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4.1 Function and Basis of Work The specifications of Section 4 shall apply to the selection of turfgrass seed mixtures and to the conduct of certain aspects of turfgrass seeding operations. All labor, equipment, and materials required for the completion of Section 4 shall be furnished by the seeding contractor who shall select appropriate cultivars (Section 4.4) for seeding fine turfgrass areas (Section 4.5) or rough turfgrass areas (Section 4.6), unless specified otherwise. Specifications for seeding in areas which will not be mowed, or which will only be mowed a few times per year, or which have slopes that cannot be mowed (where the control of erosion is most important), are described in Section 9.

4.2 Seed Germination and Quality Tests Turfgrass seed shall be used within 9 months of its most recent germination test. Seed which has been in storage more than 9 months since its most recent test may have experienced a significant reduction in germination and shall be retested. Except as may be otherwise specified and approved by all affected parties, seed shall meet specifications of Section 4.3 for either fine turfgrass areas or rough turfgrass areas.

4.3a Certification and Cultivar Requirements for Fine Turfgrass Areas Seed intended for fine turfgrass areas shall carry either 'Maryland Interagency Certified' tags or other 'Certified State of Origin' tags on their bags or containers at the time of seeding, and shall conform to applicable Maryland seed laws and standards of minimum purity, minimum germination, maximum crop seed, maximum weed seed, and be free of noxious weed seed as specified for the species and summarized in the seed quality standards of Table F-1. Cultivars of species included in seed mixtures for fine turfgrass areas (Section 4.5) shall be selected from those recommended by University of Maryland Dept. of Natural Resource Sciences in Section 4.4. Refer to the most current update of 'U.M. Turfgrass Technical Update TT-77: Recommended Turfgrass Cultivars for Certified Sod and Professional Seed Mixtures', which may be accessed via the internet at www.mdturfcouncil.org. Cultivars recommended in April 2004 update of TT-77 are reproduced in Section 4.4.

4.3b Certification and Cultivar Requirements for Rough Turfgrass Areas Seed intended for rough turfgrass areas may carry 'Maryland Interagency Certified' tags or other 'Certified State of Origin' tags on their bags or containers at the time of seeding, but such certification is not required in order to meet the specifications of Section 4.6 for rough turfgrass areas. Seed intended for rough turfgrass areas shall conform to applicable Maryland seed laws and standards of minimum purity, minimum germination, maximum crop

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seed, maximum weed seed and noxious weed seed and as specified for the species and summarized in the seed quality standards of Table F-1. Cultivars of species recommended by the University of Maryland for seeding fine turfgrass areas according to the specifications of Section 4.3a may be used for seeding rough turfgrass areas but the use of such recommended cultivars shall not be required for seeding rough turfgrass areas unless otherwise specified.

Table F-1 Seed Quality Standards - Fine Turfgrass Areas

Turfgrass Species	Minimum Purity	Minimum Germination	Other Crop	Maximum Weed Seed	Noxious Weeds
Kentucky Bluegrass	95%	85%	0.25%	0.2%	None
Tall Fescue	98%	85%	0.25%	0.2%	None
Fine Fescue	98%	85%	0.25%	0.2%	None
Perennial Ryegrass	98%	85%	0.50%	0.2%	None
Zoysiagrass	90%	80%	0.50%	0.2%	None
Bermudagrass	90%	80%	0.50%	0.2%	None

Note: Seed for fine turfgrass areas shall conform in all respects to 'blue tag' certification standards of the Md. Dept. of Agriculture, including requirements regarding weed seed and other crop seed content which are not reproduced here.

Table F-2 Seed Quality Standards - Rough Turfgrass Areas

Turfgrass Species	Minimum Purity	Minimum Germination	Other Crop	Maximum Weed Seed	Noxious Weeds
Kentucky Bluegrass	90%	80%	0.25%	0.4%	0.5%
Tall Fescue	95%	85%	0.25%	0.5%	0.5%
Fine Fescue	95%	85%	0.25%	0.5%	0.5%
Perennial Ryegrass	95%	85%	0.50%	0.4%	0.5%
Cereal Rye	98%	85%	-	0.1%	None
Foxtail Millet	98%	80%	-	0.1%	None

Note: Seed for rough turfgrass areas shall conform in all respects to standards of the Md. Dept. of Agriculture, including requirements regarding weed seed and other crop seed content which are not reproduced here.

