TECHNICAL PROVISIONS

1.01 GENERAL:

The work covered by these specifications will be constructed on the Yavapai-Prescott Indian Tribal Lands at Prescott in Yavapai County, Arizona . The work will include, but not be limited to, furnishing all labor, tools, equipment and materials and performing all operations in connection with the construction of Yavapai Prescott Indian Tribe Warehouse/Office Building.

The Contractor must familiarize himself with the local conditions of the project sites. Failure to do so shall in no way relieve him of the responsibility for performing any of the work or operations required as a part of this contract. Further information regarding the work or these specifications can be obtained from the Engineer's office at J & K Engineering LLC 931 12th Place, Prescott, AZ 86305, Phone: (928) 771-2588

All construction, materials, and technical provisions shall be in accordance with the construction plans, and the Y.A.G. Standards and Specifications.

Delete Sections 101, 102, 103, 104, 105, 106, 107, 108, and 109 of the MAG Standard Specifications and replace with the applicable sections of the General Provisions.

The bidder is required to carefully examine the site of the proposed work, the Proposal, the Plans, and the Specifications. He shall satisfy himself as to the character, quality and quantities of work to be performed, materials to be furnished, and as to the requirements of these specifications. The submission of a Bid shall be evidence that the Bidder has made such an examination.

1.02. STATUS OF LAND, RIGHT-OF-WAY, AND EASEMENTS: CONSTRUCTION LIMITS:

This site is entirely located within the Prescott, Yavapai Indian Reservation. It shall be the responsibility of the Contractor to coordinate activities and access to the site with the Tribal Engineer.

1.03. ELECTRIC POWER AND CONSTRUCTION WATER SOURCE:

It shall be the responsibility of the Contractor to supply electrical generators or make arrangements with the Arizona Public Service (APS) to supply electrical power to the site should the Contractor need electricity.

It shall be the responsibility of the Contractor to obtain a water source for his water usage on the site.

1.04. EXISTING UTILITIES:

The size and location of underground utilities as noted on the plans are from the best information available as established from actual field observations and study of drawings and are believed to be correct; however, the contractor must take sole responsibility for damage to any utility line encountered whether or not located on the plans. The Contractor is responsible

for notifying the blue stake center for the location of all underground utilities two working days before they dig.

1.05. MATERIALS FURNISHED BY OWNER:

The Contractor is responsible for furnishing all materials necessary to complete the work as shown on the construction drawings and contained within the documents for this project.

1.06. OPERATIONS WITH OTHERS:

The Owner reserves the right to have other work performed by other contractors and to permit the public utility companies and others to do work on and adjacent to the site. The Contractor shall conduct his operations and cooperate with the other parties so as to minimize interference with this other work. Should a difference arise as to the rights of the Contractor and others, the Engineer, as the Owner's representative, shall be sole mediator and his decision shall be final and binding on the Contractor.

1.07. QUALIFICATIONS FOR EMPLOYMENT:

No person under the age of 16 years for normal occupations, no person under the age of 18 years in hazardous occupations, and no person currently serving a sentence in a penal or correctional institution shall be employed to perform any work under this Contract.

No persons whose age or physical condition is such as to make his employment dangerous to his health and safety, or others, shall be employed to perform any work under this Contract provided, however, this condition shall not operate against the employment of physically handicapped persons who are otherwise employable and may safely be assigned to work which they can ably perform.

1.09 <u>SUBMITTALS</u>:

A. Submittals are required:

1. Where called for in these specifications or on the drawings.

2. For any item the Contractor proposes to substitute for a specified item as an "or equal".

3. For any proposed design change or deviation from these specifications or the drawings.

4. For anything in these plans or specifications found to conflict with applicable codes and ordinances.

5. For anything the Contractor doesn't understand.

B. Six sets of submittals shall be provided to the Engineer at least three weeks before a determination is required. Substitutions or deviations not approved by the Engineer will risk rejection.
Submittals may be drawings, sketches, manufacturer's literature, catalog descriptions, or other descriptions in sufficient detail to allow a decision. The submittal will indicate

the amount to be added to or deducted from the bid price should the submittal be accepted.

1.10 PROTECTION OF SITE:

Except as otherwise provided herein, the Contractor shall protect all fences, structures, walks, utilities, trees, shrubbery, lawns, etc. During the progress of the work he shall remove all debris and unused materials and shall, upon completion of the work, restore the site as nearly as possible to its original condition, including the replacement, at the Contractor's sole expense, of any facility which has been destroyed or damaged beyond restoration.

1.11 UTILITIES:

Unless otherwise indicated in these specifications, the Contractor shall arrange for and provide any required utilities at his sole cost and expense. This includes but is not limited to water for compaction or testing, power for operating his plant or equipment including testing installed equipment, and personnel sanitation facilities.

1.12 STANDARD SPECIFICATIONS:

When referred to in these specifications, the following means the latest edition, publication, standard, or specification of:

AASHTO	American Association of State Highway and Transportation Officials
ADOT	Arizona Department of Transportation
ACI	American Concrete Institute
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
AWWA	American Waterworks Association
FDA	Food and Drug Administration
NEMA	National Electrical Manufacturers' Association
NEC	National Electrical Code
NSF	National Sanitation Foundation
OSHA	Occupational Safety and Health Administration
SSPC	Steel Structures Painting Council
UL	Underwriters Laboratories, Inc.
UPC	Uniform Plumbing Code

1.13 NOTIFICATION REQUIREMENTS:

It shall be the Contractor's responsibility to notify all utility companies involved whenever a utility line is to be cut, tapped, moved, or in any way disturbed from its original placement. Sufficient notice shall be given to the utility company so that its users can be informed of any disruption of service. Such notice must be given no less than 48 hours in advance.

PART 200

CLEARING AND GRUBBING

UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION - 1979, AND SUPPLEMENTS AND UPDATES (MAG SPECIFICATIONS), AS MODIFIED BY Y.A.G. STANDARDS, 1998, AND SUPPLEMENTS AND UPDATES, WITH THE FOLLOWING ADDITIONAL AND/OR CLARIFYING PROVISIONS:

SECTION 201: CLEARING AND GRUBBING

Section 201, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this specification with the following additional and/or clarifying provisions:

A. REMOVALS GENERAL:

Existing improvements, pavement, vegetation, designated fencing, and other material within the grading and paving limits shall be removed as indicated on the contract plans, noted herein or required to complete the project. Items and material not suitable for the construction of embankments as determined by the Engineer shall be removed from the site and become the property of the Contractor. Tree roots and stumps shall be removed from all embankment areas, as specified, for embankments of from zero (0) to two (2) feet on Table 201, MAG Specifications/Y.A.G. Standards. The Contractor shall not damage areas outside of the grading limits or authorized work and/or staging areas.

B. MEASUREMENT AND PAYMENT:

Removal of existing improvements, vegetation, designated pavement and fencing and other material not suitable or needed for embankment construction will be measured and paid as one Lump Sum (LS), removed as directed and in accordance with the provisions of Section 109 and the Contract Proposal.

SECTION 205: ROADWAY EXCAVATION

Section 205, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this specification with the following additional and/or clarifying provisions:

Description

Earthwork shall consist of roadway excavation and fill of material to provide grading per the final grades shown on the grading plans. The Contractor shall acquaint himself with the site and proposed grades. Should an imbalance in the final earthwork be experienced, consult the engineer to determine an area to balance earthwork.

Unsuitable Material

Material shall be considered unsuitable for fill, sub grade, shoulders and other uses if it contains organic matter, soft spongy earth, or other nature that compaction to the specified density is unobtainable.

Material that is unsuitable for the intended use, shall be excavated and disposed of as directed by the Engineer.

The removal and disposal of such unsuitable material will be considered in the cubic yard cost of roadway excavation.

