations are one of the areas of the pond or basin that are most susceptible to leakage. It is critical that the design and construction of these areas pay special attention to liner continuity around these interface points. Detailed analysis must be performed related to the handling of all areas of liner penetrations including but not limited to pipe inlet and outlet structures, headwalls, and areas where concrete access ramps, maintenance pads, and pump pads interface with the liner. Penetrations for wet ponds should be placed to minimize the hydraulic head over the penetration. Consideration must be given to the need for special applications such as anti-seep collars, gaskets, clay or bentonite plugs, special backfill and compaction, and other measures to prevent leakage around all these areas.

(1) **Submerged Inlets and Storm ~~Sewers~~Drains** - Due to excessive leakage issues submerged inlets and storm ~~sewers~~drains to SCMs are to be avoided whenever possible. In situations where site conditions require a submerged inlet or storm ~~sewer~~drains then the portion of the inlet pipe that is placed below the water quality elevation must be designed to store water, not simply convey it. In these situations the pond liner must extend and surround the portion of the inlet pipe or storm ~~sewer~~drains that is designed to be under water and all structural elements and piping below the water quality elevation shallbe watertight. Acceptable watertight piping includes gasketed RCP, PVC, and wastewater grade HDPE. Leak testing of the system will be performed to verify that the system is watertight and able to perform as designed.

1.6.3 - Maintenance and Construction Requirements

A. Maintenance Responsibilities. Proper maintenance is as important as engineering design and construction in order to ensure that water quality controls, referred to herein as stormwater control measures (SCMs), will function effectively. Section 25-8-231 of the Land Development Code requires maintenance be performed on SCMs when necessary as defined by this section.

Stormwater control measures required for commercial and multi-family development shall be maintained by the property owner.

Stormwater control measures for single family or duplex residential development shall be maintained by the City of Austin once the facilities have been accepted by the City, unless otherwise determined during the review process. For the City to accept an SCM, the facility must:

be constructed per the approved development plan;

meet all applicable requirements of Section 1.6.3 and the Drainage Criteria Manual, Section 1.2.4 E.;

complete a one-year warranty period, including the completion of all maintenance and rehabilitation activities identified by the Watershed Protection Department; and

obtain final warranty release approval from the Watershed Protection Department.

The City will also maintain SCMs designed to service primarily publicly owned roads and facilities. These SCMs must be designed and built according to the appropriate city standards.

B. Maintenance Requirements—Design and Construction.

The design of drainage facilities (including but not limited to headwalls, open channels, stormsewerdrain, area inlets, and detention, retention and stormwater control measures and their appurtenances) shall comply with the requirements of Section 1.2.4.E of the Drainage Criteria Manual. In addition, SCMs shall comply with the following construction requirements:

1.6.7.5 - Additional Resources

E. - Porous Pavement

1. **Description.** Porous pavement describes a system comprising a limited capacity load-bearing, durable surface together with an underlying layered structure that temporarily stores water prior to infiltration and releases the temporarily stored water by infiltration into the underlying permeable subgrade.

   Porous pavement can qualify for Water Quality credit if designed using the storage within the underlying structure or sub-base to infiltrate stormwater and provide ground water recharge to reduce pollutants in stormwater runoff. When proposing the use of a porous pavement system highly detailed specifications and details must be provided and an experienced contractor shall be selected, to minimize potential problems.

The types of porous pavement systems that are acceptable for both pedestrian and vehicular traffic are as follows:

Open-jointed block pavement, permeable interlocking concrete pavement (PICP) or concrete grid pavement (CGP): These systems consist of high strength concrete units that are separated by open or stone-filled joints that allow stormwater to infiltrate. The concrete units are laid on an open graded, single-sized granular base. See Figure 1.6.7.E-1 for a typical cross section.

Porous asphalt (PA): This system consists of regular bituminous asphalt in which the fines have been screened and reduced, creating void spaces and making it permeable. See Figure 1.6.7.E-2for a typical cross section. Permeable friction course (PFC) is a porous asphalt overlay placed over an impervious cover surface and is not eligible for water quality credit.