4.4a Kentucky Bluegrass Turfgrass mixtures described in Section 4.5 which require Kentucky bluegrass seed shall include only the cultivars included in Section 4.4a in order to meet specifications of Section 4 for fine turfgrass areas. Cultivars with an asterisk* are considered 'promising' because they have only been tested in Maryland for two years or may have limited seed availability; their use is not limited by such designation.

General Use Kentucky Bluegrass These cultivars are acceptable for any application that specifies the use of Kentucky bluegrass for fine turfgrass areas; their use is recommended for rough turfgrass areas.

Absolute Allure* Apollo Arcadia Ascot* Award Awesome Bariris* Baronie Barrister* Bedazzelled* Beyond Blackburg Blackstone Blue Velvet* Bluechip Bluemax* Bluestone* Bordeaux Brilliant Caliber Challenger Champagne Champlain Chateau Chelsea* Chicago II* Coventry Envicta Everest* Everglade* Excursion Fairfax Ginney* Goldrush Impact Jefferson Julius* Langara* Liberator Limousine Livingston Marquis Mercury* Midnight Midnight II* Moon Shadow* Moonlight North Star Nu Destiny* Nuglade Perfection* Princeton 105 Quantum Leap Rambo Raven Royce* Rugby II Serene Shamrock Showcase* SR 2284* Total Eclipse Tsunami* Voyager II* Washington

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Special Use Kentucky Bluegrass These cultivars are specially adapted to conditions that require increased shade tolerance, low maintenance tolerance, or sod strength, but are acceptable for any application that specifies the use of Kentucky bluegrass.

For Shade Tolerance: Ascot* Brilliant Champagne Chateau Coventry Liberator Moonlight Nuglade Princeton 105 Quantum Leap Showcase*

For Low Maintenance Tolerance: Apollo Arcadia Award Awesome Barirus* Baron Baronie Barrister* Bedazzled* Blackstone Blue Velvet* Bluemax* Bluestone* Bordeaux Caliber Champagne Champlain Chicago II* Everest* Everglade* Excursion Ginney* Impact Langara* Midnight Midnight II* North Star NuDestiny* Nuglade Perfection* Quantum Leap Royce* Rugby II Serene SR2284 Total Eclipse Tsunami* Washington

For Enhanced Tall Fescue or Fine Fescue Sod Strength: Baron Nottingham Wildwood

4.4b Tall Fescue Turfgrass mixtures described in Section 4.5 which require tall fescue seed shall include only the cultivars included in Section 4.4b in order to meet specifications of Section 4 for fine turfgrass areas. Cultivars with an asterisk* are considered 'promising' because they have only been tested in Maryland for two years or may have limited seed availability; their use is not limited by such designation.

2nd Millennium* Apachee II Arid 3 Avenger* Barlexus Barrera Barrington* Biltmore* Bingo Blackwatch* Bonsai 2000 Bravo Cayenne* Chapel Hill Cochise II* Constitution* Coyote Crewcut II Davinci* Daytona* Dominion Durana Duster Dynasty Empress Endeavor Falcon II Falcon IV* Finelawn Elite* Finelawn Petite Five Point* Focus* Forte* Genesis Gleneagle* Good-En Grande Grande II* Gremlin* Hounddog 5 Inferno* Jaguar 3 Justice* Kalahari* Kitty Hawk 2000* Laramie Lion Magellan* Masterpiece Matador* Millennium Mustang 3 Mustang II Ninja 2* Olympic Gold Onyx Padre* Picasso Plantation Pure Gold* Quest* Raptor* Rebel 2000 Rebel Exeda Rebel Jr. Rebel Sentry Red Coat Rembrandt Rendition* Renegade Reserve Riverside* Scorpion* Shenandoah II Shenandoah Silverado II* Silverstar* South Paw* Southern Choice II* Southern Choice SR8250* SR8300 SR8500* SR8550* SR8600* Stetson Tarheel Tarheel II* Tempest* TF66 Titan 2 Titan LTD* Titanium* Tomahawk GT* Tulsa II* Tulsa Turbo* Virtue Watchdog Wolfpack WPEZE Wyatt

4.4c Fine Fescue Turfgrass mixtures described in Section 4.5 which require fine fescue seed, i.e. one or more of the species of creeping red fescue (R), chewings fescue (C), hard fescue (H), or sheep fescue (S), shall include only the cultivars included in Section 4.4c in order to meet the specifications of Section 4 for fine turfgrass areas. Cultivars with an asterisk* are considered 'promising' because they have only been tested in Maryland for two years or may have limited seed availability; their use is not limited by such designation.