Rock

Notwithstanding any provisions in these Special Provisions, General Provisions or any other matters specified in the Plans and Specifications, the Contractor is hereby informed that soil seismic information for a portion of the site is included as a part of the geotechnical report. The report is provided as information to the Contractor. The Owner makes no representation or warranty as to the accuracy of the data, the soil and rock materials to be encountered, or to the difficulty of excavation, The Contractor shall be responsible for familiarizing himself with the site, verify the data and satisfy himself as to the type, nature and quantities of all materials to be excavated. All trenching and excavating, regardless of materials encountered, equipment or methods required for roadway excavation, will be unclassified and the cost thereof shall be considered as being included in the roadway excavation cost per cubic yard. Rock shall be deemed any material found not rip-able by a D10 bulldozer. An allowance for blasting services has been provided to cover blasting costs plus 15% markup. No additional payment or change orders will be allowed for handling or moving the rock excavation.

Fill

Fill shall be placed per section 211.2, 211.3 and 211.4 of MAG Standard Specifications

Measurement

Measurement for earthwork shall be on a cubic yard basis.

Payment

Payment for earthwork will be paid for on a cubic yard basis. Such price shall include stripping, excavation, fill backfill, compaction, grading, hauling, removal and disposal of excess excavated material, rock and debris.

SECTION 211: FILL CONSTRUCTION

Section 211, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this Specification.

A. Prior to placing any fill, the area shall be cleared of organic soil and debris, scarified to a depth of at least six (6) inches, and compacted as prescribed below.

B. All roadway embankments not containing oversize stones shall be placed in uncompacted-compacted lifts of six (6) to eight (8) inches. The moisture content shall be adjusted and the material shall be compacted, as required below, and determined by AASHTO T-99.

MATERIAL	MOISTURE CONTENT	DEGREE OF COMPACTION
Subgrade Clay Soils	3% Below Optimum to Optimum	Minimum of 95% of Maximum Dry Density Minimum of 100% of Maximum Dry Density Below ten feet
Sub Grade Granular Soils	± 2% of Optimum	Minimum of 95% of Maximum Dry Density Minimum of 100% of Maximum Dry Density Below ten feet

C. Roadway embankments, including oversize rock, shall be placed in horizontal lifts at thicknesses consistent with compaction equipment used to achieve uniform density throughout the lift thickness. This material shall be placed in layers not exceeding in thickness the approximate average size of the larger rocks, but not greater than three (3) feet. Each layer shall be leveled and smoothed with suitable equipment. The larger rocks shall be separated throughout each layer so that spalls, finer fragments of rock, and soil material can be evenly distributed between them to form a dense and compact mass with no large unfilled spaces existing within the fill. Where end dumping is employed, direct end dumping upon the entire previously constructed layer will not be permitted. Rock should be dumped on the layer being constructed and dozed ahead into place. Rock fill shall be relatively well graded and free of vegetation and deleterious materials. The upper three (3) feet of fill shall be selected material with an absence of oversize particles, low plasticity index, and sufficient fine fraction.

D. Excavated material in excess of that required for roadway embankment and structure backfill shall be removed from site.

E. MEASUREMENT AND PAYMENT:

No separate measurement or payment will be made for roadway embankment, structure backfill removed from site. This work will be considered as incidental to Section 205, Roadway Excavation.

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SECTION 220: RIPRAP CONSTRUCTION:

Section 220 MAG Specifications/Y.A.G. Standards, is hereby included and made a part of the specification.

A. Angular rock riprap shall be supplied and placed in the locations and to the dimensions and sizes shown on the project plans or and as directed by the engineer in conformance with Section 220.

B. All riprap shall be under laid with “High Survivability” filter fabric which conforms with the requirements of Arizona Department of Transportation Specifications for Road and Bridge Construction, 2000 Section 1014.

C. Measurement and Payment:

Measurement and payment for riprap construction will be made at the unit price bid by the number of Square Yards (SY) of riprap placed at the locations shown on the project plans or at the direction of the engineer. Riprap material placed without the authorization of the engineer will not be measured or paid.

SECTION 225: WATERING

Section 225, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this specification

PART 300

STREETS AND RELATED WORK

UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION - 1979, AND SUPPLEMENTS AND UPDATES (MAG SPECIFICATIONS), AS MODIFIED BY Y.A.G. STANDARDS, 1998, AND SUPPLEMENTS AND UPDATES, WITH THE FOLLOWING ADDITIONAL AND/OR CLARIFYING PROVISIONS:

SECTION 301: SUBGRADE PREPARATION

Section 301, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this specification with the following additional and/or clarifying provisions:

A. Subsequent to roadway excavation, embankment construction, drainage structure and conduit installation, the exposed subgrade shall be compacted to ninety-five percent (95%) of maximum density at the moisture content in accordance with the table contained in Section 211 above and the grading tolerances of Section 301.

B. MEASUREMENT AND PAYMENT:

Subgrade preparation of roadways will be measured and paid by the Square Yard (SY) at the unit price bid for Roadway Fine Grading.

SECTION 310: UNTREATED BASE

Section 310, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this specification with the following additional and/or clarifying provisions:

A. Untreated base shall consist of Aggregate Base (ABC) materials meeting the requirements of Section 702, Y.A.G. Specifications.

B. The Aggregate Base (ABC) shall be placed and compacted to a minimum density of ninety-five percent (95%) of the maximum dry density as determined by AASHTO T-99. Acceptance tests will be conducted by the Engineer.

C. MEASUREMENT AND PAYMENT:

Measurement and payment for the Aggregate Base (ABC) will be for the number of Square Yards (SY) of material meeting the Contract Specifications placed and compacted to the neat-lines for paving as shown on the Plans or as directed by the Engineer. ABC placed under concrete curb and gutter or sidewalks will not be measured for payment, but shall be considered as incidental to curb or sidewalk construction.

SECTION 321: ASPHALT CONCRETE PAVEMENT

Section 321, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this Specification with the following additional and/or clarifying provisions:

A. All asphalt concrete shall conform to the Specifications, Section 710, for gradation C-3/4 – Medium traffic conditions.

B. Within seven (45) calendar days of Notice of Award, the Contractor shall submit the proposed mix design to the Engineer for approval. No asphalt concrete shall be placed prior to approval of the mix design.

C. No asphalt concrete shall be placed prior to acceptance of the surface of the aggregate base course by the Engineer.

D. The Contractor shall have all necessary personnel and equipment required for the placement and compaction of asphalt concrete on-site, clean and operational prior to the commencement of paving operations. If, in the opinion of the Engineer, staff and/or equipment are or become inadequate after paving has started, paving operations shall be suspended.

E. Asphalt concrete shall be placed in lifts no thicker than 3 inches in compacted thickness. A tack coat meeting the requirements of Section 329 of MAG Specifications shall be applied prior to placement of asphalt concrete over existing pavement or between lifts of when judged as necessary by the engineer.

F. MEASUREMENT AND PAYMENT:

Measurement and payment for asphalt concrete will be in accordance with Section 321.8 and 321.9, respectively, for asphalt concrete by the price bid per Square Yard (SY) of the specified thickness. No separate measurement or payment will be made for Tack Coat. Tack Coat shall be considered as incidental to AC pavement. Measurement and payment for Thickened Pavement edge will be by the price bid per Lineal Foot (LF) at the unit price bid.

321.10 Asphalt Concrete Pavement Cost Adjustment:

(A) General:

The Owner will adjust monthly progress payments up as appropriate for cost fluctuations in asphalt concrete as determined in accordance with these technical provisions.

A cost adjustment will be made when fluctuations in the local plant price of asphalt pavement materials in excess of 10 percent, occur throughout this contract. The Owner will not provide such adjustments for fluctuations in the price of asphalt concrete of 10 percent or less.

No adjustments will be made for fluctuations in the price of transport or placement.

