

Landscape

Specifications

Apache Junction Floodway & FRS

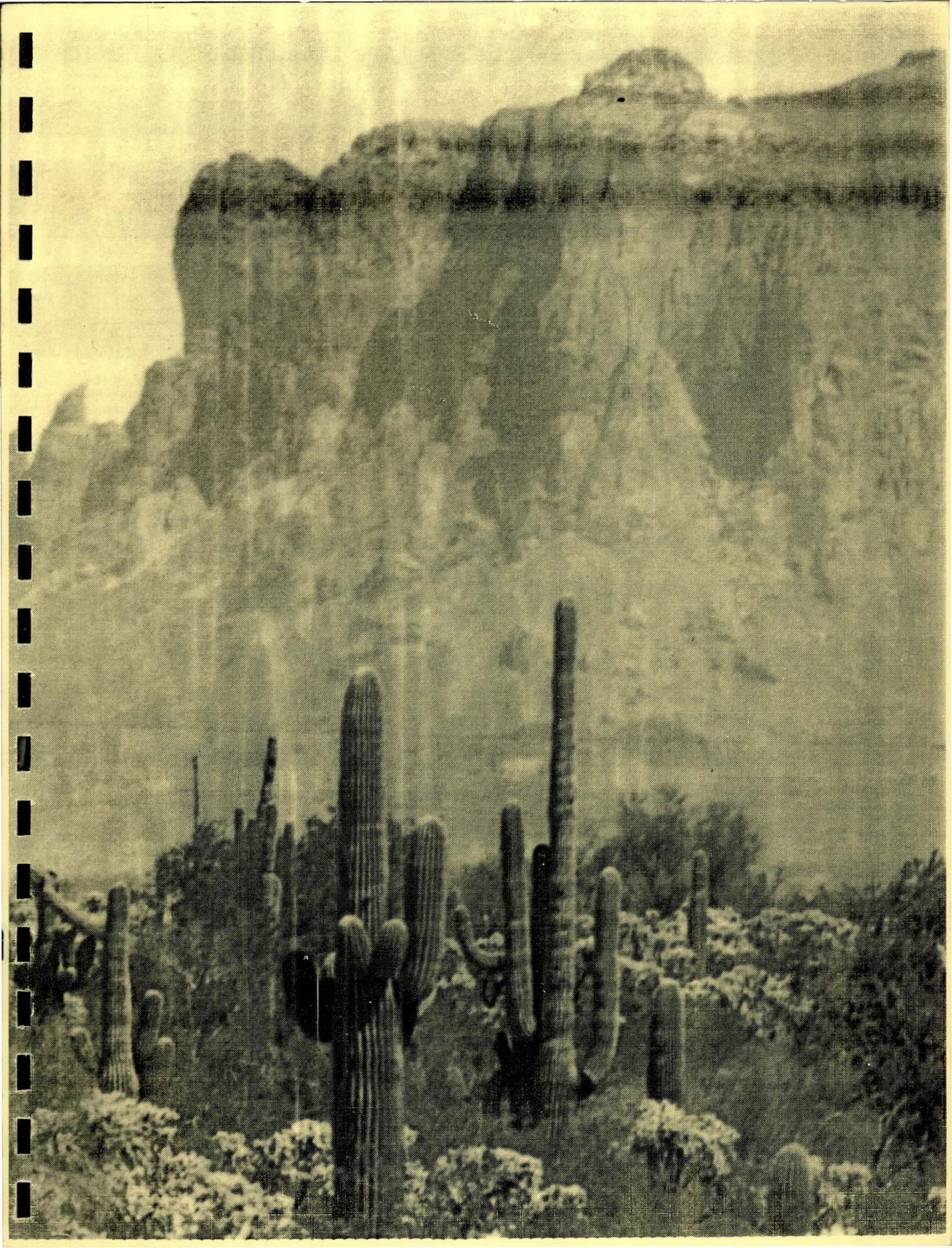
Apache Junction Outlet & Bulldog Floodway

Buckhorn-Mesa Watershed
Maricopa & Pinal Counties, Arizona

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE



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Landscape Specifications



ROGERS GLADWIN & HARMONY, INC.
LANDSCAPE ARCHITECTURE AND PLANNING

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June, 1987

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Apache Junction Floodway & FRS Apache Junction Outlet & Bulldog Floodway

Bid Item Schedule

June, 1987

BID ITEM	ITEM OF WORK	SPEC#	QTY.	UNIT	UNIT PRICE	TOTAL AMOUNT
1.	Range Drilling	6	154.03	AC		
2.	Dry Broadcasting	6	40.59	AC		
3.	Mobilization	8	1	LS		
4.	River Run Rock	61	466	TN		
5.	Gravel Cover	202	14806	SYD		
6.	Planting 5 Gallon Trees	440	61	EA		
7.	Planting 1 Gallon Shrubs	440	453	EA		
8.	Landscape Establishment	480	1	LS		

TOTAL

Construction Specifications

CONSTRUCTION SPECIFICATION

6. SEEDING, SPRIGGING, AND MULCHING FOR PROTECTIVE COVER

1. Scope

The work shall consist of preparing the area for treatment, furnishing and placing seed, sprigs, mulch, fertilizer, inoculant, soil amendments, and asphalt emulsion as specified in the designated areas as specified.

