



Planning Commission Report

Meeting Date: August 13, 2015

Subject: Synthetic Turf in Residential Front Yards

Recommendation: Consider a resolution recommending that the City Council adopt an ordinance amending the Beverly Hills Municipal Code to allow synthetic turf in residential front yards and allow synthetic turf to count toward required landscaping.

REPORT SUMMARY

Based on direction provided by the City Council, the purpose of this public hearing is to consider a resolution recommending that the City Council adopt an ordinance to allow synthetic turf in residential front yards and allow synthetic turf to count toward required landscaping (Attachment 1). Alternatively, the Planning Commission could consider a resolution recommending that the City Council not adopt an ordinance to allow synthetic turf in residential front yards or to allow synthetic turf to count toward required landscaping, while still outlining parameters that should be followed when reviewing synthetic turf (Attachment 2). This report summarizes the previous discussion on synthetic turf, which took place at a public hearing on July 23, 2015, and outlines issues that the Planning Commission may wish to consider.

BACKGROUND

Earlier this year, the state mandated that the City of Beverly Hills reduce water consumption and the City Council declared a "Stage D" water conservation event. It has been estimated that landscaping accounts for 65-70% of overall water use, and changes in landscaping can help reduce the amount of water used in the City. The City Council has discussed allowing synthetic turf in residential front yards on several occasions. At the June 30 meeting, City Council directed staff to work with the Planning Commission to craft an ordinance to allow synthetic turf in residential front yards. The Council direction included the following:

- Synthetic turf should not be allowed in the public right of way and/or in the parkway,
- Applicants may only request synthetic turf during a Stage D conservation event, and
- The ordinance should prohibit the installation of turf near heritage or native trees on private property.

Attachments:

- 1 – Resolution Recommending and Draft Ordinance
- 2 – Resolution Not Recommending and Draft Ordinance
- 3 – July 23, 2015 Planning Commission Staff Report
- 4 – Synthetic Turf: Health Debate Takes Root, Environmental Health Perspectives, 2008
- 5 – Correspondence: Suggested Ordinance Language submitted by Tom Gallup on 7/22/15

Report Author and Contact Information:

Timothea Tway, Associate Planner
ttway@beverlyhills.org
310-285-1122

At a public hearing held on July 23, 2015, the Planning Commission considered a draft ordinance that reflected this direction. The staff report from the July 23 meeting is included as Attachment 3 and contains additional pertinent information. At this meeting the Commission continued the public hearing to August 13, 2015.

DISCUSSION

Draft Ordinance

The draft ordinance regulates the application process to obtain approval to install turf, coverage requirements, turf material specifications, and installation and maintenance regulations. A summary of the draft ordinance is as follows:

Process to obtain approval to install synthetic turf

The draft ordinance allows applicants to apply to install synthetic turf in a residential front yard only when the City is in a Stage D water conservation event, as declared by the City Council. The City is currently in a Stage D event. Once a Stage D event is over, applicants will no longer be allowed to submit an application for synthetic turf in the front yard, however, those that have already received approval for turf will not be required to remove the turf as long as it complies with the regulations in the ordinance and is maintained in an acceptable manner.

During a Stage D event, an applicant will be required to obtain a building permit prior to installing synthetic turf in the front yard of a residential property. As part of the application an applicant will be required to provide:

- A sample of the synthetic turf,
- A landscape plan,
- Warranty information for the synthetic turf, and
- Information on the synthetic turf materials, installation instructions, and installer.

Coverage

The draft ordinance addresses where synthetic turf may be used in residential areas. As noted earlier in the report, the City does not regulate the use of synthetic turf in rear or side yards of properties in residential areas. The draft ordinance contains provisions that restrict synthetic turf to 70% of the landscaped area of a front yard in order to encourage property owners to supplement the synthetic turf with traditional landscaping. The Planning Commission may wish to discuss whether 70% coverage is an appropriate amount of allowed turf. Additionally, the ordinance includes provisions that prohibit the use of synthetic turf in the public right of way and along the parkway, per City Council direction.

Further, the ordinance stipulates that turf may not be installed within the dripline (the circumference below the branches of a tree) of a heritage or native tree, as defined in the BHMC. This provision is meant to protect these trees from harm associated with turf installation and turf heat retention.

Turf material

One objective of the attached draft ordinance is to ensure that high-quality, realistic-looking turf material is used when synthetic turf is installed. In order to achieve this objective the draft ordinance

includes provisions intended to regulate the quality of the turf such as blade height, color, materials used, seams (where panels of turf are connected), and infill material (the material that is brushed into the turf to make it feel more realistic and hold up the blades, such as sand). For example, per the provisions of the draft ordinance synthetic turf must:

- Be the type known as cut-pile infill consisting of polyethylene or polypropylene pile,
- Have a blade height (pile length) of at least 1 ¾ inches and contain infill made of silica sand (rubber infill is prohibited),
- Contain at least two colors and must be constructed to resist damage and UV degradation,
- Contain a “thatch” layer, or a curly lower layer of yarn that holds up the other blades, and replicates the look of real grass,
- Have a spacing between tufting rows (gauge) of no less than ½ inch as defined by the manufacturer,
- Have a face weight of 60 (face weight is defined as the ounces of synthetic turf fibers on one square yard of fabric),
- Be nontoxic, and
- Have a 15 year warranty from the manufacturer.

Some of these provisions also attempt to address potential negative impacts of turf related to toxicity and health impacts. For this reason, rubber infill is not allowed to be used in synthetic turf systems.

Installation

Provisions in the ordinance regarding installation are meant to ensure that when synthetic turf is approved it will be installed by an individual who is trained to install the proposed type of synthetic turf per the specifications of the particular type of turf. In addition, there are provisions to ensure that the installation of the turf does not harm existing trees or prevent the drainage of water. Further, all existing irrigation infrastructure that will not be used in the area where turf will be installed must be capped and/or removed.

Maintenance

Under the provisions of the attached draft ordinance, property owners with synthetic turf are required to maintain the turf in an attractive and clean condition and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation or excessive wear.

Planning Commission Discussion

During the discussion at the Public Hearing on July 23, the Planning Commission expressed concerns regarding the following:

- Environmental and human health concerns related to turf;
- The ability to keep synthetic turf clean, especially related to pet use;
- Turf heat and contribution to urban heat island effect; and
- General aesthetics and appropriateness of synthetic turf in front yards.

Additional Information

Staff has researched the concerns expressed by the Planning Commission at the July 23 Planning Commission public hearing:

Environmental and human health concerns:

The following link contains a number of scientific articles on the health impacts of synthetic turf as compiled by the Pennsylvania State College of Agricultural Sciences:

<http://plantscience.psu.edu/research/centers/ssrc/research/synthetic-turf-health>

A majority of the articles and studies related to human health concerns and turf study the impact of the rubber infill material. The current draft ordinance would not allow rubber infill in synthetic turf that is installed in residential front yards. Concerns about lead in turf materials are mostly related to nylon based products. The draft ordinance would not allow nylon synthetic turf to be installed in front yards. A 2008 article from the Environmental Health Perspectives Journal (Attachment 4) provides an overview of these turf related health concerns.

Turf cleanliness:

Turf manufacturers provide specific information about how to keep turf clean. Generally, cleaning turf does involve water, and can involve soaps and chemicals. The amount of cleaning and water/chemicals required depends on frequency of spills, turf usage, and whether or not the turf is used by pets. Staff was unable to locate scientific articles on turf cleanliness and/or the environmental impacts related to cleaning turf.

Urban heat island:

There are a number of scientific studies that confirm that synthetic turf does get hotter than traditional turf, and synthetic turf retains heat longer than traditional turf. A New York Times article on the topic is included as an attachment to the July 23, 2015 Planning Commission. This article states that synthetic turf can get up to 86.5 degrees warmer than grass.

Discussion Points

Percent of landscape coverage

One provision of the draft ordinance states that turf may only be used for 70% of the landscaped area in the front yard of a residence. There were several comments made during the July 23 meeting that this number should be lowered. Staff is seeking Planning Commission direction on the appropriate amount of turf that should be allowed in the front yard.

Tufting gauge

The current draft ordinance reads that the minimum tufting gauge size should be 1/2 an inch. There was a comment from a public speaker that a 3/8 inch minimum tufting gauge is more appropriate and will result in higher quality turf materials. Staff is seeking Planning Commission direction regarding this potential change.

Turf backing material

The current draft ordinance does not specify the type or quality of backing for turf. There was a comment from a public speaker that the Planning Commission should consider requiring a tri-layer primary backing to ensure higher quality turf in the City. More complex backings can prevent fiber loss and keep turf from folding and wrinkling. Staff is seeking Planning Commission direction on the turf backing material.

Warranty

The current draft ordinance requires a 15 year warranty for turf, per direction from the City Council. There was a comment from a public speaker that the substance of a warranty is more important than the number of years of the warranty. Staff has concerns regarding regulating the contents of warranties, due to the difficulty of reviewing warranties and associated legal language at the time of approval. Staff is seeking Planning Commission direction on the regulation of turf warranties.

Resolutions

Staff has attached two resolutions to this staff report. The first (Attachment 1) is the resolution that was included in the staff report on July 23, 2015. This resolution recommends that the City Council adopt an ordinance allowing synthetic turf in residential front yards. The second resolution (Attachment 2) conveys that the Planning Commission does not support the use of synthetic turf in residential front yards. This resolution also includes a draft ordinance for the City Council to consider should they determine that they still wish to move forward with allowing synthetic turf in residential front yards despite the Planning Commission's recommendation. In either case, a draft ordinance will be forwarded to the City Council.

Benefits and Considerations

As presented during the July 23, 2015 Planning Commission hearing, there are a number of benefits and considerations related to allowing synthetic turf in residential front yards that the Planning Commission may wish to consider.

Benefits	Considerations
<ul style="list-style-type: none">• Requires less maintenance than natural grass• Requires less water than natural grass• Does not require fertilizer or pesticides• One-time installation costs	<ul style="list-style-type: none">• Requires upkeep, will eventually deteriorate or show wear• Could impact trees due to reduced watering in landscaped areas• The manufacturing and composition of turf could increase the community's carbon footprint• Could increase "urban heat island" effect• Must be cleaned• If low quality materials are used turf could detract from the garden quality of the City

GENERAL PLAN CONSISTENCY

The proposed ordinance amendments are consistent with policies in the Conservation Element of the General Plan including "Conservation 2.5 – Water Efficient Landscaping," which calls for the encouragement of drought tolerant landscaping in the City.

ENVIRONMENTAL ASSESSMENT

The amendments included in the draft ordinance have been assessed in accordance with the authority and criteria contained in the California Environmental Quality Act (CEQA), the State CEQA Guidelines, and the environmental regulations of the City. The amendments will not have a significant environmental impact and are exempt from CEQA pursuant to Section 15305 of Title 14 of the California Code of Regulations because they represent minor alterations in land use limitations and do not result in any changes in land use or density. Further, the residential areas of the City to which the amendments apply have an average slope of not more than 20%.

PUBLIC OUTREACH

The July 23, 2015 public hearing was noticed in the Beverly Hills Courier on July 10, 2015, and in the Beverly Hills Weekly on July 16, 2015. At the July 23 meeting, the Planning Commission continued the matter to a date certain (August 13, 2015). Additionally, meeting agendas have been posted at City Hall, the Library, and Civic Center Parking Garage, and on the City's website.

RECOMMENDATION

Pursuant to City Council direction, it is recommended that the Planning Commission consider the attached resolutions related to an ordinance amending the Beverly Hills Municipal Code to allow synthetic turf in residential front yards.

Report Reviewed By:



Ryan Gohlich
City Planner

Attachment 1
Resolution Recommending a
Draft Ordinance

RESOLUTION NO.

A RESOLUTION OF THE PLANNING COMMISSION
OF THE CITY OF BEVERLY HILLS
RECOMMENDING ADOPTION OF AN ORDINANCE
OF THE CITY OF BEVERLY HILLS AMENDING THE
BEVERLY HILLS MUNICIPAL CODE TO ALLOW
SYNTHETIC TURF IN RESIDENTIAL FRONT YARDS

WHEREAS, the Planning Commission has considered the proposed amendments to the City of Beverly Hills Municipal Code, as set forth and attached hereto as Exhibit A and more fully described below (the "Amendments"); and

WHEREAS, the Planning Commission conducted a duly noticed public hearing on July 23, 2015, and August 13, 2015, at which time it received oral and documentary evidence relative to the proposed Amendments; and

WHEREAS, the Planning Commission finds that the proposed Amendments are required for the public health, safety, and general welfare, and that the Amendments are consistent with the general objectives, principles, and standards of the General Plan;

NOW, THEREFORE, the Planning Commission of the City of Beverly Hills does resolve as follows:

Section 1. The Amendments have been environmentally reviewed pursuant to the provisions of the California Environmental Quality Act (Public Resources Code Sections 21000, et seq. ("CEQA")), the State CEQA Guidelines (California Code of Regulations, Title 14, Sections

15000, et seq.), and the City's Local CEQA Guidelines (hereafter the "Guidelines"). The Planning Commission finds that adoption of the Amendments will not have a significant environmental impact and are exempt from CEQA pursuant to Section 15305 of Title 14 of the California Code of Regulations because the Amendments represent minor alterations in land use limitations and do not result in any changes in land use or density. Further, the residential areas of the city to which the Amendments would apply have average slopes of not more than 20%.

Section 2. As proposed, the Amendments to the Beverly Hills Municipal Code in Exhibit A would allow the use of synthetic turf in residential front yards and allow the synthetic turf to count toward required landscaping. Under the proposed ordinance, the installation of synthetic turf would require a building permit.

Section 3. The Amendments are consistent with the objectives, principles, and standards of the General Plan. General Plan Policies "Conservation 2.5 – Water Efficient Landscaping" and "Conservation 3.9 – Water Efficient Landscaping" call for the encouragement of drought tolerant landscaping for private and public landscaping.

Section 4. The Planning Commission does hereby recommend to the City Council the adoption of an ordinance approving and enacting the proposed Amendments substantially as set forth in Exhibit A, which is attached hereto and incorporated herein by reference.

Section 5. The Secretary of the Planning Commission shall certify to the passage, approval, and adoption of this resolution, and shall cause this resolution and his/her Certification to be entered in the Book of Resolutions of the Planning Commission of the City.

Adopted: August 13, 2015

Alan Robert Block
Chair of the Planning Commission of the
City of Beverly Hills, California

Attest:

Ryan Gohlich
Secretary

Approved as to form:

David M. Snow
Assistant City Attorney

Approved as to content:

Ryan Gohlich
City Planner

EXHIBIT A

AN ORDINANCE OF THE CITY OF BEVERLY HILLS
AMENDING THE BEVERLY HILLS MUNICIPAL CODE TO
ALLOW SYNTHETIC TURF IN RESIDENTIAL FRONT
YARDS

THE CITY COUNCIL OF THE CITY OF BEVERLY HILLS HEREBY ORDAINS AS
FOLLOWS:

Section 1. On _____, the Planning Commission held a duly noticed public hearing after which it adopted Resolution No. _____, recommending that the City Council amend portions of Title 10 (Planning and Zoning) of the Beverly Hills Municipal Code to allow synthetic turf in residential front yards (collectively, the “Amendments”). On _____, the City Council held a duly noticed public hearing, received public testimony, and thereafter introduced this Ordinance.

Section 2. This Ordinance and the Amendments were assessed in accordance with the authority and criteria contained in the California Environmental Quality Act (CEQA), the State CEQA Guidelines, and the environmental regulations of the City. The City Council finds that adoption of the Amendments will not have a significant environmental impact and is exempt from CEQA pursuant to Section 15305 of Title 14 of the California Code of Regulations because the Amendments represent minor alterations in land use limitations and do not result in any changes in land use or density. Further, the residential areas of the City to which the Amendments apply have an average slope of not more than 20%.

Section 3. The Amendments are consistent with the objectives, principles, and standards of the General Plan. General Plan Policies “Conservation 2.5 – Water Efficient

Landscaping” and “Conservation 3.9 – Water Efficient Landscaping” call for the encouragement of drought tolerant landscaping for private and public landscaping.

Section 4. The City Council hereby amends Section 10-3-100 of Article 1 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code by adding two new definitions with all other definitions in the section remaining unchanged.

The term “Synthetic Turf” is added between the terms “Supportive Housing” and “Target Population” as they presently appear in Section 10-3-100, to read as follows:

“SYNTHETIC TURF: Synthetic man-made material that simulates the appearance of live sod, grass or lawn. Synthetic turf shall not mean painted natural grass or sod.”

The term “Dripline” is added between the terms “District” and “Drive-up, Drive-in or drive-through facilities” as they presently appear in Section 10-3-100, to read as follows:

“DRIPLINE: the area located directly under the circumference of a tree’s canopy.”

Section 5. The City Council hereby adds Section 10-3-2423.5 to Article 24 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2423.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf

that is legally installed during Stage D declared periods may be retained thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.

B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:

1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
4. Maintenance information for the synthetic turf.

C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:

1. Within the public right of way/parkway.

2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 ¾ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
 2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
 3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
 4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.

5. Have a manufacturer's warranty lasting at least 15-years.
 6. Have a spacing between tufting rows (gauge) of no less than ½ inch as defined by the manufacturer.
 7. Have a face weight of at least 60. The face weight is defined as the weight in ounces of the synthetic turf fibers found in one square yard of synthetic turf as defined by the manufacturer.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:
1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the manufacturer intended to conceal edges and ensure proper anchoring of turf.
 5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.

6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.

F. Maintenance. Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 6. The City Council hereby adds Section 10-3-2519.5 to Article 25 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2519.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf that is legally installed during Stage D declared periods may be retained thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.

B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:

1. A landscape plan that includes:

- a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
 3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
 4. Maintenance information for the synthetic turf.
- C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:
1. Within the public right of way/parkway.
 2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 ¾ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead.

Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.

2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
 3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
 4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.
 5. Have a manufacturer's warranty lasting at least 15-years.
 6. Have a spacing between tufting rows (gauge) of no less than ½ inch as defined by the manufacturer.
 7. Have a face weight of at least 60. The face weight is defined as the weight in ounces of the synthetic turf fibers found in one square yard of synthetic turf as defined by the manufacturer.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:

1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the manufacturer intended to conceal edges and ensure proper anchoring of turf.
 5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.
 6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.
- F. Maintenance. Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 7. The City Council hereby adds Section 10-3-2619.5 to Article 26 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2619.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf that is legally installed during Stage D declared periods may be retained thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.
- B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:
 1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
 2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
 3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.

4. Maintenance information for the synthetic turf.
- C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:
1. Within the public right of way/parkway.
 2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 ¾ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
 2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
 3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.

4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.
 5. Have a manufacturer's warranty lasting at least 15-years.
 6. Have a spacing between tufting rows (gauge) of no less than ½ inch as defined by the manufacturer.
 7. Have a face weight of at least 60. The face weight is defined as the weight in ounces of the synthetic turf fibers found in one square yard of synthetic turf as defined by the manufacturer.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:
1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the

manufacturer intended to conceal edges and ensure proper anchoring of turf.

5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.
 6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.
- F. **Maintenance.** Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 8. The City Council hereby adds Section 10-3-2813.5 to Article 28 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2813.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. **Stage D required.** Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf that is legally installed during Stage D declared periods may be retained

thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.

B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:

1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
4. Maintenance information for the synthetic turf.

C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:

1. Within the public right of way/parkway.

2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 ¾ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
 2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
 3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
 4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.

5. Have a manufacturer's warranty lasting at least 15-years.
 6. Have a spacing between tufting rows (gauge) of no less than ½ inch as defined by the manufacturer.
 7. Have a face weight of at least 60. The face weight is defined as the weight in ounces of the synthetic turf fibers found in one square yard of synthetic turf as defined by the manufacturer.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:
1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the manufacturer intended to conceal edges and ensure proper anchoring of turf.
 5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.

6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.

F. Maintenance. Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 9. **Severability.** If any section, subsection, subdivision, sentence, clause, phrase, or portion of this Ordinance or the application thereof to any person or place, is for any reason held to be invalid or unconstitutional by the final decision of any court of competent jurisdiction, the remainder of this Ordinance shall be and remain in full force and effect.

Section 10. **Publication.** The City Clerk shall cause this Ordinance to be published at least once in a newspaper of general circulation published and circulated in the City within fifteen (15) days after its passage in accordance with Section 36933 of the Government Code, shall certify to the adoption of this Ordinance, and shall cause this Ordinance and his certification, together with proof of publication, to be entered in the Book of Ordinances of the Council of this City.

Section 11. **Effective Date.** This Ordinance shall go into effect and be in full force and effect at 12:01 a.m. on the thirty-first (31st) day after its passage.

Adopted:
Effective:

JULIAN A. GOLD, M.D.
Mayor of the City of
Beverly Hills, California

ATTEST:

(SEAL)

BYRON POPE
City Clerk

APPROVED AS TO FORM:

APPROVED AS TO CONTENT:

LAURENCE S. WIENER
City Attorney

MAHDI ALUZRI
Interim City Manager

SUSAN HEALY KEENE
Director of Community Development

Attachment 2

**Resolution Not Recommending
a Draft Ordinance**

RESOLUTION NO.