(B) Measurement:

The index price of asphalt concrete will be determined by the Owner from the selling price of asphalt concrete provided by Rinker Materials in the Prescott Area. The base index price to be used will be the plant price for 19mm Asphalt Concrete FOB on June 1, 2009.

This price will be deemed to be the "initial cost" for asphalt concrete for this project.

The amount of adjustment per ton will be the net difference between the "initial cost," adjusted by 15 percent, and the then current price. The monthly adjustment will be determined by the Engineer thru receipts provided by the contractor and contact with local suppliers of asphalt concrete in the Prescott area. These adjustments will be included in the payment estimate

as an asphalt concrete adjustment. For fluctuations in excess of 10 percent, fuel cost adjustments will only be made for current price increases greater than 1.10 times the "initial cost" or for decreases less than 0.90 times the "initial cost." No calculation will be made for fluctuations in the current index price of 10 percent or less when compared to the "initial cost."

No additional compensation will be made for any additional charges, costs, expenses, etc., which the contractor may have incurred since the time of bidding and which may be the result of any fluctuation in other associated costs for asphalt concrete.

No adjustments will be made for work performed beyond the contract time.

The need for application of the adjustments herein to extra work will be determined by the Engineer on an individual basis and, if appropriate, will be specified on the work order.

(C) Payment:

Price adjustments will be shown on the monthly progress estimate for asphalt concrete price adjustment allowance.

SECTION 330: ASPHALT CHIP SEAL

Section 330, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this Specification with the following additional and/or clarifying provisions:

A. The designated pavement area shall receive a single asphalt chip seal coat per YAG Specifications Section 330 and MAG Specifications Section 712. Liquid Asphalt shall be AC-15-5TR applied at the rate of 0.5 Gallons per Square Yard. Cover material shall conform to the requirements of MAG Specifications Section 716, Table 716-2 for high volume roadways and be placed at the rate of 32 pounds per square yard. The roadway surface shall be swept with a “pick-up” broom prior to opening the roadway to traffic.

B. Measurement and Payment:Measurement and payment for asphalt chip seal will be in accordance with Section 35 of the General Provisions, for the price bid per Square Yard (SY).

SECTION 336: PAVEMENT MATCHING AND SURFACING REPLACEMENT

Section 336, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this Specification with the following additional and/or clarifying provisions:

A. Asphalt concrete pavement shall be sawcut to the neatlines indicated on the Plans and/or along the alignment staked by the Engineer. Alternate methods of asphalt concrete pavement cut will be considered if the Contractor can demonstrate that a neat, true line with vertical edges free from irregularities can be achieved. The acceptability of alternate pavement cut methods is totally at the discretion of the Engineer.

B. Pavement replacement shall be in accordance with Standard Details and Specifications.

C. MEASUREMENT AND PAYMENT:

No measurement or payment will be made for temporary pavement, removal and replacement. Payment for temporary pavement replacement shall be included in the cost of the pipe. Saw cutting for temporary pavement replacement will not be measured.

SECTION 340: CONCRETE CURB, GUTTER, SIDEWALK AND DRIVEWAY

Section 340, MAG Specifications/Y.A.G. Standards, and ADOT Construction Standards are hereby included and made a part of this specification with the following additional and/or clarifying provisions:

A. All concrete shall be of the Class indicated and shall conform to the provisions of Section 725, Y.A.G. Standards.

B. NO CONCRETE shall be placed prior to ACCEPTANCE of the base and the concrete forms by the Engineer.

C. Expansion and contraction joints shall be constructed in accordance with the provisions of Section 340, and as shown on the Plans.

D. Cracks or other deformities in the placed concrete shall be removed and replaced at the Contractors expense. Cracks which a dime can fit or where two or more hairline cracks have formed within 1 foot will constitute the need for removal. Also unevenness of the top, face or pan of concrete work will be finished in a neat manner waves greater than 1/4 inch will constitute the need for removal.

D. MEASUREMENT: Concrete construction will be measured as follows:

1. Concrete single curb and curb and gutter will be measured by the Lineal Foot (LF) along the back edge of curb.
2. Concrete sidewalks, driveways and sidewalk ramps, will be measured by the Square Foot (SF) or Each (EA) as indicated in the bid schedule complete in place. Note that the quantity of concrete for sidewalk ramps and driveways are not included within the sidewalk square foot quantity.

E. PAYMENT:

Payment for the concrete items measured as described above will be at the unit price bid and in accordance with the provisions of Section 35 of the General Provisions.

PART 400

RIGHT-OF-WAY AND TRAFFIC CONTROL

UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION - 1979, AND SUPPLEMENTS AND UPDATES (MAG SPECIFICATIONS), AS MODIFIED BY Y.A.G. STANDARDS, 1998, AND SUPPLEMENTS AND UPDATES, WITH THE FOLLOWING ADDITIONAL AND/OR CLARIFYING PROVISIONS:

SECTION 401: TRAFFIC CONTROL

All applicable portions of Section 401, MAG Specifications/Y.A.G. Standards, Traffic Control, are hereby incorporated into this Specification. The following additional conditions shall apply:

A. **The Contractor shall maintain traffic access to the adjacent and nearby residences for the duration of the project. Special traffic access needs are required by several homes. Contractor shall refer to sheet CV15 and CV16 for the locations of these homes.**

B. The Contractor shall provide the traffic control signs, markings and devices in accordance with the Manual of Uniform Traffic Control Devices and ADOT supplements. The contractor shall prepare a traffic control plan and submit the plans to the engineer.

C. Flaggers shall be provided as required and/or deemed necessary by the Engineer to facilitate the safe movement of traffic within the construction area. All flagger control will be considered incidental to the roadway construction.

D. If, at any time during construction, the Engineer feels that the traffic control being provided by the Contractor is inadequate, he may direct the Contractor to provide additional signs, channelization devices and/or flagmen. Should the Contractor fail to provide the required traffic control, the Engineer will arrange for said control. The cost of this control will be deleted from the Contractor's pay.

E. MEASUREMENT AND PAYMENT:

Traffic Control will be measured and payment made as a Lump Sum (LS).

SECTION 431 SEEDING (CLASS II):

1.0 Description:

The work under this item shall consist of furnishing all materials, preparing the soil, applying Class II seed, and establishing the seeded areas per ADOT Standard Specifications.

Areas to be seeded are those disturbed or unvegetated areas listed herein, shown on the plans, called for in the contractor’s erosion control plan, or designated by the Engineer.

Seeding may be included as part of a landscape project as specified in ADOT Standard Specification Section 807, or used for erosion control as part of a Storm Water Pollution Prevention Plan (SWPPP) as specified in Subsection 104.09 of the specifications, or both.

In either case, seeding shall be accomplished in two stages. The first stage shall consist of tillage, furnishing and applying chemical fertilizer, furnishing and planting the contract-specified seed mix, and furnishing, applying and affixing mulch. The second stage, beginning after the first stage has been accepted by the Engineer, shall be a 45 calendar-day period during which time the contractor shall be responsible for maintaining and stabilizing the seeded and mulched areas, and restoring damaged or eroded areas.

Seeding used as part of a SWPPP shall be completed, including the 45 calendar-day maintenance period, before the end of the contract time, or sooner as specified in the SWPPP. Seeding used as part of a landscape project shall be completed, including the 45 calendar-day maintenance period, before the end of the Construction Phase. When seeding is part of a landscape project, the maintenance activities described herein shall be in addition to the work specified in Section 807 for landscape establishment. No time extension will be granted for seeding not completed as specified herein, including the 45 calendar-day maintenance period, before the end of the contract time or Construction Phase as applicable.

2.0 Materials:

2.01 General:

Appropriate documentation, as specified below, shall be submitted to the Engineer a minimum of 30 calendar days before the start of a scheduled seeding activity. No materials shall be delivered to the site until the documentation has been approved by the Engineer.

Unless otherwise specified, Certificates of Compliance conforming to the requirements of Subsection 106.05 of the specifications shall be provided for all materials.

