

# MIAMI BEACH

## COMMITTEE MEMORANDUM

TO: Finance and Economic Resiliency Committee Members

FROM: Eric Carpenter, City Manager

DATE: October 18, 2024

TITLE: RESOLUTION OF THE MAYOR AND CITY COMMISSION OF THE CITY OF MIAMI BEACH, FLORIDA, DIRECTING THE CITY ADMINISTRATION TO EXPLORE FEASIBLE STRATEGIES FOR CREATING AND EXPANDING "GREEN ROOFS", AS WELL AS INCORPORATING GREENERY AND LANDSCAPING ON CITY BUILDINGS, AND PRESENT ITS FINDINGS TO THE LAND USE AND SUSTAINABILITY COMMITTEE AND THE FINANCE AND ECONOMIC RESILIENCY COMMITTEE WITHIN 90 DAYS OF THE ADOPTION OF THIS RESOLUTION.

### **RECOMMENDATION**

The Administration recommends implementing a green roof pilot project as provided herein.

### **BACKGROUND/HISTORY**

On May 15, 2024, the Mayor and City Commission (the City Commission) adopted a dual referral pursuant to Resolution No. 2024-33064, sponsored by Commissioner Joseph Magazine (item C7 BH) to the Finance and Economic Resiliency Committee (FERC) and the LUSC to discuss creating and expanding green roofs, greenery and landscaping on City buildings.

Green roofs help to cool the buildings below them by storing heat and helping to reduce temperature fluctuations. They also act as insulators and decrease the flow of heat through roof structures which can help improve indoor comfort for building occupants.

In addition to helping to cool the buildings below them, green roofs can help reduce the urban heat island effect. The urban heat island effect is known to increase the temperatures in developed areas and therefore worsen the impacts of extreme heat.

The urban heat island effect is caused by materials commonly used in urban development which absorb significant amounts of energy from the sun and increase the ambient temperature of their surroundings. Materials that utilize darker colors are a major culprit of heat island effect, as they absorb more of the sun's energy than lighter colors. Materials which consist of very light colors, otherwise known as "High Albedo Surfaces", tend to reflect a greater amount of the sun's energy into the atmosphere, and therefore reduce the potential for the urban heat island effect.

An additional benefit of green roofs is that their vegetation helps to reduce air pollution and emissions. Researchers estimate that a 1,000-square foot green roof can remove about 40 pounds of particulate matter (PM) from the air in a year<sup>1</sup>. The vegetation of green roofs also helps to provide stormwater management benefits. A North Carolina study of actual green roof performance found that test green roofs reduced runoff from peak rainfall events by more than 75 percent.<sup>2</sup>

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<sup>1</sup> Peck, S. & Kuhn, M. (2003) Design Guidelines for Green Roofs.

<sup>2</sup> Moran, A., Hunt, B., et al. (2004) A North Carolina Field Study to Evaluate Greenroof Runoff Quantity, Runoff Quality, and Plant Growth.

A prime example of a successful green roof project exists at the New World Symphony located at 500 17th Street and designed by Gehry Partners, LLP.

## **ANALYSIS**

On March 13, 2019, the City Commission adopted the Urban Heat Island Ordinance (Ordinance No. 2019-4252), requiring that all new construction install a sustainable roof. Approved roof types under the Ordinance include metal roofs, solar roofs, blue roofs, white roofs, cool roofs, green roofs, or any other roofing system recognized by a green building certification agency that helps to reduce heat island effect, allows for the reuse or retention of storm water or reduces greenhouse gases.

Given the structural considerations necessary on account of weight (or dead load) of the plantings, soil, and water, as well as the complex drainage infrastructure needed for proper irrigation, green roof projects are most successful when contemplated during the early design phase of a building.

A secondary option for incorporating greenery and landscaping into City buildings is the installation of “living walls”, or vertical plantings installed within a prefabricated armature, mounted adjacent to a building’s façade.

