



April 26, 2019

**RE: Chorro Creek Ecological Reserve Floodplain Restoration Project, Addendum No.4**

This Addendum shall be considered part of the bid documents for the above-mentioned project. In the case of any conflicting information, the provisions of this addendum supersede the original bid documents and any prior addenda. Bidders must acknowledge the addendum with the bid submittal.

**ADDENDUM NUMBER 4**

**A. Bid Documents and Specifications Updates**

The following changes have been made:

1. Technical Specification Section 31 33 00 Erosion and Sedimentation Control
  - a. DELETE entire Section
  - b. INSERT revised Section 31 33 00 Erosion and Sedimentation Control, attached.

If you have any questions regarding this addendum, please contact Carolyn Geraghty (cgeraghty@mbnep.org, 805-772-3834 ext.12)

Sincerely,

Carolyn Geraghty  
Restoration Projects Manager  
Morro Bay National Estuary Program

## **SECTION 31 25 00**

### **EROSION AND SEDIMENTATION CONTROL**

#### **PART 1 – GENERAL**

##### **1.01 SUMMARY**

- A. This section describes the following work:
  - 1. Implementation of sediment and erosion control measures (1) during construction, and (2) upon completion of construction.
  - 2. Maintenance and repair of erosion and sediment control measures during the maintenance period.

##### **1.02 RELATED WORK**

- A. Section 01 57 19 Environmental Protection
- B. Section 31 23 00 Excavation and Fill

##### **1.03 DEFINITIONS**

- A. Substantial Completion: As defined in Section 01 71 70 Closeout Procedures.
- B. Construction Period: Between the dates of Notice to Proceed and Substantial Completion.
- C. Seed Application: Shall occur after September 20 and no later than October 11, unless directed otherwise by the Restoration Engineer.
- D. Maintenance Period: Between the date of Substantial Completion and April 15, 2020.

##### **1.04 SUBMITTALS**

- A. The following shall be submitted to the Restoration Engineer for all fabric materials:
  - 1. Product Data: Manufacturer's printed product data, specifications and samples for each type of material proposed for use by the Contractor.
  - 2. Manufacturer's Printed Instructions: Instructions for storage, handling, installation and overlapping of materials in accordance with this section.

3. Compliance with Manufacturer's Installation Specifications: Manufacturer installation details for hold-downs, anchoring, stapling, repairs and other details as required for the installation per manufacturer's standards and as shown on the Drawings.
  4. Manufacturer's Certification: That the installer and installation procedures are manufacturer-approved and proposed materials comply with the requirements specified in this section and that the proposed materials are suitable for the intended uses.
  5. Manufacturer's Certificate of Warranty: For each of the materials, including installation.
- B. The following shall be submitted to the Restoration Engineer for all seeding materials:
1. Seed mix verification by way of certified mix labels from supplier in sealed seed mix bags. In addition, the Contractor shall submit a 1-pound bag of the seed for each seed mix for approval before any seeding operations.
  2. Equipment: Within 21 days of the Award of Contract, the Contractor shall submit catalog data sheets on all equipment to be used under this Contract.
  3. Product certificates for:
    - a. Mycorrhizal Inoculant
    - b. Cellulose Fiber mulch
    - c. Hydraulic Wood/Straw Fiber Mulch
    - d. Organic Tackifier
    - e. Straw Mulch

### **1.05 DELIVERY, HANDLING AND STORAGE**

- A. All commercially processed or packaged materials shall be delivered to the site in sealed bags or containers clearly marked to identify the item or materials.
- B. Fabric Materials:
1. Each roll of fabric material shall be wrapped with a material covering that will protect the fabric from damage due to shipment, direct sunlight, moisture, and storage.
  2. Supply fabric material in rolls, tagged with manufacturer or supplier name, product identification and indicating roll number and roll dimensions.

3. Handling of the materials on site shall utilize manufacturer-approved methods, such as forklifts, cables and slings. Materials shall be kept clean and free from damage prior to installation. Fabric materials shall be protected from direct sunlight, ultra-violet rays, temperatures greater than 140 degrees F, mud, dirt, dust and debris during shipment and storage. To the extent possible, the fabric shall be maintained wrapped in a heavy duty protective coating.
  4. At the time of installation, fabric shall be rejected if it has defects, rips, holes, flaws, deterioration or damage incurred during manufacture, transportation or storage.
- C. Seed Materials:
1. The seed mix shall be delivered to the project site in original sealed packages bearing the producer's guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material; bearing manufacturer's tags indicating "sell by" date. All tags shall be saved and submitted to the District.
  2. Inoculants, hydraulic wood/straw fiber mulch, tackifier and other materials shall be delivered to and stored on site in original unopened containers bearing the manufacturer's guaranteed analysis, name, trade-name, trademark and conformance to state law, and bearing name and warranty of manufacturer.
  3. The Contractor shall be responsible for storing and maintaining the seed in a cool, clean location away from moisture, contaminants, and rodents throughout the Construction Period. Seed shall be kept free of other seed sources such as weeds or agricultural products and shall not be stored where temperatures exceed 95 degrees Fahrenheit.