The type of porous pavement system that is acceptable for pedestrian use only is as follows:

Porous concrete pavement: This system is monolithically poured concrete produced by binding aggregate particles with a mortar created with water and cement as specified by the manufacturer. Minimal sand content results in large voids and high pavement porosity, typically between 15 and 25%. This high porosity and the weaker cement bond result in less strength compared to conventional concrete. See Figure 1.6.7.E-3 for a typical cross section.

2. Site Selection.

Land Use - Porous pavement should be limited to pedestrian areas, areas with low vehicular traffic volumes, smaller axle loads and low speeds such as, parking stalls, smaller parking lots, overflow parking areas of larger parking lots and other areas with little or no traffic. Permeable surfaces are currently not considered suitable for roads with heavy traffic or high speeds due to the risks associated with failure, the safety implications of ponding, and disruption arising from reconstruction.

Off Site Flows - Run-on from drainage area(s) outside of the porous pavement area is not allowed.

Hot Spots - Porous pavement systems depend upon infiltration into the underlying permeable subgrade. Due to the potential for groundwater contamination, porous pavement shall not be allowed under stormwater hot spots or in areas where land use or activities generate highly contaminated runoff or yield high sediment loads. Hot spot runoff frequently contains pollutant concentrations exceeding those typically observed in stormwater. Hot spots include, but are not limited to, commercial nurseries, auto salvage facilities, hazardous materials generators (where containers are exposed to rainfall), vehicle fueling and maintenance areas, and vehicle and equipment washing dry or steam cleaning facilities, food production/distribution loading dock and trash compactor areas (Note: Some of these land uses/activities may have additional discharge restrictions under City Code Chapter 6-5, Article 5, Discharges into Storm ~~Sewers~~Drains or Watercourses).

Barton Spring Zone - Porous pavement is not acceptable as a water quality control and will not receive credit against water quality volume calculations.

Geotechnical Evaluation - A major factor for most design decisions is related to the existing soil conditions. It shall be necessary to obtain geotechnical/soils and subsurface information prior to the design of a porous pavement system. To demonstrate the feasibility of the design the following information must be submitted to the Planning and Development Review Department engineer with the site plan or subdivision construction permit application:

1.6.9.2 - Pollution Prevention Measures

A. **General.** Pollution prevention measures shall be used to the greatest extent possible to reduce the number of potential sources of pollutants on sites. For commercial and multi-family sites, the applicant shall identify such potential sources of pollutants such as: liquid or solid waste storage locations, storage locations for chemicals including, but not limited to, pesticides, herbicides, fuels, petroleum products, hazardous wastes; vehicle fueling or washingareas; storage of raw materials, by-products or products of manufacturing processes; and mechanical equipment repair facilities.

Such areas shall be identified on the site plan and in the engineer's report. In addition, the report shall identify the proposed methods for the prevention of the discharge of pollutants from the potential sources. Preference shall be given to measures that prevent the exposure of these areas to stormwater runoff such as through covering or enclosing the areas within a building. Drains from such covered or enclosed areas shall not be routed to the storm ~~sewer~~drain system.

In addition, all storm ~~sewer~~drain inlets located on commercial and multi-family sites shall be stenciled by the owner with a sign which indicates that the inlet drains to local creeks or waterways and that no wastes should be dumped. The design of the stencil must be approved by the Director of the WPDR prior to its use on the site.

1.6.10 - Technical Notes

A. Sample Calculation for Determining Water Quality Volume - Commercial Site I. Site

Description: Urban Watershed

Total Site = 2 acres

Critical Water Quality Zone = 0 acres

No Water Quality Transition Zone in Urban Watershed

The site will be developed at 65 percent impervious cover. Runoff from parking lots and roof tops will drain to an enclosed storm ~~sewer~~drain system designed to detain the25 year design storm for the 1.3 acres of impervious cover (= 2 acres × .65). There wil 1be 0.2 acre of landscaped area which will drain to the parking lot. A 0.2 acre picnic area will not be developed. Runoff from this area will flow overland and drain into a pipe which conveys the runoff to an on-site detention pond. The remaining 0.3 acre will beused for drainage and water quality treatment.

