Kansas State University, Seaton Hall green roof demonstration project [information sheet]

Lee R. Skabelund

KDHE Clean Water Neighbor Program
Kansas State University, Seaton Hall Green Roof Demonstration Project

The Kansas Department of Health and Environment (KDHE) has provided financial assistance to this project through USEPA Section 319 Nonpoint Source Pollution Control Grant #C9007405 16 (KDHE Funding Codes 3889 2643959).

Project Description:

This project shows how stormwater can be temporarily captured in rooftop growing medium (living roof soils) and the associated vegetated system (sedums and native herbaceous grasses and forbs).

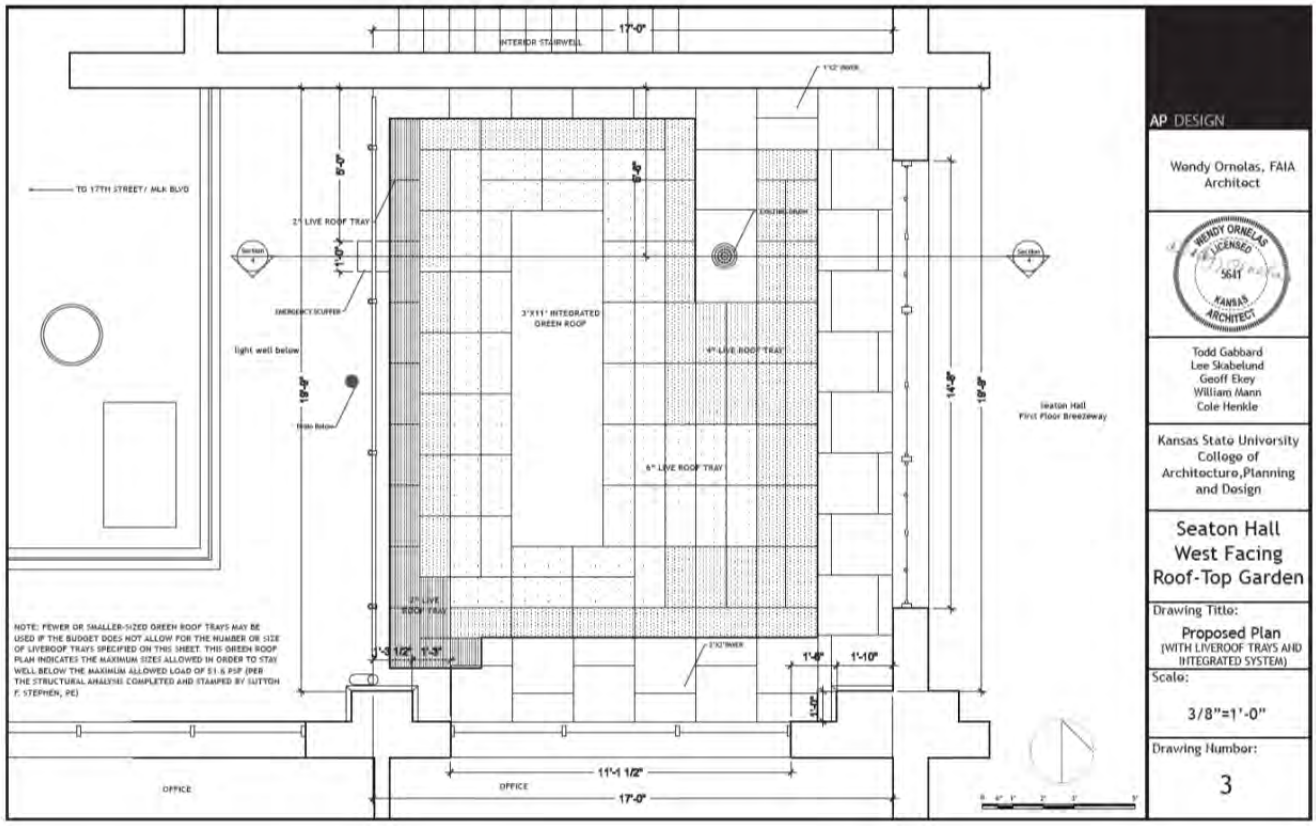
Installation of this living roof was initiated on May 8, 2012 by K-State faculty, staff and students, after installation/maintenance training by LiveRoof® grower Teresa Nelson of RoofTop Sedums (Davenport, Iowa). LiveRoof® green roof modules (three different heights—2-1/2", 4-1/4" & 6"), Permaloc aluminum edging, and RoofStone pavers, and American Hydrotech, Inc. components (including a drainage layer and approximately five inches of lightweight integrated soil/grow media sitting above a layer of filter fabric) were installed— along with two-inch concrete pavers (set atop Owens Corning Foamular® insulation).