A RESOLUTION OF THE PLANNING COMMISSION
OF THE CITY OF BEVERLY HILLS
RECOMMENDING AGAINST ADOPTION OF AN
ORDINANCE OF THE CITY OF BEVERLY HILLS
AMENDING THE BEVERLY HILLS MUNICIPAL
CODE TO ALLOW SYNTHETIC TURF IN
RESIDENTIAL FRONT YARDS

WHEREAS, the Planning Commission has considered the proposed amendments to the City of Beverly Hills Municipal Code, as set forth and attached hereto as Exhibit A and more fully described below (the “Amendments”); and

WHEREAS, the Planning Commission conducted a duly noticed public hearing on July 23, 2015 and August 13, 2015, at which times it received oral and documentary evidence relative to the proposed Amendments; and

WHEREAS, the Planning Commission finds that the Amendments are consistent with the general objectives, principles, and standards of the General Plan; however the proposed Amendments are not required for the public health, safety, and general welfare;

NOW, THEREFORE, the Planning Commission of the City of Beverly Hills does resolve as follows:

Section 1. The Amendments have been environmentally reviewed pursuant to the provisions of the California Environmental Quality Act (Public Resources Code Sections 21000,

et seq. (“CEQA”), the State CEQA Guidelines (California Code of Regulations, Title 14, Sections 15000, et seq.), and the City’s Local CEQA Guidelines (hereafter the “Guidelines”). The Planning Commission finds that adoption of the Amendments will not have a significant environmental impact and are exempt from CEQA pursuant to Section 15305 of Title 14 of the California Code of Regulations because the Amendments represent minor alterations in land use limitations and do not result in any changes in land use or density. Further, the residential areas of the city to which the Amendments would apply have average slopes of not more than 20%.

Section 2. As proposed, the Amendments to the Beverly Hills Municipal Code in Exhibit A would allow the use of synthetic turf in residential front yards and allow the synthetic turf to count toward required landscaping. Under the proposed ordinance, the installation of synthetic turf would require a building permit.

Section 3. The Amendments are consistent with the objectives, principles, and standards of the General Plan. General Plan Policies “Conservation 2.5 – Water Efficient Landscaping” and “Conservation 3.9 – Water Efficient Landscaping” call for the encouragement of drought tolerant landscaping for private and public landscaping.

Section 4. The Planning Commission does not recommend the use of artificial turf in residential front yards. Should the City Council move forward with the adoption of an ordinance approving the use of artificial turf in residential front yards the Planning Commission does hereby recommend the Amendments as set forth in Exhibit A, which is attached hereto and incorporated herein by reference.

Section 5. The Secretary of the Planning Commission shall certify to the passage, approval, and adoption of this resolution, and shall cause this resolution and his/her Certification to be entered in the Book of Resolutions of the Planning Commission of the City.

Adopted: August 13, 2015

Alan Robert Block
Chair of the Planning Commission of the
City of Beverly Hills, California

Attest:

Ryan Gohlich
Secretary

Approved as to form:

Approved as to content:

David M. Snow
Assistant City Attorney

Ryan Gohlich
City Planner

EXHIBIT A

AN ORDINANCE OF THE CITY OF BEVERLY HILLS
AMENDING THE BEVERLY HILLS MUNICIPAL CODE TO
ALLOW SYNTHETIC TURF IN RESIDENTIAL FRONT
YARDS

THE CITY COUNCIL OF THE CITY OF BEVERLY HILLS HEREBY ORDAINS AS
FOLLOWS:

Section 1. On _____, the Planning Commission held a duly noticed public hearing after which it adopted Resolution No. _____, recommending that the City Council amend portions of Title 10 (Planning and Zoning) of the Beverly Hills Municipal Code to allow synthetic turf in residential front yards (collectively, the “Amendments”). On _____, the City Council held a duly noticed public hearing, received public testimony, and thereafter introduced this Ordinance.

Section 2. This Ordinance and the Amendments were assessed in accordance with the authority and criteria contained in the California Environmental Quality Act (CEQA), the State CEQA Guidelines, and the environmental regulations of the City. The City Council finds that adoption of the Amendments will not have a significant environmental impact and is exempt from CEQA pursuant to Section 15305 of Title 14 of the California Code of Regulations because the Amendments represent minor alterations in land use limitations and do not result in any changes in land use or density. Further, the residential areas of the City to which the Amendments apply have an average slope of not more than 20%.

Section 3. The Amendments are consistent with the objectives, principles, and standards of the General Plan. General Plan Policies “Conservation 2.5 – Water Efficient

Landscaping” and “Conservation 3.9 – Water Efficient Landscaping” call for the encouragement of drought tolerant landscaping for private and public landscaping.

Section 4. The City Council hereby amends Section 10-3-100 of Article 1 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code by adding two new definitions with all other definitions in the section remaining unchanged.

The term “Synthetic Turf” is added between the terms “Supportive Housing” and “Target Population” as they presently appear in Section 10-3-100, to read as follows:

“SYNTHETIC TURF: Synthetic man-made material that simulates the appearance of live sod, grass or lawn. Synthetic turf shall not mean painted natural grass or sod.”

The term “Dripline” is added between the terms “District” and “Drive-up, Drive-in or drive-through facilities” as they presently appear in Section 10-3-100, to read as follows:

“DRIPLINE: the area located directly under the circumference of a tree’s canopy.”

Section 5. The City Council hereby adds Section 10-3-2423.5 to Article 24 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2423.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf

that is legally installed during Stage D declared periods may be retained thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.

B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:

1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
4. Maintenance information for the synthetic turf.

C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:

1. Within the public right of way/parkway.

2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 $\frac{3}{4}$ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
 2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
 3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
 4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.

5. Have a manufacturer's warranty lasting at least 15-years.
 6. Have a spacing between tufting rows (gauge) of no less than ½ inch as defined by the manufacturer.
 7. Have a face weight of at least 60. The face weight is defined as the weight in ounces of the synthetic turf fibers found in one square yard of synthetic turf as defined by the manufacturer.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:
1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the manufacturer intended to conceal edges and ensure proper anchoring of turf.
 5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.

6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.
- F. Maintenance. Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 6. The City Council hereby adds Section 10-3-2519.5 to Article 25 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2519.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf that is legally installed during Stage D declared periods may be retained thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.
- B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:
 1. A landscape plan that includes:

- a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
 3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
 4. Maintenance information for the synthetic turf.
- C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:
1. Within the public right of way/parkway.
 2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 $\frac{3}{4}$ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead.

Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.

2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
 3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
 4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.
 5. Have a manufacturer's warranty lasting at least 15-years.
 6. Have a spacing between tufting rows (gauge) of no less than ½ inch as defined by the manufacturer.
 7. Have a face weight of at least 60. The face weight is defined as the weight in ounces of the synthetic turf fibers found in one square yard of synthetic turf as defined by the manufacturer.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:

1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the manufacturer intended to conceal edges and ensure proper anchoring of turf.
 5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.
 6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.
- F. Maintenance. Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 7. The City Council hereby adds Section 10-3-2619.5 to Article 26 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2619.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf that is legally installed during Stage D declared periods may be retained thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.
- B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:
 - 1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
 - 2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
 - 3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.

4. Maintenance information for the synthetic turf.
- C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:
1. Within the public right of way/parkway.
 2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 $\frac{3}{4}$ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
 2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
 3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.

4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.
 5. Have a manufacturer's warranty lasting at least 15-years.
 6. Have a spacing between tufting rows (gauge) of no less than ½ inch as defined by the manufacturer.
 7. Have a face weight of at least 60. The face weight is defined as the weight in ounces of the synthetic turf fibers found in one square yard of synthetic turf as defined by the manufacturer.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:
1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the

manufacturer intended to conceal edges and ensure proper anchoring of turf.

5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.

6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.

F. Maintenance. Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 8. The City Council hereby adds Section 10-3-2813.5 to Article 28 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2813.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf that is legally installed during Stage D declared periods may be retained

thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.

B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:

1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
4. Maintenance information for the synthetic turf.

C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:

1. Within the public right of way/parkway.

2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 ³/₄ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
 2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
 3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
 4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.

5. Have a manufacturer's warranty lasting at least 15-years.
 6. Have a spacing between tufting rows (gauge) of no less than ½ inch as defined by the manufacturer.
 7. Have a face weight of at least 60. The face weight is defined as the weight in ounces of the synthetic turf fibers found in one square yard of synthetic turf as defined by the manufacturer.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:
1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the manufacturer intended to conceal edges and ensure proper anchoring of turf.
 5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.

6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.

F. Maintenance. Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 9. **Severability.** If any section, subsection, subdivision, sentence, clause, phrase, or portion of this Ordinance or the application thereof to any person or place, is for any reason held to be invalid or unconstitutional by the final decision of any court of competent jurisdiction, the remainder of this Ordinance shall be and remain in full force and effect.

Section 10. **Publication.** The City Clerk shall cause this Ordinance to be published at least once in a newspaper of general circulation published and circulated in the City within fifteen (15) days after its passage in accordance with Section 36933 of the Government Code, shall certify to the adoption of this Ordinance, and shall cause this Ordinance and his certification, together with proof of publication, to be entered in the Book of Ordinances of the Council of this City.

Section 11. **Effective Date.** This Ordinance shall go into effect and be in full force and effect at 12:01 a.m. on the thirty-first (31st) day after its passage.

Adopted:
Effective:

JULIAN A. GOLD, M.D.
Mayor of the City of
Beverly Hills, California

ATTEST:

(SEAL)

BYRON POPE
City Clerk

APPROVED AS TO FORM:

APPROVED AS TO CONTENT:

LAURENCE S. WIENER
City Attorney

MAHDI ALUZRI
Interim City Manager

SUSAN HEALY KEENE
Director of Community Development

Attachment 3

**July 23, 2015 Planning
Commission Staff Report**



City of Beverly Hills

Planning Division

455 N Rexford Drive Beverly Hills, CA 90210
TEL (310) 485-1141 FAX (310) 858-5966

Planning Commission Report

Meeting Date: July 23, 2015

Subject: Synthetic Turf in Residential Front Yards

Recommendation: Adopt a resolution recommending that the City Council adopt an ordinance amending the Beverly Hills Municipal Code to allow synthetic turf in residential front yards and allow synthetic turf to count toward required landscaping.

REPORT SUMMARY

The purpose of this public hearing is to consider a resolution recommending that the City Council adopt an ordinance to allow synthetic turf in residential front yards and allow synthetic turf to count toward required landscaping.

BACKGROUND

Existing Regulations

Synthetic turf, also referred to as artificial turf or artificial grass, is a man-made groundcover that is meant to resemble sod or grass. Currently the City of Beverly Hills limits the use of synthetic turf to areas that are not visible from the public right of way including side and rear yards in residential areas. Synthetic turf is not allowed in residential front yards or the public-right-of-way¹.

Synthetic Turf Discussions

Earlier this year, the state mandated that City of Beverly Hills reduce water consumption and the City Council declared a "Stage D" water conservation event. It has been estimated that landscaping accounts for 65-70% of overall water use, and changes in landscaping can help reduce the amount of water used in the City. The City Council has discussed allowing synthetic turf in residential front yards on several occasions including:

- May 4, 2010,
- November 4, 2014,
- May 18, 2015, and

¹ There is a pending State Assembly Bill, AB 1146, which would prohibit a local government from enacting or enforcing an ordinance or regulation that prohibits installation of synthetic or artificial turf on residential property. Staff will continue to monitor this legislation. More information can be found in the Appendices of Attachment 3.

Attachments:

- 1 – Resolution and Draft Ordinance
- 2 – June 30, 2015 City Council Staff Report

Report Author and Contact Information:

Timothea Tway Associate Planner
ttway@beverlyhills.org
310-285-1122

- July 30, 2015.

During these discussions the City Council considered issues such as aesthetics, water use, impacts to existing trees, maintenance, material quality, health impacts, and alternatives to turf. At the July 30 meeting, City Council directed staff to work with the Planning Commission to craft an ordinance to allow synthetic turf in residential front yards. The Council direction included the following:

- Synthetic turf should not be allowed in the public right of way and/or in the parkway,
- Applicants may only request synthetic turf during a Stage D conservation event, and
- The ordinance should prohibit the installation of turf near heritage or native trees on private property.

The Design Review Commission also discussed the use of synthetic turf in front yards during their May 7, 2015 meeting. At this meeting, The Design Review Commission expressed an interest in promoting the use of drought tolerant/native plants in lieu of synthetic turf landscaping. However, if the City Council did allow for synthetic turf, the Commission prefers the use of high quality materials. The Commission also noted that there may be challenges with enforcing the use of high quality turf products.

DISCUSSION

Summary of Attached Draft Ordinance

The proposed ordinance amends several sections of the Beverly Hills Municipal Code (BHMC) to make it permissible to use synthetic turf in residential front yards and to allow this turf to count toward the required landscaped area. Many of the provisions in the ordinance are meant to address the specific direction from the City Council as well as potential issues associated with synthetic turf. Specifications are included in the ordinance in an attempt to ensure that when turf is used it will be of a high quality, installed in the proper manner, and will not harm existing trees. The following is a summary of the provisions of the ordinance.

Code changes

The draft ordinance includes language that amends the following articles in Title 10, Chapter 3:

- Article 24 – Single-Family Residential Standards For The Central Area Of The City
- Article 25 – Single-Family Residential Standards For The Hillside Area Of The City
- Article 26 – Single-Family Residential Standards For Trousdale Estates
- Article 28 – Multiple-Family Residential Development Standards

Process to obtain approval to install synthetic turf

The draft ordinance allows applicants to apply to install synthetic turf in a residential front yard only when the City is in a Stage D water conservation event, as declared by the City Council. The City is currently in a Stage D event. Once a Stage D event is over, applicants will no longer be allowed to submit an application for synthetic turf in the front yard, however, those that have already received approval for turf will not be required to remove the turf as long as it complies with the regulations in the ordinance and is maintained in an acceptable manner.

During a Stage D event, an applicant will be required to obtain a building permit prior to installing synthetic turf in the front yard of a residential property. As part of the application an applicant will be required to provide:

- A sample of the synthetic turf,
- A landscape plan,
- Warranty information for the synthetic turf, and
- Information on the synthetic turf materials, installation instructions, and installer.

Coverage

The draft ordinance addresses where synthetic turf may be used in residential areas. As noted earlier in the report, the City does not regulate the use of synthetic turf in rear or side yards of properties in residential areas. The draft ordinance contains provisions that restrict synthetic turf to 70% of the landscaped area of a front yard in order to encourage property owners to supplement the synthetic turf with traditional landscaping. The Planning Commission may wish to discuss whether 70% coverage is an appropriate amount of allowed turf. Additionally, the ordinance includes provisions that prohibit the use of synthetic turf in the public right of way and along the parkway, per City Council direction.

Further, the ordinance stipulates that turf may not be installed within the dripline (the circumference below the branches of a tree) of a heritage or native tree, as defined in the BHMC. This provision is meant to protect these trees from harm associated with turf installation and turf heat retention.

Turf material

One objective of the attached draft ordinance is to ensure that high-quality, realistic-looking turf material is used when synthetic turf is installed. In order to achieve this objective the draft ordinance includes provisions intended to regulate the quality of the turf such as blade height, color, materials used, seams (where panels of turf are connected), and infill material (the material that is brushed into the turf to make it feel more realistic and hold up the blades, such as sand). For example, per the provisions of the draft ordinance synthetic turf must:

- Be the type known as cut-pile infill consisting of polyethylene or polypropylene pile,
- Have a blade height (pile length) of at least 1 ¼ inches and contain infill made of silica sand (rubber infill is prohibited),
- Contain at least two colors and must be constructed to resist damage and UV degradation,
- Contain a "thatch" layer, or a curly lower layer of yard that holds up the other blades, and replicates the look of real grass,
- Be nontoxic, and
- Have a 15 year warranty from the manufacturer.

Some of these provisions also attempt to address potential negative impacts of turf related to toxicity and health impacts. For this reason, rubber infill is not allowed to be used in synthetic turf systems.

Installation

Provisions in the ordinance regarding installation are meant to ensure that when synthetic turf is approved it will be installed by an individual who is trained to install the proposed type of synthetic turf

per the specifications of the particular type of turf. In addition, there are provisions to ensure that the installation of the turf does not harm existing trees or prevent the drainage of water. Further, all existing irrigation infrastructure that will not be used in the area where turf will be installed must be capped and/or removed.

Maintenance

Under the provisions of the attached draft ordinance, property owners with synthetic turf are required to maintain the turf in an attractive and clean condition and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation or excessive wear.

Benefits and Considerations

There are a number of benefits and considerations related to allowing synthetic turf in residential front yards that the Planning Commission may wish to consider.

Benefits	Considerations
<ul style="list-style-type: none">• Requires less maintenance than natural grass• Requires less water than natural grass• Does not require fertilizer or pesticides• One-time installation costs	<ul style="list-style-type: none">• Requires upkeep, will eventually deteriorate or show wear• Could impact trees due to reduced watering in landscaped areas• The manufacturing and composition of turf could increase the community's carbon footprint• Could increase "urban heat island" effect• Must be cleaned• If low quality materials are used turf could detract from the garden quality of the City

GENERAL PLAN CONSISTENCY

The proposed ordinance amendments are consistent with policies in the Conservation Element of the General Plan including "Conservation 2.5 – Water Efficient Landscaping," which calls for the encouragement of drought tolerant landscaping in the City.

ENVIRONMENTAL ASSESSMENT

The amendments included in the draft ordinance have been assessed in accordance with the authority and criteria contained in the California Environmental Quality Act (CEQA), the State CEQA Guidelines, and the environmental regulations of the City. The amendments will not have a significant environmental impact and are exempt from CEQA pursuant to Section 15305 of Title 14 of the California Code of Regulations because they represent minor alterations in land use limitations and do not result in any changes in land use or density. Further, the residential areas of the City to which the amendments apply have an average slope of not more than 20%.

PUBLIC OUTREACH

This public hearing was noticed in the Beverly Hills Courier on July 10, 2014, and the Beverly Hills Weekly on July 16, 2014. Additionally, meeting agendas have been posted at City Hall, the Library, and Civic Center Parking Garage, and on the City's website.

RECOMMENDATION

Pursuant to City Council direction, it is recommended that the Planning Commission consider the attached resolution recommending that the City Council adopt the ordinance amending the Beverly Hills Municipal Code to allow synthetic turf in residential front yards.



Report Reviewed By:
Michele McGrath
Principal Planner

Attachment 1
Resolution and Draft Ordinance

RESOLUTION NO.

**A RESOLUTION OF THE PLANNING COMMISSION
OF THE CITY OF BEVERLY HILLS
RECOMMENDING ADOPTION OF AN ORDINANCE
OF THE CITY OF BEVERLY HILLS AMENDING THE
BEVERLY HILLS MUNICIPAL CODE TO ALLOW
SYNTHETIC TURF IN RESIDENTIAL FRONT YARDS**

WHEREAS, the Planning Commission has considered the proposed amendments to the City of Beverly Hills Municipal Code, as set forth and attached hereto as Exhibit A and more fully described below (the "Amendments"); and

WHEREAS, the Planning Commission conducted a duly noticed public hearing on July 23, 2015, at which time it received oral and documentary evidence relative to the proposed Amendments; and

WHEREAS, the Planning Commission finds that the proposed Amendments are required for the public health, safety, and general welfare, and that the Amendments are consistent with the general objectives, principles, and standards of the General Plan;

NOW, THEREFORE, the Planning Commission of the City of Beverly Hills does resolve as follows:

Section 1. The Amendments have been environmentally reviewed pursuant to the provisions of the California Environmental Quality Act (Public Resources Code Sections 21000, et seq. ("CEQA")), the State CEQA Guidelines (California Code of Regulations, Title 14, Sections

15000, et seq.), and the City's Local CEQA Guidelines (hereafter the "Guidelines"). The Planning Commission finds that adoption of the Amendments will not have a significant environmental impact and are exempt from CEQA pursuant to Section 15305 of Title 14 of the California Code of Regulations because the Amendments represent minor alterations in land use limitations and do not result in any changes in land use or density. Further, the residential areas of the city to which the Amendments would apply have average slopes of not more than 20%.

Section 2. As proposed, the Amendments to the Beverly Hills Municipal Code in Exhibit A would allow the use of synthetic turf in residential front yards and allow the synthetic turf to count toward required landscaping. Under the proposed ordinance, the installation of synthetic turf would require a building permit.

Section 3. The Amendments are consistent with the objectives, principles, and standards of the General Plan. General Plan Policies "Conservation 2.5 – Water Efficient Landscaping" and "Conservation 3.9 – Water Efficient Landscaping" call for the encouragement of drought tolerant landscaping for private and public landscaping.

Section 4. The Planning Commission does hereby recommend to the City Council the adoption of an ordinance approving and enacting the proposed Amendments substantially as set forth in Exhibit A, which is attached hereto and incorporated herein by reference.

Section 5. The Secretary of the Planning Commission shall certify to the passage, approval, and adoption of this resolution, and shall cause this resolution and his/her Certification to be entered in the Book of Resolutions of the Planning Commission of the City.

Adopted: July 23, 2015

Alan Robert Block
Chair of the Planning Commission of the
City of Beverly Hills, California

Attest:

Ryan Gohlich
Secretary

Approved as to form:

Approved as to content:

David M. Snow
Assistant City Attorney

Ryan Gohlich
City Planner

EXHIBIT A

[DRAFT] ORDINANCE NO. 15-O-_____

AN ORDINANCE OF THE CITY OF BEVERLY HILLS
AMENDING THE BEVERLY HILLS MUNICIPAL CODE TO
ALLOW SYNTHETIC TURF IN RESIDENTIAL FRONT
YARDS

THE CITY COUNCIL OF THE CITY OF BEVERLY HILLS HEREBY ORDAINS AS
FOLLOWS:

Section 1. On _____, the Planning Commission held a duly noticed public hearing after which it adopted Resolution No. _____, recommending that the City Council amend portions of Title 10 (Planning and Zoning) of the Beverly Hills Municipal Code to allow synthetic turf in residential front yards (collectively, the "Amendments"). On _____, the City Council held a duly noticed public hearing, received public testimony, and thereafter introduced this Ordinance.

