Guideline Specifications To Turfgrass Sodding

Revised 2006

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Preface

These guideline specifications have been prepared in response to the need for information regarding soil preparation, turfgrass sodding and post-installation maintenance over wide geographic/climatic areas.

With recent research results and production experience, it is commonly understood that consideration must be given to the region where turfgrass sod installation is to be accomplished. Quality performance of turfgrass sodded areas depends on a number of closely related and interdependent factors. These include the selection of adapted turfgrasses, adequate preparation of the site, proper transplanting of sod and good cultural practices which will result in rapid establishment and good turfgrass growth.

These specifications have been prepared to provide architects (both structural and landscape), landscape contractors, builders and owners information that will fulfill the objectives they envision. The materials and methods suggested are applicable, or can be adapted, for the vast majority of landscape work being undertaken.

It is recommended that areas with highly specialized requirements, such as major sports complexes, highly erodible or flood prone areas be addressed by a combination of specialized experts because of the unique situations and requirements that may be present at the site.

These specifications neither imply, suggest nor guarantee satisfaction in results because of the extremely wide variety of localized conditions that might exist. As stated in this publication’s title, the following pages are intended as “guidelines” only.

Acknowledgements

Turfgrass Producers International is an independent, not-for-profit trade association of professional turfgrass sod producers. Since its formation in 1967 as the American Sod Producers Association, it has served three objectives stated in its official bylaws. These include, “To better acquaint the public with the product of the Association and to provide suggestions and instructions for the planting and culturing thereof.” One of the earliest projects of the organization was the development and publication of its "Guideline Specifications to Turfgrass Sodding." First published in 1972, this booklet has provided a common basis upon which business has been reasonably conducted between educated and informed producers and consumers of turfgrass sod.

The turfgrass sod production industry is indebted to numerous individuals and organizations for their many contributions to the information contained in this publication. While there are too many to identify individually, TPI extends its appreciation to all who contributed to the updating and success of this invaluable publication.
Foreword

Turfgrass sod has gained universal recognition and world-wide acceptance as the most effective technique to establish lawns and other turf areas. While the immediate project completion and/or beautification of an area with turfgrass are the most readily acknowledged advantages of using mature turfgrass sod, there are a number of very valid environmental and economic reasons to select turfgrass as the plant-material of choice.

Environmental benefits of turfgrass, as carefully documented in the scientific report by Dr. James B. Beard and Dr. Robert L. Green, in “The Role of Turfgrasses in Environmental Protection and Their Benefits to Humans,” published in the peer-reviewed Journal of Environmental Quality, January, 1994 (Volume 23, Number 3, Pages 452-460) by the American Society of Agronomy, Crop Science Society of America and the Soil Science Society of America, include:

1. **Functional benefits** such as soil erosion control, dust prevention, heat dissipation, noise abatement, air pollution control and nuisance animal reduction;
2. **Recreational benefits** such as low cost surfaces, physical health, safety and spectator entertainment; and,
3. **Aesthetic benefits** such as beauty, quality of life, mental health, social harmony, community pride, increased property values and a compliment to trees and shrubs in the landscape.

Economic benefits of turfgrass sodding, as analyzed by Dr. Eliot Roberts, former executive director of the Lawn Institute, and others, would include such factors as:

1. **Known, visible results** in the form of a mature turf, as opposed to an unpredictable product that typically results from other forms of turf establishment such as seeding, or hydro-seeding.
2. **Reduced input requirements** such as water, herbicides, fungicides and insecticides and the associated increased labor costs that would be required to establish turf by any means other than through the use of turfgrass sod.
3. **Near-immediate use** of the turfed area resulting from the installation of sod, as opposed to lengthy periods of time where a seeded area would be unavailable for use.
4. **One-time establishment** of the turf area is accomplished with turfgrass sodding, thus eliminating the time-consuming, frustrating and costly requirement of re-seeding or patching of areas that are washed out or otherwise deemed unacceptable as a result of seedling failure.

