

SECTION 7200 – SEEDING

7201 SCOPE. This section covers the furnishings of all labor, equipment, tools and materials, and the performance of all work for seeding, sodding and landscaping as designated on the contract drawings.

7202 GENERAL. The seeding work shall consist of furnishing and drilling in or sowing seed by an experienced seeding contractor having approved equipment manufactured expressly for the purpose, such as a seed drill with fertilizer attachment, mulch chopper and blower for the application of hay or straw mulch, mulch puncher or straight serrated disc for punching mulch into soil and a cultipacker that may be used for final compaction.

For public improvement projects seeding shall be required at all locations shown on the plans and for all grass covered areas that are disturbed by construction operations, either by grading, parking of equipment, temporary roads, or any other operation that has destroyed the existing grasses of the original site, and that is not designated on the drawings to be replaced with sod.

For all other types of construction, including that work done under a work within right-of-way permit, seeding shall be required where areas are disturbed by construction within the right-of-way in established yards or as directed by the Engineer.

7203 MATERIAL.

Seed shall be the kind and mixture specified herein. Seed shall be free of prohibited weed seeds and shall not have more than one (1%) percent of noxious weed seeds. Seed shall be delivered to the site in convenient containers, each fully labeled, bearing the name, or trademark and a warranty of the producer and a certificate of the percentage of the purity and germination of each kind of seed specified. The tags shall be made available to the Engineer for filing.

A. TEMPORARY SEEDING The establishment of fast-growing annual vegetation to provide economical erosion control for up to twelve (12) months and reduce the amount of sediment moving off the site. Annual plants, which sprout rapidly and survive for only one (1) growing season are suitable for establishing temporary vegetative cover. The Engineer may require mowing of temporary vegetation.

This practice applies where short-lived vegetation can be established before final grading or in a season not suitable for permanent seeding. It helps reduce costly maintenance operations on other erosion control systems such as sediment basin clean-out. Temporary or permanent

seeding is necessary to protect earthen structures such as dikes, diversions, and the dams of sediment basins.

* Species	Seeding Rate		Plant Characteristics
	lbs. per Acre	Lbs. per 1,000 ft.2	
Oats	80 lbs	2 lbs.	Not cold tolerant, height up to 2 feet
Cereals: Rye/Wheat	90 / 120	2.0 / 2.5	Cold tolerant, height up to 3 feet, low pH tolerant
Milllets, Sudangrass	45 / 60	1.0 / 1.5	Warm season annual, aggressive growth, height up to 5 feet
Annual Ryegrass	75	2	May be added to mix, not heat tolerant, height up to 16 inches
Annual Lespedeza** Plus Tall Fescue	15 plus 45	0.5 plus 1.0	Warm season annual legume, makes own nitrogen, tolerates low pH

If site may not be developed for more than one year consider using permanent species.

** If there is any possibility that the seeding will be required to control erosion for more than one year, then consider the addition of fescue or another permanent species as part of a mixture when seeding.

B. PERMANENT SEEDING The establishment of perennial vegetation on disturbed areas for periods longer than twelve (12) months. Permanent vegetation provides economical long-term erosion control and helps prevent sediment from leaving the site.

This practice is used when vegetation is desired to permanently stabilize the soil. It is necessary to protect earthen structures such as dikes, channels, and embankments. Particular care is required to establish a good, thick cover of permanent grass.

Where seeding is required in areas of established yards, shoulders and slopes in street right-of-way, and any other areas where a high-quality seeding is deemed necessary, the seed mixture will be as follows:

Alta Fescue or Kentucky 31 Fescue	400lbs/per acre
Kentucky Blue Grass	100lbs/per acre
Rye Grass(Lolium Perenne or L.Multiflorum)	<u>100lbs/per acre</u>
Total Application	600lbs/per acre

Where seeding is required in vegetation-covered medians, the seed mixture will be as follows:

Alta Fescue or Kentucky 31 Fescue	350lbs/per acre
Kentucky Blue Grass	50lbs/per acre
Rye Grass(Lolium Perenne or L.Multiflorum)	<u>50lbs/per acre</u>
Total Application	450lbs/per acre

Nurse crops such as wheat, rye, and oats are sometimes used in a seeding mixture. These winter annuals can reduce weeds, control erosion and provide winter protection to young seedlings. Nurse crops should be planted about one (1) inch deep (however, the nurse seed can be mixed with the permanent seed mix and planted shallower.) Most permanent grasses and legumes are sown one fourth (¼) inch deep. Permanent seeding should not be planted deeper than one fourth (¼) to one half (½) inch.