Unless otherwise specified, the contractor shall perform all testing, or provide test results to the Engineer from accredited laboratories as specified herein.

2.02 Seed:

(A) General Requirements:

The species, variety, and strain of seed (designated elsewhere herein as contract-specified seed) shall be as shown on the plans or as specified herein. The contract-specified seed shall be obtained from seed suppliers through harvesting of wildland collections, or field-grown seeds grown prior to or during the contract period.

Within 30 calendar days after the award of contract, the contractor shall submit the name of the seeding subcontractor to be used, along with written confirmation from seed suppliers and collectors, on their letterhead, that the source(s) for the contract-specified seed has been secured. If any of the contract-specified seed is expected to not be available during the contract period prior to seeding, in accordance with Subsection 2.02(B) below, the contractor shall notify the Engineer at this same time.

The seed shall be delivered to the project site unmixed in standard, sealed, undamaged containers for each seed species. Each container shall be labeled in accordance with the appropriate provisions of the Arizona Revised Statues and the U.S. Department of Agriculture rules and regulations under the Federal Seed Act. Labels shall indicate the variety or strain of seed, the percentage of germination, purity and weed content, the date of analysis which shall

not be more than nine months prior to the delivery date, and testing information. A Certificate of Analysis from an accredited seed-testing laboratory, and conforming to Subsection 106.05 of the specifications, shall accompany each container of seed.

Unless otherwise approved by the Engineer, weed content of the contract-specified seed mix shall not exceed 0.5 percent.

The contractor shall provide all seed tag labels to the Engineer. No payment will be made for seed unless tag labels from all seed to be used on the project have been submitted as specified.

The contractor shall store seed under dry conditions, at temperatures of between 35 °F and 120 °F, and out of direct sunlight. Prior to using the seed, the contractor shall provide a certification letter to the Engineer that the seed was stored as specified herein.

Legume seed shall be inoculated with appropriate bacteria cultures approved by the Engineer, in accordance with the culture manufacturer's instructions.

Tetrazolium staining shall be acceptable to test for germination and hard seed. Cut or fill testing will not be allowed. As directed by the Engineer, seeds with an expiration date past the acceptable test date or not meeting the specified conditions for storage shall be retested by the contractor. The Engineer may perform random sampling of seeds throughout the project. Mixing of the specified seed at the project site shall be under the supervision of the Engineer.

Application rates of seed as specified are for Pure Live Seed (PLS). PLS is determined by multiplying the sum of the percent germination of seeds, including hard or dormant seeds, by the percent purity.

Seed mix species and the Pure Live Seed (PLS) rates are shown in Table 1 below:

TABLE 1

SEED MIX

Botanical Name	Common Name	PLS Rate (Pounds Per Acre)	Per Pound Value for Substitution (see text)
Argenmone platyceras	Prickly Poppy	1	$70
Bouteloua gracilis	Blue Grama	3	$14
Bouteloua curtipendula	Sideoats Grama	4	$12
Coreopsis tinctoria	Plains Coreopsis	3	$16
Eurotia lanata	Winter Fat	2	$24
Garillardia aristata	Blanket Flower	6	$24
Gaillardia pulchella	Firewheel	3	$24
Hilaria jamesii	Galleta Grass	5	$44
Linum Lewisii	Blue Flax	12	$12
Lycium andersonii	Wolfberry	2	$50
Ratibida columnaris	Yellow Prairie Coneflower	3	$24

Ratibida columnaris forma pulcherrima	Red Mexican Hat	6	$24

(B) Seed Substitution:

No substitution of the contract-specified seed will be allowed unless evidence is submitted documenting that the contractor has made a diligent effort to obtain the contract-specified seed, from either seed suppliers or collectors, and that the contract-specified seed will not become available prior to the time specified for seeding in the contractor's approved construction schedule.

The contractor may also request a substitution if the lowest price available for the contract-specified seed is greater than 2.0 times the value shown in Table 1. The contractor shall provide documentation from a minimum of three seed suppliers or collectors supporting such request. Documentation shall include copies of the invoices from each supplier or collector. Only those invoices obtained within four weeks of the time specified for seeding in the contractor's approved construction schedule will be acceptable.

Should a substitution of the contract-specified seed be requested for one of the two reasons specified above, and the contractor's documentation is approved by the Engineer, the Engineer will specify an alternate seed. The alternate seed will only be allowed when there is an insufficient quantity of the contract-specified seed, as determined in the previous two paragraphs, for the areas to be seeded as called for herein or as required for erosion control. The contractor shall obtain and apply the alternate seed, as required, to all such remaining areas. Unless otherwise approved by the Engineer, the approved alternate seed will only be allowed until such time that contract-specified seed meeting the availability and price requirements specified herein can be provided.

For each pound of contract-specified seed not provided by the contractor, the value indicated in Table 1 will be deducted from the contract amount. The price per pound for the alternate seed selected by the Department, as specified above, will be determined in accordance with ADOT Standard Specifications Subsection 109.04(D)(2). No additional adjustments will be made for substituting the alternate seed, the costs being considered as included in the contract item for seeding.

No payment will be made for areas seeded with unapproved seed.

2.03 Tacking Agent:

Tacking agent shall be a naturally occurring organic compound and be non toxic. It shall be a product typically used for binding soil and mulch in seeding or erosion control operations. Approved types shall consist of mucilage or gum by dry weight as active ingredient obtained from guar or plantago. The tacking agent shall be labeled indicating the type and mucilage purity.

The contractor shall have the tacking agent swell volume tested by an approved testing laboratory using the USP method. The standard swell volume shall be considered at 30 milliliters per gram. Material shall have a swell volume of at least 24 milliliters per gram.

Certified laboratory test results shall be furnished to the Engineer for each shipment of homogenous consistency to be used on project areas or as directed by the Engineer. Tacking agent rates shall be adjusted to compensate for swell volume variation. Material tested with lesser volume shall have the tacking agent rate increased by the same percentage of decrease in swell volume from the standard 30 milliliters per gram. Material tested with greater volume may reduce tacking agent rates by the same percentage of increase in swell volume from the standard 30 milliliters per gram. Tacking agent shall be pure material without other starches, bentonite, or other compounds that would alter the swell volume test results of mucilage, or the effectiveness of the tacking.

2.04 Wood Fiber Mulch:

Wood cellulose fiber mulch shall conform to the requirements of Subsection 805-2.03 of the Standard Specifications, except as modified herein, and shall be from thermo-mechanically processed wood, processed to contain no growth germination inhibiting factors. The mulch shall be from virgin wood manufactured and processed so the fibers will remain in uniform suspension in water under agitation to form homogenous slurry. Paper products will not be considered as virgin wood. The wood fiber mulch shall have the properties shown in Table 2 below:

TABLE 2	
Virgin Wood Cellulose Fiber	90% min.
Recycled Cellulose Fiber	10% max.
Ash Content	0.8% +/-0.3%
PH	4.5 +/-1.0
Water Holding Capacity	10:1 (water:fiber)

Rye straw and oat straw will not be acceptable.

2.06 Chemical Fertilizer and Sulfur:

Chemical fertilizer shall conform to the requirements of ADOT Standard Specifications Subsection 805-2.06 of the specifications and shall be the kind hereafter specified. Fertilizer shall be composed of a mixture of one part sulfur-coated urea 25-4-8, one part monammonium phosphate 11-52-0, and one part methylene urea 38-0-0. The sulfur-coated urea, a blended fertilizer 25-4-8, shall have 80 percent of the nitrogen defined as slow release, and contain 5 percent Iron, 10 percent sulfur and trace amounts of zinc and manganese. The resulting 24-18-2 chemical blended fertilizer, as specified herein, shall be applied at the rate of 200 pounds per acre. In addition to the fertilizer mixture, agricultural sulfur compounds, comprised of between 80 percent and 96 percent sulfur, shall be applied at the rate of 200 pounds per acre.