Section 2. This Ordinance and the Amendments were assessed in accordance with the authority and criteria contained in the California Environmental Quality Act (CEQA), the State CEQA Guidelines, and the environmental regulations of the City. The City Council finds that adoption of the Amendments will not have a significant environmental impact and is exempt from CEQA pursuant to Section 15305 of Title 14 of the California Code of Regulations because the Amendments represent minor alterations in land use limitations and do not result in any changes in land use or density. Further, the residential areas of the City to which the Amendments apply have an average slope of not more than 20%.

Section 3. The Amendments are consistent with the objectives, principles, and standards of the General Plan. General Plan Policies "Conservation 2.5 – Water Efficient

Landscaping” and “Conservation 3.9 – Water Efficient Landscaping” call for the encouragement of drought tolerant landscaping for private and public landscaping.

Section 4. The City Council hereby amends Section 10-3-100 of Article 1 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code by adding two new definitions with all other definitions in the section remaining unchanged.

The term “Synthetic Turf” is added between the terms “Supportive Housing” and “Target Population” as they presently appear in Section 10-3-100, to read as follows:

“SYNTHETIC TURF: Synthetic man-made material that simulates the appearance of live sod, grass or lawn. Synthetic turf shall not mean painted natural grass or sod.”

The term “Dripline” is added between the terms “District” and “Drive-up, Drive-in or drive-through facilities” as they presently appear in Section 10-3-100, to read as follows:

“DRIPLINE: the area located directly under the circumference of a tree’s canopy.”

Section 5. The City Council hereby adds Section 10-3-2423.5 to Article 24 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2423.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf

that is legally installed during Stage D declared periods may be retained thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.

B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:

1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
4. Maintenance information for the synthetic turf.

C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:

1. Within the public right of way/parkway.

2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 ³/₄ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
 2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
 3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
 4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.

5. Have a manufacturer's warranty lasting at least 15-years.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:
1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the manufacturer intended to conceal edges and ensure proper anchoring of turf.
 5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.
 6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.
- F. Maintenance. Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 6. The City Council hereby adds Section 10-3-2519.5 to Article 25 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2519.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf that is legally installed during Stage D declared periods may be retained thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.
- B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:
 - 1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.

2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
 3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
 4. Maintenance information for the synthetic turf.
- C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:
1. Within the public right of way/parkway.
 2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 ¾ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
 2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf

shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.

3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
 4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.
 5. Have a manufacturer's warranty lasting at least 15-years.
- E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:
1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
 2. Synthetic turf shall not be installed on slopes greater than 5%.
 3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
 4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the

manufacturer intended to conceal edges and ensure proper anchoring of turf.

5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.
6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.

F. **Maintenance.** Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 7. The City Council hereby adds Section 10-3-2619.5 to Article 26 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2619.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. **Stage D required.** Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf that is legally installed during Stage D declared periods may be retained

thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.

B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:

1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.
2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
4. Maintenance information for the synthetic turf.

C. Coverage. Synthetic turf located in the front yard may be used for up to 70% of the landscaped area. Synthetic turf shall not be located:

1. Within the public right of way/parkway.

2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
3. In any area that is used for the parking or driving of motor vehicles.

D. Material. Synthetic turf must simulate the appearance of live grass and shall:

1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 ¾ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.
3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.

5. Have a manufacturer's warranty lasting at least 15-years.

E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:

1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.

2. Synthetic turf shall not be installed on slopes greater than 5%.

3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.

4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the manufacturer intended to conceal edges and ensure proper anchoring of turf.

5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.

6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.

F. Maintenance. Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 8. The City Council hereby adds Section 10-3-2813.5 to Article 28 of Chapter 3 of Title 10 of the Beverly Hills Municipal Code to read as follows:

“10-3-2813.5: SYNTHETIC TURF IN FRONT YARDS

Synthetic turf shall be allowed as landscaping in front yards for the purposes of this article provided that the following provisions are satisfied:

- A. Stage D required. Applications for the use of synthetic turf may only be approved, and permits for installation may only be issued when the City Council has declared and implemented Stage D water conservation measures. Synthetic turf that is legally installed during Stage D declared periods may be retained thereafter, even if the City Council withdraws the Stage D declaration, provided the synthetic turf is maintained in accordance with all applicable standards.
- B. Permit required. A building permit must be obtained prior to the installation of any synthetic turf in the front yard of a residential zone. Upon application for a building permit the following shall be submitted to the Community Development Department:
 1. A landscape plan that includes:
 - a) Dimensions and details of the landscaped area including the synthetic turf and other landscaping materials.
 - b) Drawings that include scaled cross sections of the proposed landscaping materials and details showing the methods of installation and attachment of the synthetic turf as well as drainage information.

2. Material description including manufacturer's product data, specifications and installation instructions, installer information and qualifications, and warranty information.
 3. A sample of the proposed synthetic turf material that is at least 12 inches by 12 inches.
 4. Maintenance information for the synthetic turf.
- C. Coverage. Synthetic turf located in the front yard may be used for up to 70 % of the landscaped area. Synthetic turf shall not be located:
1. Within the public right of way/parkway.
 2. Within the dripline of any native or heritage tree as defined in 10-3-2900. Further, the installation of turf shall not disturb the area within the dripline of any native or heritage tree.
 3. In any area that is used for the parking or driving of motor vehicles.
- D. Material. Synthetic turf must simulate the appearance of live grass and shall:
1. Be of a type known as cut-pile infill with parallel-long slit blades manufactured from polyethylene or polypropylene. The minimum pile length shall be 1 ¾ inches and the turf shall contain thatch. Synthetic turf shall be required to contain at least two colors and shall not contain lead. Turf that is made from recycled materials is encouraged. The use of indoor or outdoor plastic or nylon carpeting is prohibited.
 2. Be constructed to maximize dimensional stability, resist damage during normal use and to minimize UV degradation. Further, the synthetic turf

shall be resistant to staining, weather, insects, rot, mildew and fungus growth, and shall be non-allergenic and non-toxic.

3. Contain an infill material of clean silica sand fill that is brushed into the synthetic turf to keep the blades upright and achieve a natural grass look. Any replacement infill shall be silica sand. Rubber infill is prohibited.
4. Be affixed to a permeable backing with regularly spaced holes that allow water to percolate through the synthetic grass at a drain rate of at least 30 inches per hour. The synthetic turf system shall allow for the free movement and drainage of water through the system to prevent run-off, pooling, and flooding.
5. Have a manufacturer's warranty lasting at least 15-years.

E. Installation. Synthetic turf shall be installed pursuant to manufacturer's requirements by licensed professionals who are experienced and trained by the manufacturer in the installation of the synthetic turf. In addition:

1. The synthetic turf shall be installed over at least 3 inches of a compacted aggregate base that provides adequate drainage. The base material shall be installed over 90% compacted subgrade.
2. Synthetic turf shall not be installed on slopes greater than 5%.
3. Seams shall not be visible and shall be fastened in a manner that ensures they are firm, tight and permanent.
4. The synthetic turf shall be anchored over the entire coverage area and shall be installed with a nailer board or any such substitute recommended by the

manufacturer intended to conceal edges and ensure proper anchoring of turf.

5. All existing irrigation infrastructure in the synthetic turf area including piping and sprinkler heads that are no longer used must be capped or removed and shall not be visible.
6. All reasonable efforts shall be made to protect existing trees and tree roots from damage during installation.

F. **Maintenance.** Synthetic turf shall be maintained in an attractive and clean condition pursuant Chapter 7 of Title 5 and shall not contain holes, tears, stains, discoloration, seam separations, uplifted surfaces, heat degradation, or excessive wear.

Section 9. Severability. If any section, subsection, subdivision, sentence, clause, phrase, or portion of this Ordinance or the application thereof to any person or place, is for any reason held to be invalid or unconstitutional by the final decision of any court of competent jurisdiction, the remainder of this Ordinance shall be and remain in full force and effect.

Section 10. Publication. The City Clerk shall cause this Ordinance to be published at least once in a newspaper of general circulation published and circulated in the City within fifteen (15) days after its passage in accordance with Section 36933 of the Government Code, shall certify to the adoption of this Ordinance, and shall cause this Ordinance and his certification, together with proof of publication, to be entered in the Book of Ordinances of the Council of this City.

Section 11. Effective Date. This Ordinance shall go into effect and be in full force and effect at 12:01 a.m. on the thirty-first (31st) day after its passage.

Adopted:

Effective:

JULIAN A. GOLD, M.D.
Mayor of the City of
Beverly Hills, California

ATTEST:

_____(SEAL)

BYRON POPE
City Clerk

APPROVED AS TO FORM:

APPROVED AS TO CONTENT:

LAURENCE S. WIENER
City Attorney

MAHDI ALUZRI
Interim City Manager

SUSAN HEALY KEENE
Director of Community Development

Attachment 2
June 30, 2015 City Council Staff
Report



STAFF REPORT

Meeting Date: June 30, 2015
To: Honorable Mayor & City Council
From: Ken Pfalzgraf-Parks and Urban Forest Manager
Subject: Artificial Turf and Landscaping Alternatives for Residential Front Yards and Parkways

Attachments:

1. May 18, 2015 Study Session Public Works Department Staff Report "Artificial Turf and Live Plant Alternatives for Residential Front Yards and Parkways (including attachments)
2. City Lobbyist Statement re: AB 1164
3. Artificial Turfgrass Specification provided by Community Works Design Group

INTRODUCTION

This report provides additional information previously requested by the City Council with regards to the use of artificial turfgrass in residential front yards and City parkways and other landscaping alternatives as a means of achieving water use reduction mandates.

BACKGROUND

As part of Governor Brown's executive order declaring a state of emergency drought in the state of California, the City of Beverly Hills was mandated to reduce water use by 32%. In response, the City immediately stopped irrigating in turfgrass medians and implemented other water saving mandates including reducing the number of days that landscaping in the City can be watered (to two days per week) and limiting sprinkler run times (to eight minutes per watering day). In addition, the City is considering a number of other options aimed at helping residents meet water use reduction targets, including the use of artificial turfgrass in residential front yards and in City parkways. At present, City code limits the use of artificial turfgrass at residential properties to side and rear yards only.

At the request of Councilmember Krasne, the City Council began discussion on the issue during the April 21, 2015 Study Session meeting. As a result of that discussion, staff was requested to provide a report on artificial turfgrass and landscaping alternatives for residential front yards and parkways, including information about artificial turfgrass product quality.

Meeting Date: June 30, 2015

At the May 18, 2015 City Council Study Session, the Council expressed its wishes that the City is able to provide materials and resources to help residents make educated decisions on what they can do to save water around their homes.

With regards to artificial turfgrass, the May 18, 2015 staff report provided an overview of the current code; information detailing the advantages and disadvantages of both live plants and artificial turfgrass in terms of water conservation; and a brief synopsis of the environmental, health and safety topics that typically surface when the use of artificial turfgrass is being considered. The preference of the Design Review Commission to promote the use of drought tolerant/native plants in residential front yards in lieu of artificial turfgrass was noted, as was the concern of the City arborist that the use of artificial turfgrass in the parkways would elevate soil temperatures, which may negatively impact the health of the City trees, including the potential loss of City trees.

Turning the focus to live plant alternatives, staff introduced principals from the Green Gardens Group ("G3"), a landscape consulting firm that provides water saving advisory services to customers of governmental agencies including the Metropolitan Water District and the Los Angeles Department of Water and Power. The G3 presentation tracked several landscapes through the transition from spray irrigated live turfgrass to drip irrigated and waterwise. Several practical water saving methodologies were discussed including land forming for water retention, soil modification and rain catching. Examples of printed resources produced by G3 for other agencies, which are also available via the internet, were provided for Council review.

In closing discussion on artificial turfgrass and natural landscape alternatives at the May 18, 2015 Study Session, Honorable Mayor Gold summarized the issues and suggested future discussion should focus on three considerations:

- Outside of requiring a few minor modifications, current City code is such that property owners can transition spray irrigated live grass areas to waterwise drought tolerant/California native plantings irrigated by a drip system. Councilmembers agreed that information should be provided to residents about drip systems including how long a drip system should run during an irrigation cycle.
- If artificial turfgrass is allowed in front yards, how will the City ensure that quality products are being installed and maintained to a standard that preserves the City's aesthetic quality while protecting the City against artificial turfgrass related risks?
- If artificial turfgrass is allowed in City parkways, how will trees be protected from decline and loss?

DISCUSSION

The following address the three issues stated above:

Does the current City municipal code enable property owners to effectively transition live grass lawn areas to waterwise drought tolerant/native plantings and produce the desired water savings targets in the future? Are minor modifications to the current municipal code required to enhance the ability of property owners to make waterwise changes?

Meeting Date: June 30, 2015

While doing routine windshield surveys of the City's trees, staff has noted an increasing number of properties that have converted traditional live turfgrass areas to more drought tolerant plantings. While some property owners have decided to retrofit their overhead spray systems to a subterranean drip configuration, others have left the spray system in place to irrigate their new plantings. For example, residents report the cost to remove parkway grass and replace with a drought tolerant *Dymondia* ground cover ranging from \$4.00 to \$12.50 per square foot, with the higher cost including a change in the irrigation system from overhead spray to subterranean drip. Both property owners reported immediate water savings, which they felt would increase as the *Dymondia* plantings become established and require even less water (see Fig. 1).



Figure 1- *Dymondia* parkway planting, McCarty Drive

The only problem either of these sample property owners referenced in the interview was a question about the use of mulches to cover open dirt spaces while newly installed plants grow to become established and cover more ground. Current code classifies some materials which could be used as mulches under the category of "paving."

It is becoming increasingly apparent that as more of these aesthetically pleasing drought tolerant landscapes are installed throughout the City, neighbors are finding them attractive enough to consider conversion projects of their own. To encourage more residents to make the conversion from live turfgrass to drought tolerant landscapes in the interests of meeting water conservation targets, the City Council may consider the following:

- Provide a web-based plant list for drought tolerant landscapes which identifies durable and appropriate plants for specific uses in the landscape (e.g. low parkway plantings).
- Modifying current code to allow the use of stepping stones or pathways in no more than ten percent of the parkway surface to enhance pedestrian traffic flow from adjacent parking sites.
- Modify the landscape irrigation run time mandates to be appropriate for drip systems and low flow irrigation spray heads (i.e. after landscape is established, run times up to one hour for drip systems and 25 minutes for low flow spray heads on allowed water days).

Meeting Date: June 30, 2015

In summary, an increasing number of live grass lawn to drought tolerant landscape conversions are being seen throughout the City. This trend indicates that some residents are willing to make an investment that will pay off in continued water savings while enjoying the aesthetic and environmental benefits of a live landscape. For the most part, these converted landscapes offer a better aesthetic than lawns which are currently receiving a fraction of the water they actually require to thrive during the hottest months of the year.

If artificial turfgrass is allowed in front yards, how will the City ensure that quality products are being installed and maintained to a standard that preserves the City's aesthetic quality while protecting the City against artificial turfgrass related risks?

At present, the City of Beverly Hills Municipal Code does not allow artificial turfgrass in residential front yards.

In response to the Governor's emergency drought declaration, governmental agencies throughout California are considering a number of water saving methods, including the expanded use of artificial turfgrass. Assembly Bill 1164 (AB 1164) includes language that looks to prohibit local agencies from enacting or enforcing any ordinance or regulation that prohibits the installation of synthetic grass or artificial turf on residential property. In turn, approximately \$300 million would be appropriated over three years to provide matching funds for local incentives to replace water inefficient residential landscaping with drought tolerant landscaping.

During discussions on whether to expand the permissible use of artificial turfgrass to residential front yards in the City, several health and safety, including tree health and aesthetic concerns have been raised. In the interests of offering an option to those property owners who wish to consider the use of artificial turf in their private property yards as an effective means of reaching water use reduction targets, the City Council has requested that staff present a specification that is intended to ensure that those residents who might choose to use artificial turfgrass in front yard areas will install a high quality, long lasting product in a proper manner so as to avoid aesthetic problems (see Fig. 2), while limiting the City's exposure to risk liabilities.



Figure 2- Poor quality artificial turfgrass installation

Meeting Date: June 30, 2015

A sample specification from a landscape architecture firm that has designed several park and play area improvements in the City is attached. The specification is applicable for a residential application and requires an experienced contractor to properly install an environmentally friendly product with a 15 year warranty period and to provide a maintenance plan to ensure the long-term durability and aesthetic of the product.

The next step in allowing the use of artificial turfgrass in residential front yards would be to request the Planning Commission to develop an ordinance with new standards regarding the use of artificial turfgrass in residential front yards. Among the considerations in developing the ordinance would be defining what percentage of artificial turfgrass coverage in a residential front yard would be permissible and what proximities would need to be maintained in order to install artificial turfgrass into residential front yards without jeopardizing the health of any heritage and/or protected trees.

In summary, should the City Council choose to modify the Municipal Code to allow the use of artificial turfgrass in residential front yards, then it is recommended that stringent product, installation and maintenance specifications must be conditioned into a permitting process to avoid long-term aesthetic and liability problems.

If artificial turfgrass is allowed in City parkways, how will trees be protected from decline and loss?

The specification for the proper installation of a quality artificial turfgrass requires that the upper portion of the soil profile be removed and replaced. In addition, the specification requires that the sub-base material be compacted. Therefore, preparing the parkway for the proper installation of artificial turfgrass per specification will result in damage to tree roots and includes compacting soil above the remaining root system, which impedes both water and air flow. Finally, artificial turfgrass is known to elevate soil temperatures which will also have an ill effect on tree roots and ultimately, the City's parkway trees.

On June 23, 2015, the Recreation and Parks Commission moved unanimously (4-0) to not endorse the use of artificial turf in City parkways.

Considering the long-term effect on City trees, staff suggests that the City Council consider the use of artificial turfgrass in City parkways only as a last resort in water conservation and if used, require a separate tree irrigation system to provide for the proper irrigation needs of the parkway tree(s).

FISCAL IMPACT

Costs related to landscape improvements on residential properties and parkways are the responsibility of the property owner. There will be staff time and related costs should the City Council direct staff to modify the Municipal Code. In addition, code changes may require additional staff time and related costs for construction inspection and code enforcement activities related to the use of artificial turfgrass. Cost estimates will be provided once direction is received on whether or not a permitting process to allow for artificial turf installation is to be developed.

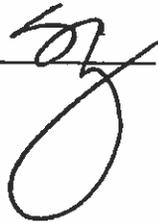
Meeting Date: June 30, 2015

RECOMMENDATION

Staff seeks City Council direction in the following areas:

1. The modification of current municipal code and water restrictions to promote the conversion of residential live grass lawns and parkways to drought tolerant materials.
2. Modification of current municipal code to allow for the use of artificial turfgrass in residential front yards.
3. Modification of current municipal code to allow for the use of artificial turfgrass in City parkways.

Steve Zoet
Approved By

A handwritten signature in black ink, appearing to be 'SZ', written over a horizontal line that extends from the text 'Approved By' to the right.

Attachment 1



STAFF REPORT

Meeting Date: May 18, 2015
To: Honorable Mayor & City Council
From: Trish Rhay, Assistant Director of Public Works Services - Infrastructure
& Field Operations *TR*
Michelle Tse, Senior Management Analyst *MT*
Subject: Artificial Turf and Live Plant Alternatives for Residential Front Yards
and Parkways
Attachments: 1. Synthetic Surface Heat Study
2. Safety Issues Related to Artificial Turf
3. Sample Parkway Design Guide

INTRODUCTION

This report is a follow-up to the City Council's direction from the April 21, 2015 Study Session to provide an overview of synthetic turf options and live plant alternatives for residential front yards and parkways.

DISCUSSION

During the April 21, 2015 Study Session, in response to a request by Councilmember Krasne, the City Council discussed the possible use of artificial turf in residential front yards and parkways to achieve water conservation. The discussion took place when the State declared a statewide water use reduction and is requiring the City to reduce water use by 36%. During the Study Session, the City Council directed staff to return with a review of synthetic turf options and live plant alternatives for use in both residential front yards and parkways.

The City's current Zoning Code limits the use of nonliving material in front yards. Thus, synthetic turf is limited to areas not visible from the public street. Parkways, the area between the outside edge of the sidewalk and inside edge of the curb, are a component of the public right-of-way. According to the Beverly Hills Municipal Code, the abutting property owner shall plant and maintain the parkway with grass or other plant material that is maintained at no more than six inches (6") in height as approved by the City's arborist. Changes in any of the existing regulations would require an amendment to the City's Municipal Code.

Both live plant and artificial turf presents advantages and disadvantages. The following is a summary of these considerations.

Artificial Turf	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Requires relatively low maintenance • Requires considerably less water use than natural grass • Higher grade quality products have better aesthetics and look more like real grass • One-time installation cost 	<ul style="list-style-type: none"> • Eventually deteriorates due to wear and tear; requires upkeep • If used in parkways, reduced water use will impact City trees • The manufacture and composition of synthetic turf (typically plastic), together with reduction in living plant material, could increase the community's carbon footprint • May trap heat, creating "heat islands"

Sample studies related to artificial turf are included in this report as attachments. One study reports that artificial turf creates "heat islands," with surface temperatures greater than asphalt and natural turf. There have also been reports that the rubberized infill made from recycled tires may contain carcinogens, posing health risks.