Where seeding is required in areas off street right-of-way that are not maintained periodically, the seed mixture will be as follows:

NATIVE GRASS SEED BLEND

SCIENTIFIC	COMMON NAME	GERMINATION MINIMUM %	#PLS/ACRE
ANDROPOGON GERARDI	BIG BLUESTEM V. "KAW"	80	5.00
BOUTELOUA CURTPENDULA	SIDEOATS GRAMA v. "EL RENO"	75	3.00
BOUTOE DACTYLOIDES	BUFFALO GRASS	80	3.50
PANICUM VIRGATUM	SWITCHGRASS V. "BLACKWELL"	85	4.00
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM V. "ALDOUS"	75	7.20
SORCHASTRUM NUTANS	INDIANGRASS V. "OSAGE"	85	3.00
AMORPHA CANESCENS	LEADPLANT AMORPHA	50	0.40
CASSIA FASCICULATA	PARTRIDGE PEA	50	0.18
DALEA PURPUREA	PURPLE PRAIRE CLOVER	50	0.32
ECHINACEA PURPUREA	PURPLE CONE FLOWER	50	1.20
HELIANTHUS ANNUS	COMMON SUNFLOWER	50	0.06
HELIANTHUS MAXIMILANII	MAXIMILIAN SUNFLOWER	50	0.32

LIATRIS PYCHNOSTACHYA	BLASINGSTAR	50	0.32
RHUS AROMATICA	FRAGRANT SUMAC	50	0.06
RUDBECKIA	BLACK-EYED SUSAN	85	0.15
TRITICUM AESTIVUM	REGREEN STERILE WHEAT	85	23.00
TOTAL SEED			51.73

C. SOD. Sod may be required, in lieu of seeding, if indicated on the plans. The sod shall be of the same type as removed or damaged and shall be of the best grade. If type is not indicated or unknown, sod shall be Kentucky Blue Grass. The sod shall contain a growth of not more than ten (10%) percent of other grasses and clovers, shall be free from all prohibited and noxious weeds, and shall be three-fourths (3/4") inch to one and one-fourth (1-1/4) inch; each strip containing at least one (1) square yard. Sod shall be cut in strips not less than twelve (12) inches wide.

D. FERTILIZER. Commercial fertilizer for seeded areas shall be inorganic and contain twelve (12%) percent (12% by weight) Nitrogen, twelve (12%) percent (12% by weight) phosphoric acid, and twelve (12%) percent (12% by weight) potash.

It shall be uniform in composition, free flowing, and delivered to the site in standard size bags, showing weight, analysis, and name of manufacturer. It shall be stored until use in a weatherproof storage place in such a manner that it will be kept dry and its effectiveness will not be impaired.

E. MULCH. Mulch for application to seedbed areas shall include wheat straw, oat straw, smooth brome grass hay, Sudan grass hay or prairie hay. Prairie hay shall consist chiefly of bluestem grasses, switch grass, Indian grass and other desirable native perennial grasses. Mulch shall be free of prohibited and noxious weed seeds.

7204 INSTALLATION

A. TIME OF SEEDING . Seeding and fertilizing shall be performed between August 15 and October 15 for fall planting and between February 15 and April 30 for spring planting, unless otherwise approved by the Engineer. Seeding and fertilizing shall not be done during periods of such severe drought, high winds, or excessive moisture, as determined by the Engineer, that satisfactory results are not likely to be obtained.

Native grass seeding shall be performed between November 15 and June 1 unless otherwise acceptable to the Engineer.

Any seeding to be performed during periods other than those previously designated will require a written request to extend the permissible period for performing such work. Said request shall explain the reason for the variance and shall include a guarantee (by the general Contractor) of satisfactory results by the end of the first four (4) weeks of the following growing season as previously defined, or the necessary re-seeding work performed at that time. The request shall be initiated by the General Contractor and directed to the Engineer for consideration for approval.