2. Materials

Seed - All seed shall conform to the current rules and regulations of the state where it is being used and from the latest crop available. It shall meet or exceed the standards for purity and germination listed in Section 7.

Seed shall be labeled in accordance with the state laws and the U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act in effect on the date of invitations for bids. Bag tag figures will be evidence of purity and germination. No seed will be accepted with a date of test of more than 9 months prior to the date of delivery to the site.

Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted. The percent of noxious weed seed allowable shall be as defined in the current state laws relating to agricultural seeds. Each type of seed shall be delivered in separate sealed containers and fully tagged unless exception is granted in writing by the Contracting Officer.

Fertilizer - Unless otherwise specified, the fertilizer shall be a commercial grade fertilizer. The fertilizer shall meet the standard for grade and quality specified by state law. Where fertilizer is furnished from bulk storage, the Contractor shall furnish a supplier's certification of analysis and weight. When required by the contract, a representative sample of the fertilizer shall be furnished the Contracting Officer for chemical analysis.

Inoculants - The inoculant for treating legume seeds shall be a pure culture of nitrogen-fixing bacteria prepared specifically for the species and shall not be used later than the date indicated on the container or as otherwise specified. A mixing medium, as recommended by the manufacturer, shall be used to bond the inoculant to the seed. Two times the amount of the inoculant recommended by the manufacturer shall be used, except four times the amount of inoculant recommended by the manufacturer shall be used when seed is applied by use of a hydraulic seeder. Seed shall be sown within 24 hours of treatment and shall not remain in the hydraulic seeder longer than 4 hours.

Soil Admencments - Lime shall consist of Standard Ground Agricultural Limestone, or approved equivalent. Standard Ground Agricultural Limestone is defined as ground limestone meeting current requirements of the State Department of Agriculture.

Mulch Tackifiers - Asphalt emulsion shall conform to the requirements of ASTM D-977, Specification for Emulsified Asphalt. The emulsified asphalt may be rapid setting, medium setting, or slow setting. Nonasphaltic tackifiers required because of environmental considerations shall be as specified in Section 7.

Straw Mulch Materials shall consist of wheat, oat, or rye straw, hay, grass cut from native grasses or other plants approved by the Contracting Officer. The mulch material shall be air dry, reasonably light in color, and shall not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds will not be permitted. The Contractor shall provide a method satisfactory to the Contracting Officer for determining weight of mulch furnished.

Other Mulch Materials - Mulch materials, such as wood cellulose fiber mulch, mulch tackifiers, synthetic fiber mulch, netting, and mesh are other mulching materials that may be required for specialized locations and conditions. The materials, when specified, must be accompanied by the manufacturers' recommendations for methods of application.

3. Seeding Mixtures, Sod, Sprigs, and Dates of Planting

The per acre rate for seed mixtures, sprigs, or sod and date of seeding or planting shall be as shown on the vegetating plan, or as specified in Section 7.

4. Seed Bed Preparation and Treatment

Areas to be treated shall be dressed to a smooth, firm surface.

On sites where equipment can operate, (generally slopes 2:1 or flatter), the seedbed shall be adequately loosened (4 to 6 inches deep) and smoothed. Disking or cultipacking or both may be necessary.

On sites where equipment cannot operate, the seedbed shall be prepared by hand by scarifying to provide a roughened surface so that broadcast seed will stay in place.

If seeding is to be done immediately following construction, seedbed preparation may not be required except on compacted, polished, or freshly cut area.

Rocks larger than 6 inches in diameter, trash, weeds, and other debris that will interfere with seeding or maintenance shall be removed or disposed of as directed by the Contracting Officer.

Seedbed preparation shall be discontinued when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed as determined by the Contracting Officer.

5. Seeding, Sprigging, Fertilizing, Mulching, and Stabilizing

All seeding or sprigging operations shall be performed in such a manner that the seed or sprigs are applied in the specified quantities uniformly on the designated areas. The method and rate of seed application shall be as specified in Section 7. Unless otherwise specified, seeding, or sprigging shall be done within 2 days after final grading is complete.

Fertilizer and soil amendments shall be applied as specified in Section 7. When specified the fertilizer and soil amendments shall be thoroughly incorporated into the soil as soon as possible after being applied.

The rate, amount, and kind of mulching or mesh shall be as specified in Section 7. Mulches shall be applied uniformly to the designated areas, and shall be applied to the seeded areas not later than 2 work days after seeding has been performed. Straw mulch materials shall be stabilized by the use of a disk or by a suitable tackifier. A disk harrow weighing as specified in Section 7 shall have the disks set straight and the harrow shall be used to anchor the straw mulch into the soil as specified in Section 7.

The tackifier shall be applied uniformly over the mulch material at the specified rate, or by injecting it into the mulch material as it is being applied. The mesh or netting stabilizing materials shall be applied smoothly but loosely on the designated areas, and the edges shall be buried or securely anchored by means of spikes or staples as specified in Section 7.