2.07 Water:

Water shall be free of oil, acid, salts or other substances which are harmful to plants. The source shall be as approved by the Engineer prior to use.

2.08 Compost:

Compost shall consist of composted organic vegetative materials. Prior to being furnished on

the project, compost mulch samples shall be tested for the specified microbiological and nutrient conditions, including maturity and stability, by a testing laboratory approved for testing of organic materials. Written test results shall be submitted to the Engineer for approval.

Compost material shall be dark brown in color with the parent material composted and no longer visible. The structure shall be a mixture of fine and medium size particles and humus crumbs. The maximum particle size shall be within the capacity of the contractor's equipment for application to the constructed slopes. The odor shall be that of rich humus with no ammonia or anaerobic odors.

Compost shall also meet the requirements of Table 3:

TABLE 3	
Cation Exchange Capacity (CEC)	Greater than 60 meq/100 g
Carbon:Nitrogen Ratio	Less than 20:1
pH (of extract)	6.0 – 8.5
Organic Matter Content	Greater than 25%
Total Nitrogen (not added)	Greater than 1%
Humic Acid	Greater than 5%
Maturity Index	Greater than 50% on Maturity Index at a 10:1 ratio
Stability	Less than 100 mb 02/Kg compost dry solids – hour

When specified, compost shall be applied to areas to be seeded at the specified rate per acre prior to final tillage for incorporation into the soil seedbed. Unless otherwise specified, compost shall be applied to areas to be seeded at 12 cubic yards per acre prior to final tillage for incorporation into the soil seedbed.

2.09 Soil Conditioners:

Soil conditioners, when required, will be as shown in the Special Provisions.

3.0 Construction Requirements:

3.01 General:

The contractor shall notify the Engineer at least two days prior to commencing seeding operations.

The equipment and methods used to distribute seeding materials shall provide an even and uniform application of seed, mulch, and other materials at the specified rates.

Unless specified otherwise in the Special Provisions, seeding operations shall not be performed on undisturbed soil outside the clearing and grubbing limits of the project or on steep rock cuts.

The contractor shall coordinate the seeding operations with the grading operations to determine mobilization frequency as embankment and cut slopes are finished throughout the duration of the project. Seeding shall be done during suitable weather and soil conditions for tillage and placement of materials. Seeding operations shall not be performed when wind

would prevent uniform application of materials or would carry seeding materials into areas not designated to be seeded.

The contractor shall not expose an area greater than 750,000 square feet at any one location within the project limits until the seeding proposed for that portion of the project has been installed and accepted by the Engineer. Seeding shall be accomplished within 60 days after slopes and disturbed areas have been completed. Seeding operations shall comply with Subsection 104.09 and the applicable portions of Section 203 of the specifications, and as directed by the Engineer.

Frequent mobilizations may be required to accomplish seeding as specified herein. The Owner will consider the cost of such multiple mobilizations to be included in the price bid for the seeding. No adjustments will be made to the contract for the number of seeding mobilization activities. Should the contractor fail to provide seeding for a sub-area as specified herein, the Engineer will immediately notify the contractor of such non-compliance. Should the contractor fail to immediately remedy the unstabilized area, the Engineer may suspend work until such seeding stabilization has been completed, or proceed to provide the necessary seeding stabilization. The entire cost of such work will be deducted from the monies due or to become due to the contractor. In addition, no adjustment to the contract time will be made for suspensions resulting from the contractor's failure to provide seeding for a sub-area within the time periods specified herein.

Seeding shall also be applied to all new earthen and milled asphaltic concrete shoulder build-up areas. Unless directed by the Engineer, shoulder build-up areas shall not be tilled prior to seeding. Seeding and mulching shall be done in two separate steps. For the first step, seed shall be applied by hydroseeding for both types of shoulder build-up areas. For the second step, seeded shoulders comprised of milled asphaltic concrete shall have wood fiber mulch and tacking agent applied. For seeded earthen shoulders, the second step shall be application of straw mulch with tacking agent.

3.02 Tillage:

Where equipment can operate, the area to be seeded shall be prepared with a ripper bar, chisel plow, or with other devices, which will provide thorough soil cultivation to the depth specified below. For areas too steep to be prepared for seeding after the slope has been completed, as determined by the Engineer, tillage shall be accomplished with appropriate equipment as the slope is being constructed. On slope areas, all tillage shall be directional along the contours of the areas involved. All areas, which are eroded shall be restored to the specified condition, grade and slope as directed prior to seeding.

On cut and fill slopes the operations shall be conducted in such a manner as to form minor ridges thereon to assist in retarding erosion and favor germination of the seed.

Except as specified herein, slopes shall be constructed in accordance with Subsection 203-3.03(B) of the specifications. Cut slopes flatter than 3:1 (horizontal to vertical) shall be tilled a minimum of 12 inches in depth, and fill slopes flatter than 3:1 shall be tilled to a six-inch minimum depth. All slopes steeper than 3:1, and areas which could potentially be affected by underground utilities, shall be tilled to a minimum 6 inches in depth, and left in a roughened condition as they are constructed.

Care shall be taken during the seeding operations to prevent damage to existing trees and

shrubs in the seeding area in accordance with the requirements of Subsection 107.11 of the specifications.

Tillage may require passing the equipment over the area several times to provide thorough soil cultivation. Furrows from tillage shall be no more than 12 inches apart. No work shall be done when the moisture content of the soil is unfavorable to tillage.

All competitive vegetation shall be uprooted prior to seeding and the soil shall be left in a friable roughened condition free of clods or large stones over four inches in any dimension and other foreign material that would interfere with the seeding operation. Exposed stones larger than four inches shall be removed and disposed of in an approved manner prior to grading and seeding.

Regardless of the method of seeding application, all areas prepared with tilling shall have fertilizer and compost uniformly applied and incorporated into the soil at the specified rates per acre with final tillage and seeding. Slopes 3:1 and flatter shall have fertilizer and compost tilled into a minimum of the top four inches of the surface. Slopes steeper than 3:1 shall have fertilizer, soil amendments, and compost applied for incorporation into the soil as directed by the Engineer.

For mini-benched slopes, fertilizer, compost, and soil amendments shall be applied to at the specified rates with no tillage or incorporation.

3.03 Seeding:

(A) General:

Drill seeding with straw mulch shall be considered as the preferred method of seed application when practicable. Unless otherwise specified by the Engineer, drill seeding shall be used for all areas with slopes of 3:1 or less.

Hydroseeding shall be the alternative method for seed distribution for slopes in excess of 3:1, and where drill seeding is not practicable or suitable for soil conditions and seed types, as determined by the Engineer.

Straw mulch or wood fiber mulch shall be applied on drilled or hydroseeded areas with crimping and tacking, as specified herein or directed by the Engineer, within 24 hours of seed application.

Unless otherwise specified in the Special Provisions, Class II seeding areas shall not be watered after planting.

(B) Drill Method:

After the tillage and incorporation of fertilizer and compost is completed and accepted by the Engineer, seed shall be planted with a drill seeder capable of accurately metering the specific seed mix. Use of a drill seeder shall not damage the prepared seedbed, and shall provide a soil cover over the planted seed.

Seed shall be planted approximately 1/4 inch deep, with a maximum depth of 1/2 inch. The distance between the furrows produced using the drill process shall not be more than eight

inches. If the furrow openers on the drill exceed eight inches, the area shall be drilled twice. Seeding shall be done with grass seeding equipment with double disc openers, depth bands, packer wheels or drag chains, rate control attachments, seed boxes with agitators and separate boxes for small seed. Seed of different sizes shall be sowed from at least two separate boxes adjusted or set to provide the planting rate as specified.

