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USACE / NAVFAC / AFCEC UFGS-32 92 23 (April 2006)  
Change 1 - 08/21  
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Preparing Activity: NAVFAC Replacing without change  
UFGS-02922 (May 2004)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated April 2024

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04/06, CHG 1: 08/21

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SECTION 32 92 23

SODDING

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NOTE: This guide specification covers the requirements for sod.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable item(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

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NOTE: The following information shall be shown on the project drawings:

1. Clearly indicate all areas to be sodded and if more than one type of sod is specified, delineate areas for each type.

2. All draft sod specifications shall be submitted to the cognizant Landscape Architect/Natural Resources Specialist for review to ensure that the specifications are in accordance with environmental conditions peculiar to the project areas.

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PART 1 GENERAL

1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a Reference Identifier (RID) outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C602	(2023) Agricultural Liming Materials
ASTM D4427	(2018) Standard Classification of Peat Samples by Laboratory Testing
ASTM D4972	(2018) Standard Test Methods for pH of Soils

TURFGRASS PRODUCERS INTERNATIONAL (TPI)

TPI GSS	(1995) Guideline Specifications to Turfgrass Sodding
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U.S. DEPARTMENT OF AGRICULTURE (USDA)

DOA SSIR 42	(2022) Kellogg Soil Survey Laboratory Methods Manual, Soil Survey Investigations Report, No. 42, Version 6.0
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1.2 DEFINITIONS

1.2.1 Stand of Turf

100 percent ground cover of the established species.

1.3 RELATED REQUIREMENTS

Section 31 00 00 EARTHWORK, [Section 32 84 24 IRRIGATION SPRINKLER

SYSTEMS], [Section 32 96 00 TRANSPLANTING EXTERIOR PLANTS], [Section 32 92 19 SEEDING], [Section 32 93 00 EXTERIOR PLANTS], and Section 32 05 33 LANDSCAPE ESTABLISHMENT applies to this section for pesticide use and plant establishment requirements, with additions and modifications herein.

#### 1.4 SUBMITTALS

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NOTE: Review Submittal Description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list, and corresponding submittal items in the text, to reflect only the submittals required for the project. The Guide Specification technical editors have classified those items that require Government approval, due to their complexity or criticality, with a "G". Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item if the submittal is sufficiently important or complex in context of the project.

For Army projects, fill in the empty brackets following the "G" classification, with a code of up to three characters to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy and Air Force projects.

The "S" classification indicates submittals required as proof of compliance for sustainability Guiding Principles Validation or Third Party Certification and as described in Section 01 33 00 SUBMITTAL PROCEDURES.

Choose the first bracketed item for Navy and Air Force projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" or "S" classification. Submittals not having a "G" or "S" classification are for information only. When used, a code following the "G" classification identifies the office that will review the submittal for the Government. Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

##### SD-03 Product Data

Fertilizer; G

Include physical characteristics, and recommendations.

##### SD-06 Test Reports

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**NOTE: In states that require certification, adjust  
testing requirements to suit local conditions.**  
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Topsoil composition tests; G  
(reports and recommendations).

#### SD-07 Certificates

Nursery or Sod farm certification for sods; G

Indicate type of sod in accordance with TPI GSS or specified on  
the Standard Specifications for Landscape Consturction by Korea  
Land & Housing Corporation.

### 1.5 DELIVERY, STORAGE, AND HANDLING

#### 1.5.1 Delivery

##### 1.5.1.1 Sod Protection

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**NOTE: If sod is to be delivered in quantity over  
considerable distance, specify trucking in vans  
equipped with temperature control.**  
\*\*\*\*\*

Protect from drying out and from contamination during delivery, on-site  
storage, and handling.

##### 1.5.1.2 Fertilizer, Gypsum, Sulfur, Iron and Lime Delivery

Deliver to the site in original, unopened containers bearing  
manufacturer's chemical analysis, name, trade name, trademark, and  
indication of conformance to state and federal laws. Instead of  
containers, fertilizer, gypsum, sulphur, iron and lime may be furnished in  
bulk with certificate indicating the above information.