## **PART 2 – PRODUCTS**

### **2.01 BEST MANAGEMENT PRACTICES (BMPS)**

- A. The following is the minimum list of products for typical BMPs that the Contractor shall employ throughout the site for erosion and sediment control. The Contractor shall supplement this list as needed.
1. Stabilized construction entrance.
  2. Silt Fence: Woven filter fabric, UV resistant silt fence. Wooden or steel posts three (3) feet high minimum (does not include embedment).
  3. Fiber Roll: Fiber rolls shall be 9-inch diameter biodegradable straw wattle. Made from 100% weed-free agricultural straw wrapped in a biodegradable

woven jute net tube. The straw content shall be a minimum 2.88 lbs/linear foot and jute netting shall be a minimum of 1.28 oz/linear foot. At no time shall “Photodegradable” or “UV stabilized” material be used. The Contractor shall use 20-foot roll lengths, except where continuous shorter distances are encountered. The wattle shall be North American Green Sedimax-SWB9 or approved equal.

4. Erosion Control Fabric: Woven erosion control fabric constructed of 100% biodegradable materials with a 100% coconut fiber matrix and a functional longevity of approximately 48 months. The material shall be evenly wheel spun and uniformly twisted from well-cleaned 100% biodegradable natural organic coir woven into an approximate 2-inch x 2-inch mesh. Manufacturer: Belton Industries – Geocoir Dekowe 400, or equivalent.
5. Staples: Staples shall be Eco-STAKE, 100 % biodegradable "1"- shaped hardwood pin, 6-inches long, as manufactured by North American Green (1-800/772-2040), or approved equal. Greater lengths can be substituted if desired.
6. Twine: Twine shall be machine-spun bristle coir, biodegradable, a minimum thickness of ¼-inch in diameter, and with a minimum breaking strength of 100-pounds. It shall be capable of lasting a minimum of 3 years in-place when in contact with soil and water periodically throughout the year. Twine shall not stretch when wet.
7. Floating silt curtains (for isolating work from creek flow): Fabric shall be UV resistant, woven monofilament material, suitable for sediment trapping under moderate currents and tidal conditions. Curtains shall be bottom-weighted, minimum 5 feet high, and have overlapping seams. Layfield FSC, or approved equivalent.

## 2.02 SEEDING

- A. Native Seed Species Names: All native seed species names shall be true to botanical and common name and variety as indicated in:
  1. Hickman, J.C. (ed.). 1993. *The Jepson Manual: Higher Plants of California*. University of California Press. Berkeley, CA.
  2. U.S. Natural Resources Conservation Service. 2009. Plants Database. Available: <<http://plants.usda.gov>>. Last updated June 15, 2009.
- B. Seed Mixes: The native Riparian and Upland seed mixes shall be provided by the Contractor and shall be the same species, varieties, percentages, and seeding rates shall be as shown on the Drawings. Seed shall be pre-mixed by the supplier

before shipment to the project site. The seed mix shall not contain noxious weed seed.

1. Seeding rates in the seed mix tables on the Drawings assume seeding by hydroseeding. Any revegetation seed to be applied via a native grass drill seeder shall be applied at 1/2 the rates shown in the seed mix tables on the Drawings.
2. Seed mixes shall be state certified seed of specified species with no less than 90% purity and 80% germination rate with no more than 1.00% weed seed and guaranteed to be 100% free of prohibited and restricted noxious weeds identified in Section 52332 of the Food and Agriculture Code.
3. If any seed delivered to the site does not meet these Specifications Contractor shall immediately notify the Owner's Representative.
4. Wet, moldy, insect infested or otherwise damaged seed shall be rejected and removed from the project site and disposed of in a legal manner.

C. Inoculant shall consist of spores, mycelium, and mycorrhizal root fragments of arbuscular fungi in a solid carrier suitable for handling by hydroseeding or dry-seeding equipment.