(C) Hydroseed Method:

Areas and seed types not suitable for drill-seeding, as directed by the Engineer, shall be hydroseeded with straw mulch or wood fiber mulch applied following application of the seed. The contract-specified seed shall be applied in a slurry containing a minimum of 40 pounds tacking agent and 200 pounds of wood fiber mulch per acre. Seed shall not be in the slurry for more than 30 minutes. Seed planted by this method will not require covering with soil. Soil areas shall be tilled to produce loose and friable surfaces with crusted hard soils broken up prior to hydroseeding.

3.04 Applying Wood Fiber Mulch with Tacking Agent:

Areas seeded but not practical for straw mulch, as determined by the Engineer, shall have wood fiber mulch with tacking agent applied at the variable rates shown in the Table 4 below.

TABLE 4

Slope (H:V)	Tacking agent (Pounds pure mucilage per acre)	Wood Fiber Mulch (Pounds per acre)
Flat to 4:1	50	1,000
From greater than 4:1 to 3:1	100	2,000
From greater than 3:1 to 2:1	150	2,500
Greater than 2:1	200	3,000
Erosive Soil Slopes*	300	3,500
*As determined by Engineer		

The contractor shall submit a batch (tank) mix quantity schedule for seed application and the temporary erosion control mulch application for approval of the Engineers prior to mixing seed, fertilizer, wood fiber mulch and tacking agent in a slurry. Batch mixing and coverage will be monitored throughout the seeding operations. The contractor shall coordinate the mixing and application operations with the Engineer in advance of all mixing.

3.05 Seeding Acceptance:

After application the Engineer will inspect seeded areas or sub-areas for conformance to the contract requirements. The contractor shall correct, to the satisfaction of the Engineer, any areas not conforming to the specifications. The 45-day maintenance period will begin upon acceptance of the area by the Engineer.

The contractor shall maintain and stabilize each area or sub-area, including shoulder build-up areas, for a minimum period of 45 calendar days after application of the seeding and mulching materials, and acceptance by the Engineer. Any areas damaged from erosion, or that have less than 90 percent of applied mulch remaining, shall be re-seeded, re-mulched, and re-

tacked at no additional cost to the Department.

Except for landscape projects, seeding shall be completed, including the 45 calendar-day maintenance period, before the end of the contract time, or sooner if required in the SWPPP or elsewhere in the contract documents. Seeding used as part of a landscape project shall be completed, including the 45 calendar-day maintenance period, before the end of the Construction Phase.

4.0 Method of Measurement:

Seeding (Class II) will be measured by the acre, to the nearest one acre of ground surface seeded. Measurements will be along the ground surface for the areas seeded and mulched, as approved by the Engineer.

5.0 Basis of Payment:

The accepted quantities for Seeding (Class II), measured as provided above, will be paid in two phases corresponding to the application stage and the 45 calendar-day maintenance stage.

Upon completion of the application stage and acceptance by the Engineer, the contractor will be paid 70 percent of the contract bid price per acre for the completed work. Such price will be considered full compensation for furnishing and applying the contract-specified seed mix, fertilizers, soil amendments, tillage, mulch materials, and tacking agent, all required testing, and all equipment and labor required to complete the work as specified herein.

Upon completion of the 45 calendar-day maintenance stage, and acceptance by the Engineer, the contractor will be paid 30 percent of the contract bid price per acre for the completed work. Such price will be considered full compensation for seeding maintenance, including all equipment, labor, and materials required to correct deficiencies in seeded, mulched areas, as specified herein.

No measurement or payment will be made for the mobilizations required to apply and stabilize the seeding for each area or sub-area, as specified herein, the cost being considered as included in the contract price for Seeding (Class II).

An adjustment to the contract will be made if a contractor-requested seed substitution is approved as specified in Subsection 2.02(B) above.

SECTION 450: TRAFFIC CONTROL SIGNS

Section 450, MAG Specifications/Y.A.G. Standards, is hereby included and made a part of this specification with the following additional and/or clarifying provisions:

A. Traffic control signs shall be installed and/or relocated at the locations indicated on the Construction Plans and/or as directed by the Engineer.

B. All signs shall conform to the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD).

C. All materials for signs and/or posts shall conform to the requirements of State of Arizona Department of Transportation Highway Division Standard Specifications for Road and Bridge Construction, 2000 (ADOT Specifications). Posts materials shall conform to ADOT Standard 4-M-4.01, but supplied in the required length for the application. Sign panels shall be flat sheet aluminum with Type II high reflectivity sheeting in accordance with ADOT Specifications, Section 608.

D. MEASUREMENT AND PAYMENT:

Measurement and payment for signs will be for Each (EA) unit of the type shown on the plans and bid schedule completed in place including posts and foundations.

SECTION 451: TRAFFIC STRIPING & MARKING

Section 451 is not a MAG Specification or Y.A.G. Standard. Section 708 of the State of Arizona Department of Transportation Highway Division Standard Specifications for Road and Bridge Construction, 2000 is hereby included and made a part of this Specification with the following additional and/or clarifying provisions:

A. Traffic Striping and Marking shall be installed at the locations indicated on the Construction Plans and/or as directed by the Engineer. Existing striping and marking in conflict with new striping or markings shall be removed from pavement using high pressure water spray or alternate method as approved.

B. MEASUREMENT AND PAYMENT:

Measurement and payment for pavement markings will be for Each (EA) unit completed in place at the unit price bid. Measurement and payment for pavement striping will be for the Lineal Foot (LF) of 6-inch width of stripe of the specified material type and color at the unit price bid. Stripes of greater or lesser width will be measured and paid at the appropriate multiple of 6-inch width. The unit price paid for striping and markings shall include the removal of the existing striping and marking as necessary.

PART 800

EROSION CONTROL

UNIFORM STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION - 1979, AND SUPPLEMENTS AND UPDATES (MAG SPECIFICATIONS), AS MODIFIED BY Y.A.G. STANDARDS, 1998, AND SUPPLEMENTS AND UPDATES, WITH THE FOLLOWING ADDITIONAL AND/OR CLARIFYING PROVISIONS:

SECTION 810 - EROSION CONTROL AND POLLUTION PREVENTION:

810-2.02 Straw Bales: the title and text of the Standard Specifications are revised to read:

810-2.02 Compost Stabilization:

Compost stabilization shall consist of composted organic vegetative materials stabilized with a tacking agent and used for erosion control.

Compost material shall be dark brown in color with the parent material composted and no longer visible. The structure shall be a mixture of fine and medium size particles and humus crumbs. The maximum particle size shall be within the capacity of the contractor's equipment for application to the constructed slopes. The odor shall be that of rich humus with no ammonia or anaerobic odors.

Compost shall also meet the following requirements:

COMPOST MATERIAL	
Cation Exchange Capacity (CEC)	Greater than 60 meq/100 g
Carbon: Nitrogen Ratio	Less than 20:1
PH (of extract)	6 – 8.5
Organic Matter Content	Greater than 25%
Total Nitrogen (not added)	Greater than 1%
Humic Acid	Greater than 5%

Maturity Index	Greater than 50% on Maturity Index at a 10:1 ratio
Stability	Less than 100 mb 02/Kg compost dry solids – hour

Prior to furnishing on the project, compost mulch samples shall be tested for the specified microbiological and nutrient conditions, including maturity and stability, by a testing laboratory approved for testing of organic materials. Certified laboratory test results shall be submitted to the Engineer for approval.

Tacking agent shall be a naturally occurring organic compound and be non toxic. It shall be a product typically used for binding soil and mulch in seeding or erosion control operations. Approved types shall consist of mucilage or gum by dry weight as active ingredient obtained from guar or plantago. The tacking agent shall be labeled indicating the type and mucilage purity.