#### 1.5.2 Storage

##### 1.5.2.1 Sod Storage

Lightly sprinkle with water, cover with moist burlap, straw, or other  
approved covering; and protect from exposure to wind and direct sunlight  
until planted. Provide covering that will allow air to circulate so that  
internal heat will not develop. Do not store sod longer than 24 hours. Do  
not store directly on concrete or bituminous surfaces.

##### 1.5.2.2 Topsoil

Prior to stockpiling topsoil, treat growing vegetation with application of  
appropriate specified non-selective herbicide. Clear and grub existing  
vegetation three to four weeks prior to stockpiling topsoil.

##### 1.5.2.3 Handling

Do not drop or dump materials from vehicles.

## 1.6 TIME RESTRICTIONS AND PLANTING CONDITIONS

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**NOTE: Check with the local Agriculture County  
Extension Service to determine proper planting  
seasons for species specified.**  
\*\*\*\*\*

### 1.6.1 Restrictions

Do not plant when the ground is frozen, snow covered, muddy, or when air temperature exceeds 32 degrees Celsius.

## 1.7 TIME LIMITATIONS

### 1.7.1 Sod

Place sod a maximum of thirty six hours after initial harvesting, in accordance with TPI GSS as modified herein.

## PART 2 PRODUCTS

### 2.1 SODS

\*\*\*\*\*  
**NOTE: The specific species and varieties used  
should be based on recommendations of the local  
Agriculture County Extension Service Office. Modify  
sod thickness as required for species specified.  
State certified is usually more stringently  
monitored than State approved, and therefore more  
expensive.**  
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#### 2.1.1 Classification

Nursery grown, certified as classified in the TPI GSS or specified on the Standard Specifications for Landscape Construction by Korea Land & Housing Corporation. Machine cut sod at a uniform thickness of 19 mm within a tolerance of 6 mm, excluding top growth and thatch. Each individual sod piece shall be strong enough to support its own weight when lifted by the ends. Broken pads, irregularly shaped pieces, and torn or uneven ends will be rejected. Wood pegs and wire staples for anchorage shall be as recommended by sod supplier.

#### 2.1.2 Purity

Sod species shall be genetically pure, free of weeds, pests, and disease.

#### 2.1.3 Planting Dates

Lay sod from March to June for warm season spring planting and from September to November for cool season fall planting.

#### 2.1.4 Composition

##### 2.1.4.1 Proportion

Grass species must be proportioned as recommended by the supplier or as indicated on drawings.

#### 2.2 TOPSOIL

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NOTE: If topsoil properties are included in another section of Division 31, delete this paragraph and include a cross-reference to the appropriate section. Otherwise, select appropriate paragraphs on topsoil. Check with the local Agriculture County Extension Service Office for soil properties appropriate for the plant materials to be planted. Where suitable topsoil is available within limits of the work area, stripping and stockpiling of topsoil should be included in the applicable section of Division 31 of the specification. If suitable topsoil is not available within the limits of the work area, it should generally be the Contractor's option to either treat the soil of the graded areas with fertilizer and supplements so as to be conducive to turf establishment and maintenance, or to transport topsoil to the project site. Modify pH range for specified turf and geographical requirements.

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##### 2.2.1 On-Site Topsoil

Surface soil stripped and stockpiled on site and modified as necessary to meet the requirements specified for topsoil in paragraph COMPOSITION. When available topsoil shall be existing surface soil stripped and stockpiled on-site in accordance with Section 31 00 00 EARTHWORK.

##### 2.2.2 Off-Site Topsoil

Conform to requirements specified in paragraph COMPOSITION. Additional topsoil shall be furnished by the Contractor .