Immediacy and beauty are significant benefits of turfgrass sodding, but they are not the only reasons to rely on turfgrass sod for a wide variety of landscape and sportsfield projects. The many advantages of turfgrass sod that are made available with a high quality product are also an added benefit. The conscientious efforts of the turfgrass sod production industry have contributed immeasurably to the availability of high quality sod of the best turfgrass varieties available.

**Turfgrass Producers International**, TPI, (formerly the American Sod Producers Association), is organized to represent the progressive turfgrass sod producer. The members are dedicated to continuing efforts in the production of improved turfgrass sod for a better and more enjoyable environment. This publication has been prepared to help assure that the finest quality turf is obtained and properly installed on a variety of sites, by an equally wide variety of individuals or companies.

**Local turfgrass producer members of TPI** should be consulted on all turfgrass sodding projects to gain information related to “micro-climates” and other localized conditions that could affect selection, installation and overall satisfaction with the newly sodded area.
How To Use This Publication

These specification guidelines are presented in six specific sections, and produced in a manner that will permit the use of all or selected sections with tremendous ease and maximum flexibility. Each section can stand alone, be incorporated into an overall set of specifications for an entire turfgrass sodding project, or used in any combination. For example, firms that specialize in a certain type of activity may use these guideline specifications when bidding only on a portion of a project, such as supply or placement of topsoil, etc. On the other hand, a general contractor, architect or owner may present these specifications as a means of establishing comparable bidding considerations.

The specifications are divided into the following six major areas:

Section I. Specifications for Subsoil Preparation (Where Topsoil Is To Be Added)
Section II. Specifications for Topsoil Material and Application
Section III. Specifications for Fertilizer pH Correction Materials and Final Soil Preparation
Section IV. Specifications for Turfgrass Sod Materials
Section V. Transplanting and Installing Turfgrass Sod
Section VI. Specifications for Maintenance of Transplanted Turfgrass Sod
Specifying the Class/Grade and Composition Of Turfgrass Sod

“Turfgrass sod” and “sod” are used somewhat interchangeably throughout this publication; however, because the term “sod” is objectionable in some cultures, TPI is encouraging the use of the term “turfgrass sod” to be properly descriptive of the product. In those instances where the term “sod” is used in this publication it is because other words would not “sound” appropriate to the North American audience.

Advancements and improvements in turfgrass sod harvesting equipment and post-harvesting techniques have increased by a considerable margin the variety of available sizes and conditions of the finished product. Where turfgrass sod was once available only in one square yard or a meter piece, either in a strip or as a roll, today’s producers may also offer turf in rolls that are upwards of 48-inches wide (1.3 meters) and many upwards of 100 feet (30 meters) long. In some markets, there may also be “washed sod,” where the soil has been removed after harvesting, or “soil-less sod,” that has been grown in a non-soil medium, usually on plastic or some other surface, or “thick-cut” sod (upwards of 2-inches /5 cm thick) for use on sportsfields and other areas requiring high levels of immediate use. Custom-grown turfgrass sod, meeting the purchaser’s exact specifications for variety and growth medium (such as technical sand mixtures) may also be produced at some farm locations.

In some geographic areas, the soil types may be termed “mineral,” “muck,” “peat,” or “organic,” in reference to the basic composition of the farm's soils. When combined with turfgrass sod, the product may be called “Mineral Sod,” “Muck Sod,” “Peat Sod,” or “Organic Sod.” While this may cause some initial confusion, the overall condition of the turfgrass sod and its basic classification, as defined elsewhere in this publication, is generally considered to be of much greater importance. These terms do not refer to the class of turfgrass sod, or the composition of its plant materials.

Factors to consider in determining the appropriate class/grade of turfgrass and its composition can be quite extensive. The following factors should be kept in mind:

A. The ultimate purpose of, or use for the turfgrass area being specified can affect the proper selection of turfgrass sod;
B. Local consumer preference demands will strongly influence what grasses will be grown for turfgrass sod.
C. Varietal improvements continually occur, permitting the turfgrass sod producer greater flexibility in selecting blends and mixtures that are appropriate for a particular purpose or area.
D. Composition of turfgrass sod differs widely over any major geographic area because climatic conditions and/or other variables.