The contractor shall have the tacking agent swell volume tested by an approved testing laboratory using the USP method. The standard swell volume shall be considered at 30 milliliters per gram. Material shall have a swell volume of at least 24 milliliters per gram. Certified laboratory test results shall be furnished to the Engineer for each shipment of homogenous consistency to be used on project areas or as directed by the Engineer. Tacking agent rates shall be adjusted to compensate for swell volume variation. Material tested with lesser volume shall have the tacking agent rate increased by the same percentage of decrease in swell volume from the standard 30 milliliters per gram. Material tested with greater volume may reduce tacking agent rates by the same percentage of increase in swell volume from the standard 30 milliliters per gram. Tacking agent shall be pure material without other starches, bentonite, or other compounds that would alter the swell volume test results of mucilage, or the effectiveness of the tacking.

810-2.03 Riprap and Rock Mulch: the first paragraph of the Standard Specifications is revised to read:

Riprap for cut and fill transitions designated on the plans shall be angular in shape and shall conform to the requirements of Section 913. Unless otherwise specified, riprap for cut and fill transitions shall conform to gradation A or B in the table below, as designated on the project plans.

810-2.03 Riprap and Rock Mulch: the second paragraph of the Standard Specifications is revised to read:

Rock mulch for pipe inlet and outlet protection, headwall and wingwall treatment, and rock check dams shall be angular in shape and shall conform to the requirements of Section 803. Rock mulch shall be in accordance with gradation C below, unless otherwise specified. Section 803 requirements for use of pre-emergent herbicide and for post-placement watering of rock mulch shall not apply to rock mulch applied under Section 810.

810-2 Materials: of the Standard Specifications is modified to add:

810-2.05 Erosion Control Blankets:

(A) General:

Erosion control blankets shall consist of temporary, degradable, rolled erosion-control products of short-term or extended-term duration, composed of natural fibers mechanically or structurally bound together with natural or polymer netting to form a continuous matrix.

Erosion control blankets of short-term duration shall have a minimum one-year degradation period for both the netting and fibers, and be composed of 100 percent virgin aspen excelsior wood fibers or 100 percent agricultural straw. Extended-term erosion control blankets shall have a minimum two-year degradation period for the netting and fibers, and be composed of heavy-duty excelsior blankets, or a mix of 70 percent straw and 30 percent coconut fibers, or 100 percent coconut fibers. Heavy-duty excelsior blankets used in the extended-term category shall have a minimum weight of 0.7 pounds per square yard. All other types of blankets, whether for short-term or extended-term use, shall have a minimum weight of 0.5 pounds per square yard.

Fibers for short-term erosion control blankets shall be encased top and bottom with photodegradable polypropylene or 100-percent biodegradable natural organic fiber netting, as specified on the plans. Should the plans not specify type of netting for short-term blankets, fibers shall be encased with photodegradable polypropylene. Fibers for extended-term blankets shall be encased within either a heavy duty UV-stabilized top netting (black) and bottom netting (green), or two UV-stabilized nettings (black). All netting for extended-term blankets shall be photodegradable polypropylene.

Erosion control blankets shall also conform to the following requirements:

Property	Test Method	Short-Term Duration	Extend-Term Duration
Minimum mass per unit area (ounces/sq. yd.)	ASTM D 6475	8	8*
Minimum Thickness** (inches)	ASTM D 5199	0.25	0.25
Minimum Tensile Strength (lbs./ft) ***	ASTM D 5035	75x75	100x100
*Heavy duty blankets shall have a minimum mass per unit area of 11 ounces per square yard. **Numerical value represents total thickness of blanket, including netting. ***Numerical value represents minimum average test result in either direction.			

The contractor shall provide Certificates of Analysis, in accordance with Subsection 106.05, for all erosion control blankets.

Fiber color shall be natural unless otherwise specified in the special provisions.

Fibers shall be free of weed seed, and shall be locked in place to form a mat of consistent thickness. Erosion control blankets using straw shall conform to the requirements of Subsection 810-2.05(B). Fibers shall remain evenly distributed over the entire area of the blanket after being placed on the slope.

Erosion control blankets shall be furnished in four-foot to eight-foot wide rolls, and shall be wrapped with suitable material to protect against moisture and extensive ultraviolet exposure prior to placement.

Each roll shall be labeled to provide sufficient identification for quality control purposes.

Staples shall be U-shaped, 11 gauge steel wire, and shall be one inch wide by six inches long or two inches wide by eight inches long.

810-2.06 Sediment Logs, Sediment Wattles, and Fiber Rolls:

(A) General:

Sediment logs, sediment wattles, and fiber rolls shall be manufactured or constructed rolls of fiber matrix, secured with netting, and used for the purpose of controlling erosion by slowing high flow water velocity and trapping silt sediments. Netting for fiber rolls and sediment wattles shall have a minimum durability of one year after installation, and shall be tightly secured at each end of the individual rolls.

The unit weight for wattles and fiber rolls shall be 0.144 pounds per inch of diameter per linear foot. Sediment log unit weight shall be 0.167 pounds per inch of diameter per linear foot. The minimum weight per linear foot for sediment logs, wattles, and fiber rolls shall be determined by multiplying the specified diameter of the device by the appropriate unit weight, in pounds per inch of diameter per linear foot per, as specified above.

Netting at each end of sediment logs and wattles shall be secured with metal clips or knotted ends to assure fiber containment.

(B) Sediment Logs:

Sediment logs shall be constructed of 100 percent curled-fiber aspen wood excelsior with interlocking barbs, and with 80 percent (±10 percent) of the fiber at least six inches in length. Netting shall consist of long-term degradable, open weave, plastic or natural fiber containment mesh, with a maximum one-inch by one-inch grid. Sediment logs may also be filled with compost conforming to the requirements of Subsection 810-2.02. Mesh shall be photodegradable or biodegradable with a life expectancy of 12 to 24 months. Sediment logs shall be twenty inches in diameter. Unless approved by the Engineer, sediment logs shall be 10 feet (±10 percent) in length.

(C) Sediment Wattles:

Sediment wattles shall be manufactured rolls composed of weed-free, 100-percent agricultural wheat or rice straw, or excelsior wood fiber, encased in a tube of long-term photodegradable plastic or biodegradable natural fiber netting with a maximum one-inch by one-inch grid. Sediment wattles shall have nominal diameters of 9, 12, or 18 inches, with lengths from seven to twenty-five feet, as specified on the plans. Fibers shall be evenly distributed throughout the wattle.

Wattles composed of wheat straw shall conform to the requirements of Subsection 810-2.05(B). Wheat straw wattles without the specified certification will not be acceptable.

(D) Fiber Rolls:

Fiber rolls shall be constructed from heavyweight manufactured blankets consisting of wood

excelsior, straw, or coconut fibers, or any combination of such fibers, mechanically or structurally bound together with natural or polymer netting to form a continuous matrix. Blankets used to construct fiber rolls shall be between 6.5 and 8 feet wide by approximately 50 feet long. Wood excelsior blankets shall have 80 percent of its fibers equal to or greater than six inches. Blankets used to construct the fiber rolls shall have photodegradable plastic or biodegradable natural netting, with a maximum one-inch by one-inch grid, on at least one side.

Fiber rolls containing any amount of wheat straw shall conform to the requirements of Subsection 810-2.05(B). Fiber rolls with wheat straw that are not certified as specified herein will not be acceptable.

The contractor shall produce fiber rolls by rolling the blankets along their width to produce 50-foot lengths, and securing the rolls with jute twine spaced at 6.5-foot intervals along the roll for the full length and at six inches from each end. If shown on the plans or directed by the Engineer, the contractor shall cut the blankets before rolling to produce completed fiber roll lengths of between 14 and 50 feet. The nominal diameter of the finished rolls shall be 9, 12, or 18 inches, as specified on the plans. Overlapping of more than one blanket may be required to achieve larger diameters. When overlapping is required, the end of one blanket shall overlap six inches onto the end of the next blanket prior to rolling.

810-2.07 Sediment Control Berms:

Sediment control berms shall consist of soil obtained from within the project limits, or compost, or both, as called for on the plans.

