



## GREEN LIVING ROOF PRODUCT BINDER

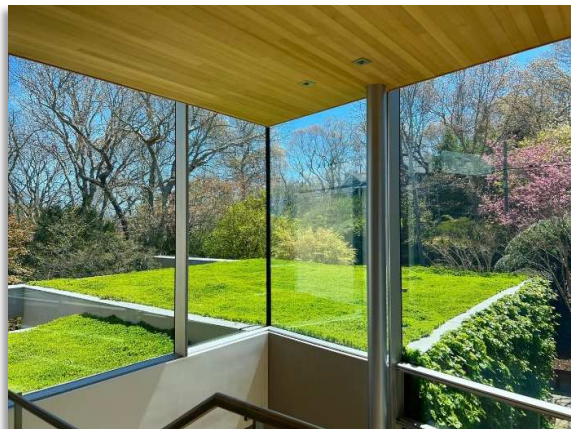
EXTENSIVE – INTENSIVE – ROOF FARMS

SLOPED GREEN ROOFS – AMENITY SPACE

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### PATENTED PRODUCTS AND SERVICES

- Stormwater Pollution Prevention and Compliance (SPPC)
- Stormwater Compliance and Management (SCM)
- Green Roof - Patented Product Supply
- Design - Build – GLT Pro Staff Teams (Global)
- Consulting and Estimation
- Jobsite Supervision





## GREEN LIVING ROOF PRODUCT BINDER

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### Proponent Credit Union (NJ)

This design build project featured an extensive green roof integrated with amenity space, combining custom stairs and railings with traditional pavers & landscape lighting package installed atop the GLT green roof system. GLT is also the manufacturer of the custom drain covers & blind edging detail.

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Green Living Tech (GLT) is a pioneer in the design and manufacturing of green roofs, green walls, and vertical farms. For over two decades, we've been bringing innovative "living architecture" solutions to projects worldwide, shaping the foundation of the green industry.

With our expertise, GLT has expanded its reach to 13 countries, delivering numerous major projects from Alaska to the Middle East. We have set the standard for sustainable design, influencing the growth and evolution of the green sector.

As the first manufacturer to introduce a formal training program, GLT has led the way in education, offering certifications in green roofs, green walls, urban farming, rooftop agriculture, and vertical farming. Our training has evolved into the GLT "ProStaff" certification, recognizing the professional status of our dedicated installers and maintenance technicians.

Our green roof system is strong, flexible, and lightweight, designed to optimize water management and plant health. Each material layer is adhered, ensuring a fast, clean, and easy installation. The system's modularity & flexibility make it ideal for various applications, and water retention is easily enhanced with our affordable water retention fabric.





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### Major League Baseball (MLB) – Miami Marlins

When MLB required the outfield to be shortened, the Miami Marlins turned to GLT to make it happen. As a trusted partner of MLB, GLT has worked with several teams including the New York Mets, Miami Marlins, Minnesota Twins, and Boston Red Sox.

### Why Clients Trust Us

Clients trust GLT because of their **proven expertise, commitment to sustainability, quality products, and personalized customer service**. GLT has earned a reputation for providing reliable, high-performance living architecture solutions that are designed to last and meet the needs of any project.

- **Proven Expertise and Innovation:** With over two decades of experience, GLT has established itself as a pioneer in the living architecture industry. The company's commitment to innovation and excellence has led to the development of patented products and industry-first systems that continue to set the standard for green roofs, walls, and urban farming solutions.
- **Sustainability and Quality:** GLT's products are manufactured using eco-friendly, durable materials, such as recycled aluminum and stainless steel, ensuring both sustainability and long-lasting performance. Their green roofs and walls are designed to last a lifetime, making them a smart investment for environmentally-conscious clients looking to make a lasting impact.
- **Comprehensive Training and Certification:** As the first manufacturer to implement a formal training program, GLT offers certification in green roofs, green walls, and vertical farming. Their ProStaff certification ensures that every installer and technician is highly trained and capable of delivering the highest quality service, adding a layer of trust and professionalism to every project.



## GREEN LIVING ROOF PRODUCT BINDER

- **Global Reach and Successful Projects:** GLT's impact is felt in 13 countries around the world, with countless successful projects spanning from Alaska to the Middle East. Their ability to execute complex and large-scale projects in diverse environments has earned them the trust of architects, builders, and developers worldwide.
- **Customization and Flexibility:** Whether it's a residential, commercial, or urban farming project, GLT's solutions are customizable to meet the unique needs of each client. The flexibility of their living wall systems and green roofs allows for easy integration into different types of architecture, climates, and design goals, ensuring that each installation is the perfect fit for its environment.
- **Client-Centric Approach** GLT puts a strong emphasis on collaboration and customer satisfaction. Their knowledgeable team works closely with clients from concept to completion, ensuring that every project runs smoothly and meets all expectations. GLT is committed to delivering personalized service and providing ongoing support for maintenance and troubleshooting.
- **Proven Performance and Reliability** Clients trust GLT because of the proven performance of their products. With a focus on ease of installation, low maintenance, and reliable systems, GLT's living walls and green roofs are designed to function flawlessly for years, providing environmental benefits and aesthetic appeal without the hassle.
- **Commitment to Innovation and Research** GLT remains at the forefront of the green architecture movement by continually researching and developing new technologies to improve the performance and functionality of their products. Clients trust GLT because they know the company is always looking for ways to make their systems even better and more efficient.

## Waterproofing

### Waterproofing Guidance for Long-Term Vegetative Roof Success



## GREEN LIVING ROOF PRODUCT BINDER

Waterproofing is the most critical element in any vegetative roof assembly. Though GLT is not a waterproofing manufacturer, we have extensive field experience and can recommend system types—ranging from basic to high-performance—tailored to the demands of green roof applications.

Selecting subpar membranes or inadequate thicknesses may offer short-term capital savings, but the long-term cost of removing and reinstalling a vegetative system to repair failures far outweighs the initial investment. We encourage specifiers to prioritize robust waterproofing solutions that ensure structural integrity and longevity of the entire assembly. Here are membrane applications in order of durability and application.

### ✓ 1. Hot-Applied Rubberized Asphalt

**Best for:** High-performance, long-term vegetative systems

- Fully bonded, monolithic application
- Self-healing and seamless
- Root-resistant with proper additives
- Excellent for complex roof geometries
- Long track record in intensive green roofs

**Drawback:** Requires skilled installation and heating equipment

### ✓ 2. Cold-Applied Liquid Membranes

**Best for:** Detailed and irregular surfaces, fast-track projects



## GREEN LIVING ROOF PRODUCT BINDER

- Fully adhered and seamless
- Can be applied over existing substrates
- UV-resistant options available
- Durable and root-resistant

**Drawback:** Weather-sensitive during application (temperature/humidity)

### ✓ 3. Thermoplastic Membranes (TPO/PVC)

**Best for:** Extensive green roof systems

- Factory-made sheets welded together
- PVC options can include root-resistant properties
- Relatively easy to inspect and repair
- Common in commercial flat roofs

**Drawback:** Seams are potential weak points

### ✓ 4. EPDM (Ethylene Propylene Diene Monomer)

**Best for:** Simple lightweight extensive green roofs, budget-conscious installs

- Durable rubber sheet membrane
- Easy to install with minimal equipment
- Good UV resistance

**Drawback:** Not inherently root-resistant (requires additional root barrier)

- Seams are glued, not welded (potential for long-term vulnerability)

### ✓ 5. Built-Up Roofing (BUR) or Modified Bitumen

**Best for:** Retrofit green roofs on older buildings



## GREEN LIVING ROOF PRODUCT BINDER

- Multi-layer protection
- Proven performance history

**Drawback:** Labor-intensive & heavier

### **Root Barrier**

Regardless of the waterproofing type, a separate root barrier is required. \*The GLT Green Living Roof system has root barrier already adhered as part of the “System”.

### **Recommendations:**

- Ensure compatibility with overlying drainage, retention, and vegetation layers.
- GLT works with manufacturers that offer long-term warranties for green roof use.

## **SPECIFICATION [extensive or intensive- specify] Green Living Roof**

NOTE TO SPECIFIER – GLT pre grown vegetative green roof systems

This section is for Green Living Tech LLC (GLT) green living roof systems.



## GREEN LIVING ROOF PRODUCT BINDER

GLT 800-631-8001 [www.agreenroof.com](http://www.agreenroof.com)

The GLT Green Living Roof System was the first modular system engineered to replicate the performance of a traditional multi-layer green roof build-up. All essential layers—drainage, root barrier, growing media, and vegetation—are integrated into a single, easy-to-install module, providing a monolithic, interlocking system that allows for tool-free removal when access to the underlying waterproofing is needed.

Built for exceptional strength (rated up to 3,200 psf) and design flexibility, the system accommodates rooftop undulations, curves, and irregular layouts with ease. Its stormwater management capabilities are unmatched, offering customizable retention levels tailored to each project's structural load or sustainability goals. Suitable for both extensive and intensive green roof applications, the GLT system delivers scalable, durable, and high-performance green infrastructure.

### GLT Lightweight Pre-Grown Sedum Mats

#### Product Overview

GLT's pre-grown sedum mats are engineered for rapid deployment and long-term performance. Installed directly onto GLT's patented Green Living Roof panels, they deliver an instant vegetated roof system with minimal labor and no grow-in time.

#### Key Features

*Fully Mature Coverage* – 100% pre-grown, laid like sod for immediate green roof finish

*Weed-Resistant & Stable* – Reduces maintenance and resists erosion from wind and water



## GREEN LIVING ROOF PRODUCT BINDER

*Wind Uplift Protection* – Secure installation method ensures long-term durability

*Regionally Grown* – Locally sourced for climate adaptability and faster delivery

*LEED® Credit Eligible* – Contributes to sustainable design and regional sourcing points

*Lightweight & Scalable* – System starts at just 10 lbs/sq. ft., customizable for extensive or intensive applications

### **Multilayer vegetation support system.**

#### **PART 1 - GENERAL**

**1.1 SUMMARY** – Provide all labor, materials, equipment, services related items necessary to complete all work required as per this specification, drawings and associated details.

NOTE TO SPECIFIER – Delete any section not relevant.

A. Section Includes:

1. Panel system green roof covering.
2. Engineered growth media with bioSoil.
3. Irrigation for roof covering.
4. Vegetation for roof covering.
5. Accessories and components as necessary for a complete installation of the vegetated roof covering.

B. Related section 07 \_\_\_\_ (07\_\_): Waterproofing Membrane for Vegetative Roofing.

#### **1.2 SYSTEM DESCRIPTION**



## GREEN LIVING ROOF PRODUCT BINDER

### A. DEFINITIONS

1. Root Barrier: A flexible, synthetic polymer layer installed below the drain board and waterproofing that serves as protection against root encroachment into underlying roof components.
2. Drainage Board: A 3D high density polyethylene structure that creates a free-flowing space below the green roof to permit unrestricted movement of excess water to roof drains.
3. Water Retention Fabric: A non-woven polyester fabric layer to serve as filter fabric against particle erosion and to retain supplemental water for root uptake and plant use. Additional water retention layer(s) may be used in the green roof system assembly for additional water holding capacity.
4. Pre-Grown Vegetation Mat: An integrated unit of plant material, growing medium and natural fiber or geotextile carrier. Pre-Grown mats are harvested fully vegetated from the production field and delivered to the installation site as flat or rolls.
5. Growing Medium: An engineered composition of organic and inorganic mix blended to specific design outcomes complete with BioSoil.

### B. Design Requirements *EXTENSIVE GREEN LIVING ROOF*

**NOTE TO SPECIFIER – Delete any section not relevant.**



## GREEN LIVING ROOF PRODUCT BINDER

1. The vegetated cover shall include a modular panel type system and include engineered growth media, consisting of a [specify] inches of depth.
  2. The weight of this panel type system at Maximum Water Capacity / Saturated weight with irrigation and rainfall runoff occurring, shall be less than or equal to [specify] pounds per square foot fully saturated.
  3. The panel type system dead load, when added to the weight of the roofing membrane system, shall not exceed the maximum allowable dead load for the roof.
- C. Performance Requirements: Vegetated roof covering system shall:
1. Support a perennial and / or vegetated ground cover and / or larger plantings, trees as per specification defined as "Extensive or Intensive or a combination of both;
  2. Provide efficient drainage of moisture that is in excess of that required for the vigorous growth of the installed vegetation;
  3. Retain up to 8 gallons of water per 10.5 square feet without exceeding the saturated weight specified in design requirements.

### 1.3 SUBMITTALS



## GREEN LIVING ROOF PRODUCT BINDER

**NOTE TO SPECIFIER – Delete any section not relevant. Include mock up if the project size and / or quality warrant precaution.**

**A. Submittals and Product Data:**

1. Submit under provisions of Section \_\_\_\_\_.
2. Product Data: Manufacturer's data sheets on each product to be used, including:
  - Preparation instructions and recommendations.
  - Storage and handling requirements and recommendations.
  - Installation methods.
3. Shop Drawings: The manufacturer shall provide a cross section of the green roof system detailing the components comprising the extensive vegetated roof system.
  - The green roof system specified in this Section is based upon products of Green Living Tech LLC 800-631-8001 [www.agreenroof.com](http://www.agreenroof.com)  
[info@agreenroof.com](mailto:info@agreenroof.com)
4. 1 meter or 2 meter section of panel type green roof system, complete with drainage board filter / water retention mat with min 16 oz weight.
5. Protection fabric according to the waterproofing manufacturer.
6. Submit third party media analysis for the mentioned engineered growing media.
7. Submit written approval from membrane manufacturer confirming compatibility of the roofing system with the specified green roof. \*If waterproofing does not

comply with the specified green roof system, green roof manufacturer of the panel type system may provide alternate / equal waterproofing.



## GREEN LIVING ROOF PRODUCT BINDER

8. Green roof manufacturer's warranty
  - Green roof manufacturer will warranty the non – organic green roof components to equal that of the waterproofing manufacturer, minimum 20 years.
  - Extensive green roof manufacturer will use 100% mature succulents or other in a mat form and warranty the plants for a two-year period from the installation as part of the installation cost.
  - After two years if the client continues the maintenance agreement green roof manufacturer will continue to warranty the plant material.
9. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - Install materials in areas designated by Architect.
  - Do not proceed with remaining work until materials and installation are approved by Architect.
  - Demonstrate changes to the mock-up area as required to produce acceptable work.