To assist in determining the best specifications for the turfgrass sod required for each site, the following examples of quality definitions are provided. Please note, that the criteria most typically included would be the quality of the original seed or plant material, the presence or absence of noxious or other weeds, the degree of maintenance involved during growing and the overall uniformity of the finished product. Recognizing that not all sites require the same quality standard of products and that local market practices will prevail, the following examples are provided as a guideline.
Within the U.S. many states have Crop Improvement Associations, Seed Commissions or other agencies which administer voluntary programs to inspect and certify certain crops, including turfgrasses. “Certified,” used in this context means that the variety of grass is adapted to the climatic region, has been grown from seed or planting stock of known origin and has been inspected for varietal purity and freedom from noxious weeds. However, not all varieties and/or species that are adaptable or perhaps commonly used in the area may be included in these certification programs. Additionally, these programs do not establish standards for quality of the turfgrass sod related to strength or ability to be handled and installed without coming apart. Furthermore, many State Departments of Agriculture inspect soil grown crops such as turfgrass sod and then issue certificates for freedom from insects, diseases or other pests. This is usually required by state or federal law and does not require specification.

It should also be noted that while independent turfgrass sod certification programs establish uniform quality standards, there may well be producers in a certification area, or other areas where no certification program exists, whose turfgrass sod may meet or exceed certification standards.

The following definitions of turfgrass sod quality standards should help guide in the specification of the required level of product appropriate to the site.

A. **Certified Turfgrass Sod**: Certified turfgrass sod is superior sod grown from certified, high quality seed of known origin or from plantings of certified grass sprigs or stolons. It is inspected by the certification agency of the area to assure satisfactory varietal identity and purity, overall high quality and freedom from noxious weeds or excessive amounts of other crop and weedy plants at time of harvest. It may be of either one variety or composed of a mixture of two or more varieties or species. However, all seed in a mixture must be certified. The turfgrass sod must meet the area’s published standards for certification.

B. **Approved Turfgrass Sod**: Approved turfgrass sod is superior sod, grown from approved seed of known origin or from plantings of approved grass sprigs or stolons. Field standards for approved sod are similar to those of certified sod. It is inspected by the official certification agency of the area to assure overall high quality and freedom from noxious weeds or excessive amounts of other crop and weedy plants at time of harvest. It may be either one variety or composed of a mixture of two or more varieties or species. However, all seed in a mixture must be approved.

D. **Nursery Turfgrass Sod**: Any turfgrass sod planted on cultivated agricultural land and grown specifically for turfgrass sod purposes. It shall have been mowed regularly and carefully and otherwise maintained from planting to harvest to assure reasonable quality and uniformity. May also be termed “Cultivated Turfgrass Sod.”

E. **Field Turfgrass Sod**: This class of sod may include all turf not covered in the above classes. It may consist of turf lifted from pastures or meadows, which may have been grown primarily for forages. May also be termed “Pasture Turfgrass Sod.”

Alternate Standards for Specifying Turfgrass Sod Quality are presented on the next two pages.
Alternate Standards of Turfgrass Sod Quality

The following standards considerably reduce the complexity of the specifications previously outlined and in many instances will be adequate for a given project’s needs.

Sample 1:   Standards of Quality

Labeling:  Every shipment of turfgrass sod shall be accompanied by an invoice or sales slip indicating whether the material is of a single variety, a blend or a mixture and the quality.

A. Any turfgrass sod in which one variety of any species makes up in excess of 90% of the turf shall be sold as that variety.
B. Turfgrass sod classified as a “Bluegrass Blend” shall have been seeded using a blend of two or more varieties of Kentucky bluegrass. The names of these varieties and the percentages in the original seed blend shall be available on request.
C. Turfgrass sod grown from a mixture of turfgrass species, such as Kentucky bluegrass and turf-type tall fescues, shall be labeled as such and the species identified. Percentages by weight of each sown variety shall be available on request.
D. Any turfgrass sod that has not been sown and maintained as a nursery sod crop shall be labeled as “Pasture Sod.”

