

SECTION 02921 - SEEDING

PART 1 - GENERAL

1.1 REFERENCES

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

AGRICULTURAL MARKETING SERVICE (AMS)

AMS-01 (Aug 95) Federal Seed Act Regulations Part 201

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 4972 (1995a) pH of Soils

ASTM B 209 (2004) Aluminum and Aluminum-Alloy Sheet and Plate

1.2 SEED LOCATION, SEED MIX AND SEEDING METHODOLOGY

Table of seeding locations, seed mix type, seeding methodology

| LOCATION                | ACREAGE                         | METHODOLOGY   |
|-------------------------|---------------------------------|---|
| Bridge SE (7A)          | 14.5                            | Imprinting  |
| Central NE (8B)         | 14                              | Imprinting  |
| I-40 SE (8F)            | 71-ACRES TOTAL<br>FOR I-40 EAST | IMPRINTING 50%<br>HYDROSEEDING 50%<br>(ASSUMES PLOT DESIGN) |
| I-40 NE (8G, 9A)        |                                 |   |
| Montano SE (10A)        | 9                               | Imprinting  |
| Montano NE (10B)        | 1.5                             | Imprinting  |
| 10F                     | 8                               | Imprinting  |
| Alameda NE (12D, E, E)  | 9                               | Imprinting  |
| Montano NW (10E)        | 50                              | Imprinting  |
| Central NW/Atrisco (8C) | 5                               | Imprinting  |
| Bridge SW (7B)          | 7                               | Imprinting  |
| Brown Burn W (4C/A)     | 14                              | Imprinting  |
| Brown Burn E (4B)       | 38.5                            | Imprinting  |
| Corrales                | 15                              |   |
| TOTAL                   | 256.50                          | Imprinting  |

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the

submittal for the Government (EV, Environmental Branch). The following shall be submitted in accordance with Section 01330 - SUBMITTAL PROCEDURES:

SD-03 Product Data

Equipment; G, EV

A listing of equipment to be used for the seeding operation.

Delivery; G, EV

Delivery schedule.

Finished Grade; G, EV.

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and quantity installed.

SD-06 Test Reports

Equipment Calibration; G, EV

A test report shall be developed by the Contractor on the type of equipment that will be used in the seeding operation.

SD-07 Certificates

Certification of calibration tests conducted on the equipment used in the seeding operation.

Seed; G, EV

Prior to delivery of materials, certificates of compliance attesting that materials meet the specified requirements shall be provided to the Contracting Officer. Certified copies of the material certificates shall include the following:

a. Seed. Classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content. Seed should be weed free of all weed species on the federal and State of New Mexico noxious weed list including *Bromus tectorum* (cheatgrass), and date tested.

SD-11 Contract Closeout

Tool

Provide one wrench to remove tamper-resistant fasteners at contract completion.

#### 1.4 INSPECTIONS

The Contracting Officer in consultation with the Corps Biologist will make inspection visits at each of the reseeded sites.

#### 1.5 DELIVERY, INSPECTION, STORAGE, AND HANDLING

##### 1.5.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

##### 1.5.2 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality. Seed that is wet, moldy, or bears a test date five months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements.

##### 1.5.3 Storage

Materials shall be stored in designated areas. Seed, shall be stored in cool and dry locations away from contaminants.

##### 1.5.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

##### 1.5.5 Time Limitation

Time limitation for holding seed shall be a maximum of 5 days.

#### 1.6 MEASUREMENT AND PAYMENT

##### 1.6.1 "Imprint Seeding"

###### 1.6.1.1 Measurement

The total quantity of seed installation by imprinter for which payment will be made is the quantity listed in Modification No. C-012. This measurement includes areas that are required to be disturbed in order to perform the work under this contract, but will not include areas unnecessarily disturbed by the Contractor. Areas unnecessarily disturbed by the Contractor shall be restored at the Contractor's expense as described in the specifications. No allowance will be made for seeding outside the areas described in the specifications and shown on the drawings unless authorized. The measurement does not include labor, materials, or equipment required to handle or process obstacles or logs. The measurement is specific to labor and equipment required to install seed and does not include the cost of seed or delivery of seed.