NOTE TO SPECIFIER – Delete any section not relevant.

SPLIT WARRANTY – Separates waterproofing and green roof



## GREEN LIVING ROOF PRODUCT BINDER

1. Green Roof manufacturer will warranty the non – vegetative green roof components for a period of 5 years (Not including Irrigation)
  - Extensive Green Roof manufacturer will use 100% mature plants in a mat form and warranty the plants for a two-year period from the installation as part of the installation cost.
  - After two years if the client continues the maintenance agreement with the green roof manufacturer, the green roof manufacturer will continue to warranty the plant material.
  - Green Roof manufacturer will provide overburden green roof removal as part of this split warranty.
2. Submit installation shop drawings for green roofing systems to show at minimum details:
  - Drains
  - Flashing
  - Terminations
  - Intersection of horizontal and vertical surfaces
  - Penetrations
  - Roof parapets
  - Transitions from vegetation to pavers
  - Drip irrigation
  - Submit for typical and non-typical conditions of Project. Manufacturer's standard data sheets are not acceptable for shop drawings.



## GREEN LIVING ROOF PRODUCT BINDER

3. Shop Drawings shall clearly indicate each and every component of the panel type planted green roof assembly.
4. Shop Drawings shall include large scale details of each different material/interface as well as terminations and transitions.
5. Shop Drawings shall clearly show each different system component; including material sequence of installation.
  - Waterproofing
  - Waterproofing manufacturers protection fabric
  - Pre-Assembled green roof system
  - Engineered growing media with bioSoil
  - 100% mature succulent mats or other specified plant material
  - Paver, walkway or patio installation
6. Sample Maintenance Agreement

**NOTE TO SPECIFIER – Delete any section not relevant.**

### B. Quality Control Submittals



## GREEN LIVING ROOF PRODUCT BINDER

### 1. Installer Certification

- Certificate or letter from the green roof manufacturer certifying that the installer is licensed or approved to install the specified green roof system, and has been in operation applying the system for 3 years or more.
- Names, address, and telephone numbers of three projects.
- Certificate or letter from the panel type green roof manufacturer certifying that the job foreman or crew chief and at least one other member of the team have installed at least five green roof systems specified.
- Green roof manufacturer will provide a representative on the job site at all times.

### 2. Contract Closeout Submittals:

- Panel type green roof manufacturer certification of completed assembly: As per specification.
- Letter from panel type green roof manufacturer stating that the project is registered with the manufacturer to uphold warranty. The Contractor is to bring this to the Post-installation conference.
- Guaranty and Warranty: As specified.

### 3. Protection / Safety

- Provide a detailed safety plan



## GREEN LIVING ROOF PRODUCT BINDER

### C. Site Protection

- The roof membrane is to be protected from damage by first sweeping off all debris and then laying protective paneling in work and traffic areas.
- Heavy materials are only to be placed in designated areas on roof which have been approved by a structural engineer to be suitable to carry the specified load. If there are no areas that can support additional weight then all loads must be “floated” above the roof surface by lift, never to set the load down on the roof.
- Protect area by 8” of polystyrene.

### Part 2 Products Description

NOTE TO SPECIFIER – Delete any section not relevant. Contact GLT for sloped applications up to 4:12 pitch. Beyond 4:12 pitch see GLT Green Living Wall for sloped green roof applications.



## GREEN LIVING ROOF PRODUCT BINDER

- A. Acceptable Manufacturer: Green Living Tech LLC – 800-631-8001 – [www.agreenroof.com](http://www.agreenroof.com)  
[Info@agreenroof.com](mailto:Info@agreenroof.com)
- B. Pre-Grown Extensive Green Living Roof System
1. The pre assembled panel system is made up of modular 1 or 2 meter sections:  
109.2 cm (43") by 109.2 cm (43") including overlap areas Or  
218.4 cm (86") by 109.2 cm (43") including overlap areas of vegetation area that  
are delivered as a preassembled panel to the site for installation.
- C. Required Components
1. High density polyethylene drainage board;
- Made of high-density polyethylene that contains at least 80% post industrial recycled materials.
  - Class "B" fire rating
  - Compressive strength of 3200 lbs f2 (150 Kn/ m2)
  - Flow rate of 6.868gpm/10.76 f2 (3.28' x 3.28') or (26Lpm/m2)
  - UV resistant
  - Temperature range -40°F to 176° F (-40°C to 80°C).
  - Water holding capacity = 16 oz per square foot (1.34 gallons per m2)
  - Weight dry 4 ounces per square foot (2.68 lbs per meter2)
  - Weight saturated 1lb – 4 oz per square foot (11.20 lbs per meter2)
2. Water retention mat attached to the vegetation carrier with a minimum depth of 7 mm (0.27");
- The Water Retention is provided and attached to the drainage board.
  - The Water Retention must have a minimum depth of 7 mm (0.27").



## GREEN LIVING ROOF PRODUCT BINDER

- The Water Retention must be made to cover the entire module except for the 2 rows around the exterior of two sides, which are left exposed for the fastening one panel to the next.
- Water holding capacity = 16 oz per square foot (2.64 gallons per m<sup>2</sup>)
- Weight dry 4 ounces per square foot (2.68 lbs. per meter<sup>2</sup>)
- Weight saturated 1.97 lbs 4 oz per square foot (21.12 lbs. per meter<sup>2</sup>)

### D. ASTM Testing Methods



## GREEN LIVING ROOF PRODUCT BINDER

| Physical Property | Property              | Units (English)                 | Units (Metric)        |                     |
|-------------------|-----------------------|---------------------------------|-----------------------|---------------------|
|                   | Material              | Recycled Polyester              |                       |                     |
|                   | Total Thickness       | .60 inches                      | 15.25 mm              |                     |
|                   | Total Weight (Ave.)   | 36 oz / yd <sup>2</sup>         | 1021 g/m <sup>2</sup> |                     |
|                   |                       |                                 |                       | <b>ASTM Method</b>  |
|                   | Polymer               | Polypropylene                   |                       |                     |
|                   | Fabric Color          | Light Green/ Maroon             |                       |                     |
|                   | Weight                | 20.0 oz / yd                    |                       | ASTM D 5261         |
|                   | Grab Strength MD      | 135.0 lbs.                      | .6005 kN              | ASTM D 4632         |
|                   | Grab Elongation       | 70%                             | 70%                   | ASTM D 4632         |
|                   | Mullen Burst Strength | 300 psig                        |                       | ASTM D 3786         |
|                   | Puncture Strength     | 70.0 lbs                        | 0.31 kN               | ASTM D 4833         |
|                   | Water Holding         | 1200 – 1500%                    |                       | ASTM D 4250         |
|                   | Water Holding         | 0.12 – 0.25 gal/ft <sup>2</sup> |                       | ASTM D 4250         |
| <b>Flow Rate</b>  |                       | <b>1.0 Gradient</b>             |                       | <b>0.1 Gradient</b> |
|                   | 1000 psf              | 23.0 gal/min/ft                 |                       | 6.9 gal/min/ft      |

E. Extensive / Intensive Green Roof Media with bioSoil.



## GREEN LIVING ROOF PRODUCT BINDER

- GLT Engineered growing media with bioSoil, a locally produced substrate must be applied to the system on top of the Water Retention for the purpose of plant sustainability.
  - When weight is a concern lightweight growing medium recipe / component may be used to reduce the load on the roof structure approved by the panel type green roof manufacturer.
  - Any growing medium required must be approved or provided by green roof manufacturer or agent to ensure viability and performance of the system as per the specifications.
- F. Extensive Planting 95% pre-grown vegetation succulent mats or other plants grown and mature within 100 miles of the project site with mature root growth with a mixed species of drought tolerant vegetation. Intensive planting will be pending design loading dictated by structural engineer.
- G. Irrigation
- See irrigation specification
  - There are multiple irrigation applications pending the type of green roof application.
  - Irrigation will be designed per project application by green roof manufacturer.
- F. Aluminum edging detail to be non-penetrating.
- G. Roof Pavers



## GREEN LIVING ROOF PRODUCT BINDER

- Pavers shall be loose laid and weigh [\_\_\_\_] lb/sf minimum, [\_\_\_\_] lb/sf maximum
- Install pavers, complete with assembly, accessories and features, as indicated on the drawings and as recommended by green roof manufacturer of the roofing system.
- Place pavers, accurately aligned. Cut pavers to fit irregularly shaped areas and around protrusions.

### H. Stone Ballasting / Additional Pavers

- Immediately following the placement of the fabric, install the ballast.
- Provide a minimum of [\_\_\_\_] pounds per square foot of ballast for coverage in areas as per drawings.

### E. Additional Accessories as required:

- Root Barrier
- Waterproofing manufactures protection fabric

### F. Typical Extensive Assembly

- Waterproofing



## GREEN LIVING ROOF PRODUCT BINDER

- GLT Green Living Roof Panels

### Assembled GLT Drain Board

- GLT Green Living Roof Panels
  - GLT Weed barrier, HDPE water retention and filter fabric
- Engineered Growing Media to specified depth
- Pre-Grown GLT lightweight extensive vegetative mats
- 2-3" of media = 10 – 15 lbs. per square foot saturated
- 3-6" of media = 15 – 30 lbs. per square foot.\*

\*Specify maximum loading

### Part 3 – Execution

- Underlying roof components (including but not limited to deck, vapor barrier, insulation, waterproofing membrane) shall be installed and tested according to manufacturer guidelines.
- Do not begin installation until substrates have been properly prepared.
- Hose Bib / Water Supply: A spigot source or other point of connection for supplying water to the roof with sufficient pressure shall be provided. Irrigation shall be applied during the plant installation phase, e.g. first 2 to 4 weeks, after installation. In order to support mature establishment of the vegetated community, periodic irrigation shall be applied during the hottest months of the year. The method of supplying irrigation may vary with regard to removable or permanent piping, rotary heads, drip irrigation, or other approved irrigation technologies, contact manufacturer.



## GREEN LIVING ROOF PRODUCT BINDER

### 1. Delivery

- Co-ordination of delivery time lines is the responsibility of certified installer. Two (2) days advance notice of delivery to the producer is necessary to ensure there are no delays.
- The pre-grown mats will be palletized and delivered to site for installation on the date of installation unless otherwise specified.

### 2. Storage

- If the outside temperature is above 25°C (77°F) the mats must be installed within one (1) day after being palletized to prevent damage to the vegetation. If the outside temperature is between 15°C (59°F) and 25°C (77°F) the modules must be installed within (2) days after being palletized to prevent damage to the vegetation. If the outside temperature is between 5°C (41°F) and 15°C (59°F) the modules must be installed four (4) days after being palletized to prevent damage to vegetation.
- Palletized vegetated material must be stored in a secure, cool shady environment out of direct sunlight prior to installation. Vegetated panels must be protected from rapid temperature changes of more than 15°C (59°F)/hour.
- All other materials (non-living) should be stored in a dry location out of direct sunlight with original packaging and documentation left intact prior to installation.



## GREEN LIVING ROOF PRODUCT BINDER

### 3. Installation

- The roof area must be vacuumed, swept or other means free of minor debris or other material.
- The root barrier and/or protection sheet (if required) must be placed over the membrane or insulation in the area being greened.
- The pre assembled panels can then be installed in the proper area. A wagon or cart with pneumatic tires may be used to move multiple panels / rolls to the designated area provided this doesn't exceed load restrictions of the roof.
- The panels must be cleaned and overlapped by two pockets.
- Apply and screed growing media to the specified depth.
- Install subsurface irrigation.
- Saturate media prior to vegetation installation.
- Install pre-grown vegetative mats or intensive plantings as per specification.
- Irrigate vegetation to insure recovery.

### 4. Ballasted green roof systems

- Such as high-elevation surfaces or protected roof assemblies, washed river stone 3/4 inch to 1-1/2 inches (19 mm to 38 mm) shall be overlaid on the installed green roof system at a (\_\_\_\_") width. Verify approval of stone ballast material and installation depth before applying.
- To minimize foot-traffic on the vegetated Sedum mats during distribution of ballast stone, the stone shall be applied concurrently with installation of the vegetated Sedum mats. This shall be achieved by pre-staging the bags being



## GREEN LIVING ROOF PRODUCT BINDER

used for stone distribution at appropriate intervals adjacent to each row of installed Sedum mats.

### 5. ROOF EDGES, DRAINS, AND PENETRATIONS INSTALLATION

- A minimum of 12 inches (305 mm) shall separate vegetation mats from the roof edge and roof penetrations, such drains and vents. The green living roof shall be installed abutting a fixed boundary, such as a metal edging, stone, or paver. Washed river stone or concrete paver blocks shall be placed onto the green living roof system base components in the non-vegetated border areas as scheduled or required at drain locations and to comply with the design.

### 6. Maintenance

- Maintenance must be provided by green roof manufacturers Certified Maintenance Technician.
- Maintenance contract beginning from the completion of system installation and is provided with initial quotation by the certified installer.

END SECTION



## GREEN LIVING ROOF PRODUCT BINDER

### Patented Green Living Roof Options

#### 1. Green Living Roof Panels

##### Highlights

Use: < 20 degrees – 4:12 pitch

- Available pre-vegetated with 100% mature mats
- The foundation for all types of green roofs (extensive / Intensive)
- Create shapes and odd angles and account for undulations
- Extensive can be 10 - 30 pounds per square foot saturated pending on media depth
- We can meet a 10 lb. per f<sup>2</sup> specification for lightweight applications
- 100% root to root contact
- 3200 lbs. compressive strength



#### 2. Green Living Wall Panels

##### (Sloped Green Roofs) Highlights

> 20 degrees – 90 degrees

- Non penetrating bracket system
- Guaranteed not to slip or wash out
- 4", 6" and 8" depths
- Flexible design and weight loads





## GREEN LIVING ROOF PRODUCT BINDER

### 1. **Green Living Roof Panels**

PAT #s 7716873 & 7716873

*Uses: Extensive, Intensive, Hybrid Green Roofs*



- The Patented Green Living Roof Panel contains all the key layers adhered to one easy to use pick up and put down / roll out technique.
- Easy to remove to access waterproofing without destroying the green roof.
- Unlike modular systems the GLT Roof Panel has 100% soil to soil contact.
- Has scientifically designed water retention and drainage to prevent plant disease.
- Does not require excessive irrigation because of the patented water retention technology.
- Same system / technology for Extensive and Intensive without modification.
- Flexible and can account for undulations, can be cut for curves and angles.
- Used on slopes <20 degrees.
- Can be as light at 10 lbs. per square foot saturated. \*Limitations apply
- Even saturation to prevent pooling water.
- Retro fit or new construction.
- Installation is faster and less labor intensive



## GREEN LIVING ROOF PRODUCT BINDER

- 3200 lb per square foot compression rating eliminate expensive pedestal systems and build patios and walks directly on top of the water retention. See Fig. 1



Fig 1 - LEFT: Traditional pavers built on top of the Green Living Roof system enhance the beauty, provide more design options and eliminate the use of pedestals.