This new west-facing green roof, above two conditioned offices, surrounded on three sides by building mass, and open on the street side (17th Street or Martin Luther King, Jr. Blvd.) employs green roof trays with an internal area using integrated soil left over from the upper green roof project. Precipitation is evapo-transpired through the vegetation on this small rooftop—thus reducing in a small but important way downstream flooding, streambank erosion, and urban stormwater pollutants and heat loads.

Sedums and native species (planted on 5/11 & 5/16) will be monitored over time on this semi-shaded rooftop.

Another living roof—above the third-floor breezeway an integrated (semi-intensive) green roof, and was installed in May 2009. Ongoing monitoring of the upper green roof provided useful for the lower green roof project as well as other green roof designs at K-State (especially for K-State's Memorial Stadium).

Final Construction Drawing (Plan View):



KDHE Clean Water Neighbor Program
Kansas State University, Seaton Hall Green Roof Demonstration Project

 Little Bluestem  Purple Prairie Clover  Spiderwort

Prairie Species supplied by Applied Ecological Services:

Grass-like Plants

Little Bluestem - *Schizachyrium scoparium* (11)
Prairie Dropseed - *Sporobolus heterolepis* (11)
Prairie Sedge - *Carex bicknellii* (11)

Forbs (Wildflowers)

Purple Prairie Clover - *Dalea purpurea* (10) – a nitrogen-fixing plant

Nodding Onion - *Allium cernuum* (6)
Roundleaf Groundsel - *Packera (senecio) obovata* (6)
Wild Quinine - *Parthenium integrifolium* (6)
Foxglove Beardtongue - *Penstemon digitalis* (6)
Sky Blue Aster - *Symphyotrichum oolentangiense* (6)
Germander - *Teucrium canadense* (6)
Common Spiderwort - *Tradescantia ohiensis* (6)

For images and text refer to Kansas Wildflowers & Grasses: http://www.kswildflower.org/about.html
and USDA-NRCS Plants Database: http://plants.usda.gov

Sedum Species supplied by RoofTop Sedums in pre-planted LiveRoof® Modules (2-1/2", 4-1/4" & 6"trays):

Green Mix – leftover 4" modules from the Kiowa County Commons Project in Greensburg, KS

Sedum floriferum	Florific Sedum
Sedum takesimense 'Gold Carpet'	Golden Carpet Sedum
Sedum hybridum 'Czar's Gold'	Czar's Gold Sedum
Sedum kamtschaticum	Kamchatka Sedum
Sedum sexangulare	Six Angled Sedum

Red Mix – leftover 4" modules from Greensburg, KS

Sedum album var. micranthum 'Red Ice'	Red Ice Sedum
Sedum spurium 'Dragons Blood'	Dragon's Blood Sedum
Sedum spurium 'Red Carpet'	Red Carpet Sedum
Sedum spurium ' Royal Pink'	Royal Pink Sedum
Sedum spurium 'Voo Doo'	Voo Doo Sedum

Yellow Mix – leftover 4" modules from Greensburg, KS

Sedum acre 'Aureum'	Gold Leaved Goldmoss Sedum
Sedum album	White Flowered Sedum
Sedum ellacombianum	Ellacombe's Sedum
Sedum hybridum 'Immergrunchen'	Evergreen Sedum
Sedum rupestre 'Angelina'	Angelina Sedum

All Deep (6") and Standard (4") delivered to K-State by RoofTop Sedums were the Kiowa Green mix with the following plugs added: Sedum ellacombianum, Sedum ternatum, Sedum spurium 'Roseum', Sedum album, Sedum spurium 'Green Mantle', Sedum middendorffianum var. diffusum, and Sedum spurium 'Royal Pink'.

Photo by Chip Winslow – May 8, 2012 during installation of filter fabric (which lies beneath the integrated soil system).

Photo by Lee R. Skabelund – May 16, 2012 following completion of prairie species planting within the integrated area.

Photo by Lee R. Skabelund – Sep. 22, 2012.

Photo by Lee R. Skabelund – Sep. 22, 2012.
Native plants in integrated area.

Photo by Lee R. Skabelund – Nov. 9, 2012.
Pavers, drain, sedum trays & native plants (going dormant).

Photo by Lee R. Skabelund – Jan. 1, 2013, following Dec. 31, 2012 snowstorm.

Photo by Lee R. Skabelund – Jan. 1, 2013.
Monitoring snowfall in two locations.

Photo by Lee R. Skabelund – Feb. 22, 2013.
6-8 inches of snow and 0.70-0.80 inches of precipitation.

Photo by Lee R. Skabelund – August 5, 2013 amid the second full growing season on the lower green roof. Note that supplemental irrigation (by hand-held hose) is being provided on an “as need” basis (in other words, when soils are dry and vegetation is stressed).