The Contractor shall maintain the mesh or netting areas until all work on the entire contract has been completed and accepted. Maintenance shall consist of the repair of areas damaged by erosion, wind, fire, or other causes. Such areas shall be repaired to reestablish the condition and grade of the soil and shall be refertilized, reseeded, and remulched prior to the new application of the mesh or netting.

6. Measurement and Payment

For items of work for which specific unit prices are established in the contract, each area treated as specified will be measured to the nearest 0.1 acre. Payment for treatment will be made at the contract unit price for the designated treatment which shall constitute full compensation for all materials, labor, equipment, tools, and other items necessary and incidental to the completion of the work.

When specified as an item of work mesh or netting will be measured to the nearest square yard of surface area covered. Payment will be made at the contract unit price and shall constitute full compensation for labor, equipment, materials, and other items necessary and incidental to the completion of work.

The following provisions apply to all methods of measurement and payment. Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 7 of this specification.

7. Items of Work and Construction Details

Items of work to be performed in conformance with this specification and the construction details are:

a. Bid Item 1, Range Drilling

- (1) This item shall consist of site preparation, fertilizing, seeding, and mulching on slopes flatter than 3.5:1. This includes all areas designated as receiving Seed Mix I, and in the FRS Borrow Pit areas designated as receiving Seed Mix II, as shown on the drawings.
- (2) In Section 2, Materials, Soil Amendments shall not apply.
- (3) In Section 2, Materials, Straw Mulch Materials, "hay, grass cut from native grasses" shall not apply.
- (4) In Section 3, Seeding Mixtures, Sod, Sprigs and Dates of Planting, sod and sprigs shall not apply.
- (5) In Section 4, Seed Bed Preparation and Treatment, areas to be treated shall be left in a roughened condition resulting from disking, harrowing, chiseling, or other approved method. Also, the tilled depth as specified (4 to 6 inches) does not apply. The soil shall be tilled as specified in Section 7a. (14).
- (6) In Section 5, Seeding, Sprigging, Fertilizing, Mulching, and Stabilizing, references to "sprigging" shall not apply.
- (7) Seeding operations shall be conducted between October 15 and December 1.
- (8) Due care shall be taken during the seeding operations to prevent damage to existing structures in the seeding area.
- (9) Premixing of the seed is permitted if the contractor submits satisfactory evidence to the Contracting Officer that the seed of each species in the mix will be placed at the specified application rate.

- (10) Fertilizer shall be a hard prill type fertilizer, which is uniform in composition, pelleted, and dry and free flowing. Guaranteed analysis of fertilizer shall be as follows:

Ammoniacal nitrogen (N)	16.0%
Available phosphoric acid (P2O3)	8.0%
Water soluble potash (K2O)	4.0%
Sulphur (S)	18.0%
Iron (Fe) (chelated)	1.5%
Manganese (Mn) (chelated)	0.1%
Zinc (Zn) (chelated)	0.1%

- (11) Legume seed shall be scarified by mechanical means. Add seed to rotating bin scarifier lined with coarse grit sandpaper. Operate at 60 to 100 RPM for not more than two (2) minutes. Provide sample to Contracting Officer. Adjust speed and run time as directed to properly scarify seed.

- (12) No additional soil amendments will be required.

- (13) The seeding mixture shall be of the species and applied rates as listed below. Alternates are provided where certain species are not available. Any change to the seed mixture by substitution of any alternate species shall be approved by the Contracting Officer.

Type I Seed Mix:

<u>Species</u>	<u>PLS Rates/Ac</u>
Cercidium microphyllum	2 oz.
Foothill paloverde (scarify and inoculate)	
Ambrosia deltoidea	1.5 lb.
Triangle leaf bursage	
Encelia farinosa	0.5 lb.
Brittle bush	
Sphaeralcea ambigua	0.5 lb.
Globe mallow	
Cassia covesii	0.75 lb.
Desert senna	
Festuca megalura	1.0 lb.
Foxtail fescue	
Artistida purpurea	2.0 lb.
Purple three awn (do not de-awn)	

Alternates:

<u>Species</u>	<u>PLS Rates/Ac</u>
Prosopis juliflora var. velutina Velvet mesquite (scarify and inoculate)	2 oz.
Ambrosia dumosa White bursage	1.0 lb.
Plantago insularis Indian wheat	0.5 lb.
Schismus barbatus Arabian grass	1.0 lb.
Cenchrus ciliaris Buffelgrass (flame coated)	1.5 lb.

Type II Seed Mix:

<u>Species</u>	<u>PLS Rates/Ac</u>
Atriplex polycarpa Desert saltbush	1.0 lb.
Ambrosia deltoide Triangle leaf bursage	1.5 lb.
Encelia farinosa Brittle bush	0.5 lb.
Sphaeralcea ambigua Globe mallow	0.5 lb.
Cassia covesii Desert senna	0.75 lb.
Aristida purpurea Purple three awn (do not de-awn)	2.0 lb.
Festuca megalura Foxtail fescue	1.0 lb.

