

## **ABSTRACT**

*The purpose of this study is to present the results of landscape performance investigations and lessons learned from quantifying benefits of the Park Seventeen project, a ¾ acre residential roof garden in uptown Dallas, Texas. Park Seventeen is the residential component (25-story tower) of an urban mixed-use development completed in March 2011. It is complemented by a 19-story office tower that sits to the immediate east of Park Seventeen. The research team was formed to quantify their landscape performance benefits during the summer of 2012 and sponsored by Landscape Architecture Foundation's Case Study Investigation Program. Because of limited resources (funding and time), the research team identified simple environmental, economic and social metrics that could effectively provide meaningful performance information. Metrics were used to investigate urban heat island mitigation qualities of the roof garden, stormwater detention characteristics, residents' satisfaction and sense of community, and cost comparison between a conventional rooftop and the project. By measuring the air temperature on ground and roof surfaces, researchers found that the roof garden mitigated urban heat island effect by reducing the average air temperature by 1.3 °F, and the average surface temperature by 15.9 °F. The growth media used on the roof garden could hold the equivalent of 2.5-inch rainfall. For the cost comparison analysis, the cost for constructing a park on the ground within the uptown Dallas of the same size would be much higher than that for the Park Seventeen project. As for the social benefits, 78% of residential and commercial tenants who regularly used the roof garden felt the sense of the community through socializing with others. The researchers documented the lessons learned related to material selection and wind/heat effects on user's comfort and safety during the summer. Elements that are deemed sustainable are also compiled as a guide for designing future urban roof garden projects in hot climate areas.*