Ambassador* (C) Berkshire (H) Chariot (H) Defiant (H) Discovery (H) Heron* (H) Jasper II* (R) Longfellow II (C) Magic (C) Nordic (H) Osprey (H) Oxford* (H) Reliant II (H) Rescue 911 (H) Scaldis (H) Treasure (C)

4.4d Perennial Ryegrass Turfgrass mixtures in Section 4.5 which require perennial ryegrass seed shall include only the cultivars included in Section 4.4d in order to meet the specifications of Section 4 for fine turfgrass areas. Cultivars with an asterisk* are considered 'promising' because they have only been tested in Maryland for two years or may have limited seed availability; their use is not affected.

Accent Admire* Affirmed Allstar 2* Amazing* Applaud Arrival* Ascend* Barlennium* Blazer IV Brightstar Brightstar II Brightstar SLT* Cabo* Caddieshack Calypso II Catalina II* Cathedral II* Charismatic Churchill Citation Fore* Courage* Cruiser* Cutter Divine Elfkin* Exacta Extreme Fiesta 3 Gallery Gator 3* Grand Slam* Head Start Icon* Imagine Inspire IQ* Jet* Kokomo* Laredo Mach I Majesty Manhattan 4 Monterey II Nexus Omega 3 Pacesetter* Passport* Pentium* Pinnacle II* Pizzazz Pleasure XL* Prelude III Premier II Prizm Prowler Quest II* Quickstart Racer* Racer II Radiant* Renaissance* Salinas* Seville I* Splendid* SR4220* SR4350* SR4420* SR4500* Stellar Sunkissed* Terradyne* Top Gun Wilmington* Wind Star

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4.4e Zoysiagrass Turfgrass mixtures in Section 4.5 which require zoysiagrass seed shall include only the cultivars included in Section 4.4e in order to meet the specifications of Section 4 for fine turfgrass areas. Cultivars with an asterisk* are considered 'promising' because they have only been tested in Maryland for two years or may be have limited seed availability; their use is not affected.

Seeded Cultivars: J-14* J-36* J-37* Zen 400* Zen 500* Zenith

Vegetative Cultivars: Cavalier* Marquis* Meyer Sunburst*

4.4f Bermudagrass Turfgrass mixtures in Section 4.5 which require Bermudagrass seed shall include only the cultivars included in Section 4.4f in order to meet the specifications of Section 4 for fine turfgrass areas. Cultivars with an asterisk* are considered 'promising' because they have only been tested in Maryland for two years or may be have limited seed availability; their use is not affected.

Seeded Cultivars: Blackjack* Continental* Mohawk* Princess* Riviera* Savannah* Southern Star* Sundevil II* Transcontinental* Yukon*

Vegetative Cultivars: Midfield Midiron Midlawn Patriot Quickstand Tifsport Tufcoat Vamont

4.5a Fine Turfgrass Areas Use and Expected Maintenance Fine turfgrass areas are mowed on a regular basis, and include home lawns, commercial sites, parks, athletic fields, and playgrounds. Fine turfgrass areas receive variable amounts of fertilizer and pest control as part of their routine maintenance. The seeding rates specified in Section 4.5c-i are based on the specifications of Section 4.2, Section 4.3, and Section 4.4. The lower end of the seeding range is appropriate for maximum economy; the upper end of the seeding range is appropriate where optimum coverage and turf density is required.

4.5b Fine Turfgrass Areas Seeding Times The seeding times for fine turfgrass areas are shown in Table E-1 (cool season turf) or Table E-2, (warm season turf). When seeding is completed within these times, the seeding contractor shall guarantee the success of the seeding (Section 4.8 and Section 5.14) and shall be bound by the specifications for grow-in care (Section 5.6), unless specified otherwise.

