OVERBURDEN, SOLAR ARRAYS & OTHER MISCELLANEOUS ROOF COMPONENTS

Part 9 GENERAL

9.0 OVERBURDEN GENERAL INFORMATION

A. The IBRS Roof System does not include roof components that rest on top of the finished roof membrane. Such components are considered an 'overburden.' Components such as stone ballast, paver systems (concrete, composites, rubber, porcelain, or wood), planters, walking or sun decks, solar arrays, vegetative garden roofs components, and large equipment or any overlying materials which impede investigation or observation to the IB Roof Membrane are considered Overburden Materials.
B. Permanent overburden materials such as poured concrete, mortar, and tile or any other non-removeable materials prevent the IBRS Roof System from eligibility of an IB Total Systems Warranty.
C. Overburden materials may require removal during the service life of the roof to permit inspection, investigation, repair, maintenance, or additions to the assembly. Overburden materials remain the sole responsibility of the building owner or other parties. At all times, the responsibility for removal and replacement of overburden materials installed above IB roof membranes for inspection access, repair, maintenance, or alteration remains with the building owner or other parties.
D. Ballast & Paver overburden criteria are outlined in the IB General Requirements Section, Part 6, and Table A.13. Ballast & Paver Roof Assembles specification guidelines are outlined in the Ballast & Paver Specification Guideline of this Manual. Additional Warranty Requirements are outlined in the Warranty Section of this Manual.
E. Solar Array overburden criteria are outlined in the General Requirements Section, Part 7 of this Manual. Additional Warranty Requirements and Limitations are outlined in the Warranty Section of this Manual.
F. Vegetative Garden Roof overburden criteria are outlined in the General Requirements Section, Part 6 of this Manual. Vegetative Garden Roof & IRMA Assemblies specification guidelines are outlined in the Vegetative and IRMA Roof Assemblies Specification Guidelines of this Manual.
G. Additional Warranty Requirements and Limitations are outlined in the Warranty Section of this Manual.
H. Vegetative roofs, roof gardens, and landscaped roofs shall comply with Chapter 15 of the IBC, Section 1607.13.3, and the International Fire Code.
I. The determination of the weight of all landscaping materials shall be considered as dead load and shall be computed based on the saturation of the soil as determined in accordance with ASCE 7, Section 3.1.4. The uniform design live load in unoccupied landscaped areas of the roofs shall be a minimum of 20 psf (0.958 kN/m^2). The uniform design live load for occupied landscaped areas on roofs shall be determined in accordance with Table 1607.1 of IBC Chapter 16.
J. For all other overburden types not specifically addressed in this Manual, contact IB Technical Services for specific instructions and additional information.

9.1 OVERBURDEN DESIGN CONSIDERATIONS

A. The International Building Code (IBC) references requirements for roof systems secured by ballast. Refer to ANSI/SPRI RP-4 Wind Design Standard for Ballasted Single-Ply Roofing Systems.
B. In certain ballast applications, the perimeter and corner zones may require concrete pavers in lieu of ballast. Concrete pavers are 20-30 pounds per square foot, making them less vulnerable to wind.
C. On higher building structures or on a building in a high wind speed zone, concrete pavers should be the only paver options considered – as opposed to rubber, porcelain, or wood pavers. In areas especially prone to high winds, several concrete paver manufacturers have interlocking paver systems, creating a monolithic system that is more resistant to wind.
D. Designers of vegetative roofing systems should reference ANSI/SPRI RP-14 Wind Design Standard for Vegetative Roofing Systems. This standard provides several 'best practices' such as minimum offset distances around perimeters and corners of the roof (like ANSI/SPRI RP-4) due to the higher uplift pressures in those areas based on the building's wind speed, location, height, exposure, and height of parapet walls. It also recommends the use of wind erosion blankets to prevent wind scouring of growing medium that are not nominally covered by vegetation.
E. For other types of raised overburdens, attachment support systems may be incorporated into the system. Attachment solutions incorporate equipment and other components that are attached through the roof system and into the structure. This attachment support anchorage may apply point loads (upward, downward, transverse or in all directions) to the deck or other structural elements. This design approach may not be feasible in all applications. The new equipment, as well as the effects of the new equipment, will add weight to the

structure as well as alter wind effects. In addition, as a result of adding the new equipment, additional weight will be imposed onto the structural requiring an engineering evaluation. IB Roof Systems recommends that an independent structural engineer evaluate the impact to the entire building structure to determine the adequacy of the structural elements to withstand these added loads. Identifying and determining these imposing loads is the responsibility of the system designer and not that of IB Roof Systems.

9.2 MISCELLANEOUS ROOF COMPONENT ATTACHMENT

A. Recent code changes have outlined additional considerations for the building design, calculating wind force (f), or pressure (p) on various rooftop equipment and utilities anchorage such as but not limited to:
   1. Signs and Walls
   2. Rooftop structures and equipment
   3. For other structures
   4. Rooftop solar panels
B. Traditional methods of installation for rooftop equipment include three categories; ballasted, adhered, and positively attached. In many cases, these traditional methods of installation are field fabricated, often labor intensive, and rely on sealants for long-term watertightness. Field fabrication requires the installer to determine the proper design, installation method, and compatibility of the material, which can vary significantly based on the application. Many of the traditional attachment methods require regular maintenance to ensure performance, watertightness, and the continuation of the roofing warranty.
C. Some rooftop equipment presents certain challenges for mounting rooftop equipment. It is critical to evaluate the overall project requirements, including code, wind, and seismic loads (tensile, shear, and compression), differential movement, etc. as a whole when determining the attachment type and fitness for use. Recent code changes require securement to meet the following criteria:
   1. Nonstructural components and their supports shall be attached (or anchored) to the structure.
   2. Component attachments shall be bolted, welded, or otherwise positively fastened without consideration of frictional resistance produced by the effects of gravity.
   3. A continuous load path of sufficient strength and stiffness between the component and the supporting structure shall be provided.
   4. The use of wood “sleepers” shall not be permitted.
D. Depending on the penetration type, size, and height, additional considerations include movement, expansion and contraction, load capacity, and frequency of use.
E. Flashing solutions for rooftop equipment, penetration and other devices are often flashed with incompatible roof system flashings that compromises the integrity and performance of the roofs primary purpose – to keep water out while protecting the assets within the building.
F. The engineered attachment methods such as U-Anchors are intended to address these code requirements, minimize potential for property loss and life safety concerns, and offer several advantages over the traditional methods of installation such as:
   1. Pre-fabrication of flashing to support device
   2. Have an intentional design philosophy
   3. Manufacturer compatible and approved
   4. Testing data to verify fitness for use in handling roof loads
   5. Standardized connection points and mounts
G. The following types of rooftop equipment, penetrations and other devices that require attachment can be addressed with prefabricated engineered attachment solutions such as U-Anchors:
   1. Fixtures attached or mounted to walls
   2. Rooftop A/C units
   3. Life Safety Devices
   4. Sleepers
   5. Photovoltaic (PV) Solar Array
   6. Snow Retention
   7. Pipe Supports
   8. Miscellaneous Equipment Restraint
H. The U-Anchor is designed with a membrane compatible flashing component that integrates with the roof membrane and can be included as a flashing component of the warranty.