Similar to green roofs, living walls can help absorb heat from the sun, thus insulating buildings, as well as aid in the reduction of air pollution and emissions. However, unlike green roofs, “living walls” can be appreciated and enjoyed by the general public at a pedestrian scale.

The Facilities Management Division has identified a potential location for installation of a “living wall” on the west façade of the “777” building located at 1701 Meridian Avenue.

Project specific cost data for either a green roof or a living wall is not available at this time, however, the current industry average cost for a green roof is \$120.00 per square foot; and the current industry average cost for a “living wall” is \$160.00 per square foot.

The item was discussed at the July 9, 2024, meeting of the Land Use and Sustainability Committee where it was recommended that the Facilities Management Division collaborate with the Environment and Sustainability Department to research all-in costs for implementation of green roof systems and bring the item back to the Committee’s October 10, 2024, meeting.

Additionally, the Facilities Management Division was asked to research whether or not the implementation of green roofs increases the longevity (or useful service life) of a facility’s roof and what the fiscal impact of a green roof might be with regard to operation and maintenance.

Finally, the Land Use and Sustainability Committee requested that the Facilities Management Division evaluate the cost of installing a green roof over an existing roof system versus replacing an existing roof with a green roof system.

Several studies have pointed to greater (roofing) membrane longevity under green roofs, given that the vegetated areas provide protection from the sun. However, roof areas that lie in the periphery of the vegetated areas remain exposed to the sun and may wear earlier than the primary roof field. Depending on the system selected, the cost associated with a green roof retrofit can be very similar to that of replacing an existing roof with a new green roof system. While it is difficult to assign a maintenance cost for a green roof prior to selecting a specific design, most green roofs

require maintenance once per month. Subsequently, yearly maintenance costs can be expected to surpass that of a traditional roof system.

According to a 2011 study published by the U.S. General Services Administration, green roofs on commercial and public buildings provide a payback period of approximately 6.2 years, nationally.

Given its available area on a single-plane, high parapet wall, generous roof pitch and robust drainage infrastructure, the Facilities Management building located at 1833 Bay Road in the Sunset Harbor neighborhood is a prime location in which to pilot a green roof installation. Based on a potential green roof field area of approximately 6,000 SF, installation of a green roof at the Facilities Management building would cost approximately \$720,000.00, inclusive of design and permitting fees.

The Facilities Management Division recommends allocating an additional 5% of the installation costs for yearly maintenance of the proposed green roof, possibly in the form of a comprehensive roof warranty, thus bringing the total fiscal impact of the pilot program up to \$756,000.00

### **FISCAL IMPACT STATEMENT**

The fiscal impact of the proposed green roof pilot project is approximately \$756,000 inclusive of design, permitting fees, and comprehensive roof maintenance program.

### **Does this Ordinance require a Business Impact Estimate?** (FOR ORDINANCES ONLY)

The Business Impact Estimate (BIE) was published on .

See BIE at: <https://www.miamibeachfl.gov/city-hall/city-clerk/meeting-notices/>

### **FINANCIAL INFORMATION**

n/a

### **CONCLUSION**

Based on the foregoing, the Administration recommends implementing a green roof pilot project. Should the FERC recommend moving forward with a pilot project, it is recommended that this be considered as part of the Fiscal Year 2026 budget process.

### **Applicable Area**

Citywide

### **Is this a "Residents Right to Know" item, pursuant to City Code Section 2-17?**

Yes

### **Is this item related to a G.O. Bond Project?**

No

### **Was this Agenda Item initially requested by a lobbyist which, as defined in Code Sec. 2-481, includes a principal engaged in lobbying?** No

If so, specify the name of lobbyist(s) and principal(s):

**Department**

Facilities and Fleet Management

**Sponsor(s)**

Commissioner Joseph Magazine

**Co-sponsor(s)**

Commissioner David Suarez

**Condensed Title**

Create/ expand "Green Roofs", greenery and landscaping on City buildings.