



AGENDA
CITY OF LAKE WORTH BEACH
CITY COMMISSION WORK SESSION - LANDSCAPING ORDINANCE
CITY HALL COMMISSION CHAMBER
THURSDAY, APRIL 13, 2023 - 6:00 PM

ROLL CALL:

PLEDGE OF ALLEGIANCE: led by Mayor Betty Resch

UPDATES / FUTURE ACTION / DIRECTION

A. [Landscape and Artificial Turf](#)

ADJOURNMENT:

The City Commission has adopted Rules of Decorum for Citizen Participation (See Resolution No. 81-2022). The Rules of Decorum are posted within the City Hall Chambers, City Hall Conference Room, posted online at: <https://lakeworthbeachfl.gov/government/virtual-meetings/>, and available through the City Clerk's office. Compliance with the Rules of Decorum is expected and appreciated.

If a person decides to appeal any decision made by the board, agency or commission with respect to any matter considered at such meeting or hearing, he or she will need a record of the proceedings, and that, for such purpose, he or she may need to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which the appeal is to be based. (F.S. 286.0105)

STAFF REPORT WORK SESSION

AGENDA DATE: April 13, 2023

DEPARTMENT: Community Sustainability

TITLE:

Landscape and Artificial Turf

SUMMARY:

The City Commission paused Code Compliance actions on all violations relating to groundcover including artificial turf for 90 days beginning January 11, 2023, to hold a work session meeting to discuss the ordinances regarding artificial turf and the installation of groundcover in yards with mulch or rock. The reference materials for this item include a link to the City's "Landscape and Trees" webpage, draft language that was pulled (not adopted) from Ordinance 2020-15 on artificial turf, and a summary of the potential impacts of rock yards.

The City's Landscape Regulations (Sec. 23.6-1. – Landscape regulations), which utilizes a point system by development type, can be accessed via the City's "Landscape and Trees" webpage at: <https://lakeworthbeachfl.gov/landscaping-and-trees/>. The links on the page provide helpful information for residents and property owners, including a link to the University of Florida IFAS Florida Friendly Landscaping Program's webpage.

BACKGROUND AND JUSTIFICATION:

Artificial Turf:

Attachment A includes the draft artificial turf code provisions that were pulled (not adopted) from Ordinance 2020-15 as background material. These draft regulations included limits on the location, application, and amount of artificial turf. As artificial turf is not a landscape material, the draft language treated it as a semi-permeable material similar to gravel, permeable pavers, or permeable asphalt. The language also provided quality standards for visual appearance and safety as artificial turf comes in a wide variety of grades. Also included in Attachment A is the 2020 staff presentation on the pros and cons of artificial turf and a summary of the proposed code language at that time.

Landscaping Areas in Yards:

The City's Landscape Regulations (Section 23.6-1.) requires the implementation of Florida-Friendly Landscaping Principles, which are 9 science-based principles for sustainable landscapes. These principles were developed by the University of Florida's IFAS and are the foundation of the University's Florida Friendly Landscaping Program. The City's Landscape Regulations employ a point system in addition to minimum requirements for screening and shade trees for the two different categories of development: "New and existing single-family and duplex properties" and "New and existing multiple-family, commercial and industrial development." As consistent with the City's water conservation objectives in the Conservation Element and Florida Friendly Landscaping principles, the code does not require or encourage sod/grass/turf. The code also provides installation specifications so that living ground covers and native grasses used in lieu of turf or sod will have "a finished appearance and reasonably complete coverage within six (6) months based on the expected mature spread."

In addition to the requirements in Section 23.6-1, there is a provision in all of the City's residential zoning districts and the Mixed Use – East zoning district that "the lesser of nine hundred (900) square feet or seventy-five (75) percent of the front yard area shall remain pervious and be landscaped." The landscape

code and district requirements were intended to maintain and expand the green/tropical visual corridor along the City roadways, and to maximize shade for pedestrians.

While rock yards or rock as mulch are installed in the region, they are not considered Florida-Friendly by the University of Florida, and are discouraged for the reasons provided in Attachment B. Rock as mulch is only recommended by the program in limited applications. However, due to requests by residents in recent years to utilize more rock in their landscape areas, rock was permitted as a mulch substitute. Regardless of the type of mulch selected, a "landscape area shall contain a maximum of fifty (50) percent mulch or rock in planting beds" (Section 23-1-12). Substantial expansion of rock yards or expanses of rock in landscape areas would likely impact the visual corridor over time and have environmental impacts (Attachment B) as approximately 67% of the City's land area is in a residential zoning district..

DIRECTION:

Bring forward/not bring forward an ordinance allowing artificial turf with limitations as directed by the City Commission

Bring forward/not bring forward an ordinance modifying current yard landscaping requirements as specified by the City Commission

ATTACHMENT(S):

Attachment A – 2020 Previously Proposed (NOT ADOPTED) Artificial Turf Regulations & 2020 Staff PowerPoint Slides on Artificial Turf

Attachment B – Rock Yards & Mulch

FOR REFERENCE ONLY - NOT ADOPTED OR PROPOSED

Attachment A:
Previous DRAFT Artificial Turf Exhibit
that was stricken from Ordinance 2020-15 on November 17, 2020

Chapter 23

ARTICLE 6 "ENVIRONMENTAL REGULATIONS"

Sec. 23.6-1. - Landscape regulations.