Table E-1 Seeding Times for Cool-Season Fine Turfgrass Areas: Kentucky Bluegrass, Tall Fescue, Fine Fescue, Perennial Ryegrass

Region	Spring	Fall
Western Maryland	March 15 - June 01	August 01 - October 01
Central Maryland	March 01 - May 15	August 15 - October 15
Eastern Shore and Southern Md.	March 01 - May 15	August 15 - November 01

Table E-2 Seeding Times for Warm-Season Fine Turfgrass Areas: Zoysiagrass and Bermudagrass

Region	Summer
Western Maryland (Zoysiagrass only)	May 15 - June 30
Central Maryland	May 01 - July 15
Eastern Shore and Southern Md.	April 15 - August 01

4.5c Kentucky Bluegrass Mixtures Shall be seeded in sites with full sun to partial shade exposure. Because the water and pest control requirements of Kentucky bluegrass can be high for optimum growth, this mixture has fallen out of favor for general-purpose lawns since c.1985. Nevertheless, mixtures of Kentucky bluegrass for low maintenance use are still popular. A minimum of three (3) cultivars of Kentucky bluegrass shall be used, with each cultivar ranging from 10%-35% of the mixture by weight. Note: Although the routine inclusion of perennial ryegrass is not recommended, perennial ryegrass may be added to Kentucky bluegrass seed mixtures when the seeding site is at high risk for soil erosion or when cool temperatures may hinder bluegrass establishment. The seeding rate for Kentucky bluegrass mixtures shall be 1.5 to 2.0 lbs. per 1000 ft².

Certified Kentucky Bluegrass Cultivars (3 or more)	85-100%
Certified Perennial Ryegrass Cultivar (1 only, see note)	0-15%

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4.5d Tall Fescue Mixtures Shall be seeded in sites with full sun to partial shade exposure that will receive moderate inputs of routine maintenance. Although this mixture remains popular, mixtures that include Kentucky bluegrass have increased in use since c.1995. Note: The routine inclusion of perennial ryegrass is not recommended, but may be added to the tall fescue mixture when the seeding site is at high risk for soil erosion or when cool temperatures may hinder establishment of tall fescue. A single cultivar of tall fescue may be used, but the inclusion of two or more cultivars is recommended. The seeding rate of such mixtures shall be 6.0 to 8.0 lbs. per 1000 ft².

Certified Tall Fescue Cultivar(s)	90-100%
Certified Perennial Ryegrass Cultivar (1 only, see note)	0-10%

4.5e Tall Fescue + Kentucky Bluegrass Mixtures Shall be seeded in sites with full sun to partial shade exposure that will receive moderate inputs of routine maintenance. This mix is currently popular for general-purpose lawns in Maryland because of its sun/shade adaptability and disease resistance. Note: The routine inclusion of perennial ryegrass is not recommended, but may be added to the mixture when the seeding site is at high risk for soil erosion or when cool temperatures may hinder establishment of tall fescue and Kentucky bluegrass. One cultivar of tall fescue and one cultivar of Kentucky bluegrass may be used, but the inclusion of two or more tall fescue cultivars is recommended. The seeding rate of this mixture shall be 5.0 to 7.0 lbs. per 1000 ft².

Certified Tall Fescue Cultivar(s)	80-95%
Certified Kentucky Bluegrass Cultivar(s)	5-10%
Certified Perennial Ryegrass Cultivar (1 only, see note, above)	0-10%

4.5f Kentucky Bluegrass + Creeping Red Fescue Mixtures Shall be seeded in sites with full sun to medium shade exposure that will receive moderate amounts of routine maintenance. This mixture was popular for general purpose lawns before c.1985 when mixtures of tall fescue became popular, and is still popular in cooler regions of Maryland. A minimum of three cultivars of Kentucky bluegrass, each ranging from 10% to 35% of the mixture by weight, shall be used with one cultivar of creeping red fescue. The seeding rate of this mixture shall be 1.5 to 3.0 lbs. per 1000 ft².

Certified Kentucky Bluegrass Cultivars (3 or more)	80-95%
Certified Creeping Red Fescue Cultivar (1 only)	5-20%

4.5g Fine Fescue Mixtures Shall be seeded in sites with minimal inputs of routine fertility and maintenance. These species have been popular since c.1995, especially in sites with infrequent summer mowing. Cultivars of any species may be mixed; mixes intended for full sun exposure shall not include creeping red fescue. The seeding rate shall be 4.0 to 6.0 lbs. per 1000 ft².

