

**PART 8
STANDARD SPECIFICATIONS
FOR SITE RESTORATION**

CITY OF ONALASKA, WISCONSIN

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SECTION 801: SITE RESTORATION

801.1 GENERAL

This section describes furnishing, placing, spreading and finishing topsoil from locations the contractor furnishes; preparing seed beds and furnishing and sowing the required seed on slopes, appurtenances, and other areas; furnishing and incorporating fertilizing material in the soil on areas of proposed seeding or proposed sodding; furnishing, placing, and anchoring a mulch cover, usually in connection with seeding; and furnishing and laying live sod on the shoulders, slopes, ditches, lawns, or at other designated locations.

This section also describes removing topsoil from the sites of proposed excavations in amounts and depths available and necessary to cover the work areas. This work also includes reclamation, placing, spreading, and finishing this topsoil.

This section also includes furnishing and sowing temporary seed mixture and furnishing and incorporating agricultural limestone in the soil.

801.2 MATERIALS

801.2.1 TOPSOIL

Topsoil consists of humus bearing soils adapted to the sustenance of plant life and such topsoil shall be neither excessively acid nor excessively alkaline. Topsoil shall not contain excessive amount of sand or sandy loam, which have a tendency to dry out and not hold moisture.

Material used for topsoil shall be pulverized to a diameter of less than ¼ inch.

Material shall be approved by City Engineer prior to application.

801.2.2 SEED

801.2.2.1 GENERAL REQUIREMENTS

Conform to the Wisconsin Statutes and Wisconsin Administrative Code Chapter ATCP 20 regarding noxious weed seed content and labeling.

Use seed within one year of the test date appearing on the label.

Seed mixtures 70, 70A, 75, and 80 contain wild type forbs and grasses. Wild type is defined as seed that is derived directly from native, wild stock, including seed that was wild collected and placed into production or has been harvested directly from native strands.

Seed shall be approved by City Engineer prior to application.

801.2.2.2 PURITY AND GERMINATION

Test seed according to the methods and procedures used for sampling and analyzing seed for purity, germination, and noxious weed seed content specified in the current edition of Rules for Testing Seed, published by the Association of Official Seed Analysts.

801.2.2.3 INOCULATION

Inoculate legume seed (white clover, red clover, ladino clover, alsike clover, alfalfa, empire birdsfoot trefoil, partridge pea, purple prairie clover, Canada tick-trefoil, and lupine) unless it has been pre-inoculated by the vendor. Follow the inoculation instructions that come with the culture purchases. If applying the seed according to method B, treat seeds requiring inoculation with 5 times the amount of inoculant required in the instructions.

Avoid exposure to the culture or inoculated seed to the sunlight, and in no case shall any exposure exceed ½ hour.

801.2.2.4 STORING SEED

Store any seed delivered before use in a manner that protects it from damage by heat, moisture, rodents, or other causes. Discard and replace any previously tested and accepted seed that becomes damaged.

801.2.2.5 SEED MIXTURES

801.2.2.5.1 PERMANENT

Seed mixtures shall, unless specified otherwise, be composed of seeds of the purity, germination and proportions; by weight, as given in the Table of Highway Seed Mixtures and the Table of Native Seed Mixtures

TABLE OF HIGHWAY SEED MIXTURES

SPECIES	PURITY minimum %	GERMINATION minimum %	MIXTURE PROPORTIONS in percent				
			NO. 10	NO. 20	NO. 30	NO. 40	NO. 60
Kentucky Bluegrass	98	85	40	6	10	35	
Red Fescue	97	85	25		30	20	
Hard Fescue	97	85		24	25	20	
Tall Fescue	98	85		40			
Salt Grass	98	85			10		
Redtop	92	85	5				
Timothy	98	90					12
Canada Wild Rye		PLS ⁽¹⁾					10
Perennial Ryegrass	97	90	20	30			
Improved Fine Perennial Ryegrass	96	85			15	25	
Annual Ryegrass	97	90					30
Alsike Clover	97	90					4
Red Clover	98	90					4
White Clover	95	90	10				
Birdsfoot Trefoil	95	80			10		
Japanese Millet	97	85					20
Annual Oats	98	90 ⁽¹⁾					20

⁽¹⁾Substitute winter wheat for annual oats in fall plantings started after September 1.