Parkways

If synthetic turf is allowed in parkways, the "heat islands" and reduced watering in these areas will impact the City trees planted in these areas. An alternative may be to use California native/drought tolerant plant options and include a drip irrigation system, which reduces overall water use while maintaining live landscaping. A sample Parkway Design Guide is included as Attachment 3, highlighting various ways in which drought tolerant and/or native plant alternatives can be used on parkways. A similar guide can be developed for both parkways and residential front yards.

Residential Front Yards

The Design Review Commission discussed the potential use of artificial turf on residential front yards during their May 7, 2015 meeting. The Commission prefers the use of drought tolerant/native plants over artificial turf. However if the City Council did allow for artificial turf, then the Commission recommends it would have to be a high quality turf product. The Commission also expressed there may be challenges with enforcing the use of high quality products.

The advantages and disadvantages for live plant alternatives are as follows:

Live Plant Alternatives	
Advantages	Disadvantages
<ul style="list-style-type: none"> • Requires less water than natural grass • Flexibility in design to promote live garden-like community • Large selection of native drought tolerant landscaping options • Native plants require less fertilizer and pesticides than natural grass 	<ul style="list-style-type: none"> • Requires some maintenance (pruning, cutting, etc.) • May limit the yard's use as a recreational area • Initial cost of installation and some maintenance • Must be properly maintained and driveways kept clear to not be visual obstructions for vehicles and pedestrians

Meeting Date: May 18 2015

Staff has been working with Green Gardens Group ("G3"), a landscape professional group, to provide guidance and information on live plant alternatives that could be used to maintain the City's garden-like community while conserving water. G3 is one of the conservation program partners with Metropolitan Water District and is also working with Los Angeles Department of Water & Power ("LADWP") with their turf removal program.

G3 will be in attendance during the May 18, 2015 City Council Study Session to provide an overview of live plant alternatives that could be used in residential front yards and parkways. G3 will also highlight the distinctions between drought tolerant plant and native plant options.

FISCAL IMPACT

Costs related to landscape improvements on parkways and residential front yards will be borne by the resident. Any needed removal and replacement of impacted City trees along the parkway generally costs the City between \$1,200 to \$2,000 per tree.

RECOMMENDATION

Staff seeks City Council direction on the use of artificial turf or live plant alternatives in residential front yards and parkways


George Chavez
Approved By

Attachment 1

"Synthetic Surface Heat Studies"

*C. Frank Williams and Gilbert E. Pulley
Brigham Young University*

Synthetic turf surfaces have long been regarded as a lower maintenance alternative to natural turf. However, synthetic surfaces like natural turf have their shortcomings. In the spring of 2002 a Field Turf synthetic surface was installed on one half of Brigham Young University's Football Practice Field. The other half of the installation is a sand-based natural turf field. Shortly after the Field Turf was installed football camps were started. The coaches noticed the surface of the synthetic turf was very hot. One of the coaches got blisters on the bottom of his feet through his tennis shoes. An investigation was launched to determine the range of the temperatures, the effect water for cooling of the surfaces, and how the temperatures compared to other surfaces.

On June of 2002 preliminary temperatures were taken at five feet and six inches above the surface and at the surface with an infrared thermometer of the synthetic turf, natural turf, bare soil, asphalt and concrete. A soil thermometer was used to measure the temperature at two inches below the surface of the synthetic turf. Also, water was used to cool the surface of the natural and artificial turf. It was determined that the natural turf did not heat up very quickly after the irrigation so only the artificial turf was tracked at five and twenty minutes after wetting. The results of the preliminary study are shocking. The surface temperature of the synthetic turf was 37° F higher than asphalt and 86.5° F hotter than natural turf. Two inches below the synthetic turf surface was 28.5° F hotter than natural turf at the surface. Irrigation of the synthetic turf had a significant result cooling the surface from 174° F to 85° F but after five minutes the temperature rebounded to 120° F. The temperature rebuilt to 164° F after only twenty minutes. These preliminary findings led to a more comprehensive look at the factors involved in heating of the artificial turf.

Three aspects of light were measured along with relative humidity. The synthetic surface was treated as two areas, the soccer field and the football field and the natural turf was one area. Four randomly selected sampling spots were marked with a measuring tape from reference points on the fields so it could be accessed for subsequent data collection. Bare soil, concrete, and asphalt sampling areas were selected and marked in a similar manner. The results are shown in table form below:

Table 1.

Surface	Average Surface Temperature between 7:00 AM and 7:00 PM	
Soccer	117.38° F	high 157° F
Football	117.04° F	high 156° F
Natural Turf	78.19° F	high 88.5° F
Concrete	94.08° F	
Asphalt	109.62° F	
Bare Soil	98.23° F	

Table 2.

Two inch depth	Average Soil Temperature between 7:00 AM and 7:00 PM	
Soccer	95.33° F	high 116° F
Football	96.48° F	high 116.75° F
Natural Turf	80.42° F	high 90.75° F
Bare Soil	90.08° F	

Table 3.

Shade	Average Temperature between 9:00 AM and 2:00 PM	
Surface Temperature of Natural Turf	66.35° F	high 75° F
Surface Temperature of Artificial Turf	75.89° F	high 99° F
Average Air Temperature	81.42° F	

Surface Temperature of A.T. (Artificial Turf) is significantly higher than air or soil temperature of A.T. The amount of light (electromagnetic radiation) has a greater impact on temperature of A.T. than air temperature. The hottest surface temperature recorded was 200° F on a 98° F day. Even in October the surface temperature reached 112.4° F. This is 32.4° F higher than the air temperature. White lines and shaded areas are less affected because of reflection and intensity of light. Natural grass areas have the lowest surface and subsurface temperatures than other surfaces measured. Cooling with water could be a good strategy but the volume of water needed to dissipate the heat is greatly lessened by poor engineering (infiltration and percolation).

Average air temperature over natural turf in the late afternoon is lower than other surfaces. Soil temperature of A.T. is greater than bare soil and natural turf. Humidity appears to be inversely related to surface and soil temperature. It is likely that energy is absorbed from the sunlight by the water vapor.

The heating characteristics of the A.T. make cooling during events a priority. The Safety Office at B.Y.U. set 120° F as the maximum temperature that the surface could reach. When temperature reaches 122° F it takes less than 10 minutes to cause injury to skin. At this temperature the surface had to be cooled before play was allowed to continue on the surface. The surface is monitored constantly and watered when temperatures reach the maximum. The heat control adds many maintenance dollars to the maintenance budget.

A budget comparison was made using actual dollars spent and for every dollar spent on the A.T. maintenance one dollar and thirty cents was spent on the natural turf (N.T.) practice field. While construction costs are very unbalanced, for every dollar spent on the N.T. eleven dollars and seventy-seven dollars were spent on the A.T.

The area under the carpet of BYU's installation is designed to move water from the surface and into an extensive drain mat system. This part of the installation is two thirds of the overall cost of the A.T. Thus, for a 2.5 million dollars installation approximately 1.7 million dollars go for the subsurface and drainage. The most interesting thing about this is that the drain mat probably sees little or no water. The surface is hydrophobic and the undersurface is poorly engineered to favor water retention rather than drainage. That seems like a high price to pay for something that does not work!

Artificial turf surfaces have their place in the turf industry. They can work in environments where grass will not grow and are marginal. However, they are costly and not maintenance free. It is important to take all the factors in to consideration before making a large investment. Don't take the manufacture's word for the factors of concern i.e. don't let the fox guard the hen house. The propaganda on BYU's installation is charts with surface temperatures less than the air temperature and claims for drainage of 60 inches per hour. The question still remains is A.T. 11.47 times better than natural turf?

Attachment 2

The Washington Post

Early Lead

Is there a link between artificial turf and cancer in soccer goalies?

By Cindy Boren October 9, 2014

Every day, hundreds of thousands of soccer goalies come home from competing on artificial turf fields and remove rubber crumbs from their hair, mouths, nose and abrasions, shaking the stuff from their clothing and gear.

The particles, called butadiene rubber or “crumb rubber,” is made from synthetic fibers and scrap tires. It raises dust over the fields and smells like, well, former tires. Now, a number of people are questioning the safety of fields that contain those crumbs and an NBC News report cited incidences of cancer specifically among goalies. Because of a lack of research, it is not clear whether there is a causal connection yet, but it's a question worth exploring because the material can contain benzene, carbon black and lead and it's prevalent on the soccer fields at schools and parks across the country. The turf is the latest iteration of the artificial playing surface, one that carried the promise of a softer impact for athletes — important in an era of increasing awareness of the dangers of concussions.

In 2009, Amy Griffin, the associate head soccer coach at the University of Washington, was visiting two female goalies who had been diagnosed with non-Hodgkin's lymphoma, when a nurse brought a disturbing trend to her attention. NBC's Hannah Rappleye reports:

That day, the nurse looked down at the woman Griffin was sitting with and said, “Don't tell me you guys are goalkeepers. You're the fourth goalkeeper I've hooked up this week.”

Later, the young woman with the chemo needle in her arm would say, “I just have a feeling it has something to do with those black dots.”

Artificial turf fields are now everywhere in the United States, from high schools to multi-million-dollar athletic complexes. As any parent or player who has been on them can testify, the tiny black rubber crumbs of which the fields are made — chunks of old tires get everywhere. In players' uniforms, in their hair, in their cleats.

But for goalkeepers, whose bodies are in constant contact with the turf, it can be far worse. In practices and games, they make hundreds of dives, and each plunge sends a black cloud of tire pellets into the air. The granules get into their cuts and scrapes, and into their mouths. Griffin wondered if those crumbs — which have been known to contain carcinogens and chemicals — were making players sick. “I’ve coached for 26, 27 years,” she said. “My first 15 years, I never heard anything about this. All of a sudden it seems to be a stream of kids.” Since then, Griffin has compiled a list of 38 American soccer players — 34 of them goalies — who have been diagnosed with cancer. At least a dozen played in Washington, but the geographic spread is nationwide. Blood cancers like lymphoma and leukemia dominate the list.

How Safe Is the Artificial Turf Your Child Plays On? <http://t.co/hR3jajfge> @HRappleye reports. pic.twitter.com/oFpjpTwRkr

NBC Investigations (@NBCInvestigates) October 8, 2014

The turf, whether toxic or not, is also drawing attention as “the next battlefield for workplace gender discrimination,” as Quartz puts it. FIFA plans to use the turf, rather than natural grass, for the women’s World Cup next summer in Canada, a decision that prompted a lawyer representing Abby Wambach and other stars to file a lawsuit in the human rights tribunal of Ontario. The issue gained traction when Sydney Leroux tweeted a photo of her legs after a game — and it was immediately shared by Kobe Bryant, Kevin Durant and others.

This is @DrinkBODYARMOR athlete [sydneyleroux](https://twitter.com/sydneyleroux) after playing on turf! #ProtectTheAthlete #USWNT <http://t.co/e5NhMgu kCq> pic.twitter.com/5jFpl12L8j — Kobe Bryant (@kobebryant) August 13, 2014

Whether there are greater dangers to health, though, is uncertain. “NBC’s own extensive investigation,” Rappleye writes, “which included a review of the relevant studies and interviews with scientists and industry professionals, was unable to find any agreement over whether crumb turf had ill effects on young athletes, or even whether the product had been sufficiently tested.”

While more testing is needed, New York City moved to stop installing crumb rubber fields in its parks in 2008 and the Los Angeles Unified School District did the same in 2009. In Maryland, the Safe Healthy

Playing Fields Coalition supports legislation to require warning signs at artificial turf fields and opposes a bill to use state funds to construct artificial turf fields.

Meanwhile, Griffin continues to do her own research on the topic, telling Rappleye that she sends crumbs from each field her team plays on to a lab for testing.

"I'm looking for answers, because I'm not smart enough to come up with them on my own," Griffin said.

"I would love someone to say, 'We've done some tests and we've covered all of our bases — and, yes, it's safe.' That would be awesome. I would love to be proved wrong."

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Attachment 3

PARKWAY DESIGN GUIDE



*City of West Hollywood
March 2010*

WHY ARE PARKWAYS IMPORTANT?

1

The parkway is the strip of land between the street and the walkway. In other geographic regions, it is known as tree lawn or planting strip. The parkway and walkway together make up the sidewalk, which is part of the public right-of-way. Street trees are planted in the parkway and are the most important plants in the parkway.

Parkways are important to individual property owners and the City as a whole for the following reasons:

- Parkway provide soil volume that street trees need to grow into healthy, mature trees that provide shade, collect stormwater, consume carbon and provide other environmental and health benefits.
- Parkway can collect stormwater and irrigation runoff and return it to the groundwater table.
- Parkway provide a buffer between pedestrians on the walkway and cars in the street.
- Parkway improve the curb appeal of your home, potentially increasing its value.
- Parkway provide a buffer between pedestrians on the sidewalk and cars in the street.
- Parkway enhance the visual quality of the city.

In West Hollywood, the adjacent property owner is responsible for maintaining all of the parkway except the street trees, which are maintained by the City. They can only be planted, trimmed and removed by the City and not by private property owners.

Parkways can be designed in a variety of ways, depending on the individual property owner's design objectives and commitment to maintenance. However, all parkways should require relatively little supplemental water, little mowing and little fertilizing to reduce their carbon footprint. In particular, conventional grass parkways that require high levels of supplemental water and regular mowing and fertilizing should be avoided. West Hollywood property owners are encouraged to convert their conventional grass parkways (and front yards) into drought-tolerant, sustainable parkways (and front yards). This brief document provides guidance for making that transition.

Typical residential parkway of the past based on those on the East Coast and Midwest where supplemental irrigation typically is not required and where parkways are called "tree lawns"



In South
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mowers
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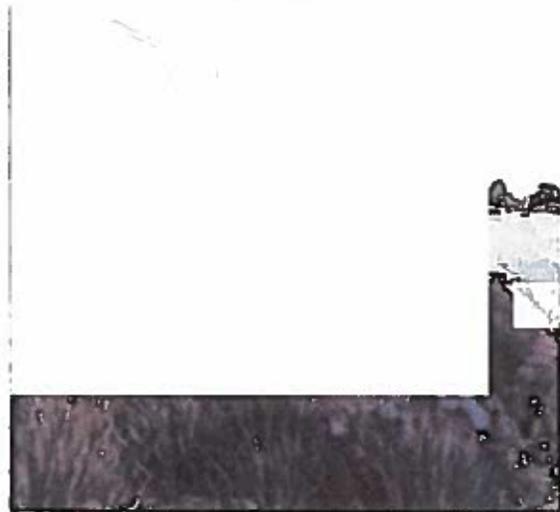
ct

2 PARKWAY DESIGN CRITERIA

To reduce water use and carbon emissions and provide storm and irrigation water infiltration, soil volume for street trees, a buffer between pedestrians and the street, pedestrian access between the street and walkway, visibility of both motorists and pedestrians, erosion/fugitive dust control, and the visual benefits of landscaped parkways, all parkways shall be:

- As wide as possible up to 8' wide, given minimum walkways widths of 4' in residential zones and 5' in commercial zones.
- At the same elevation as the curb and walkway within 6" of them, for example, soil 2" below edge of curb and walkway elevations and covered with 2" of mulch, so the surface elevations of the walkway or curb and adjacent parkway are the same.
- At least 75% unpaved and either 1) slightly swaled, that is, sloping a few inches to the center at not more than a 3:1 slope, to collect storm and irrigation water if the plant materials in the parkway are not walkable or 2) at the same finished elevation as the walkway if the plant materials in the parkway are walkable.
- Irrigated in a manner that results in no overspray onto the walkway or street, e.g., buried in-line drip, and consistent with the City's landscape ordinance and State Model Landscape Ordinance (9-10-09).
- At least 50% covered with plant materials, which 1) do not require mowing more frequently than once every few months, 2) are drought tolerant and can survive with irrigation only occasionally from November - March, once a week April - June, and twice a week July - October (for example, plants listed in WUCOLS III¹ as having Moderate, Low or Very Low water use- see Table 1 for examples), 3) do not exceed a height of 2' within 5' of a driveway/curbcut and, excluding trees, 4' elsewhere, 4) do not have thorns or sharp edges adjacent to any walkway or curb, and 5) are located at least 4 feet from any tree trunk.
- Where unpaved, covered with a permeable natural material, e.g., mulch, stabilized decomposed granite, gravel, or stones, that prevent erosion and dust.

¹ WUCOLS, an acronym for Water Use Classification of Landscape Species, can be downloaded at <http://www.water.ca.gov/wateruseefficiency/docs/wucols00.pdf>

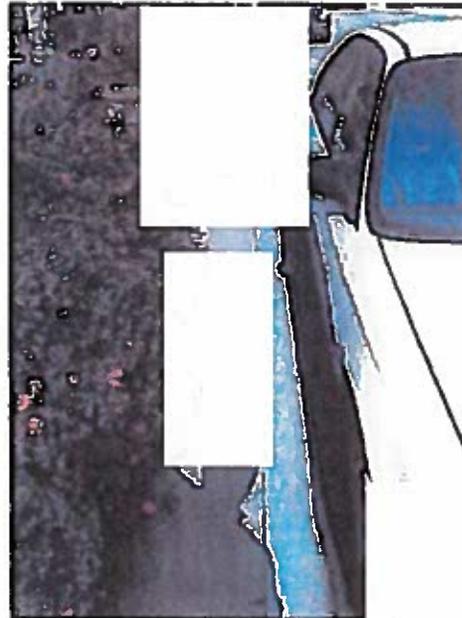


For parkways adjacent to curbside parking, if the parkway planting is not walkable (see Table 1 for examples of plants that are walkable), a means of access from the curb to the walkway shall be provided. It may vary with the adjacent use and street characteristics, for example:

- On heavily trafficked streets (major and minor arterials), an 18" wide paved, walkable strip along the back of the curb that is at the same finished elevation as the curb should be provided.
- Where there are striped curbside parking spaces, a path across the parkway should be provided every two cars between two marked spaces.
- Adjacent to single-family homes and low-density multi-family housing (2 to 4 units/5,000 SF lot), stepping stones or a walkway across the parkway should be provided every 50 feet.

Where there is no curbside parking and the parkway is not walkable, a path or stepping stones shall be provided every 50 feet.

As specified on page 2, plants with thorns should not be planted adjacent to any walkway where someone might come in contact with the thorns.



A "landing strip" at the curb allows easy access from parked cars



A path across the parkway completes access from parked cars to the walkway



3 DESIGNING YOUR PARKWAY

WHAT'S YOUR TYPE?

Type 1 Parkway - Low-Maintenance, Walkable Plants

If you want a parkway that requires minimal design and maintenance, install walkable plants. Table 1 lists some examples. Most of the grasses listed do not require mowing. Sedge, Buffalo and Grama Grass can be mowed a few times a year to maintain a lawn-like appearance.

Type 2 Parkway - Low-Growing, Low-Maintenance Plants

If you want a parkway that requires a little more design and the addition of a walkway or stepping stones, but still requires minimal maintenance, plant low-growing grasses and/or groundcover. There are many choices; Table 2 lists some of them. Your parkway might be meadow-like in appearance with a mix of grasses and perennials, including some from Table 1 and some from Table 2.

Type 3 Parkway - Complement Your Front Yard

If you want a parkway that is an extension of your sustainable, non lawn front garden, use low- to medium-height grasses, shrubs and perennials. There are many plant choices with this parkway type. Table 3 lists some reliable drought-tolerant natives that are taller - but still less than 3 feet tall - that can be mixed in with plants in Table 2.

Note: there are many other plants that are suitable for parkways, which you can find in the on-line resources. Email us your parkway success stories and we will add them to the parkway list.

DIGGING IN

Preparing Your Parkway Soil

The most important thing you can do to ensure your parkway's success is to prepare the soil. Soil preparation saves you money in the long run because it reduces the need to replace plants, lowers water use and reduces fertilizer applications.

- Remove all existing turf - let it die and dig it out.
- Remove enough soil to create the swale described on page 2 and then remove 2-3" more.
- Till the parkway soil to depth of one foot.
- Amend it with compost.

Watering Your Drought-Tolerant Parkway

Too much water can kill drought-tolerant plants. So, don't over-water, especially in clay soil. The best approach is to water only when the soil is dry at a depth of 3" to 4". Or, turn on your in-line drip irrigation three times a week (45 minutes each time) to establish your parkway (first 3 months); then, once it is established, once a week from October through March and twice a week from April through September.

On-Line Resources

Use these resources to see images, recommended spacing, and detailed descriptions of these plants and others:

bewaterwise.com
thedorepayne.org
elnativo.com
smg growers.com
monrovia.com
sunset.com and *Sunset Garden Book*
California Native Plants for the Garden Bornstein et al.

Table Legend

N = California or Southwest native
L = Low water use
M = Moderate water use
o.c. = on center



Table 1. Sample Type 1 Walkable Plants - No Path Required

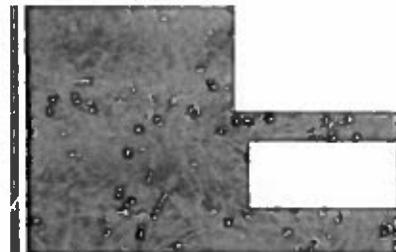
Botanical Name	Common Name	Water Use	Height x Spacing	Notes
Low Water Use/Low or No Mow Turf or Grass-like Perennials				
<i>Buchloe dactyloides</i> UC Verde™	UC Verde™ Buffalo Grass	N, L	6" x 6"	winter dormant (brown)
<i>Bouteloua gracilis</i> 'Hachita'	'Hachita' Blue Grama Grass	N, L	6" x 6"	
<i>Carex pansa</i> (<i>C. praegracilis</i>)	California Meadow Sedge	N, M	6" x 9"+	Grows in shade or sun
<i>Achillea millefolium</i> cultivars	Achillea cultivars	L	12" x 3'	mow 3-4x/year
<i>Chamaemelum nobile</i>	Chamomile	M	8" x 12"	
<i>Dymondia margaritae</i>	Dymondia	L	3" x 6"	slow growing

Other untested ideas: there are several lawn substitute seed mixes, including Fleur de Lawn and Ecology Lawn, that may work.