(k) *Landscape design standards.* The following are the minimum standards for the design and installation of all landscaping within the City of Lake Worth Beach:

(15) Artificial turf.

a. All installation of artificial turf shall require a landscape permit. The use and location of artificial turf shall be limited to the following:

(1) Single family and duplex properties in the rear yard only and not visible from the right of way.

(2) Between parking strips in the front yard of non-conforming properties previously constructed with off-street parking utilizing sixty percent (60%) or more of the width of the front yard. This application of artificial turf shall be approved by the Development Review Official or applicable review board, which shall review the proposed application for consistency with the City's land development regulations, visual appropriateness, enhanced site design and appearance, and improved drainage.

(3) On roof top terraces.

(4) As part of a planned development in a recreation or amenity area.

b. In all areas of installation, artificial turf shall be treated as a semi-pervious surface. The quantity of artificial turf to be incorporated into a project shall be limited by the maximum percentage of impervious surface for the subject property within the applicable zoning district.

c. Artificial turf shall not be installed:

(1) as part of any landscape buffer or landscape area required by this article;

(2) within permanent drainage features (e.g., ponds, swales); or

(3) in any public right of way.

d. Minimum material standards. All artificial turf shall comply with each of the following minimum standards:

(1) Artificial turf shall consist of green lifelike individual blades of grass that emulate natural turf in look and color and shall have a minimum pile height of one- and one-half inches and shall have a minimum tufted weight of 80 ounces per square yard.

FOR REFERENCE ONLY - NOT ADOPTED OR PROPOSED

- 44 (2) Artificial turf installations shall have a minimum permeability of 30 inches per
45 hour per square yard.
- 46 (3) All artificial turf shall have a minimum ten-year manufacturer's warranty that
47 protects against color fading and a decrease in pile height.
- 48 (4) Artificial turf shall be lead free and be partially or wholly manufactured from
49 recyclable materials.
- 50 (5) All materials must include test documentation which declares that the artificial
51 turf yarn and backing materials are disposable under normal conditions, at
52 any U.S. landfill station (Total Content Leach Protocol (TCLP) test).
53 Documentation must also be provided that identifies all components that are
54 recyclable and all components that consist of recycled material.
- 55 (6) The use of indoor or outdoor plastic or nylon carpeting as a replacement for
56 artificial turf or natural turf shall be prohibited.
- 57 (7) The artificial turf system shall utilize organic plant-derived and other natural
58 infill components, including, but not limited to, cork, coconut, corn husk, rice
59 husk, and sand. The use of crumb rubber and other synthetic materials shall
60 be prohibited in all applications except for sports fields.
- 61 (8) Artificial Turf shall not be treated as a fill in material, but rather as a planned
62 element of the site or yard outside of required landscape areas and buffers

63 e. Installation, maintenance and repair.

- 64 (1) All artificial turf shall, at a minimum, be installed according to the
65 manufacturer's specifications.
- 66 (2) All artificial turf installations shall be anchored to ensure that the turf will
67 withstand the effects of wind.
- 68 (3) All seams shall be secured and edges shall be trimmed to fit against all
69 regular and irregular edges to resemble a natural look.
- 70 (4) If artificial turf is planned to be installed immediately adjacent to a seawall,
71 the artificial turf shall be pinned or staked behind the seawall. No artificial
72 turf or installation mechanism shall be attached directly to or placed on a
73 seawall or seawall cap.
- 74 (5) All artificial turf shall be installed over a subgrade prepared to provide
75 positive drainage and an evenly graded mass of compacted, porous
76 crushed rock aggregate material. Base comprising of sand only is not
77 permitted. Proper drainage shall be provided for all Artificial Turf
78 installations to prevent runoff or pooling of water.
- 79 (6) Artificial turf shall be visually level, with the grain pointing in a single
80 direction.
- 81 (7) An appropriate solid barrier device (e.g., concrete mow strip, bender board
82 or other barrier with a minimum of 38" thickness) is required to separate
83 artificial turf from soil and live vegetation and to prevent intrusion of living
84 plant material.