TABLE OF NATIVE SEED MIXTURES

SPECIES	SPECIES BOTANICAL NAME	PURITY AND GERMINATION minimum %	MIXTURE PROPORTIONS in percent				
			NO. 70	NO. 70A	NO. 75	NO. 80	
FORBS	Canada Anemone	<i>Anemone canadensis</i>	PLS	2			
	Butterflyweed	<i>Asclepias tuberosa</i>	PLS		2		
	New England Aster	<i>Aster novae-angliae</i>	PLS	2	2		
	Partridge-pea	<i>Chamaecrista (Cassia) fasciculata</i>	PLS		2		
	Purple Prairie Clover	<i>Dalea (Petalostemum) purpurea</i>	PLS	2	2	4	
	Canada Tick-trefoil	<i>Desmodium canadense</i>	PLS	2			
	Flowering Spurge	<i>Euphorbia corollata</i>	PLS		2		
	Wild Geranium	<i>Geranium maculatum</i>	PLS	2			
	Western Sunflower	<i>Helianthus occidentalis</i>	PLS	3	2		
	Rough Blazingstar	<i>Liatris aspera</i>	PLS		2		
	Prairie Blazingstar	<i>Liatris pycnostachya</i>	PLS	2			
	Lupine	<i>Lupinus perennis</i>	PLS		3		
	Wild Bergamot	<i>Mondara fistulosa</i>	PLS	2			
	Horse Mint	<i>Mondara punctata</i>	PLS		2		
	Yellow Coneflower	<i>Ratibida pinnata</i>	PLS	2	2		
	Blackeyed Susan	<i>Rudbeckia hirta</i>	PLS			1	
	Showy Goldenrod	<i>Solidago speciosa</i>	PLS	2	2		
	Spiderwort	<i>Tradescantia ohioensis</i>	PLS	2	2		
	Golden Alexanders	<i>Zizia aurea</i>	PLS	2			
GRASSES	Big Bluestem	<i>Andropogon gerardi</i>	PLS	15	15	10	
	Sideoats Grama	<i>Bouteloua curtipendula</i>	PLS	15	20	20	25
	Canada Wildrye	<i>Elymus Canadensis</i>	PLS	15	15	35	23
	Slender Wheatgrass	<i>Elymus trachycaulus</i>	PLS				20
	Junegrass	<i>Koeleria macrantha</i>	PLS		5		
	Annual Ryegrass	<i>Lolium multiflorum</i>	(1)			10	10
	Switchgrass	<i>Panicum virgatum</i>	PLS				10
	Salt Grass	<i>Puccinella distans</i>	(1)				2
	Little Bluestem	<i>Schizachyrium (Andropogon) scoparium</i>	PLS	15	20	10	10
	Indiangrass	<i>Sorghastrum nutans</i>	PLS	15		10	
ALTERNATE FORBS	Sky Blue Aster	<i>Aster azureus</i>	PLS	(2)	(2)		
	White Wild Indigo	<i>Baptisia leucantha</i>	PLS	(2)	(2)		
	Pale Purple Coneflower	<i>Echinacea pallida</i>	PLS	(2)	(2)		
	White Prairie Clover	<i>Petalostemum candidum</i>	PLS	(2)	(2)		
	Stiff Goldenrod	<i>Solidago rigida</i>	PLS	(2)	(2)		
	Hoary Vervain	<i>Verbena stricta</i>	PLS	(2)	(2)		

(1) Provide the minimum purity and germination specified in the table of highway seed mixtures.

(2) The contractor may, if the City Engineer approves, substitute an alternate forb for a required forb that is not available using the same percentage as specified for the required forb. Use a different alternate forb for each unavailable required forb. Provide documentation showing that a required forb is not available before using an alternate.