Alternates:

<u>Species</u>	<u>PLS Rates/Ac</u>
Atriplex canescens Fourwing saltbush (dewinged)	2 oz.
Ambrosia dumosa White bursage	1.0 lb.
Plantago insularis Indian wheat	0.5 lb.
Schismus barbatus Arabian grass	1.0 lb.
Cenchrus ciliaris Buffelgrass (flame coated)	1.5 lb.

(14) Atriplex canescens seed shall be from a source located at an elevation of between 500 feet and 2,500 feet above sea level.

(15) Method of installation shall be as follows:

aa. Apply, by dry broadcasting, fertilizer at a rate of 100 pounds per acre. Coverage shall be uniform. Application method shall be approved by the Contracting Officer.

bb. Till soil in a direction parallel with prevailing slope to a depth of 8 inches by disking, harrowing, chiseling, or other approved method. Surface shall be left in a roughened condition. Condition of soil surface shall be approved by Contracting Officer prior to commencing seeding operations.

Tilling shall not be performed when soil conditions are excessively moist or dry. The Contracting Officer shall determine the suitability of soil conditions for tilling operations.

cc. Seed shall be placed by a rough terrain drill to a minimum depth of one quarter (1/4) inch and a maximum depth of one half (1/2) inch. Drill shall be fitted with depth bands, packer wheels, an agitator, and a legume box.

dd. Apply, with industry standard blower equipment, straw mulch at a rate of two tons per acre. Crimp in place with a blunt notched disk roller.

(16) The Contractor shall be responsible for damage caused to seeded areas until Final Inspection.

b. Bid Item 2, Dry Broadcasting

- (1) This item shall consist of site preparation, fertilizing, seeding and mulching on slopes greater than 3.5:1. This includes all structure slope areas designated as receiving Seed Mix II, all channel slope areas, designated as receiving Seed Mix III, and all embankment slope areas, designated as receiving Seed Mix IV, as shown on the drawings.
- (2) In Section 2, Materials, Soil Admendments shall not apply.
- (3) In Section 2, Materials, Straw Mulch Materials, "hay, grass cut from native grasses" shall not apply.
- (4) In Section 3, Seeding Mixtures, Sod, Sprigs and Dates of Planting, sod and sprigs shall not apply.
- (5) In Section 4, Seed Bed Preparation and Treatment, areas to be treated shall be left in a roughened condition resulting from disking, harrowing, chiseling or by other approved method. Also, the tilled depth as specified (4 to 6 inches) does not apply. The soil shall be tilled as specified in Section 7(b) 15.
- (6) In Section 5, Seeding, Sprigging, Fertilizing, Mulching and Stabilizing, references to "sprigging" shall not apply.
- (7) Seeding operations shall be conducted between October 15 and December 1.
- (8) Due care shall be taken during the seeding operations to prevent damage to existing structures in the seeding area.
- (9) Premixing of the seed is permitted if the Contractor submits satisfactory evidence to the Contracting Officer that the seed of each species in the mix will be placed at the specified application rate.
- (10) Fertilizer shall be as specified in Bid Item 1, Section 7.a (10) and (12).

- (11) Legume seed shall be scarified by mechanical means. Add seed to rotating bin scarifier lined with coarse grit sandpaper. Operate at 60 to 100 RPM for not more than two (2) minutes. Provide sample to Contracting Officer. Adjust speed and run time as directed to properly scarify seed.
- (12) No additional soil amendments will be required.
- (13) In Section 2, Materials, Mulch Tackifiers, tackifier shall be an organic muciloid containing no agents toxic to seed germination. When applied, tackifier shall form a transparent crust permeable by air and water.
- (14) The seeding mixture shall be of the species and be applied at the rates listed below. Alternates are provided where certain species are not available. Any change to a seed mixture by substitution of an alternate shall be approved by the Contracting Officer.

Type II Seed Mix:

<u>Species</u>	<u>PLS Rates/Ac</u>
Atriplex polycarpa Desert saltbush	2.0 lb.
Ambrosia deltoidea Triangle leaf bursage	3.0 lb.
Encelia farinosa Brittle bush	1.0 lb.
Sphaeralcea ambigua Globe mallow	1.0 lb.
Cassia covesii Desert senna	1.5 lb.
Aristida purpurea Purple three awn (do not de-awn)	1.5 lb.
Festuca megalura Foxtail fescue	2.0 lb.

