

Section 7000 Intensive Green Roof PLANTING MEDIA

PART 1 – GENERAL

1.0 SUMMARY

A. Section Includes:

1. Intensive Green Roof Planting Media

B. Related Sections

1.01 REFERENCES

A. ASTM – American Society for Testing and Materials

B. USDA – US Department of Agriculture

1.02 DEFINITIONS

1.03 SYSTEM DESCRIPTION

A. Premixed Intensive Green Roof Media containing the components below:

**Estimated weight of: 50% Expanded Shale 3/8",
10% Expanded Shale Fines, 25% Root Zone Sand, & 15% compost**

1 cubic foot saturated (not drained)	93.0 pounds per cubic foot
1 cubic foot tamped damp:.....	68.5 pounds per cubic foot
1 cubic foot tamped, wet and drained:	79.4 pounds per cubic foot

1.04 SUBMITTALS

1.05 QUALITY ASSURANCE

1.06 WORK CONDITIONS

1.07 SEQUENCING AND SCHEDULING

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS AND SUPPLIERS

A. Norlite LLC, 628 S. Saratoga Street, Cohoes, NY 12047
(518) 235-0401

2.02 MATERIALS

A. 3/8" x No. 8 Rotary Kiln Expanded Shale (9.5mm x 2.36mm)

1. ASTM C29 Unit Dry Weight loose (42 lb./cf to 50 lb./cf)
2. ASTM C127 Specific Gravity: 1.30 to 1.40

3. ASTM C330: ASTM Gradation 3/8" x No. 8 size

3/8" x No.8	
Sieve Size	% Passing
1/2"	100
3/8"	80 -100
#4	5 - 40
#8	0 - 20
#16	0 – 10
#200	0 – 10

4. The expanded shale must contain **no** clay lumps or any organic impurities.

B. No. 4 x 0 Rotary Kiln Expanded Shale (Fines)

1. ASTM C29 Unit Dry Weight loose (52 lb./cf to 58 lb./cf)

2. ASTM C330: ASTM Gradation No. 4 x 0 (4.75mm x 0)

No.4 x 0	
Sieve Size	% Passing
3/8"	100
#4	85 - 100
#16	40 - 80
#50	10 – 35
#100	5 – 25

3. The expanded shale must contain **no** clay lumps or any organic impurities.

C. Root Zone Sand

1. Grain Size Distribution (ASTM C136)

Sieve Size	% Retained on Sieve
2.00 mm	<3%
1-2 mm	10% max
0.5 -1 mm	45% max
0.25 - 0.5 mm	35% - 75%
0.15 - 0.25 mm	15% max
0.05 - 0.15 mm	5% max

D. Organic Component

1. Humus material shall have an ash content of no less than 8 percent and no more than 40 percent.
2. The pH of the organic matter shall be between 5.5 and 7.5
3. The salt content shall be less than 10 millimho/cm at 25 degrees C, (Ece<10) on a saturated paste extract.
4. Boron content of the saturated extract shall be less than 1.0 part per million.
5. Silicon content (acid-insoluble ash) shall be less than 30 percent.
6. Types of acceptable composted products can be derived from the following feed stocks: manures, mushroom composts, straw, alfalfa, yard wastes, low in salts, low in heavy metals, free from weed seeds, free of pathogens and other deleterious materials.
7. Composted wood products are conditionally acceptable (stable humus must be present).
8. The organic amendment must have a Carbon/Nitrogen ratio of <25:1.
9. The compost shall be aerobic without malodorous presence of decomposition products.
10. From 75 to 100 percent organic amendment particles shall pass the 2.0 mm sieve size and from 50 to 80 percent shall pass the 1.0 mm sieve.
11. Maximum total permissible pollutant concentrations (heavy metals) in the organic amendment shall not exceed the following parts per million (dry weight) concentrations for constituents listed.

Arsenic:	20
Cadmium:	15
Chromium:	300
Cobalt	50
Copper	100
Lead	200
Mercury:	10
Molybdenum:	60
Nickel	100
Selenium	30
Silver:	10
Vanadium:	50
Zinc:	250
12. From 45 to 65 percent moisture measured via wet-weight basis.
13. Free of stones, debris, plant material.
14. Organic amendment must test between 5 to 8 on Solvita Maturity Test

2.03 Mixes

A. Intensive Green Roof Media

3/8" Expanded Shale	50%*
Expanded Shale Fines	10%
Root Zone Sand	25%
Approved Compost	15%

*Increase or decrease volume to meet weight requirement.