FOR REFERENCE ONLY - NOT ADOPTED OR PROPOSED

- 85 (8) Artificial turf shall not be installed directly against the trunk of trees and/or
86 palms. A 3-foot mulch bed measured from the base of the tree or palm must
87 be maintained around all trees and or palms. Precautions for installation
88 around existing trees shall be monitored and may be restricted to ensure
89 tree roots are not damaged with the installation of the base material and
90 that the overall health of the tree will not be compromised.
- 91 (9) All artificial turf shall be maintained in a green fadeless condition and shall
92 be maintained free of dirt, mud, stains, weeds, debris, tears, holes, and
93 impressions. Maintenance shall include, but not be limited to cleaning,
94 brushing, debris removal; repairing of depressions and ruts to maintain a
95 visually-level surface; elimination of any odors, flat or matted areas, weeds,
96 and invasive roots; and all edges of the artificial turf shall not be loose and
97 must be maintained with appropriate edging or stakes.
- 98 (10) There shall be no parking on artificial turf.
- 99 (11) Artificial turf shall not be visible from public rights-of-way except where it is
100 installed between parking strips or approved as part of a planned
101 development.
- 102 (12) All other landscape requirements must be met.
- 103 (13) Applicants shall provide an owner affidavit agreeing to perpetually maintain
104 the artificial turf system in good working order to ensure that there is
105 continued permeability. If the artificial turf falls into disrepair with fading or
106 holes or loose areas. The replacement and/or repairs shall be done with like
107 for like materials from the same manufacturer and done so in a manner that
108 results in a repair that blends in with the existing artificial turf.
- 109 f. A landscape permit shall be obtained from the City prior to the installation of any
110 artificial turf. The permit application shall include the following material
111 specifications and plans.
- 112 (1) A landscape plan showing the area of synthetic turf, area of living plant
113 material, and separation between these areas;
- 114 (2) A dimensioned cross section of proposed materials and installation details,
115 including subgrade, drainage, base or leveling layer, and infill;
- 116 (3) Edge material and detail for seams;
- 117 (4) Material description and specifications, including manufacturer,
- 118 (5) Installer (with contact information), and warranty information.
- 119 (6) A sample of the artificial turf proposed that meets these standards.
- 120 (7) Product specifications that demonstrate compliance the requirements for
121 artificial turf in this article and the ability to be warranted in the United States
122 of America.
- 123 (8) The plan shall demonstrate conformance with the City's landscape
124 requirements.
- 125 g. A Certificate of Appropriateness shall be obtained from the HRPB prior to the
126 installation of any artificial turf in a historic district.

FOR REFERENCE ONLY - NOT ADOPTED OR PROPOSED

- 127 h. Inspections. An in-progress inspection shall be required to ensure that the
128 appropriate base material has been installed in accordance to the
129 manufactures' specifications. A final inspection shall also be required.

Summary

- Exhibit G: Article 6 - Section 23.6-1 – Landscape Regulations (Artificial Turf)
 - The proposed amendments would allow for artificial turf within the City subject to the requirements related to location, quality and installation.

Pros/Cons Artificial Turf:

Pros	Cons
Maintains Color and Appearance Year Round	Can be damaged and torn or worn down with heavy foot traffic over time
Not Damage by Pests	50 to 100 degrees hotter than ambient air temperature
May be lower maintenance than traditional sod applications. No fertilizer or pest control treatments.	Regular washing and raking of the product is necessary to mitigate the accumulation dirt and odor from leaves, pet hair and animal waste
New less toxic products are on the market and alternate fill is available to crumb rubber.	Some products can leach into soils and there are concerns about water run-off from crumb rubber infill which might be harmful to families, pets, or the environment.
Some products are made from recycled materials	Artificial turf is not recyclable
Semi-pervious surface when correctly installed	Is not a fully pervious surface as soil or landscaping. Incorrectly installed material may pool water.

Summary

- Exhibit G: Article 6 - Section 23.6-1 – Landscape Regulations (Artificial Turf)
 - Where should it be allowed?
 - How should it be maintained and permitted?
 - What quality of material should be required?



Summary

- Exhibit G: Article 6 - Section 23.6-1 – Landscape Regulations (Artificial Turf)

- Where

- Single family and duplex properties in the rear yard only and not visible from the right of way.
- Between parking strips in the front yard of non-conforming properties previously constructed with off-street parking utilizing sixty percent (60%) or more of the width of the front yard. This application of artificial turf shall be approved by the Development Review Official or applicable review board, which shall review the proposed application for consistency with the City's land development regulations, visual appropriateness, enhanced site design and appearance, and improved drainage. Properties located in historic districts will require a Certificate of Appropriateness from the HRPB.
- On roof top terraces.
- As part of a planned development in a recreation or amenity area.
- Artificial turf shall **not** be installed:
 - (1) as part of any landscape buffer or landscape area required by this article;
 - (2) within permanent drainage features (e.g., ponds, swales); or
 - (3) in any public right of way.

Summary

- Exhibit G: Article 6 - Section 23.6-1 – Landscape Regulations (Artificial Turf)

- How

- Landscape permit is required with 2 inspections
- Affidavit of maintenance is required
- Barrier is required between the artificial turf and landscaping
- Subsurface material specifications, crumb rubber is not permitted

- What

- Minimum quality standards
 - Test documentation which declares that the artificial turf yarn and backing materials are disposable under normal conditions, at any U.S. landfill station (Total Content Leach Protocol (TCLP) test).
- Appearance standards
 - Artificial turf shall consist of green lifelike individual blades of grass that emulate natural turf in look and color and shall have a minimum pile height of one- and one-half inches and shall have a minimum tufted weight of 80 ounces per square yard.
- 10 Year Warranty
- Drainage standards