Alternates:

<u>Species</u>	<u>PLS Rates/Ac</u>
Atriplex canescens	4 oz.
Fourwing saltbush (dewinged)	
Ambrosia dumosa	2.0 lb.
White bursage	
Plantago insularis	1.0 lb.
Indian wheat	
Schismus barbatus	2.0 lb.
Arabian grass	
Cenchrus ciliaris	3.0 lb.
Buffelgrass (flame coated)	

Type III Seed Mix:

<u>Species</u>	<u>PLS Rates/Ac</u>
Sphaeralcea ambigua	2.0 lb.
Globe mallow	
Cassia covesii	1.5 lb.
Desert Senna	
Aristida purpurea	4.0 lb.
Purple three awn (do not de-awn)	
Festuca megalura	4.0 lb.
Foxtail fescue	

Alternates:

<u>Species</u>	<u>PLS Rates/Ac</u>
Plantago insularis	1.0 lb.
Indian wheat	
Baileya multiradiata	1.0 lb.
Desert marigold	
Schismus barbatus	2.0 lb.
Arabian grass	
Cenchrus ciliaris	3.0 lb.
Buffelgrass (flame coated)	

Type IV Seed Mix:

<u>Species</u>	<u>PLS Rates/Ac</u>
Prosopis juliflora velutina Velvet mesquite (scarify and inoculate)	3 oz.
Sphaeralcea ambigua Globe mallow	1.0 lb.
Cassia covesii Desert senna	0.75 lb.
Aristida purpurea Purple three awn (do not de-awn)	2.0 lb.
Festuca megalura Foxtail fescue	2.0 lb.

Alternates:

<u>Species</u>	<u>PLS Rates/Ac</u>
Cercidium floridum Blue palo verde (scarify and inoculate)	3 oz.
Plantago insularis Indian wheat	0.5 lb.
Baileya multiradiata Desert marigold	0.5 lb.
Schismus barbatus Arabian grass	1.0 lb.
Cenchrus ciliaris Buffelgrass (flame coated)	1.5 lb.

- (15) Atriplex canescens seed shall be from a source located at an elevation of between 500 and 2,500 feet above sea level.
- (16) Method of installation shall be as follows:
- aa. Till soil in a direction parallel with prevailing slope to a depth of 8 inches by disking, harrowing, chiseling, or other approved method. Leave soil surface in roughened condition. Condition of soil surface shall be approved by Contracting Officer prior to commencing seeding operations. Tilling shall not be performed when soil conditions are excessively moist or dry. Contracting Officer shall determine suitability of soil conditions for tilling operations.

- bb. Apply the specified seed mix and fertilizer by dry broadcasting. Fertilizer shall be distributed at a rate of 100 pounds per acre. Coverage shall be uniform. Application method shall be approved by Contracting Officer.
- cc. Apply, with industry standard blower equipment, straw mulch at a rate of two tons per acre. Crimp straw mulch in place with a blunt notched disk roller. Do not apply straw mulch to areas designated as receiving gravel cover.
- dd. Apply tackifier at a rate of 80 pounds per acre.

(17) The Contractor shall be responsible for damage caused to seeded areas until Final Inspection.

CONSTRUCTION SPECIFICATION

8. MOBILIZATION

1. Scope

The work shall consist of the mobilization of the Contractor's forces and equipment necessary for performing the work required under the contract. Mobilization will not be considered as work in fulfilling the contract requirement for commencement of work.

Mobilization shall include the cost for transportation of personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary facilities at the site not covered in specific bid items, and other preparatory work at the site. The cost of the entire amount of premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable shall be paid upon request when evidence of full payment to the surety has been provided to the Contracting Officer.

Work done under this specification shall not include mobilization for any specific item of work for which payment for mobilization is provided elsewhere in the contract.

The specification covers mobilization for work required by the contract at the time of award. If additional mobilization costs are incurred during performance of the contract as a result of changed or added items of work for which the Contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the items of work changed or added.

2. Payment

Payment will be made as the work proceeds, after presentation of invoices by the Contractor showing his own mobilization costs and evidence of the charges of suppliers, subcontractors, and others for mobilization work performed by them. If the total of such payments is less than the contract lump sum for mobilization, the unpaid balance will be included in the final contract payment. Total payment will be the lump sum contract price for mobilization, regardless of actual cost to the Contractor.

Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated in the project, or the purchase costs of operating supplies.

Payment of the lump sum contract price for mobilization will constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to completion of the work.

3. Items of Work and Construction Details

Items of work to be performed in conformance with this specification and the construction details are:

a. Bid Item 3. Mobilization

- (1) This item shall consist of the mobilization of the Contractor's equipment and forces as required for performing the work required under this contract.

CONSTRUCTION SPECIFICATION

61. LOOSE ROCK RIPRAP

1. Scope

The work shall consist of the construction of loose rock riprap revetments and blankets, including filter layers or bedding where specified.

2. Materials

Rock for loose rock riprap shall conform to the requirements of Material Specification 523 or, if so specified shall be obtained from designated sources. It shall be free from dirt, clay, sand, rock fines, and other materials not meeting the required gradation limits.

At least 30 days prior to delivery of rock from other than designated sources, the Contractor shall designate in writing the source from which he intends to obtain the rock and information satisfactory to the Contract Officer that the material meets the requirements of the contract. The Contractor shall provide the Engineer free access to the source for the purpose of obtaining samples for testing. The size and grading of the rock shall be specified in Section 8 of this specification.

Rock from designated sources shall be excavated, selected, and processed as necessary to meet the quality and grading requirements in Section 8 of this specification. The rock shall conform to the specified grading limits when installed in the riprap.

Filter or bedding materials when required, shall, unless otherwise specified, conform to the requirements of Material Specification 521.

