SECTION 64 – SEEDING (FAA T-901 MODIFIED)

64-1 GENERAL

The Contractor shall perform all work in accordance with the Standard Specifications, except as specified otherwise in the FAA Specifications, Item T-901, Seeding, as modified herein and as shown on the plans. Seeding shall be applied using the wet method (Hydroseeding) as described herein. Dry method application will not be allowed.

ITEM T-901 – SEEDING

DESCRIPTION

901-1.1 This item shall consist of soil preparation, seeding, and fertilizing the areas shown on the Plans or as directed by the Engineer in accordance with these specifications.

MATERIALS

901-2.1 SEED. The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Fed. Spec. JJJ-S-181.

Seed shall be furnished separately or in mixtures in standard containers with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the Engineer duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within 6 months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed.

Seed shall be spread in a slurry composed of commercial Seed, Fertilizer, Wood Fiber/Mulch, and a Binder/Tackifier.

Fiber/Mulch shall comply with Section 212-1.2.4 of the Standard Specifications for Type 1 Organic Mulch. Binder/Tackifier shall be a commercially prepared material specifically manufactured as an emulsifying agent for hydroseeding installation. Slurry components shall be combined and applied at the following rates:

Botanical Name (Common Name)	Percent Germination (Minimum)	Pounds Per Acre (Slope Measurement)

Sheep Fescue (Festuca Ovina)	80	25# Live Seed
Zorro Annual Fescue (Festuca Megalura Zorro)	80	25# Live Seed
Lotus scoparious (Deerweed)	40	4.0# Live Seed
Trifolium wildenovii (Tom Cat Clover)	45	3.6# Live Seed
Wood Fiber / Mulch	N/A	1,500#
Binder / Tackifier	N/A	100#
Vulpia microstachys (Small Sixweeks grass) or *Vulpia Myuros (Rattail Sixweeks grass)*	N/A	35.0
Eschscholzia Californica (California Poppy)	N/A	8.0

Seeding shall be performed during the period between November and April inclusive, unless otherwise approved by the Engineer.

901-2.2 FERTILIZER. Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-soluble potash. They shall be applied at the rate and to the depth specified herein, and shall meet the requirements of Fed. Spec. O-F-241 and applicable state laws. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

The fertilizers may be supplied in one of the following forms:

a. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;
b. A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or
c. A granular or pellet form suitable for application by blower equipment.
Fertilizers shall be 0 percent nitrogen, 36 percent phosphoric acid, and 19 percent water soluble potash commercial fertilizer and shall be spread at the rate of 326 pounds per acre.

901-2.3 SOIL FOR REPAIRS. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the Engineer before being placed.

CONSTRUCTION METHODS

901-3.1 ADVANCE PREPARATION AND CLEANUP. After grading of areas has been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches in any diameter, sticks, stumps, and other debris which might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches as a result of grading operations and, if immediately prior to seeding, the top 3 inches of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

However, when the area to be seeded is sparsely sodded, weedy, barren and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches. Clods shall be broken and the top 3 inches of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

901-3.2 DRY APPLICATION METHOD. Section not used.

901-3.3 WET APPLICATION METHOD

a. **General**. The Contractor shall apply seed and fertilizer by spraying them on the previously prepared seedbed in the form of an aqueous mixture of the materials described above, and by using the methods and equipment described herein. The rates of application shall be as specified in the special provisions.

b. Spraying Equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons per minute at a pressure of 100 pounds per square inch. The pump shall be mounted in a line which will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipe lines shall be capable of providing clearance for 5/8 inch solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet. One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet in length shall be provided to which the nozzles may be connected.

c. **Mixtures**. Seed, fertilizer, mulch and binder shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds of these combined solids shall be added to and mixed with each 100 gallons of water.
All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. Brackish water shall not be used at any time. The Contractor shall identify to the Engineer all sources of water at least 2 weeks prior to use. The Engineer may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source which is disapproved by the Engineer following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within 2 hours from the time they were mixed or they shall be wasted and disposed of at locations acceptable to the Engineer.

d. **Spraying.** Mixtures of seed, fertilizer, mulch and binder shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high-pressure spray which shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to insure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area. Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces which are to be mulched as indicated by the Plans or designated by the Engineer, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

901-3.4 MAINTENANCE OF SEEDED AREAS. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the Engineer. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water and otherwise maintain seeded areas in a satisfactory condition and as directed until final inspection and acceptance of the work. The contractor shall water the seeding mix twice every night from the runway/taxiway edge at night for a period of time beginning when the seed is placed to a period of time that shall end 1 week after the grass is ½" tall as measured from the root level.

When either the dry or wet application method outlined above is used it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the Engineer. If at the time when the contract has been otherwise completed it is not possible to make an adequate determination of the color, density, and uniformity of such stand of grass, payment for the unaccepted portions of the areas seeded will be withheld until such time as these requirements have been met.

METHOD OF MEASUREMENT

901-4.1 See Section 64-2.

BASIS OF PAYMENT

901-5.1 See Section64-3.

MATERIAL REQUIREMENTS

ASTM D 977	*Emulsified Asphalt*
Fed. Spec. JJJ-S-181B	*Agricultural Seeds*

Fed. Spec. O-F-241D	*Commercial Mixed Fertilizer*

END OF ITEM T-901

64-2 METHOD OF MEASUREMENT

The quantity of seeding to be paid for shall be the number of seeded acres, measured on the ground surface, completed and accepted. Measurement shall be to the nearest 1/10 acre.

64-3 BASIS OF PAYMENT

Payment will be made at the contract unit price per acre or fraction thereof, of completed and accepted seeding, which price shall be full compensation for furnishing all materials, including seed, fertilizer, mulch, binder, water, and maintenance, for all preparation, placing of these materials, and for all labor, equipment, tools and all incidentals necessary to complete this item.

Payment will be made under:

Item 64.1 Seeding ..... per acre

END OF SECTION 64