Buchloe dactyloides UC Verde™

Bouteloua gracilis 'Hachita'

Carex pansa (*C. praegracilis*)



Achillea millefolium cult var mowed

Chamomile

Dymondia margaritae



Table 2 Example Type 2 Low-Growing, Low Maintenance - Path Required

Botanical Name	Common Name	Water Use	Height x Spacing	Notes
Low-Growing Grasses or Grass-like Perennials (18 inches or less)				
<i>Carex divulsa</i> (<i>C. tumicola</i>)	Berkeley Sedge			
<i>Festuca glauca</i> 'Siskiyou Blue' & other var.	Blue Fescue		12" x 12"	
<i>Pennisetum alopecuroides</i> 'Little Bunny'	Little Bunny Fountain Grass		12" x 12"	
<i>Sesleria autumnalis</i>	Autumn Moor Grass	M	15" x 2'	
Low-Growing Perennials/Succulents (18 inches or less)				
<i>Achillea millefolium</i> 'Terra Cotta'	Yarrow Terra Cotta & other cultivars		12" x 4'	
<i>Aptania cordifolia</i> /A. <i>cordifolia</i> 'Red Apple'	Heartleaf Ice Plant		6" x 12"	
<i>Delosperma cooperi</i>	Trailing Ice Plant			
<i>Drosanthemum floribundum</i>				
<i>Dudleya hassei</i>	Santa Catalina Live Forever	N, VL	8" x 18"	
<i>Erigeron karvinskianus</i> & E. <i>glauca</i>	Santa Barbara & Seaside Daisy	N,M	12" x 2'	
<i>Fragaria vesca</i> ssp. <i>Californica</i> or <i>F. chiloensis</i>	Woodland or Coastal Strawberry		8" x 2'	
<i>Gazania rigens leucolaena</i>			6" x 2'	
<i>Gazania linearis</i> 'Colorado Gold'	Colorado Gold Gazania (green lvs)		6" x 2'	
<i>Hypericum calycinum</i>	Creeping St. Johnswort	M	12" x 12"	Clip yearly; likes shade
<i>Iris douglasiana</i> & 'Pacific Coast Hybrids'	Douglas & Pacific Coast Iris		12" x 18"	
<i>Lantana</i> Patriot series cultivars	Dwarf Lantana		12" x	
<i>Lessingia flaginifolia</i> 'Silver Carpet'	Beach Aster	L	12" x 4'	
<i>Monardella villosa</i>	Coyote Mint	N, VL	15" x 2'	
<i>Nepeta mussinii</i> (<i>N. faassenii</i>)	Catmint		15" x 18"	
<i>Osteospermum fruitcosum</i>	Trailing African Daisy		6" x 18"	
<i>Oenothera caespitosa</i> & other species	Tufted evening primrose		12" x 2'	
<i>Rosmarinus officinalis</i> 'Huntington Carpet' or other prostrate varieties				
<i>Scaevola aemula</i> varieties				
<i>Senecio serpens</i> , <i>S. mandraeliccae</i>	no common name		12" x 2'	
<i>Thymus</i> species	Thyme			
<i>Verbena peruviana</i> & hybrids	Verbena	L	6" x 2'	
<i>Vinca minor</i>	Dwarf Periwinkle			Plant in shade
<i>Ceanothus</i> 'Centennial'			18" x 4'	needs good drainage
<i>Cotoneaster dammeri</i> 'Lowfast', <i>C. salicifolia</i> 'Repens', <i>C. apiculatus</i> 'Tom Thumb'	Groundcover Cotoneaster varieties	M		
<i>Juniperus horizontalis</i> & <i>J. procumbens</i> var	Groundcover Juniper varieties			see Sunset for list



Carex divulsa

Festuca glauca

Sesleria autumnalis

Pennisetum 'Little Bunny'



Achillea 'Terra Cotta'

Apnea cordifolia 'Red Apple'

Delosperma cooperi

Drosanthemum floribundum



Dudleya hassel

Erigeron glaucus 'Wayne Roderick'

Gazania rigens leucolaena

Gazania linearis



Fragaria chiloensis

Hypericum calycinum

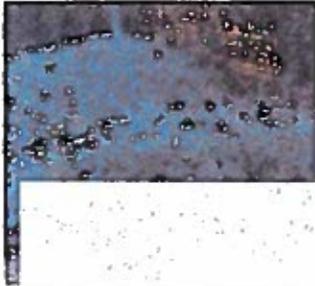
Iris douglasiana

Lantana 'Patrol Rainbow'



3 DESIGNING YOUR PARKWAY

Lessingia flaginifolia 'Silver Carpet'



Mondardella villosa



Nepeta mussinii



Osteospermum fruticosum



Oenothera caespitosa



Rosmarinus officinalis



Scaevola aemula



Senecio mandraelicus



Thymus



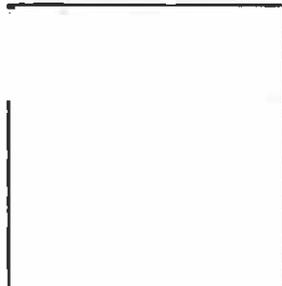
Verbena peruviana varieties



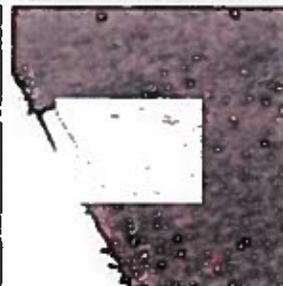
Vinca minor



Ceanothus 'Centennial'



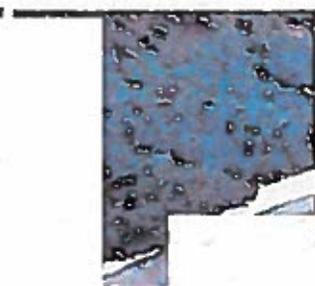
Cotoneaster dammeri



Juniperus procumbens



Juniperus horizontalis var.



PARKWAY DESIGN GUIDE



Table 3 Example Type 3 Medium Height, Drought Tolerant Plants - Path and More Maintenance Required

Botanical Name	Common Name	Water Use	Height x Spacing	Notes
<i>Verbena lilacina</i> & <i>V. lilacina</i> 'De La Mina'	Lilac verdena	N, L	3 x 3	



3 DESIGNING YOUR PARKWAY

Helictotrichon sempervirens



Leymus condensatus 'Canyon Prince'



Nasella tenuissima



Pennisetum orientale



Pennisetum setaceum 'Eaton Canyon' Aloe 'Blue Elf'



Anigozanthos 'Bush Pearl'



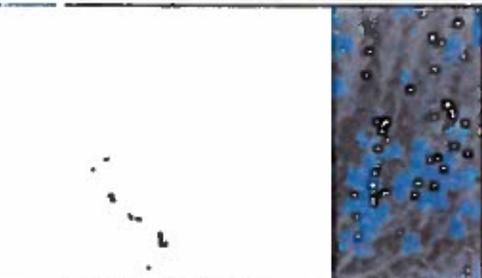
Limonium perezii



Lomandra longifolia 'Breeze'



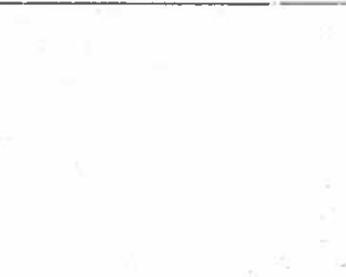
Penstemon heterophyllus 'Margarita BOP'



Phormium 'Jack Spratt'



Arctostaphylos densiflora 'Pacific Mist'



Artemisia pycnocephala 'David's Choice'



Ceanothus glaucus 'Anchor Bay'

Cistus salvifolius



Iva hayesiana

Lantana montevidensis

Lantana 'Gold Rush'

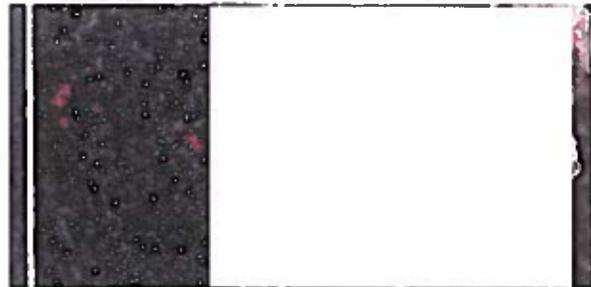


Mimulus 'Jelly Bean Yellow'

White Flower Carpet Rose

Red Flower Carpet Rose

Amber Flower Carpet Rose



Salvia aplana

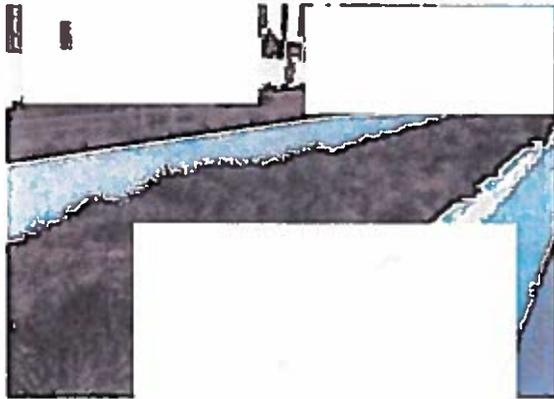
Salvia 'Bee's Bliss'

Verbena lilacina



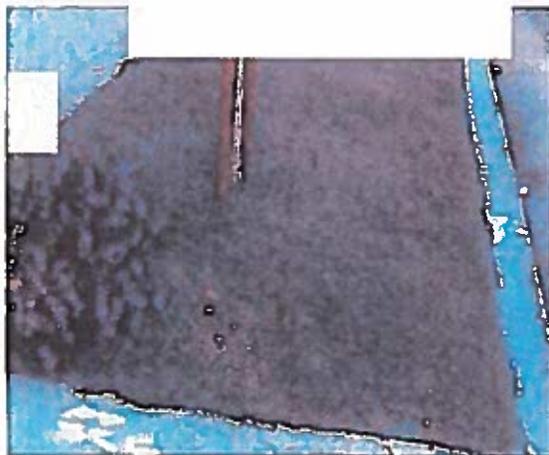
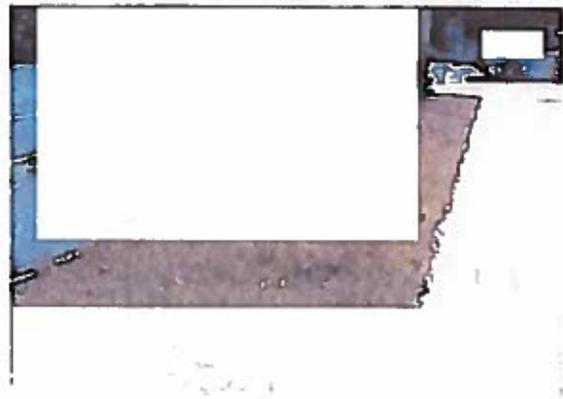
4 EXAMPLES

6 Walkways (Walkable Plants)

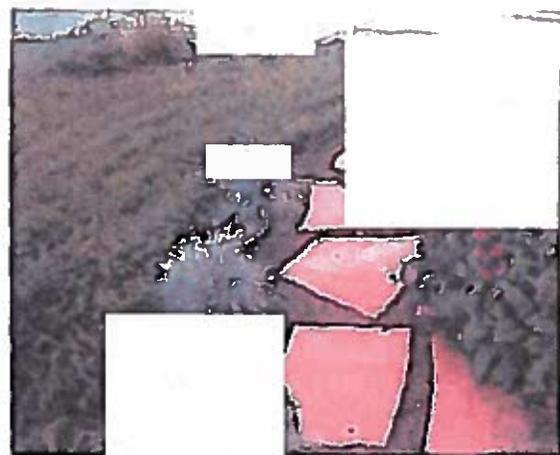


California Meadow
no supplements
week the rest of
more lawn-like

or
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Dymondia (*Dymondia margaritae*) (Rangley Ave.) is a low growing,
walkable groundcover



Regularly mowed Yarrow (*Achillea millefolium*) is lawn-like.

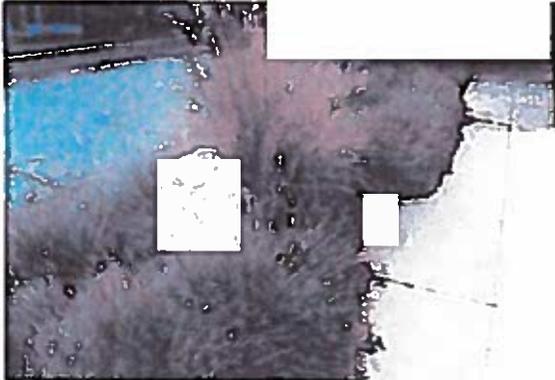
Good Examples of Type 2 Parkways



Berkey Sedge (*Carex divulsa*) requires very little care and similar water to the Sedges.



Gazanias (Norwich Dr.) are a reliable relatively drought tolerant



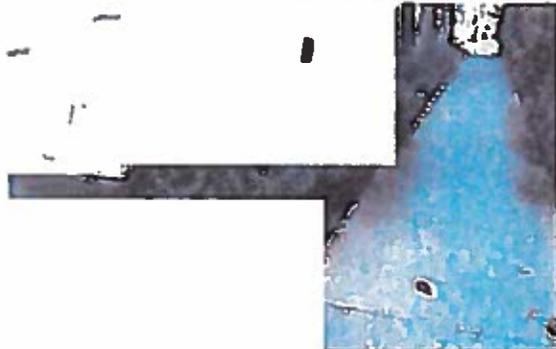
Autumn Moor Grass (*Sesleria autumnalis*) requires very little care and similar water to the Sedges.



A prostrate Rosemary like 'Huntington Carpet' (Poinsettia Dr.)



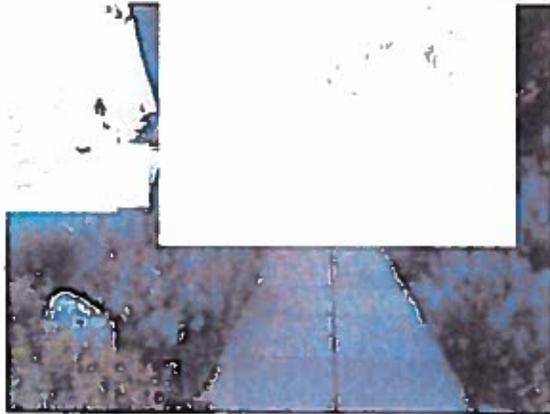
Blue Fescue (*Festuca cultivars*) (Dornington Ave.) require good drainage and tolerate some shade



Dwarf Penwinkle (*Vinca minor*) is a good choice for a shady parkway.

4 EXAMPLES

Good Examples of Type 3 Parkway : Perennial Gardens



This mix of drought-tolerant perennials (Orlando Ave.) extends the front yard landscaping to the curb and incorporates river rock. It is beautifully maintained and would be a perfect example if the parkway were swaled rather than mounded.



This mix of fairly drought-tolerant perennials (Westbourne) provides color to brighten the street and includes a path.

Other Good Example--



Lantana needs to be cut back so it does not become too tall and woody



Native Deer Grass (*Muhlenbergia rigens*) needs a wide parkway.



Autumn Moor Grass and other low, clumping grasses require little maintenance

4 EXAMPLES

Special Parkway Conditions



Pots or other elements may be appropriate in some locations. An encroachment permit is required for elements other than plants and paving.



While plants should not be placed within 4' of a tree trunk to reduce competition for nutrients, grasses and clumping perennials may be planted between large surface roots farther away, provided they do not adversely affect the tree.

Attachment 2



SHAW/YODER/ANTWIH, inc.
LEGISLATIVE ADVOCACY • ASSOCIATION MANAGEMENT

DATE: June 23, 2015

TO: Cheryl Friedling,
Deputy City Manager
City of Beverly Hills

FROM: Andrew K. Antwih, Partner
Shaw / Yoder / Antwih, Inc.

SUBJECT: AB 1164 (Gatto) – Water conservation: drought tolerant landscaping

Purpose: Assembly Bill 1164 would prohibit a local government from enacting or enforcing any ordinance or regulation that prohibits the installation of synthetic grass or artificial turf on residential property, and would appropriate \$300 million over three years to provide matching funds for local incentives to replace water inefficient residential landscaping with drought tolerant landscaping.

Background: With the state's historic drought entering its fourth year, government entities at all levels are considering methods to cut back on water use. Governor Brown has called for a 25% reduction in urban water use and approved emergency regulations to meet that reduction goal, including compelling the replacement of 50 million square feet of lawns throughout the state.

Many Californians have decided to replace their lawns with more drought tolerant landscaping options, including artificial turf and drought resistant plants, and many of them are able to take advantage of local turf removal rebate programs like the one operated by the City of Beverly Hills. However, some local governments and homeowner associations (HOAs) have placed bans on artificial lawns, citing aesthetic, property value, or safety-related reasons while defending their local control over these issues.

This bill would prevent artificial turf bans by local governments, including cities and counties. It should be noted that one city that has received attention for its ban is the City of Glendale, which is located in the author's district. Another bill, AB 349 (Gonzalez), would similarly prevent bans for HOAs. That bill passed the Senate Committee on Transportation and Housing on June 23 by a unanimous vote of 11-0, and the Governor, who previously vetoed a similar bill, has displayed openness to it in light of the continuing drought. Asm. Gonzalez is also the coauthor of AB 1164.

This bill has an urgency clause, meaning that it would take effect immediately, and also that it would require a 2/3rds vote in both houses of the Legislature to pass.

Impact: This bill would prevent the City of Beverly Hills from prohibiting the installation of synthetic grass or artificial turf on residential property. If the bill passed, the City's turf removal

rebate program would likely be eligible for state matching funds from the State Water Resources Control Board.

Recommendation: Beverly Hills has been required by the state to reduce its water consumption, much of which is related to lawn upkeep, by 36%. The City has already put a number of new restrictions in place in response to this requirement. The City should consider the importance of retaining local control over housing requirements while remaining sensitive to the urgent need to achieve its reduction targets and prepare for continuing drought conditions. It should also consider the financial benefits of matching funds for the turf removal rebate program. We would recommend a watch position for now, and we would also note that the League of California Cities has not yet taken a position.

Status: AB 1164 passed the Assembly before the current language of the bill was amended in on June 22. It is currently pending before the Senate Committee on Transportation and Housing. It is likely that this bill will be sent to the Governance and Finance committee, which would have more significant jurisdiction over this policy. It will have to return to the full Assembly for a vote if it passes the Senate.

Support/Opposition:

Support: None yet registered.

Oppose: None yet registered.

Attachment 3

**SECTION 32 18 16
SYNTHETIC GRASS SURFACING SYSTEM**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections apply to this Section.

1.2 SUMMARY

- A. Section includes synthetic grass surfacing for installation with accessories as indicated on the Drawings and specified herein.

1.3 SYSTEM DESIGN

- A. The synthetic grass surfacing system shall be specifically designed and recommended by the manufacturer for use specified on the plans.
- B. The synthetic grass surfacing system shall be constructed to maximize dimensional stability, to resist damage during normal use, and to minimize UV degradation, including fading.
- C. The synthetic grass surfacing system shall be resistant to staining, weather, insects, rot, mildew, and fungus growth, and shall be non-allergenic and non-toxic.

1.4 ACTION SUBMITTALS

- A. Product Data: Submit manufacturer's product data, specifications and installation instructions for each product specified.
 - 1. Include sources for component materials.
- B. Material Certificates: Signed by manufacturer, certifying the material and system proposed for the project comply with the specified performance criteria
- C. Shop Drawings: Submit shop drawings that include scaled plans, sections, and large-scale details showing the installation and attachment of the synthetic grass surfacing system
 - 1. Include locations of all seams in fabric surfacing.
- D. Samples:
 - 1. 18 inch by 18 inch samples showing details of finished installation. Include an example of a field joined seam between adjacent rolls and outside edge attachment.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualifications for Installer.
- B. Qualifications for Manufacturer.

- C. **Maintenance Data:** For synthetic grass surfacing system and maintenance equipment, to be included in maintenance manuals. Include the following:
 - 1. Manufacturer's written instructions manual for routine cleaning, adjustment, grooming, and other maintenance procedures. Include activities and procedures that could be detrimental to the synthetic grass surfacing system and should be avoided.
 - 2. Owner's manuals for field grooming and sweeping equipment.
 - 3. Warranty information for field grooming and sweeping equipment.
- D. **Project Record Drawings:** Record actual locations of seams and drains on the Record Drawings.
- E. **Warranty:** 3 signed copies of signed warranty.