1. The rate of application of endomycorrhizal inoculum shall be based on the guarantee of the supplier or the analysis returned by an independent laboratory and shall be a minimum of 3,600,000 propagules per acre.
2. Inoculant shall be endomycorrhizal biological inoculum manufactured by Mycorrhizal Applications or approved equal.

D. Cellulose Fiber Mulch

1. Cellulose fiber mulch shall be made from natural or recycled pulp fiber, such as wood chips, sawdust, newsprint, chipboard, corrugated cardboard, or a combination of these materials; and shall be free of synthetic or plastic materials, lead paint, printing ink, varnish, petroleum products, seed germination inhibitors, and chlorine bleach.
2. Cellulose fiber mulch shall be colored green to contrast with the area on which the fiber is to be applied. The coloring agent must be biodegradable, nontoxic, and free from copper, mercury and arsenic and must not stain concrete or painted surfaces.
3. Cellulose fiber mulch shall be Enviro-Fiber S100 or approved equal

E. Hydraulic Wood/Straw Fiber Mulch

1. Hydraulic Wood/Straw Fiber mulch shall be produced from annually renewable and certified weed-free rice straw, recycled paper, and other natural materials. Fiber mulch shall be free from plastic material, growth or germination inhibiting additives, or other non-biodegradable substances. Fiber mulch shall be of such character that the fiber will disperse into uniform slurry when mixed with water.
  2. Unless noted otherwise, Hydraulic Wood/Straw Fiber Mulch shall conform to Section 21-1.02E of the State of California Department of Transportation Standard Specifications.
  3. Hydraulic Wood/Straw Fiber mulch shall be FiberWood Hydraulic Straw/Fiber Blend mulch manufactured by Fiber Wood, LLC, or approved equivalent
- F. Tackifier shall be a concentrated, biodegradable, and an organic derivative of corn or other organic material.
1. Tackifier shall be non-toxic to plant and animal life, non-corrosive and non-crystalline, and be non-staining to concrete or painted surfaces., and shall conform to Section 21-1.02F of the State of California Department of Transportation Standard Specifications.
  2. Tackifier shall be Ecology Control M-Binder Tackifier or approved equal
- G. Straw Mulch: Straw mulch shall be mold-free, air-dry uncut straw, certified weed free.
1. The Contractor shall furnish evidence that clearance has been obtained from the County Agricultural Commissioner, as required by law, before straw obtained from outside the county in which it is to be used is delivered to the site of the work. Straw that has been used for stable bedding shall not be used.

## **2.03 EQUIPMENT**

- A. Drill Seeding Equipment: Mechanical seed drill shall be a Brillion type or equal rangeland drill seeder with a ring roller or light-duty roller attached. The seeder must be equipped with a fluffy seed box with agitators to prevent bridging and clogging of seed mix. The seed box must have metal row dividers and individual box adjustments to meter the seed flow.

## **PART 3 – EXECUTION**

### **3.01 GENERAL REQUIREMENTS**

- A. At a minimum, the Contractor shall install and maintain temporary erosion and sediment control measures in accordance with the SWPPP, manufacturer's

recommendations, as shown on the Drawings and as required by these Technical Specifications. In case of a conflict, the more rigorous installation requirements shall apply.

- B. Implement additional measures as needed to control erosion from exposed soil surfaces and to minimize sediment runoff from the project site. These measures shall be implemented and maintained throughout the construction and maintenance periods.
- C. During the construction period, the Contractor shall maintain onsite sufficient quantities of erosion and sediment control materials to be installed in the event that rain is forecast, and for rapid response to failures or emergencies. The Contractor shall consult the local weather forecast daily.
- D. If rain is forecast during construction, Contractor shall, at a minimum, secure all soil stockpiles by covering and/or installing a perimeter silt barrier.
- E. All temporary erosion control measures deemed necessary during the rainy period shall be installed by October 11<sup>th</sup>.

### **3.02 SILT FENCES**

- A. Silt Fences shall be used and installed as necessary during the project construction period as a temporary measure for sediment and erosion control.
- B. At a minimum, install silt fences to enclose soil stockpiles if rain is forecast.
- C. Install silt fence in accordance with manufacturer's recommendations and as described in the SWPPP.
- D. Silt fence placement and removal shall be coordinated and approved by the Restoration Engineer.