Unit of Measure: Lump Sum

#### 1.6.1.2 Payment

Payment will be made on a Lump Sum basis for Imprint Seeding listed on Modification C-012. Payment will constitute full compensation for labor and equipment required to install seed and erosion control as shown on the drawings and described in SECTION 01010 - SCOPE OF WORK and SECTION 02921 - SEEDING, including the costs associated with incidental operations; seed mixing, erosion and sediment control, and clean-up.

#### 1.6.2 "Hydro-Seeding"

##### 1.6.2.1 Measurement

The total quantity of seed installation by hydro-seeding for which payment will be made is the quantity listed in Modification C-012. This measurement includes areas that are required to be disturbed in order to perform the work under this contract, but will not include areas unnecessarily disturbed by the Contractor. Areas unnecessarily disturbed by the Contractor shall be restored at the Contractor's expense as described in the specifications. No allowance will be made for seeding outside the areas described in the specifications and shown on the drawings unless authorized. The measurement does not include labor, materials, or equipment required to handle or process obstacles or logs. The measurement is specific to labor and equipment required to install seed and does not include the cost of seed or delivery of seed.

Unit of Measure: Lump Sum

##### 1.6.2.2 Payment

Payment will be made on a Lump Sum basis for Hydro-Seeding listed on Modification C-012. Payment will constitute full compensation for labor and equipment required to install seed and erosion control as shown on the drawings and described in SECTION 01010 - SCOPE OF WORK and SECTION 02921 - SEEDING, including the costs associated with incidental operations; seed mixing, erosion and sediment control, and clean-up.

#### 1.6.3 "Signs"

##### 1.6.3.1 Measurement

The total quantity of signs for which payment will be made will be the quantity listed in Modification C-012.

Unit of Measure: Lump Sum

##### 1.6.3.2 Payment

Payment will be made on a Lump Sum basis for signs listed on Modification C-012. Payment will constitute full compensation for costs associated with furnishing and installing signs and posts described herein. No separate payment will be made for accessories and payment will be included in the contract price for the items of work to which the accessories are incidental.

PART 2 - PRODUCTS

2.1 SEED

2.1.1 Seed Classification

State-approved seed of the latest season's crop shall be provided in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. Labels shall be in conformance with AMS-01 and applicable state seed laws.

2.1.2 Permanent Seed Species and Mixtures

2.1.2.1 Standard Seed Mix

Permanent seed species and mixtures shall be proportioned by weight as follows:

STANDARD SEED MIX

| COMMON NAME              | SPECIES NAME                                      | RATE<br>(*Pls.<br>Lbs./acre) |
|--------------------------|---|------------------------------|
| Indian ricegrass         | <i>Achnatherum hymenoides</i>                     | 0.93                         |
| Four-wing saltbush       | <i>Atriplex canescens</i>                         | 1.68                         |
| Side oats gramma         | <i>Bouteloua curtipendulum</i>                    | 0.68                         |
| Blue gramma              | <i>Bouteloua gracilis</i>                         | 0.26                         |
| Bottlebrush squirreltail | <i>Elymus elymoides</i>                           | 0.68                         |
| Slender wheatgrass       | <i>Elymus trachycaulus</i>                        | 0.82                         |
| Needle and Thread grass  | <i>Hesperostipa neomexicana</i>                   | 1.87                         |
| Western wheatgrass       | <i>Pascopyrum smithii</i>                         | 1.19                         |
| Galleta                  | <i>Pleuraphic jamesii</i>                         | 0.77                         |
| Indiangrass              | <i>Sorghastrum nutans</i>                         | 1.09                         |
| Sand dropseed            | <i>Sporobolus cryptandrus</i>                     | 0.04                         |
| Regreen                  | <i>Triticum elongatus</i><br>(sterile cover crop) | 15.56                        |
| TOTAL                    |   | 25.57 Pls.<br>Lbs./acre      |

\*PLS--Pure Live Seed. PLS is determined by multiplying the germination of a lot of seed by the purity. For example, a 100-pound bag of seed with a germination of 50 percent and purity of 80 percent would be computed thus: 50 percent X 80 percent = 40 percent PLS. This means, that from a 100-pound lot of seed, only 40 pounds would be pure viable seed. To establish a suitable strain of this quality of seed, a person would need to seed 2-1/2 times the number of bulk pounds to achieve desired PLS seeding rate. Except

as noted, all seeding recommendations in these specifications are based on PLS.