Use seed of the species and varieties listed below. If no variety is listed, there will be no restriction on the variety furnished, except as follows:

1. Species composed of pure live seed (PLS) shall contain no named or improved varieties. PLS shall be grown in Wisconsin or northern Illinois, northeastern Iowa, or eastern Minnesota. Seed grown from out-of-state must be grown in one of the following counties:

From northern Illinois:

Boone, Bureau, Carroll, Cook, De Kalb, Du Page, Grundy, Henry, Jo Daviess, Kane, Kendall, Lake, La Salle, Lee, McHenry, Ogle, Putnam, Rock Island, Stevenson, Whiteside, Will, or Winnebago

From northeastern Iowa:

Allamakee, Benton, Black Hawk, Bremer, Buchanan, Cedar, Chickasaw, Clayton, Clinton, Delaware, Dubuque, Fayette, Floyd, Howard, Jackson, Johnson, Jones, Linn, Mitchell, Muscatine, Scott, or Winnebago

From eastern Minnesota:

Aitkin, Anoka, Carlton, Carver, Chisago, Dakota, Dodge, Fillmore, Goodhue, Hennepin, Houston, Isanti, Kanabec, La Sueur, Mille Lacs, Mower, Olmsted, Pine, Ramsey, Rice, Scott, Sherburne, Steele, Wabasha, Washington, Winona, or Wright

2. PLS for seed mixtures 70, 70A, 75, and 80 shall be packaged separately by species and clearly labeled with the vendor's name, species common and botanical names, gross weight, percent PLS, year of harvest and any specialized treatments that have been applied to ensure or enhance germination. If PLS is not listed, determine PLS by multiplying the percent germination times the purity.
3. Minimum percent purity for native for species is 90 percent. If a listed species is not available, substitutions may be made with the City Engineer's approval and must be documented.

Mix native species at the project site. Clean and debarbed seeds having awns or excessive hairs before mixing.

SPECIES COMMON NAME	SPECIES BOTANICAL NAME	ACCEPTABLE VARIETES
Kentucky Bluegrass	Poa pratensis	Low Maintenance
Red Fescue	Festuca rubra	Creeping
Hard Fescue	Festuca ovina var. duriuscula	Improved
Tall Fescue	Festuca arundinacea	Improved turf type
Salt Grass	Puccinella distans	Fults
	Puccinella distans	Salty
Redtop	Agrostis alba	
Timothy	Phleum pretense	
Canada Wild Rye ⁽¹⁾	Elymus Canadensis	
Perennial Ryegrass	Lolium perenne	
Perennial Ryegrass	Lolium perenne	Improved Fine
Annual Ryegrass	Lolium multiflorum	
Alsike Clover	Trifolium hybridum	
Red Clover	Trifolium pretense	
White Clover	Trifolium repens	
Birdsfoot Trefoil	Lotus corniculatus	Empire
Japanese Millet	Echinochola crusgalli var. frumentacea	
Annual Oats	Avena sativa	
Alfalfa	Medicago sativa	
Bromegrass	Bromus inermis	
Orchardgrass	Dactylis glomerata	
Ladino Clover	Trifolium repens var. latum	Ladino
Agricultural Rye	Secale cereale	
Winter Wheat	Triticum aestivum	
⁽¹⁾ Pure live seed		

801.2.2.5.2 MIXTURE TYPE

The contractor shall select a seed mixture or mixtures that meet with the City Engineer's approval, and unless specified otherwise in the contract, shall conform to the following:

1. Use seed mixture No. 10 where average loam, heavy clay, or moist soils predominate.
2. Use seed mixture No. 20 where light, dry, well-drained, sandy, or gravelly soils predominate and for all high cut and fill slopes generally exceeding 6-8 feet, except where using No. 70.
3. Use seed mixture No. 10 or No. 20 on all ditches, inslopes, median areas, and low fills, except where using No. 30 or No. 70.
4. Use seed mixture No. 30 for medians and on slopes or ditches generally within 15 feet of the shoulder where a salt-tolerant turf is preferred.
5. Use seed mixture No. 40 in urban or other areas where a lawn type turf is preferred.
6. Use seed mixture No. 60 only on areas, the contract designates or the City Engineer specifies. Use is as a cover seeding for newly graded wet areas or as a nurse crop for specified wetland seed mixtures. The contractor shall not apply it to flooded areas.
7. Use seed mixture Nos. 70 and 70A on slopes and upland areas the contract designates or the City Engineer specifies. Use seed mixture No. 70 on loamy soils and seed mixture No. 70A on sandy soils.
8. Use seed mixture No. 75 where native grasses are desired for erosion control.
9. Use seed mixture No. 80 on inslopes where a salt tolerant seed mix containing native grasses is desired.