The use of the Green Living Roof allows for stormwater to flow freely under the pavers eliminating any chance of pooling or hindered runoff.

### Planting Options

- GLT Pre-Grown Mats (Extensive)
- Planted in place with plugs or cuttings (Extensive / Intensive)
- Pre-grown contains 10-15 sedum varieties for full sun or part shade (Extensive only)
- Deeper rooted perennials, grasses, bushes, trees, agriculture (Intensive) GLT Growing Media with bioSoil
- Specifically engineered advanced growing media additive designed for the use of patented GLT systems.



## GREEN LIVING ROOF PRODUCT BINDER

- 100% Organic with no added fertilizers promoting strong root systems.
- NO vermiculite or other short-lived pumice.
- Lightweight, free draining and promotes aerobic activity at the root level.
- Highly concentrated nutrients will not leech into the storm water runoff.
- Exceeded FLL standards.



# GREEN LIVING ROOF PRODUCT BINDER

## Green Living Roof Panels

From Field



To Delivery



To Installation





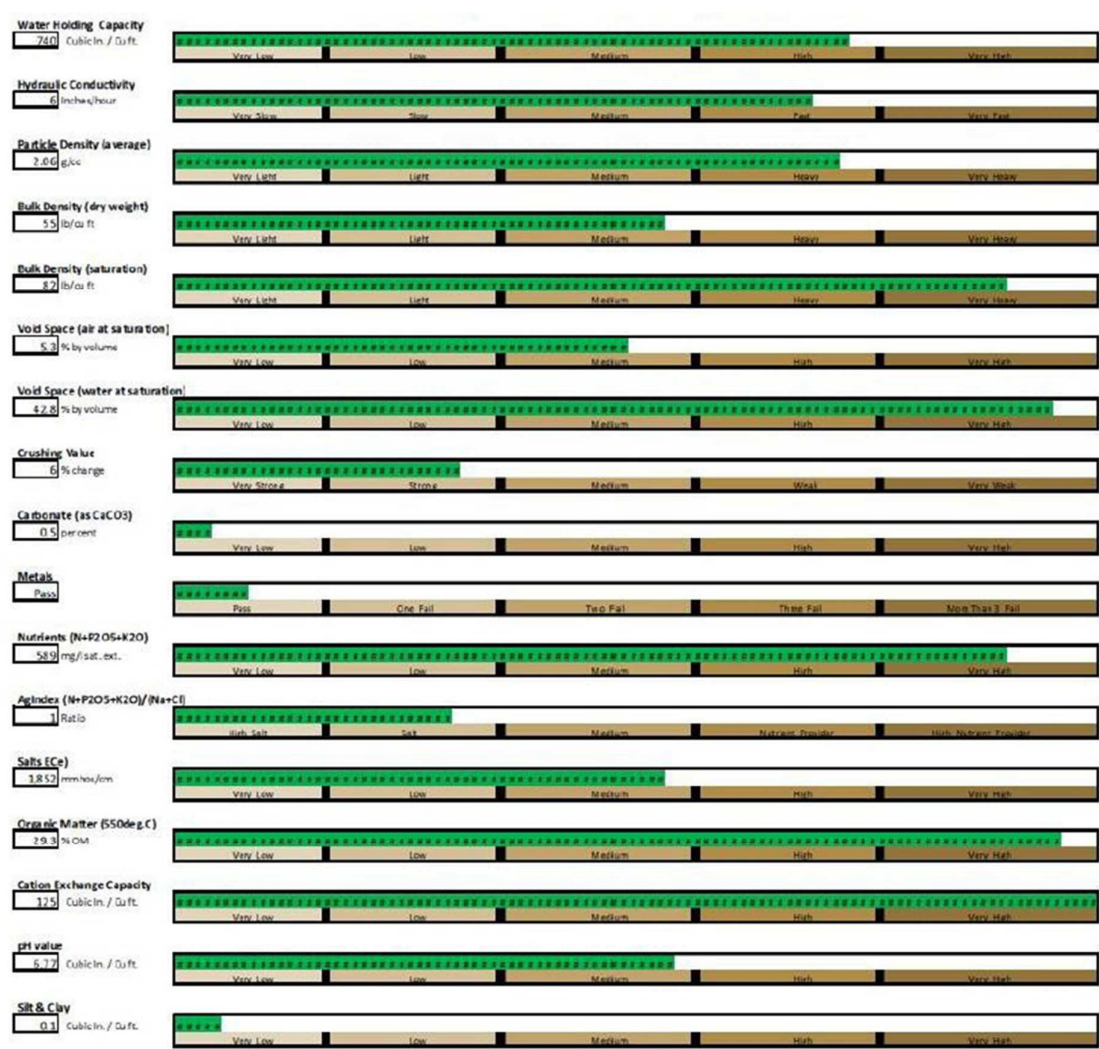
## GREEN LIVING ROOF PRODUCT BINDER

|                                                                                       |                                                                                                                               |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| <b>Dimensions:</b>                                                                    | Green Area:100 cm (39.5") x 100 cm (39.5") x 4.45 cm (1.75")*<br>*Height of base model configuration only no media            |
| <b>Water Retention:</b>                                                               | (.55-.60 gal/sq ft) = 5.88 – 6.42 gal per 10.7 sf (Without vegetation)                                                        |
| <b>Saturated Weight:</b><br>(*Min. Substrate Depth - **Deeper depths will be heavier) | *39 kg/m2 (10 lbs/sq ft) 2" – 2.5" media depth<br>**73kg/m2 (15lbs/sq ft) 3" - 3.5" media depth                               |
| <b>Max. Flow Rate through Drainage Holes:</b>                                         | 26 gal/minute/10.72 f <sup>2</sup>                                                                                            |
| <b>Fire Rating of Plastic Carrier:</b>                                                | Class "B"                                                                                                                     |
| <b>Product Warranty (not including vegetation):</b>                                   | 5 - 15 years extended warranty available                                                                                      |
| <b>Vegetation Warranty:</b>                                                           | Annually renewable full system warranty and maintenance (including vegetation) program available                              |
| <b>Compressive strength of</b>                                                        | 3200 lbs f <sup>2</sup> (150 Kn/ m <sup>2</sup> )                                                                             |
| <b>Weight dry</b><br><b>Weight saturated</b>                                          | 4 ounces per square foot (2.68 lbs per meter <sup>2</sup> )<br>1lb – 4 oz per square foot (11.20 lbs per meter <sup>2</sup> ) |
| *Without media or vegetation                                                          |                                                                                                                               |



# GREEN LIVING ROOF PRODUCT BINDER

## GLT Media with bioSoil, Engineered Extensive Blend



Soil Analysis by: Soil Control Lab, Watsonville, CA 95076



## GREEN LIVING ROOF PRODUCT BINDER

### WHAT IS GLT bioSoil?

bioSoil is probiotics for plants, turf, agriculture, trees and golf course applications. bioSoil contains a wide consortium of living, natural, beneficial bacteria.

- Nitrogen fixing bacteria convert nitrogen from the air into natural fertilizer right at the plant, reducing input and fertilizer runoff. Nitrifying bacteria convert higher nitrogen forms into nitrates, the principal form of nitrogen used by plants and turf.
- Phosphate solubilizing makes the phosphorous in the growing media more available. The combination allows growers and maintenance technicians to greatly reduce their fertilizer inputs. The photosynthetic bacteria in bioSoil “feed” the plant as well as the entire growth media food web by producing sugars and adding carbon biomass. The multiple Bacillus strains in bioSoil increase plant and turf health thus increasing their natural resistance to pathogens and disease, lowering the need for pesticides.

bioSoil is advanced science and biotechnology and an all-in-one agriculture product that will augment your compost, manure, humus, compost teas and other biologicals and lower your use of fertilizers, water, fungicides and chemicals.

- Most competitor products contain spore-forming (inert) microorganisms. In contrast, the beneficial bacteria in bioSoil are vegetative (alive and actively growing) so they start working instantly - results are often seen in hours as opposed to days or weeks.
- bioSoil contains a wide variety of beneficial bacteria that perform various functions for the plant. Many competitor products contain 1 or just a few strains.
- We do not use growth inhibitors or other chemicals to keep our microbes alive.
- bioSoil is shelf stable for at least two years, a significant advancement in microbiology.
- bioSoil contains photosynthetic microorganisms that produce energy for plants.



## GREEN LIVING ROOF PRODUCT BINDER

- bioSoil is compatible with fertilizers and most chemicals.
- bioSoil can be mixed with dry or pelletized products.
- bioSoil can be applied by your normal watering equipment: Irrigation systems, watering cans, sprayers (end-hose, backpack, truck), etc.
- bioSoil can be applied as a foliar or a drench treatment.
- bioSoil can be used with Hydroponics
- Reduce fertilizer use by 50%.
- Reduce water use by up to 50%.
- Reduce fungicide and chemical use significantly.
- Increase yields and brix levels by 20% or more.
- Healthier and greener plants, trees and turfs.

The substance of the food we eat today is not the same as it was decades ago due to the way we grow our crops. Practices such as over-fertilization, chemical and hormone use can greatly diminish the nutritional quality in our food supply. These techniques cause plants to grow very quickly, but they don't necessarily have the time to obtain nutrients from the soil or to produce the vitamins, anti-oxidants, and other vital nutrients that add value to our diet and health. This results in food that is deficient in nutrition and adds more empty calories to our diet. bioSoil contains beneficial bacteria as well as organic humates, a combination that has proven very effective in producing nutrient dense food. Our photosynthetic bacteria produce sugars by utilizing the energy in sunlight. This provides sugar to the plants - increasing the brix (sugar) levels, taste and nutritional quality and density.



## GREEN LIVING ROOF PRODUCT BINDER

The other beneficial bacteria in bioSoil help to break down and cycle organic compounds and to sequester minerals, thus providing plants with the raw materials they need to produce healthy substances and to store vital nutrients in their fruits and vegetables. Humates are known to bind over 50 elements from the periodic table, including vital minerals such as calcium and magnesium. The humates in bioSoil concentrate these substances near a plant, allowing the nutrients that are present to be better utilized by the plant and incorporated into the fruits and vegetables.

Data from our field tests and from our many produce growers, including those for one of the largest food chains in the world, have demonstrated fruit and vegetables with higher brix levels, as well as increased nutrient levels of magnesium, calcium and other micronutrients in plants grown with bioSoil.

### **What does this mean for your green roof?**

#### **GLT Green Living Roof: A True Solution, Not a Problem**

Unlike traditional green roofs that often require fertilizer—leading to runoff issues—GLT's system is designed to prevent the very problem others create. In typical porous media, up to 90% of fertilizers wash away, contributing to nutrient-rich runoff that pollutes stormwater systems.

The GLT Green Living Roof eliminates the need for excessive fertilization by using mature, nutrient-balanced sedum mats and a carefully engineered system that retains stormwater and nutrients where they belong—in the plants, not in the drains.



## GREEN LIVING ROOF PRODUCT BINDER



Left: Potato Roots without bioSoil

Right: Potato Roots with bioSoil



## GREEN LIVING ROOF PRODUCT BINDER

### Green Living Roof Panels: INTENSIVE & ROOF TOP GARDEN APPLICATIONS

#### One System. Unlimited Possibilities.

Extensive, Intensive & Hybrid (Semi-Intensive) Compatible

The GLT Green Living Roof System is engineered to support all types of green roof applications—from low-profile ground cover to deep planting beds for full-sized trees. Thanks to its advanced panel technology, exceptional compressive strength, and high-water retention capacity, the system adapts effortlessly to a wide range of media depths—from 2" to 102"—using the same modular platform.

#### Key Advantages:

- ✓ Supports extensive, intensive, and hybrid designs
- 🏗️ Engineered for extreme structural loads
- 💧 Superior water-holding capabilities
- 🌱 Scalable from sedums to full-sized trees
- ⚙️ Single, easy-to-install system regardless of depth



GLT CUSTOM EDGING DETAIL



GLT MEDIA



INITIAL PLANTING  
SPRING 2023



OCTOBER 2023



GREEN LIVING ROOF PRODUCT BINDER

Green Living Roof Panels Common Details

PROTECTED MEMBRANE ASSEMBLY - GREEN LIVING ROOF PANEL.....41

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EXTENSIVE VENT PROTRUSION DETAIL .....49