3. Subgrade Preparation

The subgrade surfaces on which the riprap or bedding course is to be placed shall be cut or filled and graded to the lines and grades shown on the drawings. When fill to subgrade lines is required, it shall consist of approved materials and shall conform to the requirements of the specified class of fill.

Riprap shall not be placed until the foundation preparation is completed and the subgrade surfaces have been inspected and approved by the Engineer.

4. Equipment-Placed Rock Riprap

The rock shall be placed by equipment on the surfaces and to the depths specified. The riprap shall be constructed to the full course thickness in one operation in such a manner as to avoid serious displacement of the underlying materials. The rock shall be delivered and placed in a manner that will insure that the riprap in place shall be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks and spalls filling the voids between the larger rocks.

Riprap shall be placed in a manner to prevent damage to structures. Hand placing will be required to the extent necessary to prevent damage to the permanent works.

5. Hand-Placed Riprap

The rock shall be placed by hand on the surfaces and to the depths specified. It shall be securely bedded with the larger rocks firmly in contact one to another. Spaces between the larger rocks shall be filled with smaller rocks and spalls. Smaller rocks shall not be grouped as a substitute for larger rock. Flat slab rock shall be laid on edge.

6. Filter Layers and Bedding

When the drawings specify filter layers or bedding beneath riprap, the filter or bedding material shall be spread uniformly on the prepared subgrade surfaces to the depth specified. Compaction of filter layers or bedding will not be required, but the surface of such layers shall be finished reasonably free of mounds, dips, or windrows.

7. Testing

The Engineer will perform such tests as are required to verify that the riprap, filter, and bedding materials and the completed work meet the requirements of the specifications. These tests are not intended to provide the Contractor with the information he needs to assure that the materials and workmanship meet the requirements of the specifications, and their performance will not relieve the Contractor of the responsibility of performing his own tests for that purpose.

8. Measurement and Payment

For items of work for which specific unit prices are established in the contract, the quantity of each type of riprap, placed within the specified limits will be measured to the nearest ton by actual weight, and the volume of each type of filter layer or bedding will be measured within the specified limits and computed to the nearest cubic yard by the method of average cross-sectional end areas. For each load of rock placed as specified, the Contractor shall furnish to the Engineer, a statement of delivery ticket showing the weight to the nearest 0.1 ton of rock in the load.

Payment for each type of riprap, will be made at the contract unit price for that type of riprap. Payment for each type of filter or bedding will be made at the contract unit price for that type of filter or bedding. Such payment will be considered full compensation for all labor, materials, equipment, and all other items necessary and incidental to the completion of the riprap, filter layers, and bedding.

The following provisions apply to all methods of measurement and payment. Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 9 of this specification.

9. Items of Work and Construction Details

Items of work to be performed in conformance with this specification and the construction details are:

a. Bid Item 4. River Run Rock.

- (1) This item shall consist of procuring and placing river run rock in the plant basins as described in this specification and shown on the drawings.
- (2) Rock shall be uncrushed, uncoated, rounded, smooth and worn particles, 6 to 12 inches in size and shall be free of debris and fines.
- (3) Place river run rock in all planting basins as shown in drawings. The rock shall be placed in one operation in a manner which will produce a reasonably well graded mass with the larger rock evenly distributed throughout the mass. Place rock in such a manner as to avoid damage to plant materials and structures.

CONSTRUCTION SPECIFICATION

202. GRAVEL COVER

1. Scope

The work shall consist of the construction of gravel cover over slopes or on other areas that are subject to erosion.

2. Materials

Gravel shall meet the requirements of Section 8 of this specification or be obtained from designated sources as shown on the drawings. Gravel from designated sources shall be excavated, selected, handled, and processed as necessary to meet the quality and grading requirements specified.

3. Subgrade Preparation

The subgrade surfaces shall be the neat lines and grades shown on the drawings.

Gravel cover shall not be placed until the subgrade surfaces have been inspected and approved by the Engineer.

4. Placement

The gravel cover shall be placed by equipment on the surfaces and to the depths specified in Section 8 of this Specification. The cover shall be constructed to the full course thickness in one operation and in such a manner as to avoid serious displacement of the underlying materials. The gravel shall be delivered and placed in a manner that will ensure that the cover in-place shall be reasonably homogeneous and the fractions well distributed.

Hand placing of gravel cover shall be required to the extent necessary to prevent damage to the permanent works.

The gravel cover may be placed in sequence with the placement of earth fill zones of the embankment or after completion of the embankment. If sequential placement is used, it is emphasized that the Contractor shall complete the earthwork to the required cross-sectional line and grade prior to gravel cover placement. Contamination of earth fill zones by gravel cover placement operations will not be allowed. Surfaces of the completed gravel cover shall be finished reasonable free of mounds, dips, or windrows to the lines and grades specified.

5. Compaction and Moisture Requirements

No compaction will be required beyond that resulting from the placing and spreading operations unless otherwise specified in Section 8 of this specification. Moisture control shall be that necessary to control dust during borrow and placing operations.