1.6 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** Firm specializing in the manufacturing of synthetic grass surfacing for a minimum of five years and who has completed work similar in design and extent to that required for the project and whose work has resulted in construction with a record of successful in-service performance.
- B. **Installer Qualifications:** Firm experienced in the installation of synthetic grass who is certified by the synthetic grass manufacturer to install their materials, who has successfully installed work similar in design and extent to that required for the project, in not less than 10 projects of similar scope, to the satisfaction of the Owner, in the last three years, who employs trained workmen that are experienced in the installation of the synthetic grass system proposed for the project, and whose work has resulted in construction with a record of successful in-service performance.
- C. **Single Source Responsibility:** Obtain synthetic grass surfacing system material, including drainage mat adhesives and seaming materials, from a single manufacturer regularly engaged in manufacturing the material.
- D. **Pre-installation Conference:** Prior to the start of the synthetic grass surface system work coordinate a conference to be held at the Site, in accordance with Section 01 31 00, Project Management and Coordination, to review the construction schedule availability of materials, installer's personnel qualifications and experience, equipment and facilities needed to make progress and avoid delays, in installation procedures, testing, inspection, and certification procedures, and coordination with other work.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the site in original, unopened containers, wrapping, or packaging, with manufacturer's labels intact identifying project, material, and production run or lot number for fabric roll.
- B. Immediately following delivery, inspect materials and component for damaged or defective items, including material that are not uniform in color, out of tolerance regarding edge alignment and minimum pile height. Materials that are found to be damaged or defective shall be replaced at no additional cost to the Owner.

- C. Store materials in a secure, dry, well-ventilated location where protected from weather, exposure to UV, soil, dust, moisture and other contaminants. Store fabric rolls horizontally, on a flat surface.
- D. Handle according to manufacturer's recommendations to prevent damage, deterioration, distortion, or soiling.

1.8 PROJECT CONDITIONS

A. Environmental Limitations:

- 1. Do not install synthetic grass surfacing materials when:
 - a. Substrate surface /materials are wet, excessively damp, or have standing water.
 - b. Rain is imminent or forecast within 48 hours following proposed time of installation.
 - c. Weather conditions, or forecasted conditions, in the opinion of the installer or manufacturer's representative, will have an adverse effect on the installation.
 - d. Humidity levels are outside of the limits recommended by adhesive manufacturer
- 2. Install synthetic grass surfacing materials only when:
 - a. Material surface temperatures including aggregate base material are above 45 degrees F, and anticipated to remain above 45 degrees F for not less than 48 hours following installation.
 - b. Ambient air temperature is 50 degrees F and rising, but not more than 95 degree F, and forecast to remain above 50 degree F for not less than 48 hours following installation
 - 1) Ambient air temperatures shall be taken in the shade, away from artificial heat sources such as exposed pavement and stone aggregate fill.

1.9 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Synthetic Grass Surfacing System Fabric: For repairs and/or replacement of areas displaying excessive wear.
 - a. 100 sq ft of fabric, 15 ft wide roll.
 - 2. Cleaning Solution: One gallon of industrial-strength cleaning solution recommended in writing by fabric manufacturer, and fabric manufacturer' written cleaning instructions.

1.10 WARRANTY

- A. Warranty: Submit a written warranty for the synthetic grass surfacing system agreeing to repair or replace materials and components of the synthetic grass surfacing system that develop defects in materials or workmanship within the specified warranty period and any other deterioration of the surfacing system or evidence of failure to meet performance requirements. Defects include the following:

SYNTHETIC GRASS SURFACING SYSTEM

32 18 16-3

1. Excessive Fading: Defined as the synthetic grass surfacing system shall remain a uniform color, without a change in appearance that is perceptible and objectionable, as determined by the Owner, when viewed visually in comparison with the original samples.
 2. Ultraviolet (UV) and heat degradation.
 3. Excessive Wear. Defined as the synthetic grass surfacing system pile height shall not decrease by more than 10 percent each year, or more than 50 percent within the specified warranty period beyond that attributable to normal use
 4. Tuft bind loss
 5. Fabric delamination.
 6. Loss of backing integrity.
 7. Seam and edge raveling
 8. Perimeter attachments
 9. Distortion, either vertically or horizontally, due to dimensional instability.
- B. Warranty Period. 15 year from the date of Substantial Completion.
- C. The warranty shall include that if the synthetic grass surfacing system is determined to no longer be serviceable within the specified warranty period, the manufacturer and installer shall, at no cost to the Owner, remove and replace those areas of the surfacing system not meeting the specified performance criteria.
- D. The warranty shall not be limited by the amount of use and shall not be prorated.
- E. Provide warranty signed by the Contractor, surfacing system manufacturer, and installer
- F. The above warranties are in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. The synthetic grass surfacing system shall comply with the following.
1. Linear Density: Not less than 5,040 Denier; ASTM D 1557.
 2. Pile Weight: Total pile weight 80 oz/sq yd; ASTM D 5848.
 3. Primary Backing Weight: 8 oz/sq yd; ASTM D 5848.
 4. Secondary Backing Weight: Average 20 oz/sq yd; ASTM D 5848.
 5. Total Weight: 104 oz/sq yd; ASTM D 5848.
 6. Tuft Bind: Not less than 8 lbs; ASTM D 1335.
 7. Flame Resistance: Pass, ASTM D 2859.
 8. Drainage Through Fabric: Not less than 30 inches per hour; ASTM F 1551.
 9. Lead Content: Comply with ASTM F 2765 for maximum lead content. Meet all federal and state heavy metal compliance standards.
- B. Provisions for Thermal Movement: The synthetic grass surfacing system, when installed shall accommodate expansion and contraction, to a maximum of 1.0 percent, over the average range of temperature and humidity conditions experienced in Beverly Hills.
- C. Uplift Resistance: The synthetic grass surfacing system shall be capable of withstanding wind loads in cladding wind load test report

- D. Drainage: The synthetic grass surfacing system shall allow for the free movement and drainage of surface water through the surfacing system

2.2 SYNTHETIC GRASS FABRIC

- A. Yarn: Athletic quality polyethylene parallel-long slit fiber yarn engineered specifically for outdoor use and stabilized to resist the effects of ultra-violet breakdown, heat, wear, water, fungus attacks, and airborne pollution.
 - 1. Yarn:
 - a. Field: Polyethylene with HeatBlock.
 - b. Trim: Texturized Polypropylene.
 - 2. Yarn Length:
 - a. Field: 1-1/2 inches long, nominal.
 - b. Trim: 1-1/4 inch long, nominal, +/- 15 percent.
 - 3. Color:
 - a. Field: Turf Green.
 - b. Trim: Turf Green.

2.3 INFILL

- A. Granular Infill: Manufacturer's standard granular infill to control odors made from 100 percent natural organic material and 97 percent pure clinoptilolite zeolite, installed in ratio, density, and thickness recommended by the manufacturer for the application.

2.4 ACCESSORIES

- A. Perimeter Board: Wood and plastic composite materials made from reclaimed wood fiber and reclaimed or recycled thermoplastic polymer plastic material.
 - B. Drainage Pad: Recycled closed cell polyethylene foam pad with drainage channels on the bottom of the pad. Density of pad as recommended by synthetic grass manufacturer.
 - 1. Poly-Green Foam, Poly-Green Foam LLC.
 - 2. Or other as recommended by grass surfacing manufacturer.
- OR-
- C. Drainage Mat: Recycled polypropylene drainage core of fused, entangled filaments in a square waffle pattern with a geocomposite fabric bonded to one side.
 - 1. Enkadrain 3811R, Colbond, Inc
 - 2. Or other as recommended by grass surfacing manufacturer.
 - D. Provide all additional materials, equipment and accessories necessary for a complete installation as recommended by the manufacturer. Included are all perimeter fasteners backings, tools, labor, equipment, and means for protection of adjacent surfaces and materials.

2.5 FABRICATION

- A. Fabric Rolls: Fabricate synthetic grass fabric in strips, 15 ft wide by length required to extend completely across the grass surfacing area, without intermediate cross seams.

SYNTHETIC GRASS SURFACING SYSTEM

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine area to receive synthetic grass surfacing system, with installer present, for compliance with manufacturer's requirement and other conditions affecting performance.
 - 1. Verify the finish elevations, slopes, and planarity of the base comply with requirements of the Project and surfacing system manufacturer.
 - 2. Record findings, prepare a written report, signed by Contractor and installer, and submit copies of report to the Owner.
- B. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of installation shall indicate acceptance of existing conditions.

3.2 PREPARATION

- A. Thoroughly clean the area to receive the synthetic grass system of foreign material and all other substances and materials that may be detrimental to permeability and/or installation of the synthetic grass system.

3.3 INSTALLATION

- A. General: All work shall be performed by skilled workmen, who are experienced and trained by the manufacturer in the installation of the synthetic grass system. Work shall be performed in accordance with the Drawings, reviewed shop drawings, and manufacturer's written installation instructions.
- B. Synthetic grass surfacing fabric roll shall be unrolled and allowed to relax prior to installation.
- C. Fabric Roll Installation:
 - 1. Synthetic grass surfacing fabric rolls shall be installed across entire width of area, parallel to long dimension, or as directed by the Architect, directly over drainage pad/mat.
 - a. Rolls shall extend from edge to edge and be attached to perimeter boards. Cross seams are not allowed
 - b. Rolls shall be rolled out in same direction and installed with uniform pile direction of fibers.
 - c. Rolls shall be laid straight and true to line. Adjacent rolls, when laid together, shall form a tight fitting seam for the entire length of the fabric. Fitted pieces are not allowed.
 - 2. Spot glue to drainage pad/mat and concrete slab at edges as recommended by the surfacing system manufacturer.
 - 3. Attach the surfacing fabric to the perimeter boards with staples or nails as recommended by the surfacing system manufacturer
- D. Seaming of Fabric:
 - 1. Seams in the synthetic grass fabric rolls shall be glued together with seaming cloth utilizing the manufacturer's standard seaming procedures and materials, ensuring that each roll is properly attached to the next.
 - a. Seams shall be flat, tight, and permanent, with no separation or fraying.

- b. Seams, when completed, shall display no visible signs of joining, with fibers brushed to provide full coverage of fibers over the seam.
- E. Infill Material Installation: Install infill materials shall be applied as recommended by the surfacing system manufacturer, to ensure the voids between the fibers are filled and the fibers are being held vertically and non-directional

3.4 CLEANING AND PROTECTION

- A. The installer shall keep the site clean and clear of debris throughout the project. Waste materials, including excess materials remaining after completion of the Work shall be removed and legally disposed of offsite.
- B. Installer shall provide all labor, supplies, and equipment required to completely remove stains and other blemishes from all finished surfaces.
- C. Provide protection over installed synthetic grass surfacing systems, including closing the area to traffic, as required to ensure installed system will be free of damage at time of Substantial Completion.

3.5 INSPECTION

- A. Inspection: After installation is complete, the synthetic grass surfacing system installer, synthetic grass surfacing system manufacturer's representative, and Owner shall inspect the installation. Any corrections shall be noted in a written report and completed prior to Substantial Completion.

3.6 DEMONSTRATION AND TRAINING

- A. Train Owner's staff regarding maintenance and repair/replacement of the synthetic grass surfacing system, and maintenance Training dates and times shall be coordinated by the Owner.
- B. All training shall be completed prior to Substantial Completion of the project.

END OF SECTION

Attachment 4

**Synthetic Turf: Health Debate
Takes Root, Environmental
Health Perspectives, 2008**



Environ Health Perspect. 2008 Mar; 116(3): A116–A122.

PMCID: PMC2265067

Environews

Focus

Synthetic Turf: Health Debate Takes Root

[Luz Claudio](#)

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In Little League dugouts, community parks, professional athletic organizations, and international soccer leagues, on college campuses and neighborhood playgrounds, even in residential yards, the question being asked is "grass or plastic?" The debate is over synthetic turf, used to blanket lawns, park spaces, and athletic fields where children and adults relax and play; the questions are whether synthetic turf is safe for human and environmental health, and whether its advantages outweigh those of natural grass. Despite or perhaps because of the fact that it is too early to definitively answer those questions, the debate is fierce.

New York City, which buys the largest amount of synthetic turf of any U.S. municipality, held a hearing 13 December 2007 on the use of synthetic turf in city parks. There is a clear need for open space in the city. The 28,700 acres of land constituting some 4,000 parks are distributed unevenly throughout the city. "Many districts have no green parks, not even one," said Helen Sears, a city council member representing the Jackson Heights neighborhood, during the hearing.

New York City Department of Parks & Recreation commissioner Adrian Benepe wants to address the need for parks and athletic fields by installing not only natural grass fields and lawns but also synthetic turf. "With quality recreational facilities—which means, in some cases, synthetic turf fields—we will be able to better confront this issue," he says. In New York City, he points out, at least 35 synthetic turf fields are or will be a replacement for asphalt surfaces.

Others oppose the move toward synthetic turf. "Grassroots organizations have been working hard to have pesticide use reduced or banned in places where it is unnecessary," says Tanya Murphy, a board member of Healthy Child, Healthy World, an advocacy organization. "Now we're going from the frying pan and into the fire when replacing grass with synthetic turf."

The debate leaves many on the fence. Orlando Gil, an assistant research scientist at New York University and soccer coach, is weighing both alternatives: "We want children to play outside, exercise, and play sports, but with pesticides and fertilizers in grass and chemicals in artificial turf, I don't know which to choose."

Indeed, a dearth of research on the nonoccupational human health effects of exposure to the constituents of synthetic turf hampers the ability to make that choice with any degree of confidence. On the basis of limited toxicity

data, some reports have concluded the health risks are minimal. Most agree, however, that far more research is needed before the question can be definitively answered. In the 13 December 2007 issue of *Rachel's Democracy and Health News*, William Crain of the City College of New York Psychology Department and Junfeng Zhang of the University of Medicine & Dentistry of New Jersey School of Public Health called conclusions of minimal risk "premature."

A Turf History

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During the 1950s, the Ford Foundation studied ways to incorporate physical fitness into the lives of young people, particularly in cities where outdoor play areas were scarce. Ford joined Monsanto Industries to create an artificial surface on which children could play sports. In 1964 the first artificial playing surface was marketed under the name Chemgrass.

Meanwhile, the first domed stadium was being built in Houston, Texas. The Astrodome, with its retractable translucent plastic ceiling, let in enough sunshine to maintain a natural grass field. But after the first baseball season, it was clear there was a problem. The plastic panes produced a glare that made it difficult for players to see the ball. This problem was solved by painting the panes black—but then the grass began to die from lack of sunlight. By the beginning of the second season, the Astros were playing on dead grass and painted dirt. At this time, production of Chemgrass was limited, but what little was available was installed in the Astrodome. By the end of the 1966 season, the material had been renamed AstroTurf. The green nylon carpet was a success.

The popularity of AstroTurf grew steadily during the 1970s and 1980s, with most of its use in professional sports arenas. However, a backlash began to unfold when players started to complain about the surfacing. The English Football Association banned synthetic turf in 1988, mainly because of complaints from athletes that it was harder than grass and caused more injuries. Similar concerns were growing in the United States. A poll conducted by the National Football League Players Association in 1995 showed that more than 93% of players believed playing on artificial surfaces increased their chances of injury. This sentiment was famously expressed by baseball player Dick Allen: "If a horse won't eat it, I don't want to play on it."

The movement against AstroTurf gained traction, and many ballparks were converted to natural grass during the 1990s. One example was Giants Stadium in New Jersey, which had used AstroTurf since its construction in 1976. The stadium was refitted with a system of 6,000 removable trays of natural grass. Even the new stadium in Houston, built to replace the original Astrodome, was surfaced with grass.

In this story of grass, the balance is tilting once more against the natural kind. Natural grass, under some circumstances, cannot consistently withstand the demands of sports where a lot of running is involved. Parallel to this back-and-forth controversy over which is best have come new developments in the manufacture of synthetic turf. Several companies, including the makers of the original AstroTurf, have come on the market with new playing surfaces.

FieldTurf, for example, is made of a blended polyethylene–polypropylene material woven to simulate blades of grass. The "grass" is held upright and given some cushioning by adding a layer of infill made of recycled tires, rubber particles 3 mm in diameter or smaller. This crumb rubber infill is sometimes mixed with silica sand. Many stadiums that switched to grass from AstroTurf have since switched back to FieldTurf-style synthetic turf.

Figures from the Synthetic Turf Council, a trade organization based in Atlanta, show that 10 years ago there were 7 new-generation fields installed in the United States. Today there are 3,500. Says Geoffrey Croft, president of the nonprofit New York City Parks Advocates, which promotes public funding and increased park services, "There are millions of square feet of synthetic turf already installed on fields around the country, and not one environmental impact statement has been issued."

Human Health Questions

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Given the relatively recent development of new-generation synthetic turf, there are unanswered questions regarding its potential effects on health and the environment, with the rubber infill one of the main sources of concern. The crumbs become airborne and can be breathed in and tracked into homes on clothes and athletic gear. There are also questions about dermal and ingestional exposures, and about ecosystem effects.

For athletes, the little black rubber pellets may seem little more than a nuisance. Others express more concern, especially when it comes to children's exposure to the infill. Patti Wood, executive director of the nonprofit Grassroots Environmental Education, argues, "This crumb rubber is a material that cannot be legally disposed of in landfills or ocean-dumped because of its toxicity. Why on earth should we let our children play on it?"

Recycled crumb rubber contains a number of chemicals that are known or suspected to cause health effects. The most common types of synthetic rubber used in tires are composed of ethylene-propylene and styrene-butadiene combined with vulcanizing agents, fillers, plasticizers, and antioxidants in different quantities, depending on the manufacturer. Tire rubber also contains polyaromatic hydrocarbons (PAHs), phthalates, and volatile organic compounds (VOCs).

According to the Rubber Manufacturers Association, only 8 states have no restrictions on placing tires in landfills. Most of these restrictions have to do with preventing pest problems and tire fires, which release toxicants such as arsenic, cadmium, lead, nickel, PAHs, and VOCs.

Some studies suggest that the same chemicals that can be released profusely during a tire fire may also be released slowly during deterioration of crumb rubber. For instance, researchers at the Norwegian Institute of Public Health presented a report at the 2006 meeting of the International Association for Sports Surface Sciences on turf-related chemicals in indoor stadiums. The report, *Artificial Turf Pitches: An Assessment of the Health Risks for Football Players*, showed that VOCs from rubber infill can be aerosolized into respirable form during sports play. The authors calculated health risk assuming the use of recycled rubber granulate, which releases the lowest amounts of these chemicals of any type of rubber infill.

The report concluded that, given current knowledge, the use of synthetic turf indoors does not cause any elevated health risk, even in vulnerable populations such as children. However, the report continues, "It should also be noted that little or no toxicological information is available for many of the volatile organic compounds which have been demonstrated as being present in the air in the [indoor stadiums]. . . . [Furthermore], not all organic compounds in the [stadium] air have been identified." In particular the report called for more information regarding the development of asthma and airway allergies in response to exposure to the latex in many tires.

Similarly, the California Office of Environmental Health Hazard Assessment (OEHHA), in the January 2007 report *Evaluation of Health Effects of Recycled Waste Tires in Playground and Track Products*, concluded that 49 chemicals could be released from tire crumbs. Based on an experiment simulating gastric digestion, the OEHHA calculated a cancer risk of 1.2 in 10 million assuming a one-time ingestion over a lifetime—well below the 1 in 1 million *di minimis* risk threshold. In a hand-wipe experiment, the OEHHA calculated an increased cancer risk of 2.9 in 1 million for ingestion of chrysene (a suspected human carcinogen found in tire rubber) via hand-to-mouth contact with crumb rubber infill. This estimate assumed regular playground use for the first 12 years of life and was termed by the authors to be "slightly higher" than the *di minimis* level.

In the summer of 2007, Environment and Human Health, Inc. (EHHI), a nonprofit organization headquartered in North Haven, Connecticut, commissioned a study from the Connecticut Agricultural Experiment Station to determine whether toxic compounds from crumb rubber could be released into air or water. The report *Artificial Turf* describes identifying 25 chemical species with 72–99% certainty using mass spectrometry–gas chromatography. Among those definitively confirmed were the irritants benzothiazole and *n*-hexadecane; butylated hydroxyanisole, a carcinogen and suspected endocrine disruptor; and 4-(*t*-octyl) phenol, a corrosive that can be injurious to mucous membranes.

The Synthetic Turf Council said in a statement issued on 13 December 2007 that “Claims of toxicity [in the EHHI report] are based on extreme laboratory testing such as the use of solvents and high temperatures to generate pollutants.” But the EHHI stands by its studies. *Artificial Turf* author David Brown, EHHI’s director of public health toxicology, says, “It is clear the recycled rubber crumbs are not inert, nor is a high temperature or severe solvent extraction needed to release metals, volatile, or semi-volatile organic compounds.” Brown asserts that the laboratory tests approximate conditions that can be found on the field, and that no solvent besides water was used.

According to Brown, the basic barrier to accurately assessing the safety of recycled tire rubber is the high variability in tire construction and the lack of chemical characterization of the crumb rubber. “Very few samples have been tested,” he says. “There is no study with sufficient sample sizes to determine the potential hazard.” He adds, “Since new tires contain vastly different amounts of the toxic materials, based on the intended use, it is impossible to ensure players or gardeners and others that their personal exposure is within safe limits.”

Another debated health issue is that of injuries. Several studies published in a supplement to the August 2007 issue of the *British Journal of Sports Medicine* reported no differences in the incidence, severity, nature, or cause of injuries in soccer teams who played on grass versus new-generation synthetic turf. However, injuries may depend on the type of sport being played. A five-year prospective study of football injuries among high school teams published 1 October 2004 in *The American Journal of Sports Medicine* showed that there were about 10% more injuries when games were played on synthetic turf than when played on grass surfaces. Conversely, the risk of serious head and knee injuries was greater on grass fields.

