



SEED & SUPPLIES FOR NORTHERN CALIFORNIA

## **SEEDING AND EROSION TREATMENT SPECIFICATIONS**

### **Part 1: General**

#### **1.01 Scope of Work**

Provide all materials, labor and equipment necessary to complete all work as shown on the drawings and as specified herein, including but not limited to, the following:

1. Apply specified treatments to all cuts and fill slopes, soil stockpiles, all disturbed areas and other areas as specified on the plans.
2. Install all temporary erosion control devices as per specification.
3. All other labor and materials reasonably incidental to the satisfactory completion of the work, including clean up of the site.

#### **1.02 Site Conditions**

It is the responsibility of the contractor to visit the site to determine existing conditions including: access to the site, the nature and extent of existing improvements upon adjacent public and private property, the nature of materials to be encountered, and other factors that may affect the work of this section. It is the responsibility of the owner to have finished the seasonal grading of the slopes, including track walking the areas to be treated with erosion control treatments.

#### **1.03 Submittals**

The contractor shall submit manufacturer's letters of compliance and manufacturer's literature for the following items:

1. Seed Mixes (or individual items)
2. Mulches
3. Binders/Tackifiers
4. Fertilizer
5. Humate
5. Soil inoculates
6. Straw (Weight receipts from scales shall be required)

#### **1.04 Work schedule**

The contractor shall proceed with work during a period of August 15 through October 15, 200X or between January 15 and February 15 200X. The work shall progress as soon as the site becomes available consistent with normal seasonal limitations.

#### **1.05 Product delivery, storage and handling**



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1. All products shall be delivered to the site in manufacturer's unopened standard containers bearing original labels showing quantity, analysis and name of manufacturer.
2. All materials shall be stored in designated areas and in such a manner as to protect them from weather or other conditions that might damage or impair the effectiveness of the product.

### **1.06 Analysis of samples and tests**

1. Samples: The owner reserves the right to take and analyze samples of materials for conformity to the specifications at any time. On request, seed shall delivered to owner 30 days prior to seeding so seed can be tested. Seed samples shall be drawn in accordance with procedures outlined in AOSA, Association of Official Seed Analysts.
2. Rejected material: Rejected materials shall be removed immediately from the site at Contractor's expense. Contractor shall pay the cost of testing replacement materials.

### **1.07 Final Acceptance and Warranty Period**

Upon completion of each 25% of the specified work, the owner shall accept each area. The contractor shall not provide warranty beyond those granted by any of the material manufacturers. It shall be the right of the owner to inspect work for compliance to the specifications and advise the contractor, in writing, of any work that is found to deviate from specifications.

## **Part 2: Products**

### **2.01 General**

All products shall be in conformance with the specifications listed below. Any changes to products to be used shall be approved, in writing, by the owner or owner's representative prior to job site delivery.

### **2.02 Seed Mixes**

#### **1. Composition:**

<b>Species</b>	<b>Common name</b>	<b>PLS lbs /acre</b>
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*Seed mix to be  
detailed here.*

#### **2. Quality**



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All seed shall be in conformance with the California State Seed Law of the Department of Agriculture. Each seed bag shall be delivered to the site sealed and clearly marked as to species, purity, percent germination, dealer's guarantee, and dates of test. In addition, the container shall be labeled to clearly reflect the amount of Pure Live Seed (PLS) contained. Prior to seeding at the request of the owner, the contractor shall provide a letter of certification, original Association of Official Seed Analysts (AOSA) seed test results, and calculations of PLS <http://www.pcseed.com/docs/PureLiveSeed.pdf> content.

All legume seed shall be pellet-inoculated. Inoculant sources shall be species specific and shall be applied at a rate of 2 pounds of inoculant per one hundred pounds of seed.

### **2.03 Mulch**

100% wood hydroseed mulch shall be composed of wood fiber derived from whole wood chips with no growth or germination inhibiting substances, and shall be manufactured in such a manner that when thoroughly mixed with seed, fertilizer, organic stabilizer, and water, in the proportions specified, will form a homogeneous slurry which is capable of being sprayed to form a porous mat. The fibrous mulch in its air-dry state shall contain not more than 15% by weight of water. The fiber shall have a temporary green dye and shall be accompanied by a certificate of compliance stating that the fiber conforms to these specifications.

