

System Specifications and Drawings

- _____ Specifications are very fast and easily developed using Specwriter on LiveRoof.com in A & E section.
- _____ Choose sole spec. option to protect design integrity.
- _____ Use performance spec. for public jobs if sole spec is not allowed.
- _____ Be sure to overlay the green roof design over other rooftop design elements (such as lighting, electrical conduits, drains, mechanicals, etc.) to ensure compatibility.
- _____ Overlay design with 1' x 2' grid pattern to aid installer in take offs and budget development. (1' x 1' for LiveRoof Maxx modules)

Plant Material Specifications and Drawings

- _____ Plant material is integral to the functional, visual, and maintenance characteristics of the LiveRoof. Choose wisely and consult with your local LiveRoof grower for advice on pairing the plants with the particular rooftop environment. Ask your local grower to assist with and to review your plant list so as to make the best choices based upon such variables as; colors and patterns, sun and shade exposure, reflected light, strong winds or dead air, building height, climate, soil depth, irrigation, desired winter colors, etc.
- _____ Call out the plant selections, regardless of the system (X-Lite, Lite, Standard, Deep, or Maxx), specify the particular "base" plant material, and "accent" plants. Craft the plant selections in regard to light exposure and account for the specific exposures if there are multiple roofs. If there are accent plants in the mix, specify the density and position of the plants with a visual diagram so that bidders know what is required and the grower knows how to plant it.

Irrigation

- _____ If a built in irrigation system is part of the design (a good idea for many installations), specify spray rotor type system.
Note: This is far more effective than drip systems.
- _____ If no irrigation, be sure to provide sufficient spigots so that a 50' hose can easily be manipulated to reach the various areas of the green roof.

Bidding Contractors

- _____ Consult your local LiveRoof grower for referrals of "Certified" installers.
- _____ Require contractors to adhere to design and specifications. Disallow substitutions.

System Protection and Worker Safety

- _____ Specify and follow all safety, code, wind uplift, structural loading, and other important considerations. Be sure to have these items developed or reviewed by a structural engineer if needed.

Water-tightness

_____ Require flood testing or electronic leak detection to insure membrane integrity prior to placement of green roof.

Problem Areas - Avoid using plant material in the following locations:

_____ Underneath roof lines unless there is built in irrigation.

_____ Within 2 feet of south or west facing walls, unless irrigated weekly (during growing season), as reflected light will cause excessive loss of soil moisture. Likewise for windows that are at the same level as the green roof. And, if the windows have a mirror finish, we recommend not planting within 6 feet of the windows.

_____ Within 10 feet of mirror-finished glass cladding.

_____ Underneath downspouts and rooftop overhangs which cause soil erosion and plant loss.

_____ In corners where snow tends to drift during winter.

_____ In shady areas, those that get less than 3 hours of direct sunlight per day—too shady for sedums. Such locations require the Deep system and shade tolerant perennials such as Hosta, Epimedium, etc.

_____ Locations with constricted air movement.

_____ Areas where there is reflected light from white membrane, glass and skylights, unless there is a built-in irrigation system and access to water at least once per week.

_____ Areas where there is excessive heat below roof deck, such as from steam or hot water pipes. Use pavers or stone ballast in such areas.

_____ Any area where water pools on the roof.

_____ Within 10 feet of the leeward side of wind screens unless they extend to the ground. If there is a gap, the wind will blow under it, accelerate, and dry out the plants.

_____ Under landscape lighting that is close enough to plant material to throw heat onto the plant material.

Design for Longevity

_____ Cover up all membrane so that it is protected from sunlight and will wear at a similar pace as the membrane under the green roof. It is suggested that flashing cover the membrane on the parapet and extend to 2 or 3 inches above the roof deck. Similarly, membrane around drains should be covered with a RoofEdge drainbox with lid or 2" to 4" of round river rock to shelter it from sun.

_____ The membrane surrounding drain boxes should be covered with slip sheet material as well as underneath the green roof system.

Edging

_____ Make it clear on the drawings where the LiveRoof RoofEdge® needs to be used for system integrity and enhanced wind uplift resistance. For example, around drains, mechanical units, next to stone ballast or traditional paver pedestals, etc. If the plant material runs from parapet to parapet, then RoofEdge is not required along parapet.