Injuries lead to another concern: infection with methicillin-resistant *Staphylococcus aureus* (MRSA), which is thought to spread especially easily among athletes because of repeated skin-to-skin contact, frequency of cuts and abrasions, and sharing of locker room space and equipment. A study conducted by the Centers for Disease Control and Prevention and published in the 3 February 2005 issue of the *New England Journal of Medicine* showed that, although synthetic turf itself did not appear to harbor MRSA, the greater number of turf burns caused by the abrasive friction of this type of surface increased the probability of MRSA infection, especially among professional athletes playing on hard surfaces.

There is, however, some evidence to suggest that synthetic turf may harbor more bacteria. For example, an industry study sponsored by Sprinturf, a maker of synthetic turf, found that infill containing a sand/rubber mixture had 50,000 times higher levels of bacteria than infill made of rubber alone. To address this, the company markets synthetic turf that is “sand-free” as a safer alternative and offers sanitation for those fields already installed.

Proper maintenance of synthetic turf requires that the fields be sanitized to remove bodily fluids and animal droppings; manufacturers market sanitizing products for this purpose. According to *Synthetic Turf Sports Fields: A Construction and Maintenance Manual*, published in 2006 by the American Sports Builders Association, some synthetic turf owners disinfect their fields as often as twice a month, with more frequent cleanings for sideline areas, where contaminants concentrate.

Different Shades of Green

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Cultivated natural grass carries plenty of environmental baggage. According to “Water Management on Turfgrass,” a paper on the Texas A&M University Cooperative Extension website (<http://plantanswers.tamu.edu/>), natural grass sports fields can require up to 1.5 million gallons of water per acre per year. The frequent mowing required for natural grass lawns and fields also results in emissions of hydrocarbons and carbon monoxide (up to 5% of such emissions in the United States, according to the Environmental Protection Agency).

Natural grass does offer tangible benefits, however. According to Turfgrass Producers International, these include increased pollution control, absorption of carbon dioxide, a cooling effect, water filtration, and prevention of soil erosion. There are also perhaps intangible benefits to a field of grass. Crain presents the idea that replacing grass

with synthetic turf can hinder children's creative play and affect their development. "Today's children largely grow up in synthetic, indoor environments," he says. "Now, with the growing popularity of synthetic turf fields, their experience with nature will be less than ever."

Adds Croft, "Although there is an important need for open spaces, the issue here is not open space but active recreational facilities. I don't see the connection between open space and installing synthetic turf fields."

Synthetic turf does offer certain advantages over natural grass. *A New Turf War: Synthetic Turf in New York City Parks*, a report released in 2006 by the advocacy group New Yorkers for Parks, points out, "Proponents of synthetic turf fields tout the reduction of allergy and asthma triggers. The removal of natural pollens and grasses may be beneficial to children and adults with these afflictions."

One of the main arguments used in favor of synthetic turf is that it can be installed relatively quickly and, once functional, can be used almost continuously. In contrast, grass fields need time to take root and must be closed periodically for proper maintenance. For example, the Central Park Conservancy, a private philanthropy that maintains New York City's Central Park, closes grass fields all winter; during the summer and spring, fields are closed on a rotating basis for restoration. Also, tackle football and cleated shoes are prohibited on all of the fields, and the fields are closed whenever it rains or they are wet. According to estimates from the New York City Department of Parks & Recreation, synthetic fields can be open for use 28% more of the time in a year than natural grass fields because they can withstand heavy use, which the department estimates has doubled in the last eight years.

Lower cost for long-term maintenance is another argument that is made for synthetic turf, although the degree of the savings is disputed. It is generally agreed that installation costs of synthetic turf can be almost double those of natural grass. For instance, a synthetic turf soccer field can cost almost \$1.4 million compared with a natural grass field at about \$690,000. But when the costs are prorated over the expected lifespan of the field, including maintenance, the difference in cost narrows to less than \$15,000 more for the natural grass, according to *A New Turf War*.

Although some, like Benepe, consider this cost savings to be substantial, others consider it insignificant. As Christian DiPalermo, executive director of New Yorkers for Parks, puts it, "The amount of money saved is negligible considering the many unknowns about artificial turf."

One drawback that both fans and critics of synthetic turf agree on is that these fields can get much hotter than natural grass. Stuart Gaffin, an associate research scientist at the Center for Climate Systems Research at Columbia University, initially became involved with the temperature issues of synthetic turf fields while conducting studies for another project on the cooling benefits of urban trees and parks. Using thermal satellite images and geographic information systems, Gaffin noticed that a number of the hottest spots in the city turned out to be synthetic turf fields.

Direct temperature measurements conducted during site visits showed that synthetic turf fields can get up to 60° hotter than grass, with surface temperatures reaching 160°F on summer days. For example, on 6 July 2007, a day in which the atmospheric temperature was 78°F in the early afternoon, the temperature on a grass field that was receiving direct sunlight was 85°F while an adjacent synthetic turf field had heated to 140°F. "Exposures of ten minutes or longer to surface temperatures above 122°F can cause skin injuries, so this is a real concern," said Joel Forman, medical director of the Pediatric Environmental Health Specialty Unit at Mount Sinai School of Medicine, speaking at a 6 December 2007 symposium on the issue.

Many physical properties of synthetic turf—including its dark pigments, low-density mass, and lack of ability to vaporize water and cool the surrounding air—make it particularly efficient at increasing its temperature when exposed to the sun. This is not only a hazard for users, but also can contribute to the "heat island effect," in which cities become hotter than surrounding areas because of heat absorbed by dark man-made surfaces such as roofs and

asphalt. From many site visits to both black roofs and synthetic turf fields, Gaffin has concluded that the fields rival black roofs in their elevated surface temperatures.

Although it is often argued that one of the advantages of synthetic turf is that it does not need irrigation, some installations must be watered to control the excessive heat. Benepe stated in public hearings that water misters may have to be installed in some fields to help remedy the heat problem. According to Gaffin, synthetic turf is so efficient at absorbing sunlight, that cooling with water is only temporarily effective. "After a short while of watering, I expect the temperature should rebound and the surface become intolerably hot again," he says.

In addition to heat control, the International Hockey Federation requires that college teams saturate synthetic turf fields before each practice and game to increase traction, according to an article in the 19 October 2007 Raleigh (North Carolina) *News & Observer*. The article, which examined why local universities were watering their synthetic turf fields in the midst of severe ongoing drought in the U.S. Southeast, noted that Duke University received a business exemption to water the fields provided overall campus water consumption decreased by 30%.

The EHHI study addressed the question of whether synthetic turf fields can contribute to increased water contamination from rain or from spraying or misting. The study found that 25 different chemical species and 4 metals (zinc, selenium, lead, and cadmium) could be released into water from rubber infill. Moreover, because synthetic turf is unable to absorb or filter rain-water, chemicals filter directly into storm drains and into the municipal sewer system without the beneficial filtration that live vegetation provides. Benepe and others agree this can be an issue that New York City would need to address, as water runoff from synthetic turf fields could overwhelm storm drains, thus contributing to the estimated 27 billion gallons of raw sewage and stormwater that discharge from 460 combined sewer overflows into New York Harbor each year.

Finally, what happens to synthetic turf fields when they are no longer usable? Industry estimates that synthetic turf fields have a lifespan of 10 to 12 years, whereupon the material must be disposed of appropriately. Rick Doyle, president of the Synthetic Turf Council, says the infill could be cleaned and reused; put to another purpose, such as for rubber asphalt; incinerated; used in place of soil to separate landfill layers; or otherwise recycled. Typically, however, it is landfilled.

Alternatives

Go to:

One of the benefits of synthetic turf is that it can serve as a way to reuse old tires, a real problem given the 1 billion-plus tires that are sold every year. Doyle says the synthetic turf industry currently recycles one-twelfth of the 300 million auto tires that are withdrawn from use each year. The average soccer field can contain crumb rubber made from 27,000 tires at a density of about 4 to 15 pounds of infill per square foot.

Europe has launched an aggressive tire recovery campaign in which tires that meet quality criteria can be retreaded and reused. End-of-life tires that cannot be reused are recycled for other uses including some industrial energy-generating applications, the production of rubberized pavement, and recycling into materials for the car industry (in addition to some use in producing synthetic turf). In western Europe, recovery rates of used tires have increased from 65% in 2001 to almost 90% in 2005.

Whereas end-of-life tires add tons of waste a year for disposal in many areas, in Europe they are turning into a potentially lucrative secondary raw material. "There are increasingly numerous applications," says Serge Palard, head of the end-of-life tire recovery department at Michelin, one of the largest tire manufacturers in the world. "In some countries where we did not know what to do with end-of-life tires a few years ago, now we do not have enough to meet the demand of all the reprocessors."

In accordance with the European Union's recently implemented REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) regulations, which will require more testing of industrial chemicals, companies such as Michelin are working to reduce the use of harmful chemicals in tires in order to facilitate recycling into other

products.

European companies are also finding innovative ways to address concerns regarding recycled tire infill in synthetic turf. In Italy, for example, there is an effort to market synthetic turf fields that feature infill made of a new thermoplastic material that is thought to be nontoxic. Mondo, a manufacturer of floor surfaces, produces Ecofill, a patented polyolefin-based granule used in synthetic turf. According to the company, this material disperses heat more efficiently; is highly shock absorbent; does not contain polyvinyl chloride, chlorine, plasticizers, heavy metals, or other harmful chemicals; and is 100% recyclable.

Another alternative is infill made from plant-derived materials. Synthetic turf manufacturer Limonta Sport produces Geo Safe Play, an infill made from coconut husks and cork. Company spokesperson Domenic Carapella says, "There are certainly alternatives to crumb rubber. There is no longer a reason to sacrifice the playing quality and more importantly the health of children [playing on synthetic turf]."

Why can't the alternative to bad grass fields simply be well-maintained grass fields, asks Croft. Certain varieties of turf grasses have been bred for resistance to stress, ability to withstand trampling and low water conditions, and other characteristics that make them appropriate for athletic field use.

But according to Doyle, increased maintenance is not the answer. "More maintenance cannot overcome overusage of a natural grass sports field," he says. "And overusage of a natural grass sports field or usage during a rainstorm or in months of dormancy will produce an unsafe playing surface." Adds Benepe, "Even the wealthiest professional sports teams and Ivy League universities have concluded that grass fields are a losing proposition for intense-use sports such as football or soccer. . . . There is also the reality that natural turf fields used for high-intensity sports must be replaced every few years, unless you severely restrict use."

For now, New York State Assembly-members Steve Englebright, William Colton, and David Koon have proposed legislation to impose a six-month moratorium on the installation of synthetic turf until the state health and conservation departments have better studied the pros and cons of natural and synthetic grass. Said Englebright in a 5 November 2007 statement, "Before we take risks with our children's health and drinking water quality, we need to make sure that the uncertainties . . . are fully investigated."



Synthetic turf field at Cadman Plaza Park, Brooklyn, New York



Weighing costs and benefits



Moratorium introduced



Thermal effect



Growing demand

Articles from Environmental Health Perspectives are provided here courtesy of National Institute of Environmental Health Science

Attachment 5

Correspondence: Suggested
Ordinance Language Submitted
by Tom Gallup on 7/22/15

TURFSCAPE

RECOMMENDED ORDINANCE CONSIDERATIONS

Below are the considerations for the potential/recommended Ordinances for City, Municipalities, State, Associations and Regulatory Entities with regard to the use of synthetic grass for landscape applications. It is important to note that the landscape synthetic grass market is best considered as three separate applications: Residential, Municipal and Commercial. The term “turfscape” is synonymous with the practice of utilizing synthetic turf for all landscape applications.

1. CONCEPT PARAMETERS:

1.1 Plant A Tree:

In an effort to be environmentally responsible it is recommended that a one-inch (1") caliper tree be incorporated and planted as part of the overall turfscape/synthetic turf installation design. It is not required that the tree be within the area to be covered by the turfscape/synthetic turf surface, but within the property to feature the turfscape/synthetic turf.

The oxygen production of natural grass is actually negligible, and the incorporation of a single one-inch (1") caliper tree dramatically impacts the oxygen production positively with respect to the removal of the natural grass and installation of the turfscape/synthetic turf.

1.2 Percentage of Coverage:

It is recommended that the Total Outdoor Living Space be no greater than 90% turfscape/synthetic turf by square footage. Whether as a result of existing hardscape, such as walkways, driveways, decks, etc., or the preservation/incorporation of drought tolerant landscapes, 100% coverage of the total outdoor living space is not allowed. This concept parameter is necessary to keep outdoor living spaces dynamic, natural looking and esthetically pleasing.

The total outdoor living space is calculated by taking the overall property area and subtracting the footprint of any building structures on the property.

Total Outdoor Living Space = Overall Property Square Footage – Building Structure Square Footage
Turfscape Allowable Maximum Area = Total Outdoor Living Space * 90% (Ninety Percent)

1.3 Water Harvesting:

The concept of Water Harvesting is promoted, recommended and even financially incentivized. The concept parameter of Water Harvesting is for the non-potable water to be captured, stored and inevitably utilized on the property from which it was collected for various landscape and washing applications. Note that rainwater is not considered potable (not recommended for human consumption).

The use/sale of water from Water Harvesting activities on any property to another property are strictly prohibited. The overall concept parameter is that water collected can be stored and utilized over time on

the same property, resulting in the water going where it was always going to go naturally/organically. The process of Water Harvesting is merely time releasing this water, but never intended to disrupt the natural flow of rainwater to the underground water table.

Water Harvesting Design Capacity: The design capacity of the water harvesting storage should be a minimum volume of double the 100-year storm event for the specific property location.

2. DESIGN PARAMETERS:

A Product Approval Protocol has been developed to streamline the review of various competitors' turfscape/synthetic turf systems offered. Several of the sections below are governed within the Product Approval Protocol.

2.1 Tree Setback:

The incorporation of turfscape/synthetic turf on any property is required to be setback from any existing or newly incorporated trees. The following setbacks have been established based on the caliber of the tree at the time of installing turfscape/synthetic turf.

The Tree Trunk Caliper Size: (Determination/Formula)

Height below 5 feet: For the purpose of this determination is measured at 1/3 of the trees total height. Therefore a tree that is 3 feet in total height will be measured at 1 foot of the ground.

Height 5 feet or above: For the purpose of this determination is measured at 3 feet off the ground.

Tree Trunk Caliper Size Setback: (Requirement/Calculation)

Minimum: One (1) foot radius setback for all trees from the base in all directions at time of turfscape/synthetic turf installation.

Minimum Calculation: One (1) foot radius for every six (6) inches of Tree Trunk Caliper is the Required Setback.

Recommended Calculation: One (1) foot radius for every (4) inches of Tree Trunk Caliper is the Recommended Setback.

Setback Ground Cover Recommendation: It is recommended that the Tree Trunk Setback be either, organic soil, mulch or tree grate. It is recommended that drip irrigation be incorporated when possible to support the healthy growth of trees, while maintaining a responsible water management strategy.

2.2 Drainage:

Turfscape surface: The minimum drainage requirement for turfscape/synthetic turf is forty (40) inches per hour. The system should have independent laboratory testing to support this requirement

submitted as part of the approval process.

Subsurface: The drainage requirement for any subsurface below a turfcape/synthetic turf installation should be designed, constructed and tested to be a minimum of six (6) inches per hour.

Fabric Lining: No liner shall be utilized unless Water Harvesting has been or will be incorporated. The prime directive is that the water is intended to go where it has always gone. Any fabric that does not allow a minimum of forty (40) inches per hour is considered restrictive and must not be utilized.

2.3 System Testing-ASTM:

There are 21 ASTM tests that are applicable to turfcape/synthetic turf to ensure quality and validate the performance. Any product submitted for approval must have independent testing completed for all the test methods as detailed in the Product Approval Protocol. The Product Approval Protocol outlines the acceptable value range by testing method.

Approved Testing Procedure: The mandatory ASTM testing procedures are detailed in the Vendor Approval Protocol. Required test results are detailed in the Vendor Approval Protocol.

2.4 System Testing-LHM:

The turfcape/synthetic turf system (not just the turf material) must have Lead and Heavy Metal (LHM) testing completed to be submitted for approval. Any product submitted for approval must have independent Lead and Heavy Metal testing completed as required by ASTM 3052 @ 210 degrees. The maximum values allowed are listed in the Product Approval Protocol.

Approved Testing Procedure: ASTM 3052 @ 210 Degrees – RCRA Mercury (Hg) and RCRA Metals. Required test results are detailed in the Vendor Approval Protocol.

2.5 Warranty-Insured:

All turfcape/synthetic turf surfaces must feature an eight (8) year insured warranty by an A.M. BEST – A rated or higher provider.

Any product submitted for approval must be covered by a comprehensive prepaid eight (8) year insured warranty. The Product Approval Protocol outlines the general warranty requirements/features.

2.6 ADA Compliance:

All turfscape/synthetic turf surfaces must have independent testing to confirm ADA compliance as detailed and required by ASTM F1951-09 (Wheel Chair Accessibility). The Product Approval Protocol outlines the ADA testing requirements.

The general ADA Compliance requirements regarding slopes and outdoor public areas are required as applicable.

Approved Testing Procedure: ASTM 1951-09 – Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment – (Wheel Chair Accessibility). Required test result “Pass”.

3. PRODUCT QUALITY PARAMETERS:

A Product Approval Protocol has been developed to streamline the review of various competitors' turfscape/synthetic turf systems offered. Several of the sections below are governed within the Product Approval Protocol.

3.1 Density Rating (DR):

The Density Rating (DR) is utilized to ensure there is adequate face weight (fiber) to endure its intended use without excessive matting. More fiber is required to support a turfscape/synthetic turf system as the pile height increases and/or gets taller.

Turfscape/synthetic turf systems density ratings typically range from 450 to 3000.

The Minimum Density Ratings is 650.

The Recommended Density Rating is from 1000 to 2000.

Face Weight Definition: The definition of Face Weight (FW) is the weight in ounces (oz) of the grass zone fiber.

Note: That the microbed fiber used as reinforcement within the turfscape/synthetic turf system is not eligible as part of the face weight calculation.

The Density Rating (DR) Calculation:

$$DR = \frac{\text{Face Weight} * 36}{\text{Pile Height}}$$

3.2 Face Weight:

Minimum Face Weight is 33 ounces

Face Weight (FW) Definition: The definition of Face Weight (FW) is the weight in ounces (oz) of the grass zone fiber. The weight of the Microbed fiber is not to be included in the Face Weight (FW) calculation.

MicroBed Weight (MW) Definition: The definition of Microbed Weight (MW) is the weight in ounces (oz) of the secondary support fiber. The weight of the Microbed fiber is not to be

included in the Face Weight (FW) calculation.

The recommended Microbed Weight (MW) is to be no less than 25% and no more than 50% of the Face Weight (FW).

Approved Testing Procedure: ASTM D5848-07 – Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings. (Face Weight). Required test result – min 33 oz/sy.

3.3 Infill:

Infill is measured in many different aspects. There exist many options for infill materials utilized within a turfscape/synthetic turf landscape installation. The aspects listed below are intended to afford various infill options but maintain quality and preserve the general aesthetic appeal.

Infill Weight:

Minimum 3 pounds per square foot (SF)

Recommended 5 pounds per square foot (SF)

Infill Height:

Recommended that the minimum infill depth be 1/3 of the pile height of the grass zone fiber.

Infill Reveal:

The definition of Reveal is the amount of exposed fiber above the infill layer. The minimum Reveal is half an inch (0.5"). There should be a minimum of 1/2" of exposed fiber above the infill level.

3.4 Pile Height:

The pile height of the grass zone fiber must be a minimum of one (1) inch and a maximum of two and one half (2.5) inch in height.

Minimum one (1") inch

Maximum two and one half (2.5") inch

Approved Testing Procedure: ASTM D5823-05a – Standard test Method for Turf Height of Pile Floor Coverings – (Pile Height). Required test result – Min 1" and Max 2.5".

3.5 Backing Strength:

Based on ASTM D5034-09 – the minimum breaking strength is 200 pounds/force or 889 newtons (N) in both the Machine Direction (MD) – Length and Cross Machine Direction (CMD) – width.

Min. 200 lbs/force – 889 Newtons (N) in both MD and CMD

Approved Testing Procedure: ASTM D5034-09 – Standard Test Method for Breaking Strength and Elongation of Textile Fabrics – (Grab Tear Strength). Required test result minimum 200 lbs/force = 889 N in both MD and CMD.

3.6 Gauge:

The gauge is the spacing between tufting rows:

Minimum Gauge is 3/8"

Maximum Gauge is 1/2"

Approved Testing Procedure: ASTM D5793-05 – Standard Testing Method for Binding Sites Per Unit Length or Width of Pile Yarn Floor Coverings – (Machine Gauge). Required test result minimum gauge 3/8" and maximum gauge 1/2".

3.7 Hardness-Gmax:

Hardness is a safety aspect to any green-space. The Gmax should never exceed 200 G's and the preferred maximum Gmax is 150 G's. The Gmax should never be below 80 G's and the preferred minimum Gmax is 90 G's.

Gmax Maximum - 200 G's.

Gmax Minimum – 80 G's.

Preferred Gmax Range – 90 G's - 150 G's.

Approved Testing Procedure: ASTM F355-01 – Standard Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials – (Gmax Rating). Required test result - minimum Gmax Rating 80 and maximum Gmax Rating 200. Preferred Gmax Rating range 90-150.