801.2.3 FERTILIZERS

801.2.3.1 GENERAL

Use fertilizers for seeding, sodding, or other planting that are standard, commercial, packaged or bulk products, in granular or liquid form conforming to Wisconsin Statutes and the Wisconsin Administrative Code Chapter ATCP 40. Ensure that each container of packaged fertilizer is plainly marked with the analysis of the contents showing minimum percentages of total nitrogen, available phosphoric acid, and soluble potash. If furnishing the fertilizer in bulk, include an invoice in each shipment indicating the minimum percentages of total nitrogen, available phosphoric acid, and soluble potash in the contents.

If using fertilizer with a total of nitrogen, phosphoric acid, and potash greater than 32 percent for type A or 50 percent for type B, apply them at a rate that provides equal nitrogen, phosphoric acid, and potash.

801.2.3.2 TYPE A

Type A fertilizer shall conform to the following minimum requirements:

Nitrogen, not less than 16%

Phosphoric Acid, not less than 6%

Potash, not less than .6%

The total of nitrogen, phosphoric acid, and potash shall equal at least 32 percent.

Total nitrogen shall at least equal the sum of the phosphoric acid and soluble potash.

801.2.3.3 TYPE B

Type B fertilizer shall conform to the following minimum requirements:

Nitrogen, not less than 16%

Phosphoric Acid, not less than 6%

Potash, not less than 24%

The total of nitrogen, phosphoric acid, and potash shall equal at least 50 percent.

801.2.3.4 AGRICULTURAL LIMESTONE

Conform to chapter 94.66 of the Wisconsin Statutes and of the Wisconsin Administrative Code Chapter ATCP 44. Furnish limestone with a neutralizing index of not less than 40 or more than 109.

Before using, furnish a statement to the City Engineer indicating the index zone or grade of the limestone for each deposit.

801.2.4 MULCHING

Mulching material consists of straw or hay in an air-dry condition, wood excelsior fiber, wood chips, or other suitable material of a similar nature that the City Engineer approves, and is substantially free of noxious weed seeds and objectionable foreign matter.

If using tackifier, the City must prequalify before use. Select tackifiers from the Wisconsin Department of Transportation's erosion control Product Acceptability List (PAL).

801.2.5 SOD

The sod shall consist of a dense, well-rooted growth of permanent and desirable grasses, indigenous to the City of Onalaska, that is practically free from weeds or undesirable grasses. When cutting the sod, the grass should be approximately 2 inches long. If longer, cut the grass to approximately this length and rake the sod free of debris.

Cut the sod in uniform commercial size strips.

Make the sod thickness as uniform as possible, approximately $\frac{3}{4}$ inch or more, depending on the nature of the sod, so that practically all of the dense root system is retained, but exposed, in the sod strip and so that handling the sod causes no undue tearing or breaking.

If the sod is in a dry condition such that cutting it causes crumbling or breaking, the contractor shall, at least 12 hours before cutting, apply water to it in sufficient quantities to provide a well-moistened sod throughout the depth it is cut.

Sod provided under the Sod bid item shall have a lush appearance, be dense, have a uniform texture, and be bright in color throughout. The sod shall not contain blade widths of $\frac{1}{4}$ inch or greater. Provide a weed free sod that contains no more than $\frac{3}{8}$ inch of thatch over the base soil. The sod shall consist of a blend or mix of at least 4 fine-leaved turf grasses. At least $\frac{2}{3}$ of the grasses by weight, as determined by initial seeding proportions, consists of improved/elite type Kentucky bluegrass varieties.

801.2.6 WATER

When watering sodded areas, use clean water, free of impurities or substances that might injure the sod.

801.3 CONSTRUCTION

801.3.1 TOPSOIL

801.3.1.1 PREPARING SURFACE FOR TOPSOIL

Undercut or underfill all areas designated to receive topsoil to a degree that if covered to the required depth with topsoil the finished work conforms to the required lines, grades, slopes and cross sections the plans and drawings show.

801.3.1.2 PROCESSING TOPSOIL OR SALVAGED

Mow topsoil procurement areas to a height of approximately 6 inches. Remove litter such as brush, rock, and other material that will interfere with subsequent vegetation establishment.

Strip of the humus-bearing soil. Take care to minimize removing the underlying sterile soil. Then stockpile the topsoil on the right-of-way or place it directly on the designated areas.