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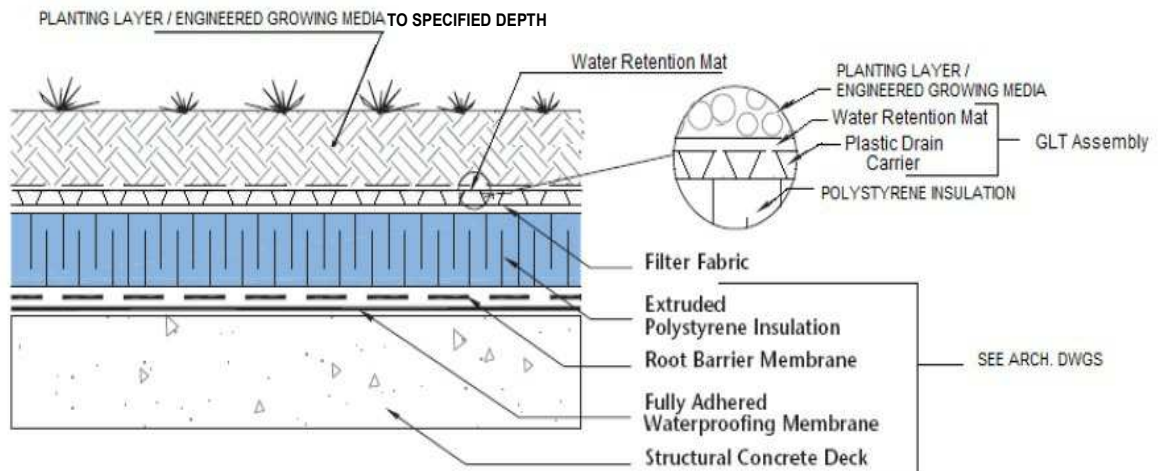
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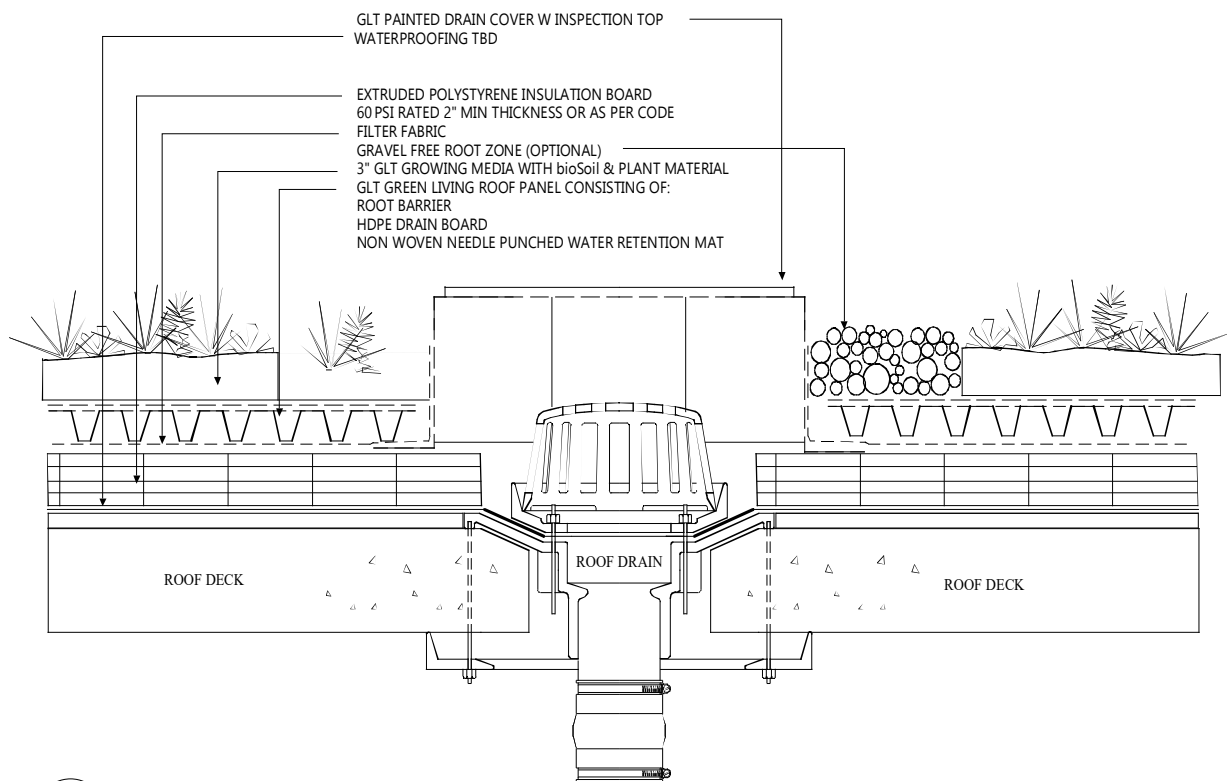
## GREEN LIVING ROOF PRODUCT BINDER



### 1 Protected Membrane Assembly



## GREEN LIVING ROOF PRODUCT BINDER

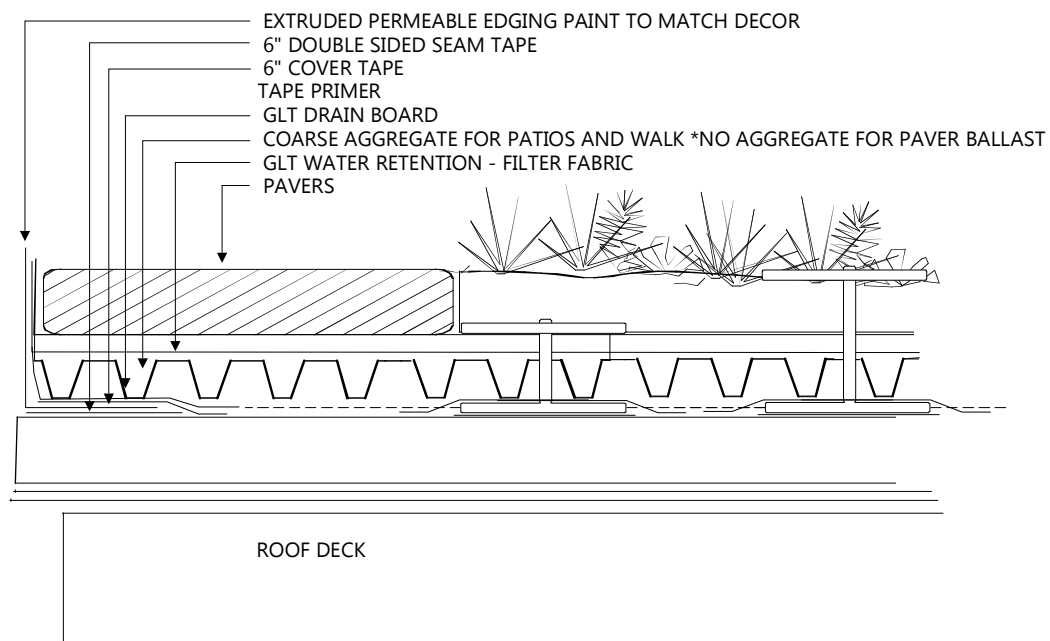


- 1 TYPICAL GREEN LIVING ROOF PANEL - PROTECTED MEMBRANE ASSEMBLY
- SHOWN WITH INSPECTION CHAMBER ASSEMBLY \*
- NO STONE BALLAST IN HURRICANE AREAS





## GREEN LIVING ROOF PRODUCT BINDER



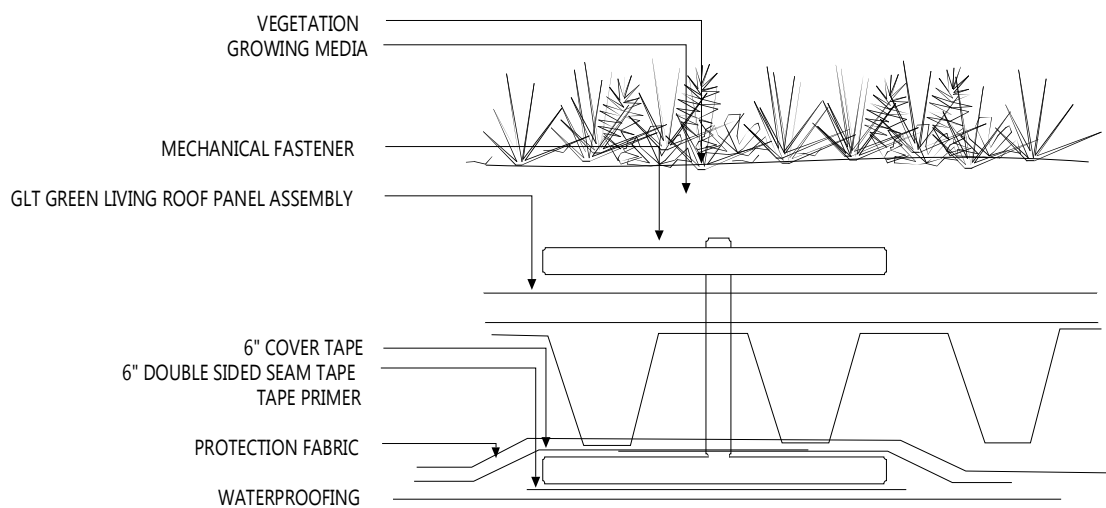
2

### TYPICAL GREEN LIVING ROOF PANEL / PROTECTED MEMBRANE ASSEMBLY

EDGING DETAIL SHOWN WITH PAVES ASSEMBLY  
 MECHANICAL / HURRICANE FASTENER MIAMI-DADE NOA PENDING



## GREEN LIVING ROOF PRODUCT BINDER



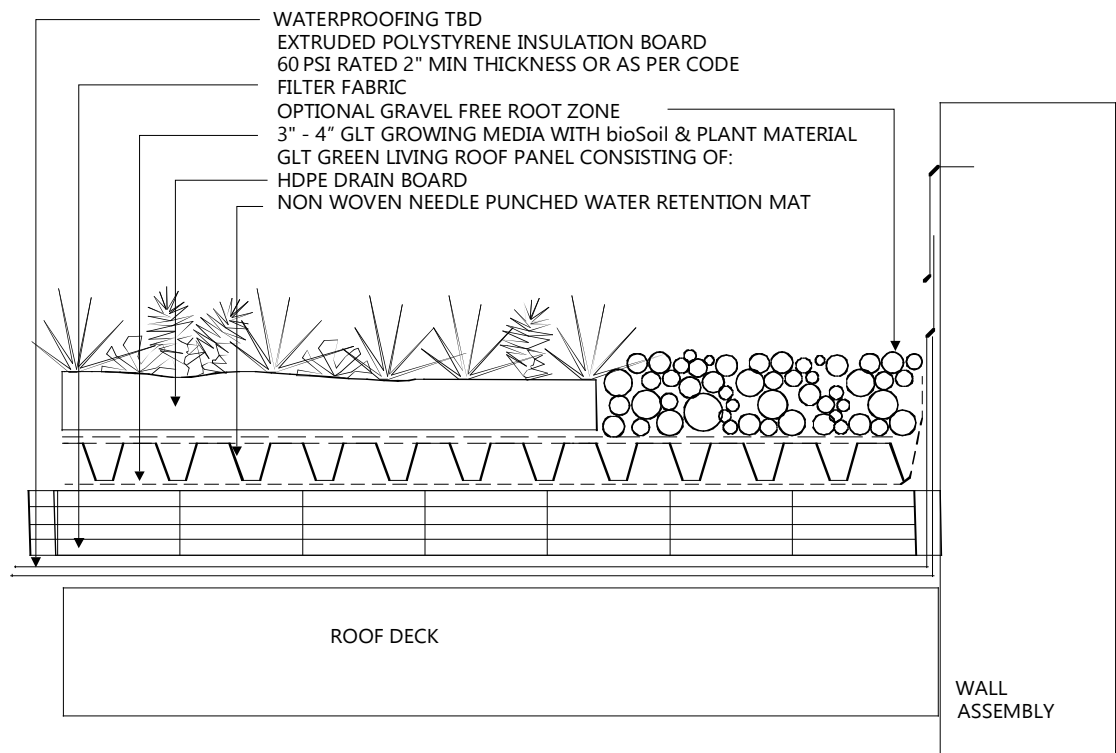
3

MECHANICAL / HURRICANE FASTENER NON PENETRATING

EDGING DETAIL SHOWN WITH PAVER ASSEMBLY  
MECHANICAL / HURRICANE FASTENER MIAMI-DADE NOA PENDING  
USED TO FASTEN COMPLETE SYSTEM OR JUST THE PANELS