#### 2.1.3 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture but shall be 100% free of seed from any federal or New Mexico listed noxious weeds and *Bromus tectorum* (cheatgrass).

#### 2.1.4 Seed Mixing

If the seed box on the seed imprinter does not contain separate compartments for different sized seed, then the mixing of seed may be done by the seed supplier prior to delivery, or on site when approved by the Contracting Officer. If the seed box used for seed application does not have separate compartments for different sized seed, and requires that seed of every species (described in paragraph, Standard Seed Mix.) be mixed together in one seed box compartment, then the contractor shall mix "red flaky wheat bran" in the seed box with the native grass seed to assist with uniform distribution of different sized seed during the seeding process. The proportion of red flaky wheat bran to native grass seed shall be mixed 1:1 (by weight). The contractor must ensure that the seed/wheat bran mix is actively agitated prior to and during seed application to promote uniform discharge/distribution of different sized seed to the soils in project area.

#### 2.1.5 Substitutions

Substitutions will not be allowed without written request and approval from the Contracting Officer.

### 2.2 WATER

Water shall be the responsibility of the Contractor, unless otherwise noted. Water shall not contain elements toxic to plant or human life.

### 2.3 SIGNS

#### 2.3.1 General

Exterior signs shall be the standard product of a single manufacturer regularly engaged in the manufacture of signs.

#### 2.3.2 Signs Posts

Signs shall be post mounted on 2 one-piece galvanized steel U-Channel posts with tamper-resistant fasteners. Posts shall have a minimum 0.125 -inch wall thickness.

#### 2.3.3 Characteristics

Signs shall be 48 -inch x 48 -inch aluminum signs per ASTM B 209 with high-intensity reflective sheathing. Aluminum plate thickness shall be a minimum 0.090 -inch thick. Sign colors shall be black lettering on orange background. Letters and arrows shall be sized according to the viewing distance from which

they are to be read. The minimum height is measured using an upper case letter "X". Lower case letters are permitted. Signs shall read,

REVEGETATION  
IN  
PROGRESS

and have an arrow indicating the appropriate direction to the seeded area.

PART 3 - EXECUTION

3.1 INSTALLING SEED TIME AND CONDITIONS

3.1.1 Seeding Time

Seed shall be installed between 15 May and August 31. The Contractor shall obtain approval in writing from the Contracting Officer for exceptions to this planting period. If, by the planting dates specified above, the Contracting Officer determines that work under this contract has not progressed sufficiently on an area to allow efficient performance or prevents satisfactory results, the work under this section for that area will be delayed until the next planting season.

3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture or unsatisfactory conditions prevail, the work will be stopped. When special conditions warrant a variance to the seeding operations, the Contractor shall submit proposed alternate times for approval by the Contracting Officer.

3.1.3 Equipment and Equipment Calibration

The Contractor shall use a "Dixon Land Imprinter", or equal to apply seed to the project area. The Contractor shall follow the imprinter manufacturer's instruction manual to ensure proper operation, with careful attention to calibrating the static imprinting pressure (i.e. "ballast") according to local soil conditions. Immediately prior to the commencement of seeding operations, calibration tests shall be conducted on the seeding equipment. These tests shall confirm that the equipment is operating within the manufacturer's specifications and will meet the specified criteria. The equipment shall be calibrated a minimum of once every day during the operation. The calibration test results shall be submitted each day to the Contracting Officer.

