

## **SECTION 903 EROSION CONTROL**

Delete this Section in its entirety and replace with the following:

### **SECTION 903 EROSION CONTROL**

**903-1 DESCRIPTION:** This work consists of providing all; administrative, labor, materials, equipment, and accessories required to permit, install, monitor, maintain, and remove where required, temporary and permanent sedimentation and erosion control measures.

**903-2 MATERIALS:** Materials shall comply with the following Sections and Subsections.

Topsoil	1022-1
Fertilizer	1022-2
Seed	1022-3
Straw Mulch & Fiber Mulch	1022-5
Straw Mat	1022-7.1
Excelsior Mat	1022-7.2
Slab Sod	1022-9

Materials not covered by project specifications shall meet commercial grade standards and shall be approved before being incorporated into the project. No testing of materials used in temporary erosion control features will be required. Acceptance of temporary erosion control materials will be by visual inspection.

**903-3 CONSTRUCTION:** Installation of temporary erosion control features shall be coordinated with construction of permanent erosion control features to ensure effective erosion control at all times. The contractor shall install or construct temporary erosion control features prior to initiation of land disturbance activities.

**903-3.1 Temporary Erosion Control and Storm Water Pollution Prevention Plan:** In accordance with Section 7-7 the contractor will abide by the terms and conditions of the appropriate LPDES General Permit. The Contractor shall prevent to the maximum extent practicable the transmission of soil particles into streams, canals, lakes, reservoirs or other waterways. Except as necessary for construction, excavated material shall not be deposited in streams or impoundments, or in a position close enough to be washed into waterways by high water or runoff. Lands or waters outside construction limits shall not be disturbed, except as authorized. The contractor shall not unnecessarily strip vegetation near stream banks.

The engineer may limit exposure of unprotected earth and may direct the contractor to provide immediate permanent or temporary erosion or pollution control measures to prevent contamination of streams, lakes, reservoirs, canals or other impoundments or prevent detrimental effects on property outside the right-of-way.

For projects with a total cumulative disturbed area greater than 1 acre including but not limited to: project construction limits, staging and disposal areas, temporary access roads, detours, and borrow areas, the contractor shall be required to develop a SWPPP (Storm Water Pollution Prevention Plan) by completing the current EPA SWPPP template. The contractor shall contact LADEQ for the latest specific requirements regarding the appropriate LADEQ Storm Water General Permit, Notice of Intent, and Notice of Termination forms.

As required by the contract documents and as detailed in the contractors SWPPP, the contractor shall place, monitor, and maintain; temporary seed, fertilizer, mulch, sandbags, hay bales, silt fences, slope drains, sediment check dams, sediment basins, and other best management practices/stormwater containment measures. Earth berms shall be constructed as needed to direct water away from slopes.

The use of erosion control features or methods other than those in the contract shall be as contained in the Contractors SWPPP and shall be considered included in the lump sum cost for the development and maintenance of the SWPPP.