### **2.04 The Organic Stabilizer/Tackifier**

Shall be an organic substance supplied in powder form and shall be psilium-based and packed in clearly marked bags stating the contents of each package. The California Department of Food and Agriculture shall certify the material as an Auxiliary Soil Chemical.

### **2.05 Fertilizer**

To be used in the slurry, shall be of commercial quality, conform to the requirements of the California Food and Agriculture Code, shall have a guaranteed analysis for nitrogen, phosphorus and potassium of 7-2-3. Products specified as slow-release shall have been tested and demonstrate a nearly linear release curve.

### **2.06 Humate**

Shall be OMRI listed and contain at least 40 % Humic acid. It shall is a natural granual humic acid based material that functions as an organic chelator and microbial stimulator . Humate shall not burn plant material and shall be non-toxic and non-staining.



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### Humate Soil Conditioner

Humic Acids (from Leonardite)	40.00 %

Organic matter	40.00 % - 50.00%
Carbon	50.00 % - 60.00%
Nitrogen	0.05 % - 1%
Phosphoric Acid	0.07 %
Potash	0.13 %
Sulfur	0.21 %
Magnesium	0.18 %
Calcium	0.32 %
pH	4.0
Soluble Salts	1.8

### 2.07 Soil Inoculant

#### 10-1. EROSION CONTROL (TYPE HYDRAULIC STRAW MULCH)

Erosion control (Type Hydraulic Straw Mulch) shall conform to the provisions in Section 20-3, "Erosion Control," of the Standard Specifications and these special provisions and shall consist of applying erosion control materials to embankment and excavation slopes, erosion control (Type B), erosion control (netting) areas, and other areas disturbed by construction activities.

Erosion control (Type Hydraulic Straw Mulch) shall be applied when an area is ready to receive erosion control as determined by the Engineer and in conformance with the provisions in "Move-in/Move-out (Erosion Control)" of these special provisions.

Prior to installing erosion control materials, soil surface preparation shall conform to the provisions in Section 19-2.05, "Slopes," of the Standard Specifications, except that rills and gullies exceeding 50 mm in depth or width shall be leveled. Vegetative growth, temporary erosion control materials, and other debris shall be removed from areas to receive erosion control.

#### MATERIALS

Materials shall conform to the provisions in Section 20-2, "Materials," of the Standard Specifications and these special provisions.



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**Seed**

Seed shall conform to the provisions in Section 20-2.10, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the Engineer.

Seed shall be delivered to the project site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.

**Non-Legume Seed**

Non-legume seed shall consist of the following NON-LEGUME SEED\*

Botanical Name (Common Name)	Percent Germination (Minimum)	Kilograms Pure Live Seed Per Hectare (Slope Measurement)
Baccharis pilularis var. pilularis (Coyote Bush)	20	0.05
Artemisia californica (California Sagebrush)	25	0.5
Mimulus aurantiacus. (Sticky Monkeyflower)	25	.1
Elymus glaucus, (Blue Wildrye,)	40	9
Festuca idahoensis (Idaho Festuca)	35	4
Hordium brachyantherum californicum (Meadow Barley)	40	8
Regreen	60	45.0

\*Source of this seed mix is Pacific Coast Seed. Contact David Gilpin (925) 373-4417

**Commercial Fertilizer –Natural**

Commercial fertilizer shall conform to the provisions in Section 20-2.02. “Commercial Fertilizer,” of the Standard Specifications and shall have a guaranteed chemical analysis range:



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Ingredient	Percentage
Nitrogen	6-7
Phosphoric Acid	1-2
Water Soluble Potash	2-3

Commercial fertilizer shall be 100 percent natural, slow-release with at least 70 percent organic substance.

### **Mycorrhizal Inoculum**

Endo (arbuscular) mycorrhizal inoculum shall be registered by the California Department of Food and Agriculture and consist of spores, mycelium and mycorrhizal root fragments in a solid carrier suitable for handling by hydro-seeding. The carrier shall be the material in which the inoculum was originally produced, and may include organic materials, vermiculite, perlite, calcined clay, or other approved materials consistent with mechanical application and with good plant growth.

Each endomycorrhizal inoculum shall carry a supplier's guarantee of 80,000 propagules minimum per kilogram. The minimum propagule count shall be shown on each label provided. If more than one fungal species is claimed by the supplier, the label shall include a guarantee for each species of mycorrhizal fungus claimed.

Endomycorrhizal fungal species shall be suitable for the pH of the soil at the planting site. If the inoculum consists of a mixture of species, no more than 20% of the claimed propagule count shall consist of fungal species known to be unsuitable for the pH of the soil at the planting site.