Certified Cultivar(s) Creeping Red Fescue, Chewings Fescue, Sheep Fescue, Hard Fescue	100%
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4.5h Zoysiagrass Shall be seeded in sites with full sun or minimal shade exposure, and which will receive low to moderate inputs of maintenance. Seeded cultivars of zoysiagrass are not widely used in Maryland but several have proved to be adapted. One certified cultivar of zoysiagrass shall be seeded at a rate of 1.0 to 2.0 pounds per 1000 ft². No other species or cultivars shall be included.

4.5i Bermudagrass for Sports Turf Shall be seeded in sites with full sun or minimal shade exposure, and which will receive moderate to intensive maintenance inputs appropriate for their use as sports turf fields (i.e., golf course fairways, football and fields, etc.). Bermudagrass is not recommended in Western Maryland due to lack of cold-hardiness. The Maryland Dept. of Agriculture requires the issue of a permit before Bermudagrass may be seeded. One certified cultivar of Bermudagrass shall be seeded at a rate of 1.0 to 3.0 pounds per 1000 ft². No other species or cultivars shall be included.

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4.6a Rough Turfgrass Area Use and Expected Maintenance Rough turfgrass areas are used on an occasional basis for activities such as road shoulders, campgrounds, automobile parking, recreational areas, occasional-use ball fields, play areas, picnic sites, and to preserve open space. Because the intensity of their use is low, rough turfgrass areas receive routine mowing but the mowing may be performed at long intervals and at heights not common for fine turfgrass areas (i.e., 3.0 to 6.0 inches or more). Fertilization and pest control is usually not a part of their routine maintenance. Rough turfgrass areas may be level or gently sloping, but areas with steep or erodible slopes which are not likely to be used for any of the purposes mentioned above should be seeded with an appropriate erosion control seed mixture according to the specifications of Section 9. The vegetative height limitations of rough turfgrass areas generally preclude the use of legumes such as Lespedeza and Crown Vetch, and tall grasses such as weeping lovegrass.

4.6b Rough Turfgrass Area Preparation and Establishment Rough turfgrass areas often cannot be prepared with conventional seeding equipment, and certain aspects of their grow-in maintenance, such as irrigation, may be difficult or impossible. Hydraulic seeding is a commonly used method for seeding rough turfgrass areas. Seeding rates specified in Section 4.6d-g are based on the specifications of Section 4.2, 4.3b and Table F-2. Rough turfgrass areas are expected to be prepared according to the specifications of Section 1 through Section 4, and seeded according to the specifications of Section 4, Section 5, Section 6. However, the seeding contractor shall not be bound to provide grow-in care for rough turfgrass seedings, nor to guarantee the success of such seedings, unless specified otherwise.

4.6c Rough Turfgrass Area Mixtures and Seeding Times Specifications for seed mixtures are shown in Section 4.6d - Section 4.6g, below, according to the season of seeding. The seed mixtures used for rough turfgrass areas may vary widely; total seeding rate may be up to 1.5 times (1.5x) the minimum rates shown. Although the use Maryland Certified and/or University of Maryland recommended cultivars is not required, the Maryland Seeding Association encourages their use.

4.6d Rough Turfgrass Winter Seeding Season

16 November to 28 February

Minimum seeding rate is 4.5 pounds per 1000 ft² = 200 pounds per acre. Where the establishment of more rapid groundcover is needed on sites with steep slopes, Cereal Rye may be added to the mix at a rate of 0.5 pound per 1000 ft² = 22 pounds per acre.

Tall Fescue	0 - 80%	0 - 3.6 lbs per 1000 ft ²	0 -160 lbs per acre
Hard Fescue and/or Sheep Fescue	0 - 60%	0 - 2.7 lbs per 1000 ft ²	0 -120 lbs per acre
Creeping Red and/or Chewings Fescue	0 - 60%	0 - 2.7 lbs per 1000 ft ²	0 -120 lbs per acre
Kentucky Bluegrass	5 - 40%	0.2 - 1.8 lbs per 1000 ft ²	10- 80 lbs per acre
Perennial Ryegrass	5 - 20%	0.2 - 0.9 lbs per 1000 ft ²	10- 40 lbs per acre

4.6e Rough Turfgrass Spring Seeding Season

1 March to 15 May

Minimum seeding rate is 4.5 pounds per 1000 ft² = 200 pounds per acre.