Quality Definition(s):

A. Number 1 Quality/Premium:  The turf shall be of sufficient density so that no surface soil is visible when mowed to a height of 1.5 inches (40 mm). Maximum mowing height shall be 2.5 inches (60 mm). At the time of sale, the turf shall contain no more than one percent undesirable grasses or clover and not more than two weeds per 50 square yards (50 sq m). The thickness of the soil portion of the turfgrass sod should not exceed one-half inch (15 mm).

B. Commercial Grade:  Turfgrass sod being sold as “Commercial Grade,” shall meet the density and mowing requirements of No. 1 sod. It may however contain up to 10 percent undesirable grass species and 10 weeds per 50 square feet (50 sq m). Any grass other than the species shown on the invoice/sales slip shall be deemed as an undesirable. Annual bluegrass (Poa annua) shall be included in this classification. The thickness of the soil portion of the turfgrass sod should not exceed one-half inch (15 mm).

IMPORTANT

Research concludes that the thinner the soil layer, the more rapidly rooting will occur after installation; however, installers should be aware that thin soil layers tend to dry-out more quickly than thicker soil layers. Attention to adequate post-installation watering is very important to the success of any turfgrass sod project.
Sample 2: Standards of Quality

Labeling: Every shipment of turfgrass sod shall be accompanied by an invoice/sales slip indicating the variety, species and quality grade of the shipment.

Quality Grades:
A. **Premium Grade** turfgrass sod shall contain only the species and variety of turfgrass shown on the invoice/sales slip, and contain no weeds or foreign grasses (i.e., no other varieties or species). It may have no visible signs of disease or insect stress. The turfgrass sod shall be neatly mowed and be mature enough that when grasped at one end, it can be picked-up and handled without damage.

B. **Standard Grade** turfgrass sod may have no visible broadleaf weeds when viewed from a standing position and the turf shall be visibly consistent, with no obvious patches of foreign grasses. In no case may the total amount of foreign grasses or weeds exceed two percent of the total canopy. The turfgrass sod shall be neatly mowed and be mature enough that when grasped at one end it can be picked up and handled without damage.

C. **Commercial Grade** turfgrass sod shall be any material that fails to meet the Standard Grade specifications.
SECTION I
Specifications For Subsoil Preparation
(Where Topsoil Is To Be Added)

(NOTE: This specification applies only if additional topsoil will be placed over existing soil.)

A. General: The area(s) to which these specifications apply and on which topsoil is to be placed shall be as indicated on the drawings or as otherwise specified. Equipment, labor and materials necessary for the preparation of the specified area(s) shall be furnished by the grading contractor.

B. Grading: Grades on the area(s) to be topsoiled, which have been previously established in conformance with the drawings and/or other applicable specifications, shall be maintained in a true and even grade.

C. Low pH Correction: Where the subsoil is highly acid, it shall be tested by a reputable laboratory and a pH correction material shall be spread at a rate sufficient to correct the pH to a range of 6.0 to 7.0. The material shall be distributed uniformly over the designated area(s) and worked into the soil in conjunction with an expanded tillage operation as described in Paragraph E below.

D. High pH Correction: Saline and alkali soils may be found in arid and semiarid regions and in areas near sea water. In many of these areas the salts can be leached, but other soils will require special amendments or management. In areas where these soil characteristics may occur, subsoil samples shall be tested by a reputable laboratory and subsequent recommendations, to include a possible delay in topsoil addition, shall be followed.

E. Tilling: After the area(s) to be topsoiled have been brought to grade, compacted where necessary and immediately prior to the dumping and spreading of topsoil, the subgrade shall be loosened by disk ing or by scarifying to a depth of at least 2 inches (50 mm) to permit bonding of the topsoil to the subsoil.

F. Acceptance: Acceptance shall be given by the general contractor, owner, architect or their agent, upon satisfactory completion of each section or area(s), as indicated on the drawings or as otherwise specified.