Summary

- Exhibit G: Article 6 - Section 23.6-1 – Landscape Regulations (Artificial Turf)
 - Board Discussion

Attachment B: Rock Yards & Mulch

The City's Landscape Ordinance section 23.6-1 requires the implementation of Florida-Friendly Landscaping Principles, which are 9 science-based principles for sustainable landscapes. These principles were developed by the University of Florida's IFAS and are the foundation of the University's Florida Friendly Landscaping Program. While rock as mulch or rock yards are installed in the region by some homeowners, they are not considered to be Florida-Friendly by the University, and are discouraged for the following reasons within the City:

- Rocks increase heat on plants, especially plants' roots, which can stress plants. This heat stress causes dehydration and affects plant growth and development. (UF IFAS Extension, 2023 & Zhao, J., Lu, Z., Wang, L., & Jin, B., 2020)
- Rocks do not support Florida's wildlife, including bees, butterflies, birds and animals as the removal of trees and landscaping can result "in loss of habitat, or in habitat that does not support wildlife." (UF IFAS, 2023)
- According to the US EPA, "trees and other plants help cool the environment, making vegetation a simple and effective way to reduce urban heat islands." (US EPA, 2023)
- Xeriscape yards, which typically use rocks with very few plants or none at all, have a higher water runoff rate than yards with sod or plant material. (Simpson, T. J., and R. A. Francis. 2021)
- Even with a weed barrier, weeds will still grow and will need to be pulled or treated with herbicide.
- Leaves and other organic matter will not properly decompose, which will cause the rock to be unsightly without maintenance.

Acceptable uses of rock consistent with the UF IFAS Florida-Friendly Program:

- Smaller rocks such as pea gravel or crushed rock are great for walkways in single-family/two-family properties. Broad flat rocks like flagstone in lieu of concrete stepping stones for added attraction.
- Medium-sized rocks can be arranged to create edging around landscape beds.
- Large rocks can be used as art. Set on their own in landscape beds they make great sculptural accents.
- Placed under roof overhangs to lessen the effects of rainfall.
- Used in rain gardens or in wet, slow draining areas.

A good alternative to rockered yards is a thick layer of organic mulch planted with shrubs and groundcovers. Proper plant selection and placement will create an attractive landscape that will require minimal irrigation and maintenance.

(UF IFAS, 2023)

References:

- University of Florida IFAS Extension. (March 2023). *Florida-Friendly Landscaping Program*. <https://ffl.ifas.ufl.edu/about-ffl/>
- U.S. Environmental Protection Agency. (March 2023). *Heat Islands – Using trees and vegetation to reduce heat islands*. <https://www.epa.gov/heatislands/using-trees-and-vegetation-reduce-heat-islands>
- Simpson, T. J., and R. A. Francis. (2021). “Artificial Lawns Exhibit Increased Runoff and Decreased Water Retention Compared to Living Lawns Following Controlled Rainfall Experiments.” *Urban Forestry & Urban Greening* 63:127232. <https://doi.org/10.1016/j.ufug.2021.127232>
- Zhao, J., Lu, Z., Wang, L., & Jin, B. (2020). Plant Responses to Heat Stress: Physiology, Transcription, Noncoding RNAs, and Epigenetics. *International journal of molecular sciences*, 22(1), 117. <https://doi.org/10.3390/ijms22010117>

Artificial Turf Requirements in PBC Local Governments

Local Government	Artificial Turf Allowed Yes/No	Regulations
Boca Raton	Yes, Limited to residential	Historically permitted in residential front, side, and rear yards subject to drainage review.
Boynton Beach	Yes, treated as impermeable surface	For Residential, artificial turf is allowed in back yards and treated as impermeable/paving, which has setback requirements. No specific regulations have been adopted. It is treated as pavement
Delray Beach	Yes, currently very limited New LDR Amendment in Process	<p>Artificial turf is currently permitted in sidewalk cafes through the City’s sidewalk café permitting process. LDR Section 6.3.3(f)(12): (12) The use of carpeting, artificial turf, or other services of any kind must be approved as a part of the Sidewalk Café application.</p> <p>Delray Beach staff is currently working on finalizing an ordinance to allow artificial turf as hardscape surface with performance standards. The draft ordinance was reviewed by the City’s Planning and Zoning Board on March 20, 2023 to provide feedback to staff. In the draft ordinance:</p> <ul style="list-style-type: none"> • Artificial turf is considered hardscape, and must be designed and permitted with a minimum permeability of 30 inches per hour per square yard. Artificial turf cannot be used within permanent drainage features (ponds, swales, etc.). • Artificial turf may be used in combination with living plants as part of a landscape design, but artificial turf shall not by itself constitute landscaping. No more than 15 percent of the lot area remaining after building coverage, open space, and hardscaping are subtracted from the total lot area may be comprised of artificial turf.
Greenacres	No	Not permitted, staff is reviewing issue
Jupiter	No	Definition of Turf: means continuous plant coverage consisting of grass species suited to growth. Jupiter staff is beginning to research and draft regulations to potentially allow artificial turf as an impervious surface (e.g. patio area). Draft regulations are tentatively scheduled to go to public hearing sometime in Winter 2023/2024.
Lantana	Yes	Sec. 10.5-23(e) provides performance standards, but no limitation on the application of the material. Sites have to comply with all landscaping requirements, but may also utilize artificial turf.