### **3.03 FLOATING SILT CURTAIN**

- A. Floating silt curtain shall be installed so it will not be disturbed by construction activities.
- B. The silt curtain shall be placed parallel to or at an angle to the direction of flow.
- C. The silt curtain shall extend the full depth of the water body. The curtain depth shall be 10% longer than the water depth (at the anticipated high water level) to ensure the curtain rests on the bottom.
- D. Both the top and the bottom of the silt curtain shall continue up onto the shore beyond the anticipated high water level. The bottom of the silt curtain shall be tapered to the shape of the shore.



### 3.04 EROSION CONTROL FABRIC

- A. At a minimum, erosion control fabric shall be installed as shown on the Drawings, and in supplemental locations as deemed necessary for erosion and sediment control.
- B. Prior to installation of fabric, area shall be seeded in accordance with this section and the Drawings.
- C. Install erosion control fabric in accordance with manufacture's specifications, including stapling, staking and securing ends with toe trench or equivalent.
- D. The Contractor shall maintain the areas covered with erosion control fabric until final Acceptance of the Work. Prior to final acceptance, any damaged areas shall be reshaped as necessary with the erosion control fabric satisfactorily repaired or replaced

### 3.05 SEEDING

- A. All areas shall be seeded with the same species, varieties, and percentages for the seed mix as shown on the Drawings.
- B. All areas, less than 3:1 slope shall be drill seeded. Slopes 3:1, or steeper shall be hydroseeded. The areas to be seeded shall not include the creek. Slopes shall be prepared by disking or harrowing to break up large clods and to smooth the surface. The seed bed shall be prepared at the time of completion of grading, soil moisture conditions permitting.
- C. Areas that are not feasible for drill seeder or hydroseeder will be broadcast seeded. The seed shall be broadcast onto the areas to be seeded, then raked in so that it is covered by approximately 1/8 inch of soil. Seed shall be broadcast by hand or by mechanical spreader onto the prepared soil surface. Following seeding, the seed shall be worked into the soil surface by hand raking or by chain dragging.
- D. Drill Seeding:
  - 1. Seed applied via a native grass drill seeder shall be applied at 1/2 the rates shown in the seed mix tables on the Drawings.
  - 2. Drill Seed in rows no greater than 8 inches apart and to a depth of 1/4 to 1/2 inch.
  - 3. Make a minimum of 3 passes in two different directions with at least 45° difference in angle of approach with drill seeding equipment to reduce uniform row appearance.
  - 4. All equipment used shall be calibrated to apply the specified pounds per acre of the seed mix for each seeding zone.

5. Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate, guarding against missed areas and excessive overlaps.
6. Contractor can apply seed using multiple passes on contour. Seed passes shall overlap by one (1) foot within seed mix zone, and may overlap no more than one (1) foot with other seed mix zones.

E. Hydroseeding

1. Hydroseeding shall include a two-step process starting with hydroseed slurry application and concluding with hydraulic wood/straw mulch and tackifier application.
2. Hydroseed Application: The specified seed mixes shall be applied in planting zones as identified on the Drawings. Seed shall be mixed in a hydroseeding machine with mycorrhizal inoculum and water for application in areas demarcated by the Contractor and approved by the Owner's Representative.
3. Hydroseeding shall be performed in accordance with the following application method:
  - a. Hydroseed slurry application (components and minimum rates specified)
  - b. Seed mix at rates shown on the Drawings.
  - c. Mycorrhizal inoculum (per manufacturers specifications at such rate as to apply a minimum of 3,600,000 propagules per acre)
  - d. Green dyed cellulose fiber mulch (500 lbs./acre paper mulch - tracer)
  - e. Water (to create an adequate slurry for hydraulic application)
4. Hydroseed slurry preparation shall be done on the job site and in the presence of the Owner's Representative. All specified ingredients except seed shall be added to the tank simultaneously so that the finished load is a homogenous mix.
5. Seed shall be added to the slurry mixture last and shall be discharged within 2 hours. Loads held over 2 hours will be recharged with ½ the seed rate prior to application.
6. Once fully loaded, the complete slurry mixture shall be agitated for 3-5 minutes to allow for uniform mixing.
7. The slurry shall be applied in a sweeping motion to cover all seeding areas with a uniform, visible coat, using the color of the mulch as a guide.

