

SECTION 33 46 23.19.1

GREEN ROOF DRAINAGE LAYER

Date: 22MAY07

PART 1 – GENERAL

1.01 SUMMARY

- A. This specification describes the J-DRain GRS, Green Roof System and/or J-DRain 400 RB, one component of a Vegetated Roofing System. It is intended to be used as a guide to the architect designing individual components of a complete Green Roof System. The remainder of the components required for this complete installation can be found in the Divisions listed below.

1.02 RELATED SECTIONS

- A. Division 31 Earthwork
- B. Division 32 Green Roof Planting
- C. Division 32 Pavers
- D. Division 3 Cast in Place Concrete
- E. Division 6 Miscellaneous Carpentry
- F. Division 7 Protected Membrane Roofing
- G. Division 7 Roof Drains
- H. Division 7 Vegetated Roofing
- I. Division 7 Thermal Insulation
- J. Division 7 Sheet Metal Flashing
- K. Division 7 Caulking and Sealants
- L. Division 22 Plumbing Specialties

1.03 REFERENCES and INDUSTRY STANDARDS

- A. American Society for Testing and Materials (ASTM)
- B. Underwriters Laboratories (UL) Class A

1.04 DEFINITIONS

- A. Roofing Terminology: Refer to the ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definition of terms related to roofing work in this Section.
- B. Green Roof: Area of planting/landscaping, built up on a waterproofed substrate at any level that is separated from the natural ground by a man-made structure.
- C. Geotextile: Any permeable textile used with foundation, soil, rock, earth, or any other geotechnical material, as an integral part of man-made product, structure, or system.

- D. Normal direction: Direction perpendicular to the plane of a geotextile.
- E. Permittivity: Volumetric flow rate of water per unit cross sectional area per unit head under laminar flow conditions, in the normal direction through a geotextile.
- F. Permeability: Rate of flow of a liquid under a differential pressure through a material.
- G. Transmissivity: Flow or amount of liquid water per foot of material width passing through composite system at certain maximum soil pressure against geotextile at defined hydraulic gradient.

1.05 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide prefabricated drainage composites which have been manufactured and installed to maintain positive drainage without defects, damage or failure.

1.06 SUBMITTALS

- A. Product Data: Manufacturer's product data; indicate products supplied. Provide complete installation instructions proposed for use.
- B. Samples: 6" x 6" J-DRain GRS or J-DRain 400 RB , Green Roof Drainage sample.

1.07 QUALITY ASSURANCE

- A. Preinstallation Conferences: Coordinate with conference scheduled for roofing materials. Follow requirements indicated in waterproofing materials section.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Packing and shipping: Provide materials in original unopened containers with manufacturer's labels intact and legible.
- B. Acceptance at site:
 - 1. Unload materials: check for damage.
 - 2. Damaged materials determined by visual inspection will not be accepted.
 - 3. Remove rejected materials from site immediately.
- C. Storage and protection:
 - 1. Store materials in dry area in manufacturer's protective packaging in original containers with labels and installation instructions intact.
 - 2. Store materials under cover, off ground; protect from sunlight.
 - 3. Do not expose to aromatic hydrocarbons.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Basis of Design: **J-DRain GRS**, as manufactured by:
JDR Enterprises, Inc.
292 S. Main Street Suite 200
Alpharetta, GA 30004
Telephone: 800.843.7569 or 770.442.1461. Fax: 770.664.7951.
Website: www.j-drain.com
- B. **J-DRain GRS** (Prefabricated Drainage Course):
1. A composite drainage system consisting of 100% post industrial polystyrene regrind dimple core and two layers of geosynthetic fabric attached top and bottom. It should meet the following properties:

<u>PROPERTY:</u>	<u>TEST METHOD:</u>	<u>VALUE</u>
DRAINAGE CORE:		
Compressive Strength (psf)	ASTM D-1621	9500
Thickness (in.)	ASTM D-1777	1.0
Flow @ 3600 psf & hydraulic gradient of .1 for 300 hrs. (gal/min/ft. width)	ASTM D-4716	30
ROOT RESISTANT FABRIC: (*See Fabric Notes Below*)		
Basis Weight (oz.)		3.3
Grab Tensile (lbs/inch)	ASTM D-4632	MD 54.2 CD 47
Grab Elongation (%)	ASTM D-4632	MD 54 CD 78
Trapezoidal Tear (lbs.)	ASTM D-4533	MD 26.2 CD 19.9
GEOTEXTILE:		
Mass/unit area (oz./sy)	ASTM D-5261	4.0
Grab tensile strength (lbs.)	ASTM D-4632	100
Puncture (lbs.)	ASTM D-4833	65
WATER RETENTION:		
Capacity (gallons/sf)	ASTM E-2398-05	.10

- C. **DIMPLE CORE DRAINAGE SYSTEM material**, characteristics:
1. Type: JDR Enterprises, Inc.; **J-DRain 400 RB**
 2. **CORE:**
 - a. Material: High impact polypropylene.
 - b. Type: Formed dimpled core.
 - c. Compressive strength: **400 RB**: 15,000 PSF (719 kN/m²).