A sample of approximately 28 grams (one ounce) of inoculum will be taken from each inoculum container by the Engineer. The number of propagules will be determined by laboratory testing. Propagules shall include live spores, mycelial fragments and viable mycorrhizal root fragments.

Endomycorrhizal inoculum shall be stored, transported and applied at temperatures of less than 32° C (90° F)

### **2.08 Straw**

Shall be derived from irrigated wheat, barley fields or from rice straw. The contractor shall furnish evidence that clearance has been obtained from the County Agricultural Commissioner, as required by law, before straw from outside the county in which it is to be used is delivered to the site of the work. Straw that has been used for bedding is prohibited.



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## **2.09 Equipment**

Hydroseeding: Equipment used for application of slurry shall be a commercial-type Hydro-Seeder and have a built-in agitation system with an operation capacity sufficient to agitate, suspend and homogeneously mix slurry.

1. Tank capacity shall be a minimum of 1,500 gallons and shall be mounted on a truck to allow access to the site.
2. Pump shall be able to generate 150 psi at the nozzle.
3. Straw blowers: Equipment shall be specifically designed and manufactured for the application of straw and shall be of sufficient horsepower to break up and distribute straw at the specified application rate.

## **2.07 Water**

Water shall be furnished by owner and shall be made readily available at the sites indicated on the project map. Water shall be of potable quality.

# **Part 3: Execution**

## **3.01 General**

1. Areas to receive erosion control treatments include all graded areas as shown on the site plan and other areas as determined by the owner.
2. Perform erosion control treatments on a section by section basis. On approval of the owner, and as soon as possible after grading, complete treatments in the following order of priority: stream zones, graded slopes, non-trafficked road and parking areas, building pads and other flat areas.
3. Contractor shall be available to re-treat areas disturbed by on-going activities. Cost of retreatment is the responsibility of the owner.

## **3.02 Soil Preparation**

A. Verification: No soil amendments shall be required except as noted on site plan.

1. That all areas to receive erosion control treatments are free of vegetation and other objectionable material.
2. That grades are final for permanently treated areas and within reasonable standard for temporary treatments.
3. That all sloped areas are uniformly compacted: wherever possible, the surface compaction of the top 1 foot shall be 85% or less.



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### 3.03 Hydroseeded Area

- A. Preparation: All slurry preparation to be conducted at the job site.
1. Water, mulch, fertilizer, compost, binder and other ingredients shall be added to the tank simultaneously so that the finished load is a homogenous mix of the specified ingredients.
  2. Seed shall be added last and shall be discharged within 2 hours. Loads held over 2 hours will be recharged with ½ the seed rate before application.
  3. Once fully loaded, the complete slurry shall be agitated for 3-5 minutes to allow for uniform mixing.
- B. Application:
1. General: Apply specified slurry in a sweeping motion to form a uniform application.

Step 1: with hydroseeder apply

Lbs per acre -	Material
X lbs	[seed mix name here]
500	100 % Wood fiber mulch
1200	BioSol natural fertilizer
400	Humate 40
60	AM 120 Inoculant

Step 2 : with straw blower apply

4000	Straw
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Step 3: with hydroseeder apply

500	100% Cellulose Fiber Mulch
150	Organic Binder (such as M-binder)

Under suitable conditions straw shall be uniformly spread at the specified rates. The straw may be pneumatically applied as long as the resulting straw is predominately 3 to 6 inches in length. The straw shall be treated with mulch and tackifier before it can blow off the site but in no case shall straw be left untreated for more than 24 hours. The contractor will clean up areas of straw which are blown from the site, and the areas shall be retreated at no additional expense to the owner.

2. Protection: Contractor is to stay off treated areas.
3. Unused Loads: If mixture remains in tank for more than 8 hours it shall be removed from the job site at contractor's expense.
4. Reseeding: After "Final Acceptance", reseeded will be done at the request of the owner and shall be considered extra.





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### **3.05 Clean-up**

1. General: Erosion control work areas shall be maintained in a neat and orderly condition. Keep paved area free of erosion treatment, soil, and other debris.
2. Overspray: Installing contractor is responsible for washing or otherwise cleaning excess material off all areas not intended to receive treatment.
3. Debris: Clean up and remove erosion control associated materials and debris from project site before Final Acceptance.

End of Section.