6. Testing and Measurements

The engineer will perform such tests and measurements as are required to verify that the gravel material and work meet the requirements of this Specification. These tests are not intended to provide the Contractor with the information he needs to assure that the materials and workmanship meet the requirements of this Specification, and their performance will not relieve the Contractor of the responsibility of performing his own tests for the purpose.

7. Measurement and Payment

For items of work for which specific unit prices are established in the contract, the true surface area of gravel cover will be measured within the specified pay limits and computed to the nearest square yard. Payment for gravel will be made at the contract unit price. Such payment will be considered full compensation for all labor, materials, equipment, and all other items necessary and incidental to the placement of the gravel.

Compensation for any items of work described in the contract but not listed in the Bid Schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 8 of this Specification.

8. Items of Work and Construction Details

Items of work to be performed in conformance with this specification and the construction details are:

b. Bid Item 5, Gravel Cover

- (1) This item shall consist of procuring and distributing gravel cover as described in this specification and as shown in the drawings.
- (2) Section 3, Subgrade Preparation, the subgrade surfaces shall be the surface of the existing earthen flood control structure.
- (3) Gravel cover shall be pit run or skip graded material and shall be free of debris and fines.
- (4) Material shall have the following size gradation:

Size of Opening (inches)	Percent Passing (by weight)
15	100
8	40-80
2	0-10
1	0

- (5) Place gravel cover after completion of seed application.
- (6) Do not apply straw mulch in gravel cover area.
- (7) Each Transition and Gravel Cover Area shall have the required number of tons of gravel cover per square yard of surface area as specified below. The gravel cover shall be evenly distributed over the entire surface ranging from a minimum of 3-inches up to the maximum particle size of material specified and as shown in the drawings.

Transition Area #1 - 0.1 tons per sq. yd.
Transition Area #2 - 0.2 tons per sq. yd.
Gravel Cover - 0.3 tons per sq. yd.

CONSTRUCTION SPECIFICATION

440. PLANTING TREES AND SHRUBS

1. Scope

This work shall consist of planting containerized plants as specified and as shown on the drawings.

2. Materials

- A. Containerized plants shall be healthy, shapely, and well rooted, with roots showing no evidence of having been damaged, restricted, or deformed. Plants found to be root or pot bound will not be acceptable. Plants shall be vigorous and free of disease, insect pests, eggs, or larva and shall be subject to inspection and approval by the Contracting Officer upon delivery.

Quality and size of plants shall be in accordance with rules and grading adopted by the American Association of Nurserymen, Inc., and included in the American Standard for Nursery Stock. Plant materials shall be grown in nurseries which have been inspected by the State Department of Agriculture and have complied with the regulations thereof. Inspection certificates shall be submitted to the Contracting Officer. The Contractor shall obtain clearance from the County Agricultural Commissioner, as required by law, before planting plants delivered from outside the County in which they are to be planted. Evidence that such clearance has been obtained shall be filed with the Contracting Officer.

- B. Durable, legible labels in weather-resistant ink stating the correct botanical name shall be securely attached to all plants.
- C. Mulch shall be 5% minimum nitrogen-stabilized composted forest product, consisting of composted ground or shredded fir or pine bark or shavings. The mulch shall have a minimum pH of 7.0 and shall not exceed 7.5.
- D. Gypsum shall be agricultural gypsum, composed of calcium sulfate.

- E. Tree ties shall be double strand twisted 12 gauge galvanized steel wire, looped around tree trunk through 12 inch length of 2 ply reinforced garden hose as shown in drawings.
- F. Water used in installation of plantings shall be clear and free from injurious amounts of oil, salt, acid, alkali, or any other toxic substances. It shall be the responsibility of the Contractor to make necessary arrangements for use of available water supplies.

3. Planting Requirements

- A. No planting will be allowed in soil that, in the opinion of the Contracting Officer, is too wet, too dry, or otherwise improperly conditioned.
- B. Plants shall be of the varieties and arrangements as shown on the drawings. The locations of plants shall be marked by the Contractor for approval of the Contracting Officer prior to excavating the plant pits. The locations shall be marked by stakes, paint, or other approved means. The Contractor shall give 2 days prior notice for plant location inspection by the Contracting Officer.
- C. Minimum excavated tree planting hole shall be:
 - 1. For 1 to 4 gallon container plants: 12 inches greater than the rootball.
 - 2. For 5 to 8 gallon container plants: 18 inches greater than the rootball.
- D. The side of the pit shall be vertical, lightly scarified, and the bottom shall be loosened to a minimum additional depth of 2 inches.
- E. Plants shall be removed from containers just prior to planting. Cans shall be cut on at least 2 sides opposite each other so as to remove plants without damage to the root ball. Plants found to be root or pot bound will not be accepted.
- F. Adjust plants on mound of packed planting mix in the upright and to center position of pit, and so that the top of the root ball will be at finish grade as shown on the drawings. Backfill pits with planting mix, tamping mix to eliminate air pockets.

G. Immediately after planting, tree stakes and protective netting shall be installed. Stakes shall be driven vertically to specified depth or as required and shall not be driven through the rootball of the plant. Netting shall completely encircle each plant and shall have a minimum 12 inch overlap. Attached netting to stakes with 3-1/2" heavy duty staples per stake.