- a. **Temporary Seeding, Fertilizing and Mulching:** Seeding, fertilizing and mulching shall be performed in accordance with Subsection 903-3.2, modified as follows. Ground preparation shall be limited to blading the area; grass seed shall be a fast-growing species suitable to the area; application rates of seed, fertilizer and mulch may be reduced when directed.
- b. **Sandbags and Hay Bales:** Sandbags shall be 1 cubic foot burlap bags, filled at least 3/4 full with sand. Hay bales shall be standard size bales and shall be secured by stakes.
- c. **Slope Drains:** Slope drains shall be constructed of pipe, riprap or other suitable material, with riprap protection at the discharge end.
- d. **Sediment Basins:** Sediment basins shall be excavated to collect silt, and shall be cleaned out as necessary to maintain their effectiveness. Basin outfall shall be riprap protected.
- e. **Sediment Check Dams:** Check dams shall be constructed in ditches, and shall consist of logs and brush or fencing.
- f. **Silt Fencing:** Silt fencing shall be geotextile fabric, either wire-supported or self-supported, attached to posts. Silt fencing shall be trenched in to ensure effectiveness.
- g. **Curb Inlet Protection:** Temporary sediment control device or measure to prevent silt, sediment and debris from entering storm drain curb inlets. Inlet protection is to be implemented at existing curb inlets prior to construction. The device shall be centered against the curb inlet with a minimum of 12 inches of the device overhanging on each side of the inlet opening. No part of the device, or ponding created by the device, shall interfere with the flow of traffic, create a safety hazard, or cause property damage. Effective curb inlet protection must be provided throughout the project until all sources with potential for discharging into inlets have been paved or stabilized. Contractor shall remove curb inlet protection once surface restoration in the contributing drainage area is complete. Due care shall be taken to ensure sediment does not fall into the inlet and impede the intended function of the device. Any material falling into the inlet shall be removed. Contractor shall maintain devices and remove all accumulated sediment and debris from surface and vicinity of unit after each rain event or as directed by Engineer in order to provide adequate sediment holding capacity and performance of device.
- h. **Maintenance of Erosion Control Features:** Temporary erosion control features shall be inspected at least once every 14 calendar days, in advance of any anticipated rain events, and within 24 hours after a rainfall event of 0.5 inches or greater. The features are to be maintained as described below or replaced as directed at no direct pay.
  1. **Temporary Seeding:** The seeded areas showing erosion after inspection shall be reseeded if necessary.
  2. **Mulches:** Mulched areas showing erosion shall be repaired and the mulch reapplied if necessary.
  3. **Straw or Hay Bale Barriers:** The bale barriers shall be inspected after each rainfall and time frame as defined above and at least daily during

prolonged rainfall. Close attention shall be paid to the repair of damaged bales, "end runs" and undercutting beneath bales.

4. **Slope Drains:** Slope drains shall be inspected weekly and after each rainfall as defined above, and repairs made if necessary. The contractor shall avoid the placement of any material on and prevent construction traffic across the slope drain.
  5. **Sediment Check Dams:** Sediment deposits shall be removed when the deposits reach one-half the height of the check dam. Inspections shall be made to insure that the center of the dam is lower than the edges. Erosion around the edges shall be corrected immediately.
  6. **Silt Fencing:** Sediment deposits shall be removed when the deposits reach one-half the height of the fence. If the fabric on the silt fence decomposes or becomes ineffective, the fabric shall be replaced promptly.
  7. **Temporary Stone Construction Entrance and/or Wash Racks:** The construction entrance shall be maintained to allow for removal of mud from the tires. The sediment from the wash rack runoff shall be removed once the wash rack is no longer performing as intended.
- i. **Removal of Temporary Erosion Control Features:** Temporary erosion control features existing at the time of construction of permanent erosion control features shall be removed or incorporated into the soil in such manner that no detrimental effect will result. The engineer may direct that temporary features be left in place.

**903-3.2 Permanent Erosion Control:**

**903-3.2.1 Seeding and Fertilizing:** Seed beds shall be disked and pulverized at least 3" deep; then leveled and lightly rolled prior to seeding. Seed shall be applied by one of the following methods:

- a. **Broadcast:** Seed and fertilizer shall be uniformly spread by hand or mechanical methods. If hand spreading is used, seed and fertilizer shall be sown in 2 directions at right angles to each other.

1. **Fertilizer:** Fertilizer shall be applied at the following rate:

<u>Type</u>	<u>Pounds Per Acre</u>
8-8-8	1,000
12-12-12	667
13-13-13	615
16-16-16	500

2. **Seed:** Seed shall be sown at the following rate:

	<u>Seed Mixture and Rate/1000 SF</u>
March-September	1 Lb Hulled Bermuda
October-February	1 Lb Unhulled Bermuda and 2 Lb Winter Rye

- b. **Hydroseeding:** Seed, fertilizer, mulch and tackifier shall be placed in a single mechanical operation at the following rates:

Planting Mixture and Rate (Lb/1000 SF)

	Hulled Bermuda Seed	Unhulled Bermuda Seed	Winter Rye Seed	Water Soluble Fertilizer	Fiber Mulch	Soil Tackifier
March- September	1	-	-	30	35	1.5
October- February	-	1	2	30	35	1.5

**903-3.2.2 Watering:** Seeded and sodded areas shall be watered at a rate of 5 gal/sy immediately after seed is broadcast or sod is placed. When necessary, additional water shall be applied to seeded or sodded areas to supplement natural rainfall until the Owner accepts the work. Water shall be applied with approved sprinkling equipment what will spread the water evenly and in a manner that will not cause erosion of the soil surface.