Under the Salvaged Topsoil bid item, remove the topsoil from excavation areas and the roadway foundation up to the quantity necessary to cover the slopes for bid items of Salvaged Topsoil and Topsoil. Salvage topsoil from embankment areas outside the roadway foundation only if that additional material is required to cover the slopes.

Use Salvaged Topsoil in excess of the contract quantity to replace contract quantities of Topsoil. Utilize excess topsoil on the project or dispose of as required.

801.3.1.3 PLACING

After preparing and finishing the areas designated for topsoil to the required lines, grades, slopes and cross section, place and spread the topsoil to a uniform depth as the plans show or the contract requires. If no depth is shown, place and spread the topsoil to a minimum depth of 6 inches.

Break down all clods and lumps using the appropriate equipment to provide a uniformly textured soil.

Ensure 100 percent of the topsoil passes a one inch sieve and at least 90 percent passes the No. 10 sieve.

Remove rocks, twigs, foreign material, and clods that cannot be broken down. Dress the entire surface to present a uniform appearance.

If light sandy soils are covered with heavier clay bearing loam topsoil, then mix or blend the 2 types of soils to a more or less homogeneous mixture by using the appropriate equipment.

801.3.2 SEED

801.3.2.1 GENERAL

If not protecting with a mulch cover, perform seeding, except Nos. 60, 70 and 70A mixtures at times of the year when temperature and moisture conditions are suitable for seeding, except during midsummer.

Perform seeding, except Nos. 60, 70 and 70A mixtures, in conjunction with mulching as specified at any time the City Engineer allows.

The contractor may perform seeding of Nos. 60, 70 and 70A mixtures at any time soil conditions are suitable, except between June 15 and October 15, unless the City Engineer allows otherwise.

The contractor may perform seeding with the selected seed mixture, sown at the specific rate.

801.3.2.2 PREPARATION OF SEED BED

Complete grading, shouldering, topsoiling, and fertilizing, if part of the work under contract, before permanent seeding, except the contractor may place the fertilizer and seed mixture in one operation if using equipment designed for the purpose.

Just before seeding, work the area being seeded with discs, harrows, or other appropriate equipment to obtain a reasonably even and loose seedbed. Place topsoil as specified.

801.3.2.3 SOWING

Select the method of sowing from either method A, method B, method C or an appropriate combination, of methods A, B and C. Obtain the City Engineer's approval for the sowing method and specific procedures used for each seed mixture used before sowing that mixture.

801.3.2.3.1 METHOD A

Sow the selected seed mixture using equipment adapted to the purpose, or by scattering it uniformly over the areas to be seeded. Lightly rake or drag to cover the seed with approximately ¼ inch of soil. After seeding, lightly roll or compact the areas using suitable equipment, preferably the cultipacker type, when the City Engineer judges the seedbed too loose, or if the seedbed contains clods that might reduce seed germination. The contractor shall not roll slopes steep than 3:1.

If scattering seed by hand, perform this work with satisfactory hand seeders and only when the air is calm enough to prevent seeds from blowing away.

801.3.2.3.2 METHOD B

Sow or spread the seed upon the prepared bed using a stream or spray of water under pressure and operated from an engineer-approved machine designed for that purpose. Place the selected seed mixture and water into a tank, provided within the machine, in sufficient quantities that when spraying the seed on a given area it is uniformly spread at the required application rate. During this process, keep the tank contents stirred or agitated to provide uniform distribution. Spread the tank contents within one hour after adding the seed to the tank. The City Engineer will reject seed that remains mixed with the water for longer than one hour. The City Engineer will not require dragging or rolling.

801.3.2.3.3 METHOD C

For spring seeding of seed mixtures 70 and 70A into existing ground cover, mow existing vegetation to 4 inches or less in height 2 to 4 weeks before seeding. Ten to 14 days after mowing, spray with vegetation control herbicide.

For fall seeding of seed mixtures 70 and 70A into existing ground cover, mow existing vegetation to 4 inches or less in height 4 to 6 weeks before seeding. Ten to 14 days after mowing, spray with vegetation control herbicide. Retreat with vegetation control herbicide 10 to 14 days after initial application if live vegetation persists.