Tall Fescue	0 -100%	0 - 4.5 lbs per 1000 ft ²	0-200 lbs per acre
Hard Fescue and/or Sheep Fescue	0 -100%	0 - 4.5 lbs per 1000 ft ²	0-200 lbs per acre
Creeping Red and/or Chewings Fescue	0 - 60%	0 - 2.7 lbs per 1000 ft ²	0-120 lbs per acre
Kentucky Bluegrass	0 - 40%	0 - 1.8 lbs per 1000 ft ²	0- 80 lbs per acre
Perennial Ryegrass	0 - 20%	0 - 0.9 lbs per 1000 ft ²	0- 40 lbs per acre

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4.6f Rough Turfgrass Summer Seeding Season

16 May to 30 July

Minimum seeding rate = 4.5 pounds per 1000 ft² = 200 pounds per acre. Where the establishment of more rapid groundcover is needed on sites with steep slopes, Foxtail Millet may be added at the rate of 0.02 pounds per 1000 ft² = 10 pounds per acre.

Tall Fescue	0 -100%	0 - 4.5 lbs per 1000 ft ²	0-200 lbs per acre
Hard Fescue and/or Sheep Fescue	0 -100%	0 - 4.5 lbs per 1000 ft ²	0-200 lbs per acre
Creeping Red and/or Chewings Fescue	0 - 60%	0 - 2.7 lbs per 1000 ft ²	0-120 lbs per acre
Kentucky Bluegrass	0 - 40%	0 - 1.8 lbs per 1000 ft ²	0- 80 lbs per acre
Perennial Ryegrass	0 - 20%	0 - 0.9 lbs per 1000 ft ²	0- 40 lbs per acre

4.6g Rough Turfgrass Fall Seeding Season

1 August to 15 November

Minimum seeding rate = 4.5 pounds per 1000 ft² = 200 pounds per acre

Tall Fescue	0 -100%	0 - 4.5 lbs per 1000 ft ²	0-200 lbs per acre
Hard Fescue and/or Sheep Fescue	0 -100%	0 - 4.5 lbs per 1000 ft ²	0-200 lbs per acre
Creeping Red and/or Chewings Fescue	0 - 60%	0 - 2.7 lbs per 1000 ft ²	0-120 lbs per acre
Kentucky Bluegrass	0 - 40%	0 - 1.8 lbs per 1000 ft ²	0- 80 lbs per acre
Perennial Ryegrass	0 - 20%	0 - 0.9 lbs per 1000 ft ²	0- 40 lbs per acre

4.7 Materials Acceptance The seeding contractor shall inform all affected parties of the composition of the seed mixtures which are intended for use at the seeding site before they are seeded; acknowledgment of acceptance of the seed mixtures shall be given by the owner, general contractor, landscape architect, or other person(s) authorized to make such a decision before seeding operations are begun. Samples of the seed mixtures, with labels and other material identification pertaining to them, shall be retained by the seeding contractor for a minimum of 90 days after the conclusion of seeding operations.

4.8 Professional Guarantee The seeding contractor shall guarantee that the seed mixtures selected for seeding according to the specifications of MSA-GS-05.0 shall be appropriate for the site and its intended use, according to the specifications of Section 5, unless specified otherwise.

4.9 Damages Disclaimer The seeding contractor shall not be held liable to repair damages incurred to the site as a result of materials not applied under the supervision of the seeding contractor, nor by vandalism, nor by acts of God. The seeding contractor shall not be held liable to repair or otherwise amend the site as a result of the use of seed or other materials which are labeled in error or which are otherwise not in accordance with the label or description provided with them by the manufacturer or distributor of the products, when they are applied by the seeding contractor in good faith, in accordance with their label or description.

4.10 Payment The seeding contractor shall give notification upon the completion of Section 5; the site shall be inspected within 24 hours of such notification, and payment shall be made at that time, or as specified in the contract. When payment is not received within the specified time period, the seeding contractor may void any guarantees related to Section 5, and may seek appropriate legal remedies.