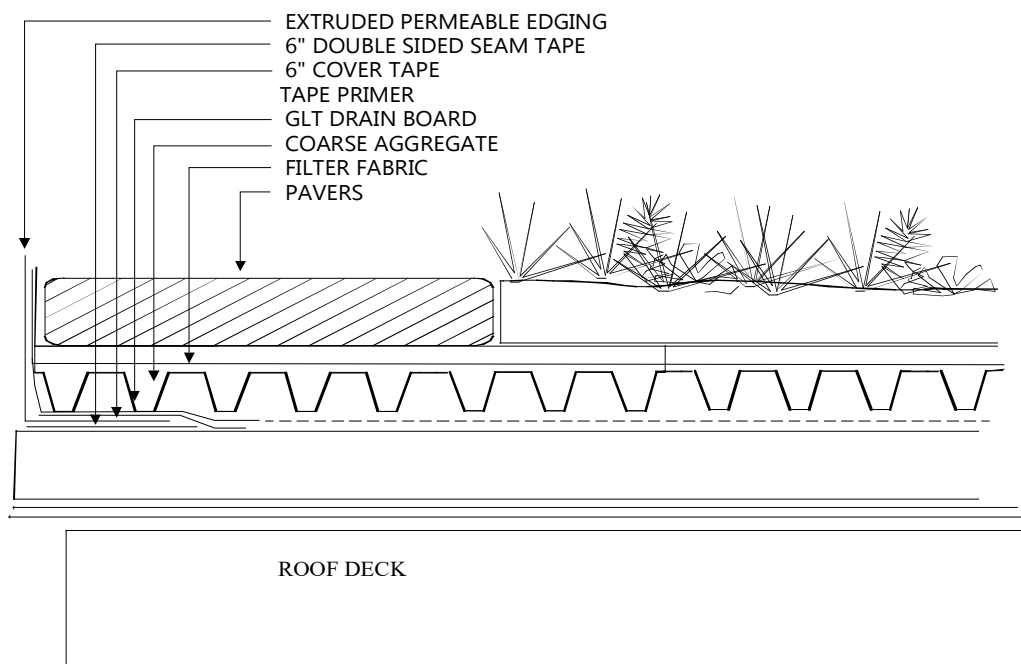
## GREEN LIVING ROOF PRODUCT BINDER



- 4 TYPICAL GREEN LIVING ROOF PANEL /PROTECTED MEMBRANE ASSEMBLY
- \*NO STONE BALLAST IN HURRICANE AREAS



## GREEN LIVING ROOF PRODUCT BINDER



5

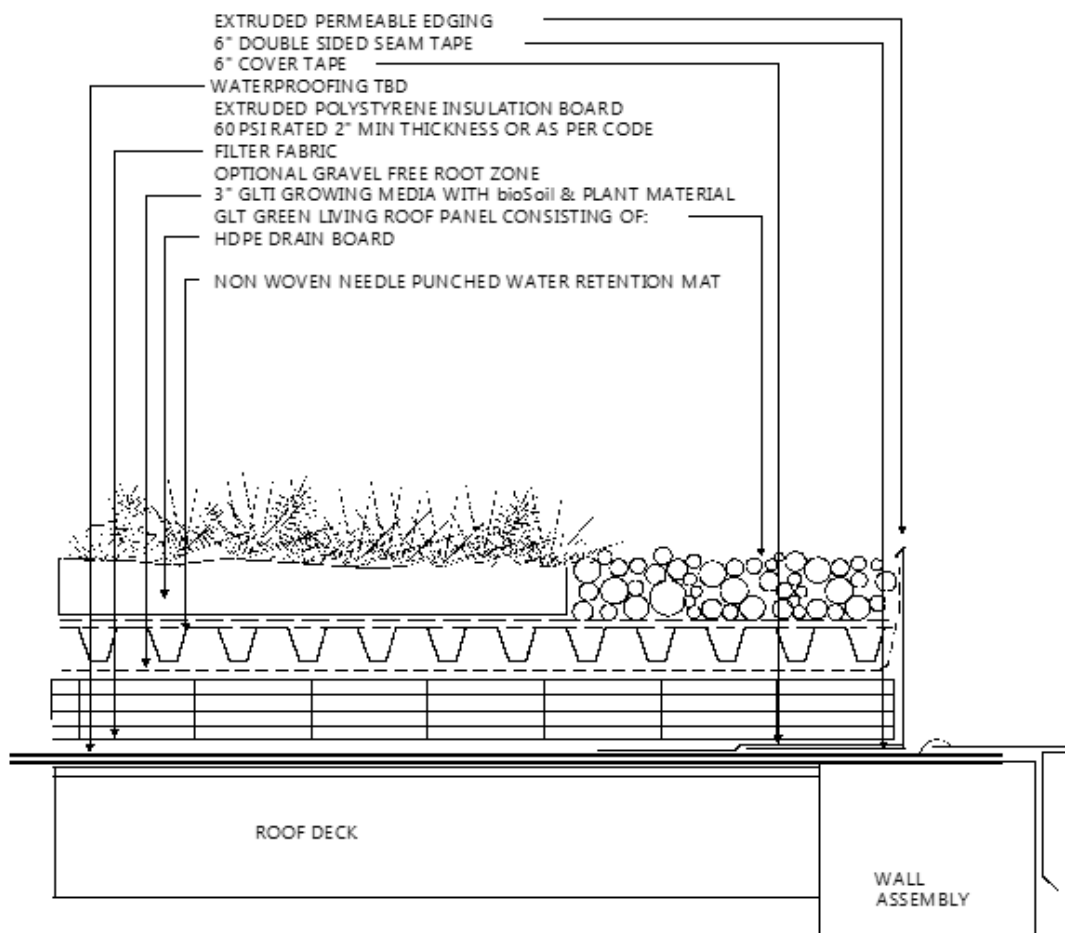
TYPICAL GREEN LIVING ROOF PANEL / PROTECTED MEMBRANE

EDGING DETAIL SHOWN WITH PAVER ASSEMBLY





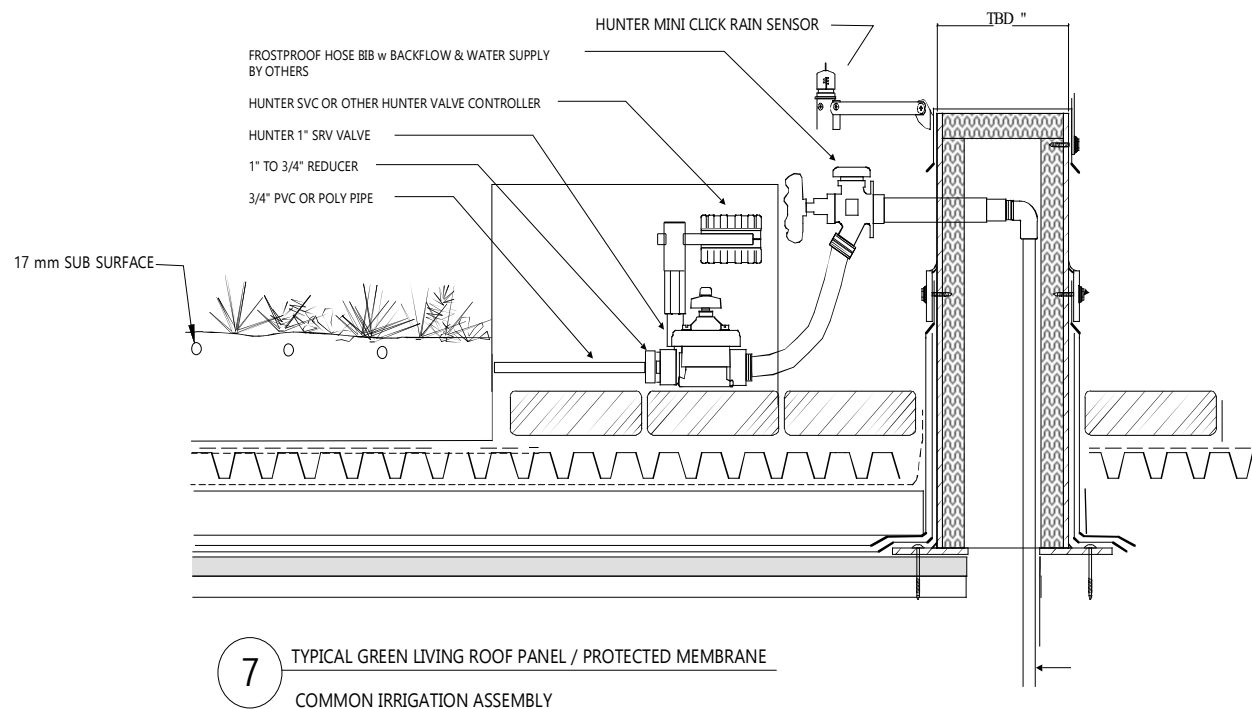
## GREEN LIVING ROOF PRODUCT BINDER



**6** TYPICAL GREEN LIVING ROOF PANEL / PROTECTED MEMBRANE  
 EDGING DETAIL TERMINATION

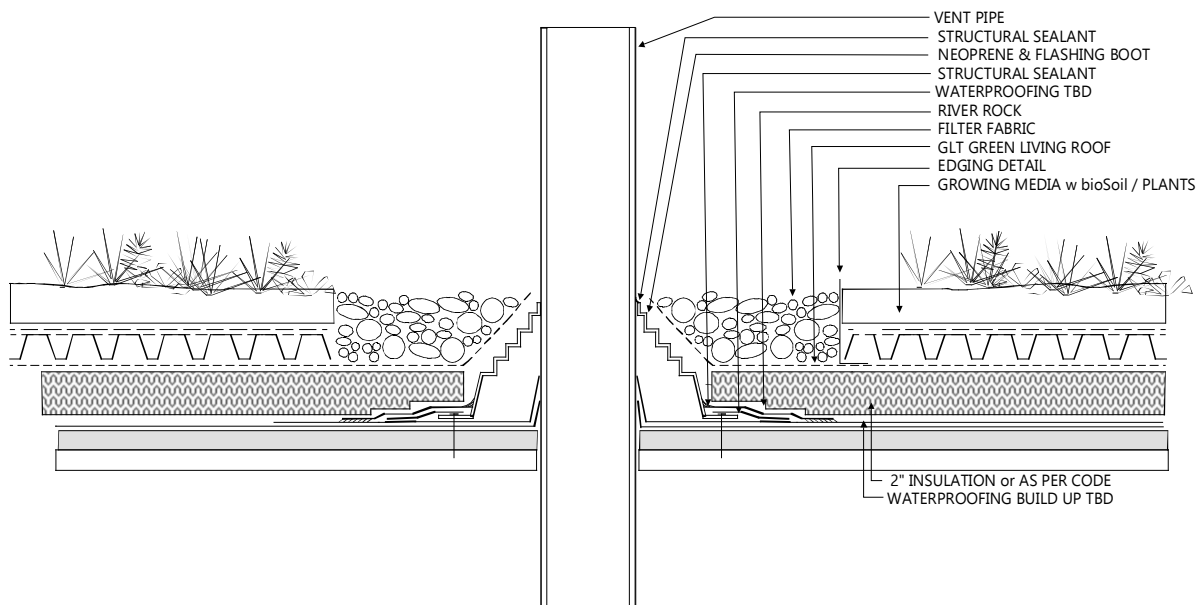


## GREEN LIVING ROOF PRODUCT BINDER





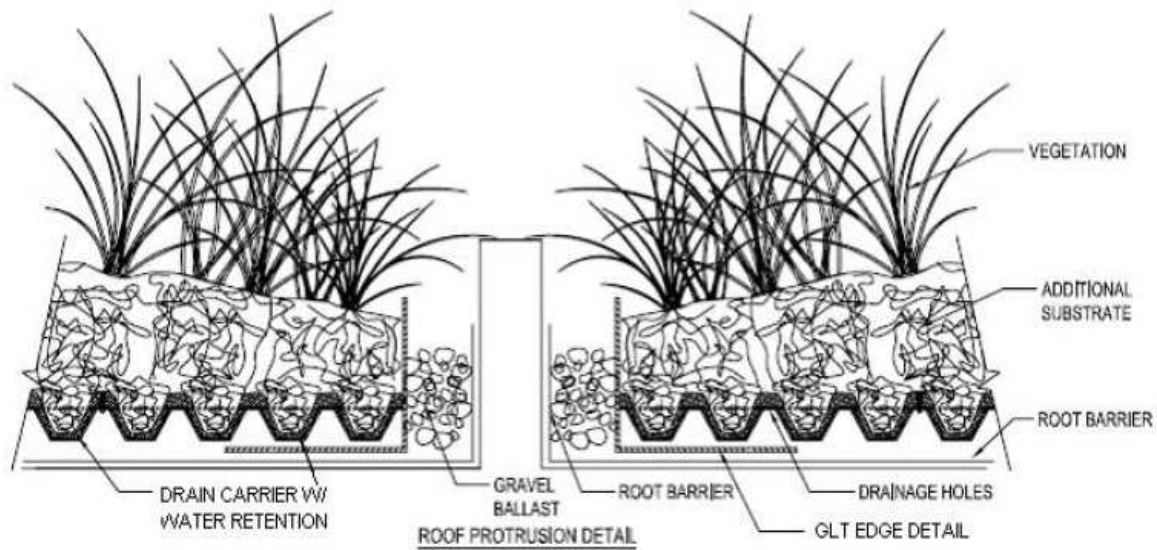
## GREEN LIVING ROOF PRODUCT BINDER



8 TYPICAL GREEN LIVING ROOF PANEL / PROTECTED MEMBRANE  
 VENT PROTRUSION DETAIL\*  
 NO STONE BALLAST IN HURRICANE AREAS