G. Payment: Specifications of method of payment, retainer and final payment shall be as customary to the industry in this area.
NOTE: Topsoil on the existing site may often be used; however, it should meet the same standards as set forth in these specifications.

A. General: The grading contractor shall furnish all topsoil, labor, material and equipment required to complete the work described herein in strict accordance with the drawings and/or terms of the contract.

B. Materials: Topsoil shall be a loamy sand, sandy loam, clay loam, loam, silt loam, sandy clay loam or other soil approved by the architect. It shall not have a mixture of subsoil and shall contain no slag, cinders, stones, lumps of soil, sticks, roots, trash or other extraneous materials larger than 1.5 inches (40 mm) in diameter. Topsoil must also be free of viable plants or plant parts of common bermudagrass, quackgrass johnsongrass, nutsedge, poison ivy, Canada thistle, or others as may be specified. All topsoil shall be tested by a reputable laboratory for pH and soluble salts. If needed, pH correction material shall be applied at a rate sufficient to correct the pH to a range of 6.0 to 7.0. Soluble salts shall not be higher than 500 parts per million.

No turfgrass sod shall be placed on soil which has been chemically treated until sufficient time has elapsed to permit dissipation of all toxic materials. The general contractor shall assume full responsibility for any loss or damage to turfgrass sod arising from improper use of chemicals or due to his failure to allow sufficient time to permit dissipation of toxic residues, whether or not such materials are specified herein.

C. Grading: The topsoil shall be uniformly distributed on the designated area(s) and it shall be a minimum of 3 inches (75 mm) deep after firming. Spreading shall be performed in such a manner that sod installation can proceed with a minimum of additional soil preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets. Topsoil shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading or proposed for turfgrass sod installation.

D. Clean Up: After the topsoil has been spread and the final grade approved, it shall be cleared of all grade stakes, surface trash or other objects that would hinder installation and/or maintenance of turfgrass sod and other plantings. Paved areas over which hauling operations are conducted shall be kept clean and any soil which may be brought upon the surfacing shall be promptly removed. The wheels of all vehicles shall be kept clean to avoid tracking soil on the surfacing of roads, walks or other paved areas.

E. Acceptance: Acceptance will be given by the general contractor, owner, architect or their agent, upon satisfactory completion of each section or area(s), as indicated on the drawings or as otherwise specified.

F. Payment: Specifications of method of payment, retainer and final payment shall be customary to the industry in this area.
SECTION III
Specifications For Fertilizer, pH Correction Materials and Final Soil Preparation

NOTE: Specifications given in this section apply both to areas where topsoil has been added and to areas where soil from the existing site is used.

A. General: The general contractor shall furnish, or have furnished by others, all labor, material and equipment required to complete the work described herein, in strict accordance with the drawings and/or terms of the contract.

B. Materials: Soil tests shall be made to determine the exact requirements for any amendments. Soil tests shall be conducted by a reputable laboratory.
(Note: For the next three items, use appropriate recommendations of the state agricultural experiment station, extension service, or other reputable agent, for the variety of turfgrass being specified.)

1. Fertilizers: All fertilizers (either granular or liquid) shall be uniform in composition, free flowing and suitable for application with approved equipment. Fertilizers shall be delivered to the site fully labeled, according to applicable fertilizer laws and shall bear the name, trade name or trademark, and warranty of the producer or manufacturer.

Fertilizer applications shall be determined by soil tests. If soil testing is waived where there is insufficient time for complete soil tests, fertilizer materials that supply the following levels of nutrients can be applied:

a. _________ lbs actual N per 1000 sq ft (____ kg/100 sq m)
b. _________ lbs actual P2O5 per 1000 sq ft (____ kg/100 sq m)
c. _________ lbs actual K2O per 1000 sq ft (____ kg/100 sq m)

Fertilizers shall be distributed uniformly over the entire area(s) where turfgrass sod is to be installed.