3.2 SITE PREPARATION

3.2.1 Preparation Prior to Seeding

The site shall be prepared prior to seeding in order to remove obstacles that will interfere with imprinter path. As many obstacles as possible shall be left that the imprinter can maneuver over or around. The ground cannot be disturbed once imprinting has occurred. If there are some obstacles that are too big (logs greater than 6 inch DBH) or concentrated over an area greater than 5 square feet, they shall be moved to the side prior to imprinting. Once imprinting is

complete, the removed obstacles can be handled or processed per paragraph Log Handling and Processing, below.

### 3.2.2 Finished Grade

The Contractor shall verify that finished grades, including moist soil depressions are as shown on drawings and as field approved by the Contracting Officer, in consultation with the Corps Biologist.

### 3.2.3 Log Handling and Processing

#### 3.2.3.1 Brown Burn E, Brown Burn W, and Bridge SE.

Once seeding is complete, large logs that have been left for wildlife habitat may be placed around the perimeter of the seeded area. Final log locations shall be field approved by the Contracting Officer in consultation with the Corps Biologist.

#### 3.2.3.2 Bridge SE, I-40, Brown Burn E, and Brown Burn W.

Stumps that have been removed from the ground during construction of swales shall be mulched on site.

#### 3.2.3.3 Bridge SE and Brown Burn W.

At these burn sites, logs will be further processed by bucking up the logs (greater than 6 inch DBH) into fuel wood size material (no longer than 3 feet in length) and mulching the remaining material that is smaller than log size. Final selection of material to be mulched shall be field approved by the Contracting Officer, in consultation with the Corps Biologist. Mulch shall be spread out evenly across the site.

### 3.2.4 Prepared Surface

#### 3.2.4.1 Protection

Each area of prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion immediately prior to and during seeding operations by signing the area as a work zone.

## 3.3 INSTALLATION

Prior to installing seed, previously prepared surfaces that have been compacted or damaged shall be reworked to meet the requirements of paragraph, SITE PREPARATION. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

### 3.3.1 Installing Seed

#### 3.3.1.1 Imprinting.

The Land Imprinting method shall be used throughout the majority of the locations. This method is a no-till, mechanical land treatment technique that firms and stabilizes the soil by forming a geometric grid of impression patterns.

The smaller imprinting machine (no greater than 7 feet wide) shall be used to implement this method. The imprinter shall be towed on the back of a tractor or hydraulic powered heavy equipment to provide adequate downward pressure for proper imprints. The contractor shall assess and calibrate the imprinter weight on a daily basis as described in paragraph, Equipment and Equipment Calibration above.

#### 3.3.1.2 Hydro Seeding

Hydro seeding shall be performed in specified locations of the I-40 project area. Seed shall be uniformly broadcast at the rate of 1.5 x pounds per acre of adjusted PLS using hydro seeders. Half of the total rate of seed application shall be broadcast in one direction, and the remainder of the seed rate broadcast at 90 degrees from the first direction.

#### 3.4 QUANTITY CHECK

For materials provided in bags, the empty bags shall be retained for recording the amount used. For materials provided in bulk, the weight certificates shall be retained as a record of the amount used. The amount of material used shall be compared with the total area covered to determine the rate of application used. Differences between the quantity applied and the quantity specified shall be adjusted. Final adjustments shall be field approved by the Contracting Officer in consultation with the Corps Biologist.

#### 3.5 RESTORATION AND CLEAN UP

##### 3.5.1 Restoration

Existing turf areas, pavements and facilities that have been damaged from the seeding operation shall be restored to original condition at Contractor's expense.

##### 3.5.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed offsite in accordance with Federal, State, and local regulations. Adjacent paved areas shall be cleaned.

#### 3.6 PROTECTION OF INSTALLED AREAS

Immediately after seeding operation in an area, the area shall be protected against traffic or other use by providing and erecting signs at each end of each newly seeded area. Signs and posts shall be as specified in paragraph, SIGNS above. Signs shall be mounted with tamper-resistant fasteners to posts driven into the ground. A minimum of four fasteners per sign plate shall be used. Posts shall be plumbed during and after driving. Final location of signs will be field approved by the Contracting Officer. The Contractor shall deliver one tamper-resistant wrench to the Government at contract completion.

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