

6.8 Green Roof



Figure 6-35: Parking Lot with Turf-Covered Roof, Google building, Mountain View

Best Uses

- For innovative architecture
- Urban centers

Advantages

- Minimizes roof runoff
- Reduces “heat island” effect
- Absorbs sound
- Provides bird habitat
- Longer “lifespan” than conventional roofs

Limitations

- Sloped roofs require steps
- Non-traditional design
- High installation costs

A green roof can be either **extensive**, with a 3 to 7 inches of lightweight substrate and a few types of low-profile, low-maintenance plants, or **intensive** with a thicker (8 to 48 inches) substrate, more varied plantings, and a more garden-like appearance. The extensive installation at the Gap Headquarters in San Bruno (Figure 6-39), has experienced relatively few problems after nearly a decade in use. Native vegetation may be selected to provide habitat for endangered species of butterflies, as at the extensive green roof of the Academy of Sciences in San Francisco.

Design and Sizing Guidelines

- Green roofs are considered “self-treating areas” or “self-retaining areas” and may drain directly to the storm drain, if they meet the following requirements specified in the MRP:
 - The green roof system planting media should be sufficiently deep to provide capacity within the pore space of the media to capture 80 percent of the average annual runoff.
 - The planting media should be sufficiently deep to support the long-term health of the vegetation selected for the green roof, as specified by the landscape architect or other knowledgeable professional.
- Design and installation is typically completed by an established vendor.
- Extensive green roof systems contain layers of protective materials to convey water away from roof deck. Starting from the bottom up, a waterproof membrane is installed, followed by a root barrier, a layer of insulation (optional), a drainage layer, a filter fabric for fine soils, engineered growing medium or soil substrate, and plant material.

- The components of intensive green roofs are generally the same as those used in extensive green roofs, with differences in depth and project-specific design application.

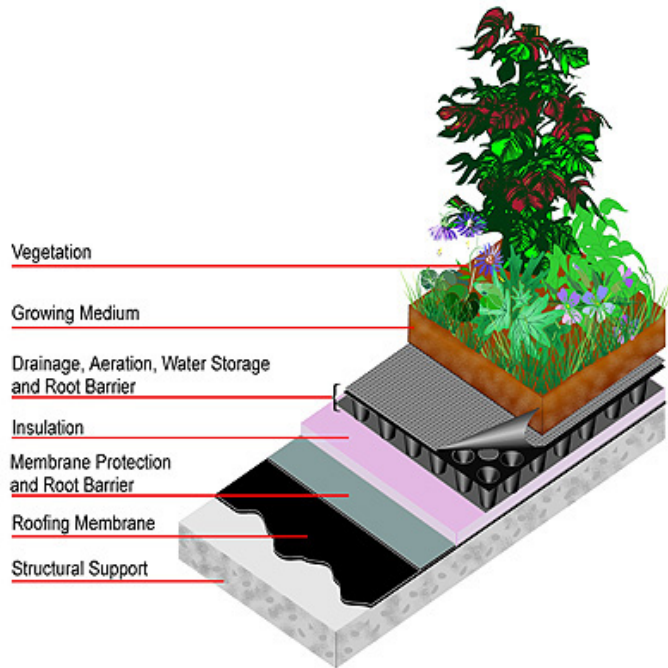


Figure 6-36: Green roof cross-section. Source: American Wick Drain Corp.

- Follow manufacturer recommendations for slope, treatment width, and maintenance.
- Either grass or a diverse selection of other low growing, drought tolerant, native vegetation should be specified. Vegetation whose growing season corresponds to the wet season is preferred. See Appendix A for planting guidance.
- Green roof should be free of gullies or rills.
- Irrigation is typically required.
- Beginning December 1, 2011, green roofs will need to meet green roof specifications (to be included in Appendix L) approved by the Regional Water Board in order to be considered biotreatment measures.

Maintenance Considerations

- Inspection required at least semiannually. Confirm adequate irrigation for plant health.
- Fertilize and replenish growing media as specified by landscape designer and as needed for plant health. See Appendix A for alternatives to quick release fertilizers.
- See www.greenroofs.com for information about and more examples of green roofs.



Figure 6-37: Extensive Green Roof at Gap Headquarters, San Bruno (William McDonough & Partners)



Figure 6-38: Intensive Green Roof, Kaiser Center Parking Garage, Oakland



Figure 6-39: Plants selected to support endangered butterflies (California Academy of Sciences, San Francisco)