Local Government	Artificial Turf Allowed Yes/No	Regulations
Palm Beach County	Yes	<p>ULDC. Article 7 Section 7 E</p> <p>Artificial turf may be installed in the interior, terminal, or divider medium of a bull pen vehicle storage area. The applicant shall receive product approval from the Zoning Director, prior to indicating in the Landscape Plan or installation. Article 7 Section 7 E</p> <p>No artificial plants or vegetation shall be used to meet any standard of this article. Chapter E section 6</p> <p>Artificial turf has also been permitted on athletic fields in recent approvals.</p>
Palm Beach Gardens	Yes Allowed in limited areas. Code also has performance standards	<p>Sec. 78-321. - Minimum landscape and hardscape standards:</p> <p>(c) Artificial turf. Up to one hundred (100) percent of the recreational use (e.g., playground, athletic field) of artificial turf shall be permitted to count toward open space requirements. Artificial turf shall consist of green lifelike individual blades of grass that emulates natural turf. The installation of artificial turf shall not restrict or compromise the health or maintenance of natural vegetation required by any other section of this Code. The location of artificial turf shall be limited to the following:</p> <p>(1) In residential lots, the quantity of artificial turf is restricted by the maximum percentage of impervious surface for the subject property permitted within the applicable zoning district.</p> <p>(2) Artificial turf is not permitted within required landscape buffers, parkways, or preserve areas.</p> <p>Sec. 78-322. - Hardscape and nonliving landscape materials installation requirements:</p> <p>(f) Artificial turf. Artificial turf shall be designed for the intended use and meet the appropriate industry standards for installation, drainage, and aesthetics. Artificial turf shall resemble a natural turf/sod/grass look at all times. Artificial turf shall be visually level, with the grain pointing in a single direction. The improper maintenance or disrepair of artificial turf shall be a violation of the city's Code, which may include, but not be limited to, unanchored areas, water pooling, and/or unsightly or unclean areas.</p>
Palm Springs	No	Not permitted
Wellington	Yes, Allowed in limited areas. Code also has performance standards	<p>Chapter 8, Section 7.8.1</p> <p>K. The limited use of artificial/synthetic turf, grass, sod, lawn, etc., is allowed per the following standards:</p> <p>1.The use of artificial turf is limited to the following uses:</p> <p>a. Residential properties: Allowed in the rear and side yard areas if not visible from the right-of-way. Rear and side yard areas where artificial turf is visible from the right-of-way shall be screened from view by continuous opaque fencing or hedge material with a minimum height of five feet. Artificial turf shall be prohibited in front yards, except for the limited use as a decorative grid design with maximum four-inch wide strip used in conjunction with approved pavement materials for patio, walkway and driveway as approved with a building permit for the improvement.</p> <p>....Continued on next page...</p>

Local Government	Artificial Turf Allowed Yes/No	Regulations
Wellington* *Continued from previous page	Yes, Allowed in limited areas. Code also has performance standards	b. Residential common areas: Allowed in areas designated as recreation or amenity areas on the approved site plan. c. Non-residential: i. Commercial: Allowed in areas that are not required to meet the minimum landscape requirements and shall be designated on the approved site plan. Artificial turf shall be prohibited in designated landscape buffers, areas adjacent to, or visible from, any rights-of-way, drainage and swale areas, lake/canal bank, or other areas within the site that are not required to meet the intent of the landscape requirements as determined during the site plan review process. ii. Recreational areas: Allowed for athletic/activity fields, as designated on an approved site plan. All athletic/activity fields shall be designed to meet the industry standards for the intended use.
West Palm Beach	Yes, Allowed in limited areas. Code also has performance standards	Sec. 94-451. - Artificial turf. (a) The use and location of artificial turf shall be limited to the following: (1) The construction of non-city-owned athletic fields and playgrounds associated with a non-city-owned community center, park, school, or university; (2) As part of the construction of any nonresidential development; (3) On roof top terraces; (4) On residential lots in the rear setback and side setback; or (5) In multifamily residential developments as part of a recreation or amenity area.

Synthetic Turfgrass and the Nine Principles of Florida-Friendly Landscaping™¹

Jason Kruse, Bryan Unruh, Jennifer Marvin, Tom Wichman, Lynn Barber, Norma Samuel, John Bossart, Claire Lewis, and Esen Momol²

Introduction

Homeowners in Florida are offered many different species and cultivars of natural turfgrass to consider for their lawns, each offering varying levels of shade, maintenance, water, disease, and pest resistance, as well as differences in color, texture, and overall aesthetics. Recent additions to the list of available turfgrasses have benefited from extensive breeding programs to develop cultivars that need fewer inputs (e.g., water and fertilizer), have fewer pest problems, and require less mowing, all traits that contribute to their appropriate use in Florida-Friendly Landscaping™ (FFL) (Momol et al. 2021).