##### 2.2.3 Composition

Containing from 5 to 10 percent organic matter as determined by the [topsoil composition tests](#) of the Organic Carbon, 6A, Chemical Analysis Method described in [DOA SSIR 42](#). Maximum particle size, [19 mm](#), with maximum 3 percent retained on [6 mm](#) screen. The pH shall be tested in accordance with [ASTM D4972](#). Topsoil shall be free of sticks, stones, roots, and other debris and objectionable materials. Other components shall conform to the following limits:

Silt	7 to 17 percent
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Clay	4 to 12 percent
Sand	70 to 82 percent
pH	5.5 to 7.0
Soluble Salts	600 ppm maximum

## 2.3 SOIL CONDITIONERS

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NOTE: Prior to including these provisions in  
project specifications, perform tests of on-site  
topsoil to determine its suitability and the  
possible need of pH adjusters or soil conditioners.  
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Add conditioners to topsoil as required to bring into compliance with  
"composition" standard for topsoil as specified herein.

### 2.3.1 Lime

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NOTE: Use ASTM C602 calcium carbonate equivalent  
(C.C.E.) as specified in Table 1: for burnt lime,  
C.C.E. shall not be less than 140 percent; for  
hydrated lime, C.C.E. shall not be less than 110  
percent; and for limestone, C.C.E. shall not be less  
than 80 percent.  
\*\*\*\*\*

Commercial grade hydrate or burnt limestone containing a calcium carbonate  
equivalent (C.C.E.) as specified in [ASTM C602](#) of not less than 110 percent  
for hydrate and 140 percent for burnt lime.

### 2.3.2 Aluminum Sulfate

Commercial grade.

### 2.3.3 Sulfur

100 percent elemental

### 2.3.4 Iron

100 percent elemental

### 2.3.5 Peat

Natural product of peat moss derived from a freshwater site and conforming  
to [ASTM D4427](#) or as modified herein. Shred and granulate peat to pass a  
[12.5 mm](#) mesh screen and condition in storage pile for minimum 6 months  
after excavation.

### 2.3.6 Sand

Clean and free of materials harmful to plants.

### 2.3.7 Perlite

Horticultural grade.

### 2.3.8 Composted Derivatives

Ground bark, nitrolized sawdust, humus or other green wood waste material free of stones, sticks, and soil stabilized with nitrogen and having the following properties:

#### 2.3.8.1 Particle Size

Minimum percent by weight passing:

4.75 mm (No. 4) screen	95
2.36 mm (No. 8) screen	80

#### 2.3.8.2 Nitrogen Content

Minimum percent based on dry weight:

Fir Sawdust	0.7
Fir or Pine Bark	1.0

### 2.3.9 Gypsum

Coarsely ground gypsum comprised of calcium sulfate dihydrate 91 percent, calcium 22 percent, sulfur 17 percent; minimum 96 percent passing through 850 micrometers, 100 percent passing thru 970 micrometers screen.

### 2.3.10 Calcined Clay

Calcined clay shall be granular particles produced from montmorillonite clay calcined to a minimum temperature of 650 degrees C. Gradation: A minimum 90 percent shall pass a 2.36 mm (No. 8) sieve; a minimum 99 percent shall be retained on a 0.250 mm (No. 60) sieve; and a maximum 2 percent shall pass a 0.150 mm (No. 100) sieve. Bulk density: A maximum 640 kilogram per cubic meter.

## 2.4 FERTILIZER

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**NOTE: Check with the local Agriculture County  
Extension Service Office for recommended fertilizer  
mixture for local conditions.**  
\*\*\*\*\*

### 2.4.1 Granular Fertilizer

Organic or synthetic, granular controlled release fertilizer containing the following minimum percentages, by weight, of plant food nutrients:

10 percent available nitrogen
3 percent available phosphorus
3 percent available potassium

## 2.5 WATER

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NOTE: When water is Government furnished, locate the source. Recycled or reclaimed irrigation water may be available through a tertiary treatment plant on or off site. It is preferred that this type of water be used for irrigation whenever possible. Check project specific conditions.

Unless otherwise directed, water shall be the responsibility of the Contractor. Water source shall be potable or non-potable. If non-potable edit specification accordingly. Source of water shall be approved by the Contracting Officer and shall be of suitable quality for irrigation, containing no elements toxic to plant life.

Coordinate information presented here with Section  
01 50 00 TEMPORARY CONSTRUCTION FACILITIES AND  
CONTROLS.