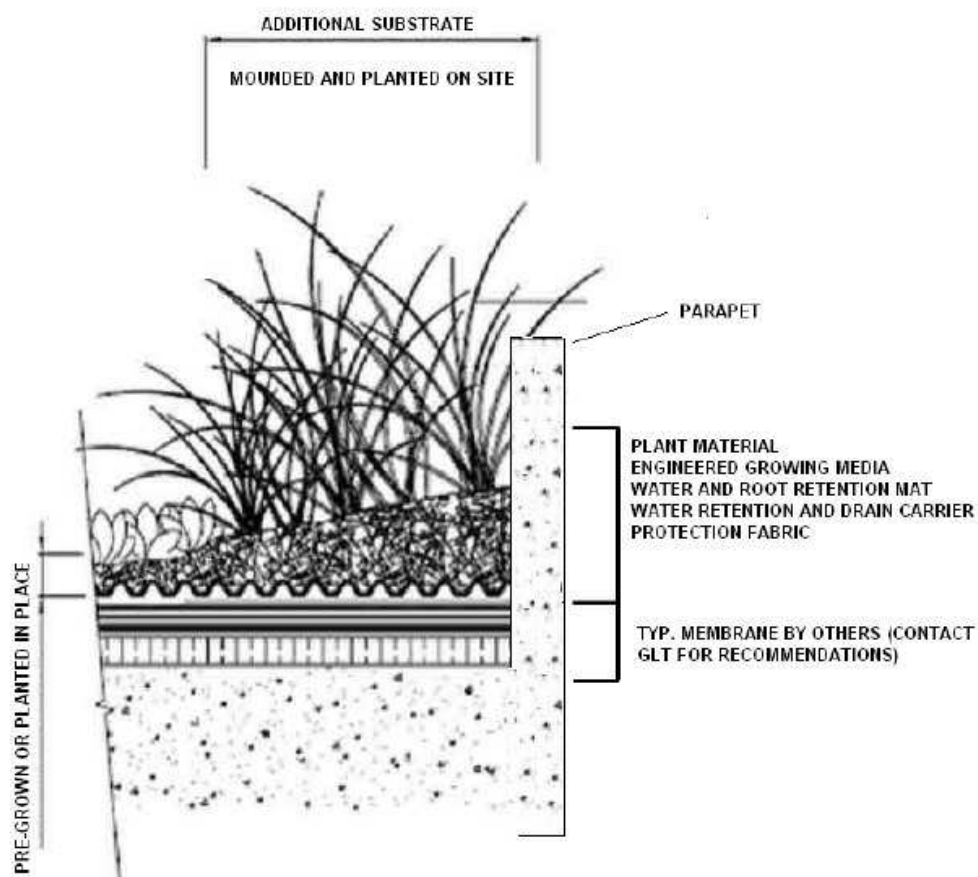
## GREEN LIVING ROOF PRODUCT BINDER



### 2 Protrusion Detail



## GREEN LIVING ROOF PRODUCT BINDER

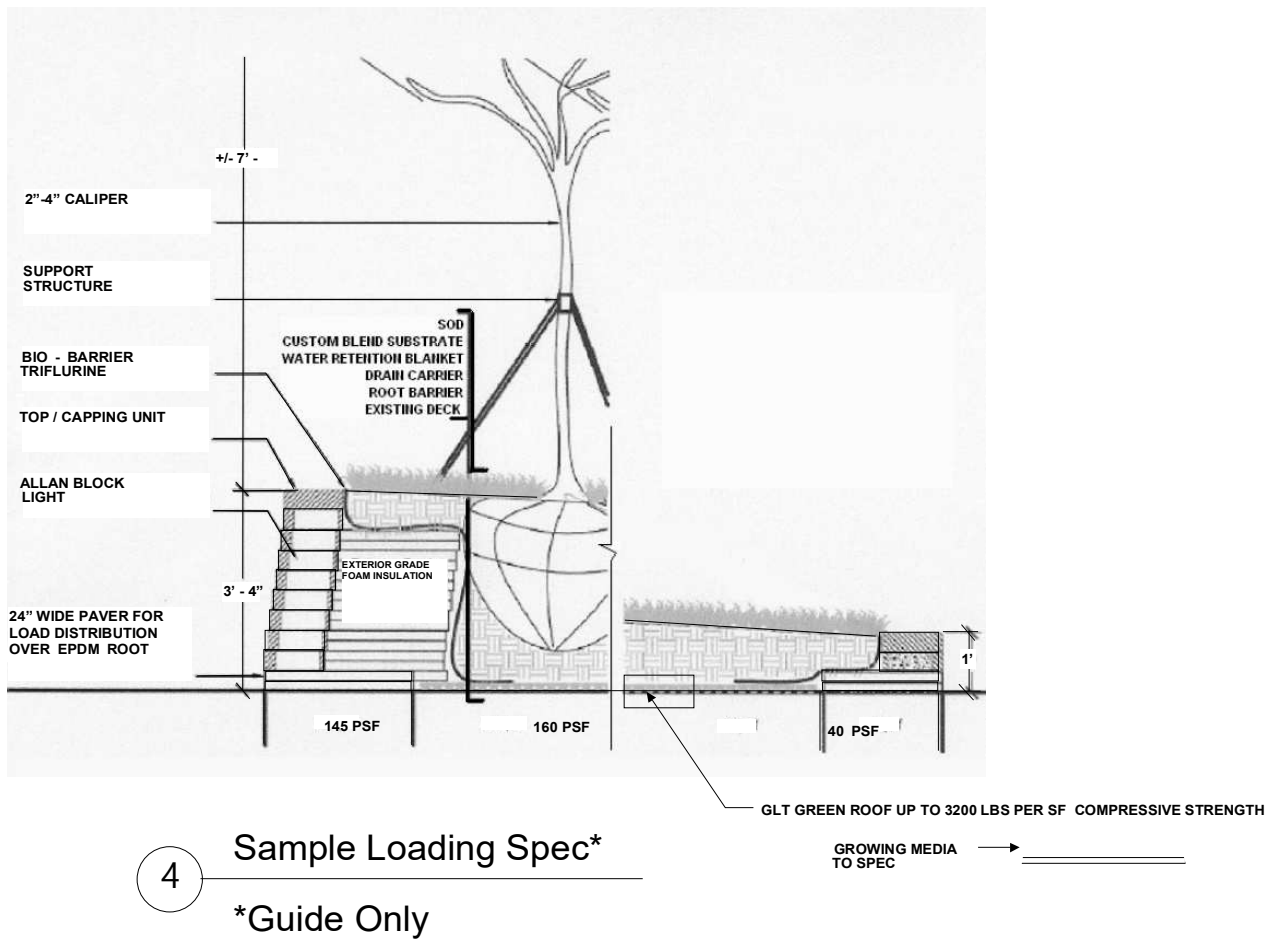


3

### Additional Growing Media

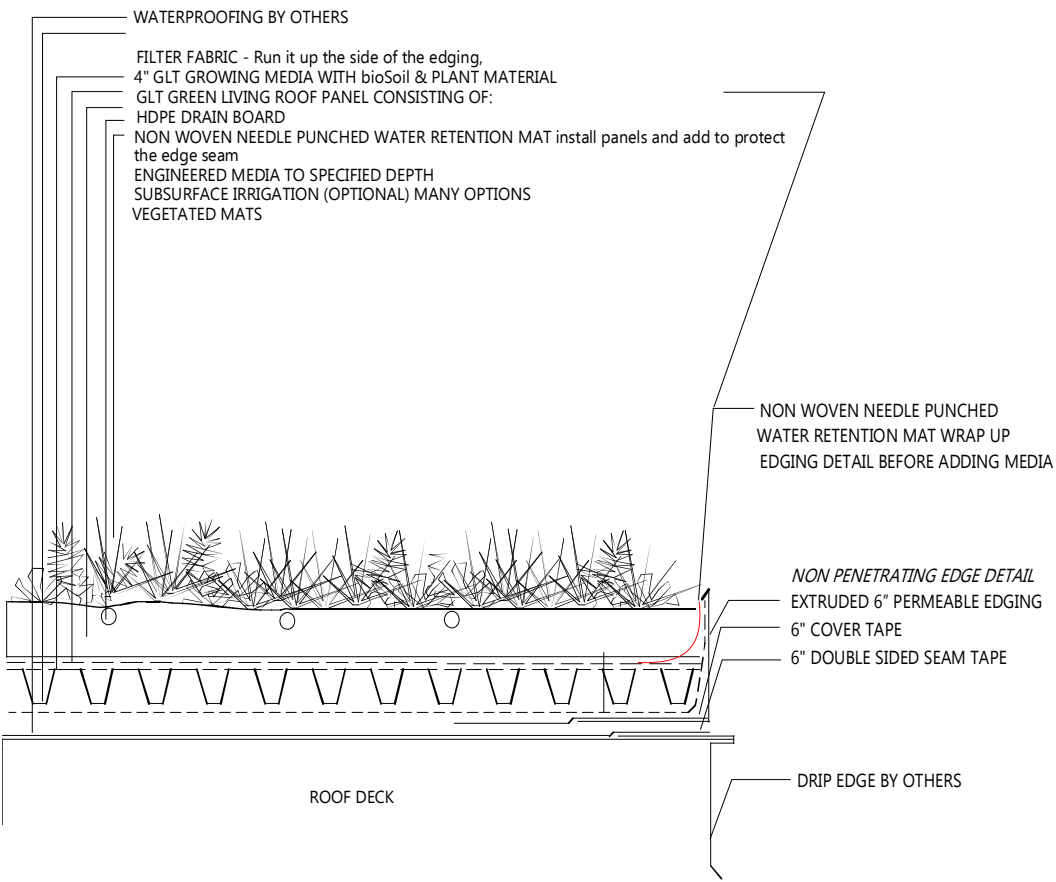


## GREEN LIVING ROOF PRODUCT BINDER





# GREEN LIVING ROOF PRODUCT BINDER



## 6 Terminating Edge Detail



## GREEN LIVING ROOF PRODUCT BINDER

### Green Living Wall, Sloped Green Roof Applications

**US Pat # 7921599**

**Uses: Extensive, Intensive, Hybrid, for slopes greater than 20 degrees**

- The Green Living Wall system was originally developed as a sloped green roof application.
- Manufactured in 4" and 6" depths; 5052 Marine Grade Aluminum.
- Marine grade aluminum or stainless options ( upgrade to stainless in coastal areas prone to salt) allow for maximum flexibility in a sloped system. Standard or custom manufacturing available.
- The variety of depths can account for Deeper rooted perennials, grasses and ground cover.
- Easy to remove to access waterproofing without destroying the green roof.
- Has scientifically designed apertures for drainage to prevent overwatering and disease, allowing for free drainage.
- Same system technology for Extensive and Semi - Intensive (up to 6" depth).
- Can be custom manufactured & powder coated.
- Used on slopes >20 degrees to 90 degrees.
- Can be as light at 20 lbs. per square foot saturated.
- Even saturation to prevent pooling water.
- Retro fit or new construction.





## GREEN LIVING ROOF PRODUCT BINDER

### Planting Options

- Available pre-grown for an instant green roof (4" & 6" depths)
- GLT Pre-Grown Mats for instant coverage (Extensive)
- Planted in place or off site for deeper rooted perennials, grasses (Semi -Intensive)

### GLT bioSoil

- Specifically engineered advanced growing media designed for the use of patented GLT systems.
- 100% Organic with no added fertilizers promoting strong root systems.
- NO vermiculite or other short-lived pumice.
- Lightweight, free draining and promotes aerobic activity at the root level.
- Highly concentrated nutrients will not leech into the storm water runoff.



Green Living Wall; Sloped Green Roof - Pre-Grown Installation- NON-Penetrating Detail



## GREEN LIVING ROOF PRODUCT BINDER

SPECIFICATION Living Wall System – Sloped Green Roof Application

**NOTE TO SPECIFIER – Delete any section not relevant.**

Green Living Wall Panel System – GLT Specification Overview

This specification outlines the GLT Green Living Wall Panel System, engineered to deliver sustainable vegetative coverage on both vertical and sloped surfaces (greater than 20 degrees). The system is supplied as a pre-grown modular assembly, ensuring immediate coverage and simplified installation.

The GLT Green Wall Panels are suitable for both surface-mounted applications (affixed to existing vertical structures) and freestanding installations. Freestanding systems are available in a variety of customizable configurations, making them adaptable for landscape partitions, standalone features, or architectural accents.

This specification is designed to be included under Sections titled “Sloped Green Roof”, “Green Walls,” “Living Walls,” or equivalent categories within construction and design documentation.

### 1. General

#### 1.1 Related Sections

- Mounting Surfaces, Hardware, Panels, Panel Covers, Trim, Catch Basins and Irrigation
- LEED Qualifications

#### 1.2 Installation Contractor

.1 The Green Living Wall Panels must be installed by an authorized ProStaff of GLT products or local labor in addition to authorized GLT supervision.



## GREEN LIVING ROOF PRODUCT BINDER

### 1.3 Proof of Structural Load Bearing Capacity

- .1 An engineer's report confirming the load bearing capacity of the existing structure must be provided before any additional drawings or other design phases.

### 1.4 Plans & Shop Drawings

- .1 The client must provide scale drawings to authorized agent / installer for quotation and design purposes.
- .2 If acceptable scale drawings are not available, authorized agent or approved alternate will be required to produce said drawings at the client's expense.
- .3 Authorized agent will provide shop drawings to client showing all material terminations, transitions and penetrations upon a complete contract including monetary deposits. authorized agent will not provide shop drawings without a deposit and / or a paid fee for services.

### 1.5 Waterproofing Membrane

- .1 There may be a need for an approved high quality waterproofing membrane in place under the wall system prior to installation of the green wall / sloped green roof.
- .2 The waterproofing manufacturer specifications must allow for the membrane to be installed in a vertical / sloped position.
- .4 The waterproofing membrane will be covered by a separate warranty issued by the waterproofing provider.
- .5 Accessories - All other components or accessories must be approved or provided by GLT to ensure viability and performance of the system as per the specifications. This includes any flashing, trim and other materials.



## GREEN LIVING ROOF PRODUCT BINDER

### 1.6 Masonry Mounting Surface

- .1 Include but not limited to: Cinder Block, Stone Wall, Masonry Wall, Brick Walls, Marble and Granite. Generally, masonry mounting surfaces must conform to the requirements specified in the 2006 International Building Code (IBC) Section 2103.
- .2 Masonry mounting surfaces must be in a condition to accept suitable hardware to meet a minimum sheer force of 1500 pounds (680 kilograms) as specified by the hardware manufacturer. The GLT details include a minimum of 1500 lbs of shear force specified by the hardware manufacturer.

### 1.7 Other Mounting Surfaces

- .1 Other mounting surfaces may include but not limited to sheet rock, ply wood and dens glass. These surfaces may require a half inch to three quarter inch ply wood backer. Please refer to the GLT specification to installing the Green Living Wall Panels on these surfaces.

**NOTE TO SPECIFIER – Installations normally do not require waterproofing or vapor barrier unless mounting surface is a wood mounting surface exterior.**

If a waterproofing or vapor barrier is required by code or by other GLT suggests a LAM (Liquid Applied Membrane) to be painted or rolled directly onto the plywood backing. Redgard is such a product that is readily available at the local hardware big box store and is used to waterproof shower surrounds prior to the installation of tile. A self-healing peel and stick membrane is also an option

### 1.8 Lead Time

- .1 It can take as long as 8 weeks to manufacturer the living wall / sloped green roof system depending on plant species and propagation method. The decision to purchase the system must be made 3-6 months prior to the installation date to allow sufficient



## GREEN LIVING ROOF PRODUCT BINDER

time for this production

- .2 Upon contractual obligations and deposit confirmations authorized agent will issue an anticipated ready date for the delivery of the green wall panels.

### 1.9 Contract Documents

- .1 In the case where authorized agent / installer is hired to install the system a signed contract specifying the scope of work, terms and conditions, payment scheduling, warranties, and any other relevant information is required before panel manufacturing and plant propagation is started.

### 1.10 Warranty on Workmanship

- .1 A Two (2) year standard warranty on workmanship is to be provided by the installer / authorized agent. This does not include a plant warranty.

**NOTE TO SPECIFIER – See plant warranty 1.12**

### 1.11 Warranty on Components

- .1 GLT warrants all non-living components of the GLT system will perform as specified for 2 years (for Aluminum Panels) and for 5 years (for Stainless Steel Panels) provided it was installed by an authorized agent / GLT installer. All warranties are void if the installation is maintained by a non-certified installer or if the client named or other non-certified GLT person(s) attempt to service the wall. All and any work performed on the system has to be done by GLT approved agent.

- .1a Irrigation components are warranted for one (1) Year.



## GREEN LIVING ROOF PRODUCT BINDER

- .2 The 2-year warranty for the brackets, spacers, green wall panels, catch basins and edging details of the GLT system (all parts GLT manufacturers) states that these components will not degrade due to physical, chemical or biological processes that naturally occur in a green wall system. The labor and material cost of any warranty work is covered in this warranty. An extended warranty is available for this portion of the system but must be used in conjunction with the GLT maintenance program performed by a GLT authorized agent.
- .3 All warranties are void if a GLT maintenance agreement is not current.

### 1.12 Warranty on Vegetation

- .1 A one (1) year warranty and maintenance contract for the approved vegetation shall be provided with the initial quotation for an extra cost as part of the GLT maintenance agreement. (\*All vegetation warranties are voided unless an automatic low volume irrigation system is installed) This will cover all aspects of the vegetation, irrigation and system performance. An extended warranty (including vegetation) is available as part of the continued maintenance program and can be extended through an authorized GLT representative.

### 1.13 Extended Warranty and Maintenance Program

- .1 An extended warranty and maintenance program can be purchased for the GLT system.
- .2 The warranty and maintenance program is available in the form of an annually renewable contract between GLT approved agent and the client. The warranty will cover all system components including plant performance provided that all maintenance has been performed by a GLT approved agent since the date of installation.
- .3 Upon completion of the 2-year warranty on the brackets, spacers, green wall panels, catch basins and edging details the system will retain the GLT warranty beyond the 2



## GREEN LIVING ROOF PRODUCT BINDER

years if a maintenance agreement has been in place and continued, GLT will extend the manufactures warranty in conjunction with the maintenance agreement. Once the maintenance agreement is terminated the extended GLT warrantee become void.