2. Low pH Correction Materials: Lime material shall be ground limestone (hydrated or burnt lime may be substituted), which contains at least 50% total oxides (calcium oxide plus magnesium oxide). Ground limestone shall be ground to such fineness that at least 50% shall pass through a 100-mesh sieve and 98% to 100% shall pass through a 20-mesh sieve.
Application rates for liming materials shall be determined by soil tests. If soil testing is waived, when there is insufficient time for a complete soil test, lime shall be applied at a minimum rate of _____ lbs of ground limestone or its equivalent per 1000 sq ft (____kg/100 sq m).

Lime shall be distributed uniformly over the entire area(s) where turfgrass sod is to be installed.

3. High pH Correction Materials: Materials and application rates shall be determined by appropriate soil tests performed by a reputable laboratory. If leaching or special management is necessary, final grading will be delayed as specified.

C. Grading:
   1. Tillage: Soil amendments, such as fertilizer and lime, shall be uniformly incorporated into the top 4 inches (100 mm) of soil by discing, harrowing or other approved method.
   2. Final Grading: Any undulations or irregularities in the surface, resulting from fertilizing, liming, tilling or other causes, shall be smoothed prior to turfgrass installation. Flooded, washed out areas, damaged or otherwise, shall be reconstructed and all grades re-established by the grading contractor in accordance with the drawings and/or other applicable specifications.

D. Clean-Up: Prior to installation of the turf, the surface shall be cleared, to a depth of 4 inches (100 mm), of all trash, debris, stones larger than 1.5 inches (40 mm) in diameter, and of all roots, brush, wire, grade stakes and other objects that would interfere with planting or maintenance operations.

E. Acceptance: Acceptance shall be given by the general contractor, owner, architect or their agent, upon satisfactory completion of each section or area(s) as indicated on the drawings or as otherwise specified.

F. General Contractor's Responsibility: The general contractor shall be responsible for maintaining the accepted area(s) which are to be sodded until the effective date to begin installation. The effective turfgrass sod installation date shall be specified in a written notice from the general contractor.

G. Payment: Specifications or method of payment, retainer and final payment shall be customary to the industry in this area.
SECTION IV
Specifications For Turfgrass Sod Materials

A. General: The turfgrass sod supply contractor shall furnish all labor, material and equipment required to complete the work described herein, in strict accordance with the drawings and/or terms of the contract.

B. Materials:
   1. Class/Grade of Sod and Composition:
      a. Class of the turfgrass sod shall be _______________________________
      b. This turfgrass sod shall be composed of __________________________
         (designate variety/type/blend/mixture above)

   2. Thickness of Cut: Turfgrass sod shall be machine cut at a uniform soil thickness of 0.60 inch (15 mm), plus or minus 0.25 inch (6 mm), at the time of cutting. Measurement for thickness shall exclude top growth and thatch.

   3. Pad Size: Individual pieces of turfgrass sod shall be cut to the supplier’s standard width and length. Maximum allowable deviation from standard widths and lengths shall be plus or minus 0.5 inch (15 mm) on width and plus or minus five percent on length. Broken pads and torn or uneven ends will not be acceptable.

   4. Strength of Turf Sod Sections: Standard size sections of turfgrass sod shall be strong enough that it can be picked up and handled without damage.

   5. Moisture Content: Turfgrass sod shall not be harvested or transplanted when its moisture content (excessively dry or wet) may adversely affect its survival.

   6. Mowing Height: Before harvesting, the turfgrass shall be mowed uniformly at a height of 1 to 2.5 inches (25 to 60 mm) on cool season grasses (i.e., bluegrass, bentgrass, rye and fescue), and 0.75 to 1.50 inches (20 to 40 mm) on warm season grasses (i.e., zoysiagrass, bermudagrass, St. Augustinegrass, etc.)

   7. Time Limitations: Turfgrass sod shall be harvested, delivered and installed/transplanted within a period of 24 hours, unless a suitable preservation method is approved prior to delivery. Turfgrass sod not transplanted within this period shall be inspected and approved by the inspecting officer or his representative prior to its installation.
(NOTE: Items 8 through 10 of the following “Materials Standards” may also be specified when not using certified or approved turfgrass sod.)