\*\*\*\*\*

Source of water shall be approved by Contracting Officer and of suitable quality for irrigation containing no element toxic to plant life.

### PART 3 EXECUTION

#### 3.1 PREPARATION

##### 3.1.1 Extent Of Work

Provide soil preparation (including soil conditioners), fertilizing, and sodding of all newly graded finished earth surfaces, unless indicated otherwise, and at all areas inside or outside the limits of construction that are disturbed by the Contractor's operations.

##### 3.1.2 Soil Preparation

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NOTE: Elevation of subgrade will vary depending upon the needs for additional topsoil, sod, or other treatment.

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Provide 102 mm of off-site topsoil or on-site topsoil to meet indicated finish grade. After areas have been brought to indicated finish grade, incorporate fertilizer, pH adjusters or soil conditioners into soil a minimum depth of 100 mm by disking, harrowing, tilling or other method approved by the Contracting Officer. Remove debris and stones larger than 19 mm in any dimension remaining on the surface after finish grading. Correct irregularities in finish surfaces to eliminate depressions. Protect finished topsoil areas from damage by vehicular or pedestrian traffic.

##### 3.1.2.1 Soil Conditioner Application Rates

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NOTE: Check with the local Agriculture County Extension Service and specify amounts applicable for the project area.

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Apply soil conditioners at rates as determined by laboratory soil analysis of the soils at the job site.

### 3.1.2.2 Fertilizer Application Rates

\*\*\*\*\*  
**NOTE: Check with the local Agriculture County  
Extension Service and specify amounts applicable for  
the project area.**  
\*\*\*\*\*

Apply fertilizer at rates as determined by laboratory soil analysis of the soils at the job site.

## 3.2 SODDING

### 3.2.1 Finished Grade and Topsoil

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**NOTE: Coordinate the placement of topsoil with  
Section 31 00 00 EARTHWORK. Coordinate the topsoil  
requirements with Sections 32 92 19 SEEDING; 32 92 26  
SPRIGGING; and 32 93 00 EXTERIOR PLANTS.**  
\*\*\*\*\*

Prior to the commencement of the sodding operation, the Contractor shall verify that finished grades are as indicated on drawings; the placing of topsoil, smooth grading, and compaction requirements have been completed in accordance with Section 31 00 00 EARTHWORK.

The prepared surface shall be a maximum 25 mm below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. The prepared surface shall be completed with a light raking to remove from the surface debris and stones over a minimum 16 mm in any dimension.

### 3.2.2 Placing

Place sod a maximum of 36 hours after initial harvesting, in accordance with TPI GSS as modified herein.

### 3.2.3 Sodding Slopes and Ditches

For slopes 2:1 and greater, lay sod with long edge perpendicular to the contour. For V-ditches and flat bottomed ditches, lay sod with long edge perpendicular to flow of water. Anchor each piece of sod with wood pegs or wire staples maximum 600 mm on center. On slope areas, start sodding at bottom of the slope.

### 3.2.4 Finishing

After completing sodding, blend edges of sodded area smoothly into surrounding area. Air pockets shall be eliminated and a true and even surface shall be provided. Frayed edges shall be trimmed and holes and missing corners shall be patched with sod.

### 3.2.5 Rolling

Immediately after sodding, firm entire area except for slopes in excess of

3 to 1 with a roller not exceeding 134 kg per m for each foot of roller width.

#### 3.2.6 Watering

Start watering areas sodded as required by daily temperature and wind conditions. Apply water at a rate sufficient to ensure thorough wetting of soil to minimum depth of 150 mm. Run-off, puddling, and wilting shall be prevented. Unless otherwise directed, watering trucks shall not be driven over turf areas. Watering of other adjacent areas or plant material shall be prevented.

#### 3.3 PROTECTION OF TURF AREAS

Immediately after turfing, protect area against traffic and other use.

#### 3.4 RESTORATION

Restore to original condition existing turf areas which have been damaged during turf installation operations. Keep clean at all times at least one paved pedestrian access route and one paved vehicular access route to each building. Clean other paving when work in adjacent areas is complete.

-- End of Section --