Seed with a rangeland type drill with one or more seed boxes that can be calibrated independently to deliver different sized seeds uniformly at the required rate and equipped with a rear-mounted press wheel for each seed drop tube. If seeding into existing vegetation or thatch, use a rangeland type drill equipped with a no-till attachment that can cut through the vegetation or thatch in front of the V disc and seed drop tube. If the configuration of the area to be seeded allows, apply seed at ½ the specified seed rate and apply the second ½ in a perpendicular direction.

801.3.2.3.4 SEEDING RATES

Use the following sowing rate for seeds in pounds per 1000 square feet of area:

- Seed mixture No. 10 at 1.5 pounds
- Seed mixture No. 20 at 3 pounds
- Seed mixture No. 30 at 2 pounds
- Seed mixture No. 40 at 2 pounds
- Seed mixture No. 60 at an equivalent seeding rate of 1.5 pounds⁽¹⁾
- Seed mixture No. 70 or 70A at 0.4 pounds
- Seed mixture No. 75 at an equivalent seeding rate of 0.7 pounds⁽¹⁾
- Seed mixture No. 80 at an equivalent seeding rate of 0.8 pounds⁽¹⁾
- Temporary seeding at 3 pounds

⁽¹⁾Determine the actual seeding rate by multiplying the equivalent seeding rate by the sum of the unadjusted and adjusted percentages of the various species in the seed mixtures as sown.

The unadjusted percentage equals the minimum percent of purity and germination specified in the table of seed mixtures for the applicable species.

Obtain the adjusted percentage for each of the PLS species by dividing the specified percentage of the species by the product of the percent of purity and the percent of germination for each of the PLS species as delivered.

801.3.2.3.5 ESTABLISHMENT PERIOD FOR NATIVE SEEDING

During the growing season after planting of seed mixture 70 or 70A, mow all seeded areas twice as directed by the City Engineer. Mow vegetation back to 6 inches high when it has reached a height of at least 12 inches.

During the growing season after planting seed mixture 70 or 70A, eradicate the following species from the seeded areas as soon as they become evident:

SPECIES COMMON NAME	SPECIES BOTANICAL NAME
Musk thistle	<i>Carduus nutans</i>
Spotted knapweed	<i>Centaurea maculosa</i>
Canada thistle	<i>Cirsium arvense</i>
Bull thistle	<i>Cirsium vulgare</i>
Field bindweed	<i>Convolvulus arvensis</i>
Leafy spurge	<i>Euphorbia esula</i>
Sweetclover	<i>Melilotus species</i>
Wild parsnip	<i>Pastinaca sativa</i>

Eradicate by hand pulling or by applying a vegetation control herbicide to individual plants.

801.3.3 FERTILIZER

801.3.3.1 GENERAL

Uniformly apply the fertilizer selected for the seeding areas and incorporate into the soil by light discing or harrowing. If applying granular fertilizer, ensure it is well pulverized and free from lumps.

If incorporating fertilizer into topsoiled areas, the contractor may apply it just before, and in conjunction with, final discing or harrowing, or if hand manipulating the topsoil, apply it just before final raking and leveling.

If placing fertilizer on surfaces with no topsoil, prepare the soil by discing or harrowing to at least 6 inches deep and then incorporate the fertilizer as specified above.

If sowing seeding areas by pressure sprayer, then fertilize by placing the required amount of fertilizer in the tank, mixing with the water and the seed, agitating constantly and apply during the seeding operation. If applying fertilizer this way then the City of Onalaska will not require discing and harrowing after placement.

If fertilizing areas to receive sod, spread the fertilizer uniformly over the soil before sodding at the rate specified below, and then work the fertilizer into the soil while preparing the earth bed.

If applying fertilizer for work specified, then apply the fertilizer as specified in that section.

801.3.3.2 TYPE A

Apply fertilizer containing 32 percent total of nitrogen, phosphoric acid, and potash at 7 pounds per 1000 square feet of area, unless the contract specifies otherwise. For type A fertilizer that contains a different percentage of components, determine the new application rate by multiplying the specified rate by a dimensionless conversion factor determined as follows:

$$\text{Conversion factor} = 32 / \text{New Percentage of Components}$$

801.3.3.3 TYPE B

Apply fertilizer containing 50 percent total of nitrogen, phosphoric acid, and otherwise. For type B fertilizer that contains a different percentage of components, determine the new application rate by multiplying the specified rate by a dimensionless conversion factor determined as follows:

$$\text{Conversion factor} = 50 / \text{New Percentage of Components}$$

801.3.4 AGRICULTURAL LIMESTONE TREATMENT

Unless the contract specifies otherwise, spread the agricultural limestone over the contract-designated areas at a uniform rate, measured in pounds per 100 square feet, as follows:

INDEX ZONES	40-49	50-59	60-69	70-79	80-89	90-99	100-109
RATE	140(70)	120(60)	100(50)	90(45)	80(40)	70(35)	60(30)

To conveniently check the required application rate, the contractor may measure materials used on a volumetric basis, providing the conversion from weight to volume is determined from representative samples of materials used.

Incorporate the agricultural limestone with the required fertilizers into the soils in the designated areas. The pertinent construction requirements applicable to fertilizers shall apply to those materials also.

801.3.5 MULCHING

801.3.5.1 GENERAL

Unless directed otherwise, place the mulch on the specified area within 2 days after completing the seeding.

The contractor shall not perform mulching during excessively high winds that might preclude proper mulch placement.

Place the mulch loosely or open enough to allow some sunlight to penetrate and air to slowly circulate, but thick enough to shade the ground, conserve soil moisture, and prevent or reduce erosion.

Maintain the mulched areas and repair all areas damaged by wind, erosion, traffic, fire or other causes before final or partial acceptance of the work.

801.3.5.2 PLACING

The contractor may perform the work as specified in one of the following ways: Method A, Method B, or Method C, or a combination of the 3, unless a specific method is specified in the contract.

801.3.5.3 METHOD A, NETTING

Uniformly spread the mulching material over the designated areas to a loose depth of ½ to 1 ½ inches. Use a specific rate of application; dependent on the character of the material, that results in a cover conforming to the requirements specified above. Loosen or make fluffy the mulch material from compacted bales before spreading in place. Unless directed otherwise, begin mulching at the top of the slopes and proceed downward.

Securely anchor straw or hay mulch by using engineer-approved netting anchored to the ground with pegs or staples to prevent it from floating as the vegetation grows. Instead of this anchorage, the contractor may secure mulch by heavy biodegradable twine fastened by pegs or staples for form a grid with 6 to 10 feet spacing.

The contractor may use City-approved erosion control mats, listed in the PAL, instead of separately applying mulch and netting.

801.3.5.4 METHOD B, TACKIFIER

Treat straw or hay with a tackifier, blow from a machine, and uniformly deposit over designated areas in one operation. Place straw or hay uniformly over the area ½ to 1 inch deep, using ½ to 3 tons of mulch per acre. Mix and place tackifier according to the PAL. Within the above limits, the City Engineer will determine, on the job, the application rate of the mulch and the tackifier, and the City Engineer may vary the rates during mulching to produce the desired results. Use an engineer-approved machine to place the mulch that blows or ejects by constant air stream a controlled amount of mulch and applies a spray of tackifier to partially coat the straw or hay, sufficient to hold together and keep in place the deposited straw or hay. The contractor may apply the tackifier as an overspray in a separate operation after placing the straw or hay.

Apply wood fiber, wood chips, or similar material with engineer-approved blowing machines, or other engineer-approved methods, that place a controlled amount of mulch uniformly over the area ½ to 1 ½ inches deep. Treat areas receiving wood chip mulch, with one pound of available nitrogen per 1000 square feet before or after applying the chips.

Throughout the process, feed the mulch material into the blowing machine to produce a constant and uniform ejection from the discharge spout, and operate in a position to produce mulch in a uniform depth and coverage.

801.3.5.5 METHOD C, CRIMPING

Spread the straw or hay mulch uniformly over the designated areas to a loose depth of ½ to 1 ½ inches, using 1 ½ to 3 tons of mulch per acre, by blowing from a machine, as specified in Method B, or by other engineer-approved methods.

Immediately after spreading, anchor the mulch in the soil by using a mulch crimper consisting of a series of dull, flat discs with notched edges. Space the 20 inch diameter discs at about 8 inch centers. Equip the crimper with a ballast compartment to permit adjusting the weight for depth control.