### 2. Products

#### 2.1 Description

- .1 The GLT green living wall system is made up of modular sections of vegetation area that are delivered as a preassembled product to the site for installation. The plants are pre-grown or planted in place into the modules and all components that make up the system are riveted together to maintain structural integrity. The ability to customize and accessorize the system with various options, shapes, sizes and depths is possible provided the design has been approved by GLT.
- .2 The GLT Green Living Wall system may also be custom manufactured or custom engineered to accommodate non-standard design and product options.
- .3 The GLT Green Living Wall system is also available as a freestanding (Defined as: Not being mounted to a solid vertical surface)
- .4 Required Components for a vertical surface (Exterior or Interior) Mounting surface (See Section 1.6 & 1.7) suitable for retaining hardware with a minimum 1500 lbs minimum shear force as specified by the hardware manufacturer.



## GREEN LIVING ROOF PRODUCT BINDER

a 1/2" (minimum) (1.27 cm) to 3/4" (maximum) (1.905 cm) green wall bracket spacers.

|                              |                         |
|------------------------------|-------------------------|
| Type                         | Female Unthreaded Round |
| Female Unthreaded Round Type | Standard                |
| Material Type                | HDPE                    |
| Finish                       | Plain                   |
| Plastic Type                 | Recycled Polyethylene   |
| Body Length                  | 1/2"                    |
| Body Length Tolerance        | ±.062"                  |
| Screw Size                   | 1/2"                    |
| Outside Diameter             | 1"                      |
| Outside Diameter Tolerance   | ±.02"                   |
| Inside Diameter              | .51"                    |
| Inside Diameter Tolerance    | ±.02"                   |
| Threading                    | Unthreaded              |
| Color                        | Black                   |
| Rockwell Hardness            | Not Rated               |
| Tensile Strength             | Not Rated               |
| Operating Temperature        | -70°F to +180°F         |



## GREEN LIVING ROOF PRODUCT BINDER

- b. GLT green living wall brackets drilled at a minimum 16" (40.64 cm) on center for hardware.

|                                      |                                                   |
|--------------------------------------|---------------------------------------------------|
| Material                             | Multipurpose Aluminum (Alloy 6061)                |
| Finish/Coating                       | Unpolished (Mill)                                 |
| Shape                                | Sheets, Bars, Strips, and Cubes                   |
| Sheets, Bars, Strips, and Cubes Type | Plain                                             |
| Edge Type                            | Square                                            |
| Tolerance                            | Standard                                          |
| Thickness                            | .025"                                             |
| Thickness Tolerance                  | ±.002"                                            |
| Length                               | 48"                                               |
| Length Tolerance                     | ±1/8"                                             |
| Width                                | 2"                                                |
| Width Tolerance                      | ±1/16"                                            |
| Temper                               | T6                                                |
| Hardness                             | 95 Brinell                                        |
| Yield Strength                       | 35,000 to 40,000 psi                              |
| Flatness Tolerance                   | Not Rated                                         |
| Temperature Range                    | -320° to +300° F                                  |
| Specifications Met                   | American Society for Testing and Materials (ASTM) |
| ASTM Specification                   | ASTM B209                                         |



## GREEN LIVING ROOF PRODUCT BINDER

- c. Green Living Wall Panels: As Manufactured by Green Living Technologies International, Rochester, NY (Aluminum or Stainless Steel) Standard sizes: 2'x2', 2'x1', 1'x2', 1'x'1 all in 4" or 6" depths
- d. Green Living Wall Panel Covers: As Manufactured by Green Living Tech, (Aluminum or Stainless Steel) Standard sizes: 2'x2', 2'x1', 1'x2', 1'x'1



## GREEN LIVING ROOF PRODUCT BINDER

### ALUMINUM

|                                      |                                                   |
|--------------------------------------|---------------------------------------------------|
| Material                             | Multipurpose Aluminum (Alloy 6061)                |
| Finish/Coating                       | Unpolished (Mill)                                 |
| Shape                                | Sheets, Bars, Strips, and Cubes                   |
| Sheets, Bars, Strips, and Cubes Type | Plain                                             |
| Edge Type                            | Square                                            |
| Tolerance                            | Standard                                          |
| Thickness                            | .032"                                             |
| Thickness Tolerance                  | ±.003"                                            |
| Length                               | 48"                                               |
| Length Tolerance                     | ±1/8"                                             |
| Width                                | 48"                                               |
| Width Tolerance                      | ±1/16"                                            |
| Temper                               | T6                                                |
| Hardness                             | 95 Brinell                                        |
| Yield Strength                       | 35,000 to 40,000 psi                              |
| Flatness Tolerance                   | Not Rated                                         |
| Temperature Range                    | -320° to +300° F                                  |
| Specifications Met                   | American Society for Testing and Materials (ASTM) |
| ASTM Specification                   | ASTM B209                                         |



## GREEN LIVING ROOF PRODUCT BINDER

### STAINLESS STEEL

|                      |                               |
|----------------------|-------------------------------|
| Material             | Stainless Steel               |
| Stainless Steel Type | Modified 440A Stainless Steel |
| Thickness            | .032"                         |
| Thickness Tolerance  | ±.001"                        |
| Width x Length       | 6" x 24"                      |
| Length Tolerance     | ±.25"                         |
| Width Tolerance      | ±.250"                        |

Green Wall Panel Depth (inches / cm) Pounds Per Square Foot Saturated (Kilograms / Square Meter)

- 4" depth (10.16 cm) 20 lbs per sf saturated (145.87 kg / m2) \*ground covers and sedum
- 6" depth (15.24 cm) 25 lbs per sf saturated (145.87 kg / m2) \*ground covers and sedum
  - a. GLT substrate with bioSoil: (Proprietary and will require purchase via GLT)
  - b. Established vegetation with root growth and 90% coverage.



## GREEN LIVING ROOF PRODUCT BINDER

### 2.1 Optional Components

Irrigation catch basins and drainage required for all interior installations.

**Standard:** 20 ga break formed Stainless Steel welded water tight with 1-1/4" min. drain connection. Custom options are available for catch basins to allow attachment of other decorative finishes to the front face.

*Optional:* Provide gravel bed at base of exterior walls that extend to grade level.

*Optional:* Provide Stainless-steel break formed brackets for mounting signage that will float in front of vegetated walls

*Optional:* Provide .060 thick Mill finish aluminum custom sized blank out boxes for electrical fixture mounting to face of vegetated wall.

*Optional:* Provide .040 perforated aluminum or 24 ga perforated Stainless Steel soil retention clips with flat black or brown paint finish and hemmed edges that press fit onto the leading edge the green wall panel cells.

*Optional:* Provide aluminum armatures constructed of 1/4" min thickness structural aluminum sections, trussed together as needed for free standing and sloped conditions.

Engineered shop drawings to be provided for all armature designs



## GREEN LIVING ROOF PRODUCT BINDER

### 2.2 Substrate

- .1 A locally produced substrate must be applied to the interior cells of the system for the purpose of plant sustainability.
- .2 Soil based growing medium required must be provided by GLT or GLT authorized agent to ensure viability and performance of the system as per the specifications.

### 2.3 Vegetation

- .1 The plant list must be approved or provided by GLT or GLT authorized growing agent to ensure viability and performance of the system as per the specifications.
- .2 The vegetation with root establishment into the green wall panel cells with panel cover and substrate must be mature enough to provide 90% cover upon installation.
- .3 It is possible that climate regions will require growing in a green house. Additional costs may be applied to regulate greenhouse temperatures.

### 2.4 Irrigation

Irrigation to be designed by GLT or GLT authorized agent.

- .1 Various irrigation solutions are available depending on the location of the living wall. All irrigation designs must be approved or designed by GLT or GLT authorized agent.
- .2 An irrigation water source must be provided at the immediate vicinity of the green wall with a shut-off valve and backflow prevention installed by certified plumber. For exterior walls a heated remote irrigation room is required. An individual pipe from this room for each zone to each wall location is to be provided by others. Optionally, this can be provided as a conduit for flexible plastic piping to be run to wall locations. Conduit size to be determined in the shop drawing stage.
- .3 Grey water or rainwater irrigation water is encouraged for use with the GLT System.



## GREEN LIVING ROOF PRODUCT BINDER

### 2.5 Edge Trim

The edge trim system is required to conceal and mount irrigation lines.

GLT Standard: .018" Stainless break formed side and top trim with 1/16" concealed Aluminum press fit clips. All trim to be removable to provide access to irrigation lines. Width and depth are made to order to fit project conditions.

Standard options: Mill Finish stainless steel

Custom Options: Powder coated paint, fine metals, ect

Provide a rain capturing top trim on Exterior walls where possible that will assist watering the green wall. Rain capturing trim is not substitute for an irrigation system.

### 3. Execution

#### 3.1 Delivery

- .1 Co-ordination of delivery time lines is the responsibility of GLT authorized agent.  
Five  
(5) days advance notice of delivery to the producer is necessary to ensure there are no delays.
- .2 The pre-grown modules will be palletized or transported by the GLT panel carrier and delivered to site for installation on the date of installation unless otherwise specified.

#### 3.2 Storage

- .1 Palletized vegetated material must be stored in a secure, cool shady environment out of direct sunlight prior to installation. Vegetated panels must be protected from



## GREEN LIVING ROOF PRODUCT BINDER

rapid temperature changes of more than 30°F (7°C)/hour. All vegetation is to be installed within three (3) days of being delivered. If this is not possible contact GLT authorized installer for further instructions.

- .2 All other materials (non-living) should be stored in a dry location out of direct sunlight with original packaging and documentation left intact prior to installation.
- .3 All interior plants must be stored in a temperature equal to that of the installation area or as specified by GLT or GLT authorized growing agent.

### 3.3 Site Protection

- .1 The work area is to be protected from damage by first sweeping off all debris and then laying protective covering in work and traffic areas.
- .2 All areas below the installation area must be sectioned off with caution tape, protective cones and / or other means to prevent persons from walking under the installation work area. (Regional laws may apply)

### 3.4 Installation (Living Walls)

- .1 The GLT spacers and green wall brackets must be installed to support the green wall panels as per specification detail and only by certified GLT installers.
- .2 Exterior applications require the spacers to be filled with marine grade polyurethane.
- .3 The modular trays can then be picked up by two individuals and hung in the proper area.
- .4 The panels must interlock from the upper and lower sections of the panel with maximum spacing of 1/4" (.635 cm) (6.35 mm).



## GREEN LIVING ROOF PRODUCT BINDER

### 3.4.1 Installation (Sloped Green Roof)

- .1 The GLT brackets must be installed to support the green wall panels as per specification detail and only by certified GLT installers.
- .2 See engineered drawings for “Non penetrating sloped green roof application)
- .3 The modular trays can then be picked up by two individuals and hung in the proper area.
- .4 The panels must interlock from the upper and lower sections of the panel with maximum spacing of 1/4” (.635 cm) (6.35 mm).

### 3.5 Maintenance (See Sample Maintenance agreement as Appendix B)

- .1 Maintenance must be provided by a GLT approved agent.
- .2 Provide a maintenance contract included in the green wall bid, commencing at the completion of system installation, and is provided with initial quotation by the GLT authorized agent.



## GREEN LIVING ROOF PRODUCT BINDER

MAINTENANCE PACKAGE INCLUDED IN BASE BID: 20% Plant Replacement

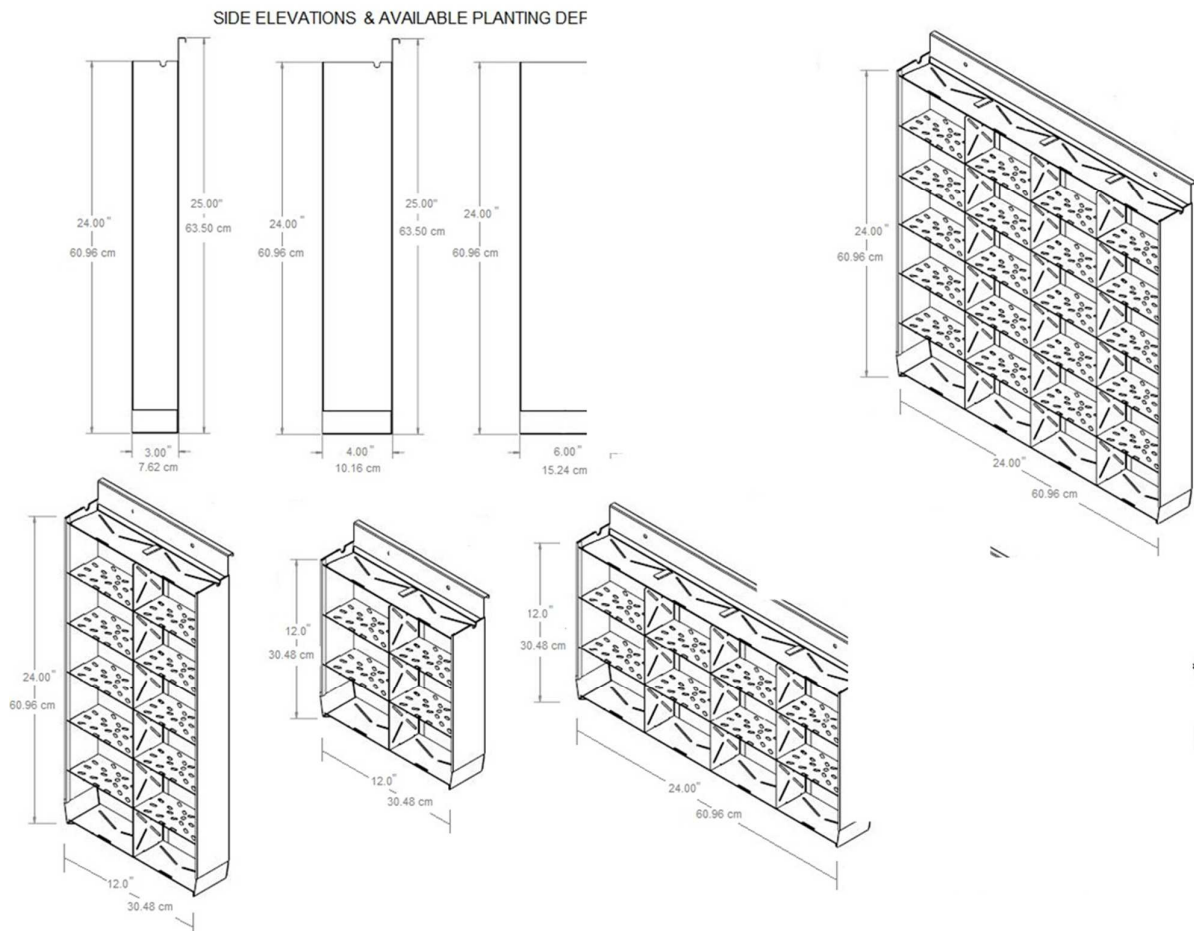
**NOTE TO SPECIFIER: Choose one plant warranty option 20% plant replacement or 100% plant replacement.**

- .3 Maintenance options: select one to be included in Green wall base bid
  - Basic – covers trimming, weeding, annual fertilizing, winterizing exterior walls, Cleaning drain troughs
  - 20% Plant Replacement – (Recommended) includes all of Basic Services
  - 100% Plant Replacement – includes all of Basic Services
- .4 Maintenance work done by an unapproved GLT agent will void any warranties.
- .5 Additional maintenance programs and costs are subject to the type of plant species and specified for the project. E.g. Edibles vs. decorative.
- .6 All maintenance contracts are subject to annual renewal. Failure to renew the maintenance agreement with GLT approved agent voids all vegetative warranties.
- .7 Every year the client renews the maintenance agreement, GLT approved agent will renew the vegetative warranty.
- .8 Upon completing the 2-year non-vegetative warranty every year the client renews the maintenance agreement GLT will continue to warranty the non-vegetative components in addition to the plant material.
- .9 To uphold the non-vegetative 2-year warranty a copy of the maintenance agreement must be left with the contact of the project site and a copy must be electronically submitted to GLT upon every site inspection, maintenance visit or service call.