3. **GEOTEXTILE: J-DRain 400 RB: (*See Fabric Notes Below*)**

ROOT RESISTANT FABRIC:

Basis Weight (oz.)		3.3
Grab Tensile (lbs/inch)	ASTM D-4632	MD 54.2 CD 47
Grab Elongation (%)	ASTM D-4632	MD 54 CD 78
Trapezoidal Tear (lbs.)	ASTM D-4533	MD 26.2 CD 19.9

4. Adhesive bonding core material to geotextile: Pressure sensitive applied to core, manufacturer's standard.

***FABRIC NOTES:**

- Depending on plant choices and root behavior, this root resistant fabric will prohibit most, but not all, root growth from typical greenroof plants.
- This root resistant fabric is not to act as a substitute for the root barrier that is required at the waterproofing membrane layer. Please consult your waterproofing company for this criterion.
- Direct UV/sunlight can damage J-DRain products and can cause deterioration. To alleviate UV/sunlight damage, the engineered soil should be installed to cover J-DRain products within 10 – 14 days.

D. DRAIN ACCESS BOX

1. Type: JDR Enterprises, Inc., powder coated aluminum casting with removable ventilated top and flange base. Access opening: 12" by 12"; Flange: 18" by 18"; Height: 6".
1. Purpose: Provides easy access and cover for inspection of floor drains in Green Roof applications.

E. ADDITIONAL ROOT RESISTANT FABRIC (See properties listed under GRS).

F. J-TAPE: Adhesive tape, available from JDR Enterprises.

G. ADHESIVES, MASTIC AND TAPE: Liquid mastic and adhesives, compatible with the waterproofing system.

2.02 RELATED MATERIALS (Furnished by others, to adhere to architects recommendation and ASTM standards).

- A. Roof structure designed to support the weight of the complete Green Roof System.
- B. Roofing Membrane and all associated components for a complete water tight installation.
- C. Growth Media (Sand or other inorganic material).
- D. Plantings and Vegetation

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Verification of conditions:
 - 1. Examine conditions and substrates where products specified in this section are installed; submit written notification of unacceptable conditions or substrates.
 - 2. Submit copy of installer's report to Architect within 72 hours of report receipt.
 - 3. Proceeding with construction activities of this section:
 - a. Indicates acceptance of conditions or substrates.
 - b. Additional work in this section due to pre-existing conditions not noted will not be paid as extra.

3.02 PREPARATION OF SURFACE

- A. Contractor shall examine the deck area to be covered with subsequent topping materials in order to insure that all deck areas have received the roofing membrane, membrane is free of damage, it is properly protected, and all flashing (as required) has been properly installed.

3.03 GRS AND DIMPLE CORE DRAINAGE MAT INSTALLATION

- A. Starting at one end of roof, unroll J-DRain drainage composite out with the dimples facing down, retention cups up to hold water.
- B. Adhesive or double sided tape can be used if needed to hold material down until installation of Growth Media. Spot glue a 2" x 2" square spaced every 4 to 6 feet.
- C. It is essential to mark the position of roof outlets before installing J-DRain, so they can be located easily and cut for easy access.
- D. Continue to roll to the end, cut to terminate. Follow to step E if additional J-DRain is needed.
- E. Additional roll may begin at this point and continue the length of the roof. Fold the fabric back over the joint and tape fabric with J-Tape and/or adhesives as required.

- F. Install 2nd run of drain mat identical to the 1st run, placing drain core parallel to the 1st run. Drain core should butt up to each other, side by side; they do not have to interlock. Peel back enough salvage edge of top filter fabric, tucking one edge under the other and overlapping the seams.
- G. Cover all exposed edges with extra filter fabric to ensure filter continuity. Use J-Tape to tape the seams.
- H. To prevent Growth Media from getting under this seam during installation, tape edges every 3 to 4 feet with J-Tape as optional protection if required.
- I. Additional GRS and/or root resistant fabric may be extended up the side of a parapet wall and terminated flush with Growth Media.
- J. Growth Media must be installed within 14 days in order to insure protection of the J-DRain.

3.04 ACCESS BOX INSTALLATION

- A. As drainage mat is being installed and roof drains have been located, cut a 12" x 12" opening in the drainage mat for the Access Box. Place Access Box directly over the roof drain. Backfill Growth Media up the sides of the Access Box.

END OF SECTION 33 46 23.19.1

Specifications prepared for:
JDR Enterprises, Inc.
292 South Main Street Suite 200
Alpharetta GA 30004
Internet address: www.j-drain.com
Voice: 800.843.7569 or
770.442.1461
Fax: 770.664.7951