

**Description of the project:**

The roof garden is located in the southwest inner core of Minneapolis, Minnesota, in a well established and well maintained residential neighborhood created in the 1920s.

The existing garage structure has a northerly exposure with a landmark 60-foot White Pine directly to the west that overhangs 25% of the roof area at the northeast corner. Directly to the south is the two-story residence.

The roof commands the highest elevated vantage point in a two-block area.

**Green roof size and building type:**

An existing residential below-grade garage with exposed flat rolled roofing on wood roof framing is supported by concrete unit masonry exterior and interior load-bearing walls. The roof structure capacity was increased to comply with the code-mandated live loads for deck occupancy. The entire roof surface of the garage is dedicated to the roof garden. The roof garden elevation varies from 8 inches to 10 feet above grade.

Gross area: 1367.

Hardscape: 428 sq. ft. Bluestone surface.

368 sq. ft. crushed Trap rock surface.

Plantscape: 571 sq. ft. beds, large Redwood box planters, decorative rock boulders, clay planting pots.

**Design objectives:**

Design Objective 1: Create an inviting and eye-pleasing pathway from the street to the front entrance.

Design Objective 2: Create an outside space for entertaining larger groups than currently available by the more intimate garden and deck at the rear of the house.

Design Objective 3: Create an outside space accessed easily by guests directly from the street. Functions can be organized without guests entering the house.

Design Objective 4: Create a pleasing natural vista from within the house.

Design Objective 5: Create a long-lasting, permanent improvement to the residence and to the neighborhood.

**Depth of growing medium:**

Designed as a lightweight, low-profile system, the Garden Roof assembly by American Hydrotech was utilized to reduce cost of the structural upgrade to the existing roof deck.

Growing medium depth ranges from 6 inches at typical planting beds to 18 inches for terraced planting beds located at deck zones able to support wet soil loads. The deck is structured for 65 PSF total load.

Structure: 5 PSF

Roofing/garden 20 PSF

Live load 40 PSF (code mandated)

Total 65 PSF

**Plant list (partial):**

Hosta – varied.

Astilbe – Sprite.

Phlox Subulata – Emerald Blue.

Strawberry – Everbearing.

Sedum – Vera Jameson.

Creeping Thyme – varied.

Ferns – varied.

Gualtheria Procumberis – Winterberry.

**Type of drainage system:**

The roof garden consists of an engineered polyethylene drainage panel over retention mat covered with filter fabric providing subsurface sheeting of rain water to continuous perimeter perforated drain through roof edge coping. American Hydrotech Inc. Floradrain FD40 drainage panels provide the water drainage, water storage, and aeration to create a harmonious balance of air and water in the substrate soil. FD40 drainage panels are lightweight panels of 100% recycled polyethylene, molded into specially designed retention cups and drainage channels. The unique design allows for the free drainage of excess water, achieving flow rates from 2.5 to 28 times higher than that of conventional drainage methods. At the same time, the system is engineered to promote irrigation through capillary action and evaporation into the soil/vegetation level. Floradrain drainage panels were installed loose-laid over the Moisture Retention Mat SSM45. A continuous perforated perimeter roof metal terminates and finishes the edge of the drainage assembly. The perimeter roof metal is fabricated from fluoropolymer painted aluminum in modular lengths that hook together giving a seamless continuous appearance.

**Type of membranes:**

The roof garden membrane is a 215 mil reinforced hot rubberized fluid applied asphalt roofing with asphalt protection course and polyethylene root barrier. The metal flashing and metal counter flashing is galvanized metal flashing and prefinished aluminum counterflashing. American Hydrotech Inc. Monolithic Membrane 6125-EV is a hot, fluid applied, rubberized asphalt produced with a minimum 25% recycled content. MM6125-EV is the industry's premier waterproofing membrane, offering tenacious bond to substrate, no seams, simplified flashing details and self-sealing capabilities. MM6125-EV is applied only by authorized, trained applicators. The MM6125-EV is applied in two coats, with a layer of fabric reinforcement between layers, to a thickness of 215 mils.

**Maintenance requirements:**

Use of commercial quality products and finishes eliminates need for annual refinishing and repair of surfaces.  
 No exposed wood, brick, or concrete walking surfaces.  
 20-year paint finishes.  
 50-year roof system.  
 Lifetime stainless steel cable rail system.  
 Lifetime natural stone and crushed stone aggregates.  
 Monitoring of plant health cultivated in shallow intensive beds is required due to the recent wide fluctuations in average monthly temperatures and rainfall in Minnesota urban dime. Supplemental hand irrigation is anticipated.  
 Natural pine needle drop used as mulch.