8. Hydroseed application should be adjusted and refined to avoid covering or spraying installed container plantings. Contractor shall be responsible for washing or otherwise cleaning excess material off all pavements, furnishings, and areas not intended to receive seed.
9. Hydroseeded areas shall be irrigated in accordance with the approved irrigation schedule until onset of seasonal rains.
10. Hydraulic Wood/Straw Fiber Mulch and Tackifier Application
  - a. Following hydroseeding, seeded areas shall be covered with a 2-inch layer of weed free hydraulic wood/straw mulch and tackifier using the following application method:
    - 1) Hydraulic wood/straw fiber mulch application (components and minimum rates specified):
    - 2) Commercially available weed-free wood/straw mulch (2,000 lbs./acre)
    - 3) Organic tackifier (150 lbs./acre)
    - 4) Water (to create an adequate slurry for hydraulic application)
  - b. Hydraulic wood/straw fiber much and tackifier slurry shall be applied over all hydroseeded and disturbed areas at a rate of 3,000 lbs./ac.
  - c. Hydraulic wood/straw fiber mulch and tackifier application shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until each area is covered. Mulch shall be distributed loosely and evenly, without clumping or piling
  - d. All ties from the straw mulch bales and seed bags are to be removed from the construction site before the start of the mulching operations.
  - e. Hydraulic wood/straw fiber mulch and tackifier application should be adjusted and refined to avoid covering or spraying installed container plantings or surrounding native vegetation.
  - f. Where hydraulic application of mulch is not appropriate due to risk of spraying over installed plantings or native vegetation, straw mulch shall be applied as described in Section 3.05 G, below.

F. Broadcast Seeding

1. Native seed shall be broadcast seeded with the at the rates specified on the Drawings along with a mycorrhizal inoculant at a rate of 3,600,000 propagules per acre. After seeding, all areas shall be harrowed or lightly raked to ensure proper seed to soil contact.

2. The Contractor shall broadcast all seed plus inoculant using cyclone, knapsack hand-operated or other broadcast type seeder whereby dry seed shall be uniformly distributed at the prescribed application rates. All equipment used shall be calibrated to apply the specified pounds per acre of the seed mix for each habitat zone. Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate, guarding against missed areas and excessive overlaps.
3. Contractor shall apply seed using multiple passes on contour. Seed passes shall overlap by one (1) foot within seed mix zone, and may overlap no more than one (1) foot with other seed mix zones.
4. Following broadcast seeding and after erosion control measures are in place, the Contractor shall mulch all broadcast seeded areas as specified in section 3.05 G of these Specifications, below with straw mulch.
5. Broadcast seeded areas shall be irrigated in accordance with the approved irrigation schedule until onset of seasonal rains.

G. Straw Mulch

1. Straw mulch shall be broadcast over all areas seeded vial drill seeding, broadcast seeding and over disturbed slopes greater than 10:1. Straw mulch shall be applied at the rate of 3,000 pounds per acre, and not more than 4000 pounds per acre, for an even distribution of mulch. Straw mulch shall be spread with a mechanical spreader, blown, or applied manually as appropriate.
2. Once spreading is complete, straw mulch shall be anchored to the soil with a standard commercial crimper which shall crimp the fiber four (4) inches or more into the soil. In areas inaccessible by mechanical spreading equipment, spreading and anchoring/crimping shall be performed manually.

H. Seeding and mulching operations shall not be permitted when wind velocities exceed 15 miles per hour or when the soil is saturated.

I. Areas to be seeded near and within driplines of existing vegetation to remain shall be seeded by hand-broadcast methods and these areas shall be hand-raked to cover the seeds. The Contractor shall use care to avoid damaging the root zone, the trunk, or any portion of vegetation to remain. During seeding operations, care shall be taken to avoid damaging existing facilities, vegetation to remain, or any other items on or around the erosion control areas.

### 3.06 MAINTENANCE

A. The Contractor shall regularly inspect, maintain and repair temporary erosion control measures throughout construction and the maintenance period. Inspect all

temporary erosion control measures when rain is forecast, and immediately following rainfall events. Inspect disturbed banks of the side channels and floodplain after storm events and monthly at a minimum.

- B. Following each event, remove accumulated sediment, repair any damage and install any additional measures as needed.
- C. The Contractor shall reseed sparse cover or bare areas with a modified seed mix according to the Restoration Engineer's direction, as needed.
- D. Follow all monitoring and reporting requirements per the SWPPP.

### **3.07 CLEANUP**

- A. Upon completion of the maintenance period, remove all materials and dispose of properly at approved offsite facility. Regrade and restore natural drainage patterns as needed at locations of disturbance and smooth grades and replace erosion control BMPs.

**\*\*\* END OF SECTION \*\*\***