However, in addition to these living turf options, some homeowners replace natural turfgrass with synthetic turf, also referred to as artificial turf. Originally developed as a durable, low-maintenance playground surface, synthetic turf is a manufactured product that utilizes synthetic fibers that mimic the aesthetic look of natural grass. Essentially outdoor carpet, artificial turf is typically composed of nylon, polypropylene, or polyethylene fibers connected to a reinforced backing material. While designed to imitate the look of natural turf, synthetic turf does not provide the

ecosystem benefits of a natural turf system. This publication examines the properties of synthetic turf in relation to each of FFL's nine principles.

Florida-Friendly Landscaping™: The Nine Program Principles

FFL protects Florida's natural resources by conserving water, reducing waste and pollution, creating wildlife habitat, and preventing runoff and erosion (Momol et al. 2021). Landscapes in Florida can be Florida-Friendly if designed and maintained according to the nine Florida-Friendly Landscaping™ principles (FYN Handbook 2015). Each of the nine Florida-Friendly Landscaping™ principles are evaluated below as they relate to living turfgrass and its potential replacement by synthetic turf.

1. Right Plant, Right Place: FFL's mission is to provide science-based information for creating resilient, sustainable landscapes of living plants that have been specifically selected and appropriately installed so that they require little or no irrigation, fertilizer, or pesticide. Because synthetic turf is not alive, it does not meet the criteria

1. This document is ENH1348, one of a series of the Environmental Horticulture Department, UF/IFAS Extension. Original publication date December 2021. Visit the EDIS website at <https://edis.ifas.ufl.edu> for the currently supported version of this publication.
2. Jason Kruse, associate professor, Environmental Horticulture Department; Bryan Unruh, professor and associate center director, Environmental Horticulture Department, UF/IFAS West Florida Research and Education Center, Jay, FL; Jennifer Marvin, statewide FYN coordinator, UF/IFAS Florida-Friendly Landscaping™ Program; Tom Wichman, assistant director and statewide GI-BMP coordinator, UF/IFAS Florida-Friendly Landscaping™ Program, UF/IFAS Center for Land Use Efficiency; Lynn Barber, program county Extension agent II, Florida Friendly Landscaping™, UF/IFAS Extension Hillsborough County; Norma Samuel, Extension agent IV, PhD, Florida Friendly Landscaping™ and urban horticulture, UF/IFAS Extension Sumter County; John Bossart, Extension program manager, UF/IFAS Florida-Friendly Landscaping™ Program; Claire Lewis, statewide FFC coordinator, UF/IFAS Florida-Friendly Landscaping™ Program; and Esen Momol, director, UF/IFAS Florida-Friendly Landscaping™ Program; UF/IFAS Extension, Gainesville, FL 32611.

of a plant choice for an FFL landscape. As a living plant, natural turfgrass plays an important role in cooling the environment that synthetic turf cannot. Average surface temperatures of a natural turfgrass lawn have been reported to be as much as 70°F cooler than a dormant brown lawn and as much as 100°F cooler than synthetic turf surfaces. Higher surface temperatures increase the surrounding air temperatures and result in an increase in the energy required for mechanical cooling of adjacent homes and buildings. Caludio (2008) describes heat island effects generated by larger installations of synthetic turf. Living turfgrass also provides a root zone, which helps to filter and slow runoff and stop erosion. Synthetic turf cannot do this, because part of its installation requires compacting the earth below, increasing runoff beneath the synthetic turf.

2. Water Efficiently: Synthetic turf systems do not require supplemental irrigation; however, installations may require water use for different reasons. As mentioned above, synthetic turf can become excessively hot, with one author (Kruse) measuring surface temperatures on synthetic turf as high as 160°F. Because of these high temperatures, it is common for users to spray the surface with water to cool it for use, which may negate some of the perceived benefit from the system not requiring “irrigation.” In addition, many manufacturers recommend weekly wash downs of the artificial turf surface to remove contaminants such as dust and pet waste and its odor. These washings, especially those to remove pet urine, often use quite a bit of water because the waste must pass through the artificial turf, the underlying substrate, and the weed barrier before being carried away. This wash water will generally not infiltrate into the ground below because of soil compaction conducted before installation of the synthetic turf. As noted in *The Ultimate Artificial Grass Maintenance Guide* (neograss.co.uk):

If your lawn has not been installed on a free-draining sub-base, then you may need to purchase one of the many artificial grass cleaning products available on the market that will remove the smell of urine and sanitize your lawn.

Living turf, on the other hand, helps cool the environment, absorbs pet urine, and does not require washing to remove odors or dust. Once established, living turf needs minimal water during times of drought.

3. Fertilize Appropriately: Synthetic turf systems do not require fertilization. However, the lack of a root system and its associated microbial community in synthetic

turf systems eliminates the water filtration benefit that is gained through the installation of a living turfgrass system.

4. Mulch: In an FFL landscape, mulch is often incorporated within ornamental beds and around shrubs to maintain soil moisture and control weed growth. However, mulch application is not applicable to synthetic turf systems.