Impress the mulch into the soil 1 ½ to 2 ½ inches deep in one pass of the crimper. The City will not allow mulch crimpers to operate on slopes so steep that damage to the mulch, seedbed, or soil occurs. Anchor the mulch on these areas by one of the following methods: Method A or Method B. Equip and operate tractors to minimize disturbing or displacing the soil. This process may require more than one pass of the crimper to ensure adequate anchoring of the mulch.

The contractor shall not use Method C if it cannot impress the mulch to a minimum of 1 ½ inch.

801.3.6 SODDING

801.3.6.1 PREPARING THE EARTH BED

Before sodding, construct the proposed area to the required cross section and contour, and round the tops and bottoms of the slopes to a minimum of 4-foot radius curve. Ensure that the sodded areas are free from stones, roots, or other undesirable foreign material. Loosen the soil on the sodded area to at least one inch deep and bring it to a reasonably fine granular texture by equipment or hand methods adapted to the purpose.

801.3.6.2 PLACING THE SOD

Moisten the earth bed that the sod is being placed on to the loosened depth, if not naturally sufficiently moist. Do not place frozen sod, nor place sod on frozen soil. Place the sod on a bed within approximately 24 hours after cutting. Lay the sod so that the joints at abutting ends of sod strips are not continuous. Lay each sod strip to abut snugly against the previously laid strip.

Lay sod in strips of commercial size where possible. Do not lay partial-size strips of sod smaller than 18 inches by 24 inches. When laying the sod, roll it or firmly but lightly tamp with suitable wooden or metal tampers to set or press the sod into the underlying soil.

At points where water will flow over a sodded area, turn the upper edges of the sod strips into the soil below the adjacent area and place a layer of earth over this juncture. Compact the earth thoroughly so surface water flows over the upper edge of the sod.

At the limits of sodded areas, if possible, place the end strips to achieve a broken line, and turn the ends of the strips in and treat as described above.

Sod shall not be placed until all concrete work has been completed.

801.3.6.3 STAKING AND CLEANUP

On all slopes steeper than 4 units horizontal to 1 unit vertical, stake the sod, or peg with pieces of plasterer's lath or equivalent stakes, at least 6 inches long, spaced as the soil nature and slope steepness dictate from 18 to 36 inches apart along the length of the sod strip. If possible, place stakes near the top edge of the sod strip and drive plumb through the sod. After installing, stakes should hold the sod firmly in place and present no danger to pedestrians or mowing crews.

Stake all sod placed in ditches, flumes, or other drainage components, where a concentrated flow of water is expected regardless of the slope. After completing the surface staking clear the surface of loose sod, excess soil, or other foreign material.

801.3.6.4 FERTILIZER

Sod shall be fertilized by contractor unless specified otherwise.

801.3.6.5 WATERING

Furnish and apply water to sodded areas. After staking and cleanup, moisten the sod thoroughly by sprinkling with water. Keep all sodded areas thoroughly moist by watering or sprinkling if rainfall is not sufficient enough to achieve sod rooting to the earth bed. Water for 30 days after placement or as the City Engineer directs. Apply water in a manner to preclude washing or erosion.

801.4 MEASUREMENT

801.4.1 TOPSOIL

The City will measure Topsoil acceptably completed by the cubic yard truckload. Topsoil shall be hauled in place under the acknowledgement of the inspector. Contractor must secure inspector's signature on load slips each day topsoil is hauled verifying total daily yardage.

801.4.2 SEED, FERTILIZE & MULCH

The City will measure the area of Seed, Fertilize & Mulch bid items by the acre.

801.4.3 SODDING

The City will measure the Sodding bid items by the square yard acceptably completed.

801.5 PAYMENT

801.5.1 TOPSOIL

Payment for topsoil is full compensation for providing, excavating, loading, hauling, and placing this material; and for undercutting excavations, or underfilling embankments necessary to receive this material.

801.5.2 SEED, FERTILIZE & MULCH

Payment for the Seed, Fertilize & Mulch bid item is full compensation for providing, handling and storing all seed; for providing the required culture and inoculating seed as specified; and for preparing the seed bed, sowing, covering and firming the seed. Payment shall also be full compensation for providing, handling, and placement of fertilizer and mulch over the same areas seeded.

801.5.3 SODDING

Payment for Sodding is full compensation for preparing the earth bed; and for furnishing, placing, staking, and rolling the sod. Payment also includes watering and fertilizing. No payment shall be made if within 60 days the sod washes away.

END OF SECTION