- B. APPLICATION OF FERTILIZER. Before tilling of the soil for seeded areas, the commercial fertilizer of the type specified shall be uniformly distributed over the entire site at the rate of 600 pounds per acre (equivalent to seven lbs. per 500 square feet), and incorporated into the soil to a depth of at least two (2) inches by discing or harrowing methods or with a fertilizer drill. The fertilizer may be applied with the seeding operation only if a seed drill with a fertilizer attachment is used.

The use of fertilizer shall not be allowed for native grass seed.

- C. PREPARATION OF THE SEEDBED. The area to be seeded shall be thoroughly tilled to a depth of at least three (3") inches by discing, harrowing or other approved methods until the soil is well pulverized. After completion of the tilling operation, the surface shall be cleared of all stones, stumps, or other objects larger than one and half (1-1/2) inches in thickness or diameter, and of roots, wire, grade stakes, and other objects that might be a hindrance to maintenance operations. Areas tilled shall then be brought to the desired line and grade and maintained until seeding and mulching is complete to ensure a smooth area with no gullies or depressions.

Any objectionable undulations or irregularities in the surface resulting from tillage or other operations shall be removed before planting operations are begun. Seedbed preparation shall be performed only during periods when satisfactory results are likely to be obtained. When results are not satisfactory because of drought, excessive moisture or other causes, the work shall be stopped until such conditions have been corrected to the satisfaction of the Engineer.

If indicated on the drawings or specified in the special provisions, apply ground agricultural limestone unless a soil test shows a pH of six (6.0) or greater. If a soil test or plan is not available, use two (2) tons of

ground agricultural lime per acre. Incorporate lime into the top three (3) to six (6) inches of soil.

- D. PLACEMENT OF SEED. Seeding may be accomplished by means of approved mechanical power-drawn drills followed by packer wheels, or by broadcast-type seeders or hydraulic type seeders in small areas not accessible to machine methods, or as approved by the city Engineer.

Mechanical power-drawn drills shall have depth bands set to maintain a planting depth of at least one-quarter (1/4") inch but not to exceed one-half (1/2") inch. All seed sown by broadcast-type seeders shall be "raked in" or otherwise covered with soil to a depth of at least one-quarter inch and rolled to obtain a firm seed bed. Water shall be applied when necessary. Hydraulic seeding equipment shall include a pump capable of being operated at one hundred (100) gallons per minute and at one hundred (100) pounds per square inch pressure, unless otherwise directed. The equipment shall have an acceptable gauge and a nozzle adaptable to hydraulic seeding requirements. Storage tanks shall have a means of agitation and a means of estimation of the volume used, or remaining in the tank.

Seed shall not be drilled or sown during windy weather or when the ground is frozen or otherwise untilable. When a seed drill is used, it shall be set to space the rows not more than four (4") inches apart.

- E. MULCHING. Straw or hay mulch shall be applied uniformly to seeded areas at the rate of not less than two (2) tons per acre. Baled straw or hay shall be broken up and loosened sufficiently before being fed into the blower hopper to avoid the placing of matted or unbroken clumps.

The use of wet straw or hay is prohibited.

Mulching shall be performed within twenty-four (24) hours after seeding, but not be done during windy or rainy weather or when such weather is imminent. Mulching shall be started at the windward side of relatively flat areas, or at the upper part of steep slopes and shall continue uniformly until each area is covered.

The mulching material shall be disced or punched into the soil so that it is partially covered. Several passes may be required, if a straight disc is used, in order to mix the mulching material with the topsoil sufficiently to ensure protection from erosion by either wind or water. The mulch tilling operation shall be performed parallel to the ground contours.

- F. MAINTENANCE. All seeded areas shall be protected against damage by vehicle and pedestrian traffic by the use of barriers and appropriate

warning signs. If at any time before completion and acceptance of the seeding work any portion of the seeded area becomes gullied or otherwise damaged, filling shall repair such damaged areas with soil to original grade, re-seeding and re-mulching. All costs of repair work shall be borne by the Contractor.

The Contractor shall be responsible for all erosion control methods stated in the plans as part of the storm water pollution plan. The Contractor is responsible for maintaining the methods and may be required to install additional items at the discretion of the Engineer