3.8 Color:

The chart below provides the color options and preferred combinations for turfscape/synthetic turf:

Color Guidelines											
Color Options	Micro Bed Options										
	No Microbed	Field	Olive	Lime	Tan	Verde	Field/Tan	Tan/Choc	Olive/Tan	Lime/Tan	
Grass Zone Fibers	Field	Preferred									
	Olive	OK		OK		OK	OK	OK	OK		
	Lime										
	Verde	OK				OK	OK				
	Winter	OK									
	Field/Lime	OK	Preferred	OK	OK	Preferred	Preferred	Preferred	Preferred	OK	OK
	Field/Olive	Preferred									
	Field/Winter										
	Lime/Olive										
	Lime/Winter										
	Olive/Winter										

Note: "N/A" means Not Approved in this context.

turfscape/synthetic turf look as natural as possible. The "Hue" of natural grass varies and as a result what might look natural in one community, might look entirely out of place in another.

3.9 UV Degradation:

The color needs to be UV Stabilized to avoid undesirable fading. The required testing method is EN ISO 20105-A02.

Greater than or equal to – 3 Grey Scales

Approved Testing Procedure: EN ISO 20105-AD2 – – (Color Change). Required test result – Greater than or equal to (> or =) Grey Scale 3.

4. CONSTRUCTION PARAMETERS:

4.1 Base Guidelines:

Soil type and stability varies from location to location. The base guidelines, methodology and solutions will depend directly on the soil profile and stability that exists under the actual location.

Governing principles:

Grade: No Change.

The topographical grade and planarity of the existing area is not intended to be altered by the turfscape/synthetic turf installation.

Stability: Stable/Prevent Settling

The base should be designed and constructed to ensure stability and prevent settling throughout the life span of the turfscape/synthetic turf installation.

Drainage: 100-Year Storm

Based on the soils indigenous porosity it will be desired to afford water storage capability if the 100-year storm is in excess of the soils ability to absorb the water. Stone bases construction can be engineered to afford water storage within the air voids of the stone profile.

Base Guidelines are attached as an Appendix to the Vendor Approval Protocol.

APPENDIX: Base Guidelines

4.2 Attachment Methods:

A physical attachment is required. The attachment must be uniform and consistent around the entire perimeter of the turfscape/synthetic turf installation footprint. Preferred embodiment examples are included in the Vendor Approval Protocol as an Appendix.

Landscape Staples are not adequate termination of a turfscape/synthetic turf edge/seam.

APPENDIX: Preferred Embodiment-Edge Attachment

4.3 Seam Strength:

The minimum seam strength must be equal or greater than 100 pounds (= or > than 100 lbs).

Seams must be maintained in an attached and secured state. Any seams that are unattached (open up/come loose) must be repaired immediately. Any open seam is a potential tripping hazard and must be designated as such until it can be prepared.

Approved Testing Procedure: ASTM D5034-05 – Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test-Modified for Seam Strength). Required test result – minimum 100 lbs (= or > 100 lbs).

4.4 Seam Type:

Sewn seams are preferred to adhered seams. Landscape staples are not an acceptable seaming method. The physical attachment is more predictable/reliable than adhered seams. Any use of chemical adhesives should be approved as part of the Vendor Approval Protocol in advance of their use.

APPENDIX: Preferred Embodiment-Seam Type

4.5 Landscape Staples:

Landscape staples are NOT considered an adequate attachment method. They should not be utilized for seams, nor edge attachment.

5. FURTHER CONSIDERATION:

5.1 Approved Vendor Status:

Only “Approved” turfscape/synthetic turf surfaces can be installed within the community. Vendors can submit products for Approval consideration by completing the Vendor Approval Protocol for each product to be considered and the appropriate fee. As part of the vendor approval process a vendor is making a commitment to conduct themselves and ensure all product applications are within the guidelines as detailed. A vendor will lose it “Approved” status if they are found to be in violation of this ordinance. The decision to approve or not approve any specific vendor or product is solely at the discretion of the municipality.

5.2 Maintenance Guidelines:

The municipality has established and reserves the right to modify the maintenance guidelines at their sole discretion.

Where to get the guidelines: The maintenance guidelines are available via the worldwide web at www.turfscape.com/maintenance-guidelines.

Maintenance Compliance Complaints: Community complaints and/or maintenance compliance concerns can be submitted via email to concerns@turfscape.com.

Maintenance Feedback: Community input is welcomed regarding the maintenance process/guidelines and can be submitted via email to Feedback@turfscape.com.

5.3 Elevated Living:

Elevated living applications must have adequate drainage capacity to meet and/or exceed the 100-year storm. The turfscape/synthetic turf material must be adequately secured to withstand 100 mile an hour wind loads. All loading of materials on and off of elevated structures must meet and/or exceed all local standards and ordinances.

5.4 Public versus Private Spaces:

All turfscape/synthetic turf applications are required to meet and/or exceed all public and private spaces requirements locally as well as state and federal requirements.

5.5 Pet – Dedicated Areas:

It is recommended that any turfscape/synthetic turf applications that involve interactions with pets/animals should consider having a dedicated pet relief area. The pet relief area should feature odor absorption properties. Odor absorption infill is recommended throughout the entire surface when pet/animal interaction is anticipated.

***** End of Section *****

PRODUCT APPROVAL PROTOCOL

MANDATORY TESTING REQUIREMENTS

The Mandatory Testing Requirements are listed below. All testing submitted is to be conducted by independent third party testing laboratories. No product will be considered without all the required testing.

ASTM F355-01	<u>Gmax RATING</u> Standard Test Method for Shock-Absorbing Properties of Playing Surface Systems and Materials
ASTM F1015-03	<u>RELATIVE ABRASIVE INDEX</u> Standard Test Method for Relative Abrasiveness of Synthetic Turf Playing Surfaces
ASTM F1551-03	<u>COEFFICIENT OF RESTITUTION (COR)</u> Standard Test Methods for Comprehensive Characterization of Synthetic Turf Playing Surfaces and Materials
ASTM D5848-07	<u>TOTAL WEIGHT</u> Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings
ASTM D5848-07	<u>PILE WEIGHT</u> Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings
ASTM D5848-07	<u>PRIMARY BACKING WEIGHT</u> Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings
ASTM D5848-07	<u>SECONDARY BACKING</u> Standard Test Method for Mass Per Unit Area of Pile Yarn Floor Coverings
ASTM D5823-05a	<u>PILE HEIGHT</u> Standard Test Method for Tuft Height of Pile Floor Coverings
ASTM D1335-05	<u>TUFT BIND STRENGTH</u> Standard Test Method for Tuft Bind of Pile Yarn Floor Coverings
ASTM D5034-09	<u>GRAB TEAR STRENGTH</u> Standard Test Method for Breaking Strength and Elongation of Textile Fabrics (Grab Test)
ASTM D5793-05	<u>STITCHES PER 3 INCHES</u> Standard Test Method for Binding Sites Per Unit Length or Width of Pile Yarn Floor Coverings
ASTM D5793-05	<u>MACHINE GAUGE</u> Standard Test Method for Binding Sites Per Unit Length or Width of Pile Yarn Floor Coverings
ASTM D2859-06	<u>FLAMMABILITY – PILL BURN</u> Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials
ASTM F1951-09	<u>WHEEL CHAIR ACCESSIBILITY</u> Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment
BS7044-Method 4	<u>INFILTRATION RATE</u> Determination of Infiltration Rate-Buffered Ponding-Type Infiltrometer
ASTM D1907-07	<u>FIBER DENIER</u> Standard Test Methods for Linear Density of Textile Fibers by the Skein Method
ASTM D3218-07	<u>FIBER THICKNESS</u> Standard Specification for Polyolefin Monofilaments
ASTM D3218-07	<u>FIBER WIDTH</u> Standard Specification for Polyolefin Monofilaments
ASTM D789-07	<u>FIBER MELTING POINT</u> Standard Test Methods for Determination of Solution Viscosities of Polyamide (PA)
ASTM D792-08	<u>FIBER SPECIFIC GRAVITY</u> Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
ASTM D2256-02	<u>FIBER BREAKING STRENGTH</u> Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method
ASTM D2256-02	<u>FIBER ELONGATION</u> Standard Test Method for Tensile Properties of Yarns by the Single-Strand Method
ASTM 3052@210'	<u>LEAD</u> Standard Test Method for Lead – Method 6010 (MDL)
RCRA 7471B	<u>MERCURY (Hg)</u> Standard Test Method for Mercury – Method 7471B (MDL)
RCRA 6010	<u>METALS</u> Standard Test Method for Heavy Metals – Method 6010 (MDL)

ASTM Values:

Test Code	Description	Acceptable		Preferred	
		Minimum	Maximum	Minimum	Maximum
ASTM F355-01	<u>Gmax RATING</u>	80 Gmax	200 Gmax	90 Gmax	150 Gmax
ASTM F1015-03	<u>RELATIVE ABRASIVE INDEX</u>	8±2	30±2	8±2	30±2
ASTM F1551-03	<u>COEFFICIENT OF RESTITUTION (CR)</u>	0.35	0.45	0.35	0.45
ASTM D5848-07	<u>TOTAL WEIGHT</u>	55 oz / SY	120 oz / SY	55 oz / SY	120 oz / SY
ASTM D5848-07	<u>FACE WEIGHT</u>	33 oz / SY	65 oz / SY	40 oz / SY	65 oz / SY
ASTM D5848-07	<u>PRIMARY BACKING WEIGHT</u>	6 oz / SY	8 oz / SY	6 oz / SY	8 oz / SY
ASTM D5848-07	<u>SECONDARY BACKING</u>	20 oz / SY	26 oz / SY	20 oz / SY	26 oz / SY
ASTM D5823-05a	<u>PILE HEIGHT</u>	1 inch	2.5 inch	1 inch	2.5 inch
ASTM D1335-05	<u>TUFT BIND STRENGTH</u>	6 lbs	N/A	6 lbs	N/A
ASTM D5034-09	<u>GRAB TEAR STRENGTH</u>	200 lbs-889 N	N/A	200 lbs-889N	N/A
ASTM D5793-05	<u>STITCHES PER 3 INCHES</u>	8±1	N/A	8±1	N/A
ASTM D5793-05	<u>MACHINE GAUGE</u>	3/8"	1/2"	3/8"	1/2"
ASTM D2859-06	<u>FLAMMABILITY – PILL BURN</u>	Pass	Pass	Pass	Pass
ASTM F1951-09	<u>WHEEL CHAIR ACCESSIBILITY</u>	Pass	Pass	Pass	Pass
BS7044-Method 4	<u>INFILTRATION RATE</u>	40" per Hr	N/A	40" per Hr	N/A
ASTM D1907-07	<u>FIBER DENIER</u>	8,000	11,000	8,000	11,000
ASTM D3218-07	<u>FIBER THICKNESS</u>	115	275	115	275
ASTM D3218-07	<u>FIBER WIDTH</u>	0.04	0.06	0.04	0.06
ASTM D789-07	<u>FIBER MELTING POINT</u>	120 C	N/A	120 C	N/A
ASTM D792-08	<u>FIBER SPECIFIC GRAVITY</u>	0.9	N/A	0.9	N/A
ASTM D2256-02	<u>FIBER BREAKING STRENGTH</u>	18 lbs / 80 N	N/A	18 lbs / 80 N	N/A
ASTM D2256-02	<u>FIBER ELONGATION</u>	40%	70%	40%	70%
ASTM 3052@210°	<u>LEAD</u>	0	100 PPM	0	100 PPM

LHM Maximum Limits:

ASTM 3052@210° LEAD Standard Test Method for Lead – Method 6010 (MDL)

Lead Digested by ASTM 3052 @210 Degrees Less than 100 mg/Kg

RCRA 7471B MERCURY (Hg) Standard Test Method for Mercury – Method 7471B (MDL)

Mercury (Hg) – RCRA 7471B Less than 0.02 mg/Kg

RCRA 6010 METALS Standard Test Method for Heavy Metals – Method 6010 (MDL)

Arsenic (As) – RCRA 6010 (MDL)	Less than 2.0 mg/Kg
Barium (Ba) – RCRA 6010 (MDL)	Less than 250 mg/Kg
Cadmium (Cd) – RCRA 6010 (MDL)	Less than 0.6 mg/Kg
Chromium (Cr) – RCRA 6010 (MDL)	Less than 8.0 mg/Kg
Lead (Pb) – RCRA 6010 (MDL)	Less than 30.0 mg/Kg
Selenium (Se) – RCRA 6010 (MDL)	Less than 3.5 mg/Kg
Silver (Ag) – RCRA 6010 (MDL)	Less than 0.5 mg/Kg

Density Rating – Design Parameters Mapping

PROP	1.0 Depth	1.25 Depth	1.5 Depth	1.75 Depth	2 Depth	2.25 Depth	2.5 Depth
00	1100	600	700	800			
01	1124	676	730	800			
02	1148	752	800	870			
03	1172	828	850	940			
04	1196	904	900	1010			
05	1220	980	950	1080			
06	1244	1056	1000	1150			
07	1268	1132	1050	1220			
08	1292	1208	1100	1290			
09	1316	1284	1150	1360			
10	1340	1360	1200	1430			
11	1364	1436	1250	1500			
12	1388	1512	1300	1570			
13	1412	1588	1350	1640			
14	1436	1664	1400	1710			
15	1460	1740	1450	1780			
16	1484	1816	1500	1850			
17	1508	1892	1550	1920			
18	1532	1968	1600	1990			
19	1556	2044	1650	2060			
20	1580	2120	1700	2130			
21	1604	2196	1750	2200			
22	1628	2272	1800	2270			
23	1652	2348	1850	2340			
24	1676	2424	1900	2410			
25	1700	2500	1950	2480			
26	1724	2576	2000	2550			
27	1748	2652	2050	2620			
28	1772	2728	2100	2690			
29	1796	2804	2150	2760			
30	1820	2880	2200	2830			
31	1844	2956	2250	2900			
32	1868	3032	2300	2970			
33	1892	3108	2350	3040			
34	1916	3184	2400	3110			
35	1940	3260	2450	3180			
36	1964	3336	2500	3250			
37	1988	3412	2550	3320			
38	2012	3488	2600	3390			
39	2036	3564	2650	3460			
40	2060	3640	2700	3530			
41	2084	3716	2750	3600			
42	2108	3792	2800	3670			
43	2132	3868	2850	3740			
44	2156	3944	2900	3810			
45	2180	4020	2950	3880			
46	2204	4096	3000	3950			
47	2228	4172	3050	4020			
48	2252	4248	3100	4090			
49	2276	4324	3150	4160			
50	2300	4400	3200	4230			
51	2324	4476	3250	4300			
52	2348	4552	3300	4370			
53	2372	4628	3350	4440			
54	2396	4704	3400	4510			
55	2420	4780	3450	4580			
56	2444	4856	3500	4650			
57	2468	4932	3550	4720			
58	2492	5008	3600	4790			
59	2516	5084	3650	4860			
60	2540	5160	3700	4930			
61	2564	5236	3750	5000			
62	2588	5312	3800	5070			
63	2612	5388	3850	5140			
64	2636	5464	3900	5210			
65	2660	5540	3950	5280			
66	2684	5616	4000	5350			
67	2708	5692	4050	5420			
68	2732	5768	4100	5490			
69	2756	5844	4150	5560			
70	2780	5920	4200	5630			
71	2804	5996	4250	5700			
72	2828	6072	4300	5770			
73	2852	6148	4350	5840			
74	2876	6224	4400	5910			
75	2900	6300	4450	5980			
76	2924	6376	4500	6050			
77	2948	6452	4550	6120			
78	2972	6528	4600	6190			
79	2996	6604	4650	6260			
80	3020	6680	4700	6330			
81	3044	6756	4750	6400			
82	3068	6832	4800	6470			
83	3092	6908	4850	6540			
84	3116	6984	4900	6610			
85	3140	7060	4950	6680			
86	3164	7136	5000	6750			
87	3188	7212	5050	6820			
88	3212	7288	5100	6890			
89	3236	7364	5150	6960			
90	3260	7440	5200	7030			
91	3284	7516	5250	7100			
92	3308	7592	5300	7170			
93	3332	7668	5350	7240			
94	3356	7744	5400	7310			
95	3380	7820	5450	7380			
96	3404	7896	5500	7450			
97	3428	7972	5550	7520			
98	3452	8048	5600	7590			
99	3476	8124	5650	7660			
100	3500	8200	5700	7730			
101	3524	8276	5750	7800			
102	3548	8352	5800	7870			
103	3572	8428	5850	7940			
104	3596	8504	5900	8010			
105	3620	8580	5950	8080			
106	3644	8656	6000	8150			
107	3668	8732	6050	8220			
108	3692	8808	6100	8290			
109	3716	8884	6150	8360			
110	3740	8960	6200	8430			
111	3764	9036	6250	8500			
112	3788	9112	6300	8570			
113	3812	9188	6350	8640			
114	3836	9264	6400	8710			
115	3860	9340	6450	8780			
116	3884	9416	6500	8850			
117	3908	9492	6550	8920			
118	3932	9568	6600	8990			
119	3956	9644	6650	9060			
120	3980	9720	6700	9130			
121	4004	9796	6750	9200			
122	4028	9872	6800	9270			
123	4052	9948	6850	9340			
124	4076	10024	6900	9410			
125	4100	10100	6950	9480			
126	4124	10176	7000	9550			
127	4148	10252	7050	9620			
128	4172	10328	7100	9690			
129	4196	10404	7150	9760			
130	4220	10480	7200	9830			
131	4244	10556	7250	9900			
132	4268	10632	7300	9970			
133	4292	10708	7350	10040			
134	4316	10784	7400	10110			
135	4340	10860	7450	10180			
136	4364	10936	7500	10250			
137	4388	11012	7550	10320			
138	4412	11088	7600	10390			
139	4436	11164	7650	10460			
140	4460	11240	7700	10530			
141	4484	11316	7750	10600			
142	4508	11392	7800	10670			
143	4532	11468	7850	10740			
144	4556	11544	7900	10810			
145	4580	11620	7950	10880			
146	4604	11696	8000	10950			
147	4628	11772	8050	11020			
148	4652	11848	8100	11090			
149	4676	11924	8150	11160			
150	4700	12000	8200	11230			
151	4724	12076	8250	11300			
152	4748	12152	8300	11370			
153	4772	12228	8350	11440			
154	4796	12304	8400	11510			
155	4820	12380	8450	11580			
156	4844	12456	8500	11650			
157	4868	12532	8550	11720			
158	4892	12608	8600	11790			
159	4916	12684	8650	11860			
160	4940	12760	8700	11930			
161	4964	12836	8750	12000			
162	4988	12912	8800	12070			
163	5012	12988	8850	12140			
164	5036	13064	8900	12210			
165	5060	13140	8950	12280			
166	5084	13216	9000	12350			
167	5108	13292	9050	12420			
168	5132	13368	9100	12490			
169	5156	13444	9150	12560			
170	5180	13520	9200	12630			
171	5204	13596	9250	12700			
172	5228	13672	9300	12770			
173	5252	13748	9350	12840			
174	5276	13824	9400	12910			
175	5300	13900	9450	12980			
176	5324	13976	9500	13050			
177	5348	14052	9550	13120			
178	5372	14128	9600	13190			
179	5396	14204	9650	13260			
180	5420	14280	9700	13330			
181	5444	14356	9750	13400			
182	5468	14432	9800	13470			
183	5492	14508	9850	13540			
184	5516	14584	9900	13610			
185	5540	14660	9950	13680			
186	5564	14736	10000	13750			
187	5588	14812	10050	13820			
188	5612	14888	10100	13890			
189	5636	14964	10150	13960			
190	5660	15040	10200	14030			
191	5684	15116	10250	14100			
192	5708	15192	10300	14170			
193	5732	15268	10350	14240			
194	5756	15344	10400	14310			
195	5780	15420	10450	14380			
196	5804	15496	10500	14450			
197	5828	15572	10550	14520			
198	5852	15648	10600				

Color Chart

Color Guidelines										
Color Options		Micro Bed Options								
	No Microbed	Field	Olive	Lime	Tan	Verde	Field/Tan	Tan/Choc	Olive/Tan	Lime/Tan
Grass Zone Fibers	Field	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
	Olive	OK	N/A	OK	N/A	OK	OK	OK	OK	N/A
	Lime	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Verde	OK	N/A	N/A	N/A	OK	OK	N/A	N/A	N/A
	Winter	OK	N/A							
	Field/Lime	OK	Preferred	OK	OK	Preferred	Preferred	Preferred	Preferred	OK
	Field/Olive	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred	Preferred
	Field/Winter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lime/Olive	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Lime/Winter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Olive/Winter	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note: "N/A" means Not Approved in this context.

General Warranty Requirements/Features:

SPECIFICATION: Insured Warranty Specification Language

The synthetic turf provider shall provide an eight (8) year pre-paid warranty that is insured by a policy of insurance issued by a reputable insurance company and must have the following policy features:

- Insurance coverage shall specifically provide for reimbursement to the warranty holder in the event of bankruptcy of the synthetic turf provider.
- Insurance coverage shall apply to entire surface inclusive of infill, seaming, labor and inlays.
- Provide the following documents: Warranty Certificate, Accord Certificate, the actual Insurance Policy, and proof of A.M. Best Rating for the insured warranty provider.
- Insurance coverage shall apply to the full 8 year period from completion date of project, with no uninsured periods or periods of self-insurance.
- Insurance is provided by a third party insurer with an A.M. Best financial strength rating of "Excellent" or higher.
- Insurance coverage shall not have exclusions for epidemic or catastrophic failure.
- Insurance coverage shall not limit the hours of use.
- Insurance coverage shall not exclude heavy trafficked.
- Insurance coverage shall not exclude any colored turf fibers.
- Insurance coverage offers a minimum claim limit of (US) \$5 million in the aggregate per annum.
- Insurance coverage offers a minimum claim limit of (US) \$ 300,000 per installation.