H. Water all plants immediately after planting.

4. Measurement and Payment

For items of work for which specific unit prices are established in the contract, payment for each type, kind and size of plant will be made at the contract unit price for that size of plant.

Such payment will be considered full compensation for all labor, equipment, transportation and materials and all other items necessary and incidental to the completion of the work.

Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the items to which they are made subsidiary are identified in Section 5 of this specification.

5. Items of Work and Construction Details

Items of work to be performed in conformance with these specifications and the construction details are:

- a. Bid Item 6, Planting 5 Gallon Trees.
Bid Item 7, Planting 1 Gallon Shrubs.

- (1) These items shall consist of furnishing and planting plants, including protective netting, staking and guying, as shown on the drawings and as specified in these specifications.
- (2) Maximum Calcium Carbonate Equivalent shall be 15% as determined from the "Quantitative Calcium Carbonate Equivalent Determination in the Field" test by George G.S. Holmgren (Soil Science Society of America Proceedings, Vol. 37, No. 2, March-April 1973.)
- (3) Fertilizer shall be a hard prill type fertilizer, which is uniform in composition, pelleted, and dry. Guaranteed analysis shall be as follows:

Ammoniacal nitrogen (N)	16.0%
Available phosphoric acid (P ₂ O ₃)	8.0%
Water soluble potash (K ₂ O)	4.0%
Sulphur (S)	18.0%
Iron (Fe), chelated	1.5%
Manganese (Mn), chelated	0.1%
Zinc (Zn), chelated	0.1%
- (4) Soil sulphur shall be grained agricultural sulphur, containing 99.5% sulphur.
- (5) Netting shall be 36 inch width galvanized poultry wire with one inch mesh and shall be supported by a minimum of 4 evenly spaced 1 inch x 2 inch x 42 inch redwood stakes per plant.
- (6) Tree stakes shall be 2 inches minimum diameter manufactured from lodgepole pine and shall be pressure treated with a copper sulfate preservative. Provide quantity of stakes as shown on the details.

- (7) Backfill mixture shall consist of, by volume, 1 part of mulch and 2 parts soil. Add, per 5 gallon plant pit, 1/4 pound of fertilizer, 1 pound of gypsum, and 1/2 pound of soil sulphur. For one gallon plant pits, use 1/2 the amounts of fertilizer, gypsum, and sulphur. Planting backfill mix shall be thoroughly blended to an homogeneous mixture prior to use in backfilling operations.
- (8) All tree species shall be multi-trunk.
- (9) In Section 4, Measurement and Payment, payment shall only include compensation for that water used in initial planting of trees and shrubs. Payment for water used to irrigate and maintain planted stock shall be included in Bid Item 8, Landscape Establishment.

CONSTRUCTION SPECIFICATION

480. LANDSCAPE ESTABLISHMENT PERIOD

1. Scope

The work shall consist of furnishing all materials and labor necessary to establish and/or replace plants and to assure maximum possible survival and vigorous growth of all plants until Final Inspection.

2. General

The Landscape Establishment Period for all trees and shrubs shall be for a minimum period of 90 days and until final inspection. The trees and shrubs shall be installed so that the 90 day establishment period is expired within the performance time allocated under this contract.

The Contractor shall furnish a schedule of the proposed plant establishment operations to the Contracting Officer for review and approval within 1 week of receiving the Notice to Proceed.

3. Inspections

Inspections shall be performed every 30 days or when reasonable to do so by the Contracting Officer to determine if plant establishment is taking place. All dead and unhealthy stock shall be removed and replaced within 5-calendar days from the date of inspection. The Contractor shall notify the Contracting Officer in writing when the replacement work has been performed. Stock furnished for replacement shall be of the same size and species as originally specified. The survivability of a plant shall be determined by the Contracting Officer.

4. Irrigation

The Contractor shall be responsible for irrigating the planted trees and shrubs as necessary to keep the soil moist throughout the root system until final inspection.

Water shall be applied in a manner so as to prevent erosion or damage to basins around plants.

5. Measurement and Payment

Payment will be made as the work proceeds, after presentation of invoices by the Contractor showing his own costs and evidence of the charges of suppliers, subcontractors, and others for landscape establishment work performed by them. If the total of such payments is less than the contract lump sum for landscape establishment, the unpaid balance will be included in the final contract payment. Total payment will be the lump sum contract price for landscape establishment, regardless of actual cost to the contractor.

Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated in the project, or the purchase costs of operating supplies.

Payment of the lump sum contract price for landscape establishment will constitute full compensation for all labor, materials, equipment and other items necessary and incidental to completion of the work.

6. Item of Work and Construction Details

Items of work to be performed in conformance with this specification and the construction details are:

a. Bid Item 8. Landscape Establishment

- (1) This item shall consist of furnishing all labor and materials necessary to promote the establishment and vigorous growth of the trees and shrubs.
- (2) In Section 5, Measurement and Payment, payment shall include compensation for water for irrigation.