## GREEN LIVING ROOF PRODUCT BINDER

### STANDARD Green Living Wall Configurations





## GREEN LIVING ROOF PRODUCT BINDER

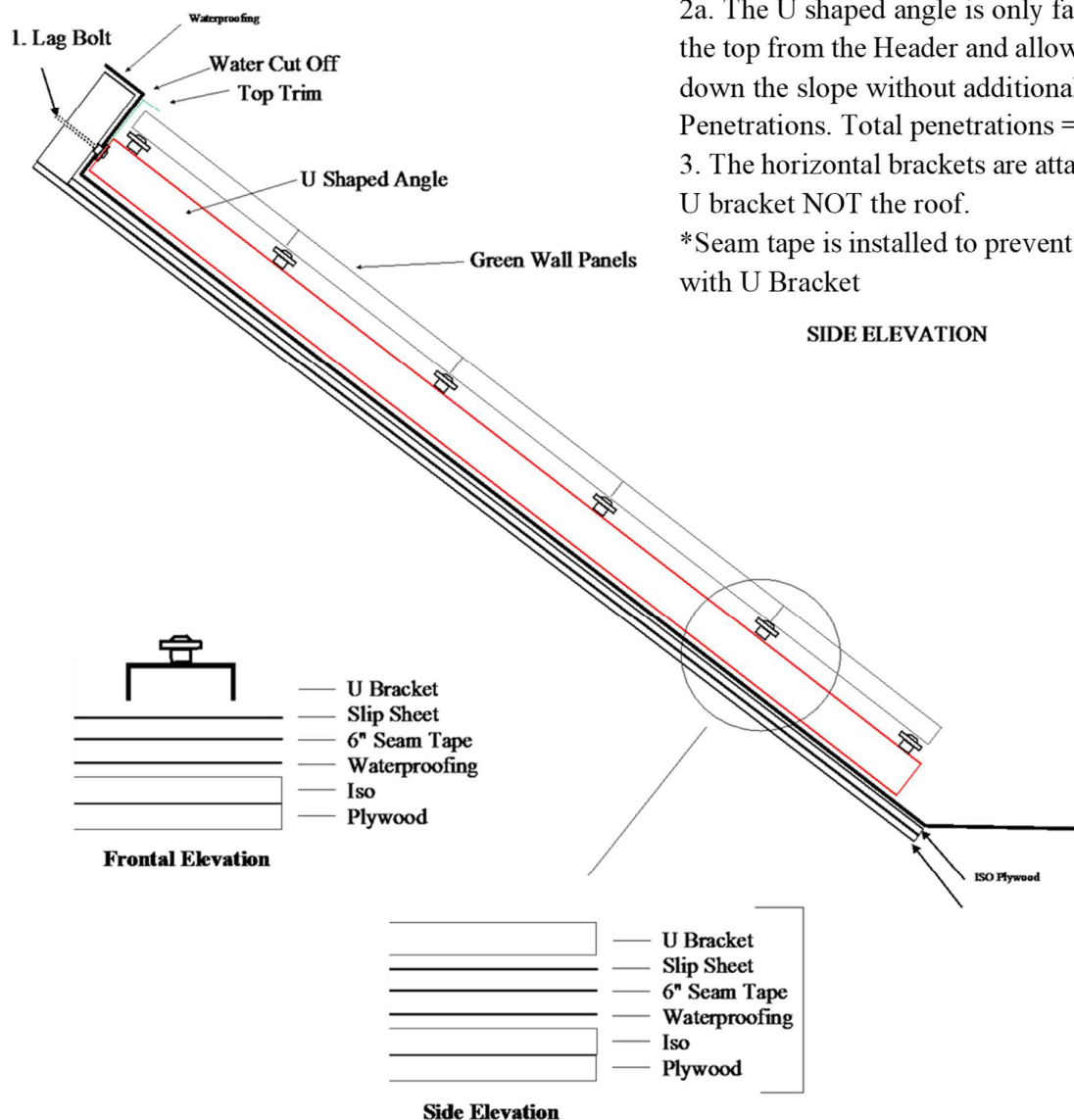
1. Lag Bolt into the wood header at the top of the slope \*This is the only penetration

2. U shaped bracket (Red)

2a. The U shaped angle is only fastened at the top from the Header and allowed to hang down the slope without additional Penetrations. Total penetrations = 4

3. The horizontal brackets are attached to the U bracket NOT the roof.

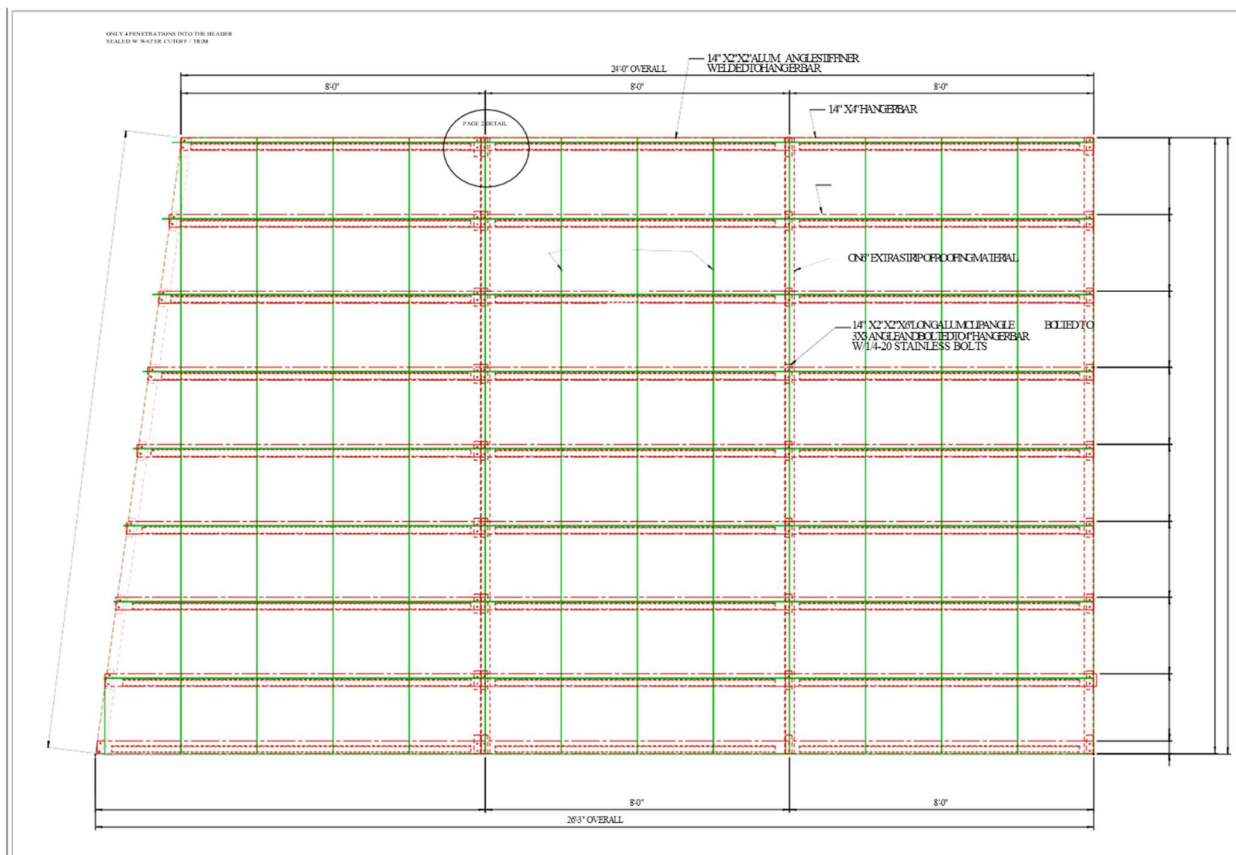
\*Seam tape is installed to prevent contact with U Bracket





## GREEN LIVING ROOF PRODUCT BINDER

### BRACKET LAYOUT – SAMPLE SLOPED GREEN ROOF APPLICATION





## GREEN LIVING ROOF PRODUCT BINDER



Top Left - Top and only penetration mechanically fastened



Top Right - Horizontal Supports to the vertical L bracket

Bottom - Floating Bracket System allows for Air and water flow behind the panels.





## GREEN LIVING ROOF PRODUCT BINDER



Complete Floating Bracket System



Partial Completion



## GREEN LIVING ROOF PRODUCT BINDER





## GREEN LIVING ROOF PRODUCT BINDER

### Sample Gallery



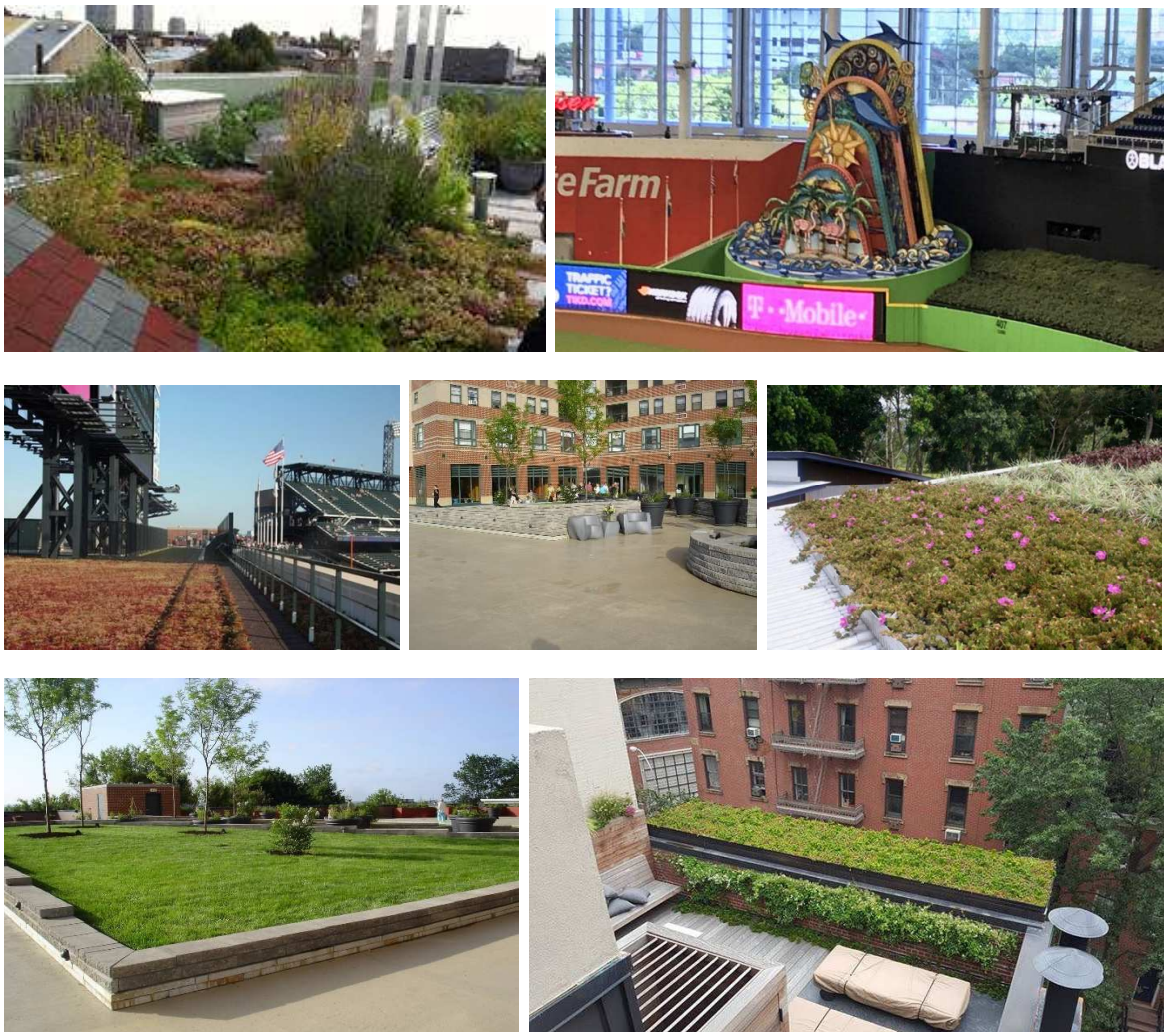


## GREEN LIVING ROOF PRODUCT BINDER





## GREEN LIVING ROOF PRODUCT BINDER





## GREEN LIVING ROOF PRODUCT BINDER





## GREEN LIVING ROOF PRODUCT BINDER