Designer's Checklist, *continued*

Traffic Areas

- _____ RoofStone paver is integrated and recommended to be used with the LiveRoof Standard and Deep systems. It may be used for pathways and patios and follows the contour of the roof.
- _____ Provide for a landing area of RoofStone brand pavers so that visitors and maintenance workers may avoid trampling plants. A 10' x 10' area is suggested immediately bordering the roof access point.
- _____ If the roof serves as a means of egress during the winter months, specify that no de-icing chemical or salt be used. Instead specify that cat litter or sand be used for traction. Alternatively, an appropriate heat cable might be installed under the paver.
- _____ If windows will be washed from the roof, develop a maintenance strip using RoofStone pavers or gravel ballast so that plants are not destroyed by foot traffic.

RoofStone Pavers

- _____ LiveRoof RoofStone pavers follow the roof contour and are compatible with Standard and Deep Systems (double base of paver with 6 in. Deep System), and require no pedestals or edging between paver and plant materials. However, if they are used in a perimeter application, they should be surrounded with edging to shield their bases from sunlight.

Installation

- _____ Require installation contractor to flood test roof, or EFVM (Electronic Field Vector Map) and verify it is watertight, prior to green roof installation.
- _____ Require that any low areas with ponding water be corrected prior to LiveRoof installation.
- _____ Require adherence to LiveRoof installation protocol.
- _____ Require installation contractor and general contractor to prevent foot traffic, trampling, and equipment storage upon LiveRoof plants.
- _____ Require that irrigation protocol (how often/how much) be approved by local LiveRoof grower.

Maintenance

- _____ **Specify who will maintain the LiveRoof immediately after installation.**
- _____ Require adherence to LiveRoof specified maintenance protocol beginning at the time of installation. **If one year of maintenance is required as part of the installation package, state so definitively.**
- _____ Provide sufficient tie off anchors for future maintenance if roof design or OSHA policy requires such safety measures for maintenance workers.
- _____ Provide for easy access by maintenance workers. Remember, maintenance personnel will at times need to access the roof with equipment, fertilizer, hoses, possibly even a lawn mower.
- _____ Specify that maintenance contractor is to subscribe to free LiveRoof monthly maintenance newsletter.
- _____ Specify that maintenance contractor and owner facilities' staff to receive maintenance training by LiveRoof rep. This is required for warranty registration.

Canopy Roofs

- _____ With flat canopy roofs, specify the installation of heat cables in the drains and downspouts to prevent wintertime ice dams.
- _____ Specify NO HEAT MELT in the concrete under North Facing canopy roof—unless the canopy has 6 or more inches of closed cell foam under the LiveRoof system (in the roof deck). In such applications, too much heat can be trapped, to the detriment of the plants' wintertime survival. The closed cell foam is required to compensate.

High Rise Applications

- _____ WindDisc for Enhanced Wind Resistance see WindDisc in A & E section of LiveRoof.com. Contact LiveRoof, LLC for wind uplift laboratory data.
- _____ Vegetation for High Rise Applications: Specify special plant mix for high rise applications. Consult your LiveRoof grower for the most wind/cold resistant varieties that can knit together and resist wind erosion during all 4 seasons.
- _____ Mandatory Irrigation System: Spray rotor irrigation system is considered mandatory as a key management tool to maintaining lush, full vegetation, for wind erosion resistance.
- _____ Maintenance Standard: Specify who will care for the roof and prescribe a standard of 100 % coverage, weed free condition. This is important to resisting wind erosion.

Structural Integrity (Sloping Roofs, Wind, Load Capacity)

- _____ If it is a sloping roof, account for downward force against the parapet or other elements on or surrounding the roof. Be sure that the system is properly braced and stabilized, in accord with the specifications and methods shown in the A & E section of the LiveRoof catalog and website, and other methods as deemed appropriate by a qualified engineer.
- _____ If the green roof is in a location that is wind challenged, be certain to account for this in the size, shape, and field location of the green roof including perhaps the LiveRoof WindDisc accessory, the parapet size and design, and the use of a built in place irrigation system to maintain thick vegetative cover.
- _____ Account for the weight of the green roof, including snow and other elements, in the structural design of the building.
- _____ Within the specification, quantify the load limits of the roof so that the installers may avoid placing materials on the roof that might exceed weight limits during the installation process.