PART 3 - EXECUTION

3.01 MIXING Procedure

Green Roof Intensive Media is to mixed by an approved blender only.

A. Compost, Expanded Shale Fines, and Sand Blending

1. Mechanically mix 5 parts USGA sand to to 3 parts compost to provide a uniform distribution of the components.
2. Inadequate Moisture Content: Do not work planting medium when moisture content is low that dust will form in the air.
3. Do not work planting medium when the moisture content is high enough that excessive compaction will occur. Aerate planting medium until moisture content is uniformly reduced as necessary to achieve optimum compaction.

B. Final Mixing of Compost and Sand Blend with Expanded Shale

1. Saturate the Expanded Shale blend with water to ensure proper soil distribution.
2. Mechanically mix 2 parts of the sand/compost blend with 3 parts of the wetted expanded shale blend until a uniform distribution of the components is achieved.
3. When stockpiling the finished mix, cover the pile with a plastic tarp to prevent drying out or soil separation from rain.

3.02 MEDIA MIX PLACEMENT

A. Placement

1. Place Green Roof Media with approved equipment and protect all other materials form damage during installation.
2. Pre-settlement: Preset the media by thoroughly watering the entire planting area.
3. Fill settled low areas with the media and repeat the compaction and filling process until settlement ceases.

3.03 PROTECTION OF SOIL MIXES

A. Contamination and Compaction

1. Do not deliver or place soils in frozen, wet, or muddy conditions. Material should be at or near optimum compaction moisture content as determined by AASHTO T 99 (ASTM D 698). Do not place materials in an excessively moist condition.
2. When stockpiled, protect soils media from absorbing excess water and from erosion at all times. Do not store materials unprotected from large rainfall events. Do not allow excess water to enter site prior to compaction. If water is introduced into the material after stockpiling, allow material to drain or aerate to optimum compaction moisture content.
3. In handling materials, operating tools and equipment, protect the media from compaction by laying down planking or plywood as required for protection.
4. Pressure wash equipment prior to handling media to prevent weed seed contamination.

PART 4 – DRAINAGE BALLAST OR LIGHTWEIGHT FILL

4.01 GENERAL

- A. 3/4" Expanded Shale 100%
1. Angle of Internal Friction (Loose) 40 degrees minimum
 Angle of Internal Friction (Compacted) 43 – 46 degrees

4.02 PRODUCTS

- A. 3/4" Rotary Kiln Expanded Shale
1. ASTM C29 Unit Dry Weight loose (38 lb./cf to 48 lb./cf)
 2. ASTM C127 Specific Gravity to meet 1.25 to 1.35
 3. ASTM C330: ASTM Gradation 3/4" x No. 4 size

3/4" x No. 4	
Sieve Size	% Passing
1"	100
3/4"	90 - 100
3/8"	10-50
#4	0 – 15
#200	0 - 10

4. The expanded slate must contain **no** clay lumps or any organic impurities.

4.03 PLACEMENT OF FILL MATERIAL

- A. Place expanded shale directly over the drainage system at specified depth to meet fill and grade shape requirement. Compact at 12 inch lifts.
1. Adequacy of the final compaction shall be determined in the field by the engineer to achieve compaction
2. **Optional-** If wooden forms are used, installed as directed by the Engineer
3. The Structural Fill shall be placed in approximately 12 inch uniform lifts over the entire area of project and compact each lift, including the open tree pit areas. Construction equipment, other than for compaction, shall not operate on the exposed structural fill. Over-compaction should be avoided. No foot or equipment traffic will be allowed on the compacted material until the stabilized surface is placed.

B. COMPACTING

1. Use of portable vibratory plate compacting machine.
Place fill in horizontal lifts not exceeding 12 inches of compacted depth. Use a minimum of two passes, of not less than 10 seconds per pass, before moving the vibratory plate to the next adjacent location. Additional passes may be required and should be determined in the field by the engineer to insure stability of the layer. Continue placing and compacting 12" lifts until the specified depth is reached.
2. Use of vibratory steel roller.
For large spaces, a vibratory steel roller weighing no more than 12 tons static weight can be used. Horizontal lifts should not exceed 12" compacted. The minimum number of passes is two and maximum number is four. Additional passes may be required and should be determined in the field by the engineer to insure stability of the layer.
3. Cover fill with approved filter cloth before placing planting media or surface treatment. Concrete may be poured directly on fill material.

END OF SECTION