5. Attract Wildlife: An FFL landscape will often incorporate elements that attract wildlife, including the installation of host and pollinator plants to attract butterflies and native bees, as well as mixes of shrubs and trees that provide food, cover, and nesting opportunities for birds and other wildlife. This effect is amplified when natural wildlife preserves, and other green areas are adjacent or nearby. Research has shown that turfgrass lawns support an abundance of beneficial arthropods, such as beetles, bees and wasps, as well as worms, which in turn support larger wildlife such as birds and other ground-feeding wildlife (Shimat et al. 2020). Synthetic turf does not offer any benefits that attract or support wildlife.

6. Manage Yard Pests Responsibly: A fundamental component of FFL is using the appropriate combinations of plants (see FFL Principle No. 1: Right Plant, Right Place) maintained through proper irrigation and fertilizer protocols, so that yard pests are controlled with little or even no need for pesticide application. This holistic pest management approach forms the basis of integrated pest management, or IPM. As discussed above, while synthetic turf plays no role in attracting or supporting wildlife, it also does not contribute to the mix and balance of landscaping plants that promote IPM.

7. Recycle Yard Waste: FFL promotes the recycling of yard and landscape clippings into mulch and compost. This not only reduces the amount of yard waste that must be picked up curbside and transported for disposal, but yard waste converted to compost and used as fertilizer decreases the need for a homeowner to buy other fertilizers, especially synthetic fertilizers. Because synthetic turf is primarily plastic, it does not directly generate yard waste such as leaf litter and clippings, although falling leaves that accumulate on the synthetic turf must still be removed to prevent wear and tear. More importantly, however, synthetic turf has a finite life span, perhaps 10 to 20 years depending on the quality of ongoing care including rinsing, removing leaves, and sanitizing. At the end of its life, the synthetic turf will need to be removed and replaced, with the ultimate disposal of the old synthetic turf most likely in a landfill.

8. Reduce Stormwater Runoff: The primary base construction for synthetic turf systems in residential landscapes involves removal of a portion (2"–3") of the topsoil followed by heavy compaction of the remaining soil to establish a firm, uniform base on which to install the synthetic turf product. This compaction reduces soil infiltration rates and increases the risk of runoff from the landscape. While it may be possible to use rain gardens, berms, and swales to retain runoff on the property, there remains a significant risk of increased runoff when compared to natural turfgrass, which has been shown to increase soil infiltration rates. A recent study by Simpson and Francis (2021) demonstrated that synthetic turf lawns had more runoff and decreased water retention compared to living turf lawns. A similar study (Chang et al. 2021) found that living turf provided greater runoff control than synthetic turf.

- a. In addition to runoff volume, synthetic turf runoff has been shown to contain zinc in concentrations that pose a potential risk to surface waters and aquatic organisms (Connecticut Department of Environmental Protection 2010). Another synthetic turf study in New York found that runoff water from rain or from spraying or misting contained some 25 different chemical species and four metals (zinc, selenium, lead, and cadmium) that were released into water from the rubber infill incorporated into the synthetic turf (Claudio 2008).
- b. In contrast to synthetic turf, a healthy, established natural turf system consists not only of the dense cover of the aboveground grass blades, but also an underlying deep, intricately intertwined root zone that can filter and absorb contaminants. Natural turf installations improve soil structure over time and as a result enhance water filtration and infiltration into the soil. A robust root zone with healthy soil will also absorb dissolved nutrients, decrease nutrient leaching into the underlying ground water, and sequester carbon. Because, by definition, synthetic turf systems do not consist of plant material, they have no capacity to provide these same ecosystem services as a living turf.

9. Protect the Waterfront: Synthetic turf systems lack the soil-stabilizing benefits offered by the rootzones of flood-tolerant plants that are typically found along the edges of water bodies. The presence of these plants protects the shoreline from erosion and has been documented as having a significant impact in reducing the concentration and amount of contaminants that enter bodies of water

through stormwater runoff. Installation of a synthetic turf system along the edge of a water body increases the risk of soil erosion due to the lack of an established soil-stabilizing rootzone. In addition, the increased risk of runoff due to compaction of the soils during installation will increase the risk of pollutants reaching the water body that may have otherwise been caught/filtered out by the natural turfgrass system.

Conclusions

Protecting and preserving Florida's water resources through sustainable landscaping practices on living landscapes is the primary focus of the Florida-Friendly Landscaping™ Program. It strives to achieve this goal through implementation of nine principles designed to reduce the environmental impact of urban landscapes while creating wildlife habitat, preventing erosion, and reducing landscape-based contributions to landfills. When considering the use of a synthetic turf system in the urban landscape, it is important to understand all the potential environmental impacts. Synthetic turf systems have not been shown to improve or create wildlife habitat, do not improve groundwater recharge, can heat excessively in the sun and, in more extensive installations, can cause a substantial heat island effect. In addition, synthetic turf generates higher stormwater runoff than natural turf and has been shown to leach a variety of contaminants, including both organic compounds and heavy metals. Finally, since synthetic turf is primarily plastic it has a finite lifespan and must eventually be disposed of in a landfill, a practice that is counter to the sustainability goals of the Florida-Friendly Landscaping™ Program.