APPENDIX Q-2
IMPERVIOUS COVER

WATER SUPPLY SUBURBAN, WATER SUPPLY RURAL, AND BARTON SPRINGS ZONE WATERSHEDS

	WATER QUALITY TRANSITION ZONE (WQTZ)		
1	WQTZ OUTSIDE OF 100-YEAR FLOODPLAIN (NON-FP WQTZ)	= _____	ACRES
	ALLOWABLE IMPERVIOUS COVER		
2	IMPERVIOUS COVER ALLOWED AT _____% X *(NON-FP WQTZ)*	= _____	ACRES
3	IMPERVIOUS COVER ALLOWED AT _____% X *(NET SITE AREA)*	= _____	ACRES
4	**TOTAL ALLOWED IMPERVIOUS COVER**	**= _____**	**ACRES**
	PROPOSED IMPERVIOUS COVER		
5	IMPERVIOUS COVER IN NON-FP WQTZ		
5a	EXISTING PROPOSED TO REMAIN = _____ ACRES		
5b	PROPOSED NEW = _____ ACRES		
5c	**SUBTOTAL**	**= _____**	**ACRES**
6	IMPERVIOUS COVER IN UPLANDS ZONE		
6a	EXISTING PROPOSED TO REMAIN = _____ ACRES		
6b	PROPOSED NEW = _____ ACRES		
6c	SUBTOTAL	= _____	ACRES
7	**TOTAL PROPOSED IMPERVIOUS COVER**	**= _____**	**ACRES**

	ALLOWABLE IMPERVIOUS COVER BREAKDOWN BY SLOPE CATEGORY				
8	TOTAL ACREAGE WITH SLOPES 15-25% = _____ ACRES X 10%		= _____		ACRES
	PROPOSED IMPERVIOUS COVER ON SLOPES				
			IMPERVIOUS COVER		
	SLOPES		BUILDING & OTHER IMPERVIOUS COVER		DRIVES / ROADWAYS
	SLOPE CATEGORIES	ACRES	ACRES	% OF CATEGORY	ACRES
9	0-15%	_____	_____	_____	_____
10	15-25%	_____	_____	_____	_____
11	25-35%	_____	_____	_____	_____
12	OVER 35%	_____	_____	_____	_____
13	GROSS SITE AREA	_____			

	PROPOSED IMPERVIOUS COVER POROUS PAVEMENT EXCEPTIONS		
14	POROUS PAVEMENT (PEDESTRIAN WALKWAYS AND MULTI-USE TRAILS)	_____	ACRES
15	FIRE LANES CONSISTING OF INTERLOCKING PAVERS	_____	ACRES

APPENDIX Q-2

IMPERVIOUS COVER

SUBURBAN WATERSHEDS

NOTE: Q-1 TABLES ARE NOT REQUIRED FOR SUBURBAN WATERSHEDS

1	IMPERVIOUS COVER ALLOWED AT _____% X *(GROSS SITE AREA)*	= _____ ACRES
	PROPOSED IMPERVIOUS COVER	
2	EXISTING IMPERVIOUS COVER PROPOSED TO REMAIN	= _____ ACRES
3	PROPOSED NEW IMPERVIOUS COVER	= _____ ACRES
4	**TOTAL PROPOSED IMPERVIOUS COVER**	**= _____ ACRES**

	ALLOWABLE IMPERVIOUS COVER BREAKDOWN BY SLOPE CATEGORY				
5	TOTAL ACREAGE WITH SLOPES 15-25% = _____ ACRES X 10%				= _____ ACRES
	PROPOSED IMPERVIOUS COVER ON SLOPES				
			IMPERVIOUS COVER		
	SLOPES		BUILDING & OTHER IMPERVIOUS COVER		DRIVES / ROADWAYS
	SLOPE CATEGORIES	ACRES	ACRES	% OF SLOPE CATEGORY	ACRES
6	0-15%	_____	_____	_____	_____
7	15-25%	_____	_____	_____	_____
8	25-35%	_____	_____	_____	_____
9	OVER 35%	_____	_____	_____	_____
10	GROSS SITE AREA	_____			

	PROPOSED IMPERVIOUS COVER POROUS PAVEMENT EXCEPTIONS	
11	POROUS PAVEMENT (PEDESTRIAN WALKWAYS AND MULTI-USE TRAILS)	_____ ACRES
12	FIRE LANES CONSISTING OF INTERLOCKING PAVERS	_____ ACRES