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# Green roofs Managing client expectations

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# **Diggable Designs**: Residential green roofs

Residential projects pose some unique challenges for green roofs. You may need to work with a structural engineer before installation begins.

Michael Moore, general manager and co-owner of Diggable Designs, another ALCC Sustainable Landscape Partner, learned this as the company first launched a residential green roof design and installation project in the Highlands area of Denver. Homes in this neighborhood are narrow, and tower four to five stories high.

"I learned you have to do more legwork on the engineering side ahead of time," says Moore. "You have to consider how heavy systems will be when wet and fully grown. When you add snow on top of that, you need to be sure the roofing structure can handle it."

To assess these types of issues, landscape companies may have to locate the original architect or builder, or hire a structural engineer. This can add time and money to the project, so Moore warns to plan accordingly.

Soil choices are important and lightweight specialty soil keeps the roof garden from getting too heavy. Some suppliers carry this type of soil, but be careful to choose one best suited to the type of plants being installed.

"It's a challenge to keep plants alive," Moore says. "The soil structure is 100 percent different on green roofs. We want soil to be reliable, porous, consistent and light. It doesn't retain moisture as much as it would on the ground, so you have to water more frequently due to the sun and wind exposure."

Diggable Designs works with a company that makes modular green roof systems and has clients in Colorado and other states.

"We like to use monoculture plants of the same watering characteristics and height," Moore says. "If you want shrubs and trees, you'd need lots of weight and space. You want to distribute the load evenly to create consistent insulation." The roof environment can be very harsh with drastic fluctuations in temperature and wind and you need to use plants that are adapted to those conditions.

Due to the lack of consistent rainwater in Colorado, green roofs need irrigation systems. If a roof has no access to water, a plumber may have to penetrate the roof to provide it, but roofing waterproofers will need to make sure the integrity of the roof is not compromised.

"Our main supplier has a high-efficiency water nozzle that lets water soak in without creating waste," Moore says. "You need overhead irrigation to broadcast even coverage and possibly drip irrigation every six to 12 inches. Sizing the pipe correctly is important to ensure the pressure and flow operate well." He adds, "getting the irrigation just right while planting on a slope is a challenge."

*Photos courtesy Mike Moore*

On small lots, homeowners create outdoor living on rooftops.

Ongoing maintenance is critical to ensuring a high-functioning green roof. You need to monitor how well plant materials adapt, water use and weather conditions. Weeding and pruning should be minimal as you want to design the garden to self-maintain as much as possible.

"Every few seasons we have to go and replace ground cover," Moore said. "Fertilizing is important depending on type of roofing system you use. Lightweight soil has no organic matter, so it has to be fertilized. Slow-leak fertilizer breaks down slowly, which is ideal."



Mike Moore