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The City of Lake Worth Tree Board
City Hall Conference Room
Regular Meeting Minutes
March 16, 2023

Call to order: 6:15

Members Present: D. Kerner, G. Powell, D. Brown and G. Timor

Members Absent: None

Agenda additions, deletions, reordering: None

Public Attendance: None

Approval of minutes: Tabled to next meeting

Reports: G. Powell provided a report on the Beach landscape inspection and report. She also informed the board that she met with the City Horticulturist at the beach property to map the invasive plants that are in the dune. The beach report will be provided to the board.

New Business:

A. Artificial turf, rock and mulch

1. The Board reviewed the previously disapproved artificial turf ordinance and discussed the pros and cons of allowing artificial turf to be installed.

Motion made by D. Brown and seconded by G. Timor to prohibit artificial turf in the City of lake Worth Beach.

Prior to the vote the board discussed adding language to the ordinance stating that Artificial turf is prohibited.

Amended motion made by D. Brown and seconded by G. Timor to prohibit artificial turf in the City of lake Worth Beach and to add language to the ordinance that- Artificial turf is prohibited.

AYES: D. Kerner, G. Timor, and D. Brown.

NAYS: G. Powell

Motion carries.

2. The Board then discussed code section 23.6.1 (c) (1) (e) -All other lots areas not covered by driveway or structures shall be planted with living groundcover or other approved materials.

Motion made by G. Powell and seconded by G. Timor that a sentence be added to the end this section - See section K for other approved materials.

AYES: D. Kerner, G. Powell, D. Brown and G. Timor

Nays: None

3. The Board discussed code section 23.6-1 (k) (10) Groundcovers

Motion made by G. Timor and seconded by G. Powell to change the word ~~turf~~ to grass and to strike the last sentence - ~~All groundcover areas must be kept free from weeds.~~

AYES: D. Kerner, G. Powell, D. Brown and G. Timor

NAYS: None

4. The Board discussed code section 23.6-1 (K) (12) Organic Mulches
G. Timor made a motion to add to the following sentence - No more than fifty (50) percent of a front or side street setback or yard may be comprised of mulch independent of living plant materials. Including but not limited to shrubs, shrubs and groundcovers. Trees and palms shall not count towards this requirement.
5. The Board discussed code section 23.6-1 (K) (12) Organic Mulches
Motion made by G. Powell and seconded by D. Brown to combine the organic and inorganic code sections in to one section with the same plant requirements.

AYES: D. Kerner, G. Powell, D. Brown and G. Timor

NAYS: None

Old Business: Tabled to next regular meeting

Adjourned: 7:50 PM

**City of Lake Worth Beach
Tree Advisory Board**

ARTIFICIAL GRASS PROS and CONS

PROS

1. Artificial grass does not require mowing, seeding, fertilizing, or watering. It is being marketed as an environmentally friendly way to conserve water and to minimize the use of fertilizers, pesticides, and weed-killers.

CONS

1. **Artificial grass has a big carbon footprint and uses huge volumes of plastic and fossil fuels to be manufactured, transported and installed.**
2. **Artificial grass contains toxic PFAS compounds (forever chemicals), heavy metals and chemicals such as acetone, arsenic benzene, and other carcinogens that can present a serious health threat. The material also emits high levels of methane, a potent greenhouse gas.**
3. **Artificial grass absorbs heat creating heat islands. It can reach temperatures of up to 200 degrees in the FL summer.**
4. **Pieces of artificial grass break down, contaminate our soils, float into the city's sewer system, release harmful compounds and pollute our waterways with microplastic and other chemicals.**
5. **Artificial grass deprives contact with natural surfaces, kills soil life beneath it and has no wildlife benefit.**

By creating a dense plastic barrier on top of compacted soil and sand, no garden material can reach the soil beneath it. Soil is a natural carbon store especially if plants are growing in it, slowly taking carbon from the atmosphere and putting it back into the plants and the ground. Removing a large area of planting that is actively locking carbon into the ground releases that locked carbon back into the atmosphere. A turf lawn has a base layer of wildlife value

because it's a good home to millions of soil-dwelling microscopic organisms that keep soil healthy.

6. Plastic grass can't or won't be recycled.

The manmade plastic materials are often bound together making it impossible to separate them and therefore making it impossible to recycle, because recycling of the materials requires them to be separated and pure.

7. Artificial grass lawns need cleaning and maintaining.

Artificial grass lawns don't recycle germs and other debris so you need to sanitize them with biocides to prevent health risks from animal droppings and bacteria.

8. University of Florida does not consider artificial turf "Florida friendly" or environmentally acceptable.

The experts said it holds in heat and raises the temperature of neighborhoods; it allows microscopic petroleum pollutants to seep into the soil and water table; it kills the beneficial bacteria and microorganisms underneath; it collects animal feces; and it is an awful substitute for conscientious natural xeriscaping.