Compost and tacking agent used in sediment control berms shall conform to the material requirements of Subsection 810-2.02.

810-3.02 Straw Bales: the title and text of the Standard Specifications are revised to read:

810-3.02 Compost Stabilization:

Compost stabilization shall be applied as shown on the plans or as directed by the Engineer.

810-3 Construction Requirements: of the Standard Specifications is modified to add:

810-3.05 Erosion Control Blankets:

(A) General:

Erosion control blankets shall be installed in accordance with the project plans and details, or as directed by the Engineer in accordance with the manufacturer's instructions.

For slope installations short-term duration blankets, as specified in Subsection 810-2.05, shall be used for slopes from 4:1 (horizontal to vertical) to 2:1. Extended-term blankets shall be used for slopes steeper than 2:1. For channel installations erosion control blankets shall conform to the requirements for extended-term duration.

The contractor shall coordinate with the blanket supplier for a qualified representative of the blanket supplier to be present at the job site at the start of installation to provide technical assistance as needed.

(B) Slope Installations:

Erosion control blankets shall be oriented in vertical strips and anchored with six-inch long staples in cohesive soil and eight-inch long staples in non-cohesive soil. A two-to-five inch overlap, or as required by the manufacturer, shall be required for side seams. A 6-inch overlap, shingle-style, shall be required for blanket ends. The distribution of staples shall be as recommended by the manufacturer. A six-inch deep by six-inch wide trench shall be located at the top of the slope. The erosion control blankets shall be stapled to the bottom of the trench with staples spaced six inches apart across the width of the blanket. The trench shall then be backfilled and compacted.

(C) Channel Installations:

For channel installations, erosion control blankets shall be installed parallel to the flow of water. The first blanket shall be centered longitudinally in mid-channel and anchored with staples, as recommended by the manufacturer. Subsequent blankets shall follow from channel center outward.

The distribution of staples shall be as recommended by the manufacturer.

Successive lengths of erosion control blankets shall be overlapped a minimum of six inches with the upstream end on top. Staple the overlap across the end of the overlapping lengths with staples spaced six inches apart.

A six-inch deep by six-inch wide trench shall be located at the upstream and top of side slope terminations of the blankets. The erosion control blankets shall be stapled to the bottom of the trench, with staples spaced six inches apart across the width of the blanket. The trench shall be backfilled and compacted.

810-3.06 Sediment Logs, Sediment Wattles, and Fiber Rolls: SAME AS 810-2.06?

(A) Sediment Logs:

Sediment logs shall be installed in channel bottoms, around catch basins, as check dams, or on slopes, as shown on the plans or as directed by the Engineer in accordance with the manufacturer's instructions. Sediment logs shall be secured with one-inch by one-inch by 46-inch hardwood stakes placed with a maximum spacing of two feet on center, or as shown on the plans. Each stake shall be intertwined with the netting on the downstream side of the log and driven approximately two feet below finished grade. Unless otherwise specified, soil shall be tamped against the upstream side of the log to assure that storm water is forced to flow through the log rather than under it.

Sediment logs installed in drainage channel bottoms shall be perpendicular to the flow of the water, and shall continue up the channel side slope two feet above the high water flow line. Spacing of the logs shall be as specified in the plans.

When sediment logs are used to construct check dams, the logs placed on the ground shall

be buried four to six inches deep as shown on plans.

Logs placed on slopes shall be installed in a two-inch deep by five-inch wide anchor trench. The ends of adjacent logs shall be abutted tightly together so that water cannot undermine the logs.

(B) Sediment Wattles:

Sediment wattles shall be installed on slopes as shown on the plans, and in accordance with the manufacturer's instructions, or as directed by the Engineer. Sediment wattles shall be secured with wooden stakes as shown on the plans. The ends of adjacent wattles shall be abutted tightly together.

(C) Fiber Rolls:

Fiber rolls shall be installed on slopes as shown on the plans, and in accordance with the manufacturer's instructions, or as directed by the Engineer. If no spacing is shown on the plans, fiber rolls shall be placed as specified in the table below. Fiber rolls shall be installed in a two-inch deep by five-inch wide anchor trench. Fiber rolls shall be secured with wooden stakes having a 3/4-inch by 3/4-inch minimum cross-sectional dimension and 3-foot minimum length, or as shown on the plans. Each stake shall be driven through the center of the finished fiber roll, spaced a maximum of three feet apart, and driven approximately two feet into the ground. The ends of adjacent rolls shall be abutted together.

Fiber Roll Spacing Table	
Slope (Horizontal to Vertical)	Spacing (feet)
Less than 6:1	65
6:1 to 4:1	45
Greater than 4:1 and less than 2:1	30
2:1 to less than 1:1	20
1:1 and greater	10

810-3.07 Sediment Control Berms:

Sediment control berms shall be installed as shown on the plans. The berm shall be considered a temporary erosion control protection measure. As directed by the Engineer, the contractor shall remove segments of the berm within areas that have been successfully re-vegetated prior to allowing traffic operations.

810-4 Method of Measurement: of the Standard Specifications is revised to read:

Silt Fence will be measured in accordance with Subsection 915-5.

Compost stabilization will be measured by the cubic yard of applied and tacked compost material.

Pipe Inlet/Outlet Treatment, Headwall and Wingwall Treatment, and Rock Check Dams will be measured per cubic yard of rock mulch. Cut and Fill Transitions will be measured per cubic yard of riprap.

Sand bags will be measured per each filled sand bag placed into service.

Erosion control blankets will be measured by the square yard of total ground area covered.

Sediment logs, sediment wattles, and fiber rolls will be measured by the linear foot.

Sediment control berms will be measured by the linear foot along the center line of the berm, parallel to the ground surface.

810-5 **Basis of Payment:** the second paragraph of the Standard Specifications is hereby deleted:

810-5 **Basis of Payment:** the last two paragraphs of the Standard Specifications are revised to read:

The accepted quantities of erosion control blankets, measured as provided above, will be paid for at the contract unit price per square yard, which price shall be full compensation for the work, complete in place, including all excavation and preparation; and furnishing, installing, and maintaining the erosion control blankets, as approved by the Engineer. Such unit bid price shall be considered full compensation for either short-term or extended-term blankets. No additional payment will be made for technical assistance provided by representatives of the blanket supplier, the cost being considered as included in the unit bid price.

The accepted quantities of sediment logs, sediment wattles, and fiber rolls, measured as provided above, will be paid for at the contract unit price per linear foot, which price shall be full compensation for all labor, including excavation, preparation, and installation, and all materials, tools, stakes, equipment, and incidentals necessary for furnishing and installing the devices, complete in place, as approved by the Engineer. No additional payment will be made for sediment logs used as check dams, the cost being considered as included in the unit bid price paid for sediment logs.

The accepted quantities of compost stabilization, measured as provided above, will be paid for at the contract unit price per cubic yard of compost material applied and tacked, as directed by the Engineer. Such price shall be full compensation for the work, complete in place, including all materials, preparation, installation, tacking, maintenance, and removal of the compost-stabilized area.

The accepted quantities of sediment control berms, measured as provided above, will be paid for at the contract unit price per linear foot, regardless of the type of material used. Such price shall be full compensation for the work, complete in place, including all materials, preparation, compaction, installation, and maintenance, and removal of the sediment control berm.

No additional measurement or payment will be made for temporary features subsequently designated by the Engineer as permanent, the cost being considered as included in the unit bid price.

No additional measurement or payment will be made for associated earthwork, ground preparation, overlapping, stakes, silt and debris removal and disposal, or maintenance, the cost being considered as included in the unit bid price.

SECTION 1014 - GEOSYNTHETICS:

1014-8 **Temporary Silt Fence Fabric:** the first line of the table of the Standard Specifications is revised to read:

Property	Requirement	Test Method
Grab Tensile Strength: lbs.	100 min.	ASTM D 4632