**903-3.2.3 Mulching:**

**903-3.2.3.1 Straw Mulch:** Straw mulch shall be spread on seeded areas at rate of 2 ton/acre.

**903-3.2.3.2 Fiber Mulch:** Fiber mulch shall be spread on seeded areas at rate of 1-1½ tons/acre.

**903-3.2.4 Erosion Blanket:** Erosion control blankets shall be straw or excelsior mats and shall be placed on seeded areas.

On slopes, blanket strips shall be placed either transverse or parallel to slope. Blanket shall be turned down into 6" anchor slots at top and bottom of slope. Mats shall be stapled to ground at maximum 6-foot intervals staggered on adjacent rows. Straw mats shall be overlapped 6" on ends and sides; excelsior blanket strips shall be tightly butted with adjacent strips at ends and sides.

In ditches, blanket strips shall be placed parallel to ditch, beginning at downstream end. Sides and ends of excelsior strips shall be tightly butted with adjacent strips; sides and ends of straw mats shall be turned down into 6" deep anchor slots at ends and sides. Mats shall be stapled to ground at maximum 4-foot intervals, staggered on adjacent rows.

**903-3.2.5 Slab Sod:** When the trench backfill has stabilized sufficiently and for a period of time not to exceed fourteen (14) days from the completion of the repair, the Contractor shall commence work on lawns and grassed areas. Prior to slab sodding, topsoil shall be uniformly spread over areas and lightly compacted. Areas to be sodded shall be finish graded, tilled, raked and debris removed. The Engineer shall approve the finish grade of all areas prior to application of sod. The Contractor shall furnish sod equal to and similar in type as the surrounding area.

Approximately 90% of the required fertilizer shall be placed on the area prior to placing sod, and the remainder of the fertilizer shall be broadcast after the sod is placed. Sod shall be rolled or tamped after placement.

Upon completion of sodding operations, all excess soil, stones, and debris remaining shall be removed from the construction area. Sodded areas shall be protected against traffic or other use by placing warning signs or erecting barricades as necessary. The Contractor, at no additional cost, shall repair any areas damaged prior to actual acceptance by the Owner.

The sodded area will not be accepted until a satisfactory stand of grass has been established. A satisfactory stand of grass is defined as a full lawn cover of the predominant vegetative species existing prior to the beginning of the Work over the disturbed areas, with grass free of weeds, alive and growing, leaving no bare spots larger than ¾ square yard within a radius of ten (10) feet. If a

satisfactory stand of grass has not been obtained within a reasonable period of time, the Engineer shall instruct the Contractor in writing that the vegetative cover is not adequate and that additional measures shall be undertaken by the Contractor to establish the required satisfactory stand of grass.

**903-4 MEASUREMENT:**

a. **Temporary Erosion Control:** When temporary erosion and pollution control measures are required due to the contractor's negligence or failure to install permanent controls, such work shall be performed by the contractor at no direct pay. Required temporary erosion and pollution control work which is not due to the contractor's negligence will be measured as follows:

1. **Seed, Fertilizer and Mulch:** Measurement will be made in accordance with Heading (b) below.
2. **Sandbags, Hay Bales, Sediment Basins and Sediment Check Dams:** Measurement will be made per each.
3. **Silt Fencing and Slope Drains:** Measurement will be made by the linear foot.
4. **Temporary Curb Inlet Protection:** Measurement shall be made by the linear foot.

When temporary erosion control work is ordered and is not covered by contract items, the work shall be performed as extra work in accordance with Sections 4-2 and 10-4 except that no extra work order will be required prior to starting work.