8. Thatch: Turfgrass sod shall be relatively free of thatch, up to 0.5-inch (15 mm) allowable (uncompressed).

9. Diseases, Nematodes and Insects: Turfgrass sod shall be reasonably free of diseases, nematodes and soil-borne insects. Specific nursery and/or plant materials laws may require that all sod entering inter-state commerce be inspected and approved for sale. The inspections and approval must be by the appropriate government representative of the agriculture department or office of entomologist.

10. Weeds:
   a. Nursery Grown Turfgrass Sod: shall be free of objectionable grassy and broad leaf weeds. Turfgrass sod shall be considered free of such weeds if less than 5 such plants are found per 100 square feet (10 sq m) of area. Turfgrass sod will not be acceptable if it contains any of the following weeds: common bermudagrass (wiregrass), quackgrass, johnsongrass, poison ivy, nutsedge, nimblewill, Canada thistle, bindweed, bentgrass, wild garlic, ground ivy, perennial sorrel and/or bromegrass.
   b. Field Turfgrass Sod: may contain no more than 10 weeds per 100 square feet (10 sq m) of area. Turfgrass sod will not be acceptable if it contains any of the weeds listed in 10-a above.

C. Delivery and Off-Loading: Turfgrass sod shall be delivered to the site specified in this contract and off-loaded using equipment furnished by the turfgrass sod supply contractor. Palletized or large-roll turfgrass sod shall be off-loaded at the location(s) designated for this purpose at the installation site.

D. Damage Disclaimer:
   1. The general contractor, owner, architect or their agent shall accept full responsibility and hold harmless the turfgrass sod supply contractor for any and all damage that may be caused by the sod delivery truck driving onto a driveway and/or walkway, if the driver of the loaded sod truck has been instructed to position the truck in an area where such damage might occur.
   2. The turfgrass sod supply contractor shall not be held liable for damages incurred to the turfgrass sod as a result of de-icing compounds, fertilizers, pesticides or other materials not applied by him or under his supervision, nor for those caused by acts of God or vandalism.

E. Acceptance: Acceptance will be given by the general contractor, owner, architect or their agent, upon satisfactory completion of each delivery to the area(s) as indicated on the drawings or as otherwise specified.

G. Payment: Specifications of method of payment, retainer and final payment shall be customary to the industry in this area.
SECTION V
Specifications For Turfgrass Sod
Transplanting and Installation

A. **General:** The installation contractor shall furnish all labor, material and equipment required to complete the work described herein, in strict accordance with the drawings and/or terms of the contract.

B. **Grading:** All previously established grades shall be maintained in conformance with the drawings and/or applicable specifications.

C. **Time Limitations:** Turfgrass sod shall be transplanted/installed within a period of 24 hours following harvesting, unless a suitable preservation method is approved prior to delivery. Turfgrass sod not transplanted within this period shall be inspected and approved by the inspecting officer or his representative prior to its installation.

D. **Transplanting:**
   1. **Moistening the Soil:** During periods of higher than optimal temperature for the species being specified, and after all unevenness in the soil surface has been corrected, the soil shall be lightly moistened immediately prior to installation of the turfgrass sod.

   2. **Starter Strip:** The first row of turfgrass sod shall be laid in a straight line, with subsequent rows placed parallel to and tightly against each other. Lateral joints shall be staggered to promote more uniform growth and strength. Care shall be exercised to insure that the pieces are not stretched or overlapped and that all joints are butted tightly to prevent voids that would cause air drying of the roots.

   3. **Sloping Surfaces:** On 3:1 or greater slopes, traditional size (1 sq yd / 1 sq m) turfgrass sod shall be laid across the angle of the slope (perpendicular), with staggered joints and secured by tamping, pegging, stapling or other approved methods of temporarily securing each piece. Large-roll turfgrass sod shall be laid in the direction of the slope, with temporary securing being at the discretion of the installation contractor.

   4. **Swales and Intermittent Waterways:** The installation of turfgrass sod within drainways or intermittent waterways shall be determined after considering maximum channel velocities for storms of a designated intensity. Traditional size turfgrass sod shall be laid perpendicular to the direction of flow and pegged to resist washout during the establishment period, while large-roll pieces shall be laid in the direction of the flow, with temporary securing being at the discretion of the installation contractor.

   5. **Watering and Rolling:** The installation contractor shall water the turfgrass sod immediately after transplanting to prevent drying. As sodding is completed in any one section, the entire area shall be lightly rolled. It shall then be thoroughly watered to a depth sufficient to ensure the underside of the new sod pad and soil immediately below the pad are thoroughly wet. The general contractor shall be responsible for having adequate water available at the site prior to and during installation.
E. **Acceptance**: Acceptance of the transplanted turfgrass sod shall be on a daily basis, within 12 hours of completion of an area or section, unless otherwise specified.

F. **Disclaimer**: The installation contractor shall not be held liable for damages incurred to the turfgrass sod as a result of de-icing compounds, fertilizers, pesticides or other materials not applied by him or under his supervision, nor for those caused by acts of God or vandalism.

G. **Guarantee**: The installation contractor shall guarantee work covered by this specification to the extent that all transplanted turfgrass sod shall be uniform in color, leaf texture and shoot density and be reasonably free of visible imperfections at acceptance.

H. **General Contractor’s Responsibility**: The general contractor shall be responsible for maintaining the accepted sodded area until the effective date for turfgrass maintenance operations. The effective date shall be specified in a written notice from the general contractor.

H. **Payment**: Specifications of methods of payment, retainer and final payment shall be customary to the industry in this area.
SECTION VI
Specifications For Maintenance of
Transplanted Turfgrass Sod

A. General: The contractor shall furnish all labor, material and equipment required to complete the work described herein, in strict accordance with the drawings and/or terms of the contract.

B. Watering: The general contractor shall supply adequate water to the site. The single-most important factor in the successful rooting of newly installed turfgrass sod is adequate, regular watering. Watering should begin immediately after installation. The amount of water required will vary depending upon season, weather, temperature, wind, slope and turfgrass variety. The general contractor shall designate the party responsible to ensure adequate water supply and application.

1. First Week: The contractor shall provide all labor and arrange for all watering necessary for rooting of the turfgrass sod. Soil on sod pads shall be kept moist at all times. In the absence of adequate rainfall, watering shall be performed daily or as often as necessary during the first week and in sufficient quantities to maintain moist soil to a depth of at least 4 inches (100 mm). Watering should be done during the heat of the day to prevent wilting.

2. Second and Subsequent Weeks: The contractor shall water the turfgrass sod as required to maintain adequate moisture in the upper 4 inches (100 mm) of soil, necessary for the promotion of deep root growth.

B. Mowing: The first mowing shall not be attempted until the turfgrass sod is firmly rooted and securely in place. Not more than 30 percent of the grass leaf shall be removed by the initial or subsequent mowings. Care shall be taken to assure cutting blades are maintained in a sharp condition.

Bluegrass and other cool season grasses shall be maintained between 1.5 and 2.5 inches (40-60 mm), unless otherwise specified.

Stoloniferous grasses shall be maintained between 0.75 and 1.50 inches (20 - 40 mm), unless other specified.

D. Time Limitations: Duration of maintenance responsibilities shall be for 30 days unless otherwise specified.

E. Disclaimer: The contractor shall not be held liable for damages incurred to the turfgrass sod caused by de-icing compounds, fertilizers, pesticides and other materials not applied by him or under his supervision, nor those caused by acts of God or vandalism.

F. Guarantee: The contractor shall guarantee work covered by this specification to the extent that all turfgrass sod shall be uniform in color, leaf texture and shoot density and shall be reasonably free of weeds, diseases and other visible imperfections at acceptance.

G. Payment: Specifications for method of payment, retainer and final payment shall be customary for this industry in this area.
“Guideline Specifications to Turfgrass Sodding” is another valuable publication of TURFGRASS PRODUCERS INTERNATIONAL

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