The construction of temporary earth berms along edges of the roadway to prevent erosion during grading and subsequent operations will not be measured for payment.

In case of failure of the contractor to control erosion, or siltation, the engineer may employ outside assistance or use his own forces to provide the necessary corrective measures, and the cost thereof will be deducted from payments for the work. Partial payments will be withheld until satisfactory temporary erosion control is established.

b. **Permanent Erosion Control:**

1. **Seed:** Seed will be measured by the pound.
2. **Fertilizer:** Fertilizer will be measured by the pound. The estimated quantity shown in the plans is based on Type 8-8-8 fertilizer. If other types are used, the measured quantities will be multiplied by the following factors to determine pay quantities:

<u>Type</u>	<u>Factor</u>
12-12-12	1.5
13-13-13	1.625
16-16-16	2.0

3. **Water:** Water will be measured in units of 1,000 gallons; however, water used in hydroseeding slurry will not be measured for payment.

c. **Slab Sod:** This item shall be measured per square yard of sod installed within the pay limits and as approved by the Engineer. The pay limits shall be in

accordance with the standard trench details and as shown on the drawings or as directed by the Engineer. When the Work falls within a right-of-way or servitude wider than 25 feet, the pay limit width shall be limited up to a maximum 12.5 feet measured from centerline of existing or proposed pipe on both sides (up to right-of-way or servitude limit) for a maximum 25 feet total. In the case of parallel pipes, overlapping areas will not be double paid. Payment shall not be made for sod placed outside of the pay limits in areas damaged by the Contractor.

- d. **Mulch and Erosion Control Mats:** Quantities of mulch and erosion control mats for payment will be the contract quantities, adjusted as necessary if the engineer makes changes to fit field conditions, if plan errors are proven, or if design changes are made.
- e. **Stormwater Pollution Prevention Plan:** Other than the contract items and items directed to be installed by the engineer, no measurement will be made for the development, administration, permitting, install, monitoring, maintenance, and removal where required, of the stormwater control measures required in the Contractor's SWPPP.

**903-5 PAYMENT:** Payment for temporary and permanent erosion control items that are included as contract items will be made at the contract unit prices.

Payment for devices used to correct unforeseen conditions will be made at the contract unit price for similar devices shown on the plans, or as extra work if plan details are not applicable.

Payment for sod will be full compensation for topsoil, finish grading, tilling, raking, debris removal, sod, water, fertilizer, rolling or tamping, and protection.

Payment for obtaining and maintaining the necessary permits; development of a complete Storm Water Pollution Prevention Plan (SWPPP) and associated documentation (to include but not limited to the NOI and the NOT if necessary), and all labor, equipment or materials required for the implementation of the SWPPP, except for the installation and maintenance of those erosion control pay items already included in the plan, shall be made under Item 9031600. Partial payments for the Storm Water Pollution Prevention Plan items will be made in accordance with the following schedule.

<u>% of Total Contract Amount Earned</u>	<u>% of SWPPP Price to be Paid</u>
1st Partial Estimate	15
10	25
25	30
50	50
75	75
100	100

**903-6 PAY ITEMS:**

<u>Item No.</u>	<u>Item</u>	<u>Unit</u>
9030100	Temporary Sand Bags	Each
9030200	Temporary Hay Bales	Each
9030300	Temporary Sediment Basins	Each
9030400	Temporary Sediment Check Dams	Each
9030500	Temporary Silt Fencing	Linear Foot
9030600	Temporary Slope Drains	Linear Foot
9030610	Temporary Curb Inlet Protection	Linear Foot
9030700	Topsoil	Cubic Yard
9030800	Seed	Pound

9030900	Fertilizer	Pound
9031000	Water	M-Gallons
9031100	Straw Mulch	Square Yard
9031200	Asphalt Mulch	Square Yard
9031300	Fiber Mulch	Square Yard
9031400	Erosion Control Mat	Square Yard
9031500	Slab Sod	Square Yard
9031600	Storm Water Pollution Prevention Plan	Lump Sum